COMMONWEALTH OF PENNSYLVANIA

COMMONWEALTH OF PENNSYLVANIA, STATE SYSTEM OF HIGHER EDUCATION, SHIPPENSBURG UNIVERSITY	:	BEFORE THE BOARD OF CLAIMS
VS.	:	
LYONS CONSTRUCTION SERVICES, INC. & LIBERTY MUTUAL INSURANCE COMPANY	:	DOCKET NO. 3916

FINDINGS OF FACT

I. General Background

A. *The Parties*

1. Shippensburg University of Pennsylvania of the State System of Higher Education ("the University"), located at 1871 Old Main Drive, Shippensburg, PA 17257, is a constituent part of the State System of Higher Education, a public corporation and government instrumentality under Act 188 of 1982, located at 2986 North Second Street, Harrisburg, PA 17110. (Statement of Claim at ¶ 1; Lyons Construction Company, Inc.'s Answer, New Matter and Counterclaim at ¶ 1; Liberty Mutual Insurance Company's Answer with New Matter at ¶ 1)

2. Lyons Construction Services, Inc. ("Lyons") is a Pennsylvania corporation with a principal place of business located at 5237 East Trindle Road, Mechanicsburg, PA 17050. (Statement of Claim at ¶ 2; Lyons' Answer, New Matter and Counterclaim at ¶ 2; Liberty Mutual Insurance Company's Answer with New Matter at ¶ 2)

3. Liberty Mutual Insurance Company ("Liberty Mutual") is a surety company, organized and existing under the laws of the state of Massachusetts, with a principal place of business located at 175 Berkley Street, Boston, MA 02117. (Statement of Claim at ¶ 3; Liberty Mutual's Answer with New Matter at ¶ 3)

4. Liberty Mutual is licensed to transact insurance business in the Commonwealth of Pennsylvania. (Statement of Claim at ¶ 3; Liberty Mutual's Answer with New Matter at ¶ 3)

B. *Description of the Project – Bidding*

5. In or around November 2005, the University solicited bids from prime contractors for Project Number SU-2003/12B (the "Project"), which involved the construction of a 64,000 square foot Student Recreation Center ("SRC") on the University's campus in Shippensburg

Township, Cumberland County, Pennsylvania. (Statement of Claim at ¶ 6; Lyons' Answer, New Matter and Counterclaim at ¶ 6; Liberty Mutual's Answer with New Matter at ¶ 6; N.T. 45; Ex. J-1)

6. The Notice to Contractors identified the overall Contract time allotted for the Project as 380 days from the issuance of the Notice to Proceed. (N.T. 55; Ex. J-1 SU0067500)

7. Lyons submitted a bid as general contractor for the Project on December 19, 2005, in the amount of $8,785,960.00. (Exs. J-5, J-36; N.T. 2485)

8. The general contractor bids were opened December 20, 2005, with Lyons being the apparent low bidder. (N.T. 2485)

9. The University issued Lyons a Notice of Award as general contractor for the Project and the two parties entered into a "Standard Form of Agreement Contract" on February 6, 2006. (N.T. 69; Ex. J-48)

C. *Project Schedule*

10. The Contract expressly stated that time was of the essence, providing as follows:

> i. The completion date for finishing all work is within 380 calendar days after the Notice to Proceed. The Contractor further agrees that time is of the essence for this contract, and that if he fails to complete the work within the time specified above or such extensions thereof, the Contractor shall pay to the System, as liquidated damages and not as a penalty for such failure, the amounts specified in the Contract Documents.

(Ex. J-5, SU054549)

11. The University issued the Notice to Proceed on March 27, 2006, setting the Contract completion date as April 10, 2007. (Exs. J-5, J-50; N.T. 73, 2498)

12. As general contractor for the Project, Lyons was responsible to develop a coordinated Contract schedule within 28 days of the Notice to Proceed with input from the other prime contractors. (Ex. J-1 p. SU006889; N.T. 77)

13. Other prime contractors on the Project were Herre Brothers, Inc. (electrical), W.G. Tomko, Inc. (plumbing), and Silvertip, Inc. (HVAC). (Ex. J-22.1)

14. Beginning on March 30, 2006, Lyons commenced a series of meetings and communications with the other prime contractors seeking each prime's proposed activities, activity durations, and schedule logic (predecessor and successor activities). The other prime contractors agreed to return the completed activity sheets to Lyons "as soon as possible." (Exs. J-22.1, J-52; N.T. 2501-02, 2503-04, 2506-07)

15. Initial submissions by the other prime contractors did not identify the primes' successor and predecessor activities and included proposed time frames which exceeded the Contract's 380 day total time frame. (Ex. J-52; N.T. 2503-04, 2506-07)

16. For example, Herre Brothers' submission included a list of activities with corresponding durations for each activity totaling 561 working days. (Ex. J-52, N.T. 2506-07)

17. By mid-May, the University expressed its concern over the lack of a Project schedule and, on May 17, 2006, issued the first of four Cure Notices to Lyons, citing Lyons' failure to submit "the required construction schedule" and alleging a "failure to progress with site work. . . ." (Ex. J-58)

18. Consequently, Lyons submitted an initial Project schedule on June 1, 2006, with a Project completion date of July 7, 2007, 63 working days beyond the Contract completion date of April 10, 2007. (Ex. J-66; N.T. 2508, 2511)

19. At a meeting on June 5, 2006, Lyons advised the University and the other prime contractors that the only way a consolidated schedule could be issued that would meet the Contract completion date would be if some of the other prime contractors' activities were overlapped. (Ex. J-72; N.T. 2512-14)

20. On June 9, 2006, the University issued a second Cure Notice, citing Lyons' "failure to provide a fully developed, signed construction schedule and [its] failure to progress with the site work. . . ." (Ex. J-71)

21. Following the meeting with the other prime contractors on June 5, 2006, Lyons submitted a schedule on June 11, 2006 (the "June Project Schedule"), which included overlapping of activities and an on-time completion date of April 10, 2007. Tomko and Silvertip signed off on the June Project Schedule within days. Herre Brothers ultimately signed off on August 28, 2006. (Exs. J-72, J-73, J-74, J-87; N.T. 482-83, 2038-39, 2514-15, 2520-24)

22. While Lyons was attempting to gain approval on a schedule for the Project from the other primes, Lyons and its excavation subcontractor, Justice Excavating, Inc. ("Justice"), had begun the initial site work on the Project on or about May 1, 2006. This included submitting required shop drawings and plans, layout of sedimentation ponds, installation of site and silt fences, the relocation of existing sanitary sewer lines, construction of new sanitary sewer lines, and other excavation cut-and-fill work. (Exs. J-22.3, J-22.4, J-22.5, J-22.7, J-86, J-87; N.T. 2529-32, 2536-37, 2542-46, 3582-84)

D. ***Micropile Foundation***

23. Prior to bidding on the Project, the University had retained the joint venture of Spillman Farmer/Gannett Fleming to design and act as administrative Professional ("the Professional") for the Project. (N.T. 43)

24. Gannett Fleming handled the civil design, structural design, and geotechnical design work for the Project. (N.T. 869)

25. Sara Frailey, a licensed professional engineer employed by Gannett Fleming, served as senior geotechnical engineer for the Project. (N.T. 867-69)

26. Gannet Fleming conducted a geotechnical investigation of the Project site for use in determining the building foundation design for the Project. (N.T. 873-76)

27. In conjunction with its investigation, Gannett Fleming prepared a report entitled "August 2005 Geotechnical Engineering Report" (hereinafter the "Gannett Fleming Geotechnical Report" or "GFGR"), for the purpose of summarizing its investigation of the Project's subsurface geology and providing for the structural designers' recommendations for foundation type and final design. (Ex. J-27; N.T. 44, 874-76)

28. Among other information, the GFGR contained a discussion of the desirability of various potential foundation types, and ultimately recommended a final design employing micropiles for the foundation of the SRC. (Ex. J-27 p. 5)

29. As general contractor for the Project, Lyons was responsible for the installation of the Student Recreation Center's foundation. According to the Project design specifications, this foundation was to be comprised of approximately 368 micropiles (each 7 inches in diameter) with pile caps as a base for the foundation to support a series of interconnected grade beams and/or footings, which in turn supported the SRC structure. (Exs. J-1, J-28, J-30, J-78, J-379, P-92, D-426)

30. The SRC design also incorporated a large slab on grade that had no building support function and was not, itself, supported by the micropile foundation. (N.T. 3999)

31. Micropiles are small-diameter, bored, grouted-in-place piles with steel reinforcement. (N.T. 871-72)

32. The micropile specifications in the Contract addressed the length of micropiles for the Project as follows:

> The overall length of a micropile will be selected such that the required capacity is developed by skin friction between grout and rock over a suitable length greater or equal to 10 feet of bond zone in competent rock. Competent rock is defined as limestone with minimal soil seams. Minimal soil seams are not to exceed 6 inches for any individual seam and a total of 12 inches over a 10 foot drilled length.

(Ex. J-1 p. SU007001)

33. The steel casing for the micropile is drilled and advanced concurrently with the drill bit and string. The casing and pile are advanced a specified distance into an acceptable rock

base i.e. the "bond zone") and then the casing is withdrawn for the required length of the bond zone so that the grout is directly in contact with the bearing material. (N.T. 871-73)

34. Micropile drilling and installation is considered to be specialty work and is performed by specialty geotechnical contracting firms. (N.T. 877, 1456)

35. On June 12, 2006, Lyons selected and entered into a subcontract with Structural Preservation Systems a/k/a Structural Group, Inc. ("Structural") to perform its micropile drilling and installation work on the Project. The total subcontract price was $1,506,460. (Ex. J-7; N.T. 2549-50)

36. Graham Smith, Structural's Geotechnical Division Manager, participated in meetings and authored the majority of correspondence on behalf of Structural during the Project. (N.T. 2964)

37. Lyons' bid on the Project included a unit price for micropile installation of $65.20 per lineal foot, which was based on the bid submitted to it by Structural. (N.T. 2477-78; Exs. J-34 – J-37)

38. The first four bidders for the general contract work for the Project all used the micropile unit price of $65.20 per lineal foot. (Ex. J-44; N.T. 285)

39. Structural's bid to Lyons identified its water supply requirements for the micropile work at 50 gallons per minute. (Ex.- J-34; N.T. 2478-79)

40. At a pre-installation meeting on May 1, 2006, Lyons identified to all in attendance that it would require water supply at a rate of 50 gallons per minute for the micropile drilling. (Ex. J-22.3; N.T. 254)

41. No representative of the University or the Professional objected to Lyons' water requirement at the May 1, 2006 meeting. (Ex. J-22.3; N.T. 254)

42. In accordance with the Contract's micropile specifications, Structural, through Lyons, provided a submission to the Professional on June 27, 2006, describing its intended work methods and procedures, including the fact that it intended to utilize a duplex drilling system with internal flush. (Exs. J-1, J-78; N.T. 255)

43. The internal flush drilling system identified by Structural in its submittal utilized the Numa Super Jaws Drill Bit System, a relatively new product suited to dealing with the pinnacles and soft soils to be encountered on the Project site. (Ex. J-78; N.T. 3873)

44. Structural's internal flush drill system with the Numa Super Jaws bit is specifically designed to minimize disturbance to the surrounding soils as it is intended to bring cuttings up and out through the drill casing between the inner and outer drill strings. (Ex. J-78; N.T. 3873; Board Finding)

45. The duplex drilling system employed by Structural utilized both air and water as flush media. (N.T. 1497)

46. The Professional approved this June 27, 2006 drilling submission from Lyons/Structural without objection. (N.T. 255-56)

47. Structural retained Dennis "Butch" Triplett at the beginning of the Project as a consultant to assist its drillers on the Project in working with the Numa Super Jaws System. (N.T. 3765-66)

48. Structural began mobilizing in late June and commenced drilling micropiles for the building foundation (referred to as "production piles") on July 7, 2006.[1] (Exs. J-11, J-12, J-13A, J-22.7, P-66, D-206; N.T. 2555, 3594)

49. On July 7, 2006, the University called a meeting with Lyons and Liberty Mutual at which the University expressed its concerns over Lyons' work schedule and what it considered to be Lyons' lack of progress on both site work and micropile installation. At this time, the University threatened to terminate Lyons' Contract. (Ex. J-86)

50. Almost immediately upon the commencement of micropile drilling, Structural began encountering problems with casings bending and drill hammers breaking. (Exs. J-11, J-12, J-13A, J-92; N.T. 963; Board Finding)

51. On July 18, 2006, the Professional reported that casings broke on five of the eleven micropiles drilled as of that date. (Exs. J-92, J-93)

52. The casings were subsequently tested and found to be consistent with the Contract specifications and appropriate for the job. (Ex. J-93; NT 3082-83)

53. On July 28, 2006, and August 2, 2006, Structural submitted to Lyons separate complaints concerning the depth of micropiles being drilled. Structural initially asserted that the micropile holes it had drilled to date were deeper than the average Structural had anticipated based on the Contract bid quantity of 22,300 linear feet for 378 micropiles.[2] Structural subsequently asserted that the Professional's field inspector was misinterpreting the Contract specifications for "competent rock" and requiring Structural to drill the micropiles deeper than required by the Contract specifications. [3] (Exs. J-99, J-103)

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[1] Structural drilled and grouted two reaction "anchor" piles for preliminary testing purposes on July 5 and 6, 2006. However, the first micropiles for the foundation (i.e. production piles) were commenced on July 7, 2006. (Exs. J-11, P-66, D-206).

[2] Structural's Graham Smith estimated the total number of micropiles anticipated on the Project to be 378. (Ex. J-99; N.T. 3455). However, the Project plans (Exs. J-28, J-379) show only 368 foundation piles originally anticipated for the Project, so we adopt the latter as more reliable. (F.O.F. 29)

[3] Structural also sent a fax to Lyons on August 24, 2006, complaining that "unanticipated subsurface voids" constituted "differential (sic) site conditions" which adversely impacted the micropile drilling. (Ex. J-128)

54. Lyons passed both complaints on to the University, which investigated and denied the claims. (Exs. J-102, J-106, J-107, J-114)

E. *Sinkholes*

55. On August 10, 2006, a sinkhole, approximately four to five feet in diameter, developed at the E-2 area of the Project site.[4] (Exs. J-379, D-206, p. 116; N.T. 2578-79)

56. A representative of the Professional observed the sinkhole. The Professional subsequently forwarded sinkhole repair recommendations to Lyons on August 15, 2006, with directions to proceed with the sinkhole remediation on a time and material basis. (Exs. D-206 p. 116, J-117, J-120)

57. The instructions for sinkhole repair provided by the University and the Professional on August 15, 2006 included excavation and backfill with rock and concrete. (Ex. J-117)

58. In addition to the sinkhole repair instructions issued on August 15, 2006, the University and the Professional directed Lyons/Structural to improve site grading to direct surface and flush water away from open holes, and to grout micropiles the same day they were drilled, as a means of lessening the possibility of sinkhole development. (Ex. J-117)

59. Structural reported a second sinkhole on August 17, 2006, which developed as the August 10, 2006 sinkhole repair was being completed. (Ex. D-206A, p. 6; N.T. 3611-14)

60. The repair of the sinkholes which developed August 10 and 17, 2006, required approximately five truckloads of concrete (50 cubic yards), and took until August 25, 2006 to complete. (N.T. 2582-85)

61. At a meeting on August 23, 2006, Lyons reported a total of five sinkholes that had developed on the Project site. (Ex. J-126; N.T. 2596-98)

62. In a letter dated August 25, 2006, addressed to Spillman Farmer, with copies sent to the University, Gannett Fleming, Liberty Mutual and ArroActiv (a consultant retained by the University to provide management and scheduling services for the Project), Lyons asserted that "voids and sinkholes that have become evident are causing delays" to the Project, causing safety concerns during drilling operations, and constitute "an unforeseen condition" for which Lyons requested "additional compensation for the additional costs." (Ex. J-129; N.T. 367)

63. Lyons' August 25, 2006 letter included the notification that the "additional time and costs cannot be determined at this time, but will be forwarded upon completion of the piles." (Ex. J-129)

[4] Areas of the Project site are frequently identified in this manner utilizing letter and number coordinates from Project design drawings. (Ex. J-379)

64. Lyons subsequently reported that additional sinkholes occurred August 25, 28 and 31, bringing the total number of sinkholes experienced on the Project to 8 by the end of August 2006. (Exs. J-128, J-129, D-206 pp. 123, 126)

65. At a September 5, 2006 meeting with Lyons and the University to discuss the sinkholes, Structural expressed concern over safety while continuing to complain that they were being required to drill deeper than anticipated. (Ex. J-132)

66. Structural also reported at this September 5, 2006 meeting, that it had used compaction grouting "to facilitate drilling" at 20 micropile locations. Following this meeting, Lyons brought on Jerry Schexnayder of URS Corporation as a micropile consultant. (Ex. J-132; N.T. 2602)

67. Compaction grouting is a process whereby holes of a smaller diameter than the micropiles are drilled and cementatious material is pumped into the ground to stabilize the area above and below the surface. (Ex. J-167)

68. On September 7, 2006, Structural reported to Lyons that it had encountered another sinkhole, "approximately 50 to 70 feet in diameter," which it claimed caused a drilling rig "to nearly sink into the earth along with our personnel." (Ex. J-137)

69. After the appearance of the sinkhole on September 7, 2006, Structural walked off the job. (Ex. J-137)

70. The following day, Lyons informed Structural that it could continue micropile drilling at other locations were there were no sinkholes, and stated that Structural's walkoff was "uncalled for." (Ex. J-138)

71. Lyons directed Structural to resume work by September 12. 2006. (Ex. J-143)

72. Lance Bryson, a University official, expressed the University's concern with Structural's action to Lyons and inquired as to whether Lyons had "another subcontractor available" to respond to the circumstances. (Ex. J-140)

73. On September 12, 2006, the University issued its third Cure Notice to Lyons, again threatening to terminate Lyons for default and asserting, inter alia, that Lyons' "continuing failure to progress with the site work, especially micropile production, is a breach of [Lyons'] duties under [the] Contract." (Ex. J-147)

74. The University also included in its third Cure Notice a response to Structural's "differing site conditions" claims, denying the existence of a differing site condition and stating that Structural's "means and methods are ineffective and indeed are causing many of the problems" complained of. The University specifically cited "ineffective flush water management" and the lack of an approved flush water management plan. (Ex. J-147)

75. Structural did not resume work by Lyons' September 12 deadline. Instead, Structural informed Lyons at this time that it considered the work site unsafe due to the series of sinkholes occurring on the Project and would not resume work unless and until "a thorough investigation and subsurface stabilization program is completed." By this demand, Structural meant a program of proof drilling and compaction grouting performed by Structural to begin under the SRC footprint and extend as Structural deemed necessary. (Exs. J-149, J-154; Board Finding)

76. By separate communications on September 12, 2006, Structural also indicated it would not return to work until it received payment of its first invoice, which Structural asserted was due August 25, 2006.[5] (Ex. J-146)

77. On September 13, 2006, Structural sent Lyons a change order proposal to perform the aforementioned proof drilling and grouting at "locations within the building footprint to further evaluate the potential for sinkhole development or other karst-related hazards" that Structural insisted upon before it would return to work on the Project. (Exs. J-149, J-154)

78. Under threats of termination from the University and work stoppage from Structural, Lyons approved Structural's proposed change order in a letter dated September 14, 2006, directing Structural to resume work by September 18, 2006. (Ex. J-154; N.T. 2621-22, 2849, 2853-58, 2949)

79. Structural brought in drills for proof drilling and compaction grouting on September 15, 2006, and commenced both compaction grouting and micropile drilling on September 18, 2006. (Ex. J-206 pp. 137-138)

80. On September 22, 2006, Lyons submitted to the University a plan for additional flush water management as well as Structural's plans for compaction grouting on the Project. In this submission, Lyons noted the University's refusal to pay for this proof drilling and compaction grouting and stated it was proceeding with this activity under protest. (Ex. J-167)

81. In response to Lyons' September 22, 2006 submission, Mr. Bryson wrote that Lyons' compaction grouting plan "appears acceptable" and the "water management plan appears acceptable except that post construction annulus grouting is not required." (Ex. J-166)

82. In a letter dated October 6, 2006, the University informed Lyons that the Professional had reviewed the compaction grouting and water management plans and stated that compaction grouting, "not directed otherwise by the contracting officer in advance," was not required but was part of Lyons' means and methods. The University therefore reaffirmed its position that it would not make payment for compaction grouting. (Ex. J-186)

83. The University never assented to Lyons' slow Contract work performance and informed Lyons in its October 6, 2006 letter that "[d]ue to continued lack of production of the

[5] Lyons protested to Structural that it had not received an invoice from Structural at that time despite Structural's assertion. The Board could find no evidence in the record of this invoice. (Exs. J-146, J-149; Board Finding).

micropiles, the University is holding its decision on the September 12, 2006 Cure Notice in abeyance." The September 12, 2006 Cure Notice had cited, inter alia, Lyons' failure to progress the site work, especially the micropiles, as a breach of Lyons' Contract duties. (Exs. J-147 J-186)

84. Between September 18 and November 7, 2006, Structural continued both compaction grouting and micropile drilling while continuing to encounter additional sinkholes. (Exs. J-22.13, J-22.14, J-22.15, J-22.16, J-178, J-189, D-206 pp. 170, 171, 174)

85. On November 7, 2006, another sinkhole developed on the K-4 line, between Piles 173 and 174. This sinkhole nearly trapped one of the construction workers on the site when an employee of Justice Excavating fell into the sinkhole as it developed but was eventually able to jump out and escape. (N.T. 3640-43, 3907-09)

86. The November 7, 2006 sinkhole developed at an area where the micropiles had already been installed and where the area was then being excavated in preparation for the pouring of the pile caps. (Exs. J-209, J-211; N.T. 3907-08)

87. The sinkhole which developed on November 7, 2006, was approximately 4' to 5' wide initially, but continued to grow throughout the day. It eventually measured approximately 20' in diameter. (N.T. 3643, 3907-12, 3949-50, 3961)

F. *Sinkhole Dispute Resolution*

88. On November 8, 2006, the Professional directed Lyons to excavate and backfill the November 7, 2006 sinkhole "in accordance with the sinkhole repair detail provided on August 15, 2006." (Ex. J-211)

89. On November 8, 2006, Structural notified Lyons that it believed the Professional's recommendation to excavate and backfill the November 7, 2006 sinkhole was a "reactionary" solution which would not adequately protect workers' safety. Structural recommended that "pretreatment" in accordance with Lyons' compaction grouting change order request be authorized by the University. (Ex. J-213)

90. Structural also stated that it would "stop work due to life safety conditions" unless Lyons acted in accordance with Structural's recommendation. (Ex. J-213)

91. On November 9, 2006, Structural advised Lyons that it had stopped micropile production to proceed with compaction grouting, declaring that "the site is currently in an unsafe condition due to the potential for sinkholes." (Ex. J-214)

92. On November 9, 2006, Lyons notified the University that it considered the November 7 sinkhole repair to be a compensable delay to the Project and requested a change order "to compensate Lyons for ... the time and costs related to the additional compaction grouting on the site," which it considered "not a means and method issues (sic), but is a required safety & feasibility activity due to the differing site conditions." (Ex. J-215)

93. Lyons also requested that the University fully investigate the asserted "differing site conditions" and issue a change order to pay for compaction grouting. (Ex. J-215; N.T. 2876-77)

94. Also on November 9, 2006, Justice Excavating notified Lyons (who in turn notified the University) that Justice would not send its employees to the job site until the threat of sinkholes had been resolved to Justice's satisfaction. (Ex. J-215)

95. In response to Justice's and Structural's stated intentions to stop working, Lyons directed Structural to proceed with additional compaction grouting to provide an access road to the November 7, 2006 sinkhole area. (Ex-J-214; N.T. 2664-65)

96. On November 15, 2006, Sara Frailey, writing for Thomas Long of the Professional, sent Lyons a letter in which she denied Structural's earlier contention that the difficulties it had encountered in drilling and casing installation constituted a changed condition, but acknowledged that the "number and extent of sinkholes" in the area of the November 7 sinkhole "is greater than we would have expected based on information available during design." (Ex. J-219)

97. Ms. Frailey's November 15, 2006 communication continued, stating that the cost for repair of sinkholes that develop during construction is "the Owner's [the University's] responsibility as a changed condition." (Ex. J-219)

98. Lyons had requested in its November 9, 2006 letter that a meeting be held with the University, Structural, and their respective consultants to review the sinkhole situation. (Ex. J-215; N.T. 2877)

99. That meeting was held November 16, 2006, and attended by representatives of Lyons, Structural, the University, the Professional, ArroActiv, Liberty Mutual and its consultant, URS Corporation. (Exs. J-220, J-221; N.T. 1046-47; 2666-67)

100. Separate meeting notes of the November 16, 2006 meeting were prepared by the Professional (Ex. J-220) and Structural (Ex. J-221). (Exs. J-220, J-221)

101. At the November 16, 2006 meeting, Barry Lyons, Graham Smith of Structural, and Paul Schraff representing Liberty Mutual all expressed concerns that sinkholes presented a threat to workers' safety on the Project site. (Exs. J-220, J-221)

102. At the November 16, 2006 meeting, Mr. Lyons asserted that the sinkholes throughout the Project site were a "changed condition" as they were not reported in the contract documents. Mr. Schraff, for Liberty Mutual, stated that "'differing' site conditions" were causing the sinkholes. (Ex. J-220)

103. At the November 16, 2006 meeting, Mr. Smith, of Structural, stated that the whole Project site "was suspect" for sinkhole development and estimated that it would cost

between $1,000,000 and $3,000,000 for compaction grouting to stabilize the site. (Ex. J-220; N.T. 3517)

104. At the November 16, 2006 meeting, Mr. Lyons stated that "blanket grouting" was the only method available to them to make the site safe from sinkhole development for workers on the Project. (Ex. J-220; N.T. 1351, 3444, 3446)

105. At the November 16, 2006 meeting, Paul Lewis of Gannett Fleming stated that the extent of sinkhole activity in the northwest corner of the Project site was greater than had been expected and that sinkholes were a "changed condition" for which the University would pay the cost of remediation. (Exs. J-220, J-221; N.T. 1330)

106. At the November 16, 2006 meeting, Mr. Lewis, however, also stated that the compaction grouting proposed by Lyons and Structural was excessive and unnecessary. He suggested alternative measures to address worker safety in areas of sinkhole development such as crane mats, as well as preliminary test excavation, surface compaction and proof rolling. (Exs. J-220, J-221; N.T. 1324-25)

107. At the November 16, 2006 meeting, Mr. Smith rejected Gannett Fleming's suggested alternatives to compaction grouting as "reactive" and inadequate to make the site safe. (Exs. J-220, J-221)

108. At the November 16, 2006 meeting, Mr. Lewis stated that the Professional was willing to meet with the other parties to discuss the sinkhole problems. However, such a meeting never occurred. (Exs. J-220, J-221; N.T. 3713)

109. At the November 16, 2006 meeting, Mr. Lewis also stated that Lyons'/Structural's water management was defective and that they were allowing surface water to flow into the sinkholes exacerbating the sinkhole problem. This claim was disputed by Mr. Lyons and Mr. Smith. (Exs. J-220, J-221)

110. It was agreed at the November 16, 2006 meeting that Lyons would submit a request for information (RFI) to ask the Professional for suggestions on how to make the site safe. (Exs. J-220, J-221)

111. At the November 16, 2006 meeting, Mr. Lyons concluded that he would file a claim for the cost of delays and compaction grouting due to the asserted "changed site condition and voids." (Exs. J-220, J-221)

112. On November 17, 2006, Lyons submitted RFI # 51 to the Professional in which Lyons requested that the Professional identify alternative methods to compaction grouting to address the safety issues discussed at the November 16, 2006 meeting. (Ex. J-223)

113. Lyons also stated in RFI # 51 that it anticipated completing compaction grouting "for the access to the sinkholes at piles 173/174" by November 22, 2006. (Exs. J-21.51, J-223)

114. Lyons also sent a separate letter to the University on November 17, 2006, requesting that the University "fully investigate the differing site conditions and provide the requested direction." (Ex. J-224)

115. Sara Frailey of Gannett Fleming prepared a response to RFI # 51, in which she stated as follows:

- Lyons should follow the directions given November 8, 2006 (Ex. J-211), that Lyons excavate and backfill the November 7, 2006 sinkhole in accordance with the sinkhole repair detail provided on August 15, 2006.
- Gannett Fleming "does not approve or recommend compaction grouting throughout the site for geotechnical design/foundation support."
- "The expression of a void at the ground surface is the only changed condition that was acknowledged by Gannett Fleming at the 11-16-06 meeting."
- "Gannett Fleming suggests that an expedient approach for arriving at a reasonable solution for the safety concerns would be to involve OSHA in a proactive role by requesting that they examine the site and observe site operations."

(Ex. J-21.51)

116. In a separate letter dated November 20, 2006, Gannett Fleming informed Lyons again that the only "changed condition" which they acknowledged was "the expression of a void at the ground surface" and reiterated the previous sinkhole repair recommendations. (Ex. J-226)

117. Pursuant to Gannett Fleming's response to RFI # 51, Lyons contacted OSHA and spoke with a "general duty officer" there. This person directed Lyons to PA/OSHA, since there was no identified violation on the Project site at the time. (N.T. 2674)

118. PA/OSHA is an independent consultation firm, associated with Indiana University of Pennsylvania. It works with contractors on workplace safety issues. It is a separate entity from the federal Occupational Safety and Health Administration ("OSHA"), (Exs. J-245, J-247; N.T. 2222)

119. A representative from PA/OSHA conducted a site visit on November 29, 2006, meeting with Barry Lyons, Lyons' superintendant Bill Cressler, and Andy Stock of Structural (Ex. J-247; N.T. 2675, 2678)

120. During the November 29, 2006 site visit, the PA/OSHA representative viewed the site, asked questions about the operations and reviewed photos and logs of past experiences with sinkholes on the Project. As a result, the PA/OSHA representative advised Mr. Lyons that there was an imminent danger on the site and that Mr. Lyons, as employer, had a duty to either remediate the imminent danger or remove his employees from same. At this meeting with the PA/OSHA representative, it was determined by Mr. Lyons that the safe areas on the Project site were those areas which had been compaction grouted and that the remaining areas were unsafe. (Exs. J-237, J-239; N.T. 2675-78)

121. As a result of this meeting, Mr. Lyons was required by PA/OSHA to sign a document to the effect that he would remove his people from the unsafe area until the danger

was remediated. Promptly following this meeting, Lyons placed yellow caution ribbon around portions of the Project work site deemed "unsafe" (i.e. the ungrouted area). (Exs. D-206 p. 192, D-421; N.T. 2675-78)

122. Lyons followed up the next day, November 30, with a letter to the University explaining what happened as a result of the site visit by PA/OSHA. (Ex. J-237; N.T. 2678-2679)

123. While stating that a "representative of PA/OSHA" had visited the site on November 29, Lyons also wrote that "OSHA [had] determined that the existing site conditions... present an imminent danger to workers on the site." (Ex. J-237)

124. Lyons continued, writing that "OSHA" had "advised Lyons that the site had to be shut down with the exception of the pregrouted [compaction grouted] areas or safe zones." Lyons noted that the "safe zone" represented "only a small area of the overall project site . . . between the elevator shaft to micropiles 173 and 174 and the same area between column lines 7 and 10." (Ex. J-237)

125. Lyons added that it and its subcontractors would continue working in the "safe zone," performing sinkhole remediation and micropile work once the remediation is completed. (Ex. J-237)

126. On December 4, 2006, the University's Mr. Bryson notified Lyons in an email that Lyons' "decision to shut down the job site" was "unacceptable" and threatened to initiate default action unless Lyons provided a "legitimate reason" for its actions or returned to work. (Ex. J-245)

127. On December 5, 2006, PA/OSHA issued a report, which Lyons forwarded to the University on December 8, 2006. (Ex. J-247; N.T. 2224)

128. In its report, PA/OSHA found that "randomly occurring sinkholes" presented an "imminent danger to workers" at the site, and recommended that Lyons correct the imminent danger situations immediately or remove employees from the danger area [underlining in the original]." However, the PA/OSHA report offered no suggestions on how to "correct" the sinkhole problem. (Ex. J-247)

129. The PA/OSHA report also recommended that the site must be evaluated by a professional engineer or otherwise qualified individual to certify that onsite activity can resume given the nature of the work and geologic characteristics of the site. However, it also stated that construction-related activities (e.g. surface water management/drainage, use of remediation techniques, soil treatment, etc.) are appropriate and effective. (Ex. J-247)

130. PA/OSHA, in its report, also recommended that the contractor and owner should use a mediator if they could not agree on the best procedures to follow to minimize further delays and costs. (Ex. J-247)

131. The report noted that following the inspection, Lyons "immediately removed all employees from the work area where sinkholes have been documented and areas where [Lyons] believed the possibility of additional sinkholes would occur." (Ex. J-247)

132. The drilling of new micropiles was significantly restricted after the PA/OSHA visit on November 29, 2006, while Lyons and its subcontractors continued to perform other work, including compaction grouting and excavating and backfilling sinkholes. (Exs. J-22.18, P-65, P-66, D-206; Board Finding)

133. The series of sinkholes occurring on the Project caused Structural and Lyons to express concern for the safety of the drillers and other personnel on the Project. This concern was communicated by Lyons to the University as early as August 25, 2006 and continued through its presence on the Project. (Ex. J-129; Findings of Fact ("F.O.F.") 55-132; Board Finding)

134. On December 13, 2006, Lyons formally requested that the University and its design team "investigate the site and issue a written directive on how the university intends to make the project site safe to permit us to continue with our work in all areas." (Ex. J-252)

135. On December 14, 2006, the University issued a letter suspending the work of Lyons' micropile subcontractor "to allow sufficient time to more fully investigate the situation." (Ex. J-255)

136. In response to the University's suspension order, Structural demobilized two of the three drilling rigs it had on site. (Ex. J-264; N.T. 4552-53)

137. The University conducted its site investigation and presented its findings in a 13-page letter to Lyons dated January 29, 2007, concluding with a Notice to Cure addressed to Lyons. (Ex. J-287)

138. The University's January 29, 2006 letter began with a recitation of "Factual Background," which included the following:

- The University initially declared that Lyons had been "behind schedule" on the Project from the outset, submitting its required project schedule "two months late" and only after the University issued its first cure notice.
- Once micropile installation had finally begun, the University asserted, Lyons' and Structural's "rate of progress was glacial."
- Noting that Lyons had initially rejected Structural's claim in September 2006 that steeply pinnacled rock presented an "unexpected site condition" which was delaying the micropile drilling, the University set forth the Professional's conclusion that pinnacles should have been expected from disclosures in the Professional's geotechnical report, and Structural's decision to use compaction grouting to aid in the drilling was not compensable as means and methods.
- With respect to the sinkholes which developed during micropile installation, the University acknowledged the Professional's concession that "a void at the ground

> surface" constituted a compensable "changed condition", while asserting that the sinkholes "may [have been] the result of poor control and management of surface and flush water on-site."

(Ex. J-287)

139. The University next addressed the PA/OSHA report. (Ex. J-287)

140. The University asserted that Lyons' November 30, 2006 letter to the University was misleading to the extent that Lyons had stated that "OSHA" had determined that the site presented "an imminent danger" to workers.[6] (Ex. J-287)

141. The University also called the PA/OSHA report "unclear, inconsistent or plainly inaccurate." (Ex. J-287)

142. The University noted that it was uncertain from the PA/OSHA report exactly what portion of the site comprised the "danger area," and that the "precise nature, extent and cause of the imminent danger" was not defined in the report. (Ex. J-287)

143. The PA/OSHA report did state that the site should be re-evaluated by a registered professional engineer "to determine whether and under what circumstances future onsite construction" should resume, the University wrote. (Ex. J-287)

144. The University went on to describe the results of its investigation. (Ex. J-287)

145. The University said it retained Advantage Engineering ("Advantage") and The Traylor Group ("Traylor"), "to conduct additional investigation of the site conditions, and to review [Structural's] drilling means, methods and production." (Ex. J-287)

146. Advantage, the University stated, conducted "Electronic Resistivity" testing at the site and concluded that, while "no evidence of caverns, air-filled voids, or sinkholes" were found, the "carbonate geology" of the site "is subject to solution activity and the development of voids and fractures in the bedrock." (Ex. J-287)

147. The Advantage report, the University continued, specifically cautioned that care should be taken during construction to ensure that surface water is directed away from low lying areas to address the potential for solution activity. (Ex. J-287)

148. The Advantage report did not, however, identify any deficiencies in Structural's micropile drilling means and methods or its management of flush or surface water. (Ex. J-287)

[6]Lyons' November 30, 2006 letter clearly identified PA/OSHA as the entity that conducted the site visit. Subsequent references in the letter to findings by "OSHA" do not appear to have been made to intentionally mislead the University, and we do not believe the University, which received a copy of the PA/OSHA report, was actually misled by this error. (See: Exs. J-237, J-247; Board Finding)

149. The University reported that Traylor agreed with Advantage's findings, but, in addition, was critical of Structural's "excessive use of flush water" which Traylor believed "disturbed the geologic stability of the site." (Ex. J-287)

150. Both the Advantage and the Traylor reports were appended to the University's January 29, 2007 letter. (Ex. J-287)

151. The Traylor report asserted that Structural's "aggressive use of water as a flushing medium" was a material cause of the sinkholes which developed on the Project site. (Ex. J-287)

152. While noting that Structural's micropile drilling techniques and equipment, which had been submitted to and approved by the Professional, were appropriate, Traylor asserted that Structural, in practice, used more water than was appropriate in the drilling process. (Ex. J-287)

153. The University's January 29, 2007 letter also addressed Lyons' and Structural's claims that their work was delayed by changed or unforeseen site conditions. The University asserted that neither existed. (Ex. J-287)

154. The University also rejected an assertion by Lyons that the University improperly withheld a July 2002 geological report prepared by David Blackmore and Associates ("Blackmore Report") for the University's Performing Arts Center (which had been built earlier on a piece of land adjacent to the Project). Lyons, by this time, had discovered the Blackmore Report and had asserted, inter alia, that the Blackmore Report had provided more detailed information about pinnacles and potential sinkhole activity in the area than did the Gannett Fleming Geotechnical Report for the SRC Project, and that this Blackmore Report should have been provided or referenced to bidders on the SRC Project. (Ex. J-287)

155. The University's January 29, 2007 letter concluded with a Notice to Cure, directing that Lyons do the following:

- Resume micropile installation within 10 days;
- Upon resumption of work, "correct the excessive use of flush water and poor surface water management" identified in Traylor's report; and
- "[C]ure the deficiencies in the micropile installation and abate all safety hazards associated therewith."

(Ex. J-287)

156. The University's January 29, 2007 letter concluded that, if Lyons did not "recommence the micropile installation work, cure the deficiencies therein, and employ appropriate safety measures" within the specified time frame, "the University will terminate the contract pursuant to Article 13.2." (Ex. J-287)

157. In response to the University's January 29, 2007 letter, Lyons and Structural began to remobilize with the intention of resuming micropile drilling by February 7, 2007. (N.T. 2686)

158. In the two weeks following the University's January 29, 2007 letter, Lyons completed the following work:

- Laid out micropiles to drill;
- Brought in an office trailer and equipment for micropile drilling;
- Set up a drill rig and ran water and air lines to same;
- Insulated the water lines;
- Dug ditches for water runoff;
- Probed the site with a backhoe for sinkholes between the 7 and 10 line; and
- Received five trailer loads of structural steel which it stored on campus.

(Ex. J-22.23)

159. Although it was not included as part of the University's January 29, 2007 Cure Notice, ArroActiv shortly thereafter requested that Lyons provide a "recovery schedule" reflecting how it intended "to recover lost time on the micropile installation." (Ex. J-22.22)

160. Although it was not included as part of the University's January 29, 2007 Cure Notice, Paul Caracciolo of ArroActiv, on February 6, 2007, notified Lyons that Thomas M. Long, P.E., Deputy Project Manager for the Professional, had requested that a meeting be held before the recommencement of micropile drilling, and that Lyons "resubmit the micropile submittal" and address the following questions posed by the Professional:

- What changes will be made to the equipment and micropile construction procedure to reduce the amount of flush water used during drilling for micropile installation?
- What changes will be made to the plan for surface and flush water management to provide for more consistent and effective control of surface water?

* * *

- What specific procedures will be undertaken to address the potential for additional sinkhole development as described in the Traylor LLC report? What specific measures will be used to enhance site safety?

Mr. Long also included a request that Lyons address how the "capacity and quality" of seven ungrouted micropiles be verified, and how Lyons intended to assure that the Contract requirement that micropiles be grouted the same day they are drilled would be met in the future. (Ex. J-294)

161. Lyons and the University or its agents subsequently exchanged a series of letters prior to the meeting requested by ArroActiv. This meeting eventually occurred on February 12, 2007. (Exs. J-297, J-301, J-303, J-306; N.T. 2691-96)

162. On February 7, 2007, Lyons submitted to ArroActiv a response to the Professional's February 6, 2007 letter, stating that it was prepared to recommence micropile drilling. This letter also stated, inter alia, that:

- Though Lyons and Structural were prepared to recommence micropile drilling, the late timing of the Professional's request for additional submissions precluded the preparation of these additional submissions by February 8, 2007;
- Lyons disputed Traylor's assertions that over 600,000 gallons of water had been used on the site and that Lyons/Structural's means, methods and equipment, which Traylor had found to be appropriate, caused the sinkholes;
- Neither Lyons nor Structural intended to make changes to the means, methods and equipment they had been utilizing, though they intended to implement certain changes to the previously submitted and approved water management plan, including additional efforts to monitor and report water usage and potential sinkhole development three times per day; and
- Lyons intended to improve safety by using rolled stone pads (proof rolling) as recommended by Traylor, but rejected the suggestion that crane mats be used because of Lyons' concern that ice would form on the mats creating a greater safety hazard.
- Lyons remained willing to discuss these issues in further detail.

With respect to questions posed by Mr. Long about certain micropiles which had not been grouted, Lyons requested more detailed information in order to prepare a response.
(Ex. J-297; N.T. 2693-96)

163. On February 8, 2007, in response to Lyons' February 7, 2007 letter to ArroActiv, Mr. Bryson of the University directed Lyons to advise the University what steps Lyons was going to take to prevent sinkhole formation if it was not going to "change the quantity of flush water usage." (Ex. J-301)

164. Lyons submitted its formal response to the University's January 29, 2007 Cure Notice on February 8, 2007 (addressed to Deborah K. Martin), in which it addressed various points raised by the University as follows:

- Lyons disputed its water usage was excessive, noting that the amount of water actually used averaged "approximately six gallons per minute."
- Lyons specifically disputed Traylor's assertion that more than 600,000 gallons of water was used for the micropile drilling.
- Lyons noted that Traylor acknowledged that the drilling technique and equipment used had been approved by the Professional and was appropriate for the Project.
- Lyons restated its claim that "the actual conditions . . . encountered differ materially from those indicated in the bidding documents," particularly when compared to the conditions described in the 2002 Blackmore Report prepared for the adjacent IAF project.
- Lyons asserted that the 2006 Gannett Fleming Geotechnical Report "misled the bidder as to the conditions" which would be encountered on the Project, amounting to possible "constructive fraud" on the bidders.

(Ex. J-303)

165. Lyons sent a second letter to University (addressed to Mr. Bryson) on February 9, 2007, in which it clarified that, while it believed that no changes to the previously approved micropile drilling methods and water management plans were necessary, it nevertheless intended to: 1) closely monitor water usage; 2) utilize a reporting form to review both safety and water management "multiple times each day;" 3) assign workers to maintain diversion channels to drain the site following drilling each day; and 4) initiate proof rolling for working pad areas "as necessary." Lyons also emphasized its desire to work and cooperate with the University going forward, and specifically requested approval to restart micropile drilling. (Ex. J-306; N.T. 2691-92)

166. At the February 12, 2007 meeting, Lyons stated that in the next two weeks it anticipated that it would continue "drilling and compaction grouting when allowed." Lyons also stated that it would respond to the Professional's request for a detailed micropile resubmittal within 48 hours and reiterated that it was not Lyons'/Structural's intent to perform compaction grouting "site wide." (Ex. J-22.23)

167. Also on February 12, 2007, the Professional requested by letter very detailed and specific information concerning Lyons'/Structural's micropile drilling means and methods, compaction grouting plan, and schedule. (Ex. J-312)

168. In an attachment to its February 12, 2007 letter, the Professional directed Lyons to submit an equipment list, a description of specific methods for drilling overburden and rock, "preventing damage to overburden due to flushing of spoil" and containment and management of spoil, grouting of micropiles, both "primary" and "beyond primary," grout mix design, and method for determination of adequate grout coverage in the bond zone. With respect to the compaction grouting plan, the Professional asked for a similar description of specific methods for drilling overburden and rock, preventing damage to overburden due to flushing of spoil, and management/containment of spoil. The Professional also directed that Lyons' submission include additional specific information on micropile grouting and a schedule going forward. (Ex. J-312)

169. On February 15, 2007, Lyons submitted a 106 page response to the Professional's February 12, 2007 request which included micropile drilling and grouting documents and a surface water management plan previously submitted and approved by the Professional, a revised compaction grouting plan, and other planned steps to improve site safety, monitor water usage and better control surface water. (Ex. J-316; N.T. 584-87, 2691-2700)

170. In addition to the previously submitted surface water management plan, Lyons indicated in its February 15, 2007 submittal that it intended to utilize stone berms to contain spoil, free-up a crew to perform additional cleanup and removal of spoil from drilling areas, and employ proof-rolling to provide a safe platform for drillers and other subcontractors, all in addition to more rigorous water usage monitoring, reporting and inspection as previously proposed by Lyons in correspondence dated February 7, 2007. (Exs. J-297, J-316 p. 90; N.T. 2691-2700)

171. Lyons'/Structural's revised compaction grouting plan described compaction grouting being performed in areas around micropiles, which Gannett Fleming and the University understood to be an intention to grout everywhere micropiles were to be installed. (Exs. J-316, J-318; N.T. 1123-25)

172. On February 19, 2007, ArroActiv (Mr. Caracciolo) forwarded to Lyons Gannett Fleming's comments to Lyons' February 15, 2007 submittal. Mr. Caracciolo requested that Lyons "address all deficiencies" cited in Gannett Fleming's comments. In particular, Gannett Fleming's comments included dissatisfaction with Lyons' micropile drilling submission, stating that "no information was provided addressing methods for preventing damage to overburden due to flushing of spoil," and with respect to micropile grouting, that "[n]o method for determination of adequate grout coverage in bond zone was provided." (Ex. J-321)

173. Lyons submitted a reply to Gannett Fleming's comments on February 21, 2007. In it, Lyons stated that it was its, and Structural's, intent "to be prudent in the drilling to limit any potential damage to the overburden" due to micropile drilling operations, but individual conditions encountered would each require a different response, and "[v]olumes could be written for each condition." Lyons further stated that it would have its consultants (Jerry Schexnayder of URS, Rudolph Frizzi of Langan Engineering, and hydrologist Jim Lolcama) available to meet with the University and the Professional to answer any questions in this regard. Lyons also addressed its procedure for cleaning and grouting of the bond zone. Lyons' February 21, 2007 submittal also addressed compaction grouting, supplementing its February 15, 2007 plan by stating that "additional holes may be added" based on observations on site, "depending on safety concerns." (Ex. J-324; N.T. 3489-91)

174. The University scheduled a meeting for February 22, 2007, with Lyons, Structural, the University, the Professional, and ArroActiv, to discuss Lyons' micropile installation plans and recovery schedule. (Ex. J-321)

175. Structural's Graham Smith testified that, as of the February 22, 2007 meeting, Structural was willing to resume micropile drilling but was not willing to do so without compaction grouting. (N.T. 3360)

176. Also at the February 22, 2007 meeting, Lyons distributed a recovery schedule projecting a completion date for the Project of approximately mid-November 2007. (Ex. J-325; N.T. 2704)

177. Lyons subsequently agreed to amend its recovery schedule to address concerns raised by ArroActiv at this meeting about sequencing and durations for compaction grouting and micropile drilling. Lyons submitted its final recovery schedule on February 23, 2007. (Ex. J-328; N.T. 2704-06, 2711)

178. Lyons final recovery schedule submitted on February 23, 2007 projected that Lyons would complete micropile installation by May 18, 2007, with a Project completion date of

December 6, 2007. This overall completion date was approximately 240 days beyond the April 10, 2007 completion date required under the Contract. (Ex. J-328; N.T. 2704-06, 2711)

179. Lyons' final recovery schedule allowed a total of 81 calendar days from the resumption of work on February 26, 2007 to complete micropile installation. It assumed the use of two drill rigs with one performing compaction grouting ahead of the second rig which would drill the micropiles, (with a third drill rig to be added at some unspecified later time). This recovery schedule also assumed, inter alia, the erection of structural steel commencing before completion of micropile drilling in different areas on site. (Ex. J-328; N.T. 2708-09)

G. Termination

180. In late February 2007, the University made the decision to terminate Lyons as general contractor on the Project. (N.T. 2239-40)

181. On February 26, 2007, the University issued a termination letter, asserting that it was exercising its rights under Article 13.2.100 of the Contract, "due to Lyons' continued failure to meet the project schedule and its stated refusal to cure the deficiencies identified in the University's January 29, 2007 Notice to Cure." (Ex. J-332)

H. Completion of the Project

182. Following its termination of Lyons, the University contracted with Lobar, Inc. ("Lobar"), which had been the second lowest original bidder on the Project, to complete the unfinished general contractor work on the Project. (Exs. J-8, J-9; N.T. 2241)

183. The University's agreement with Lobar comprised separate contracts to complete the micropile installation (Phase I) and all other general contractor work (Phase II). (Exs. J-8, J-9)

184. Lobar subcontracted with Nicholson Construction Co. ("Nicholson") to complete the installation of micropiles on the Project. (Ex. J-10)

185. Lobar commenced work as replacement general contractor on the Project on April 6, 2007, approximately 38 days following Lyons' termination. (Ex. J-347)

186. Whereas Structural's contract with Lyons was based on a unit price of $65.20 per linear foot for micropile drilling and installation, Nicholson's contract with Lobar was based on a daily rate for two drill crews of $16,350.00.[7] (Exs. J-10, J-34)

187. Structural completed approximately 238 of the 385 micropiles eventually installed on the Project which comprised approximately 10,456 linear feet of drilling. Nicholson

[7]Structural's contract provided for additional charges of $17,000.00 for mobilization and $35,300.00 for pile testing. Nicholson's contract with Lobar provided for a mobilization charge of $55,000.00 and specifically did not provide for any "pre-production micropile load testing," or "production micropile proof testing."

completed the remaining micropiles on the Project. It installed the remaining 11,141 linear feet of micropiles during the period from April 11, 2007 to June 11, 2007 (i.e 61 calendar days). (Exs. P-66, P-92; N.T. 2042, 2106, 4027, 4914-15)

188. Lobar completed the Project on March 14, 2008, 338 days beyond the Contract completion date of April 10, 2007. (Exs. P-10, P-63; N.T. 468-69, 2077, 2101)

II. Reasons Proffered for Termination

A. Contract Termination Provisions

189. The Contract provided for termination for default of the contractor as follows:

> 13.2 TERMINATION FOR DEFAULT OF THE CONTRACTOR
>
> 13.2.100 If the Contractor . . . fails to proceed as directed by the System, or performs the work unsuitably, . . . or discontinues the prosecution of the work without the approval of the System, or otherwise is guilty of a substantial violation of a provision of the Contract Documents, then the System may, without prejudice to any of its other rights or remedies, give the Contractor and its Surety written notice that the Contractor has seven (7) days from the date of the System's notice to cure the default set forth in the notice.
>
> The discretion to declare the Contractor in default is solely the System's . . .. Should the Contractor fail to cure said default within the specified time, the System may terminate the Agreement between the System and the Contractor, and may take possession of the site and of all materials, equipment, tools, construction equipment and machinery which is owned by the Contractor, located on the property and may finish the work by whatever method it may deem expedient.

(Ex. J-5 pp. SU054578-SU54579)

190. In its termination letter, the University identified two reasons for Lyons' termination as general contractor for the Project: (1) Lyons' continued failure to meet the project schedule; and (2) Lyons' "stated refusal to cure the deficiencies identified in the University's January 29, 2007 Notice to Cure." (Ex. J-332)

B. Lyons' "stated refusal to cure the deficiencies . . ."

191. The University appended to its January 29, 2007 Notice to Cure reports prepared by Advantage and Traylor. (Ex. J-287)

192. In its report, Advantage stated that it conducted "Electronic Resistivity" testing at the site and concluded that, while "no evidence of caverns, air-filled voids, or sinkholes" were

found, the "carbonate geology" of the site "is subject to solution activity and the development of voids and fractures in the bedrock." (Ex. J-287)

193. The Advantage report specifically cautioned that care should be taken during construction to ensure that surface water is directed away from low lying areas to address the potential for solution activity. (Ex. J-287)

194. The Advantage report did not, however, identify any deficiencies in Structural's micropile drilling means and methods or its management of flush or surface water. (Ex. J-287)

195. It its report, Traylor agreed with Advantage's findings, but was critical of Structural's "excessive use of flush water" which it stated "disturbed the geologic stability of the site." (Ex. J-287)

196. While noting that Structural's micropile drilling techniques and equipment, which had been submitted to and approved by the Professional, were appropriate, Traylor asserted that Structural used more water than was appropriate in the drilling process. (Ex. J-287)

197. The Traylor report appended to the University's January 29, 2007 letter was based in significant part on a determination that water usage by Structrual for its micropile drilling exceeded 600,000 gallons of water. (Ex. J-287)

198. The Traylor report centered its findings on what it called Structural's "aggressive use of water as a flushing medium." It claimed that Structural's use of "large" quantities of water, in excess of 600,000 gallons,[8] contributed to the sinkholes which developed onsite. (Ex. J-287)

199. At hearing, Mr. Traylor admitted that this water usage figure was incorrect. He further testified that he was given that water usage figure orally but did not recall who provided him with that number. (N.T. 1764-65, 1893-94)

200. On December 20, 2006, in response to an inquiry from Gannett Fleming's Tom Long, ArroActiv's Project representative (Stephen Wasylak) reported that the amount of water used for micropile drilling was 628,200 gallons. (Ex. J- 265)

201. The University's Lance Bryson did not know where Mr. Wasylak got the figure of 628,200 gallons of water used for micropile drilling. Similarly, Mr. Wasylak, who also testified at trial, did not identify where this water usage amount came from. (N.T. 2365)

202. All water used on the Project (prior to Lyons' termination) was measured through a single water meter located at Heiges Field House. (N.T. 677, 2147)

[8] We find Traylor's assertion that Lyons/Structural used in excess of 600,000 gallons of water as a flushing medium in its micropile installation to be without support on the record as no accurate measurement of flush water used was made on the Project. *See*: F.O.F. Nos. 152, 154, 203, 223.

203. The water meter located at Heiges Field House showed that a total of 471,800 gallons of water was used on the Project site between July 1, 2006, and January 1, 2007. (Ex. D-414)

204. The University's Terry Starr acknowledged that Wasylak's figure of 628,200 gallons of water used for micropile drilling was wrong and that that figure did not come from the University's water meter. (N.T. 311)

205. The 471,800 gallons of water used on the Project site included water used for compaction grouting as well as micropile drilling. It also included use by all contractors on the Project for other purposes such as cleaning tools and equipment on the job site. (Ex. J-302; N.T. 3341-42, 3901-02)

206. Lyons estimated that less than 472,000 gallons of water was used by Structural for all activities, including compaction grouting and cleaning equipment in addition to micropile drilling. (Ex. J-306)

207. No one for the University offered an opinion that 472,000 gallons of water use on the Project by all contractors established an excessive use of flush water by Structural for its micropile drilling. (Board Finding)

208. No accurate measure of water usage by Structural in connection with micropile drilling on the Project was undertaken or provided to the Board. (N.T. 292-93, 310-11, 1933, 2160; F.O.F. 195-207; Board Finding)

209. The duplex drilling system used by Structural utilized both air and water as flush media. (N.T. 1496-97)

210. Air was the primary flush medium utilized in the drilling system. Water was used to supplement air as a flush medium when drilling through clay and similar material with the duplex drilling system to prevent the drilled material from clogging the return. (N.T. 3695-97)

211. When used, water was typically injected as a flush medium at a rate of between four and seven gallons per minute. (N.T. 3053-54)

212. When drilling below the water table, no appreciable flush water would typically be introduced because the subsurface water acted as the liquid lubricating medium and air pressure as the primary flush medium. (N.T. 3899-3901, 4188-89)

213. The GFGR found that groundwater under the Project site varied from 7.4 feet to 26.2 feet below the surface. (Ex. J- 27; N.T. 4206)

214. The majority of the Project site had the water table well above the bedrock. (N.T. 1637)

215. The amount of water introduced as part of the drilling process was minimal as compared to the quantity of subsurface water in the aquifer. (N.T. 4188-89)

216. The University failed convincingly to establish that Structural's use of flush water in its drilling process was excessive or inappropriate. (F.O.F. 191-215; Board Finding)

217. Many other factors of greater significance than drilling flush water can lead to the development of sinkholes. Several of these other factors were present on this Project including: 1) an area with a tremendous number of interconnected soil-filled layers between rock or harder materials which act as conduits or "pipes" and allow for greater flow and movement of subsurface groundwater; 2) a subsurface groundwater table located within the overburden (i.e. the layers of material above bedrock) and relatively close to the surface; 3) the existence of numerous openings between layers of rock or non-porous materials such as "cutter features" or notches which appear in the rock seams below the surface; and 4) heavy rainfall which causes fluctuations in the subsurface groundwater table. (Exs. J-27, D-432; N.T. 4107, 4172-73, 4183-87, 4190-91; Board Finding)

218. The nature of micropile drilling, which involves penetrating through different layers of subsurface materials (some hard and non-porous and others soft, porous and/or wet) and the introduction of air pressure which displaces subsurface groundwater, even when done well and in an entirely proper manner, can induce sinkholes in the type of geology which existed on the Project site. (N.T. 1659; 4129-30, 4183-91; Board Finding)

219. Sinkholes can develop when drilling disrupts (i.e. reduces) or relieves the groundwater pressure within the epikarst[9] and water flows in the direction of the "dewatered" bore hole resulting in underground erosion causing sinkholes to develop. (Ex. D-432; N.T. 4129-30, 4183-84; Board Finding)

220. While the removal of an accumulation of flush water and groundwater from the drilling site would have a "small benefit" in preventing sinkholes from developing, it would not have been "too terribly beneficial." (N.T. 4254-56; Board Finding)

221. The Advantage report did not find that Lyons'/Structural's micropile drilling means and methods were deficient. Traylor's finding that Lyons'/Structural's micropile drilling means and methods were deficient was based on an incorrect premise that more than 600,000 gallons of water was used by Structural in the drilling process. A substantial amount of water on the ground around the Project site was from subsurface groundwater forced up through the micropile drill casings and rainfall. Micropile drilling was required by the design of the Project, and the duplex drilling system and groundwater management plan utilized by Structural/Lyons had been approved by the Professional. Moreover, several other factors of far greater significance in causing sinkholes than drill flush water were present on this Project, including a thick layer of epikarst with alternating layers of hard and soft materials with cutter and notch features; a high and fluctuating subsurface water table in the overburden; and the need to engage

[9] Epikarst is the zone of weathered, pourous carbonate rock that overlies a zone of more solid, intact bedrock. (N.T. 4113-14; Board Finding)

in micropile drilling which, by its very nature, disturbs the type of subsurface conditions found on the Project. (Exs. J-1, J-27, J-28, J-30, J-78, J-287 D-432; N.T. 292-93, 310-11, 1496-97, 1659, 1933, 2160, 3695-97, 3053-54, 3899-3901, 4188-89; F.O.F. 29-33, 39-46, 191-220; Board Finding)

222. Flush water used in the drilling process was not a significant factor in causing the development of sinkholes as the volume of flush water used was inconsequential as compared with the groundwater. (N.T. 4187-91, 4765-66; F.O.F. 192-220; Board Finding)

223. Structural's/Lyons' introduction of flush water in the micropile drilling process was not excessive and was not a material cause of sinkholes occurring on the Project. (Exs. J-287, J-302, J-306, D-432; N.T. 292-93, 301-11, 677, 1764-65, 1933, 2147, 3053-54, 3341-42, 3695-97, 3901-02; F.O.F. 29, 39-46, 192-222; Board Finding)

224. The University asserted in its termination letter that Lyons refused to submit "a revised work plan describing how it would address the noted deficiencies and abate the associated safety hazards." (Ex. J-332)

225. Both before and after the University's issuance of its January 29, 2007 letter and Notice to Cure, there was an extensive series of communications back and forth among Lyons, Structural, the University, the Professional and Arro-Activ with regard to: Structural's micropile drilling equipment and procedures (including its water usage and drilling methods); Lyons'/Structural's ground and surface water management; the causes, effects and prevention of sinkholes on the Project, (including related worker safety and differing site condition issues); and the inadequate progress of micropile installation and work completion on the Project. In the course of these communications the University, the Professional and/or Arro-Activ required ever-increasing detail on changes/improvements demanded of Lyons and Structural with regard to their means and methods associated with the micropile drilling and installation. This is set forth in our Findings of Fact at Paragraphs 55 to 181 and 190 to 198. (F.O.F. 55-181, 190-198; Board Finding)

226. Because Structural's use of drill flush water was not excessive, nor was it shown to be a material cause of the Project's sinkholes; and because Structural's micropile drilling means and methods were not deficient; and because Lyons' surface water management plan, which had previously been approved by the Professional, was not inadequate; and because of the additional steps to improve site conditions agreed to by Lyons' in the series of communications following the January 29, 2007 Notice to Cure letter from the University, we find that Lyons did not refuse to cure any legitimate deficiencies in the means and methods of micropile installation or surface water management utilized on the Project as identified in the University's January 29, 2007 Notice to Cure and asserted in its February 26, 2007 termination letter. (Exs. J-287, J-332; F.O.F. 137-225; Board Finding)

227. With the exception of its slow work progress on the Project and failure to provide a recovery schedule showing timely completion of same, Lyons' did not fail to properly respond to the University's demands for a revised work plan or to cure other deficiencies in its or

Structural's work procedures. This alleged failure did not provide an actual basis in fact for Lyons' termination. (Exs. J-278, J-332; F.O.F. 137-226; Board Finding)

C. Lyons' "continued failure to meet the Project schedule…

228. In addition to its assertion that Lyons had refused to cure micropile drilling procedure deficiencies identified in the January 29, 2007 Cure Notice, the University also asserted "Lyons' continued failure to meet the project schedule" as a reason for termination. (Ex. J-332)

1. Delay in schedule development

229. The University's first and second Notices to Cure, issued May 17, 2006, and June 9, 2006, related to allegations that Lyons had failed to provide a fully developed, signed Project schedule in accordance with Article 3.7.100 of the Contract. (Exs. J- 58, J-71)

230. As general contractor for the Project, Lyons was required to develop a coordinated Project schedule. (Ex. J-1 p. SU006889; N.T. 77)

231. Article 3.7.100 of the Contract required that Lyons issue a preliminary schedule to the other prime contractors within 14 days of receipt of its Notice to Proceed; that the other prime contractors then provide their input to Lyons within 21 days, and that within 28 days, Lyons submit to the University a complete Project schedule signed by all prime contractors showing (in detail) the proposed dates for the performance of each phase of the work under each contract for the Project. (Ex. J-5 p. SU054565; N.T. 2501-02)

232. Other prime contractors on the Project were Herre Brothers, Inc. (electrical), W.G. Tomko, Inc. (plumbing), and Silvertip, Inc. (HVAC). (Ex. J-22.1)

233. At a pre-construction meeting on March 30, 2006, attended by representatives of the University, Lyons, Herre Brothers, Inc. ("Herre Brothers"), W.G. Tomko, Inc. ("Tomko"), Silvertip, Inc. ("Silvertip"), Spillman Farmer Architects ("Spillman Farmer"), and Gannett Fleming, Inc. ("Gannett Fleming"), Lyons suggested (and the other prime contractors agreed) that the schedule formation process be modified so that prior to the issuance of a preliminary schedule by Lyons, Lyons would provide the other primes with activity sheets that each prime would complete by listing each of the prime contractors' activities, activity durations, and schedule logic (predecessor and successor activities). The other prime contractors further agreed to return the completed activity sheets to Lyons "as soon as possible." (Ex. J-22.1; N.T. 2501-02)

234. The three other prime contractors submitted their proposed activities and durations schedules to Lyons between April 24 and 26, 2006. However, the submissions did not identify the primes' successor and predecessor activities and included proposed time frames which exceeded the Project's 380 day total time frame. (Ex. J-52; N.T. 2503-04, 2506-07)

235. For example, Herre Brothers' submission included a list of activities with corresponding durations for each activity totaling 561 working days. (Ex. J-52, N.T. 2506-07)

236. As a consequence of the other prime contractors' submissions, it became apparent that Lyons would need to "stack" or "overlap" some of their work activities in order for the Project to be completed within the required 380 days. (Ex. J-52, N.T. 2506-07)

237. Lyons continued to discuss scheduling with the other prime contractors over the ensuing weeks, but the other prime contractors remained unwilling to agree to overlap activities. (N.T. 2507)

238. By mid-May, the University expressed its concern over the lack of a master Project schedule. On May 17, 2006, the University issued the first of four Cure Notices to Lyons, citing Lyons' failure to submit "the required construction schedule" and alleging a "failure to progress with site work. . . ." (Ex. J-58)

239. Consequently, Lyons submitted an initial project schedule on June 1, 2006, with a Project completion date of July 7, 2007, 63 working days beyond the Contract completion date of April 10, 2007. (Ex. J-66; N.T. 2508, 2511)

240. At a meeting on June 5, 2006, Lyons advised the University and the other prime contractors that the only way a consolidated schedule could be issued that would meet the Contract completion date would be if some of the other prime contractors' activities were overlapped. (Ex. J-72; N.T. 2512-14)

241. On June 9, 2006, the University issued a second Cure Notice, citing Lyons' "failure to provide a fully developed, signed construction schedule and [its] failure to progress with the site work. . . ." (Ex. J-71)

242. Following the meeting with the other prime contractors on June 5, 2006, Lyons submitted a schedule on June 11, 2006 (the "Project Schedule"), which included overlapping of activities and an on-time completion date of April 10, 2007. (Exs. J-72, J-87; N.T. 482-83, 2038-39, 2514-15)[10]

243. Tomko and Silvertip signed off on the Project Schedule within days, and Herre Brothers ultimately signed off on August 28, 2006. (Exs. J-73, J-74, J-87; N.T. 2520-24)

244. The June 11, 2006 Project Schedule did not reduce the total durations proposed by any of the other prime contractors but did overlap some of their activities. (Ex. J-75; N.T. 2515, 2521-22)

[10] The June 11, 2006 Project Schedule (Ex. J-72) was subsequently re-published on July 7, 2006 and called the original recovery schedule (Ex. J-87). The two are the same. (N.T. 482-83)

245. In April 2006, prior to adoption of the Project Schedule, Lyons and its excavation subcontractor, Justice, submitted shop drawings to the Professional, including its erosion and sediment control ("E&S") plan. This E&S plan was also submitted to the Cumberland County Conservation District. (N.T. 2529-30)

246. Between April 17 and May 1, 2006, Lyons began preliminary site work including mobilization of its trailer, layout of sedimentation ponds and installation of site and silt fences. (Ex. J.22.3; N.T. 2536-37)

247. The Professional approved Lyons' E&S plan approximately May 8, 2006, allowing Lyons and Justice to begin the relocation of existing sanitary sewer lines and construction of new sanitary sewer lines for the Project. (Ex. J-22.4; N.T. 2529-32)

248. During this time period, in late April to early May, Lyons also proceeded with cut and fill work on the Project site. (Exs. J-22.3, J-22.4; N.T. 2542)

249. On or about May 10, 2006, Justice encountered a seam of unexpected hard rock very close to the surface while installing storm and sanitary sewer lines. This seam of rock could not be removed using conventional means. (Ex. J-22.4; N.T. 2543-44, 3582-83)

250. Lyons consequently requested permission from the Professional to blast the rock. (Exs. J-22.4, 22.5; N.T. 2545, 3583)

251. The Professional subsequently granted this permission, and permits were issued for Justice to blast the rock. (Ex. J-22.7; N.T. 2545-46)

252. After receiving approval from the University and the Professional and obtaining necessary permits, Lyons/Justice performed blasting on June 15 and 19, 2006. (Exs. J-86, D-206; N.T. 109-10)

253. The amount of blasting actually performed was less than had been anticipated by Lyons/Justice. (Ex. J-86; N.T. 115)

254. While awaiting approval to dynamite the rock, Lyons and Justice changed the sequencing of their work and proceeded with cut and fill excavation elsewhere. The evidence presented does not show that encountering this rock seam resulted in a material delay to work on the Project. (N.T. 2545-46, 3584; Board Finding)

255. None of the other prime contractors had any significant work to be performed during the early stages of the Project when Lyons was performing preliminary site work such as cut and fill excavation, E&S control, underground storm and sanitary sewer placement or during micropile installation. None of the other prime contractors' critical path work was to be performed during this early work stage because the sequencing of activities required Lyons' completion of the above preliminary site work and micropile installation before any significant

work by the other prime contractors could commence. (Exs. J-1, J-72, P-4; N.T. 384, 489; Board Finding)

256. Because Lyons proceeded with plan submissions and preliminary field work including relocating existing sanitary sewer lines, installing E&S control structures (including detention ponds), constructing storm and sanitary sewer lines, and proceeding with its cut and fill operations and other preliminary excavation on the Project throughout April and May 2006; and because all this work and micropile installation was necessary before the other prime contractors could begin their work, the absence of a Project Schedule prior to June 11, 2006, did not adversely impact or slow down the actual progress of work on the Project. (Exs. J-1, J-22.3, J-22.4, J-22.5, J-22.7, J-72, J-86, J-87, P-4, P-59, P-61; N.T. 384, 489, 2030-31, 2509, 2525-33; F.O.F. 229-255; Board Finding)

257. Because the absence of a Project Schedule prior to June 11, 2006, did not adversely impact or slow down the actual progress of work on the Project in a material way, Lyons' delay in producing this signed Project Schedule was not a material cause of the overall delay on the Project nor did it amount to a material failure on Lyons' part to perform its Contract obligations with regard to scheduling.[11] (Exs. J-22.3, J-22.4, J-22.5, J-22.7, J-72, J-86, J-87, P-4, P-59, P-61; N.T. 384, 489, 2030-31, 2509, 2525-33; F.O.F. 229-256; Board Finding)

2. Actual delay in Project work

258. Lyons' original Project Schedule (issued June 11, 2006) called for micropile installation to be completed in approximately 84 days, making September 29, 2006 the anticipated date for completion of the micropiles.[12] (Exs. J-72, J-87; F.O.F. 48; Board Finding)

259. As of the date of termination (February 26, 2007), 338 days into the Project, Lyons' micropile subcontractor, Structural, had only completed approximately 10,456 linear feet of micropiles out of an estimated 22,300 linear feet or 47% of the total micropile installation expected on the Project.[13] (Exs. J-1, J-11, J-37, P-59, P-65, P-66, P-92; N.T. 2041-42; Board Finding)

260. Structural had completed approximately 47% of the micropile work needed on the Project in 161 days. This period ran from its start of work on July 7, 2006, to December 15, 2006, the last day micropiles were installed by Structural prior to the University's suspension of

[11] Though identified by the University in its first two Cure Notices, the alleged delay in developing a Project schedule was not cited by the University in its final Cure Notice or in the notice of termination. (Exs. J-58, J-71, J-287, J-332).

[12] Lyons' original Project Schedule submitted June 11, 2006 (Exs. J-72, J-87), listed micropile installation as beginning approximately June 20, 2006, and concluding approximately September 12, 2006. Drilling of production piles actually commenced July 7, 2007, making the anticipated completion date for micropile installation when this work began approximately September 29, 2006. (Exs. J-11, J-13A, P-66, D-206; N.T. 2555, 3594; F.O.F. 48; Board Finding)

[13] Ex. P-65 identifies all the successful production piles drilled on the Project. Ex. P-66 identifies all the production pile drillings (including abandoned holes) on the Project. We utilize only the successfully completed micropiles (Ex. 65) to calculate the linear footage drilled by Structural (Exs. J-11, J-12, J-13A, J-13B, P-65, P-92; N.T. 2082-83; Board Finding).

micropile drilling and eventual termination of Lyons. (Exs. P-59, P-65, P-66, P-92; N.T. 2041-42; F.O.F. 48, 135-181; Board Finding)

261. In its final recovery schedule submitted February 23, 2007, Lyons estimated that it would complete the remaining 53% of the estimated micropile installation on the Project (11,844 linear feet) in an additional 81 days (i.e. by May 18, 2007). (Ex. J-328; N.T. 2707; F.O.F. 259-260; Board Finding)

262. In its final recovery schedule, Lyons' projected a Project completion date of December 6, 2007. This would have been 240 days beyond the Contract completion date of April 10, 2007. (Exs. J-5, J-50, J-328; N.T. 73, 2498, 2704-06, 2711; F.O.F. 11; Board Finding)

263. Lyons' proposed final recovery schedule included overlapping portions of the micropile installation with other activities on the Project's critical path, thereby allowing Lyons to begin erecting steel beams in areas where micropile installation had been completed before all the micropiles on the Project were done. (Ex. J-328; N.T. 2069, 2074, 2208)

264. Following Lyons' termination, the replacement micropile subcontractor, Nicholson, overlapped portions of the micropile installation with other activities on the Project's critical path, similar to what Lyons had proposed in its final recovery schedule. (Ex. P-10; N.T. 2068-71, 2213)

265. Lyons' final recovery schedule assumed the use of two drill rigs (with one performing compaction grouting ahead of the second rig which would drill the micropiles) with an extra drill rig to be brought on site at some unspecified time later in the process. (Ex. J-328; N.T. 2708-09)

266. Following Lyons' termination, Nicholson completed the actual remaining 11,141 linear feet of micropiles in 61 calendar days with <u>two</u> rigs doing micropile drilling full time and no compaction grouting. (Exs. J-10, P-65, P-92; N.T. 2042, 2106, 4027)

267. The University's scheduling expert, Richard Easler, testified that based on Lyons'/Structural's past performance in drilling micropiles and considering Structural's stated intention to continue limited compaction grouting, he would not expect Lyons to complete the project until April 10, 2008, 366 days beyond the completion date specified in the Contract. (Ex. P-62; N.T. 2054-56)

268. Based on Structural's past rate of performance (i.e. 161 days to install 47% of the micropiles on the Project), we find that Lyons' final recovery schedule calling for completion of the remaining 53% of the micropiles in just 81 days was neither realistic nor achievable. Further proof that Lyons proposed recovery schedule was not achievable is provided by the fact that Nicholson (the replacement micropile driller) took 61 days with <u>two</u> rigs drilling micropiles full time whereas Lyons proposed to complete the micropile installation in 81 days with essentially 1 drill rig (and the added work distraction of compaction grouting preceding same). (Exs. J-10, J-37, J-72, J-328, P-59, P-65, P-92; N.T. 2041-42, 2054-56, 2106; F.O.F. 258-267; Board Finding)

269. Accordingly, we find Mr. Easler persuasive on the issue and conclude that completion of the Project was delayed 366 days as of the date of Lyons' termination. Given that the original Contract work duration was 380 days, we find this delay in progressing work on the Project at the time Lyons was terminated to be a substantial and material failure to meet the Contract performance time schedule. (Exs. J-5, J-37, J-72, J-87, J-328, P-59, P-61; N.T. 2704-06, 2711; F.O.F. 10-11, 258-268; Board Finding)

a. Causes of delay

270. Lyons and/or Structural complained on at least two occasions that it was being required to drill micropiles deeper than required by the Contract specifications and that this was causing it extra expense and delaying its progress. (Exs. J-99, J-103)

271. On July 28, 2006, Structural notified Lyons that it believed that the micropile holes it had drilled to date were deeper than the average it anticipated based on the Contract specifications. (Ex. J-99)

272. The Contract specifications estimated that the total length of micropiles for the Project would be approximately 22,300 feet, and stated that contractors should base their bids on that estimated total length, and that price adjustments would be made if the total pile length ended up being more or less than 22,300 feet. (Ex. J-1 p. SU007002)

273. With respect to its July 28, 2006 complaint concerning the depth of micropiles, Structural claimed that, based on the bid quantity of 22,300 LF for 378 micropiles, Structural had anticipated an average micropile length of approximately 59 feet. (Ex. J-99)

274. Structural also claimed that, based on the test borings noted in the GFGR, it anticipated the deepest pile to be approximately 116 feet. (Ex. J-99)

275. On August 1, 2006, a meeting was held at which Structural presented its first complaint, related to drilling depth. (Ex. J-102; N.T. 129-32, 972-73)

276. At the August 1, 2006 meeting, Structural's Graham Smith reported that they had several holes over 100 feet deep and that Structural's costs "increased exponentially" when drilling deeper. (Ex. J-102)

277. Mr. Smith also stated at this meeting that, while Structural had additional resources (i.e. additional rigs), it would not engage them without additional compensation. Lyons stated that it considered this a contract issue between Structural and Lyons. (Ex. J-102)

278. The University rejected Structural's foregoing complaint regarding the depth of micropiles noting, inter alia, that the Contract specifications provided for an estimated total micropile length of 22,300 linear feet, which total could not yet be determined, and that the GFGR clearly indicated that there would be pinnacled rock formations as well as a "significant variation" in micropile lengths due to the existence of multiple layers of intermittent but

unsuitable rock prior to attainment of suitable bedrock in which to socket the micropiles. (Exs. J-1, J-110, J-114; Board Finding)

279. The GFGR disclosed bedrock at highly variable depths, steep and intense pinnacle formations of hard rock, differential weathering of the subsurface rock with zones of very soft soil above rock, and intermittent layering of rock and soft soil. (Ex. J-27; N.T. 880-990, 917-20, 1402-05)

280. The total length of micropiles eventually drilled on the Project was 21,597 linear feet. This did not differ significantly from the original estimate of 22,300 feet. (Exs. J-1, J-37, P-59, P-65, P-92; N.T. 2042, 2106, 4027, 4914-15; Board Finding)

281. Because the GFGR contained clear indications that micropile depths would vary due, inter alia, to intermittent layers of unsuitable rock and bedrock at highly variable depths; because the total length of micropiles drilled on the Project did not differ materially from the original estimate; and because the Contract did not provide specifications that any individual micropile would not exceed a particular depth, we find Structural's complaint that some micropile depths were deeper than could be anticipated from the Contract or bid materials to be without factual support. (Exhibits J-1, J-27; F.O.F. 270-280; Board Finding)

282. On August 2, 2006, Structural submitted a second complaint to Lyons regarding the length of micropile drilling. In this complaint, Structural asserted that the Professional's field inspector was misinterpreting the Contract specifications for "competent rock" and that this misinterpretation was forcing Structural to drill micropiles deeper than required by the Contract specifications. (Ex. J-103)

283. The micropile specifications in the Contract addressed the length of micropiles for the Project as follows:

> The overall length of a micropile will be selected such that the required capacity is developed by skin friction between grout and rock over a suitable length greater or equal to 10 feet of bond zone in competent rock. Competent rock is defined as limestone with minimal soil seams. Minimal soil seams are not to exceed 6 inches for any individual seam and a total of 12 inches over a 10 foot drilled length.

(Ex. J-1 p. SU007001)

284. With respect to the field inspector's interpretation of "competent rock," Structural claimed that the inspector insisted on drilling until 11 feet of "beautiful blue-gray rock" was encountered for a bond zone. Structural did not object to drilling the extra one foot as verification that sufficient length was achieved, but did object to the inspector's alleged insistence that the rock be blue-gray in color in order to be considered "competent rock." (N.T. 1244-47, 2567, 3044, 3072-73, 3091, 3098-3100, 3112, 3124-25, 3428-32, 3439-40, 3772, 3804-05)

285. Structural also asserted that drilling through veins of otherwise "competent rock" and deeper than required by the specifications inevitably took longer and resulted in lost tooling. Structural claimed this added to its costs and delayed progress. (Exs. J-99, J-103)

286. The Professional retained David A. Blackmore and Associates (DBA) to provide field observation of the micropile drilling. DBA's William McCafferty served as the field inspector. (N.T. 128-29, 711)

287. Mr. McCafferty was responsible for determining when 10 feet or more of competent rock had been achieved by the drillers. He did this in consultation with the drillers by observing the drilling itself and the flush material blown up and out the top of the drill casing. (N.T. 714)

288. Mr. McCafferty acknowledged at hearing (and the Board agrees) that the determination of what type of material was actually being drilled was somewhat subjective. Mr. McCafferty made his assessment of the material being encountered by the drill by using clues including the appearance of the flush material as well as how the drill hammer itself was progressing and reacting. (N.T. 718-19; Board Finding)

289. Using the color of the flush material as one factor, in conjunction with how the drill hammer was reacting, to determine whether the material encountered was competent rock was not an unreasonable means of determining the type of subsurface materials being encountered by the drill. (N.T. 718-19; Board Finding)

290. Mr. McCafferty maintained a log ("DBA log") where he recorded what material was encountered at what depth for the entire length of each micropile drill hole. (Exs. J-11, J-12; N.T. 714-15)

291. In his logs, Mr. McCafferty characterized the subsurface materials encountered and returned to the surface as "Soft" or "Soil", "Weathered Soft", "Weathered Hard", "Weathered Hard Fractured", "Rock", and/or "Solid Rock." (Ex. J-12; N.T. 717-18; Board Finding)

292. Mr. McCafferty (and the Professional) considered a bond zone to have been achieved in accordance with the Contract specifications when a minimum of 11 feet of continuous material Mr. McCafferty described in his logs as "rock" or "solid rock" had been drilled. (Exs. J-12, J-110, J-114; N.T. 784; Board Finding)

293. Discounting the difference between 10 and 11 feet, which was not an issue between the parties, the DBA log (which we find credible) indicates that only one pile was drilled deeper than required under the Contract specifications.[14] (Exs. J-12, P-38, N.T. 976-84, 982-83, 1149-50; Board Finding)

[14] Drilling on the pile in question commenced July 17, 2006. According to the DBA log for Pile no. 129 (Ex. P-38), the drilling progressed through 13 feet of rock, from depths of 45-57 feet, and then continued through various layers of unsuitable material before terminating at 157 feet. Structural's own log for Pile no. 129 (Ex. J-13A) does not

294. On August 14, 2006, the Professional informed Lyons and Structural that their complaints regarding the depth of drilling and the interpretation of "competent rock" were being rejected. (Exs. J-110, J-114)

295. We agree with Lyons and Structural that the Contract specifications for "competent rock" did not require a specific color of flush material. However, we view Mr. McCafferty's references to "blue-gray rock" as but one factor along with drill reaction which he used in his determination as to whether competent rock was encountered, and we cannot conclude from this that his determination of competent rock was incorrect. Moreover, our own review of the DBA micropile drill logs leads us to conclude that only one micropile was drilled deeper than the Contract specifications required. Accordingly, we find that any amount of delay or extra cost to Structural's micropile drilling on the Project resulting from the field inspector's interpretation of "competent rock" was de minimus. (Exs. J-1, J-11, J-12, J-110, J-114, P-38; N.T. 718-19, 779-80, 976-84, 982-83, 1149-50; F.O.F. 282-294; Board Finding)

296. The sinkholes that Lyons/Structural encountered delayed the Project beyond the time required for the actual sinkhole repair to the extent that micropile work was interrupted and/or restricted. (N.T. 2580-81; F.O.F. 55-137, 155-181; Board Finding)

297. The University's scheduling expert, Richard Easler, in calculating the amount of delay to the Project he attributed to Lyons, identified the following periods where work on the Project was stopped due to sinkholes:

1. Work stoppage from 9/8/06 to 9/14/06: 7 days
2. Work stoppage from 11/29/067 to 12/10/06: 12 days
3. Work Stoppage from 12/16/06 to 2/6/07: 53 days

(Exs. P-59, P-61)

298. The 9/8/06 to 9/14/06 work stoppage immediately followed the sinkhole which appeared September 7, 2006. (Ex. J-137)

299. The 11/29/06 to 12/10/06 work stoppage immediately followed PA/OSHA's site visit and Lyons' finding that sinkholes presented an "imminent danger" to workers. (Exs. J-247, D-206; N.T. 2675-76, 2679)

300. The 12/16/06 to 2/6/07 work stoppage followed the University's order directing the suspension of micropile drilling to allow an investigation of the site with respect to the danger posed by sinkholes. (Ex. J-255)

301. The above work stoppages cited by Mr. Easler from 9/8/06 to 9/14/06, 11/29/06 to 12/10/06, and 12/16/06 to 2/6/07, totaling 72 days, were all the direct result of sinkholes which developed at the construction site and a reasonable concern for workers' safety resulting

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indicate an uninterrupted zone of rock from 45-57 feet, but shows a zone of rock from 42-44 feet, followed by intermittent layers of weathered hard rock and soft material. (Exs. J-13A, P-38)

therefrom. (Exs. P-59, P-61, J-22.18, J-22.19, J-125, J-137, J-141, J-247, J-255, D-206; N.T. 2675-76, 2679; F.O.F. 55-137; Board Finding)

302. In addition to the work stoppages identified by Mr. Easler, micropile installation was disrupted for 21 days from November 8 - 28, 2006, while Lyons and Structural performed sinkhole repair and mitigation work following the November 7 sinkhole which nearly trapped a Justice Excavation employee. (Exs. J-210, J-211, J-213, J-223, D-206; N.T. 2661, 3640-43, 3907-09; F.O.F. 55-137; Board Finding)

303. In addition to the foregoing 93 days where progress on the Project was stopped, Mr. Easler attributed an additional 16 days stoppage, from February 7 to February 22, 2007, to Lyons' "failure to cure" so-called drilling deficiencies cited by the University in its January 29, 2007 letter. This stoppage was also a direct result of sinkholes occurring on the Project and the University's demands to cure micropile drilling procedures which were not deficient. (Exs. J-287, J-297, J-301, J-303, P-61; F.O.F 155-181, 191-227; Board Finding)

304. The multiple work stoppages occurring on the Project between September 8-14, 2006, and February 22, 2009, totaling 109 days, resulted directly from sinkholes which developed on the Project site and a reasonable concern for worker safety while risks from these sinkholes were assessed and ways to deal with same and make the work site safe were discussed. (Exs. P-59, P-61, J-22.18, J-22.19, J-125, J-137, J-141, J-247, J-255, J-287, J-297, J-301, J-303, P-61, D-206; N.T. 2675-76, 2679; F.O.F. 55-181, 191-227, 296-303; Board Finding)

305. Completion of the Project was delayed 366 days at the time of Lyons' termination. (Ex. J-328; N.T. 2704-06, 2711; F.O.F. 269; Board Finding)

306. 109 of the 366 days the Project was late (approximately 30% of the total Project delay) was due to the sinkhole activity which developed on the Project site. (Exs. P-59, P-61, J-247, J-255, J-287, J-297, J-301, J-303, J-328, D-206; N.T. 2704-06, 2711; F.O.F. 55-181, 191-227, 296-305; Board Finding)

307. Notwithstanding the 109 days lost on the Project due to sinkhole activitty, Lyons was an additional 257 days behind schedule on the Project. (Exs. J-5, J-37, J-72, J-87, J-328, P-59, P-66; N.T. 2042, 2704-06, 2711; F.O.F. 10-11, 262-269, 304-306; Board Finding)

308. Although heavy rains fell on the Project site in the Spring and Summer of 2006, micropile drilling continued in the rain for the most part. For this reason, and because neither party provided credible evidence to establish how much (if any) delay to the Project was caused by these rains, we cannot find that these early rains contributed materially to the overall Project delay. (Exs. J-11, J-12; N.T. 3539, 3585-90, 3636, 3651-57, 3668; Board Finding)

309. Unexpected hard rock encountered by Justice while performing excavation work in May 2006 did not materially contribute to the overall Project delay since Lyons and Justice proceeded with other preliminary site work while awaiting approval to blast the rock. (Exs. J-22.4, J-22.7; N.T. 2543-46, 3582-85; F.O.F. 249-254; Board Finding)

310. The geologic conditions underlying the Project site were characterized, inter alia, by steep and intense pinnacle formations of hard rock below ground level, multiple layers of intermittent soft or weathered rock seams unsuitable for socketing micropiles above bedrock, and bedrock at significantly varied depths. (Exs. J-27, J-99, J-110, J-114, D-432; N.T. 3769-70, 3816-17; F.O.F. 278; Board Finding)

311. Drilling into pinnacles is difficult because tooling tends to deflect off the side of the pinnacles rather than bite into the rock, causing the drill tooling and casings to bend and break. This requires the driller to progress the drill slowly until the drill but bites into the pinnacle securely in order to prevent this bending and breaking. Drilling through multiple seams of soft or weathered rock before reaching competent rock also slows drilling. (Exs. J-99, J-102, J-110; N.T. 1836-38, 3311, 3444, 3715-17, 3769-70, 3797, 3830; Board Finding)

312. Almost immediately upon commencing micropile drilling, Structural began encountering problems with casings and drill hammers breaking. (Exs. J-11, J-12, J-92, P-65, P-66; N.T. 723-30, 746-51, 788, 963, 970-71, 1069, 1112-13, 1237, 1270-71, 1304-05, 1840-41, 1868-69, 1879-1898, 2070, 2556-57, 2568, 2708, 2785-86, 3074-84, 3105-08, 3120, 3173-74, 3311, 3463-66, 3618-20, 3716-17, 3847, 4791, 4831-32)

313. On July 18, 2006, the Professional reported that casings broke on five of the eleven micropiles drilled as of that date. (Exs. J-92, J-93)

314. The casings were subsequently tested and found to be consistent with the Contract specifications and adequate for the job. (Ex. J-93; N.T. 3082-83)

315. As of August 7, 2006, 30 days after the start of drilling micropiles for the building foundation (i.e. production piles) and three days before the first sinkhole appeared on the site, Structural had drilled only 44 production piles, and grouted only 18, an average drilling rate of 1.47 production piles per day and an average completion rate of 0.6 production piles per day. (Exs. J-22.10; F.O.F. 48, 55; Board Finding)

316. Structural's drilling of 44 production piles in the first 30 days of drilling represented approximately 12% of the total 368 production piles anticipated for the Project but took approximately 36% of the 84 days projected for micropile installation (i.e. drilling and grouting) in Lyons' June 11, 2006 Project Schedule. (Exs. J-22.10, J-28, J-99, J-379; F.O.F. 48, 55, 258; Board Finding)

317. With a drilling rate of 1.47 production piles per day achieved in the first 30 days of drilling (and before the first appearance of a sinkhole) it would have taken Structural approximately 250 days in which to drill 368 micropiles, or 166 days longer than the 84 days originally projected for micropile drilling and grouting in Lyons' June 11, 2006 Project Schedule. (F.O.F. 258-260, 315-316; Board Finding)

318. Although the Board acknowledges that the foregoing drilling rate calculation of 1.47 production piles per day and the projection of 250 days to complete the drilling of foundation micropiles is a rough calculation of Structural's initial micropile production rate (and

subject to variation due to factors such as the depth of the micropiles drilled on any given day), a comparison of the total linear feet of useable production pile drilled in these first 44 holes (2,576 feet) to the total anticipated by the Contract (22,300 feet) shows only 11.5% of the drilling to be accomplished. Both calculations confirm that Structural's micropile drilling rate, unaffected by sinkholes, was significantly slower than anticipated by Lyons and significantly slower than was needed to keep the Project on schedule.[15] (Exs. J-11, J-12, J-13A, P-65, P-92; F.O.F. 48, 53, 55, 258-279, 315-317; Board Finding)

319. The slow drilling rates of production, sheared casings and lost tooling experienced by Structural, which materially delayed its micropile drilling and installation progress, were the result of drilling into the steep and intensely pinnacled rock formations below the Project's surface and through multiple layers or seams of soft or weathered rock prior to attaining adequate bedrock in which to socket the micropiles. (Exs. J-11, J-12, J-13A, J-22.10, J-27, J-87, J-92, J-93, J-99, J-110, P-65; N.T. 963, 993, 1836-38, 3311, 3455, 3715-17, 376-70, 3797, 3830; F.O.F. 309-318; Board Finding)

320. Because Structural experienced difficulty drilling into steeply pinnacled rock below the Project's surface which caused broken and lost tooling and casings; and because these pinnacles and multiple seams of unsuitable weathered or soft rock above bedrock of variable depth resulted in significantly slower progress in micropile drilling than what was provided for in the Project Schedule; and because the sinkhole activity on the Project site accounted for only 109 days of delay to the Project; and because Structural was not required to drill deeper than indicated in the Contract specifications; and because neither heavy rainfall or other weather difficulties encountered during site excavation or micropile installation were shown to have materially contributed to the Project delay, we find that Structural's inability to drill and install micropiles on the Project in a timely fashion due to the steep and intense pinnacle formations and multiple rock seams above bedrock of varied depth below the ground surface on the Project site was the material cause of 257 days of delay to the Project (out of the total of 366 days of delay) as of the date of Lyons' termination. (Exs. J-5, J-11, J-12, J-22.4, J-22.7, J-22.10, J-37, J-72, J-87, J-99, J-110, J-328, P-59, P-65; N.T. 2042, 2543-46, 3582-85, 2704-06, 3166, 3455, 3539, 3585-90, 3636, 3651-57, 3668, 4831-32; F.O.F. 228-319; Board Finding)

321. To summarize, the Project was delayed by 366 days at the time of Lyons' termination. Of these 366 days of Project delay, 109 of these days was due to the repeated occurrence of sinkholes on the Project. The remaining 257 days of delay were caused by Structural's inability to drill and install micropiles on the Project in a timely fashion due to the steep and intense pinnacle formations and multiple rock seams above bedrock of varied depth below the ground surface on the Project site during the micropile installation phase of work. (F.O.F. 228-320; Board Finding)

[15] The total number of foundation micropiles actually installed on the Project (not counting abandoned piles) was 385 not 368, and the total linear footage of useable production pile was approximately 21,597. Neither variation from anticipated to actual is significant nor does it materially alter the foregoing calculations of slow drilling production rates. (N.T. 2082-83, 2707, 4913-16; Exs. J-11, J-12, J-13A, P-65, P-66, P-92; Board Finding)

b. Attribution of delay

322. The Gannett Fleming Geotechnical Report was a geotechnical report of subsurface ground conditions on the Project site. It was prepared initially for the foundation design investigation, but was made available to bidders on the Project by the University by Addendum No.1 on December 5, 2005. (Exs. J-2, J-27; N.T. 44, 2494; F.O.F. 23-28; Board Finding)

323. The GFGR identified the geology underlying the Project site, generally, as part of the "Rockdale Run formation." It described the Rockdale Run Formation as carbonate limestone known for solution openings and local intense pinnacle development. (Ex. J-27; N.T. 877-78; Board Finding)

324. The GFGR (and test borings contained in it) also identified bedrock at highly variable depths, steep and intense vertical pinnacles, differential weathering of the subsurface rock with zones of very soft soil above rock and intermittent layering of rock and soft soil above bedrock found at highly variable depths. (Ex. J-27; N.T. 880-990, 917-20, 1402-05, 3385, 3388, 3392-93, 4809; Board Finding)

325. The GFGR further indicated that three of the exploratory borings had to be re-drilled "due to the augers deviating from vertical when a hard, near vertical surface was encountered which caused the auger to deflect while advancing the boring." (Ex. J-27 p. 2; N.T. 884)

326. The problems with the exploratory test borings experienced and reported by Gannett Fleming, as well as the steep and intense pinnacle formations, multiple rock seams, and significant variation in depths of bedrock below the Project surface, which were clearly identified in the GFGR, are precisely the sorts of problems with subsurface pinnacle formations, intermittent rock seams and varied bedrock depths which Structural encountered and which caused the broken casings, lost hammers, abandoned holes and significantly slower drilling times which, in turn, resulted in delays to its micropile installation and to the Project as whole. (Exs. J-27, J-92, J-93; N.T. 963, 993; F.O.F. 50-52, 258-262, 268, 279-281, 310-325; Board Finding)

327. The likelihood of encountering steep and intense pinnacle formations, differential weathering of the subsurface rock with zones of very soft soil above rock, and intermittent layering of rock and soft soil above bedrock at highly variable depth on the Project during micropile drilling was clearly identified and disclosed in the GFGR. (Ex. J-27; F.O.F. 268-281, 310-311, 321-326; Board Finding)

328. Because the likelihood of encountering steep and intense pinnacle formations, multiple rock seams and bedrock at varied depths like those actually found on the Project during micropile drilling was clearly identified and disclosed in the GFGR, this report cannot be considered misleading on these points. (Ex. J-27; F.O.F. 268-280, 310-311, 321-327; Board Finding)

329. Because we have found that the likelihood of encountering steep and intense pinnacle formations, differential weathering of the subsurface rock with zones of very soft soil above rock, and intermittent layering of rock and soft soil above bedrock at highly variable depth when drilling below the Project surface was clearly identified and disclosed in the GFGR, the existence of these conditions on the Project cannot, as a matter of fact, be considered a differing site condition from that originally described in the GFGR and the Contract Documents. Accordingly, the 257 days of Project delay attributable to slow micropile installation due to difficulties presented by drilling into and through areas of steep pinnacles, multiple layers of subsurface rock and finding bedrock at varied depths is the fault of Structural (as micropile subcontractor) who was selected and engaged by Lyons (as general contractor) to perform this aspect of Lyons' Contract work. (Exs. J-5, J-27; N.T. 3815-17, 4809-11; F.O.F. 9, 29-35, 268-280, 310-328; Board Finding)

330. This 257 days of delay to the Project was caused solely by Structural, and we find no act or omission of any other party which would act to excuse this delay to the Project. We further find that this delay of 257 days to the Project (which was to be completed in 380 days) substantially deprived the University of the benefit which it reasonably expected from the Contract which stated time to be of the essence and for which there appeared no reasonable prospect of a cure as all projections (including Lyons' own) showed a substantially delayed Project completion, we find this delay in progressing work on the Project at the time Lyons was terminated to be a substantial and material failure to meet the Contract performance time schedule.[16] (Exs. J-5, J-27, J-37, J-72, J-87, P-59, P-61; N.T. 2704-06, 2711, 3815-17, 4809-11; F.O.F. 5-11, 29-35, 268-280, 310-329; Board Finding)

331. Donald A. Bruce, D.Sc., Ph.D., testified at hearing as Lyons' expert in specialty geotechnical construction, including geotechnical construction techniques such as micropile drilling and installation, as well as general grouting and drilling activities. (N.T. 4693, 4704; Board Finding)

332. Dr. Bruce demonstrated extensive qualifications and experience worldwide in the field of geotechnical construction including micropile design and installation. Among other accomplishments in this field, his work includes contributions to the Federal Highway Administration ("FHWA") manuals on micropile foundations, which manuals are looked to for standards and guidance in the micropile industry. (N.T. 4693-4704, 4724-25; Board Finding)

333. As identified by the GFGR, the geology underlying the Project site was carbonate limestone with bedrock at highly variable depths, steep and intense vertical pinnacles, differential weathering of the subsurface rock with zones of very soft soil above rock, various fractures and solution openings in the rock and intermittent layering of rock and soft soil above bedrock at highly variable depths. (Exs. J-27, D-432; N.T. 877-890; Board Finding)

[16] We also note that these 257 days of delay which we attribute to Structural (and therefore Lyons) extended Project construction into an additional academic year depriving the University of its initial expectation that this construction would affect only one academic year.

334. Karstic limestone is characterized by pinnacles; wide variations in the depth to bedrock; variable weathering of the rock (the extent to which the rock is intact or solid); multiple zones of soft soil above rock seams; and fractures, fissures, and solution openings in the rock. (Exs. J-27, D-432; N.T. 885-86, 1991-92, 1461-62, 1465, 4809-10)

335. The geology described in the GFGR as underlying the Project surface was typical of "karstic" limestone geology in the region, but Gannett Fleming did not utilize the term "karst" or "karstic" in the GFGR. (Ex. J-27; N.T. 885-86, 1456-57, 1769-73; F.O.F. 331-332; Board Finding)

336. Dr. Bruce testified that geotechnical reports provided to bidding contractors which identify the same type of karstic geologic formation as was described in the GFGR (and therefore found under this Project) typically contain "red flag" warnings as to the potential for sinkhole development. (N.T. 4734-38, 4739, 4742-50)

337. Dr. Bruce also testified that "red flag" warnings is a term used in the micropile industry denoting explicit warnings which are typically given and expected in geotechnical reports which are provided to bidders when there is something special or extraordinary about a particular site like the type of karstic geology described in the GFGR. (N.T. 4717-18, 4733-50)

338. Dr. Bruce also testified that a contractor bidding on a construction project in the micropile industry has a right to expect that a project engineer's geotechnical report (when provided to the bidders) would include red flag warnings when special or extraordinary conditions such as karstic geology or the likelihood of sinkhole development exists on the site. (N.T. 4717-18, 4733-50)

339. Dr. Bruce further testified that such warnings as to the potential for sinkhole development typically are, and should be, accompanied by recommended methods to mitigate the risk of sinkhole development and to repair sinkholes if they develop. (N.T. 4731, 4733-50)

340. Dr. Bruce cited (and Defendant provided) several examples of geotechnical reports which included such "red flag" warnings as to the potential for sinkhole development and suggestions for sinkhole prevention and/or repair for projects where geology materially similar to that underlying this Project was identified in these other reports.[17] These examples included reports prepared by David A. Blackmore & Associates ("Blackmore" or "DBA") in July 2002 and January 2003 in conjunction with the construction of another project, known as the Industrial Arts Facility (hereinafter "IAF"), which was an earlier building construction project immediately adjacent to the Project site here at issue.[18] Other examples included two reports prepared by

[17] The Board takes note that Exs. D-3, D-4, D-305, D-306, D-307, D-308, D-312, D-313 were admitted for non-hearsay purposes only. As such, the Board does not utilize these reports (either here or later) to establish the truth of the matter asserted therein (e.g. to establish what the actual ground conditions were on these other job sites). We do, however, utilize these exhibits here as examples of the types of warnings and information expected in the industry when ground conditions typical of karstic geology are identified in a geotechnical report.

[18] The Blackmore IAF geotechnical reports included specific information relative to sinkholes such as:

> The subject site is underlain by a carbonate geologic formation that is subject to dissolution activity and the subsequent development of karst features, subsoil erosion and the formation of

Gannett Fleming which, like the Blackmore Reports on the IAF project, specifically noted the potential for sinkhole development and included instructions for sinkhole repair where karstic geology similar to that underlying the Project was identified. These reports included such "red flag" warnings regardless of whether or not sinkholes, voids or closed depressions were identified as present during the site investigation. (Exs. J-500, P-35, P-36, D-3, D-4, D-305, D-306, D-308, D-312, D-313; N.T. 57-58, 4731-50; Board Finding)

341. Rudolph Frizzi, a geotechnical engineer with multiple degrees and many years of experience in this field working with structures and micropile drilling of the type here at issue also testified for Defendant (Lyons) with regard to the same matters discussed immediately above by Dr. Bruce. Mr. Frizzi reviewed the Project as well as the Gannett Fleming Geotechnical Report and other geotechnical reports such as the Blackmore Reports for the adjacent IAF project. Mr. Frizzi's testimony agreed with (and reinforced) the above-referenced testimony of Dr. Bruce regarding the expectation that "red flag" warnings as to the potential for sinkhole development (along with repair and mitigation detail) would typically be expected and included in a geotechnical report which identified karstic geology of the type underlying the Project. (Ex. J-27; N.T. 3965-76, 3987-91, 3993, 3995-99, 4002-03)

342. The Board found the testimony of Dr. Bruce and Mr. Frizzi (as summarized above in Paragraphs 334 to 341) to be credible and persuasive. We further find that a geotechnical report identifying the type of geology as was found here under the Project, when provided to the contractors bidding on micropile work for same, would typically and reasonably be expected to contain "red flag" warnings as to the potential for sinkhole development (as well as other detail on sinkhole repair and/or mitigation). (F.O.F. 331-341; Board Finding)

343. The Gannett Fleming Geotechnical Report, which was provided to contractors bidding on the Project, contained no warnings about the potential for the development of sinkholes on the construction site and, in fact, did not use the terms "karst" or "sinkholes" at all. It further stated that "no voids were encountered during the subsurface investigation." (Ex. J-27; N.T. 4716-18, 4730-31, 4735, 4747, 4750-53; Board Finding)

344. Because a geotechnical report identifying the type of geology as was found here under the Project, when provided to contractors bidding on micropile work, would typically and reasonably be expected to contain "red flag" warnings as to the potential for sinkhole development (as well as other detail on sinkhole repair and/or mitigation); and because the GFGR here presented to bidding contractors did not contain any such warnings or discussions, provided no detail on sinkhole repair or mitigation and, in fact, indicated that no voids were encountered, we find that the GFGR, as a whole, served as an affirmative representation that significant sinkhole activity was not to be expected on the Project site. (Exs. J-27, J-219, J-220,

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> sinkholes. Disturbance and/or alteration of the existing site may result in an increase in subsoil erosion and sinkhole formation. Therefore DBA has included guidelines for minimizing the risk of sinkhole development during construction in the appendix of this report.

(Ex. D-3 p. SU049269; N.T. 4735-36)

J-221; J-287; N.T. 1330, 3995-99, 4002-03, 4716-17, 4730-31, 4744-45, 4777, 4785-86; F.O.F. 35-37, 96, 105, 331-343; Board Finding)

345. Because we have found that the GFGR, as a whole, served as an affirmative representation that significant sinkhole activity was not to be expected on the Project site, we conclude that the nature and extent of the sinkholes which actually occurred on the Project constituted a concealed site condition which materially differed from that which was reasonably anticipated by Structural and Lyons from the information provided to them by the University when it published the Gannett Fleming Geotechnical Report to prospective contractors during the bid process. (Exs. J-1, J-2, J-5, J-27, J-219, J-220, J-221; J-287; N.T. 1330, 3995-99, 4002-03, 4716-17, 4730-31, 4744-45, 4777, 4785-86; F.O.F. 55-69, 85-105, 115-138, 295-303, 331-344; Board Finding)

346. The IAF (also known as the Performing Arts Center or "PAC") was an earlier University building construction project utilizing a micropile foundation which was built on a site immediately adjacent to the Student Recreation Center Project site here at issue. Lobar was the general contractor and Nicholson the micropile subcontractor on the IAF project. Sinkholes did develop during construction on the IAF project site. (Exs. J-118, J-500, P-35, P-36; N.T. 51, 57-58, 214, 220, 768-70, 1205-06, 2150-53, 2241, 2279, 2427, 4799-80, 4867-68; Board Finding)

347. The occurrence of sinkholes and the drillers' experiences on the IAF project was information which was material and relevant to general construction bidders on the Student Recreation Center Project and should have been disclosed to the bidders on the Project (including Lyons). (N.T. 4698, 4718-25, 4729, 4732-33, 4754-55; F.O.F. 346; Board Finding)

348. The DBA geotechnical reports for the adjacent IAF project site (the "Blackmore Reports") contained warnings of possible sinkhole development. (Exs. J-27, D-3, D-4; Board Finding)

349. The Blackmore Reports stated that there was the potential for sinkholes forming during construction of a performing arts building utilizing a micropile foundation on a plot of land immediately adjacent to the SRC Project, and included details for sinkhole prevention and/or repair. These reports were verbal acts providing notice that an experienced geotechnical engineering firm had previously supplied the University with advice and supporting analysis stating that the geologic structure underlying the ground immediately adjacent to the SRC Project exhibited the potential and/or likelihood for sinkhole formation when construction (including micropile drilling) would take place. As such, the Blackmore Reports were relevant and material notifications (particularly to those considering drilling and installing micropiles on the Project) that should have been referenced in the GFGR and/or provided to contractors during bidding on the Project (and the micropile work thereon). (Exs. D-3, D-4; N.T. 4698, 4708, 4717-22, 4725-29, 4732-40, 3985-89; F.O.F. 348; Board Finding)

350. Neither the GFGR nor the micropile specifications on the Project contain any reference to the drillers' experience or sinkhole occurences on the adjacent IAF project or to the Blackmore Reports. (Exs. J-5, J-27; N.T. 4721-22, 4732, 4738-42; Board Finding)

351. Because the notification provided by the Blackmore Reports for the IAF project and the drillers' experiences and occurrences of sinkholes on the IAF project were relevant to bidders on the SRC Project and no mention of either was contained in the Project specifications or the GFGR, and because such mention would typically be provided and reasonably be expected in such documents, the absence of such references was a material omission which made the GFGR materially misleading. (Exs. J-5, J-27; N.T. 3985-89, 4698, 4708, 4717-29, 4732-40, 4754-55; F.O.F. 336-350; Board Finding)

352. The term "Contract Documents" is defined at Article 1.1.100 of the Contract as follows:

> The Contract Documents consist of the agreement, notice to contractors, the bid proposal, the contract bonds (if specified), all riders, drawings and specifications, Special Requirements, General Requirements, and ***addenda issued to the contract***. . . [emphasis provided].

(Ex. J-5 p. SU054559)

353. Addendum No. 1 to the Contract issued December 5, 2005 states, in relevant part, as follows:

> **Addendum No. 1**
> Project No. SU-2003 / 12B
>
> Project: Student Recreation Building
> Shippensburg University of Pennsylvania
>
> Owner: Pennsylvania State System of Higher Education
>
> Bid Due Date: December 13, 2005 at 4:00 P.M. (Local Time)
>
> The following clarifications, amendments, additions, deletions, revisions and modifications are part of the Contract and change the original Bidding Documents only in the manner and to the extent stated.
>
> . . .
>
> GEO-TECHNICAL REPORT
> The Geo-Technical Report for this project is available for review on Spillman Farmer Architects web site at www.spillmanfarmer.com, under Bid List/Shippensburg/Geotechnical Report.

(Ex. J-2)

354. The Project specifications pertaining to the micropile work and excavation included the following disclaimers and cautionary language:

> Any available data concerning subsurface materials or conditions, which are based upon soundings, test pits, or test borings has been obtained by the retained Engineer for its own use in designing this project. Its accuracy or completeness is not guaranteed by the Owner or the Engineer, and in no event is it to be considered as part of the contract plans or specifications. Contractor must assume all risks in excavation for this project and shall not be entitled to rely on any subsurface information obtained from the retained Engineer. Bidders shall therefore make their own investigation of existing subsurface conditions and if they do not do so, the Owner will not be responsible in any way for the consequences

(Ex. J-1, Project Manual, Micropiles, Project Conditions p. SU007002)

355. The foregoing provisions of the Project specifications, in which the University states that the the GFGR is not to be considered part of the "contract plans or specifications" contradicts Article 1.1.100 of the Contract which states that addenda (such as Addendum No. 1 providing the GFGR) become part of the Contract Documents as well as the introductory language of Addendum No. 1 itself. This internal contradiction in the Project documents provided by SSHE creates ambiguity as to whether the GFGR is or is not to be considered a part of the Contract Documents. (Exs. J-1 p. SU007002, J-2, J-5 p. SU054559; Board Finding)

356. Resolving the foregoing ambiguity against SSHE, who was the drafter of the Contract Documents, would cause us to find that the GFGR was part of the Contract Documents, and to further conclude that the Contract Documents as a whole were misleading as to the potential for sinkhole activity on the Project. (Exs. J-1; F.O.F. 352, 353-355; Board Finding)

357. Articles 4.1 and 4.2 of the Contract allowed Lyons to seek adjustment of the Contract sum and/or the Contract time period if

> . . .conditions are encountered at the site which are (1) subsurface or otherwise concealed physical conditions which differ materially from those indicated in the Contract Documents or (2) unknown physical conditions of an unusual nature, which differ materially from those ordinarily found to exist and generally inherent in construction activities of the character provided for in the Contract Documents….

(Ex. J-5 p. SU054566)

358. Based on the fact that the sinkhole activity on the Project was a concealed site condition which materially differed from that which was reasonably anticipated by Structural and Lyons from the information in the Gannett Fleming Geotechnical Report and the Contract Documents, and because this unexpected sinkhole activity caused Lyons extra work and delayed Structural's micropile drilling and Lyons' progress on the overall Project for 109 days, we find this 109 day portion of the total Project delay to be excusable as to Lyons. However, we do not find that this failure to adequately disclose the potential for sinkhole development on the Project changed the essential nature of Lyons' or Structural's work on the Project or deprived Lyons of a benefit from its bargain for which it could not be adequately compensated by extending its

completion date and/or increasing its compensation for the extra-contractural work and/or delay expense caused by these sinkholes. Such adjustments are typically made in the industry to account for delay and cost of extra work caused by this type of differing site conditions, as evidenced, inter alia, by Article 4.1 and 4.2 of the Contract which contemplate such an adjustment and by Lyons' expressed intent to continue its work through the difficulties caused by these sinkholes. (F.O.F. 297-307, 342-356; Board Finding)

359. The GFGR included explicit disclaimers regarding the information contained therein and the bidders' reliance thereon:

> Notwithstanding anything contained in the contract documents, and/or in the subsurface drilling reports to the contrary, the subsurface drilling reports that will be provided to the Bidder are for informational purposes only and nothing contained therein and/or in the contract documents shall be deemed to be a representation or warranty with respect to the condition of the project site and/or any work required to be performed in connection with the excavation thereof, and in no event shall the subsurface drilling reports be considered a part of the contract documents.
>
> Bidders represent to the System that they are experts in the work to be performed pursuant to the contract documents, and they have performed, at their sole cost and expense, such due diligence investigations as they deem necessary to determine for themselves the character of materials and excavation work to be performed pursuant to the contract documents. Bidders further acknowledge that the foregoing representation is a material inducement to the System's execution of the contract agreement.

(Ex. J-1, Project Manual, Special Requirements p. SU006835)

360. The provision of a "site specific subsurface investigation is very, very important to obtain a complete and informed bid." It is beneficial to the owner as well as the contractor to provide these reports in order to obtain a complete and informal bid at the lowest price. (N.T. 3977-78; Board Finding)

361. Contractors typically rely on geotechnical reports when preparing their bids because they serve to describe the conditions of the site in anticipation of construction. (N.T. 1902, 1936-37, 4713-14)

362. Dr. Bruce testified that it is common practice in the micropile drilling industry for bidders to rely on reports of geotechnical investigations when provided by the owner for bidding a job and that it is reasonable that they do so despite the disclaimers typically contained in accompanying documents given the cost, the limited time, the uncertainty of winning the bid and other practical constraints involved in the bidding process, particularly when compared to the more ample time and opportunity for analysis of the subsurface conditions available to the author of the geotechnical report. (N.T. 3977, 4711-4715, 4785-86, 4853)

363. Lyons relied on the Gannett Fleming geotechnical report in preparing its bid. (N.T. 2493-94)

364. As a general contractor bidding on the Project, Lyons had no reasonable means of making an independent investigation of the subsurface conditions underlying the Project site given such factors as the cost of such an investigation in comparison to the uncertainty of obtaining the work and the limited time frame allowed for bidding on the Project. We find it reasonable for Lyons to have relied on the subsurface report contained in the GFGR. (N.T. 64, 283-84, 1902, 1936-37, 2493-94, 3977-78, 4713-14; Board Finding)

365. Because the GFGR constituted an affirmative representation that significant sinkhole development was not to be expected on the Project site (which later proved to be false and misleading as substantial sinkhole activity developed on the site); and because the GFGR also contained material omissions by reason of its failure to disclose the occurrence of sinkholes on the adjacent IAF project and/or its failure to reference the Blackmore Reports; and because this misrepresentation affected the micropile drilling specifications, which were material to the Contract, we find that the GFGR amounted to a material misrepresentation by Gannett Fleming and the University as to the ground conditions to be encountered on the Project. Although we are not persuaded by the evidence of an intent to deceive bidders on this Project, we do further conclude that this misrepresentation and the material omissions were occasioned through either gross mistake or arbitrary action on behalf of Gannett Fleming and/or the University as the Board heard no reasonable explanation for the lack of mention of the potential for sinkhole activity in the GFGR or for the other omissions noted above. These material misrepresentations and omissions caused Lyons to underestimate the work needed on the Project due to unexpected sinkhole activity and resulted in multiple interruptions to, and slower than anticipated prosecution of, the micropile drilling, causing 109 days of delay to the Project as well as extra-contractual work and cost to Lyons. (Exs. J-5, J-27, J-22.13, J-22.14, J-22.15, J-22.16, J-178, J-189, J-209, J-211, J-379, D-206; N.T. 2578-79, 3977-78, 4002-03, 4744-45; F.O.F. 55-136, 178-181, 190, 228, 258-262, 268, 295-305, 329-362; Board Finding)

366. Because the GFGR constituted an affirmative representation that significant sinkhole development was not to be expected on the Project site (which later proved to be false and misleading as substantial sinkhole activity developed on the site); and because the GFGR also contained material omissions by reason of its failure to disclose the occurrence of sinkholes on the adjacent IAF project and/or its failure to reference the Blackmore Reports; and because this misrepresentation affected the micropile drilling specifications, which were material to the Contract, we find that the GFGR amounted to a material misrepresentation by Gannett Fleming and the University as to the ground conditions to be encountered on the Project. We also find these material misrepresentations and omissions actively interfered with Lyons' work insofar as it caused Lyons to underestimate the work needed on the Project due to unexpected sinkhole activity that resulted in multiple interruptions to, and slower than anticipated prosecution of, the micropile drilling, causing 109 days of delay to the Project as well as extra-contractual work and cost to Lyons. (Ex. J-27, D-3, D-4; N.T. 4002-03, 4734, 4740-42, 4744-45; F.O.F. 55-136, 178-181, 190, 228, 258-262, 268, 295-305, 329-364; Board Finding)

367. As a result of this active interference and these material misrepresentations and omissions noted above concerning the potential for sinkholes developing on the Project site, and in reliance on the affirmative representation that significant sinkhole development was not to be expected on the Project site, Lyons was delayed in the performance of its Contract and suffered financial harm. (Exs. J-27, D-286B, D-365, D-434, D-448; N.T. 4276-82, 4284-95, 4312, 4344; F.O.F. 55-136, 178-181, 190, 228, 258-262, 268, 296-307, 329-366; Board Finding)

368. Although 109 of the 366 days the Project was late was due to the unexpected sinkhole activity which developed on the Project site and the University's misrepresentations and active interference as described in the preceding paragraphs, thereby excusing the 109 days of delay, Lyons was still 257 days behind schedule on the Project as of the date of termination due to Structural's slow micropile installation which resulted from drilling into the steep and intense pinnacle formations, multiple rock seams, and bedrock of variable depth encountered on the Project. (Exs. J-5, J-22.4, J-22.7, J-22.10, J-37, J-72, J-87, J-99, J-328, P-59; N.T. 2042, 2543-46, 3582-85, 2704-06, 3166, 3455, 3539, 3585-90, 3636, 3651-57, 3668, 4831-32; F.O.F. 268, 297-307, 310-330, 342-367; Board Finding)

369. Because Lyons was 257 days behind schedule on the Project as of the date of its termination on the Project (which was scheduled to take slightly over one year), Lyons was materially late in progressing the Project even after excusing and discounting the delay due to the sinkhole activity experienced on the Project. This unexcused material delay of 257 days (on a 380-day Project), caused solely by Structural's unexcused failure to drill and install micropiles timely, was attributable to Lyons as general contractor and provided the only basis, in fact, for the University's termination of Lyons under Article 13.2.100 of the Contract. This unexcused failure by Structural to timely perform the micropile work which was attributable to Lyons under the Contract and caused 257 days of delay to the Project is sometimes referred to hereinafter as "Lyons' Default" for short. (Exs. J-5, J-72, J-328, P-59; F.O.F. 268, 297-307, 310-330, 342-368; Board Finding)

III. Damages

A. The University's Damages v. Lyons

370. The University seeks damages in principal amount totaling $3,393,017, representing its claimed total cost to complete the Project ($10,444,246) reduced by the unpaid contract balance of $7,051,229. The University itemizes its damages claim as follows: 1) its cost of finishing the project paid to the replacement general contractor, Lobar, and materials suppliers Ritner Steel and Hershocks totaling $9,959,159; 2) Extra Professional costs totaling $119,370; 3) Re-procurement costs totaling $67,302; and 4) Project delay costs totaling $298,415. (Exs. P-67, P-68, P-69, P-71, P-72, P-73)

371. In the case of termination of a contractor for default, Article 13.2.101 of the Contract provides for the payment of damages as follows:

> If the unpaid balance of the Contract sum exceeds the cost of finishing the work, including compensation for the Professional's additional services and

> any other damages which the System has incurred in accordance with the Agreement, such excess shall be paid to the Contractor. If such costs exceed the unpaid balance, the Contractor or the Surety or both shall pay the difference to the system.

(Ex. J-5 p. SU054578)

372. The University's measure of damages from Lyons under Article 13.2.101 of the Contract adds two elements and subtracts a third, as follows: (1) the University's cost of finishing Lyons' work on the Project (which is expressly stated to include compensation for the Professional's extra services)[19] and (2) any other damages which the University has incurred due to Lyons' Default on the Contract, less (3) the unpaid balance of the Contract. (Ex. J-5; F.O.F. 370-371)

1. University's cost to finish Lyons' work on the Project

373. Following its termination of Lyons, the University contracted with Lobar, to complete the unfinished general contractor work on the Project. Lobar had been the next lowest of the original bidders on the Project. (Exs. J-8, J-9; N.T. 2241)

374. The University's agreement with Lobar comprised separate contracts to complete the micropile installation (Phase I) and all other general contractor work (Phase II). (Exs. J-8, J-9)

375. Lobar completed the Project on March 14, 2008, 338 days beyond the Contract completion date of April 10, 2007. (Ex. P-63; F.O.F. 182-188)

376. The University claims it incurred $9,912,652 in direct construction costs to complete Lyons' work on the Project, paid as follows:

Phase I (micropile completion) paid to Lobar	$ 1,740,027
Phase II (completion of remainder) paid to Lobar	7,222,864[20]
Structural steel, paid directly to Ritner Steel	681,840
Other materials, paid directly to Hershocks	267,921
Total	**$9,912,652**

(Exs. J-1, J-5, J-8, J-9, J-353, P-12, P-13, P-67, P-75; N.T. 2091-92, 2182-90, 2241-56, 2279-92)

377. The accuracy of the foregoing amounts (except as footnoted) was not challenged, but Lyons did challenge the University's entitlement to same by asserting, inter alia, that the completion costs paid to Lobar (particularly for Phase I – micropile completion) were excessive

[19] The "Professional" is defined in the Contract to refer only to Gannett-Fleming and Spillman Farmer. (Exs. J-1, J-5; Board Finding)

[20] The University claimed $7,269,371 in Phase II completion costs under its Phase II contract with Lobar. That amount was reduced by $46,507 in change orders as reflected in Lobar's Application for Payment (Ex. P-75), reducing the amount actually paid under Phase II to $7,222,864.

and constituted a failure to mitigate damages on the University's part. Lyons also asserted that part of these excessive completion costs were incurred due to the differing site conditions encountered on the Project. It therefore asserts that at least part of these completion costs were extra costs beyond the scope of the original Contract, thereby placing the University in a better position than it would have been upon completion of the original Contract. (Lyons' Post-Trial Reply Brief at pp. 36-37)

378. With regard to the Phase I (micropile completion) portion paid to Lobar, we acknowledge that the University paid Lobar $1,740,027 to do the 11,141 linear feet of micropile work which remained after termination (i.e. a rate of $156.18 per foot). We further recognize that, compared to the original Contract rate of $65.20 per foot to be paid to Lyons for all of the micropile work, Lobar was being paid at a rate which was roughly 2.40 times the original micropile drilling rate, which represents a premium on this part of the completion work of 140% or $1,013,634.[21] (Exs. J-1, J-36; F.O.F. 37, 187, 266, 372, 376)

379. Although the Board shares Lyons' concern with such a steep premium and the University's failure to seek proposals[22] from more than one contractor to perform micropile completion work, we note that Lyons has not provided us with a credible estimate of what it believes would have been the reasonable cost of such completion work.[23] Among other things, we also recognize that Lobar (and Nicholson as its micropile subcontractor) were being asked to come onto a troubled and delayed project in mid-stream, to accept the risk that prior work was done correctly, to accelerate micropile installation (which it did), and to do so with knowledge of the sinkhole activity that had plagued this drilling while avoiding the extra costs of compaction grouting insisted upon by its predecessor.[24] Given these factors and the surrounding circumstance (including Lobar's and Nicholson's previous success on the IAF project), we cannot say that their selection or hefty premium paid to Lobar for Phase I (micropile work) was unreasonable in this case. (Exs. J-8, J-350; N.T. 1140-45, 2429-30, 4795-99; F.O.F. 369; Board Finding)

380. As to the amount paid to Lobar to complete Lyons' remaining (non-micropile) general contractor work (Phase II at $7,222,864), we estimate this to include a premium of approximately 32% over the original Contract price.[25] Although we once again express our view

[21] At the $156.18/ft rate the University paid Lobar $1,740,027 for 11,141 feet. At the original rate of $65.20, the 11,141 feet would have cost $726,393. The difference, or premium, is $1,013,634.

[22] By this comment we mean proposals for comparison and do not intend to suggest formal bidding procedures are necessarily required where circumstances like here dictate that faster resolution is needed. (Ex. J-353)

[23] Lyons seems to suggest that Lobar's bid price of $65.20 per foot contained in its original and unaccepted bid before Project award would be the correct alternative. Given the additional factors noted in our surrounding discussion, we do not find this suggestion realistic.

[24] Among other things, Lobar's additional work to address sinkhole potential included creating additional detention ponds, and performing additional erosion and sediment control work, proof rolling, and other precautionary activities. (N.T. 1140-45, 2429-30)

[25] Lyons' full Contract price ($8,785,960) minus Structural's sub-contract price ($1,506,460) or $7,279,500 represents the value of 100% of Lyons' original non-micropile Contract work. In comparison, the University paid a total of $8,172,625 to finish the non-micropile general contract work on the Project ($7,222,864 to Lobar and $949,761 for materials directly to Ritner and Hershocks). However, because only 85% of the non-micropile work remained for Lobar to complete, we compare the original price to be paid to Lyons for 85% of the work ($7,279,500x.85 or $6,187,575) to the University's cost for Lobar to complete 85% of the work ($8,172,625) and

that seeking a proposal for this work from more than one general contractor would have been preferable, we do not find this premium to be unreasonable under the circumstances either. Here again, Lobar was being asked to come onto a troubled and delayed project in mid-stream, to accept the risk that prior work was done correctly, and to accelerate this work with knowledge that the micropile installation that was precedent to its remaining work was not yet complete. Given these factors and the surrounding circumstance (including Lobar's previous success on the IAF project), we cannot say that the 32% premium paid to Lobar was unreasonable in this case). Moreover, Lyons has again failed to provide the Board with a credible counter-estimate as to how much this premium should be reduced. (Exs. J-8, J-350, J-353, D-35, P-37; N.T. 768-70, 833-36, 1741-42, 4819; Board Finding)

381. Although we do not find either the amounts (or premiums) paid to Lobar for Phase I (micropile) or Phase II (non-micropile) completion work to be unreasonable under the specific circumstances of this case, we do note that we found the difference in the premiums paid to Lobar for Phase I (micropile completion) versus its Phase II work (non-micropile general construction) to be justified by the potential need to address sinkhole activity and related worker safety issues during Phase I. Because we have also found this sinkhole/safety concern to stem from a differing site condition (and therefore to involve extra work beyond that contemplated by the original Contract), we conclude that the higher premium (140% compared to 32%) paid to Lobar for the Phase I micropile work was due to the need to perform extra-contractual work in this phase. The premium difference paid therefore constitutes additional cost beyond the reasonable cost of completion of the micropile portion of Lyons' original Contract work. Accordingly, we consider the 108% premium difference paid to Lobar for Phase I work (or $784,504)[26] to be due to the extra work of dealing with the sinkhole activity (i.e. the differing site conditions), and only $955,523 paid to complete Lyons' original Contract micropile work. (Exs. J-1, J-8, J-36, J-350; F.O.F. 376-380; Board Finding)

382. Accordingly, we find the University to have reasonably and necessarily incurred $9,102,408 to complete Lyons' original Contract work on the Project, itemized as follows:

Phase I (micropile completion) paid to Lobar	$ 955,523
Phase II (completion of remainder) paid to Lobar	7,222,864[27]
Structural steel, paid directly to Ritner Steel	681,840
Other materials, paid directly to Hershocks	267,921
Total	**$9,128,148**

find the University paid a 32% premium over Lyons' original Contract rate for the non-micropile work ($6,187,575 x P = $8,172,625; P=1.32 representing a 32% premium paid to Lobar over Lyons Contract price). We calculated the percentage completion of non-micropile general contract work done by Lyons prior to termination by comparing the amounts paid to Lyons for all work less the amounts paid to Structural for micropile work ($1,734,731-$755,045=$979,686) plus unpaid Contract work Lyons claimed ($147,422) which totaled $1,127,108 ($979,686+$147,422). We then compared this total value of non-micropile work performed by Lyons ($1,127,108) to the total value of its non-micropile Contract work ($7,279,500) to conclude Lyons had completed 15% of the non-micropile Contract work when terminated ($1,127,108/$7,279,500=0.15 or 15%).

[26] $65.20/ft x 11,141 ft = $726,393 was original contract cost. A 108% premium on this base rate is calculated as $726,393x1.08 or $784,504.

[27] The University claimed $7,269,371 in Phase II completion costs under its Phase II contract with Lobar. That amount was reduced by $46,507 in change orders as reflected in Lobar's Application for Payment (Ex. P-75), reducing the amount actually paid under Phase II to $7,222,864.

(Exs. J-1, J-5, J-8, J-9, J-353, P-12, P-13, P-67, P-75; N.T. 2091-92, 2182-90, 2241-56, 2279-92; F.O.F. 5-7, 29-34, 182-188, 376-381; Board Finding)

383. In addition to the direct construction costs to finish the Project paid to Lobar, Ritner Steel and Hershocks, the University claimed $119,370 in extra "professional" costs which it itemized as follows:

(a) Professional Services to Respond to Deficiencies in Lyons' Micropile Construction	$76,591
(b) Drilling Inspection Services Provided by DBA	5,313
(c) Traylor Procedures Investigation	5,244
(d) Advantage Engineering Site Investigation	8,950
(e) ArroActiv Scheduling Services	8,379
(f) ArroActiv Claim Preparation Services	14,893
Total	**$119,370**

(Ex. P-68)

384. With the exception of item (f) above, all of the other costs listed in Paragraph 375 were incurred prior to Lyons' termination, and none were incurred to finish Lyons' work on the Project. (P-68; N.T. 2092-93, 2191-92; F.O.F. 137-152, 160, 167-173, 191-227, 372; Board Finding)

385. Of the $119,370 in extra "professional" costs claimed by the University, items (a), (c) and (d) above (totaling $90,785) were all incurred because of the asserted deficiencies in Lyons' and/or Structural's micropile drilling procedures. Because we have found that the micropile drilling procedures employed by Structural and/or Lyons were not deficient, these additional costs were unwarranted as a matter of fact. They were not a part of the cost of finishing Lyons' work on the Project nor were they reasonably caused by Lyons' Default (i.e. Lyons' material failure to timely progress the Project caused by Structural's failure to drill and install the micropiles in a timely manner). (Exs. P-40, P-68; N.T. 367, 1453, 2093, 2191-93; F.O.F. 137-152, 160, 167-173, 191-227, 322-369, 372; Board Finding)

386. As for item (b), drilling inspection services by DBA of $5,313, the University has failed to adequately identify the work performed or to establish a causal connection between these costs and Lyons' Default. (Ex. P-68; N.T. 2092-93, 2191-92; F.O.F. 372, 383; Board Finding)

387. The scheduling services provided by ArroActiv listed as item (e) (totaling $8,379) included early work directed by the Professional due to concerns that Lyons was late in producing a Project schedule signed by the other prime contractors (which we have found not to be a material failure) as well as work preparing independent work progress updates continuing into the Fall of 2006 due to concerns over Lyons' delay in progressing its actual work on the Project. Although we consider the latter scheduling activity to be caused by Lyons Default in failing to progress work on the Project in a timely manner, it is unclear from the record what portion of the claimed $8,379 in costs for scheduling services may have been necessitated by the

latter as opposed to the former concern. As a result, the University has failed to establish the cost of the work progress updates with reasonable certainty. (Exs. P-5 to P-9, P-68; N.T. 367, 399-410, 501-05, 2191-92; Board Finding)

388. Although ArroActiv's claim preparation services (item f) were provided to the University after Lyons' termination, they were not necessary or reasonably incurred to complete the Project. Moreover, we do not find them to have flowed naturally from Lyons' Default or been reasonably foreseen at the time of contracting since the Contract contains no specific mention of such costs; we find these costs were incurred instead due to an independent determination by the University to institute a law suit against Lyons subsequent to Lyons' Default. (Exs. P-68, P-78; N.T. 2092-93, 2191-92, 2255-56; Board Finding)

389. The University claimed $67,302 in re-procurement costs incurred as part of the transition to the replacement general contractor following Lyons' termination, as follows:

Paid to the Professional for transition to Lobar	$47,858
Paid to ArroActiv for transition to Lobar (preparation of a completion schedule for Lobar)	7,255
Paid Hill International to aid in negotiation of Phase II contract with Lobar	12,189
Total	**$67,302**

(Exs. J-353, P-11, P-69, P-74, P-76, P-77; N.T. 463-64, 2095, 2192-93, 2243-48)

390. The $67,302 in re-procurement costs claimed by the University were reasonable and necessary to finish Lyons' work on the Project. (Exs. J-5, J-353, P-11, P-69, P-74, P-76, P-77; N.T. 463-64, 2095, 2243-48; F.O.F. 182-188; Board Finding)

391. The University claimed that it incurred the following additional costs to finish Lyons' work on the Project during the "extended period" (i.e. the period from the Contract completion date of April 10, 2007 to Lobar's actual completion date of March 14, 2008) as a result of the delay caused by Lyons' Default on the Project:

Ryder flatbed truck rental to store structural steel	$ 2,949
Extension of the Professional's services to completion date	33,746
Additional salary and overhead costs paid to the Professional	1,766
Additional costs paid to ArroActiv for construction supervision and contract management	131,106
Additional costs paid to ArroActiv for administration services from the retention of Lobar through Project completion	28,848
Total	**$ 198,415**

(Ex. P-71; N.T. 2098-99, 2195-97)

392. We agree with the University to an extent and find that costs for structural steel storage and additional costs paid to the Professional for work in the extended period were

reasonable and necessary costs of finishing Lyons' work on the Project. However, we also find that only a portion of the total amount claimed for these items were caused by Lyons' Default on its Contract (as explained below in Paragraphs 392-394 more fully). (Exs. J-5, P-71; N.T. 2098-99, 2195-97; F.O.F. 322-369, 372, 389-391; Board Finding)

393. We further agree with the University to the extent we find that additional costs paid by the University to ArroActiv for administrative services and construction supervision and management in the extended period were other damages caused the University by Lyons' default on its Contract, which were reasonably and foreseeably incurred by the University. However, we also find here that only a portion of the total amount claimed for these items was caused by Lyons' Default (as explained below in Paragraphs 394-396 more fully). (Exs. J-5, P-71; N.T. 2098-99, 2195-97; F.O.F. 322-369, 372, 394-396; Board Finding)

394. The $198,415 in additional costs incurred by the University for storage and services in the extended period (as identified above in Paragraphs 389-391) were incurred due to a total Project delay of 338 days (April 10, 2007 to March 14, 2008). (Exs. P-63; P-71; F.O.F. 391-393)

395. Because we have found that, as of the date of Lyons' termination, the Project was 366 days late but Lyons was accountable for only 257 of these delay days due to Lyons' Default (i.e. its failure to progress work on the Project timely caused by Structural's slow micropile drilling and installation); and because we find that Lyons Default also caused the additional 38 days after Lyons' termination it took for Lobar to be retained and begin work as replacement general contractor on the Project, we find that Lyons Default caused only a total of 295 days of the 338 days of actual total delay experienced on the Project (i.e. 87% of the total actual delay). As such, Lyons' Default caused only 87% of the additional costs incurred by the University in the extended period. (Exs. J-72, J-328, J-347; N.T. 2704-06, 2711; F.O.F. 322-369, 392-394; Board Finding)

396. Eighty-seven percent of the $198,415 additional costs incurred by the University during the extended period for Project completion, or $172,621, was caused by Lyons' Default as a result of the 295 days of delay to completion of the Project which we attribute to Lyons. (Ex. J-328; N.T. 2704-06, 2711; F.O.F. 178, 262, 268, 306-308, 322-323, 369, 391-395; Board Finding)

397. The University's total cost to finish Lyons' original Contract work on the Project, plus other damages incurred as a result of Lyons' Default on its Contract, was $9,368,071, itemized as follows:

Direct construction costs to complete Lyons' work paid to Lobar, Ritner Steel, and Hershock's	$9,128,148
Post-termination re-procurement costs	67,302
Additional costs to complete Lyons' work in the extended period caused by Lyons' default	172,621
Total Cost to University	**$9,368,071**

(F.O.F. 322-396; Board Finding)

398. The University's cost to complete Lyons' work on the Project and its damages due to Lyons' Default on its Contract ($9,368,071), reduced by the unpaid Contract balance ($7,051,229), equals $2,316,842. (Exs. J-5, P-73; F.O.F. 322-396; Board Finding)

2. Herre Brothers Claim

399. On May 2, 2007, Herre Brothers submitted a claim to the University in the amount of $215,992 for "additional costs associated with an extension of the project's target completion date . . . from April 11, 1007 to February 14, 2008[,] . . . an extension of 44 weeks (220 days)." The project referred to by Herre Brothers was the Project that is the subject of the claim here at issue. (Exs. J-356; P-70; Board Finding)

400. Nearly all of Herre Brothers' work on the Project was contingent upon Lyons (through Structural) first completing the micropile installation, as well as other tasks required to precede Herre Brothers' electrical work on the Project. (Exs. J-1, J-87; N.T. 382, 489-90; F.O.F. 232, 255; Board Finding)

401. Because we have found that nearly all of Herre Brothers' work was contingent upon Lyons (through Structural) first completing the micropile installation, as well as other tasks required to precede Herre Brothers' electrical work on the Project, and that Lyons (because of Structural's slow micropile drilling) caused a total of 295 days of the total delay experienced on the Project, these 295 days of delay which we have attributed to Lyons is also a reasonable estimate of the delay which Lyons (through Structural) caused to Herre Brothers' work on the Project. (Exs. J-72, J-87, J-328, J-347; N.T. 382, 489-90, 2704-06, 2711; F.O.F. 232, 255, 307-321, 368-369, 376, 391-397; Board Finding)

402. On November 29, 2007, Herre Brothers filed a claim with the Board of Claims, seeking $215,992.47 in delay damages it allegedly incurred on the Project.[28] (Board of Claims Docket No. 3922)

403. On September 30, 2009, the University entered into a settlement with Herre Brothers, settling the claim for $100,000. (Ex. J-378)

404. In the settlement agreement between Herre Brothers and the University, Herre Brothers assigned to the University "any and all claims, demands, and causes of action of any kind whatsoever which Herre Brothers has or may have against Lyons for additional costs due to delays to the completion of the . . . Project." (Ex. J-378; N.T. 472-75, 2095-99, 2249-50)

405. On the basis of the foregoing assignment, the University now seeks judgment against Lyons, "in a principal amount to be determined at the time of hearing, plus interest, costs of suit and such other relief as the Board may deem just." [29] (Amended Complaint, Count II)

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[28] Herre Brothers' claim against the University was comprised of two counts: breach of contract and *quantum meriut*. Among the material breaches alleged by Herre Brothers was the claim that the University failed to "properly and timely terminate Lyons' contract to perform work at the Project...." (Board of Claims Docket No. 3922, Complaint filed November 29, 2007).

[29] The University also claimed at Count I of its Amended Complaint, that it "is entitled to indemnification from Lyons for the amount the University paid in settlement of the Herre Brothers action." By order issued December 1,

406. Article 4.4.101 of the Contract provides that Herre Brothers, as one prime contractor, may seek compensation from Lyons directly, as general contractor, for damages caused Herre Brothers by Lyons' failure to perform its work as required under the Contract terms. (Ex. J-5)

407. Although Article 4.4.100 of the Contract provides that the University "shall have no obligation to any third party for any claim, nor be a party to any claims, disputes or actions between prime contractors . . . concerning such additional expense or damage[,]" nothing in this provision or elsewhere in the Contract expressly prohibits Herre Brothers from assigning such claims it may have against Lyons to the University or states that the University may not pursue such assigned claims "in the shoes of" Herre Brothers. (Ex. J-5; Board Finding)

408. Although Article 4.4.101 of the Contract also provides that disputes between contractors are to be resolved through arbitration, Lyons did not raise this objection to proceeding before the Board in a timely manner and was, consequently, found to have waived same by the Board. (Ex. J-5; B.O.C. Docket No. 3916, Order of December 1, 2010; Board Finding)

409. Herre Brothers' May 2, 2007 claim to the University included a detailed breakdown of the additional costs it claimed to have incurred due to the extension of the Project's completion date following Lyons' termination. These costs were summarized as follows:

Trailer rental	$ 6,699.03
Stored Material (Warehouse)	1,875.00
Site Labor (Wage increase)	16,661.45
Material Cost Increases	4,446.00
Accelerated Schedule	52,966.40
Remobilization	7,499.20
Project Manager	52,800.00
Unabsorbed Office Overhead	67,949.20
Profit	5,096.19
Total:	**$ 215,992.47**

(Ex. J-356)

410. The University's damages expert, Mr. Easler, upon review of the supporting documentation Herre Brothers had submitted to the University in support of its claim, reduced or eliminated several of Herre Brothers' itemized claims, identifying only the following as being adequately supported:

2010, the Board granted Lyons' motion for partial summary judgment, dismissing the indemnification claim. Consequently, the parties did not address the indemnification claim in their post-trial briefs. (B.O.C. Docket No. 3916, Order of December 1, 2010).

Herre Brothers Claim		Easler's Revised Amount[30]
Trailer rental	$ 6,699	$6,141
Stored Material (Warehouse)	1,875	0
Site Labor (Wage increase)	16,661	$16,661
Material Cost Increases	4,446	$ 4,446
Accelerated Schedule	52,966	0
Remobilization	7,499	$ 6,521
Project Manager	52,800	$36,800
Total:	142,946	$70,569

(Ex. P-70; N.T. 2095-98, 2193-94)

411. Herre Brothers' delay claim was originally presented as one for 44 extra weeks, which equals 220 additional working days or 308 additional calendar days. This is compatible with our earlier finding that the overall Project was not complete until March 14, 2008 (or 338 days late) since Herre Brothers would have been one of the last prime contractors to leave the Project site. (Exs. J-1, J-356, P-63, P-71; F.O.F. 232, 255, 376; Board Finding)

412. With respect to Herre Brothers claim for unabsorbed office overhead and profits, Herre Brothers asserted that this claim was based on a 44 week (308 calendar day) delay, and purported to have used the Manshul Formula[31] for its calculation, as follows:

> Calculations are based on the assumption that an estimated 90% of the work is to be completed during the delay period . . .. The Contract allows 15% for Profit & Overhead. The Contract amount is $1,157,653.00.
>
> Direct Cost = (Cost of Work performed during delay period) times (contract Cost Percentage divided by (Cost Plus Markup Percentage). .90 (1,157,653) * 100/115 = $905,989.31
>
> Overhead = (Direct Cost) times (Overhead Percentage). 905,989.31 * .075 = $67,949.20
>
> Profit = (Overhead) times (Profit Percentage) 67,949.20 * .075 = $5,096.19

(Ex. J-356)

413. The Manshul Formula applies a value of .0725 rather than .075 used by Herre Brothers as the proper profit percentages to arrive at 15% for combined overhead and profit. (Board Finding)

[30] Several of Mr. Easler's revisions to the Herre Brothers claim were supported by ArroActiv's Paul Caracciolo, who also reviewed the Herre Brothers claim and found, inter alia, that Herre Brothers was not entitled to an adjustment for acceleration and that the claim for extended project management costs was overstated. (N.T. 472-74)

[31] The Manshul Formula or Manshul Method for calculating unabsorbed office overhead, set forth in Manshul Construction Corp. v. Dormitory Authority of the State of New York, 436 N.Y.S.2d 724, 730-731 (1981); 1981 N.Y. App. Div. LEXIS 9718, provides a widely accepted formula which has been adopted by the Board. *See*: e.g. Airport Industrial Park, Inc. v. Dept. of General Services, BOC Docket no. 3464 (2012)

414. Utilizing the proper individual Manshul Formula overhead and profit percentage values of .0725 results in an unabsorbed office overhead cost of $65,684, and lost profit of $4,762. (Ex. J-356; F.O.F. 412-413; Board Finding)

415. Therefore, utilizing the proper individual Manshul Formula overhead and profit percentage values of .0725, and crediting the analysis and testimony of Mr. Easler on this matter, we find that Herre Brothers incurred total delay costs on this Project in the amount of $141,015, itemized as follows:

Trailer Rental	$ 6,141
Stored Material (Warehouse)	0
Site Labor (Wage Increase)	16,661
Material Cost Increases	4,446
Accelerated Schedule	0
Remobilization	6,521
Project Manager	36,800
Unabsorbed Office Overhead	65,684
Profit	4,762
TOTAL	$ 141,015

(Ex. P-70; N.T. 2095-98, 2193-94; F.O.F. 399-414; Board Finding)

416. Because we have found Lyons to be accountable for only 295 of the 308 days of the delay claimed by Herre Brothers (or 96%), we conclude that Lyons (because of Structual) caused only $135,374 in delay damages to Herre Brothers on this Project, broken down as follows:

Trailer rental	$ 5,895
Stored Material (Warehouse)	0
Site Labor (Wage increase)	15,995
Material Cost Increases	4,268
Accelerated Schedule	0
Remobilization	6,260
Project Manager	35,328
Unabsorbed Office Overhead	63,056
Profit	4,572
TOTAL	$ 135,374

(Exs. J-72, J-87, J-328, J-347, J-356, P-63, P-71; N.T. 382, 489-90, 2704-06, 2711; F.O.F. 399-414; Board Finding)

417. Because of the assignment of Herre Brothers' rights and claims against Lyons on this Project to the University, we find this amount ($135,374) now due from Lyons to the University as Herre Brothers' assignee. (Exs. J-72, J-87, J-328, J-347; N.T. 382, 489-90, 2704-06, 2711; F.O.F. 399-416; Board Finding)

Summary of the University's Damages

418. Summarizing damages incurred by the University in this case (and without consideration of Lyons' counterclaims), we find that the University has incurred total damages against Lyons in the amount of $2,452,216. This amount is comprised of the University's combined cost to finish the Project and damages resulting from Lyons' Default ($9,368,071) reduced by the unpaid Contract balance ($7,051,229) which results in a net amount of $2,316,842; plus $135,374 constituting that portion of Project delay damages due to Herre Brothers from Lyons, which amount has been assigned to the University. (Exs. J-5, J-72, J-328, J-347, P-73; N.T. 382, 489-90, 2704-06, 2711; F.O.F. 370-417; Board Findings)

B. Lyons' Damages Claim

1. Alleged Extra-Contractual Expenses

419. In its amended counterclaim and at trial, Lyons claimed damages totaling $2,907,903, summarized as follows:

A.	Completed work not invoiced by Lyons	$ 147,422
B.	Extended wall form rental costs	18,063
C.	Post-termination Costs	38,473
D.	Extended field overhead costs	56,292
E.	Sinkhole repair costs	96,127
F.	Micropile redesign costs	26,331
G.	Pregrouting/compaction grouting	3,612
H.	Demobilization costs	23,704
I.	Lost overhead and profit on the Project	356,571
J.	Lost profit/bonding capacity	2,049,581
K.	Cost of extra drilling consultants	36,151
L.	Dispute over micropile pay length	55,576
	TOTAL	$2,907,903

(Exs. J-285, D-365, D-367, D-369, D-434, D-435, D-443, D-444, D-448; N.T. 4274-4386, 4400-4435)

420. Lyons identified its claim of $147,422 (Item A) as completed work not invoiced including retainage withheld by the University ($140,501), labor for work performed on 60 pile caps ($6,421) and the cost of wood steps for the office trailer ($500). These items are Contract work. (Exs. J-1, J-5; N.T. 4276-82; F.O.F. 5-9, 29; Board Finding)

421. All monies due Lyons for Contract work completed but not paid has been fully credited to Lyons in this decision as part of the unpaid Contract balance and subtracted from the University's cost to complete Lyons' work on the Project under Article 13.2.101. (Ex. J-5, Article 13.2.101; F.O.F. 371-372, 398; Board Finding)

422. Lyons also claims that it is entitled to payment of $96,127 (Item E) which it spent to repair the various sinkholes which developed on the Project site. (Ex. D-434; N.T. 4312)

423. Lyons incurred expenses in the amount of $96,127 for sinkhole remediation/repair. (Ex. D-286B; N.T. 4312; Board Finding)

424. Because we have found the occurrence of these sinkholes on the Project site to be a differing site condition and/or that the potential for same was not adequately disclosed by the University in the Contract Documents or elsewhere, these expenses are extra work beyond the scope of the Contract. (Exs. J-1, J-5; J-27; N.T. 4002-03, 4744-45; F.O.F. 96-97, 105, 342-367; Board Finding)

425. Lyons also asserted a claim for $18,063 (Item B) as an extra cost spent on concrete wall form rentals for the period of time it was delayed from pouring the foundation system pile caps and grade beams because of the delay in micropile drilling which, in turn, was caused by differing site conditions. (Ex. D-434; N.T. 4284-95)

426. We agree with Lyons that the delay in micropile drilling caused it to need the rented wall forms longer than expected. However, because there were two causes of delay to micropile drilling (i.e. steep and intense pinnacle formations, multiple rock layers and variable depth of bedrock on the one hand and unanticipated sinkhole activity on the other), and we have found Lyons to be excused only for the latter (which contributed 109 of the 366 days, or 30%, of delay on the Project), only 30% of its extra rental cost for wall forms or $5,419 is extra-contractual cost attributable to delay due to sinkholes. (Exs. P-59, P-61, J-22.18, J-22.19, J-125, J-137, J-141, J-247, J-255, J-287, J-297, J-301, J-303, D-206; N.T. 2675-76, 2679, 4284-95; F.O.F. 296-306, 311-322, 327-330, 357, 368-369, 424-425; Board Finding)

427. Lyons also asserts a claim for additional field overhead costs in the amount of $56,292 (Item D) because of the micropile drilling delay. These costs consist primarily of the cost of keeping Lyons' supervisor, William Cressler, on the job from the date Lyons expected to complete micropile installation (September 30, 2006) until it was terminated. (Ex. D-434; N.T. 4305-12, 4361-65, 4436)

428. The presence of Mr. Cressler (Lyons' job supervisor) or his substitute on the job during and after the micropile installation through to the completion of the Project would have been required in any event, so these claimed expenses were not "extra" costs incurred due to delay in micropile drilling. (Ex. D-443; N.T. 4359, 4361-64; Board Finding)

429. Lyons also asserts a claim for post-termination costs it incurred in the amount of $38,473 (Item C), which it breaks down as consisting of additional general condition costs like trailer and portable toilet rentals and additional cost for its jobsite supervisor, William Cressler. (Ex. D-439, D-440; N.T. 4295-4312, 4343-44, 4381-82)

430. Lyons additionally asserted claims for demobilization costs of $23,704 (Item H) and lost overhead/profit on this Project of $356,571 (Item I). (Exs. D-434, D-444; N.T. 4323-25, 4430-31, 4446-49, 4451-54, 4465, 4499, 4622)

431. Lyons' claims for post-termination costs, lost overhead/profit, and additional general costs (Items C, H and I) are based on Lyons' premise that the University's termination of Lyons was improper. (Amended Counterclaim at Paragraph 167, Lyons' Post-Trial Brief at pp. 36-37)

432. Because we have found that Lyons' termination by the University was proper; and because that the costs claimed by Lyons in Items C, H and I are not identified as being owing to Lyons under Article 13.2.101 (which controls post-termination apportionment of costs for all Contract work items), and because there was no credible evidence that these costs/damages claimed were incurred due to extra-contractual work or breach of contract by the University, we find no basis in fact exists upon which to make any award to Lyons on these claims. (Amended Counterclaim at Paragraph 167, Lyons' Post-Trial Brief at pp. 36-37; Exs. J-5, J-72, J-328, P-59, P-66; F.O.F. 370-371, 419-431; Board Finding)

433. Additionally, Lyons' claim for lost profits/bonding capacity of $2,049,581 (Item J) on subsequent projects must also be denied as it is also based on Lyon's assertion that it was improperly terminated by the University. Moreover, Lyons also failed to prove this last item of damage for lost profit on subsequent projects with reasonable certainty by a considerable margin for several reasons, including the un-quantified expansion of the business region utilized in its damage projection from the Harrisburg area to the Mid-Atlantic region. (Exs. D-287, D-434, D-450; N.T. 4411-55; F.O.F. 431-432; Board Finding)

434. Lyons also claimed it incurred extra costs in the amount of $26,331 (Item F) for micropile redesign necessitated by "lost tooling and abandoned holes caused by unforeseen subsurface conditions[.]" (Exs. J-21.18, J-21.21, J-21.24, J-21.30, J-21.32, J-21.33, J-21.38, J-21.39, J-21.46, D-434, D-442; N.T. 4283-87, 4313-20, 4354-56)

435. Because the lost tooling and abandoned holes were consistent with drilling problems caused by the steeply pinnacled subsurface rock on the Project and because this circumstance was not a differing site condition, these are not extra-contractual costs. (Exs. J-1, J-27; N.T. 4831-32; F.O.F. 311-369; Board Finding)

436. Lyons also asserted a claim for $55,576 (Item L) due to it because the University and/or the Professional allegedly used an incorrect standard to measure pay length for the micropiles which Lyons installed before termination. (Exs. J-1, J-27, J-99, D-434; N.T. 4273-75)

437. The evidence does not support Lyons' assertion that the University/Professional improperly measured the pay length of the micropiles installed by Lyons (through Structural). (Exs. J-1, J-27; N.T. 880-990, 917-20, 1402-05, 4272-75; Board Finding)

438. In addition to the claims enumerated in Exhibit D-434, Lyons offered evidence at trial that it incurred extra-contractual costs totaling $36,151 (Item K) for two consultants, Jerry Schexnayder and Joseph Welsh. (Exs. J-285, D-365, D-448; N.T. 4344-46)

439. Messrs. Schexnayder and Welsh were retained by Lyons to address the University's assertions that deficient and improper drilling methods employed by Structural (and hence Lyons) caused the sinkholes. (Exs. D-365, D-448; N.T. 2602-03, 3685, 4344-46, 4370-71; F.O.F. 133-174, 190-198)

440. Because we have found that the University's assertions that the drilling methods employed by Structural (and hence Lyons) were improper or deficient and caused the sinkholes were without merit, the costs incurred by Lyons for Mr. Schexnayder's and Mr. Welsh's consultations to address these specious assertions were extra-contractual expenses. (Exs. J-287, J-324, D-365, D-448; N.T. 292-93, 310-11, 1496-97, 1933, 2160, 3695-97, 3053-54, 3899-3901, 4188-89; F.O.F. 133-174, 190-226; Board Finding)

441. Lyons also claimed entitlement to $3,612 (Item L) in additional supervision costs to oversee compaction grouting by Structural. (Exs. D-434, D-443; N.T. 4320-23)

442. Following the development of a sinkhole on the Project site on September 7, 2006, Structural walked off the job and insisted that Lyons approve a change order authorizing compaction grouting. Structural thereafter insisted on, and did perform considerable compaction grouting on the Project site. (Exs. J-146, J-149, J-154; N.T. 2621-22, 2855-58, 2949; F.O.F. 69, 75-79, 82, 89-92, 103-104, 107, 171, 175)

443. Lyons' drilling consultant, Mr. Schexnayder, did not recommend compaction grouting, had not been involved in any jobs where compaction grouting was implemented to make a site safe with respect to sinkholes, and testified that the Project "probably" could have been performed safely without compaction grouting. (N.T. 3728-29)

444. Structural's consultant, Mr. Triplett, did not recommend the use of compaction grouting to Structural and did not believe that compaction grouting was necessary to perform micropile drilling on the Project. (N.T. 3854-55)

445. Liberty Mutual's drilling consultant, Rudolph Frizzi, was not asked by Structural to offer an opinion as to the necessity of compaction grouting on the Project since the decision had already been made by Structural to proceed with compaction grouting. (N.T. 4037-38)

446. Lyons' expert witness and Structural's consultant, Donald A. Bruce, D.Sc., Ph.D., did not recommend the use of compaction grouting to prevent sinkhole development on the Project and was not asked to form an opinion as to whether or not compaction grouting was necessary in order to safely install micropiles. He therefore made no judgment on this issue.[32] (N.T. 4801-02, 4807)

[32] Like Mr. Frizzi, Dr. Bruce testified that by the time he was asked to consult on the Project, Structural had already adopted compaction grouting as the method of attacking sinkholes on the site. (N.T. 4801)

447. Nicholson completed the installation of micropiles on the Project without utilizing compaction grouting. (N.T. 4798-99)

448. The University did not direct or request Lyons or Structural to perform compaction grouting on the Project and, in fact, advised both throughout the Project that it would not pay for compaction grouting as it did not believe it was necessary to complete the micropile drilling safely. (Exs. J-21.51, J-22.13, J-186; N.T. 1064, 2878-79)

449. Compaction grouting was not necessary to progress micropile drilling on the Project safely. (N.T. 3728-29, 3834-35, 4037-38, 4798-99, 4801-02, 4807; F.O.F. 441-448, 458-462; Board Finding)

450. Because we have found that compaction grouting was not necessary to progress micropile drilling on the Project safely it was not needed to improve site safety due to sinkholes. Therefore Lyons' costs associated with compaction grouting are not extra-contractual expenses. (N.T. 3728-29, 3834-35, 4037-38, 4798-99, 4801-02, 4807; F.O.F. 441-449; Board Finding)

451. In sum, we find Lyons incurred the following amounts for extra-contractual work performed on the Project:

Direct sinkhole repair costs	$ 96,127
Extended wall form rental: $18,063 x .30[33] =	5,419
Consultant fees to address meritless claim regarding micropile drill methods	36,151
TOTAL	$137,697

(Exs. D-365, D-434, D-448; F.O.F. 96-97, 105, 342-358, 419-450; Board Finding)

Structural's pass-through claim

452. In addition to its own claims, Lyons asserted a "pass-through" claim for the use and benefit of its micropile subcontractor, Structural. (Amended Counterclaim; N.T. 3183, 4368)

453. On November 29, 2007, Lyons and Structural entered into a "Litigation Cooperation Agreement" which provided, inter alia, that Structural would conduct its own investigation and provide an expert witness at trial to present, on Structural's behalf, a pass-through claim for damages against the University owed to Lyons for Structural based on differing site conditions. (Ex. J-601)[34]

[33] As to costs incurred due to delay in micropile installation, Lyons is entitled to these costs only to the extent that such delay was caused by sinkholes. Having found that sinkholes were the cause of 109 of 366 days (30%) of Project delay, Lyons is entitled to 30% of the extended wall form rental. F.O.F. 305, 416-417.

[34] The Litigation Cooperation Agreement was referenced in ¶ 169 of Lyons' Amended Counterclaim, filed January 23, 2008, and appended thereto as Exhibit 6. The University admitted in its Answer and New Matter to Lyons' Counterclaim that a copy of the Litigation Cooperation Agreement was appended to the Counterclaim as Exhibit 6, though it denied that it constituted a valid liquidating agreement. On October 25, 2010, the University appended a copy of the Litigation Cooperation Agreement to its Motion for Partial Summary Judgment as to Lyons'

454. Structural presented its damage claims separate and apart from Lyons' damages presentation. Structural's pass-through claims and itemization of damages are summarized as follows:

A.	Base contract work completed	$ 777, 100
B.	Compaction grouting	$ 498,242
C.	Lost tooling and excess materials	$ 219,319
D.	Loss of productivity (using micropile hours incurred 8/21-12/17/06)	$ 308,716
E.	Standby	$ 247,200
F.	Demobilization & remobilization in Jan./Feb 2007	$ 17,000
G.	Materials left on site	$ 121,024
H.	Unabsorbed home office overhead	$ 19,824
I.	Labor inefficiency associated with disbursement of labor to other projects	$ 44,462
J.	Drilling consultant (Butch Triplett)	$ 25,503
	Subtotal	$2,278,390
	Consultant and Legal Fees (through May 2010)	$ 42,894
	Geotech experts	$108,891
	Attorneys fees	$348,264
	"Properly amended contract price"	$2,778,439
	Credit paid to date	($755,045)
	Total claim for equitable adjustment	$2,023,394

(Ex. D-453; N.T. 4594-4676)

455. Structural identified its claim of $777,100 (Item A) for base contract work completed as including $17,000 for mobilization, $35,500 for micropile load testing and $724,600 for micropile installation (based on 11,113.5 linear feet multiplied by its contract price of $65.20/LF). (Ex. D-453, Schedule A; N.T. 4595-97)

456. Structural acknowledges payment of $755,045 for work on the Project, but makes no attribution of this payment to any particular task. We consider this amount to be an appropriate offset against Structural's claim for original subcontract work. (Ex. D-453, Schedule A; N.T. 4597; Board Finding)

Counterclaim For the Use and Benefit of Structural, which motion was denied by the Board December 1, 2010. The Litigation Cooperation Agreement was subsequently admitted into evidence upon Lyons' motion to reopen the record over objection from the University by Order of the Board dated May 3, 2012. The litigation cooperation agreement identified in all three interlocutory uses noted above are identical to the one admitted into evidence.

457. Because we have found the University's termination of Lyons to be proper and have given Lyons full credit for all of the unpaid Contract amount between the University and Lyons as per Article 13.2.101 of the Contract; and because the micropile drilling performed on the Project by Structural was part of that Contract work, we find no factual basis for a "pass-through" claim presented by Lyons on behalf of Structural against the University for "Base contract work completed."[35] (Exs. J-1, J-5; F.O.F. 7-9, 29-35, 368-369, 398, 417-418; Board Finding)

458. Structural's consultant, Butch Triplett, testified that compaction grouting was not necessary to complete the micropile work on the Project. Lyons' consultant, Jerry Schexnayder, testified that, though he was not asked his opinion at the time, he believed that micropile work on the Project "probably could have" proceeded safely without compaction grouting. (N.T. 3729, 3854-55)

459. Nicholson was able to complete the micropile installation on the Project without compaction grouting following Lyons' termination. (N.T. 4798-99)

460. Neither Mr. Frizzi or Dr. Bruce offered an opinion that compaction grouting was necessary to proceed safely with micropile drilling on the Project. In fact, although Structural repeated its assertions that compaction grouting was necessary to proceed safely with micropile drilling during its presence on the Project, it offered little to no direct testimony to support this assertion at hearing. (Exs. J-220, J-221, J-234, J-235; N.T. 1073, 2340, 2701, 2878, 2886-91, 3255-56, 3278-79, 4032-38, 4046, 4807-08; F.O.F. 65-79, 84-95, 101-104, 107, 132, 166, 169, 175, 443-449, 458-459; Board Finding)

461. Some portion of compaction grouting on the Project was performed by Structural for purposes other than safety measures against sinkholes. (Ex. J-132; N.T. 4637-44; F.O.F. 66)

462. To the extent that compaction grouting was used to facilitate drilling into steep vertical pinnacles, which were not a differing site condition, the cost of such compaction grouting was clearly within Lyons' and Structural's original Contract work. (Exs. J-1, J-132; N.T. 4637-44; F.O.F. 66; Board Finding)

463. Because we have found that compaction grouting was not necessary to progress micropile drilling on the Project safely; and because of the findings in Paragraphs 448 through 452 immediately above, Structural has failed to establish that the compaction grouting it insisted upon performing on the Project site was an extra-contractual activity or that the $498,242

[35] Unlike a claim for extra work performed beyond the scope of the prime contract or a case where the owner withholds money on its prime contract, where, as here, the owner fully pays out on its prime contract (or credits same amount to the prime contractor), we see no factual basis for a pass-through claim by an unpaid subcontractor against the owner for work within the scope of the prime contract. Structural has already been paid once (by our credit of the unpaid Contract amount). There is no basis to pay Lyons a second time for Contract micropile work so it can "pass" this additional amount through to Structural." Structural's claim for unpaid work performed under its subcontract with Lyons is now a contractual issue between Lyons and Structural alone and not properly a part of a pass-through claim against the University. See Visor Builders, Inc. v. Devon E. Tranter, Inc., 470 F. Supp. 911, 923 (M.D. Pa.)

claimed was an extra-contractual expense. (N.T. 3728-29, 3824-25, 4037-38, 4798-99, 4801-02, 4807; F.O.F. 443-449, 458-459; Board Finding)

464. Structural claimed $219,319 (Item C) for lost tooling and excess material which it itemized as consisting of $20,310 for lost casing, $196,863 for lost tooling and $2,146 for grouting abandoned piles. (Exs. D-434, D-453, Schedule D; N.T. 4488, 4497-98, 4525-30, 4598-99)

465. Mr. Weathers, Structural's damages expert witness, testified that he based his calculations for this category on the total amount of tooling lost on the Project then reduced this amount by 10% based on an assumption that the remaining 90% of the lost tooling was due to "differing site conditions," which he identified as being: 1) sinkholes/voids and 2) being required to drill deeper than the Contract specifications required. (N.T. 4475-76, 4520-34, 4609-11, 4648-56)

466. Mr. Weathers did nothing to independently confirm that 90% of the claimed tooling loss was caused by the two factors he identified or to assess what losses may have been due to subsurface pinnacles or other drilling problems encountered on the Project. (N.T. 4646-56)

467. Because of the absence of credible evidence to support Mr. Weathers' assumptions as to the cause of the lost tooling, and in light of our finding that, in fact, virtually all of Structural's lost tooling was due to difficulties Structural had with drilling into the intense local pinnacle formations on the Project (which was not a differing site condition), we find that Structural has failed to establish with reasonable certainty that any amount of its claim for lost tooling and excess material was, in fact, caused by a differing site condition. (N.T. 4831-32; F.O.F. 311-322, 327-330, 464-466; Board Finding)

468. Structural's loss of productivity claim of $308,716 is based on Mr. Weathers' "measured mile" analysis by which he attempts to quantify the loss of efficiency or productivity that Structural alleges it sustained during its micropile installation activity on the Project. (Ex. D-453, Schedule D; N.T. 4591, 4613-19, 4656-68)

469. Mr. Weathers described a "measured mile" analysis as follows:

> A measured mile analysis is --- I've indicated at the top of this page, it's an approach that uses actual job labor productivity during a least impacted period to form the basis of reasonable labor productivity expectations during an impacted period. Damages are then based upon the difference between the productivity experienced during an impacted period as compared to the established benchmark resulting from productivity during the least impacted period. [emphasis added]

(N.T. 4613-14)

470. In his "measured mile" analysis of the Project, Mr. Weathers ignored the actual percentage of abandoned pile drilling footage (approximately 20%) and assumed (without record support) that it should be only 1%, an analysis which Mr. Weathers conceded at hearing differed from the "measured mile" analysis he described previously. (Ex. D-453; N.T. 4659-60)

471. Because, among other problems, Structural's calculation of its claim for lost productivity is based on unsubstantiated assumptions (including the assumption of 1% abandoned piles as the base line for the "unaffected period" and the assumption all lost of productivity was due to a differing site condition), we do not find it to be at all credible as a matter of fact. The testimony and evidence provided is unable to support an award for same due, inter alia, to the flawed methodology noted above and because we found this loss of productivity to be due largely to pinnacles, rock layers and varied bedrock which was not a differing site condition occurring on the Project. (Ex. D-453, Schedule D; N.T. 4591, 4613-19, 4656-68; F.O.F. 269-294, 311-322, 327-330, 464-470; Board Finding)

472. Structural also claimed it incurred standby costs totaling $247,200. This was based on Mr. Weathers' calculation of the hourly standby rate of $600 per hour provided in the Lyons/Structural subcontract (Ex. J-7), applied to periods when drilling operations were stopped or suspended after November 7, 2006, the date a sinkhole developed which threatened a Justice employee working on a pile cap at pile numbers 173 and 174. (Exs. J-7, D-453, Schedule E; N.T. 4620-21, 4626-27, 4669-72)

473. Mr. Weathers broke down the standby costs in Schedule E of Ex. D-453 as follows:

Standby Date	# of Rigs	Hourly standby Rate per rig	Standby hour per day	# of days	Total
11/8/2006	3	$600	8	1	$14,000
11/27-28/2006	1	$600	8	2	$9,600
11/29-12/8/06	2	$600	8	8	$76,800
12/15/2006	2	$600	8	1	$9,600
12/18/06-1/3/07	1	$600	8	10	$48,000
2/7-8/2007	1	$600	8	1.5	$7,200
2/9/2007	1	$600	8	1	$4,800
2/12-13/07	1	$600	8	2	$9,600
2/14-25/07	1	$600	8	8	$38,400
2/26-3/5/07	1	$600	8	6	$28,800
				Total	**$247,200**

(Ex. D-453, Schedule E; N.T. 4620)

474. Mr. Weathers testified that three rigs were shut down on November 8, 2006, while Structural awaited direction from Lyons on how to proceed; one crew remained on standby while sinkhole repair work was done November 27-28, and two crews were able to resume work; two

crews were on standby for the PA/OSHA visit and afterward, from November 29 to December 8, and on December 15, 2006; Structural demobilized one of the two rigs remaining on site after the University's suspension order in December, with a single rig remaining on standby December 18 through January 3; and Structural returned to the site February 7, with one rig remaining on standby until March 5, 2007. (Ex. D-453, Schedule E.; N.T. 4621-22; 4626-27)

475. The only challenge raised by the University to Mr. Weathers' standby calculations was to the claim for six days of standby after the date of termination, from February 26 to March 5. (N.T. 4671)

476. Deducting the $28,800 charged for those six days, we find that Structural incurred standby costs in the amount of $218,400 and that this was an extra-contractual expense because it was due to occurrences of sinkholes and resultant work stoppages on the Project while appropriate safety measures were debated among the parties. (Ex. D-453, Schedule E; F.O.F. 96-97, 105, 297-307, 368-369, 471-474; Board Finding)

477. Consistent with his testimony and analysis of standby costs, Mr. Weathers assessed costs for the demobilization of one rig on January 3, 2007, and remobilization on February 5, 2007, following the University's direction that micropile work resume, claiming costs of $8,500 each for the demobilization and remobilization for a total of $17,000.[36] (Ex. D-453, Schedule F; N.T. 4499, 4622)

478. The $17,000 claimed by Structural for demobilization and remobilizations, which was not challenged by the University, constitutes extra-contractual costs incurred by Structural stemming from the multiple sinkholes occurring on the Project and the University's resulting demands to suspend operations and then return to work. (Exs. J-255, J-287; D-453, Schedule F; N.T. 4622; F.O.F. 96-97, 105, 133-136, 297-307, 368-369; Board Finding)

479. Structural next claims $121,024 for materials left on site or which were not able to be used on another project. (Exs. D-334A, D-453, Schedule G; N.T. 4279-82, 4323-24, 4498, 4516-20, 4623-25)

480. Mr. Weathers placed a value of these materials, which included 295 casings (of 10' and 5' lengths) as well as pile bars and other hardware at $83,963. He then added tax, freight delivery and removal, and a 30% markup, for the $121,024 total . (Ex. D-453, Schedule G; N.T. 4516-20, 4623-25)

481. Mr. Weathers testified that the materials were removed from the site January 24, 2007, and were mostly rusted by the time they were removed, having no value to Structural. (N.T. 4623-24)

482. Because we have found that Lyons' termination by the University was proper, Article 13.2.101 provides the formula for determination of amounts due to Lyons and the University in the event of such termination. It provides for payment (or credit) to Lyons only in

[36] The Lyons/Structural subcontract (Ex. J-7) provides for $17,000 for mobilization.

the amount of the unpaid Contract balance (without increase for materials provided but removed by Lyons and/or Structural). Because Structural removed this material and because full credit has been given Lyons for the unpaid Contract balance, we find no basis in fact or document to seek payment from the University for material which Structural retained. (Ex. J-5, Article 3.2.100; F.O.F. 369, 371-379, 479-481; Board Finding)

483. Structural also claims unabsorbed home office overhead in the amount of $19,824 for the period of January 4 through February 4, 2007. During this time Structural had demobilized following the University's suspension order and was uncertain as to whether work would resume. (Exs. D-334B, D-453, Schedule H; N.T. 4468-75, 4499, 4507-14, 4626-29, 4635-36)

484. Mr. Weathers arrived at his home office overhead number by applying (what he called) the Eichleay Formula. To reach this number, he divided the total billing on the Project ($1,480,858) by Structural's total billings for the contract performance period (July 2006 through February 2007) in the amount of $20,029,905, then multiplied this fraction times the total overhead for the performance period ($2,107,310), to arrive at the overhead allocable to the Contract ($150,538). Mr. Weathers then arrived at the daily home office overhead allocable to the Project by dividing the allocable overhead ($150,538) by the days in the Contract performance period (7/1/06 – 2/28/07)(243 days) arriving at the daily home office overhead allocable to the Project of $619.50. Mr. Weathers then multiplied the daily home office overhead allocable to the Project ($619.50) by the number of "delay days" (1/4/07 to 2/4/07)(32 days) for the unabsorbed extended overhead of $19,824. (Ex. D-453, Schedule H; N.T. 4626-29)

485. Mr. Weathers' testified that his calculations were based on figures for "corporate overhead and the entire billings for the office" provided him by Pam Gibler and Graham Smith of Structural. (N.T. 4628)

486. Mr. Weathers did not review audited financial statements for Structural in preparing his "Eichleay Formula" calculations nor were such financial statements offered into evidence at trial. (N.T. 4626)

487. The office overhead and billing numbers used by Mr. Weathers were apparently for a particular office of Structural, not Structural as a single entity. (Ex. D-453, p. 32; N.T. 4470-73, 4507-08, 4511-14, 4537-38, 4593-94)

488. Because the Eichleay Formula calculations presented by Structural were not based on audited corporate financial statements and little to no credible testimony was provided on how the numbers used by Mr. Weathers were arrived at, we find the calculations not to be sufficiently reliable to award Structural unabsorbed home office overhead on this basis. (Ex. 453, Schedule H; F.O.F. 484-487; Board Finding)

489. Structural's claim for labor inefficiency associated with disbursement of labor was calculated for the period from January 4 to February 4, 2007, when Structural had demobilized. (Ex. D.453, Schedule I; N.T. 4498, 4629-31, 4673-74)

490. Structural's labor inefficiency claim for this period charged 50% of driller and labor costs during the demobilization period, but was not based on any analysis or investigation by Mr. Weathers as to what other work may or may not have been done by the displaced workers or billed to other parties during the demobilization period. (N.T. 4673-74)

491. Because of the uncertainty of the calculations upon which this claim was based we find Structural has failed to establish this cost for labor inefficiency with reasonable certainty. (Ex. D-453, Schedule I; N.T. 4673-74; F.O.F. 489-490; Board Finding)

492. In order to respond to assertions by the University and the Professional that Structural's drilling procedures were deficient, Structural retained the consultation services of Bruce Triplett to review and defend Structural's drilling procedures at a cost of $25,503. Because these assertions were wholly without merit, but required by the University's demands for Structural's review of its drilling procedures, this expense constitutes an extra-contractual cost for Structural. (N.T. 3781, 3783-85, 3861-62, 4632; F.O.F. 145-152, 155, 160-163, 167-169, 172, 191-226; Board Finding)

493. The remaining pass-through claims made for use and benefit of Structural regarding costs of consultants and experts for litigation and/or attorneys' fees would be based on Board findings of bad faith on the part of the University in the case of attorneys' fees or some reason to award costs to Structural, and the Board makes no such finding. (F.O.F. 308-330, 369-370, 456-463; Board Finding)

494. To summarize, after review of the various claims made by Structural, we find only the following amounts to constitute extra-contractual costs incurred on the Project by Structural:

Standby costs	$247,200
Demobilization and remobilization costs in Jan./Feb. 2007	17,000
Cost of drilling consultant (Butch Triplett)	25,503
TOTAL	$289,703

(Ex. D-453; F.O.F. 452-493; Board Finding)

495. In addition to providing for Structural to investigate and present evidence at hearing in support of its pass-through claim, the Litigation Cooperation Agreement provided that any damages on Structural's claims which Lyons may recover are to be paid by Lyons to Structural, "[s]ubject to the provisions of Paragraph 7" of the agreement. (Ex. J-601)

496. Paragraph 7 of the Litigation Cooperation Agreement provides as follows:

> 7. In the event that Structural is successful in the prosecution of its claim, Lyons is unsuccessful in the prosecution of its claim and Shippensburg is successful in the prosecution of its claim against Lyons (***and Structural is not the***

> ***cause of the breach by Lyons that is the basis for any such decision by the Board of Claims***), Lyons agrees that Structural will be paid the amount awarded on its claims regardless of any offset or award against Lyons in favor of Shippensburg that is ***not based on the actions and conduct of Structural*** [emphasis provided].

(Ex. J-601)

497. Thus, under the plain terms of the Litigation Cooperation Agreement, if: 1) Structural is successful in the prosecution of its claim (which it has been here to the extent of $289,703); and 2) Lyons is unsuccessful in the prosecution of its claim (which it has been here except for minor extra-contractual costs); and 3) Shippensburg is successful in the prosecution of its claim against Lyons (which Shippensburg has largely been), then Lyons agrees to pass through to Structural any recovery it may receive on Structural's claims. However, as the highlighted provisions of the paragraph also make clear, Lyons is relieved from passing through such amounts to Structural if Structural is found to be the cause of Lyons' breach which forms the basis for the Board's decision (against Lyons). (Ex. J-601; F.O.F. 311-322, 323-329, 369, 419-496; Board Finding)

498. As Lyons' micropile subcontractor, Structural was contractually retained to install the approximately 22,300 linear feet of micropiles "in accordance with the terms and conditions of the principal contract. . .." (Exs. J-7, J-37)

499. Lyons' contract with Structural specified the following "TIME SCHEDULE:"

> All work by the Subcontractor is to be completed to allow sufficient time for the other Subcontractors, Prime Contractors, and Lyons to complete the project including punch list and final cleaning no later than April 10, 2007. The Subcontractor must complete its work as required by the progress of Lyons.

(Ex. J-7)

500. Because the 257 days of Project delay as of the date of Lyons' termination (which were not caused by sinkholes on the Project site) was the sole reason justifying the University's termination of Lyons; and because we have found that Structural's inability to progress its micropile installation in a timely fashion to be the material cause of that delay; and because we have found this inability to install the micropiles in a timely fashion was the fault of Structural (not of a differing site condition), we find that Structural was "the cause of the breach [of the Contract] by Lyons that is the basis" for the Board's finding against Lyons' (i.e. our finding that Lyons' termination was proper) and that "the actions and conduct of Structural" as Lyons' micropile subcontractor was the basis, in fact, for Lyons' liability to the University. (Exs. J-5, J-22.4, J-22.7, J-22.10, J-37, J-72, J-87, J-99, J-328, J-601, P-59, P-66; N.T. 2042, 2543-46, 3582-85, 2704-06, 27, 3166, 3455, 3539, 3585-90, 3636, 3651-57, 3668, 4831-32; F.O.F. 311-399; Board Finding)

501. By the plain terms of the Litigation Cooperation Agreement, Lyons is relieved from any requirement to pass-through to Structural any damages found by this Board to have

been incurred by Structural on this Project. (Exs. J-5, J-22.4, J-22.7, J-22.10, J-37, J-72, J-87, J-99, J-328, J-601, P-59, P-66; N.T. 2042, 2543-46, 3582-85, 2704-06, 27, 3166, 3455, 3539, 3585-90, 3636, 3651-57, 3668, 4831-32; F.O.F. 311-500; Board Finding)

C. University's Damages v. Liberty Mutual

502. As a condition of the Contract, Lyons, as principal, and Liberty Mutual, as surety, executed a Contract Bond through which Liberty Mutual agreed to "indemnify and save harmless the State System of Higher Education . . . from any expense incurred through the failure of said contractor to complete the work as specified and for any damages growing out of the manner of performance of said contract by said contractor . . . ." (Ex. J-4)

503. The Contract Bond did not provide Liberty Mutual the right to complete the Project upon default by Lyons. (Ex. J-4)

504. The plain and express language of the Contract Bond states that both Lyons (as contractor/principal) and Liberty Mutual (as surety) will indemnify the University "from any expense incurred through the failure of said contractor to complete the work as specified and for any damages growing out of the manner of performance of said contract by said contractor...." (emphasis supplied) (Ex. J-4)

505. As a result of Lyons' failure to progress its work on the Project in a timely manner pursuant to the terms of the Contract (which failure was the fault of Structural), the University incurred expenses to complete Lyons' work on the Project and damages resulting from Lyons' manner of performance (again caused by Structural) in the amount of $2,316,842. (Exs. J-72, J-328, J-347; N.T. 2704-06, 2711; F.O.F. 6-11, 55-181, 190-198, 225, 258-321, 368-369, 373-418, 502-504; Board Finding)

506. Liberty Mutual did not join in Lyons' amended counterclaim. (Lyons' Amended Counterclaim)

Costs, Attorneys Fees, Offsets and Award Calculations

507. The Board does not find that the University, Lyons or Liberty Mutual acted in bad faith in this matter. (Board Finding)

508. The University's award against Lyons calculated pursuant to Article 13.2.101 is $2,316,842. (F.O.F. 398, 418)

509. In addition to the University's Article 13.2.101 damages we awarded $135,374 to the University as assignee of Herre Bros.' claim against Lyons, for a total damages awafrd to the University from Lyons (before offset) of $2,452,216. (F.O.F. 398, 417-418)

510. Against the above amounts ($2,316,842 plus $135,374), we offset the award to Lyons from the University for extra-contractual work on the Project in the amount of $137,697, for a net award due to the University from Lyons in the principal amount of $2,314,519. (F.O.F. 398, 417-418, 451; Board Finding)

511. With respect to the University's claim against Liberty Mutual, we award the University the principal amount of $2,316,842 on the Contract Bond, the same amount as we have found due from Lyons to the University pursuant to Article 13.2.101 of the Contract, but excluding the additional $135,374 awarded to the University from Lyons on the Herre Bros. assigned claim and without the $137,697 offset credited to Lyons (since Liberty Mutual did not incur these extra-contractual costs nor did it join in Lyons' amended counterclaim against the University). (F.O.F. 398, 417-418, 451, 502-506; Board Finding)

512. On March 14, 2007, Lyons filed its claim for wrongful termination (and re-asserting its differing site condition claims) with the University. (Lyons' Amended Counterclaim, Paragraph 166, Exhibit 4; University's Answer and New Matter, Paragraph 66)

513. Applying six percent per annum to the principal amount due to the University from Lyons ($2,314,519) from March 14, 2007 to the date of this order yields a total prejudgment interest due the University from Lyons in the amount of $812,405, for a total award (principal plus interest) of $3,126,924.[37] (Board Finding)

514. Applying six percent per annum to the principal amount due to the University from Liberty Mutual ($2,316,842) as indemnity bond surety from March 14, 2007 to the date of this order yields a total prejudgment interest due the University from Liberty Mutual in the amount of $813,221, for a total award (principal plus interest) of $3,130,063.[38] (Board Finding)

[37] 6% per annum or .06 ÷ 365 days = .000164 daily interest rate x 311 days = .051004 plus 5 years at .06 = .351004 as total interest multiplier x $2,314,519 principal = $812,405 total prejudgment interest.
[38] $2,316,842 x .351004 = $813,221

CONCLUSIONS OF LAW

1. The Board has jurisdiction to hear and adjudicate the University's claims in this matter because the University is a Commonwealth agency and the claims arise out of its contract with Lyons for construction of the Project. 62 Pa.C.S. §§ 103, 1724(b)(1). The Board also has ancillary jurisdiction over Lyons' amended counterclaim because it arises out of the same contract and series of transactions. (62 Pa.C.S. § 1725(d)(1). See also Shovel Transfer and Storage, Inc. v. Simpson, 565 A.2d 1153, 1155 (Pa. 1989), Department of General Services v. Limbach Company and Penn Transportation Services, Inc., 862 A.2d 713, 719 (Pa. Cmwlth. 2004)).

2. The Board is the ultimate finder of fact and is charged with determining the credibility and persuasiveness of witness testimony, including that of expert witnesses. James Corp. v. North Allegheny School District, 938 A.2d 474, 495 n.21 (Pa. Cmwlth. 2007).

3. As the finder of fact, the Board is charged with the duty of determining the credibility of evidence and resolving conflicting testimony. It may believe all, or part, or none of the testimony of any witness. The Board's findings need not be supported by uncontradicted evidence, so long as they are supported by substantial evidence. Department of General Services v. Pittsburgh Building Co., 920 A.2d 973, 989 (Pa. Cmwlth. 2007); A.G. Cullen Const. Co, Inc., 898 A.2d 1145, 1155 (Pa. Cmwlth. 2006); Com. v. Holtzapfel, 895 A.2d 1284, 1249 (Pa. Cmwlth. 2006); Miller v. C.P. Centers, Inc., 483 A.2d 912 (Pa. Super. 1984).

4. Under the basic principles of contract interpretation, the entire contract should be read as a whole and in a manner to give effect to all its provisions. See, e.g., Harrity v. Continental-Equitable Title & Trust Co., 124 A. 493, 494-495 (Pa. 1924); Pritchard v. Wick, 178 A.2d 725, 727 (Pa. 1962); Capitol Bus Co. v. Blue Bird Coach Lines, Inc., 478 F.2d 556, 560 (3d Cir. 1973).

5. The fundamental rule in interpreting the meaning of a contract is to ascertain and give effect to the intent of the contracting parties. Where the contract is free from ambiguity, the parties' intent is to be determined from the express language of the contract. LJL Transportation, Inc. v. Pilot Air Freight Corporation, 962 A.2d 639, 647 (Pa. 2009); Chester Upland School District v. Edward J. Meloney, Inc., 901 A.2d 1055, 1059 (Pa. Super. 2006).

6. When interpreting a contract, the trial court must determine the intention of the parties. Where an ambiguity exists, the courts are free to construe the terms against the drafter and to consider extrinsic evidence in so doing. Molag, Inc. v. Climax Molybdenum Co., 637 A.2d 322, 323 (Pa. Super. 1994), citing Raiken v. Mellon, 582 A.2d 11 (Pa. Super. 1990).

7. A written instrument is ambiguous if it is reasonably or fairly susceptible of more than one construction. When a contract is ambiguous, it is undisputed that the rule of contra proferentem requires the language to be construed against the drafter and in favor of the other party if the latter's interpretation is reasonable. Com., State Public School Building Authority v. Noble C. Quandel Co., 585 A.2d 1136, 1144 (Pa. Cmwlth. 1991); See also Dep't of Transp. v. Semanderes, 531 A.2d 815, 818 (Pa. Cmwlth. 1987). See also Department of General Services

v. Pittsburgh Building Company, 920 A.2d 973, 989 (Pa. Cmwlth. 2007) (citing Jay Twp. Auth v. Cummins, 773 A.2d 828, 832 n.3 (Pa. Cmwlth. 2001)).

8. In asserting a claim for recovery on a breach of contract, it is the asserting party's burden to show that the facts exist to support the requested recovery. Paliotta v. Department of Transportation, 750 A.2d 388 (Pa. Cmwlth. 1999).

9. Under Pennsylvania law, in order to recover on a breach of contract claim, the plaintiff must prove by a preponderance of the evidence: (1) the existence of a valid and binding contract to which plaintiff and defendant were parties; (2) the essential terms of the contract; (3) that plaintiff compiled in all material respects with the contract's terms; (4) that the defendant breached a duty imposed by the contract; and (5) that damages resulted from the breach. Technology Based Solutions, Inc. v. Electronics College, Inc, 168 F. Supp. 2d 375, 381 (2001); A.G. Cullen Const. Co., Inc., 898 A.2d at 1161.

10. Only a material breach of a contract relieves the non-breaching party from any continuing duty of performance thereunder. LJL Transportation, Inc. v. Pilot Air Freight Corporation, 962 A.2d 639, 648 (Pa. 2009). Widmer Engineering, Inc. v. Dufalla, 837 A.2d 459, 467 (Pa. Super. 2003).

11. Whether a breach is material bears on the quantum of damages; even a nonmaterial breach is compensable. Open MRI of Allentown, LLC v. Infinitt North America, Inc., 2011 Pa. Dist. & Cnty. Dec. LEXIS 275(Pa.C.P.2011).

12. A party may recover damages, when proven, for nonmaterial breach as a setoff against the other party's counterclaim for material breach of the same contract. Exton Drive-In, Inc. v. Home Indemnity Co., 261 A.2d 319, 325 (Pa. 1969).

13. Factors to consider in determining materiality include:

a) the extent to which the injured party will be deprived of the benefit which he reasonably expected;

b) the extent to which the injured party can be adequately compensated for that part of the benefit of which he will be deprived;

c) the extent to which the party failing to perform or to offer to perform will suffer forfeiture;

d) the likelihood that the party failing to perform or offer to perform will cure his failure, taking account of all the circumstances including any reasonable assurances;

e) the extent to which the behavior of the party failing to perform or offer to perform comports with standards of good faith and fair dealing.

International Diamond Importers, Ltd. v. Singularity Clark, L.P., 40 A.3d 1261, 1271 (Pa. Super. 2012) See also: Gray v. Gray, 671 A.2d 1166, 1172 (Pa. Super. 1996); Jennings v. League of Civic Orgs. of Erie County, 119 A.2d 608, 611 (Pa. Super. 1956).

14. Whether a breach of contract is so substantial as to justify an injured party's regarding the whole transaction as at an end is a question of degree and custom in regard to the type of contract at issue in the case. Lane Enterprises, Inc. v. L.B. Foster Co., 700 A.2d 465, 471 (Pa. Super. 1997).

15. Parties may indicate if a breach is to be considered material or not by stipulation in their contract or their conduct after the breach. Tolan v. O'Malley, 299 A.2d 229, 230 (Pa. 1973); Western Savings Fund Society v. SEPTA, 427 A.2d 175, 181 (Pa. Super. 1981); Texas Energy Fuels Corp. v. Pemco Supply Co., 640 F. Supp. 2, 5 (M.D. Pa. 1985).

16. It has been held in Pennsylvania case law that when "time is of the essence" is stated in a contract, performance after the set time is not performance of the contract unless assented to by the other party. S.H. Benjamin Fuel & Supply Co. v. Bell Union Coal & Mining Co., 284 F. 227, 229 (3d Cir. Pa. 1922).

17. The Contract here provides clearly and expressly that "time is of the essence" and that construction was to be completed by Lyons "within 380 calendar days after the Notice to Proceed." These are material terms of the Contract. Ex. J-5, p. SU054549.

18. Delay to a construction project within the control of a subcontractor or supplier is "inexcusable" for the prime contractor, unless the derelict subcontractor or supplier was owner-designated or deemed to be under the owner's actual control. See: A.G. Cullen, Inc. v. State System of Higher Education, 898 A.2d 1145, 1157-1158 (Pa. Cmwlth. 2006).

19. A prime contractor is responsible for delay caused by its subcontractor where the choice of the subcontractor was within the prime contractor's discretion. Id.

20. Where delay and damages can be apportioned between breaches by two contracting parties on the basis of causation, then apportionment of the damages is appropriate. Wayne Knorr, Inc. v. Department of Transportation, 973 A.2d 1061, 1080-1084 (Pa. Cmwlth. 2009); see also: A.G. Cullen Constr., Inc. v. State System of Higher Education, 898 A.2d at 1160-1164; Tyger Const. Co., Inc. v. U.S., 31 Fed. Cl. 177, 274, 284-86 (1994).

21. Where a contractor on a construction project encounters concealed subsurface site conditions which differ materially from that represented in the contract documents and/or other materials provided to it during the bid process, any work delay caused by such differing site conditions is excusable and the contractor entitled to compensation for any additional work or delay costs caused by the differing site condition as extra-contractual work. (Acchione and Canuso, Inc., 461 A.2d 765, 768-769 (Pa. 1983); Pa. Turnpike Comm. v. Smith, 39 A.2d 139, 142 (Pa. 1944); Wayne Knorr, Inc. v. Dept. of Transportation, 793 A.2d 1061, 1081-1084 (Pa. Cmwlth. 2009); DGS v. Pittsburgh Building Co., 920 A.2d 973, 985 (Pa. Cmwlth. 2007); A.G. Cullen Construction, Inc. v. SSHE, 898 A.2d 1145, 1157-1158, 1171, 1174 (Pa. Cmwlth. 2006);

Gasparini Excavating Company v. Pa. Turnpike Commission, 187 A.2d 157, 162 (Pa. 1963); See: Bruner & O'Connor on Construction Law §§ 15.49-15.50).

22. Exculpatory language in a contract is ineffective in cases where constructive fraud is found. Pa. Turnpike Comm. v. Smith, 350 Pa. 355, 39 A.2d 139, 142-43 (Pa. 1944)(overturned on other grounds); Acchione and Canuso, Inc. v. Dept. of Transportation, 501 Pa. 337, 461 A.2d 765, 768 (Pa. 1983).

23. The critical factors in determining if constructive fraud exists are as follows:

> (1) Whether a positive representation of specifications or conditions relative to the work is made by the governmental agency letting the contract or its engineers.
> (2) Whether this representation goes to a material specification in the contract.
> (3) Whether the contractor, either by time or cost constraints, has no reasonable means of making an independent investigation of the conditions or representations.
> (4) Whether these representations later prove to be false and/or misleading either due to actual misrepresentation on the part of the agency or its engineer ***or by what amounts to a misrepresentation*** through either gross mistake or arbitrary action on the part of the agency or its engineer.
> (5) Whether, as a result of this misrepresentation, the contractor suffers financial harm due to his reliance on the misrepresentation in the bidding and performance of the contract [emphasis in the original].

Acchione and Canuso, Inc. v. Dept. of Transportation, 461 A.2d 765, 768 (Pa. 1983); Pa. Turnpike Comm. V. Smith, 39 A.2d 139, 142 (Pa. 1944) (overturned on other grounds).

24. Constructive fraud can be found in cases where the government agency has not made an "affirmative misrepresentation" but failed to disclose relevant information which was at odds with documents provided to bidders. Pittsburgh Building Company, 920 A.2d at 986.

25. The doctrine of active interference also prohibits a party from raising exculpatory provisions of a contract as a defense if: "(1) there is an affirmative or positive interference by the owner with the contractor's work, or (2) there is a failure on the part of the owner to act in some essential matter necessary to the prosecution of the work." Pittsburgh Building Company, 920 A.2d at 987 (quoting from Coatesville Contractors & Engineers, Inc. v. Borough of Ridley Park, 506 A.2d 862, 865-66 (Pa. 1986).

26. The measure of damages for breach of contract is that the aggrieved party should be placed as nearly as possible in the same position as it would have occupied had there been no breach. Dep't of Transp. v. Brozzetti, 684 A.2d 658, 665 (Pa. Cmwlth. 1996); PennDOT v.

James D. Morrissey, Inc., 682 A.2d 9, 14 (Pa. Cmwlth. 1996); Oelschlegel v. Mutual Real Estate Investment Trust, 633 A.2d 181, 184 (Pa. Super. 1993).

27. In the case of termination of a contractor for default, the Contract here at issue provides for the payment of damages at Article 13.2.101 as follows:

> If the unpaid balance of the Contract sum exceeds the cost of finishing the work, including compensation for the Professional's additional services and any other damages which the System has incurred in accordance with the Agreement, such excess shall be paid to the Contractor. If such costs exceed the unpaid balance, the Contractor or the Surety or both shall pay the difference to the system.

Ex. J-5, p. SU054578

28. An injured party in a breach of contract action is entitled to recover damages (1) that would naturally and ordinarily result from the breach or (2) were reasonably foreseeable by the parties at the time they made the contract and (3) can be proved with reasonable certainty. Adams v. Speckman, 122 A.2d 685, 687 (Pa. 1956) (cited cases omitted and emphasis added); James Corp. v. N. Allegheny Sch. Dist., 938 A.2d at 497.

29. Damages need not be determined with mathematical certainty, but only with reasonable certainty; and the evidence of damages may consist of probabilities and inferences. Sufficient facts must be introduced to allow a court to arrive at an intelligent estimate without conjecture. Spang & Co. v. U.S. Steel Corp., 545 A.2d 861, 866-867 (Pa. 1988); A.G. Cullen Constr. Inc., 898 A.2d at 1174; J.W.S. Delavau, Inc. v. Eastern America Transp. & Warehousing, 810 A.2d 672, 685-686 (Pa. Super. 2002).

30. However, damages are not recoverable if they are too speculative, vague or contingent to be ascertained with reasonable certainty. Spang, 545 A.2d at 866 (citing Restatement (Second) of Contracts, § 352); See also Scobell, Inc. v. Schade, 688 A.2d 715, 719-721 (Pa. Super. 1997).

31. When a building contractor has failed to perform its contract in every respect, it is the duty of the owner to exert reasonable efforts to mitigate the damages resulting from the unfinished work which the contractor has failed to perform. Gaylord Builders, Inc. v. Richmond Metal Mfg. Corp., 140 A.2d 358, 359 (Pa. Super. 1958). See also, Delliponti v. Deangelis, 681 A.2d 1261,1265 (Pa. 1996); Bafile v. Borough of Muncy, 527 Pa. 25, 588 A.2d 462, 464 (1991).

32. The burden of proving that losses could have been avoided by reasonable effort and expense must be borne by the party which has broken the contract. Id.; see also: S.J. Groves & Sons Company v. Warner Company, 576 F.2d 524, 529 (3rd Cir. 1978).

33. The rule that one cannot recover damages from a defaulting party which could have been avoided by the exercise of reasonable effort is applicable to construction contracts. Id.

34. The doctrine of mitigation of damages addresses the amount of damages to be awarded once liability has been established; it has no bearing whatsoever on the underlying determination of liability. Any alleged failure of the non-breaching party to mitigate damages only affected the amount of his compensatory damage award, and not his entitlement to it. Collincini v. Honeywell, Inc., 601 A.2d 292, 297 (Pa. Super. 1991).

35. "When there has been a breach of contract, damages are awarded in order to place the aggrieved party in the same position he would have been in had the contract been performed. The theory behind this philosophy is based on an attempt to make the non-breaching party whole again, not to provide him with a windfall." Northeastern Vending Company v. P.D.O., Inc., 606 A.2d 936, 938-939, (Pa. Super. 1992)(quoting Bellefonte Area School District v. Lipner, 473 A.2d 741, 744 (Pa. Cmwlth. 1984).

36. "The measure of damages for breach of contract is *compensation* for the loss sustained. The aggrieved party can recover nothing more than will compensate him (emphasis in the original)." Helpin v. Trustees of the University of Pennsylvania, 10 A.3d 267, 270 (Pa. 2010)(quoting Lambert v. Durallium Products Corporation, 72 A.2d 66, 67 (Pa. 1950).

37. To be entitled to compensation for extra work, a contractor must demonstrate that this work was performed, that it was requested by the owner and that it was not required by the terms of the contract as agreed to by the parties. A.G. Cullen Constr. Inc., 898 A.2d 1145, 1171 (Pa. Cmwlth. 2006) citing Dep't of Transp. v. Gramar Constr. Co., 454 A.2d 1205, 1207 (Pa. Cmwlth. 1983); Dep't of Transp. v. Paoli Construction Co., 386 A.2d 173, 175 (Pa. Cmwlth. 1978).

38. Pennsylvania courts have required payment for extra work done at the behest of the owner even where there is no written change order that covers the work in question. Universal Builders, Inc. v. Moon Motor Lodge, Inc., 244 A.2d 10, 15 (Pa. 1968); James Corp. v. N. Allegheny Sch. Dist., 938 A.2d 474, 487 (Pa. Cmwlth. 2007); A.G. Cullen Constr. Inc., 898 A.2d at 1171.

39. A contractor must establish its damages for alleged extra work or breach of contract claim with reasonable certainty. A.G. Cullen Const. Inc., 898 A.2d at 1174; J.W.S. Delavau, Inc. v. Eastern America Transp. & Warehousing, 810 A.2d 672, 685 (Pa. Super. 2002).

40. "Where there is a surety relationship, an obligee . . . is entitled to performance of a contractual duty by the principal or, alternatively, if the principal defaults, by the principal's surety. The surety therefore stands in the shoes of the principal and must complete any obligation due the obligee at the time of default." Kiski Area School Dist. v. Mid-State Surety Corp., 967 A.2d 368, 37-72 (Pa. 2008)(internal citations omitted).

41. The extent of a surety's obligation under a construction bond is limited to, and determined by, the language of the bond itself rather than the language set forth in the construction agreement. Downingtown Area School Dist. v. Int'l. Fidelity Ins. Co., 769 A.2d 560 (Pa.Cmwlth. 2001), appeal denied 786 A. 2d 991 (Pa. 2001).

42. The Contract Bond, here at issue, at Paragraph A, incorporates the terms of the Contract and sets forth Lyons' and Liberty Mutual's joint obligations as follows:

> [Lyons and Liberty Mutual] shall indemnify and save harmless the [University] from any expense incurred through the failure of [Lyons] to complete the work as specified and for any damages growing out of the manner of performance of said contract by [Lyons] or his Subcontractors, . . .

Ex. J-4.

43. Given the plain and express language of Paragraph A, the Contract Bond in the instant case is an indemnity bond. See: 4A Bruner & O'Connor on Construction Law §§ 12.13-12.20.

44. Under an indemnity bond, a surety's obligation is limited to reimbursing the obligee up to the penal sum of the bond for the cost of completion of the bonded contract in excess of the unpaid contract balance. Within this limit, such bonds sometimes include broad indemnity language which "may be construed to require the surety to indemnify an obligee for a variety of consequential damages, including delay damages and lost profits." See e.g. Bossier Medical Properties v. Abbott and Williams Construction Co. of Louisiana, Inc., 557 So.2d 1131, 1134 (La. Ct. App. 2d Cir. 1990)(bond language very similar to that contained in the Contract Bond here at issue); Bruner & O'Connor on Construction Law § 12.18.

45. When a bond contains a broad expression that would include "all claims and demands incurred" such performance bond may be held to include damages beyond the mere cost of completion. Pittsburgh v. Parkview Constr. Co., 23 A.2d 847, 849-50 (Pa. 1942).

46. "[I]n the case of corporate sureties, the bond is strictly construed in favor of the obligee." Purdy v. Massey et al., 159 A. 545, 547 (Pa. 1932); Pennylvania Turnpike Commission v. Andrews & Andrews, 47 A.2d 220, 221 (Pa. 1946).

47. In a contract where a public interest is affected, an interpretation is preferred which favors the public. Pritchard v. Wick, 178 A.2d 725, 727 (Pa. 1962).

48. The Contract provided for termination of the agreement by the University for default by the contractor (Lyons) in Article 13.2.100, which states, in relevant part, as follows:

> 13.2.100 If the Contractor . . . fails to proceed as directed by the System, or performs the work unsuitably, . . . or discontinues the prosecution of the work without the approval of the System, or otherwise is guilty of a substantial violation of a provision of the Contract Documents, then the System may, without prejudice to any of its other rights or remedies, give the Contractor and its Surety written notice that the Contractor has seven (7) days from the date of the System's notice to cure the default set forth in the notice.

> The discretion to declare the Contractor in default is solely the System's, ... Should the Contractor fail to cure said default within the specified time, the System may terminate the Agreement between the System and the Contractor, and may take possession of the site and of all materials, equipment, tools, construction equipment and machinery which is owned by the Contractor, located on the property and may finish the work by whatever method it may deem expedient.

Ex. J-5, pp. SU054578-SU054579.

49. The University gave Lyons notice that it was in default because its "continuing failure to progress with the site work especially micropile production, is a breach of [Lyons'] duties under [the] Contract" by way of its third Cure Notice, dated September 12, 2006. Ex. J-147.

50. The University notified Lyons in October 2006 that it was "holding its decision on the September 12, 2006 Cure Notice in abeyance" due to Lyons' "continued lack of production of the micropile. . . ." Ex. J-186.

51. The University's last Notice to Cure, dated January 29, 2007, notified Lyons of additional grounds for default, as follows:

- Resume micropile installation within 10 days;
- Upon resumption of work, "correct the excessive use of the flush water and poor surface water management" identified in Traylor's report; and
- "[C]ure the deficiencies in the micropile installation and abate all safety hazards associated therewith."

Ex. J-287.

52. In its termination letter issued February 26, 2007, the University identified two reasons for Lyons' termination as general contractor for the Project: (1) Lyons' "continued failure to meet the project schedule" and (2) Lyons' "stated refusal to cure the deficiencies identified in the University's January 29, 2007 Notice to Cure." Ex. J-332.

53. Because there were ongoing and unresolved discussions between Lyons and the University from early September 2006 up until the time of Lyons' termination in February 2007 with regard to problems and delays with the micropile drilling and the Project as a whole, including discussion, debate and studies as to the causes, potential cures and responsibility for same, and the University never assented to Lyons' delayed performance, we conclude that the cure and termination notices for (1) Lyons' "continued failure to meet the project schedule" and (2) Lyons' "stated refusal to cure the deficiencies identified in the University's January 29, 2007 Notice to Cure" were adequate and compliant with the Contract's procedural requirements for termination of the Contract. Exs. J-1, J-5, J-147, J-186, J-287, J-332; C.O.L. 48-52.

54. Because we have found that: Lyons'/Structural's use of flush water in the micropile drilling process was not excessive; Lyons' efforts to manage surface water on the Project site and Structural's drilling procedures were not deficient; the amount of surface water on the Project site was not a material factor in the formation of sinkholes on the Project; that Lyons substantially complied with all reasonable demands made by the University in its January 29, 2007 Cure Notice with regard to Structural's use of flush water and drilling procedures (as well as Lyons' management of surface water and abatement of related safety hazards); and further found that there was no merit, in fact, to the University's assertions that Lyons refused "to cure the deficiencies identified in the University's January 29, 2007" final cure notice, we conclude that Lyons' alleged refusal to cure the deficiencies identified in the University's January 29, 2007" final cure notice does not form a legitimate basis for the University's termination of the Contract. Exs. J-22.22, J-287, J-297, J-301, J-302, J-306, J-316, J-321, J-325, J-328; C.O.L. 2-3, 8-9, 13-15, 51-52.

55. However, because we have also found that, as of the date of Lyons' termination, Lyons was 366 days behind schedule on the Project; and because this delay was substantial and material given the fact that the Contract stated (and the parties had agreed) that time was of the essence and required that the Project was to be completed in 380 days; and because Lyons asserted that the delay was due to differing site conditions from those disclosed to it during the bid process, the propriety of Lyons' termination depends on what caused the delay and who was responsible for the delay. C.O.L. 10-25.

56. Because we have found ambiguity to exist in the Contract as a result of the language of Article 1.1.100 (which expressly states that "addenda issued to the contract" such as Addendum No. 1 incorporating the GFGR are part of the Contract Documents); and language in the Project Manual) which states in effect that the GFGR may not be considered part of the Contract), we resolve this ambiguity against the University as drafter and conclude that the GFGR was made part of the Contract Documents by the University. C.O.L. 7.

57. Because we have found that the sinkhole activity on the Project was a concealed site condition which materially differed from that which was reasonably anticipated by Structural and Lyons from the information provided to them by the University during the bid process (e.g. by the Gannett Fleming Geotechnical Report); and because this unexpected sinkhole activity delayed Structural's micropile drilling and Lyons' progress on the overall Project for 109 days, we find this 109 day portion of the total Project delay to be excusable as to Lyons and Structural. Accordingly, we conclude that Structural and Lyons are not responsible for, and are excused from, this portion of the 366 day Project delay existing at the time of Lyons' termination. C.O.L. 10-15, 20-25.

58. Because we have found that: by reason of time and/or cost constraints, neither Lyons or Structural had a reasonable means of making an independent investigation of the Project's subsurface conditions or representations in the GFGR; the GFGR constituted an affirmative representation that significant sinkhole development was not to be expected on the Project site (which later proved to be false and misleading as substantial sinkhole activity developed on the site); the GFGR also contained material omissions by reason of its failure to disclose the occurrence of sinkholes on the adjacent IAF project and/or its failure to reference the

Blackmore Reports; the GFGR amounted to a material misrepresentation by Gannett Fleming and the University as to the ground conditions to be encountered on the Project; that this misrepresentation affected the micropile drilling specifications which were material to the Contract; this misrepresentation and the material omissions were occasioned through either gross mistake or arbitrary action on behalf of Gannett Fleming and/or the University; these material misrepresentations and omissions caused Lyons to underestimate the work needed on the Project due to unexpected sinkhole activity and resulted in multiple interruptions to, and slower than anticipated prosecution of, the micropile drilling thereby causing 109 days of delay to the Project (as well as extra-contractual work and cost to Lyons), we conclude that the exculpatory provisions in the Contract are ineffective to shield the University from responsibility for the misleading nature of the GFGR. We further conclude that Structural and Lyons are not responsible for, and are excused from, this 109 day portion of the 366 day Project delay existing at the time of Lyons' termination. C.O.L. 10-15, 20-25.

59. Because we found that: the GFGR constituted an affirmative representation that significant sinkhole development was not to be expected on the Project site (which later proved to be false and misleading as substantial sinkhole activity developed on the site); the GFGR also contained material omissions by reason of its failure to disclose the occurrence of sinkholes on the adjacent IAF project and/or its failure to reference the Blackmore Reports; the GFGR amounted to a material misrepresentation by Gannett Fleming and the University as to the ground conditions to be encountered on the Project; this misrepresentation affected to the micropile drilling specifications which were material to the Contract; these material misrepresentations and omissions actively interfered with Lyons' work insofar as it caused Lyons to underestimate the work needed on the Project due to unexpected sinkhole activity and resulted in multiple interruptions to, and slower than anticipated prosecution of, the micropile drilling thereby causing 109 days of delay to the Project (as well as extra-contractual work and cost to Lyons), we conclude that the exculpatory provisions in the Contract are ineffective to shield the University from responsibility for the misleading nature of the GFGR. We further conclude that Structural and Lyons are not responsible for, and are excused from, this 109 day portion of the 366 day Project delay existing at the time of Lyons' termination. C.O.L. 10-15, 20-25.

60. Because we did not find that this failure to adequately disclose the potential for sinkhole development on the Project changed the essential nature of Lyons' or Structural work on the Project, or deprived Lyons of a benefit of its bargain for which it could not be adequately compensated by an extension of time and/or additional compensation as is typical in the industry and contemplated by the parties, as evidenced, inter alia, by Articles 4.1 and 4.2 of the Contract and Lyons' expressed intent to continue its work through the difficulties caused by these sinkholes, we conclude that this failure was not a material breach of the Contract by the University. C.O.L. 10-15, 20-25.

61. Because Structural's failure to drill and install micropiles on the Project in a timely fashion due to the steep and intense pinnacle formations and multiple rock seams above bedrock of varied depth below the ground surface on the Project caused the remaining 257 days of delay to the Project we conclude that Lyons (as prime contractor) is responsible to the

University for any unexcused portion of this Project delay caused by its subcontractor, Structural. C.O.L. 10-15.

62. Because we have found that 257 days of the Project delay was due to Structural's inability to drill and install micropiles on the Project in a timely fashion due to the steep and intense pinnacle formations and multiple rock seams above bedrock of varied depth below the ground surface on the Project site; and because the likelihood of encountering those geological conditions under the Project site was clearly and adequately identified in the GFGR; and because the existence of the steep and intensely pinnacled rock formations and multiple rock seams above bedrock of variable depth under the Project site was not, as a matter of fact, a concealed or differing site condition than was described to bidding contractors on the Project, we conclude that this delay to the Project of 257 days is unexcused and remains the responsibility of Structural (as micropile subcontractor) and Lyons (as the prime contractor who selected Structural). Exs. J-1, J-5, J-22.4, J-22.7, J-22.10, J-37, J-72, J-87, J-99, J-328, P-59, P-66; C.O.L. 10-20, 48-53, 61.

63. Because we also have found that: this 257 days of delay to the Project was caused solely by Structural; no act or omission of any other party would act to excuse this delay to the Project; this delay of 257 days to the Project was a substantial and material failure to comply with the Contract work performance timeframe of 380 days; the Contract expressly stated time to be of the essence; there appeared no reasonable prospect of a cure as all projections (including Lyons' own) showed a substantially delayed Project completion; this delay substantially deprived the University of the benefit of completing this construction on its campus within one academic year, we find this delay in progressing work on the Project at the time Lyons was terminated to have been a substantial and material breach of the Contract. C.O.L. 10-20, 48-53, 61-62.

64. Because 257 of the 366 days the Project was delayed at the time of Lyons' termination was attributable to Lyons due to Structural's unexcused failure to install the micropiles in a timely manner; and because this was a substantial and material breach of the Contract; and because the University's February 26, 2007 termination cited Lyons' continued failure to meet the Project schedule after it had properly notified Lyons in its September 12, 1006 Cure Notice that Lyons was subject to termination due to its "continuing failure to progress with the site work, especially micropile production," Lyons was properly terminated for default under the terms of Article 13.2.100 of the Contract. Exs. J-1, J-5, p. SU054578, J-332; C.O.L. 10-20, 48-53, 61-63.

65. Because we have found that the University properly terminated Lyons under Article 13.2.100 for substantial and material failure to perform its Contract work in a timely manner constituting a material breach, the University's measure of damages is: 1) the "cost of finishing" Lyons' work (which is expressly stated to include compensation for the Professional's extra services) and 2) any other damage which the University has incurred due to the material breach of the Contract, 3) reduced by the unpaid Contract balance. Exs. J-5, J-8, J-9, P-68, P-71; C.O.L. 10-20, 26-30, 64.

66. Because the University claimed that it incurred direct payments to Lobar, Ritner Steel, and Hershocks totaling $9,912,652 as the University's reasonable and necessary costs of

finishing Lyons' original Contract work on the Project; and because we have not found the amounts paid to these parties (including the premiums paid to Lobar) to have been unreasonable under the circumstances, but did find that $784,504 was a portion of the premium paid to Lobar for micropile work to address a differing site condition (i.e. the sinkhole problem) and, as such, was paid for extra-contractual work (not to complete Lyons' original Contract work), we find the University's cost of finishing Lyons' Contract work pursuant to Article 13.2.101 of the Contract is $9,128,148. Exs. J-5, p. SU054578, J-8, J-9, P-12, P-13, P-67, P-75; C.O.L. 26-36, 65.

67. Because we have found that none of the $119,370 claimed by the University as extra professional costs were incurred to complete Lyons' work on the Project, and because the University has either: 1) failed to show a sufficient causal connection between Lyons' only material breach of the Contract (i.e. its material failure to progress the Project timely) and the claimed item of damages or 2) failed to show the amount of such damage with reasonable certainty, the University has failed to establish its entitlement to any of these amounts under Article 13.2.101 of the Contract. C.O.L. 27-30.

68. In contrast to the foregoing claims for "extra professional and consultant fees," because we have found the University's payments (characterized as "re-procurement costs") totaling $67,302 paid to the Professional for work to aid in the transition of the Project to Lobar, to ArroActiv for preparation of Lobar's completion schedule, and to Hill International for assistance in negotiation of a completion contract with Lobar, to be part of the University's reasonable and necessary cost of finishing Lyons' work on the Project, these costs are recoverable under Article 13.2.101 of the Contract. Exs. J-5, p. SU054578, J-353, P-11, P-74, P-76-77; C.O.L. 26-30.

69. Because we have found that the direct cost to store structural steel ($2,949) and the costs to extend the Professional's services (including additional salary of $33,746 and overhead costs of $1,766 paid up to the actual Project completion date) were reasonable and necessary costs incurred by the University to finish Lyons' work on the Project; because we have found that additional "Project Delay" costs which the University paid to ArroActiv for administrative services ($28,848) and construction supervision and management ($131,106), incurred after the original Contract completion date to be reasonable and foreseeable damages incurred as a result of Lyons' material breach of the Contract; and because we have found that the total amount assigned to these additional direct costs ($198,145) was incurred due to a total delay of 338 days (April 10, 2007 to March 14, 2008) while Lyons is responsible for only 295 of these 338 days that the Project was delayed, the University is entitled to recover only 87% of the $198,145 in additional damages incurred during the extended period for Project completion or $172,621 under Article 13.2.101 of the Contract. C.O.L. 20, 26-30, 57-59, 61-65.

70. Pursuant to Article 13.2.101 of the Contract, the University is entitled to (and Lyons liable for) the cost of finishing Lyons' Contract work and damages incurred due to Lyons' material breach of the Contract, reduced by the unpaid Contract balance which totals $2,316,842, calculated as follows:

Direct costs to complete Lyons' Contract work	$9,128,148
Post-termination re-procurement costs	67,302

Additional costs incurred by Lyons' material breach of Contract ($198,415 x .87)	172,621
SubTotal (Cost to finish Project)	$9,368,071
(Less Unpaid Contract Balance)	($7,051,229)
Total due University under Article 13.2.101	$2,316,842

C.O.L. 26-36, 57-59, 61-69.

71. Article 4.4 of the General Conditions applicable to the Project allows another prime contractor on the Project (e.g. Herre Brothers) to sue the general contractor (Lyons) for damages caused by the general contractor's failure to perform on the Contract. Ex. J-5.

72. Because the University's Amended Complaint against Lyons contained separate counts for indemnification to the University (for the $100,000 the University paid to Herre Bros. in settlement of Herre Bros.' claim filed against the University on May 2, 2007) and for damages from Lyons as assignee of any Herre Bros.' claim and/or rights it had against Lyons as a fellow prime contractor on the Project; and because the Board, on December 1, 2010, granted partial summary judgment in favor of Lyons and dismissed the University's claim for direct indemnification from Lyons with respect to the University's settlement with Herre Bros.; and because the Board further concluded that no other objections raised by Lyons to the University pursuing Herre Bros. claim as assignee had merit, the only claim remaining against Lyons is that asserted by the University as assignee of Herre Bros.' rights and claims against Lyons. (B.O.C. Docket No. 3916, Order of December 1, 2010). See e.g. Sirianni v. Nugent Bros., Inc., 506 A.2d 868,870-71 (Pa. 1986); Automatic Time and Control Co. v. ifm Electronics, GmBh, 600 A.2d 220, 222 (Pa. Super. 1991) Martinique Shoes, Inc. v. New York Progressive Wood Heel Company, 217 A.2d 781, 783-84 (Pa. Super. 1996).

73. Because we have found that the University presented evidence at trial that Herre Bros. incurred delay damages totaling $141,015 due to a delay to it of 308 calendar days; that Lyons was responsible for 295 of the 308 days of delay claimed by Herre Bros.; and that, based on Lyons' responsibility for 96% (295 of the 308 days of delay) of the delay costs incurred by Herre Bros. and proved at trial ($141,015 x .96), we conclude that this amount, $135,374, is now due from Lyons to the University as Herre Bros.' assignee. Exs. J-72, J-87, J-347, J-356, P-63, P-70, P-71; C.O.L. 48-50; See e.g. Hedlund Manufacturing Company, Inc. v. Weiser, Stapler & Spivak, 539 A.2d 357, 358 (Pa. 1988)(Pennsylvania recognizes the validity of assignment of claims and rights of action); Gray v. Nationwide Mutual Insurance Company, 223 A.2d 8, 11 (Pa. 1966)(The assignee stands in the shoes of the assignor); Airport Industrial Park, Inc. v. Dept. of General Services, B.O.C. Docket No. 3464 (2012).

74. Summarizing the University's side of the damages calculation in this case (and without consideration of Lyons' counterclaims), we conclude that the University is entitled to an award against Lyons in the principal amount of $2,452,216. This amount is comprised of $2,316,842, the University's cost to finish Lyons' work on the Project plus damages incurred on the Project ($9,368,071) reduced by the unpaid Contract balance ($7,051,229) plus $135,374

constituting that portion of the Project delay damage due to Herre Brothers from Lyons which was assigned to the University. C.O.L. 70-73.

Lyons' Counterclaims

75. Because we have found that Lyons' claim for $147,422 for completed work not invoiced has been fully credited to Lyons as part of the unpaid Contract balance and deducted from the University's claim under Article 13.2.101 of the Contract, Lyons is not entitled to an additional and duplicate award for this claim. Ex. J-5, Article 13.2.101; C.O.L. 27, 70.

76. Because we have found that Lyons incurred $96,127 in costs to repair sinkholes which occurred on the Project site, and that this sinkhole activity constituted a differing site condition, and extra work beyond the scope of its Contract, Lyons is entitled to an award on its counterclaim in the requested amount of $96,127. Exs. J-5, J-27, D-386B, D-434; C.O.L. 21-30, 37-39.

77. Because we have found that Lyons incurred $18,063 in costs associated with concrete form rentals during the delay period (366 days); and that neither Structural nor Lyons was responsible for 109 days of that delay (30%) which was due to the unexpected sinkhole activity (which we have found to be a differing site condition), Lyons is entitled to an award on its counterclaim only for that portion of the delay damages caused by the sinkhole activity as extra-contractual work (i.e. 109/366 or 30% of $18,063) which amounts to $5,419. Exs. P-59, P-61, J-22.18, J-22.19, J-125, J-137, J-141, J-247, J-255, J-287, J-297, J-301, J-303, D-206; C.O.L. 21-30, 37-39, 57-59.

78. Because we have found that Lyons' field supervisor, William Cressler, would have been required on the job at the Project during the 109 days of delay caused by the sinkholes in any event, Lyons' delay claim in the amount of $56,292 for additional field overhead comprising Mr. Cressler's salary was not an additional, extra-contractual cost caused by the sinkhole activity and thus Lyons is not entitled to an award for this amount. Exs. D-434, D-439, D-440; C.O.L. 27, 30, 64.

79. Because we have found that Lyons' claims for post-termination costs ($38,473), demobililization costs ($23,704), and lost overhead/profit on the Project ($356,571) are all based on Lyons' claim that it was improperly terminated, and we have found that the University's termination of Lyons was proper; and because these costs/damages were not incurred due to extra-contractual work or breach of Contract by the University; and because these amounts are not to be credited to Lyons under Article 13.2.101 (which controls post-termination apportionment of costs for all Contract items), we conclude that Lyons is not entitled to any award on these claims. Amended Counterclaim; Exs. J-5, J-72, J-328, P-59, P-66; C.O.L. 27, 30, 64.

80. Because we have found, inter alia: that Lyons' claim for lost profit/bonding capacity ($2,049,581) was also based on Lyons' claim that it was improperly terminated; that the University's termination of Lyons was proper; and that Lyons also failed to prove this item of

damages with reasonable certainty, we conclude that Lyons is not entitled to any award on this claim. Amended Counterclaim; Exs. J-5, D-434; C.O.L. 30, 64.

81. Because we have found that costs claimed by Lyons for micropile redesign ($26,331) were incurred due to steep pinnacles encountered on the Project, which we found not to be a differing site condition, Lyons is not entitled to an award in that amount as an extra-contractual work cost. Exs. J-1, J-27, D-434; C.O.L. 61-62.

82. Because Lyons has failed to establish that the University improperly measured micropile pay length, Lyons is not entitled to its claim for $55,576 which it asserts is due to it as a result of the micropile pay length dispute. Exs. J-1, J-27; C.O.L. 30, 39.

83. Because we have found, inter alia, that the University's complaints that Lyons'/Structural's micropile drilling methods were deficient; that its further assertions that improper drilling caused the sinkholes were meritless; and that Lyons incurred consultant costs totaling $36,151 to Jerry Schexnayder and Joseph Welsh to address these meritless complaints and demands by the University, Lyons is entitled to an award of this amount as an extra-contractual work cost. Exs. J-287, J-324, D-365, D-448; C.O.L. 27, 36-37, 51-54.

84. Because we have found that compaction grouting was not necessary to safely install micropiles on the Project and was not requested by the University, Lyons is not entitled to an award for its claimed costs related to compaction grouting ($3,612) as an extra-contractual work cost. Findings of Fact 440-446; C.O.L. 27, 37.

85. In sum, we find Lyons is entitled to the following amounts for extra-contractual work performed on the Project:

Direct sinkhole repair costs	$ 96,127
Consultant fees to address meritless claim regarding micropile drill methods	36,151
Extended wall form rental: $18,063 x .30[39] =	5,419
TOTAL	$137,697

C.O.L. 75-84.

Structural's pass-through claim

86. Pursuant to a litigation cooperation agreement between Lyons and Structural (hereinafter the "Lit Coop Agr") Lyons asserted a pass-through claim to the Board on Structural's behalf for damages due to alleged differing site conditions as well as other claims.[40] Ex. J-601.

[39] As to costs incurred due to delay in micropile installation, Lyons is entitled to these costs only to the extent that such delay was caused by sinkholes. Having found that sinkholes were the cause of 109 of 366 days (30%) of Project delay, Lyons is entitled to 30% of the extended wall form rental cost.

[40] The Litigation Cooperation Agreement recites that both "Lyons and Structural claim that they are entitled to additional compensation for delays, inefficiency, certain extra work, and other costs due to, inter alia, the differing site conditions encountered during Structural's work" on the Project as well as damages for wrongful termination.

87. Because we have found the University's termination of Lyons to have been proper and have given Lyons full credit for all the remaining unpaid Contract balance between the University and Lyons pursuant to Article 13.2.101, the University has fully compensated Lyons for all base contract micropile work. This part of Structural's pass-through claim against the University of $777,100 for base micropile contract work is duplicative and properly becomes a contractual matter between Lyons and Structural. We find no liability on the part of the University to pay Lyons for this work a second time in order for Lyons to pass this amount on to Structural. Ex. J-5, Article 13.2.101; See also Visor Builders, Inc. v. Devon E. Tranter, Inc., 470 F. Supp. 911, 923 (M.D. Pa.) (precluding a duplicate payout by owner to subcontractor on a third-party claim).

88. Because we have found: that some portion of the compaction grouting performed on the Project was to facilitate Structural's drilling into pinnacled rock (which we have found not to have been a differing site condition); that compaction grouting was not necessary to safely drill and install micropiles on the Project; and that the University did not request this compaction grouting, Structural is not entitled to its claimed cost of compaction grouting ($498,242) as an extra-contractual work cost. Exs. J-5, J-132; F.O.F 445-446; C.O.L. 37, 39, 61-62, 84.

89. Because we have found that Structural's claim of $219,319 for lost tooling and excess materials was based on Structrual's damages expert's unsupported assumption that 90% of lost tooling was due to a "differing site condition" which he identified as being: 1) sinkholes/voids and 2) being required to drill deeper than the Contract specifications required; and because we found virtually all of Structural's lost tooling was due to difficulties Structural had with drilling into the steep and intense local pinnacle formations on the Project (which was not a differing site condition), Structural is not entitled to this claim as an extra-contractual work expense. Exs. J-1, J-5, J-22.4, J-22.7, J-22.10, J-27, J-132, D-453, Schedule C; C.O.L. 37, 39, 61-62.

90. Because we have found that Structrual's damages expert, in designating a least-impacted period, ignored the fact that approximately 20% of the micropiles drilled had to be abandoned during that period and instead assumed only 1% loss, so his analysis did not represent a credible "measured mile" analysis; this claimed lost productivity of $308,716 is without credible support in the record; and Structural has failed to establish this aspect of its claimed damages with reasonable certainty, this claim must therefore be denied. Ex. D-453, Schedule D; N.T. 4659-60; F.O.F. 465; C.O.L. 37, 39, 61-62.

91. Because we have found that Structural's micropile drilling activities were shut down and placed on standby 34 ½ days due to the sinkhole activity on the Project; Structural's subcontract with Lyons provided for an hourly standby rate of $600 per rig; Structrual's damages expert testified credibly that from one to three rigs were on standby during the shut-down period; and because this testimony was largely unchallenged by the University (with the exception of 6 days for which Structural seeks compensation after Lyons' termination), we find that Structural established with reasonable certainty that it incurred standby costs totaling $218,400 (deducting $28,800 claimed for the period after Lyons' termination from the total claim of $247,200). Accordingly, these are extra-contractual costs incurred by Structural due to a differing site

condition and capable of being awarded on the basis of a proper pass-through claim. Ex. D-453, Schedule E; C.O.L. 57-58.

92. The $17,000 claimed by Structural for demobilization and remobilizations, which was not challenged by the University, constitutes extra-contractual costs incurred by Structural stemming from the multiple sinkholes occurring on the Project and the University's resulting demands to suspend operations and then return to work. As such, this amount is capable of being awarded on the basis of a proper pass-through claim. C.O.L. 57-58.

93. Because Structural claimed it lost $121,024 in materials left on the Project site due to Lyons' termination, but we found that Structural removed these materials from the site in January 2007; and because the University's termination of Lyons was proper and there is no provision for payment of withdrawn materials in the Contract, we find no basis for this claim by Structural. Exs. J-5, Article 3.2.100, D-453, Schedule G; N.T. 6424; C.O.L. 37, 39.

94. Because the Eichleay Formula calculations presented by Structural were not based on audited corporate financial statements and little to no credible testimony was provided on how the numbers used by Mr. Weathers were arrived at; and because we find the calculations not to be sufficiently reliable or to establish Structural's unabsorbed home office overhead with reasonable certainty, we can make no award on this claim. C.O.L. 37, 39.

95. Because we have found that Structrual's damages expert's calculations for labor inefficiency, based on what he described as 50% of driller and laborer costs, lacked reasonable certainty, and moreover, because the University's termination of Lyons was proper, we find that there is no basis for Structural's labor inefficiency claim of $44,462. Ex. D-453, Schedule I; C.O.L. 37, 39.

96. Because we have found that Structural retained the consultation services of Bruce Triplett to review and defend Structural's drilling procedures in response to the University's mistaken assertion that Structural's drilling procedures were deficient and demands that Structural review these procedures, which assertion we have found to be without merit, the $25,503 incurred by Structural for Mr. Triplett's services constituted an extra-contractual work cost for Structural and is capable of being awarded on the basis of a proper pass-through claim. C.O.L. 51-54, 83.

97. To summarize, after review of the various claims made by Structural, we find only the following amounts to constitute legitimate extra-contractual costs incurred on the Project by Structural and capable of being awarded on the basis of a proper pass-through claim:

Standby costs	$247,200
Demobilization and remobilization costs in Jan./Feb. 2007	17,000
Cost of drilling consultant (Butch Triplett)	25,503
TOTAL	$289,703

C.O.L. 86-96.

98. Under the terms of the Litigation Cooperation Agreement between Lyons and Structural, Lyons agreed to present to the Board on Structural's behalf, a pass-through claim for damages due, inter alia, to alleged differing site conditions on the Project.[41] Ex. J-601.

99. The Litigation Cooperation Agreement provided that Lyons would pay to Structural any amounts recovered from the University on Structural's pass-through claims, only to the extent that "Structural is not the cause of [a] breach [of the Contract] by Lyons...." Ex. J-601, ¶ 7.

100. Because we have found that Structural was the cause of Lyons' material breach of its Contract with the University and Lyons' termination from the Project, Lyons' liablity to make payment to Structural on any of Structural's pass-through claims has expired under the plain terms of the Litigation Cooperation Agreement. Accordingly, we make no award to Lyons for the use or benefit of Structural on these pass-through claims. See e.g. Pearson, Dickerson, Inc. v. U.S., 115 Ct. Cl. 236, 264 (1950) (Prime contractor cannot collect amounts on a pass-through claim for benefit of a subcontractor where prime contractor's liability to subcontractor has been extinguished); George Hyman Const. Co. v. U.S., 30 Fed. Cl. 170, 177 (1993); C.O.L. 62-64.

University v. Liberty Mutual

101. The Contract Bond does not cover damages caused by one prime contractor to another on the Project. Ex. J-4.

102. Because the Contract Bond does not cover damages caused by one prime contractor to another on the Project, Liberty Mutual is not liable to the University for the amount we have found due to the University as assignee of Herre Brothers' delay damage claim against Lyons. Ex. J-4; C.O.L. 42.

103. The extent of a surety's liability under a construction performance bond is limited to, and determined by, the language of the bond itself rather than the language set forth in the construction agreement. Downingtown Area School District v. Int'l Fidelity Ins. Co., 769 A.2d 560 (Pa. Cmwlth. 2000); See also North American Specialty Ins. Co. v. Chichester School District, 158 F. Supp. 2d 468, 471-472 (E.D. Pa. 2001)(surveying Pennsylvania case law, including Downingtown, with regard to bond surety liability principles); C.O.L. 38-47.

104. The Contract Bond, signed and executed by both Lyons' (as principal and contractor) and Liberty Mutual (as surety) states, in relevant part, as follows:

> NOW, THEREFORE, the joint and several conditions of this obligation are such:
>
> A. That if the above bounden Principal as Contractor shall well and faithfully do and perform the things agreed by him to be done and performed according to the terms of said contract and general provisions, including the plans and specifications therein referred to

[41] The Litigation Cooperation Agreement recites that both "Lyons and Structural claim that they are entitled to additional compensation for delays, inefficiency, certain extra work, and other costs due to, inter alia, the differing site conditions encountered during Structural's work" on the Project as well as damages for wrongful termination.

> and made part thereof, and such alterations as may be made in said plans and specifications as therein provided, and which are hereby made part of this bond the same as though they were fully set forth herein, and shall indemnify and save harmless the State System of Higher Education and all of its officers, agents and employees from any expense incurred through the failure of said Contractor to complete the work as specified and for any damages growing out of the manner of performance of said contract by said Contractor or his Subcontractors, or his or their agents or servants including but not limited to patent, trademark and copyright infringements, then this part of this obligation shall be void; otherwise, it shall be and remain in full force and effect.

Ex. J-4. [Emphasis added].

105. There are different types of construction performance bonds which may be required or given. These types include: traditional performance bonds (such as that offered by the AIA); indemnity bonds; completion bonds and manuscript bonds. See Bruner & O'Connor on Construction Law, Vol. 4A, § 12:14; C.O.L. 43.

106. Traditional performance bonds appear to be the most common and typically allow the surety options in dealing with a contractor's default. Such options include arranging for completion by the existing contractor, taking over and completing the contract itself and/or substituting a replacement contractor to complete the work. Completion bonds, as their name suggests, usually limit the surety's option to taking over the work and completing the contract at its sole expense. Indemnity bonds, on the other hand, typically limit the surety's obligation to reimbursing the obligee (owner) up to the penal sum (i.e. total face value) of the bond for any cost of completion of the bonded contract in excess of unpaid contract amounts. Manuscript bonds are a hybrid of one or more of the above. Id. at §§ 12:13 – 12:20; C.O.L. 43-46.

107. Based on the language of the Contract Bond set forth above, as well as the conduct of the parties, the Contract Bond here at issue is an indemnity bond. C.O.L. 101-106.

108. Although an "indemnity bond" typically requires the surety to reimburse the obligee (owner) up to the total value on the face of the bond for any cost of completion, less the unpaid Contract balance, we also note that, recognizing the principle that the language of the bond itself is controlling, broad indemnity language is sometimes found in an indemnity bond which may then be construed to require the surety to indemnify the obligee (owner) for a variety of consequential damages, including delay damages and lost profits. See Bruner & O'Connor, Vol. 4A at § 12:18. C.O.L. 43-46.

109. The plain and express language of the Contract Bond here at issue requires both Lyons (as contractor) and Liberty Mutual (as surety) to "indemnify and save harmless the State System of Higher Education . . . from any expense incurred through the failure of said contractor [Lyons] to complete the work as specified and for any damages growing out of the manner of performance of said contract by said contractor. . . ." Ex. J-4. We thus conclude from this express statement that the surety's obligation is to indemnify and save harmless the University

from any expense it incurs by reason of Lyons' failure to complete the work as specified (e.g. in a timely manner) and for any damages growing out of Lyons' manner of performance on the Contract (i.e. its failure to progress its work on the Project in a timely manner which resulted in a material breach of the Contract); C.O.L. 40-46, 101-108.

110. Although our survey of Pennsylvania case law (including Downingtown) has revealed no cases involving an indemnity bond of the type here at issue nor any language similar to that in this Contract Bond, cases which we have found dealing with indemnity bond language (language very similar to that contained in the Contract Bond) have held that delay and other consequential damages arising from the contractor's breach are included within the surety's liability on the bond. See e.g. Bossier Medical Property v. Abbit and Williams Construction Co. of Louisiana, Inc., 557 Sl. 2d 1131, 1133-1134 (La. Ct. App. 2d Cir. 1990)(holding surety liable to compensate the obligee for lost rents caused by construction delays where the bond obligated the surety to "fully indemnify and save harmless the Obligee from all costs and damage which the Obligee may suffer by reason of" the Contractor's failure to "faithfully perform the work."); C.O.L. 101-109.

111. When a bond contains a broad expression that would include "all claims and demands incurred" such performance bond may be held to include damages beyond the mere cost of completion. See Pittsburgh v. Parkview Constr. Co., Inc., 23 A.2d 847, 849-850 (Pa. 1942) compared to Commonwealth v. Fidelity and Deposit Co. of Maryland, 50 A.2d 211, 212-213 (Pa. 1947).

112. Corporate surety bonds are to be strictly construed in favor of the obligee and in a manner so as to favor public over private interests. See e.g. Pretty v. Massy et al., 159 A. 545, 547 (Pa. 1932); Pennsylvania Turnpike Commission v. Andrews and Andrews, 47 A.2d 220, 221 (Pa. 1946). See also Prictchard v. Wich, 178 A.2d 725, 727 (Pa. 1962).

113. Liberty Mutual's liability and obligation on the Contract Bond extends to the University's cost of completing Lyons' work on the Project and to the delay damages the University incurred as a result of Lyons' breach of Contract. C.O.L. 101-112.

114. Because we have found that Lyons materially breached the Contract and failed to complete work on the Project as specified by the Contract, resulting in the ultimate completion of the Project by the replacement general contractor 338 days beyond the Contract completion date time; and because under the plain and express terms of the Contract Bond, Lyons and Liberty Mutual agreed to indemnify the University "from any expense incurred through the failure of [Lyons] to complete the work as specified and for any damages growing out of the manner of performance"; the University is entitled to judgment against Liberty Mutual in the principal amount of $2,316,842, representing the University's cost of finishing Lyons' work on the Project and damages incurred due to Lyons' material breach of the Contract, reduced by the unpaid Contract balance. C.O.L. 101-113.

Summary of Damages

115. Because we did not find that the University, Lyons or Liberty Mutual acted in bad faith, no penalty or attorney fees will be awarded. 62 Pa.C.S. §§ 1725 and 3935(a) and (b).

Offsets and Final Awards

116. Because the University's award against Lyons pursuant to Article 13.2.101 is $2,316,842, with an additional amount due the University from Lyons as assignee of Herre Bros.' claim against Lyons in the amount of $135,374; and because we offset these awards to the University from Lyons by the award to Lyons from the University for extra-contractual work on the Project in the amount of $137,697, the net principal award due to the University from Lyons is $2,314,519. F.O.F. 441, 508, 509; Board Finding; C.O.L. 74, 85.

117. With respect to the University's claim against Libery Mutual, Liberty Mutual is jointly and severally liable to the University on the Contract Bond in the principal amount of $2,316,842, the same amount as we have found due from Lyons to the University pursuant to Article 13.2.101 of the Contract, but excluding the $135,374 awarded the University from Lyons on the Herre Bros. assigned claim (which is not covered by the Contract Bond) and the $137,697 offset credited to Lyons (since Liberty Mutual did not incur these extra-contractual costs nor did it join in Lyons' amended counterclaim against the University). F.O.F. 390, 500-506; Board Finding; C.O.L. 74, 114.

118. The University is further entitled to pre-judgment interest on the principal amount of its awards from both Lyons and Liberty Mutual at the rate of 6% per annum from March 14, 2007 (the date Lyons' original claim was filed with the University) to the date of this Order. 62 Pa.C.S. § 1751.

119. Lyons is liable to the University for the total judgment amount of $3,126,924. C.O.L. 116, 118.

120. Liberty Mutual is liable to the University for the total judgment amount of $3,130,063. C.O.L. 117, 118.

121. The University is further entitled to post-judgment interest on the outstanding balance of these awards at the rate of 6% per annum until paid in full. 62 Pa.C.S. § 1751

122. The foregoing liabilities are several not cumulative.

123. Each party shall bear its own costs. 62 Pa.C.S. § 1725.

OPINION

INTRODUCTION

Plaintiff, Shippensburg University of Pennsylvania of the State System of Higher Education ("University"), commenced this action against Lyons Construction Services, Inc. ("Lyons") and its surety, Liberty Mutual Insurance Company ("Liberty Mutual"), seeking to recover, inter alia, the costs the University has incurred to complete Lyons' scope of work for construction of the University's new student recreation center, Project Number SU-2003/12B (the "Project"). Lyons was the general construction prime contractor on the Project.

The University's claim asserts two counts of breach of contract against Lyons and a single breach of contract count against Liberty Mutual.[42] As to Lyons, the University charges that the general contractor breached its contractual obligations "by failing to maintain the project schedule and by performing its work in a flawed, defective, improper and inadequate manner" which includes Lyons refusal to cure deficiencies identified in the University's January 29, 2007 Notice to Cure. As to Liberty Mutual, the University alleges that the surety breached its obligations under the performance bond by failing to indemnify the University for its losses incurred as a result of Lyons' breach of contract. The University seeks judgment against both Lyons and Liberty Mutual in the amount of $3,326,147, representing its claimed net cost to complete the Project and settle a delay claim paid to Herre Brothers, Inc. ("Herre Brothers"), the electrical prime contractor on the Project, plus interest, costs and other appropriate relief.

[42] The University's original complaint comprised one breach of contract count each against Lyons and Liberty Mutual. A second breach of contract count against Lyons was added in an amended complaint filed April 14, 2010, based upon a delay claim by the electrical contractor on the Project, Herre Brothers, Inc. This claim had been assigned to the University as part of a settlement of Herre Brothers' action against the University. The University's amended complaint against Lyons contained separate counts for indemnification to the University and for damages as Herre Brothers' assignee.

Lyons denies that it breached the contract and, in an amended counterclaim brought in its own name and for the benefit of its micropile subcontractor, Structural Group, Inc. ("Structural"), seeks damages for wrongful termination and compensation for extra costs incurred to deal with purported differing and unforeseen site conditions allegedly encountered during the installation of the micropile footings for the Project. Lyons specifically asserts that its performance "was adversely impacted by unforeseen site conditions which entitled it to additional compensation and an extension of time by the University." Lyons also alleges that the University's termination of Lyons was done in bad faith and otherwise in breach of the contract between the two. Lyons seeks damages on its counterclaim totaling $6,430,000. Defendant Liberty Mutual denies liability to the University, appearing to base its primary defense on the position that Lyons did not breach its contract obligations on the Project.

Hearings commenced February 14, 2011, and concluded March 15, 2011. Thereafter the parties filed post-trial briefs, the last of which was filed November 28, 2011. In addition, post-trial motions were filed to reopen the record to admit as additional exhibits a Settlement Agreement and Release entered into by Structural and Liberty Mutual dated July 22, 2011, and a Litigation Cooperation Agreement entered into by Lyons and Structural dated November 28, 2007. Both motions were granted by orders of the Board issued on October 7, 2011, and May 3, 2012, respectively.[43]

Project Background

This case originates from the construction of a 64,000 square foot Student Recreation Center on the University's campus in Shippensburg Township, Cumberland County, Pennsylvania. In November 2005, the University retained the joint venture of Spillman

[43] The Structural-Liberty Mutual Settlement Agreement and Release was admitted as Exhibit J-600, and the Lyons-Structural Litigation Cooperation Agreement was admitted as Exhibit J-601.

Farmer/Gannett Fleming ("the Professional") to design and act as administrative professional for the Project. Upon completion of the design, the University solicited bids from prime contractors for the Project. Lyons submitted an apparent low bid in the amount of $8,785,960.00 to become the general construction prime contractor for the Project. Other prime contractors on the Project were Herre Brothers (electrical), W.G. Tomko, Inc. (plumbing), and Silvertip, Inc. (HVAC).

The University issued a Notice of Award to Lyons as general contractor for the Project, and the two parties entered into a "Standard Form of Agreement" contract on February 6, 2006 (the "Contract"). The Contract identified the overall time allotted for the Project as 380 days from the issuance of the Notice to Proceed, which the University issued on March 27, 2006. This established the Project completion date as April 10, 2007.

As general contractor for the Project, Lyons was initially responsible for developing a coordinated Project schedule, with input from the other prime contractors, within 28 days of the Notice to Proceed (i.e. by April 24, 2006). Lyons, however, did not submit a Project schedule until June 11, 2006, due to an apparent inability to achieve prompt agreement on such schedule with the other prime contractors on the Project.[44]

Among its many duties, Lyons was also responsible for installation of the building's foundation, which was specified to be comprised of a series of interconnected grade beams supported by hundreds of 7 inch diameter micropiles. Lyons selected and retained Structural to be its micropile subcontractor with responsibility for drilling and installing these micropiles. Structural began mobilizing in late June and commenced drilling on or about July 7, 2006.

Almost from the beginning, the University expressed concerns about Lyons' progress on the Project because of the time consumed by Lyons to produce a Project schedule and commence

[44] Lyons did submit an initial Project schedule by June 1, 2006, which the University rejected because it called for completion of the Project 63 days beyond the completion date required under the Contract.

micropile drilling. These concerns continued as Lyons' progress was slowed when it hit rock outcrops in its initial foundation excavation, and Structural's micropile drilling was hampered by frequent encounters with subsurface rock formations which caused, inter alia, slower drill times, broken pile casings and lost or damaged drill hammers. In addition, a dispute developed between Structural's drillers and the individual retained by the Professional to oversee micropile drilling depths, with Structural alleging it was being required to drill deeper than required by the Project specifications.

To further complicate matters, numerous sinkholes[45] developed on the Project site beginning in August 2006. This further impeded progress and created conflict on the job site regarding worker safety issues and the proper way to deal with these problems. Structural, and subsequently Lyons, insisted on performing compaction grouting on the Project site ahead of micropile drilling to prevent further sinkhole development. Compaction grouting is a process whereby holes of smaller diameter than the micropiles are drilled and cementatious material pumped into the ground to stabilize the surface area above. The University and the Professional took the position that compaction grouting was unnecessary. They proposed other precautionary measures such as improved surface water management, more extensive use of gravel pads, crane mats and proof rolling to reinforce the surface area around micropile drilling areas, combined with simply repairing sinkholes once they developed.[46]

The differences over how to deal with the sinkhole problem came to a head following the appearance of a sinkhole on the Project in early November 2006 which nearly trapped one of the

[45] Although the parties differ as to the number and severity of "sinkholes" occurring on the Project, the Board found there to be approximately 12 to 17 sinkholes or surface subsidences on the Project ranging in area from a few feet to well over 40 feet in diameter and from a few feet in depth to over 25 feet deep. (Exs. J-379, P-35, D-459).

[46] The University and the Professional provided instructions for sinkhole repair which included excavation and backfill with rock and concrete. As for sinkhole prevention, the University and the Professional directed Lyons/Structural to improve site grading and surface water management to direct surface and flush water away from open holes and suggested, inter alia, the other precautionary measures noted above. (Exs. J-78, J-117).

construction workers on the site. At this time, following the suggestion of the Project Professional, Lyons sought guidance from the Occupational Safety and Health Administration ("OSHA") on how to handle the sinkhole/safety issue on the Project. OSHA, in turn, referred Lyons to PA/OSHA, an independent workplace safety consulting firm, to investigate the problem. PA/OSHA apparently agreed that the sinkholes created an imminent threat to worker safety, effectively advising Lyons to "correct" the safety problems or remove its workers, but offered no suggestions on how to "correct" the sinkhole problem. This PA/OSHA visit resulted in Lyons cordoning off a significant portion of the Project site which Lyons considered dangerous due to the potential for further sinkhole development.

On December 14, 2006, the University, in response to Lyons' actions, issued a letter suspending the work of Lyons' micropile subcontractor "to allow sufficient time to more fully investigate the situation." The University thereafter conducted its own investigation and presented its findings in a 13-page letter to Lyons dated January 29, 2007. This letter identified ongoing deficiencies in Lyons' and Structural's work and included a further notice to cure.[47] In addition to late performance cited in an earlier cure notice, new deficiencies cited by the University in the January 29, 2007 letter centered on Lyons' alleged "excessive use of flush water and poor surface water management" which the University contended caused the sinkholes to develop. This last cure notice directed Lyons to correct its alleged "excessive" use of flush

[47] The University had issued an earlier cure notice on September 12, 2006, in which it identified Lyons' "continuing failure to progress with the site work, especially micropile production," as a breach of Lyons' performance duties under the Contract. The University also cited what it termed Lyons' ineffective flush water management and the absence of an approved water management plan as a cause of the site conditions which Lyons had previously complained of. Lyons replied to the September 12, 2006 cure notice stating that it intended to perform "pregrouting" of the subgrade on a grid pattern to "fill the existing voids and prepare the site for micropile production. In responding to this advice on October 6, 2006, the University informed Lyons that it was holding its decision on the September 12, 2006 cure notice in abeyance, citing continued lack of progress on micropile production.

water and poor surface water management, abate all safety hazards and resume micropile installation within 10 days.

Structural and Lyons denied that the amount of water used in the micropile drilling process was excessive and defended the surface water management plan, which had been previously approved by the Professional. At the same time, Lyons and Structural offered to take additional steps to monitor the flush water use and make minor improvements to the overall surface water management. They also began to remobilize in order to resume micropile installation. However, in light of Lyons'/Structural's response, the University never approved Lyons' request to resume drilling. Instead, on February 26, 2007, the University terminated Lyons' Contract as general contractor.

DISCUSSION OF ISSUES

Lyons' Termination

The primary issue in this case is whether or not the University's termination of Lyons was proper. The Contract provides for the termination of the contractor in Article 13.2.100. This provision states, in pertinent part, as follows:

> 13.2.100 If the Contractor . . . fails to proceed as directed by the System, or performs the work unsuitably, . . . or discontinues the prosecution of the work without the approval of the System, or otherwise is guilty of a substantial violation of a provision of the Contract Documents, then the System may, without prejudice to any of its other rights or remedies, give the Contractor and its Surety written notice that the Contractor has seven (7) days from the date of the System's notice to cure the default set forth in the notice.
>
> The discretion to declare the Contractor in default is solely the System's . . . . Should the Contractor fail to cure said default within the specified time, the System may terminate the Agreement between the System and the Contractor, and may take possession of the site and of all materials, equipment, tools, construction equipment and machinery which is owned by the Contractor,

> located on the property and may finish the work by whatever method it may deem expedient.

(Ex. J-5).

The University asserted in its termination letter two reasons for terminating the Contract in accordance with Article 13.2.100: 1) Lyons' "continued failure to meet the project schedule" and 2) Lyons' "stated refusal to cure the deficiencies identified in the University's January 29, 2007 Notice to Cure." Lyons takes issue with both asserted grounds for termination, arguing that: 1) any failure on Lyons' part to keep to the Project schedule was due to differing site conditions it encountered, particularly during micropile drilling and installation; and 2) Lyons substantially complied with the University's January 29, 2007 Cure Notice. Lyons thus asserts that its termination was improper.

Lyons' "refusal to cure . . . deficiencies"

The University's second cited reason for termination was Lyons' "stated refusal to cure the deficiencies identified in the University's January 29, 2007 Notice to Cure." In this last cure notice, the University directed Lyons to: 1) resume micropile installation within ten days; 2) "correct the excessive use of flush water and poor surface water management" identified in an appended report on Lyons' and Structural's drilling means and methods prepared by The Traylor Group ("Traylor"); and 3) "cure the deficiencies in the micropile installation and abate all safety hazards associated therewith."

The Traylor report centered its findings on what it called Structural's "aggressive use of water as a flushing medium" and identified Structural's use of "large" quantities of flush water in its drilling operation (in excess of 600,000 gallons) as the cause of the sinkholes which

developed on the Project site.[48] While noting that Structural's micropile drilling techniques and equipment, which had been submitted to and approved by the Professional, were appropriate, Traylor asserted that Structural used more water than was needed in the drilling process, thereby eroding subsurface areas and generating sinkholes.

While the record supports a finding that the overall micropile drilling process itself contributed to the development of sinkholes, we disagree with Mr. Traylor's assertions that the volume of flush water used by Structural was excessive, inappropriate and/or a material cause of the sinkholes occurring on site. To begin with, Mr. Traylor's assertion that more than 628,000 gallons of water was used by Structural as flush water in the drilling process does not appear to be accurate. This 628,000 gallon figure cited by Mr. Traylor was given to him orally and without backup. This number also contradicts the water meter's logs which indicate only 472,000 gallons of metered water was used for the entire Project during the time period in question. In fact, the volume of flush water used by Structural as part of its approved drilling procedures was never directly monitored, and no accurate measurement of drilling water usage was ever undertaken by the University.

For its part, Lyons estimated that only a small portion of the 472,000 gallons of water consumed on the Project was used by Structural as flush water for its micropile drilling, with the majority being used for ongoing cleaning and maintenance of the equipment on-site. No expert other than Mr. Traylor testified at trial that Structural's flush water usage was excessive for the type of drilling required by the Project's foundation design.[49] Furthermore, credible testimony at

[48] See Ex. J-78. However, the report's author, Robert Traylor, conceded at trial that Structural's water usage was not the only cause of the sinkholes which developed. (N.T. 1998)

[49] In addition to the Traylor Report, the January 29, 2007 Cure Notice included a report prepared by Advantage Engineering ("Advantage"). In its report, Advantage asserted that water, in the form of ground water and flush water used in the drilling process, played a large role in the development of the sinkholes. Advantage stated that surface water should not be allowed to collect or pool in low-lying areas, and that caution should be exercised when water is introduced as part of micropile installation. Advantage's report mirrored concerns over Structural's use and

hearing confirmed that the volume of flush water utilized by Structural in its drilling operations was not significant in comparison to the overall volume of underground water encountered or brought to the surface by the drilling process.[50] Thus, the record does not support a finding that Structural's use of flush water in the micropile installation was "excessive" or something which needed to be corrected, nor does it support the proposition that it was a material cause of the sinkholes occurring on the Project.

The University also directed, in the January 29, 2007 Notice to Cure, that Lyons correct "poor surface water management" on the Project as a means of preventing the sinkhole problem. Here again, however, the record does not support the University's assertions that Lyons' surface water management was materially deficient or that it was a material cause of the sinkhole problem.

With regard to this issue, we first note that Lyons had submitted a formal surface water management plan for the Project in September 2006 which was accepted by both the Professional and the University. We further note that no credible evidence was introduced to indicate that Lyons failed, at any time, to comply with this plan during its tenure on the Project. Throughout micropile installation, Lyons undertook numerous steps to minimize pooling surface water, including the creation of diversion swales and ditches, grading the site so that water would

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management of water, voiced by the University as early as August 2006, noting the introduction of "large amounts of water into the subsurface dramatically increases the potential for erosion of the soil" into the bedrock, and "[c]ontinuous erosion of soil into the bedrock is expected to result in subsidence at the surface." Advantage did not, however, identify any specific deficiencies in Structural's micropile drilling means and methods or the management of flush or surface water.

[50] The drill type approved by the Professional and utilized on the Project was a "Numa Super Jaws" system. This was an internal flushing drill designed to utilize both air pressure and/or water pressure to clear drilling debris by flushing same back up the casing. Typically, flush water and air pressure would be used when drilling through rock, clay or other non-pourous material with the flush water returning up the casing, while mostly air pressure would be used to clear drilling debris when the drill bit was in wet, pourous layers of material. In the latter instance, the air pressure would force the groundwater or wet material along the path of least resistance which could be back up the casing or outward into the soft material cavity. This latter activity, by its very nature, entailed the possibility of disturbing the materials in and around the softer material cavity and on occasion resulted in "communication" between micropile drillings (i.e. the process of drilling one micropile caused the expulsion of air, water and/or materials from around another micropile drill hole).

naturally flow toward a temporary detention pond, and regular pumping of standing water and mud to the detention pond. Although these efforts were not always successful, we cannot say that the accumulating surface water on the Project site was substantially worse than that which normally occurs in similar construction activities. Accordingly, the record demonstrates that Lyons was reasonably diligent in its attempts to manage surface water on the Project and that its efforts to manage this surface water were not materially deficient.[51]

Additionally, the weight of evidence presented supports the conclusion that, although the surface water was beneficial to no one, the amount of surface water present on the site played no meaningful role in the formation of sinkholes on the Project. That is to say, the amount of surface water present on the Project that may have seeped through the surface or down around the micropile casings at any given time was insignificant in forming sinkholes when compared to the large volume of groundwater below the surface and to the disruption of the subsurface caused by the very nature of the micropile drilling process itself. More specifically, the Board found that the nature of micropile drilling, which, of necessity, involves penetrating through different layers of subsurface materials with the disruptive forces of vibration and the introduction and removal of water and air pressures in the process, when combined with the subsurface conditions beneath the Project, was the overwhelming cause of the sinkholes occurring on this jobsite.

In sum, we agree with Lyons and Structural that the volume of flush water used by Structural and Lyons' management of surface water were not improper or deficient. Additionally, they were not material causes of the sinkholes appearing on the Project. To the contrary, we believe these complaints to be "red herrings" proffered by the Professional, the

[51] We also take note that, although the Professional as well as the University and some of its consultants criticized Lyons' surface water management, they failed to offer any specific suggestions for its improvement. Although Nicholson's subsequent use of diverter hoses on its drill rigs did seem to reduce surface water on the site, no one suggested this to Lyons/Structural and there was ample testimony that both the diverter hoses used by Nicholson and the bell diverter system used by Structural were standard practices in the industry.

University and/or its consultants to divert attention from the real problem (i.e. the fact that the very nature of the micropile drilling process that was required by the Project's foundation design and approved by the Project Professional, coupled with the particular subsurface conditions on the Project, created the high occurrence of sinkholes on this Project).

Finally, the University directed Lyons to "abate all safety hazards" it claimed were associated with Lyons' so-called "deficiencies" in the micropile installation. Even though we have found these so-called "deficiencies" cited by the University in its January 29, 2007 letter to be illusory, Lyons nevertheless took reasonable steps to comply with these additional requirements the University put forth in its January 29, 2007 letter and with other requests made by the University or its consultants that were not specifically included in the cure notice itself. For instance, on February 6, 2007, ArroActiv notified Lyons that, prior to restarting the micropile installation, the Professional was requiring Lyons to "resubmit the micropile submittal" and address what changes it (Lyons) intends to implement to reduce the amount of flush water, manage flush and surface water, and otherwise "address the potential for additional sinkhole development" as discussed in the Advantage and Traylor reports. Lyons responded that, though its surface water management plan had previously been approved by the University and the Professional, it would take additional measures suggested by the University's consultants, including the implementation of a daily water usage reporting form, the additional use of rollers and other equipment for ground compaction and rut control, additional stone to reinforce drilling area surfaces and the use of consultants to monitor water usage. Lyons also submitted a revised plan which indicated, in a general way, the locations where Structural intended to perform compaction grouting as a prelude to micropile drilling.

Lyons also complied with ArroActiv's request that Lyons provide a "recovery schedule" by the next scheduled job conference "reflecting how they intend to recover time lost on the micropile installation." (Ex. J-22.22) In fact, Lyons prepared a recovery schedule which it distributed at a meeting with the University and others held February 22, 2007. (Ex. J-330) This recovery schedule was revised on February 23 to account for input from the other prime contractors and some of the concerns from ArroActiv (which had been retained by the Professional to act as scheduling manager by this time) about durations projected for compaction grouting and micropile installation.

In sum, we find that Lyons substantially complied with all reasonable demands made by the University in the January 29, 2007 cure notice with regard to Structural's use of flush water and drilling procedures, as well as Lyons' management of surface water and abatement of related safety hazards. Accordingly, we find no merit to the University's assertions that Lyons refused to follow the University's directives with regard to the foregoing issues identified in the January 29, 2007 Notice to Cure, and Lyons' alleged refusal to do so does not form a legitimate basis for its termination.

Project Delay

The University also cited Lyons' slow work progress and failure to meet the Project schedule as a basis for termination. On this issue, there is no meaningful dispute that Lyons, as general contractor, was behind schedule at the time of termination and would not complete the Project by the Contract date of April 10, 2007 (i.e. within the 380 days from the notice to proceed as provided in the Contract).

In order to complete the Project on time, Lyons' original Project schedule called for micropile installation to be completed in approximately 84 days, by October 1, 2006. In its

recovery schedule submitted in February 2007, Lyons itself estimated that it would not complete micropile installation until May 18, 2007, and indicated a Project completion date of December 6, 2007. This projected completion date for the Project was 240 days beyond the April 10, 2007 completion date required under the Contract. This estimate was based, among other things, on using one drill rig for the micropiles and a second one to perform compaction grouting ahead of the micropile drilling where needed, with an extra drill rig to be brought on site at some unspecified time later in the process. Lyons also proposed to overlap portions of the micropile installation with other activities on the Project's critical path, thereby allowing Lyons to begin erecting steel beams in areas where the micropile installation had been finished while still performing micropile work in other areas.

However, the University's scheduling expert, Richard Easler, testified that Lyons' February 2007 recovery schedule was too optimistic. Among other things, Mr. Easler took issue with Lyons' projected plans to drill and install micropiles while contemporaneously performing steel erection and compaction grouting. He questioned Lyons' ability to overlap these and other activities and suggested that the durations used by Lyons' for certain activities were overly ambitious. In fact, Mr. Easler maintained that Lyons would not have been able to complete the Project until April 10, 2008, asserting that, as of February 2007, the Project was delayed by 366 days beyond the original Contract completion date of April 10, 2007.

On this point, the Board ultimately agrees with Mr. Easler. That is, we find that Lyons' February 2007 recovery schedule projection was not likely to be achieved, and Mr. Easler's estimate of 366 days of delay to be the more accurate projection. We base this conclusion on Lyons' and Structural's past performance, as well as the way this work was ultimately performed by the eventual replacement micropile subcontractor, Nicholson Construction Co. ("Nicholson").

Initially, we acknowledge that Mr. Easler's concern about Lyons' ability to overlap activities like the steel erection and micropile drilling in different areas is undermined by the fact that Lobar, Inc. ("Lobar"), the replacement general contractor, successfully utilized an overlapping of activities somewhat similar to that which Lyons had proposed. However, we think the more significant factor casting doubt on Mr. Lyons' projection remains the time he estimated to complete the micropile installation itself. Here, Lyons' projection continues to miss the mark as it estimated 81 more days for Structural to install the remaining 53% of the micropiles when it had previously taken Structural 161 days to drill only 47% of these micropiles (during the period July 7, 2006 to December 16, 2006). Lyons' projection becomes even more unlikely when considering the proposed addition of more compaction grouting to the work mix. Moreover, Lyons' projection also suggests that Structural could have done in 81 days with one drill rig doing micropiles (and one drill rig doing compaction grouting and adding another micropile rig at some unspecified later time) what Nicholson did in 61 days with two drill rigs doing micropiles full time (and no compaction grouting distraction). We therefore find that Lyons' recovery schedule was not likely of achievement and that the Project was, effectively, a full year behind schedule as it stood in February of 2007.

Though one could continue to debate the accuracy of these alternate work projections, the fact remains that, as of the date of termination (February 26, 2007), Lyons was 338 days into a 380 day Project and its micropile subcontractor had only drilled approximately 47% of the micropiles needed for the foundation. It was also clear at the time that, due to this delay in the micropile work and pursuant to Lyons' own best case estimate, the Project itself would not be completed until significantly beyond the April 10, 2007 completion date required under the Contract. Thus, as of its February 27, 2006 termination date, Lyons was, by its own projection,

240 days behind schedule (and in actuality 366 days late) on a Project which was originally scheduled to run for only 380 days. Accordingly, it is clear now, and was clear at the time, that the Project was significantly behind schedule and materially delayed at the time the University terminated the Contract. The propriety of Lyons' termination thus depends on what caused the delay and who was responsible for same.

Causes of the Project Delay

Lyons asserts that its delay on the Project can be attributed almost entirely to differing and unforeseen site conditions it encountered during construction. Although Lyons and Structural initially identified "unanticipated subsurface voids" as the "differential (sic) site conditions" adversely impacting the micropile drilling (and thus delaying the Project as a whole), the differing site condition claim ultimately presented by Lyons is based on the large number of sinkholes which developed during construction. In addition to its differing site condition claims, Lyons also appears to allege that some of its delay in the micropile installation was due to the Professional's observer, Mr. McCafferty, requiring Structural to drill micropiles deeper than required under the Contract specifications. The University denies that the sinkholes encountered presented different or unforeseen site conditions as well as the assertion that Structural was required to drill micropiles deeper than required by Contract specifications.

With regard to this latter complaint, the Board agrees with Lyons and Structural that the Contract specifications for "competent rock" in which the micropiles were to be socketed did not literally require the ten or eleven continuous feet of "blue-gray rock" as was allegedly insisted upon by Mr. McCafferty. However, we also credit Mr. McCafferty's testimony that the color of the rock encountered was only one factor among others which he used to determine if and when competent rock was struck. Accordingly, we cannot say that Mr. McCafferty was in error in

judging whether or not sufficient competent rock was attained on the vast majority of micropile holes. Moreover, the evidence presented at trial also shows that, at best, overdrilling occurred on only one or two micropile holes out of nearly 400 to be installed. As a result, we must conclude that any contribution to the Project delay or extra cost which resulted from this alleged misinterpretation of the Contract specifications was de minimus.

Although Lyons focused almost exclusively on the sinkhole problem as the reason for its delay in progressing the Project, the weight of evidence presented at hearing nonetheless established that these delays were instead attributable to two material causes. These were: 1) the occurrence of multiple sinkholes and resultant safety concerns on the job site and 2) the steep and intense pinnacle formations and multiple rock seams above bedrock of varied depths encountered beneath the surface which slowed drilling operations and caused drill bits and casings to deflect and break.

For clarification sake, we do note that other potential causes of delay were mentioned in evidence, including heavy rains which fell on the Project site at different times in 2006, and the presence of a limited amount of unexpected "hard rock" encountered near the surface by Lyons' excavation subcontractor in early May 2006. However, despite the fact that the latter item necessitated blasting, the evidence also established that none of these other factors contributed materially to the overall Project delay.

Having determined that the sinkhole activity and the steeply pinnacled/multi-layered subsurface rock encountered on the job site were the two material causes of Project delay, we must now address the question of whether or not either of these problems excuse Lyons from timely performance of its Contract. This determination, in turn, depends on whether or not either of these two problems constituted concealed or unforeseen subsurface site conditions which

differed materially from the information provided to Lyons in the bidding process and/or whether the information provided constituted constructive fraud or active interference in connection with Lyons' work on the Project as defined by such cases as Acchione and Canuso, Inc. v. Dept. of Transp., 461 A.2d 765 (Pa. 1983) and Dept. of General Services. v. Pittsburgh Building Company, 920 A.2d 973 (Pa. Cmwlth. 2007).

Site Conditions: "As Represented" vs Actual

Lyons, of course, insists that the multiple occurrences of sinkholes encountered on the Project constituted concealed or unforeseen subsurface conditions which differed material from the site conditions it was led to expect by the information it was provided in the bidding process. In particular, Lyons cites to the Gannett Fleming Geotechnical Report (also referred to herein as the "GFGR"). Lyons also alleged during the Project that the extensive amount of steeply pinnacled rock encountered on the Project constituted a differing site condition.

The University denies that Lyons encountered any site conditions which were materially different from, or not adequately disclosed by, the bid documents and/or the GFGR. Instead, the University maintains that the GFGR correctly identified the geology underlying the Project and that Lyons and its drilling subcontractor, Structural, should have expected sinkhole activity and steeply pinnacled/multi-layered subsurface rock of varied depths from this geology. The University also argues, inter alia, that neither contractual provisions nor case law afford Lyons relief in this matter because language in the Contract states that the Gannett Fleming Geotechnical Report was not to be considered part of the "Contract Documents" and that the bidding contractors may not rely on the GFGR, but must instead do their own inspection of the Project site to assess subsurface conditions.

With regard to the latter arguments proffered by the University, Lyons asserts that these disclaimers as to reliance upon the geotechnical reports provided for a construction site fly in the face of reality and industry practice. Additionally, Lyons argues that the exculpatory provisions referred to by the University to disclaim liability for information provided in the GFGR are ineffective because these documents (and the GFGR in particular), viewed in the full circumstance surrounding the Project, constituted affirmative misrepresentation, constructive fraud and/or active interference with its work.

The GFGR

Prior to seeking bids on the Project, the University engaged Gannett Fleming to conduct a geotechnical investigation of the ground upon which the Project would be constructed. Gannett Fleming did so and prepared a report of this investigation (the Gannett Fleming Geotechnical Report or GFGR). Although this report was initially intended only for the purpose of determining the building foundation design, it was ultimately made available to potential contractors for their use during the bidding process by way of Addendum No. 1 to the Contact Documents issued December 5, 2005.

Pinnacles and Rock Layers

The Gannett Fleming Geotechnical Report identified the geology underlying the Project site in general terms as the Rockdale Run formation, which it described as limestone known for solution openings and local intense pinnacle development. The geology underlying the Project and described in the report was typical of the karstic limestone geology of the region, though the term "karst" did not appear in the report. The report and attached test boring data identified subsurface conditions as comprised of steep and intense pinnacle formations, differential weathering of the subsurface rock with zones of very soft soil above rock, and intermittent layering of rock and soft soil above bedrock found at highly variable depths. In fact, the report

itself and the raw data of the test boring logs indicated that Gannett Fleming experienced several problems with its own test drilling, noting that three of its exploratory borings had to be re-drilled "due to the augers deviating from vertical when a hard, near vertical surface was encountered which caused the auger to deflect while advancing the boring."

The test-drilling problems experienced and reported by Gannett Fleming as well as the intense pinnacle development, multiple rock layers and bedrock at highly variable depths below the Project surface identified in the GFGR are precisely the same problems and subsurface conditions which Structural encountered on the Project. These are also the same subsurface conditions which caused delays with Structural's micropile installation due to slower drilling times, broken casings, lost hammers and abandoned holes. While the Board acknowledges that drilling into ground with highly pinnacled and multi-layered rock such as existed at the Project site is notoriously difficult (a fact acknowledged also by all pertinent witnesses), we find that the likelihood of encountering such steep and intense pinnacle formations as well as multiple rock seams above bedrock at highly variable depths on the Project was adequately identified and clearly disclosed in the Gannett Fleming Geotechnical Report. As such, this problem cannot, as a matter of fact, be considered a differing site condition than presented in the bid documents as Structural and Lyons assert. Nor can the Gannett Fleming Geotechnical Report be considered misleading on this point. Accordingly, any delay to the Project attributable to difficulties presented by drilling into areas of steeply pinnacled and multi-layered subsurface rock seams above bedrock of varied depths is the responsibility of Structural (as micropile subcontractor) and Lyons (as the general contractor who selected and retained Structural) and must be so considered when assessing whether or not the overall Project delay justified Lyons' termination.

Sinkholes

As noted above, Structural and Lyons claim that the number and extent of sinkholes which developed on the Project site also constituted a concealed or unforeseen site condition which differed materially from the site conditions identified by the University at the beginning of the Project in the bid documents and Gannett Fleming Geotechnical Report. In response, the University takes the position that even though the Gannett Fleming Geotechnical Report did not expressly identify the possibility of sinkhole activity on the site, the report nonetheless contained sufficient information on the site's subsurface conditions from which Lyons and Structural should have inferred or understood the potential for sinkhole development on the Project.

Unlike the existence on the Project of steeply pinnacled and multi-layered rock above variable depths of bedrock, which we found to have been clearly and adequately identified by the Gannett Fleming Geotechnical Report, we also found that the number and extent of sinkholes occurring on the Project did constitute a concealed site condition which differed materially from that represented by the University in the GFGR presented to Lyons (and Structural) in the bidding process. We further found that the Gannett Fleming Geotechnical Report served to affirmatively misrepresent the potential for sinkhole activity on the Project.

Whereas the Gannett Fleming Geotechnical Report contained numerous specific references to the fact that intense pinnacle formations accompanied by multiple layers of rock seams and bedrock at highly variable depths were part of the Project site geology, no mention or reference whatsoever was made in the GFGR as to the likelihood or even the potential for sinkhole development on the Project. In fact, the GFGR gave quite the contrary impression, as it stated affirmatively that no subsurface voids were encountered during the test drilling; contained none of the usual "red flag" warnings with respect to the potential for sinkhole activity typically

included and expected in such reports encountering geology of the kind found on this Project; and made no mention whatsoever of the occurrence of sinkholes on a previous University construction site adjacent to the Project nor reference to the geotechnical reports for that adjoining project (which contained warnings and discussion of potential sinkhole activity in connection with construction on the adjacent site).

While both parties argued strongly for their respective positions as to whether or not the GFGR adequately identified the potential for sinkhole activity occurring on the Project site, the Board found the expert testimony of Donald A. Bruce, Ph.D., to be both highly credible and persuasive on this issue. Dr. Bruce demonstrated extensive qualifications and experience worldwide in the field of geotechnical construction including micropile design and installation. Among other accomplishments in this field, his work included contributions to the Federal Highway Administration ("FHWA") manuals on micropile foundations, which manuals are looked to for general standards and guidance in the micropile industry.

With regard to the case at hand, Dr. Bruce testified convincingly that it would be standard industry practice for a micropile contractor bidding on a project like this to rely on a geotechnical report of the type here provided on the Project in order to make its bid because the realities of time, expense and other restraints make such reliance a necessity regardless of the usual contract disclaimers accompanying same. He also testified that geotechnical reports provided to bidding contractors which identified the type of subsurface geologic formation described in the GFGR would normally be expected to contain "red flag" warnings of the potential for sinkhole development (particularly where micropile drilling was required) as well as some detail on sinkhole repair and/or prevention.

To fortify the foregoing opinion, Dr. Bruce identified and discussed such "red flag" warnings and sinkhole discussions included in several other geotechnical reports. The first two of these reports were actually prepared for the University in conjunction with the construction of the Industrial Arts Facility ("IAF"), another structure built a few years prior to the Project on ground immediately adjacent to the Project site. These reports (an original and a supplement), prepared by David Blackmore and Associates, Inc. ("DBA") in July 2002 and January 2003, specifically warn of the potential for sinkhole development during construction activity and include recommendations for sinkhole repair and for mitigation of sinkhole development. According to Dr. Bruce, these are examples of the sort of "red flag" warnings which would be expected but which were missing from the Gannett Fleming Geotechnical Report for the Student Recreation Center Project.

Other examples of geotechnical reports which "red-flagged" the potential for sinkhole development in reports which described subsurface geology materially similar to that underlying the Project were also presented at trial, including two prepared by Gannett Fleming itself. These reports, like the DBA reports on the prior construction site which adjoined the Project, specifically and clearly noted the potential for sinkhole development and included instructions for sinkhole repair.

Because a geotechnical report describing the type of geology which was found here under the Project, when provided to contractors bidding on micropile work, would typically be expected to contain "red flag" warnings as to the potential for sinkhole development (as well as other detail on sinkhole repair and/or mitigation);[52] and because the GFGR here presented to bidding contractors did not contain any such warnings or discussions, we find that Gannett

[52] Dr. Bruce acknowledges that such warning regarding sinkholes would not be needed were the GFGR used only internally by the Professional for design, but became necessary and expected when published for use by the bidding contractors. We agree.

Fleming Geotechnical Report, as a whole, served as an affirmative representation that significant sinkhole development was not expected on the Project site. Indeed, this interpretation of the GFGR is reinforced by statements of Sarah Frailey, Gannett Fleming's primary foundation designer and contact person on the Project, when she candidly admitted during the Project that the number and extent of sinkholes on the Project was greater than the Professional would have expected based on the information available during design and acknowledged the sinkholes to be a changed site condition.[53] Ms. Frailey's admission as to the sinkholes being a changed condition were also mirrored in contemporaneous comments by her colleague at Gannett Fleming, Paul Lewis, who was thereafter not heard from again on the Project.

In sum, the Board finds that the Gannett Fleming Geotechnical Report, as provided to contractors bidding on the Project without the warnings regarding the potential for sinkhole activity and related detail of the kind typically made for the type of geology found on the Project, amounted to an affirmative representation that no sinkhole activity of significance was expected on the Project. Thus, we also conclude that the nature and extent of the sinkholes occurring on the Project constituted a concealed subsurface site condition which differed materially from that which was reasonably anticipated by Structural and Lyons from the information provided to them by the University during the bid process.

The Board also credits Dr. Bruce's second significant point regarding the content of the GFGR. Here, Dr. Bruce asserts that industry practice and bidding contractors would also expect to see reference in the GFGR to relevant geotechnical information available on nearby or adjoining sites. Specifically, Dr. Bruce suggests that the DBA geotechnical reports prepared for

[53] Although Ms. Frailey acknowledges that Gannett Fleming (the engineering partner of the Project Professional) did not expect the extent of sinkhole development which occurred on the Project based on the Project's geotechnical data (which was included in the GFGR) she and the University nonetheless continue to assert that Lyons and/or Structural should have. We do not agree. (See e.g. Exs. J-219 and J-220; N.T. 1202-03, 1330).

the previous IAF construction site immediately adjacent to the Project, and the information contained therein, should have been referenced in the GFGR, as well as mention made of the sinkholes which developed on the IAF site during construction. Again, we agree with Dr. Bruce and find the absence of such reference in the GFGR to be a material omission, further contributing to the misleading nature of the Gannett Fleming Geotechnical Report.

Equitable Adjustment vs. Exculpatory Provisions

Having determined, as a matter of fact, that the extent of sinkhole development on the Project constituted a concealed subsurface site condition which materially differed from that which was reasonably anticipated by Lyons and Structural from the information provided to them by the University in the Gannett Fleming Geotechnical Report, we must further address the University's additional arguments that Lyons is still not entitled to an equitable adjustment to its price and/or the time period in which it was required to complete its work. To support this assertion, the University points out that the GFGR was explicitly declared not to be a part of the Contract Documents or bid materials because other exculpatory provisions disclaimed the accuracy of the GFGR and stated that bidders could not rely on same.

The first of these assertions would be based on the language in the Project Manual (Ex. J-1, Specifications, Site Construction, Micropiles, p. SU007002), which states, in effect, that the GFGR may not be considered part of the Contract or bidding documents. However, we also note that the GFGR was made available to the bidding contractors by Addendum No. 1; that language at Rider B of the Contract, Article 1.1.100 (Ex. J-5, p. SU05459) and in Addendum 1 itself (Ex. J-2), states that addenda become part of the Contract Documents; and that the language of Addendum No. 1 itself states that the material therein becomes part of the Contract Documents. Because of this apparent ambiguity among Contract provisions, and the rule of contra

proferentum, we resolve such ambiguity against the University (as drafter of the Contract Documents). Accordingly, we conclude that the GFGR was made part of the Contract Documents by the University.

Constructive Fraud

Notwithstanding the foregoing, the University's arguments for relief from responsibility for the contents of the GFGR fail for a second reason. Specifically, we note that exculpatory language in a contract such as this is ineffective in cases where constructive fraud has occurred. (See e.g. Pa. Turnpike Comm. v. Smith, 350 Pa. 355, 39 A.2d 139, 142-43 (Pa. 1944)(overturned on other grounds) and Acchione 461 A.2d at 768). In Acchione, the Pennsylvania Supreme Court set forth the following factors to consider in determining whether or not constructive fraud has occurred in a construction contract setting:

> (6) Whether a positive representation of specifications or conditions relative to the work is made by the governmental agency letting the contract or its engineers.
> (7) Whether this representation goes to a material specification in the contract.
> (8) Whether the contractor, either by time or cost constraints, has no reasonable means of making an independent investigation of the conditions or representations.
> (9) Whether these representations later prove to be false and/or misleading either due to actual misrepresentation on the part of the agency or its engineer ***or by what amounts to a misrepresentation*** through either gross mistake or arbitrary action on the part of the agency or its engineer.
> (10) Whether, as a result of this misrepresentation, the contractor suffers financial harm due to his reliance on the misrepresentation in the bidding and performance of the contract [*emphasis in the original*].

Id.

Applying the above factors, the Acchione Court held that PennDOT committed constructive fraud when the contractor justifiably relied on PennDOT misrepresentations given the substantial

extent and cost of an independent investigation by the contractor despite the presence of standard disclaimers in the contract. Id. at 768-69. See also Smith, 39 A.2d at 142; Pittsburgh Building Company, 920 A.2d at 985, (Pa. Cmwlth. 2007). (Constructive fraud can be found even where the government agency disclaimed any responsibility for its representations in the contract where the contractor reasonably relied on disclaimed representations due to the size of the project and time constraints in bidding).

Here, the University argues that constructive fraud has not been established in the instant action because the GFGR contained no affirmative representation that sinkholes would not be likely to develop on the site, asserting that cases decided since Smith have reaffirmed the requirement that the owner make a positive representation regarding the condition at issue. However, the Commonwealth Court, in Pittsburgh Building Company, indicated that constructive fraud can be found in cases where the government agency has not made a specific "affirmative misrepresentation" but failed to disclose relevant information which was at odds with documents provided to bidders, stating that "[w]hile in Acchione, constructive fraud was found where there was an affirmative representation, the holding in Acchione does not limit constructive fraud to only those situations." Id. at 986.

Whether we apply the University's interpretation of Acchione or the more recent Commonwealth Court description of constructive fraud in Pittsburgh Building Company, we conclude that the facts of this case comply with either formulation. Specifically, we have found that Lyons (and/or Structural), by reason of time and/or cost restraints, had no reasonable means of making an independent investigation of the subsurface conditions on the Project site; that the GFGR, as a whole, constituted an affirmative representation that meaningful sinkhole activity was not expected on the site; that this representation went to a material specification and proved

to be false and/or misleading to Lyons and Structural; that this misrepresentation was the product of arbitrary action or gross mistake by Gannett Fleming and/or the University as there was no credible reasoning offered for the failure to include the "red flag" warnings of sinkholes and accompanying discussion of sinkhole mitigation normally presented in such reports for geology of the type found on the Project when the GFGR was presented to bidding contractors; and that this caused Lyons to under estimate the work needed on the Project, resulting in substantial harm to it in extra costs and delay in the performance of its Contract. Similarly, we found that the GFGR's failure to reference the DBA geotechnical reports for the IAF project site immediately adjacent to the Project, as well as the occurrence of sinkholes thereon, also constitute additional elements of constructive fraud as described in Acchione and Pittsburgh Building Company. We further found that these misrepresentations and failures to adequately address the potential for sinkhole development on the Project led to unexpected work interruptions and actively interfered with Lyons ability to progress its work on the Project. See e.g. Pittsburgh Building Company, 920 A.2d at 987.

Accordingly, we find that the exculpatory disclaimers of accuracy and reliance argued by the University are ineffective to preclude Lyons' entitlement to an equitable adjustment in Contract price and work time in order to account for the extra time and cost Lyons incurred due to the unexpected sinkhole activity encountered on the Project. Id. See also Acchione 461 A.2d at 768); Smith, 39 A.2d at 142. Stated another way, any extra cost and/or delay attributable to difficulties presented by the sinkhole activity on the Project is the responsibility of the University and must be so considered when assessing whether or not the overall Project delay justified Lyons' termination. Id. See also Wayne Knorr, Inc. v. Dept. of Transportation, 793 A.2d 1061, 1081-1084 (Pa. Cmwlth. 2009); A.G. Cullen Construction, Inc. v. SSHE, 898 A.2d 1145, 1157-

58, 1171, 1174 (Pa. Cmwlth. 2006); Gasparini Excavating Company v. Pa. Turnpike Commission, 187 A.2d 157, 162 (Pa. 1963); Bruner & O'Connor on Construction Law §§ 15.49-15.50.

Apportionment of Delay Between Sinkholes and Pinnacles/Rock Seams

At trial, the University's expert, Mr. Easler, identified several work stoppages which contributed to overall delay on the Project. The following stoppages were specified:

- Work stoppage from 9/8/06 to 9/14/06: 7 days
- Work stoppage from 11/29/067 to 12/10/06: 12 days
- Work Stoppage from 12/16/06 to 2/6/07: 53 days

We find that these stoppages, totaling 72 days, were all the direct result of sinkholes which developed at the construction site and the accompanying worker safety concerns. The 9/8/06 to 9/14/06 work stoppage immediately followed the sinkhole which appeared September 7, 2006 and the ensuing discussion as to how to deal with same. The 11/29/06 to 12/10/06 work stoppage immediately followed PA/OSHA's site visit and conclusion that sinkholes presented an "imminent danger" to workers. The 12/16/06 to 2/6/07 work stoppage was the University's suspension, ordered to allow an investigation of the site with respect to the danger posed by sinkholes. All of these stoppages were the direct result of the sinkholes which the Board has found to constitute differing site conditions on the Project. In addition, the record demonstrates that micropile installation was disrupted for 21 days from November 8 - 28, while Lyons and Structural performed sinkhole repair and mitigation work following the November 7 sinkhole, making the total sinkhole delay figure 93 days. Finally, we add to that total an additional 16 days, from February 7 to February 22, 2007, which Mr. Easler attributed to Lyons' "failure to cure" so-called deficiencies cited by the University in its January 29, 2007 letter because the

delay caused by these illusory deficiencies was also the result of the sinkhole problem and no fault of Lyons. In sum, we estimate that 109 days were lost as a direct result of the sinkhole activity on the Project site.

Delay Attributable to Structural and Lyons

Deducting these 109 days of delay caused by sinkholes from the 366 day total Project delay extant at the time of Lyons' termination, we find that Lyons was still 257 days behind schedule. Thus, even excusing and discounting the delay caused by the sinkhole activity, Lyons was over eight months late on a project originally scheduled to take slightly over one year, and thus was significantly and materially late on the Project. This Project delay of 257 days must be attributed to Lyons because of Structural's unexcused failure to install the micropiles in a timely manner and therefore constituted a substantial and material breach of the Contract by Lyons. Accordingly, it was this 257 day delay which justified the University's termination of the Contract and Lyons removal from the Project under Article 13.2.100.

DAMAGES

University's Claim for Damages

The University seeks damages in principal amount totaling $3,393,017. This figure represents its claimed total cost to complete Lyons' work on the Project plus other damages incurred as a result of Lyons' breach of the Contract ($10,444,246), reduced by the unpaid Contract balance of $7,051,229. The University itemized its damages claim as follows: 1) its cost of finishing the Project paid to the replacement general contractor, Lobar, and materials suppliers Ritner Steel and Hershocks totaling $9,959,159; 2) extra Professional and consultant costs totaling $119,370; 3) re-procurement costs totaling $67,302; and 4) "Project delay" costs totaling $298,415.

In the case of termination of a contractor for default, the Contract provides at Article I, Section 13.2.101 that the University is entitled to "the cost of finishing the work, including compensation for the Professional's additional services and any other damages which the System has incurred in accordance with the Agreement" reduced by the unpaid Contract balance.[54] Because we have found that the University properly terminated Lyons under Article 13.2.100 for an unexcused material failure to perform its Contract work in a timely manner, the University's measure of damages under the Contract is: 1) the "cost of finishing" Lyons' work (which is expressly stated to include compensation for the Professional's extra services) and 2) any other damage which the University has incurred due to this material breach of the Contract, 3) reduced by the unpaid Contract balance. [55]

Although Lyons and/or Liberty Mutual, for the most part, did not challenge the accuracy of the cost and/or damage amounts claimed by Defendant, they did, of course, challenge the University's entitlement to these amounts for various reasons. Accordingly, while the Contract provides us with the appropriate damage formula in this case, we must also remain mindful of general case law requirements regarding adequate proof of damages, reasonableness/forseeability of same, casual connection, the obligation to mitigate loss and related principles as we review the amounts claimed by the University.

[54] "Agreement" is defined in Article 14.1 as synonymous with the term "Contract" throughout the document.

[55] The University asserts that the phrase "any other damages which the System has incurred in accordance with the Agreement" should be read to mean any other damages incurred by the University as a result of a breach of the Agreement (by Lyons). Although we believe this provision could have been worded more clearly, neither Lyons nor Liberty Mutual have challenged this interpretation of the Contract language. Moreover, this reading is consistent with the obligation undertaken by Lyons (and Liberty Mutual) to "indemnify and save harmless the State System of Higher Education and all of its officers, agents and employees from any expense incurred through the failure of said Contractor to complete the work as specified and for any damages growing out of the manner of performance of said contract by said Contractor or his Subcontractors…", an obligation stated in their Contract Bond (which is itself part of the Contract Documents). See Exs. J-1 at Gen. Conds. Article 1 (Sections 1.1.100 and 1.1.101) and J-4. See also our more extensive discussion of the Contract Bond language, infra.

Cost of Finishing Work – General Construction

The University's costs to Lobar, the replacement general contractor, were broken down under separate contracts for completion of the micropile installation work (Phase I) and completion of the remainder of the Project's general contractor work (Phase II). The University paid Lobar $1,740,027 for Phase I and $7,222,864 for Phase II.[56] Claimed amounts paid to Ritner Steel and Hershocks for essential materials were not disputed. The actual total paid by the University to Lobar, Ritner and Hershocks to complete Lyon's work amounted to $9,912,652, which Lyons, focusing on the amounts paid to Lobar for both Phase I and Phase II, challenged as excessive alleging, inter alia, that the University failed to mitigate its damages and/or that extra work beyond the scope of the original Contract was included in these amounts.

By the Board's calculation, Lobar was paid a premium over the original Contract price to complete Phase I (the micropiles) of approximately 140% and a premium of approximately 32% to complete Phase II (the remaining general contractor work). Although the University's failure to seek even informal proposals from more than one contractor creates some opportunity to question these premiums, the fact that Lobar was asked to come in to a very troubled and materially late project, with significant sinkhole activity and difficult drilling, while being asked to assume the risk that prior work was done properly and improve the pace of performance going forward, precludes the Board from finding these premiums to be unreasonable or to constitute a failure to mitigate on the part of the University.

However, of these amounts, we did find that a substantial portion of the premium paid to Lobar for the Phase I micropile work was not paid to perform Lyons' original Contract work, but was paid to address the sinkhole issues (i.e. the differing site conditions) encountered on the

[56] While the University claimed costs under Phase II of $7,269,371, the amount actually paid to Lobar was reduced by $46,507 under a change order to $7,222,864.

Project. Insofar as the purpose of contract damages (and the damage formulation in the Contract as well) is to fairly compensate the non-breaching party, not to put it in a better position, we have reduced the award here by the $784,504 we determined was paid for the sinkhole premium.[57] Accordingly, we found $9,128,148 to be the reasonable and necessary costs of finishing Lyons' original Contract work on the Project.

Extra Professional and Consultant Costs

The University also claimed it incurred $119,370 in extra professional and consultant costs due to Lyons' alleged breaches. The largest portion of this claim, $76,591, is attributed to fees paid to the Professional "to respond to deficiencies" in Lyons' micropile drilling procedures. Additional claims by the University under this category are for fees paid to Traylor ($5,244), Advantage ($8,950) and Blackmore ($5,313) for their investigation of the Project site and/or the drilling procedures used on site prior to Lyons' termination. The University also asserted claims for $8,379 paid in the Fall of 2006 to ArroActiv for scheduling services and for $14,893 paid to ArroActiv for claim preparation services.

To begin with, none of these costs were incurred to complete Lyons' work on the Project. Therefore, none of these costs are reimbursable to the University as a "cost of finishing" such work. Further, because we found that neither Structural's or Lyons' micropile drilling methods or surface water management procedures were deficient, the fees paid by the University to the Professional, Traylor, Advantage and/or Blackmore to investigate/criticize these methods and procedures were not caused by, or attributable to, any breach of the Contract by Lyons.

With regard to the amount of $8,379 paid to ArroActiv for "scheduling services", the evidence was unclear as to the reason this cost was incurred. Among other things, the University

[57] This amount represents the difference between the 32% premium paid to Lobar for the non-micropile work (which we view as within a normal range and relatively unaffected by the sinkhole problem) versus the 140% premium to complete the micropile drilling and installation.

failed to establish what part of these damages, if any, were caused by Lyons' failure to progress the Project in a timely manner (which we did find to be a material breach justifying Lyons' termination) as opposed to other causes. As a result, we make no award on this claim.

Finally, we find the cost of preparing a claim, like the cost of attorneys' fees to prosecute same, to be outside the realm of reasonably foreseeable damages consequent to a breach of the Contract absent an explicit mention of same in the Contract. We thus make no award for this last item.

For the foregoing reasons, we make no award on any of the $119,370 claimed. The University either failed, inter alia, to establish an adequate causal connection between these claimed damages and Lyons' breach of the Contract or that these costs were a reasonable and foreseeable result.

Re-Procurement Costs

In contrast to its claims for "extra professional and consultant fees" discussed above, the University seeks post-termination re-procurement costs incurred as part of the transition to the replacement general contractor. The $67,302 claimed as re-procurement costs were broken down as follows: $47,858 to the Professional for extra work facilitating the transition from Lyons to Lobar as general contractor; $7,255 to ArroActiv, which prepared the post-termination completion schedule; and $12,189 to Hill International, which was retained by the University "to assist in the evaluation and negotiation of a completion contract" with Lyons' replacement for the Project. These amounts were paid by the University and are properly assessed against Lyons as a reasonable and necessary part of the cost of finishing Lyons' work on the Project under Article 13.2.101.

"Project Delay" Costs

In addition to the above, the University claimed costs totaling $298,415, which it identified as additional costs incurred to finish the Project during the extended period (i.e. the period from April 10, 2007 (original Contract completion date) to March 14, 2008, the actual Project completion date.[58] Included in this portion of the University's claim are $198,415 in direct costs to the University which it attributes to delay on the Project caused by Lyons and $100,000 paid to settle a delay claim made by Herre Brothers, Inc. (the electrical prime contractor on the Project).

The direct costs claimed include costs of storing the structural steel after Lyon's termination because it was delivered to the site earlier then it could be used due to the delay in Lyons' work and other post-termination costs the University incurred for additional fees paid to ArroActiv and the Professional for their work past the original Contract completion date. The accuracy of these costs ($198,415) was not challenged at hearing. These additional costs were itemized as follows:

Ryder flatbed truck rental to store structural steel	$	2,949
Extension of the Professional's services to completion date		33,746
Additional salary and overhead costs paid to the Professional		1,766
Additional costs paid to ArroActiv for construction supervision and contract management		131,106
Additional costs paid to ArroActiv for administration services from the retention of Lobar through Project completion		28,848
Total	$	198,415

As noted above, in order to be compensable under Article 13.2.101, these costs must either be: 1) costs necessary to finish Lyons' work on the Project or 2) other damages incurred as a result of Lyons' breach of the Contract (i.e. Lyons' material failure to perform its Contract work in a timely manner). To begin here, we find that additional compensation paid to the

[58] Although we found the Project was 366 days late at the time of Lyons' termination, we acknowledge that this delay had been reduced to 338 days by Project completion.

Professional in the extended period and the cost of storing the structural steel are costs clearly necessary to finish Lyons' work on the Project. Moreover, while we acknowledge that the participation and additional cost of ArroActiv in the extended period may not have been a necessity to complete Lyons' work, we do find these costs to be reasonable, foreseeable and caused by Lyons' material delay in progressing its work on the Project. We thus conclude that these costs paid to ArroActiv are also compensable under Section 13.2.101 as damages reasonably incurred by the University as a result of Lyons' material breach of the Contract.

Having found that additional Professional fees and structural steel storage costs were necessary to complete Lyons' work and that the additional costs of ArroActiv in the extended priod were reasonable damages caused by Lyons' breach, we note that the total amounts assigned to these additional direct costs were incurred due to total delay of 338 days (April 10, 2007 to March 14, 2008). However, the Board has found that, although the Project was 366 days late as of Lyons' date of termination, Lyons was only responsible for 257 of these delay days. Although the Board would also attribute to Lyons the additional days of delay it took to put Lobar (as Lyons' replacement) to work on the Project (which we found to occur on April 6, 2007 and to consist of 38 days), that leaves Lyons responsible for only 295 of the total 338 days of the extended period costs incurred by the University. Therefore, we find that the University is entitled to (and Lyons liable for) only 87% of the $198,145 additional direct costs incurred during the extended period for Project completion or $172,621.

University's Damages under Article 13.2.101

In total, we find that the University incurred the following costs to complete Lyons' work and to account for damages incurred on the Project as a result of Lyons' material breach:

Cost of finishing work – general construction	$ 9,128,148
Re-Procurement costs	67,302

Extended period costs	172,621
TOTAL	$ 9,368,071

Since the measure of the University's damages under Article 13.2.101 is its cost needed to finish Lyons' work on the Project plus damages incurred as a result of Lyons' breach ($9,368,071), reduced by the unpaid Contract balance ($7,051,229), the University's damages under Article 13.2.101 of the Contract are $2,316,842.

Herre Brothers Claim

As noted previously, the electrical prime contractor on the Project was Herre Brothers, Inc. ("Herre Brothers"). As such, substantially all of Herre Brothers work on the Project was contingent upon Lyons first completing the micropile installation as well as many other tasks required to precede Herre Brothers electrical work on the Project. Accordingly, we found that the 295 days of delay to overall Project completion which we have attributed to Lyons is also a reasonable and accurate estimate of the delay which Lyons caused to Herre Brothers' work on the Project.

On May 2, 2007, Herre Brothers submitted a claim to the University in the amount of $215,992 for "additional costs associated with an extension of the project's target completion date . . . from April 11, 1007 to February 14, 2008[,] . . . an extension of 44 weeks (220 days)." On November 29, 2007, Herre Brothers filed a claim with the Board of Claims, seeking $215,992.47 in delay damages it allegedly incurred on the Project.[59] On September 30, 2009, the University entered into a settlement with Herre Brothers, settling the claim for $100,000. In the settlement agreement between Herre Brothers and the University, Herre Brothers, assigned to the University "any and all claims, demands, and causes of action of any kind whatsoever which

[59] Board of Claims Docket No. 3922, Complaint filed November 29, 2007.

Herre Brothers has or may have against Lyons for additional costs due to delays to the completion of the . . . Project."

On April 14, 2010, the University filed an Amended Complaint against Lyons. This amended complaint added a claim against Lyons based on the Herre Brothers settlement. This new claim against Lyons originally contained two separate counts: (1) one for direct indemnification to the University from Lyons for the settlement amount paid to Herre Brothers and (2) one for damages against Lyons as assignee of Herre Brothers claim against Lyons as a fellow prime contractor on the Project. On December 1, 2010, upon motion by Lyons, the Board granted partial summary judgment in favor of Lyons and dismissed the University's claim for direct indemnification from Lyons with regard to the Herre Brothers settlement.[60] Accordingly, the only claim remaining against Lyons in this matter is that asserted by the University as assignee of Herre Brothers rights and claims against Lyons.

Article 4.4 of the General Conditions applicable to the Project provides the contractual basis for Herre Brothers (as one prime contractor on the Project) to sue Lyons directly (as another prime contractor on the Project) for damages caused Herre Brothers by Lyons' failure to perform on the Project. While this Article also provided that such disputes would be resolved through arbitration, Lyons failure to raise this requirement of arbitration in an appropriate and timely manner was found by the Board to constitute a waiver of same.[61] Therefore, because we have found the assignment of rights from Herre Brothers to the University contained in their settlement agreement to be effective, and have also found that Lyons performance on the Project

[60] See B.O.C. Dkt No. 3916, Order of December 1, 2010. The dismissal of the University's indemnification claim against Lyons was based, inter alia, on the apparent inability of the University to establish that it was secondarily liable to Herre Brothers for Lyons' actions on the Project. See e.g. Sirianni v. Nugent Bros., Inc., 506 A.2d 868, 870-71 (Pa. 1986); Automatic Time and Control Co. v. ifm electronics, GmBh, 600 A.2d 220, 222 (Pa. Super. 1991); Martinique Shoes, Inc. v. New York Progressive Wood Heel, Company, 217 A.2d 781, 783-84 (Pa. Super. 1966).

[61] See Board Order of December 1, 2010 referenced in preceding footnote.

caused Herre Brothers to be delayed for a total of 295 days, we turn our attention to the evidence of damages experienced by Herre Brothers as a result of this delay to determine what award, if any, is due to the University as assignee of Herre Brothers contract claim against Lyons.

The University presented evidence of Herre Brothers' delay damages incurred on the Project, which were summarized as follows:

Trailer rental	$ 6,699.03
Stored Material (Warehouse)	1,875.00
Site Labor (Wage increase)	16,661.45
Material Cost Increases	4,446.00
Accelerated Schedule	52,966.40
Remobilization	7,499.20
Project Manager	52,800.00
Unabsorbed Office Overhead	67,949.20
Profit	5,096.19
TOTAL	$ 215,992.47

(Ex. J-356)

With the exception of the amount claimed for "Accelerated Schedule," no serious dispute was raised by Lyons as to the accuracy of the foregoing costs or to the assertion that these costs were accrued over a period of 308 calendar days following the original Project completion date of April 10, 2007.[62] However, Mr. Easler, the University's own damages expert, reduced and or eliminated several of these amounts. Additionally, we note that the Manshul Formula used by Herre Brothers to calculate the Unabsorbed Home Office Overhead and Profit amounts properly applies a markup value of .0725 to each element rather than the .075 used by Herre Brothers to arrive at a total 15% markup for overhead and profit combined. Therefore, utilizing the proper

[62] Herre Brothers delay claim was originally presented as one for 44 extra weeks, which equals to 220 additional working days or 308 additional calendar days. This is compatible with our earlier finding that the overall Project was not complete until March 14, 2008 or 338 days late.

Manshul Formula[63] overhead and profit percentage value of .0725, and crediting the analysis and testimony of Mr. Easler on this matter, we find that Herre Brothers incurred total delay costs on this Project in the amount of $141,015, itemized as follows:

Trailer Rental	$	6,141
Stored Material (Warehouse)		0
Site Labor (Wage Increase)		16,661
Material Cost Increases		4,446
Accelerated Schedule		0
Remobilization		6,521
Project Manager		36,800
Unabsorbed Office Overhead		65,684
Profit		4,762
TOTAL	$	141,015

See Ex. P-70.

Because we have found Lyons to be responsible for only 295 of the 308 days (or 96%) of the delay claimed by Herre Brothers, Lyons is responsible for only $135,374 in delay damages to Herre Brothers on this Project, broken down as follows:

Trailer rental	$	5,895
Stored Material (Warehouse)		0
Site Labor (Wage increase)		15,995
Material Cost Increases		4,268
Accelerated Schedule		0
Remobilization		6,260
Project Manager		35,328
Unabsorbed Office Overhead		63,056
Profit		4,572
TOTAL	$	135,374

Finally, because of the assignment of Herre Brothers rights and claims against Lyons on this Project to the University, we find this amount now due from Lyons to the University as Herre

[63] The Manshul Formula or Manshul Method for calculating unabsorbed office overhead, set forth in Manshul Construction Corp. v. Dormitory Authority of the State of New York, 436 N.Y.S.2d 724, 730-731 (1981); 1981 N.Y. App. Div. LEXIS 9718, provides a widely accepted formula which has been adopted by the Board. See: e.g. Airport Industrial Park, Inc. v. Dept. of General Services, BOC Docket No. 3464 (2012).

Brothers' assignee. See e.g. Hedlund Manufacturing Company, Inc. v. Weiser, Stapler & Spivak, 539 A.2d 357, 358 (Pa. 1988); Gray v. Nationwide Mutual Insurance Company, 223 A.2d 8, 11 (Pa. 1966).

Summary of the University's Damages

Summarizing the University's side of the damages calculation in this case (and without consideration of Lyons' counterclaims), we find that the University is entitled to an award against Lyons in the amount of $2,452,216. This amount is comprised of $2,316,842, the University's cost to finish Lyons' work plus damages incurred on the Project ($9,368,071) reduced by the unpaid Contract balance ($7,051,229), plus $135,374 constituting that portion of the Project delay damage due to Herre Brothers from Lyons, which was assigned to the University.

Lyons' Counterclaim Made on its Own Behalf

In response to the University's claims asserted against it, Lyons' has asserted a counterclaim, both on behalf of itself and for the use and benefit of Structural, its micropile subcontractor. We will first address Lyons' claims on its own behalf.

Lyons' claimed damages are summarized as follows:

K. Completed work not invoiced by Lyons	$ 147,422
L. Sinkhole repair costs	96,127
M. Extended wall form rental costs	18,063
N. Extended field overhead costs	56,292
O. Post-termination Costs	38,473
P. Demobilization costs	23,704
Q. Lost overhead and profit on the Project	356,571
R. Lost profit/bonding capacity	2,049,581
S. Micropile redesign costs	26,331
T. Dispute over micropile pay length	55,576
K. Cost of extra drilling consultants	36,151
L. Pregrouting/compaction grouting	3,612
TOTAL	$2,907,903

Lyons broke down its claim of $147,422 (Item A) for completed Contract work not invoiced as including retainage withheld by the University ($140,501), labor for work performed on 60 pile caps ($6,421) and the cost of wood steps for the office trailer ($500). However, all amounts owing to Lyons for Contract work completed but not paid have already been fully credited to Lyons in this decision as part of the unpaid Contract balance (and subtracted from the University's cost to complete Lyons' work on the Project) pursuant to Article 13.2.101. Thus, Lyons is not entitled to a separate or additional award for this claim.

Lyons also claims that it is entitled to payment of $96,127 (Item B) it spent to repair the various sinkholes which developed on the Project site. The University disputes Lyons' entitlement to this amount on the basis that Lyons did not provide sufficient proof that it actually paid its excavation subcontractor for this work. However, the Board found Lyons' assertions credible and that these extra work costs were indeed incurred and paid by Lyons as a direct result of the sinkholes occurring on the Project. We also found these sinkholes to be a differing site condition, thereby making this extra work beyond the scope of the Contract and entitling Lyons to additional compensation in the claimed amount of $96,127. See e.g. Universal Builders Inc. v. Moon Motor Lodge, Inc., 244 A.2d 10, 15 (Pa. 1968).

The next claim asserted by Lyons is for $18,063 (Item C) as an extra cost spent on concrete wall form rentals. Lyons asserts this was due to delay in pouring the foundation system pile caps and grade beams because of the delay in micropile drilling which, in turn, was caused by differing site conditions. Lyons also claims additional field overhead costs in the amount of $56,292 (Item D) because of the micropile drilling delay. This latter amount consists primarily of the cost of keeping Lyons' supervisor, William Cressler, on the job from the date Lyons expected to complete micropile installation (September 30, 2006) until it was terminated from

the Project. The University disputes this latter item, arguing that Mr. Cressler (Lyons' onsite job supervisor) as well as Lyons' other items of jobsite overhead in Item D would have been present on the job during and after the micropile installation in any event, so were not "extra" costs incurred due to delay in micropile drilling. The University also argues that Mr. Cressler's asserted costs are duplicative of costs already billed by Lyons and paid by the University as part of the normal Contract progress payments.

We agree with the University as to Lyons' claim of $56,292 for additional field overhead. These were not additional costs incurred outside the Contract work, but costs which would have been incurred regardless of micropile delay since these costs ran within the normal Contract period when Mr. Cressler and these other field support items would have been on the job in any event.

We do, however, agree with Lyons that the delay in micropile drilling caused it to need the rented wall forms longer than expected. That said, because there were two causes of delay to micropile drilling (i.e. intense local pinnacle formation and unanticipated sinkholes), and we have found Lyons to be excused only for the latter (which contributed 109 of the 366 days of delay on the Project), we conclude that Lyons is entitled to only 30% of its extra rental cost for wall forms or $5,419.

Lyons also asserts a claim for costs it incurred post-termination in the amount of $38,473 (Item E), which it breaks down as consisting of additional general condition costs like trailer and portable toilet rentals and additional cost for its jobsite supervisor, William Cressler. Lyons argues entitlement to these costs based on its wrongful termination claim. Similarly, Lyons has asserted claims for demobilization costs of $23,704 (Item F) and lost overhead/profit on this Project of $356,571 (Item G) based on the premise that the University's termination of Lyons

was improper. Since we have found, inter alia, that Lyons' termination by the University was proper; that these costs/damages claimed were not incurred due to extra-contractual work or breach of contract by the University; and that these costs are not to be credited to Lyons under Article 13.2.101 (which controls post-termination apportionment of costs for all Contract work items), we must conclude that Lyons is not entitled to any award on these claims. Additionally, Lyons' claim for lost profits of $2,049,581 (Item H) on subsequent projects must also be denied as it is also based on Lyon's assertion that it was improperly terminated by the University.[64]

Lyons also claimed it incurred extra costs in the amount of $26,331 (Item I) for micropile redesign necessitated by "lost tooling and abandoned holes caused by unforeseen subsurface conditions[.]" The University disputes this claim, arguing that lost tooling and abandoned holes were consistent with problems encountered due to the steeply pinnacled rock which was not a differing site condition. We agree with the University. Because we have found that the steep pinnacles encountered on the Project were not a differing site condition, Lyons is not entitled to recovery on this claim.

Lyons also asserted a claim for $55,576 (Item J) due to it because the University and/or the Professional allegedly used an incorrect measurement standard to determine pay length for the micropiles which Lyons installed before termination. Because we have found that the evidence does not support Lyons' assertion that the University/Professional improperly measured pay length of micropiles, this claim must be denied.

Lyons offered evidence at trial that it incurred extra-contractual costs totaling $36,151 (Item K) for two consultants, Jerry Schexnayder and Joseph Welsh. These individuals were retained by Lyons to address the University's assertions that deficient and improper drilling methods employed by Structural (and hence Lyons) caused the sinkholes. Here we find that

[64] Lyons also failed to prove this last item of damage for lost profit on subsequent projects with reasonable certainty.

Lyons is entitled to these costs as extra-contractual work required by the University's meritless claim that Lyons'/Structural's drilling methods were improper and its demand that Lyons revise its already approved micropile drilling plan.

Finally, we conclude that Lyons' claim for $3,612 (Item L) in compaction grouting supervision costs must also be denied. We reach this conclusion because, as we discuss in greater detail below, compaction grouting was not necessary to improve site safety due to sinkholes.

In sum, we find Lyons is entitled to $137,697 for extra-contractual work performed on the Project. These costs are itemized as follows:

Direct sinkhole repair costs	$ 96,127
Consultant fees to address meritless claim regarding micropile drill methods	36,151
Extended wall form rental: $18,063 x .30[65] =	5,419
TOTAL	$137,697

Lyons' Counterclaim for the Use and Benefit of Structural

In addition to its own claims, Lyons asserted a "pass-through" claim for the use and benefit of its micropile subcontractor, Structural. This "pass-through" claim is based on a "Litigation Cooperation Agreement" between Lyons and Structural dated November 28, 2007. (Ex. J-601). Under the terms of the Litigation Cooperation Agreement, Structural presented its damage claims separate and apart from Lyons' damages presentation. Structural's claims and itemization of damages are summarized as follows:

K. Base contract work completed	$ 777, 100
L. Compaction grouting	$ 498,242
M. Lost tooling and excess materials	$ 219,319

[65] As to costs incurred due to delay in micropile installation, Lyons is entitled to these costs only to the extent that such delay was caused by sinkholes. Having found that sinkholes were the cause of 109 of 366 days (30%) of Project delay, Lyons is entitled to 30% of the extended wall form rental.

N. Loss of productivity (using micropile hours incurred 8/21-12/17/06)	$ 308,716
O. Standby	$ 247,200
P. Demobilization & remobilization in Jan./Feb 2007	$ 17,000
Q. Materials left on site	$ 121,024
R. Unabsorbed home office overhead	$ 19,824
S. Labor inefficiency associated with disbursement of labor to other projects	$ 44,462
T. Drilling consultant (Butch Triplett)	$ 25,503
Subtotal	$2,278,390

Consultant and Legal Fees (through May 2010)	$ 42,894
Geotech experts	$108,891
Attorneys fees	$348,264
"Properly amended contract price"	$2,778,439
Credit paid to date	($755,045)
Total claim for equitable adjustment	$2,023,394

See Ex. D-453

Structural further itemized its claim of $777,100 (Item A) for base contract work completed as including $17,000 for mobilization, $35,500 for micropile load testing and $724,600 for micropile installation (based on 11,113.5 linear feet x its contract price of $65.20/LF). With regard to this portion of Structural's claim, we first note that Structural itself acknowledges payment of $755,045. Although no attribution of this payment amount appears to be made by Structural, we consider this amount to be an appropriate offset against Structural's claim for original subcontract work. More significantly with respect to this portion of the pass-through claim, we have found the University's termination of Lyons to be proper and have given Lyons full credit for all of the unpaid Contract amount between the University and Lyons as per Article 13.2.101.

The University has, in effect, fully paid Lyons for all work performed under Lyons' Contract (including all the micropile work performed as part of the original subcontract between Lyons and Structural). Any additional award of this amount to Lyons to "pass-through" to Structural would be duplicative of payment already made to Lyons and is no longer a legitimate component of a pass-through claim against the University. Accordingly, Structural's claim for unpaid Contract micropile work performed under its subcontract with Lyons is a contractual issue between Lyons and Structural alone.[66]

With respect to Structural's claim for its compaction grouting costs of $498,242 (Item B), Structural has not established a right to recovery of this amount as an extra-contractural expense. Although Structural asserted during its tenure on the Project that compaction grouting was necessary to assure worker safety, it offered little to no testimony to this effect at hearing to establish that compaction grouting was necessary to safely install the micropiles on the Project. In fact, nearly all of testimony offered was to the contrary. Among others, Structural's own drilling consultant, Butch Triplett (who also worked as a driller on the Project for Structural and for Nicholson, Structural's replacement) testified that compaction grouting was not necessary to complete the micropile work (NT 3854-55). Similarly, Lyons' consultant, Jerry Schexnayder, testified that, although he was not asked his opinion on this by Lyons, he believed that micropile work "probably could have" proceeded safely without compaction grouting. Additionally, the fact that Nicholson was able to complete the micropile installation on the Project without compaction grouting after Lyons' termination underscores our finding that compaction grouting

[66] Unlike a claim for extra work performed beyond the scope of the prime contract or related subcontract (or a case where the owner withholds money on its prime contract), when the owner fully pays out on its prime contract (or credits same amount to the prime contractor), we see no factual basis for a pass-through claim against an owner by a prime for the benefit of an unpaid subcontractor for work within the scope of the prime contract as this amount has already been paid once to the prime. See e.g. Visor Builders, Inc. v. Devon E. Tranter, Inc., 470 F. Supp. 911, 923 (M.D. Pa. 1978) (precluding duplicate payout by owner to subcontractor on third-party claim where contractor already paid in full).

wasn't necessary. Moreover, Structural's damage expert conceded that some compaction grouting was performed for purposes other than to protect against sinkholes, and Structural's Graham Smith acknowledged that Structural had also grouted around holes to facilitate ease of drilling. To the extent that compaction grouting was used to aid drilling next to pinnacles, which were not found to be a differing site condition, the cost of such grouting was within Lyons' and Structural's original contract work. As such, it is work for which the University (pursuant to this opinion and order) has fully paid. For all these reasons, we find that Structural's claimed compaction grouting costs are not recoverable as extra work beyond the scope of the Contract or related subcontract.

Structural next claims $219,319 (Item C) for lost tooling and excess material which it itemized as consisting of $20,310 for lost casing, $196,863 for lost tooling and $2,146 for grouting abandoned piles. Mr. Weathers, Structural's expert damages witness, testified that he based his calculations for this category on the total amount of tooling lost then reduced this amount by 10%. He then assumed that the remaining 90% of the lost tooling was due to "differing site conditions," which he identified as being 1) sinkholes/voids and 2) being required to drill deeper than the Contract specifications required. However, no effort was made by Mr. Weathers to independently confirm that 90% of the claimed losses was due to these two factors or to assess what losses may have been due to the steep underground pinnacle formations or other drilling problems encountered on the Project. Because of the absence of support for Mr. Weathers' assumptions as to the cause of the lost tooling, and in light of our finding that, in fact, virtually all of Structural's lost tooling was due to difficulties Structural had with drilling into the intense local pinnacle formation on the Project, we find that Structural's claim for lost

tooling and excess material has not been adequately established as due to a differing site condition. It is not recoverable as an extra-contractual expense.

Structural's loss of productivity claim of $308,716 (Item D) represents Mr. Weathers' "measured mile" analysis by which he sought to quantify loss of efficiency or productivity that Structural says it sustained during its micropile installation activity. Mr. Weathers described a "measured mile" analysis as follows:

> A measured mile analysis is --- I've indicated at the top of this page, it's an approach that uses actual job labor productivity during a least impacted period to form the basis of reasonable labor productivity expectations during an impacted period. Damages are then based upon the difference between the productivity experienced during an impacted period as compared to the established benchmark resulting from productivity during the least impacted period.

NT 4613-14. [Emphasis added].

However, despite having so described a proper "measured mile" analysis, Mr. Weathers failed to present same. Instead, he presented a circular analysis in which he finds, and claims, lost productivity in his "least affected" base period by ignoring the actual percentage of abandoned pile drilling footage experienced in the period of 20% and assuming (without credible support) that it should be only 1%. Additionally, Mr. Weathers' further assumption that this inefficiency was due to "differing site conditions" fails because the evidence at hearing shows little to no sinkhole activity during this period of July 24, 2006 through August 21, 2006. The evidence instead indicates that drilling problems were largely due to intense pinnacle formation (which we have found not to be a differing site condition). Then, using his ill-considered productivity rate from the "base" period calculated from unsubstantiated and/or incorrect

assumptions, he calculates additional inefficiency in the second period.[67] In sum, we do not find Structural's calculation or claim for lost productivity to be at all credible as a matter of fact and unable to support an award for same due to the one differing site condition we have found occurring on the Project.

Structural next identified a claim for $247,200 in standby costs incurred. Mr. Weathers testified that he based this calculation on the hourly standby rate of $600 per hour provided in the Lyons/Structural subcontract and included periods when drilling operations were stopped or suspended after November 7, 2006. This was the date that the sinkhole developed which threatened to trap a Justice Excavation employee working nearby and which brought the sinkhole/worker safety issue to a head. Mr. Weathers itemized these standby costs as follows:

Standby Date	# of Rigs	Hourly standby Rate per rig	Standby hour per day	# of days	Total
11/8/2006	3	$600	8	1	$14,000
11/27-28/2006	1	$600	8	2	$9,600
11/29-12/8/06	2	$600	8	8	$76,800
12/15/2006	2	$600	8	1	$9,600
12/18/06-1/3/07	1	$600	8	10	$48,000
2/7-8/2007	1	$600	8	1.5	$7,200
2/9/2007	1	$600	8	1	$4,800
2/12-13/07	1	$600	8	2	$9,600
2/14-25/07	1	$600	8	8	$38,400
2/26-3/5/07	1	$600	8	6	$28,800
				Total	**$247,200**

Mr. Weathers testified that three rigs were shut down on November 8, 2006, due to the sinkhole issue while Structural awaited direction from Lyons on how to proceed. One rig remained on standby while sinkhole repair work was done on November 27-28, while two rigs were able to resume work. Two drill rigs were on standby for the PA/OSHA visit and afterward as sinkhole

[67] While not necessary to our finding that this productivity calculation is materially flawed and unreliable, it also appears to take into account standby time thereby increasing inefficiency for Structural in this latter period. However, Structural made a separate claim for this standby timeline.

issues were debated from November 29 to December 8, and on December 15, 2006. It further appears that Structural demobilized one of the two rigs remaining on site after the University's work suspension order in December, with a single rig remaining on standby from December 18 through January 3. Structural returned to the site February 7, with one rig remaining on standby until March 5, 2007.

On cross-examination, Mr. Weathers acknowledged that his calculations included six days of standby after the date of termination, from February 26 to March 5. Although the University raised several questions on this standby cost calculation and subsequent demobilization and remobilization costs claimed during cross-examination, it ultimately raised little dispute as to the accuracy of these calculations, except to remove the last six days claimed for standby after termination.

With regard to the foregoing standby cost calculations, we found Mr. Weathers to be credible. Moreover, we consider these periods of standby to have been caused by the extensive sinkhole occurrences on the Project, and hence, to be extra-contractual costs of non-productive equipment incurred by Structural due to a differing site condition on the Project. We further found this extra-contractual cost of having to maintain non-productive equipment on the Project site for these standby periods to be reasonably estimated by the standby rates stated in Structural's subcontract. Deducting the $28,800 charged for those six days beyond termination, we find that Structural incurred extra-contractual standby costs due to a differing site condition on the Project in the amount of $218,400.

Consistent with his testimony and analysis of standby costs, Mr. Weathers also assessed costs for the demobilization of one rig on January 3, 2007, and remobilization by Structural on February 5, 2007, following the University's direction that micropile work resume. Structural

claimed costs of $8,500 each for the demobilization and remobilization for a total of $17,000 (Item F).[68] The University did not contest the accuracy of these costs, which we find to have been extra-contractual costs incurred by Structural due to the University's demands to suspend operations then return to work as a result of the sinkhole issue.

Structural next claims $121,024 (Item G) for Project materials which it was not able to use on another project. Mr. Weathers placed a value on these materials of $83,963, which included 295 ten foot and five foot casings, as well as pile bars and other hardware. He then added tax, freight delivery and removal, and a 30% markup to arrive at the $121,024 total. These materials were removed from the site on January 24, 2007, and were mostly rusted by the time they were removed. At this time, the materials had no value to Structural or to the University. It was not made clear how or why these materials became unusable on the Project or elsewhere. However, given that the Board has found Lyons' termination proper, we once again see no basis to hold the University liable to Structural for material which Structural retained. Moreover, like the claim for allegedly unpaid micropile drilling (i.e. original contract work), we see no basis to make an additional award against the University for original contract materials when our order here will already credit the full Contract price to Lyons for these materials.

Structural also claims unabsorbed home office overhead in the amount of $19,824 (Item H) for the period of January 4 through February 4, 2007, during which time Structural had demobilized due to the University's suspension order. Mr. Weathers noted, inter alia, that this period was not included in his standby period calculations but only includes the period in which Structural was demobilized. Mr. Weathers testified he arrived at this number by using the "Eichleay Formula." As he described this calculation, he divided the total billing on the Project ($1,430,858) by Structural's total billings for the Contract performance period (July 2006

[68] The Lyons/Structural subcontract (Ex. J-7) provides for $17,000 for mobilization.

through February 2007)($20,029,905), then applied this fraction to the total overhead for the performance period ($2,107,310), to arrive at the overhead allocable to this micropile drilling contract ($150,538). He arrived at the daily home office overhead allocable to the Project by dividing the allocable overhead ($150,538) by the days in the contract performance period (7/1/06 – 2/28/07)(243 days), arriving at the daily home office overhead allocable to the Project of $619.50. Mr. Weathers then multiplied the daily home office overhead allocable to the Project ($619.50) by the number of "delay days" (1/4/07 to 2/4/07)(32 days) for the unabsorbed extended overhead amount of $19,824.

Although the Board has, on occasion, accepted an Eichealey Formula calculation for unabsorbed home office overhead, we have not done so without credible proof as to the accuracy of the numbers used therein. This proof typically includes audited financial statements of the claimant. Here, however, the Board has not been presented with such confirmation of the numbers used, nor did Mr. Weathers even see such financial documents himself. He merely used numbers given him by some representative of Structural. Moreover, these "total billings" numbers were not for Structural as a whole but for some division of same provided on a spreadsheet which itself contained unexplained anomalies. Accordingly, we do not find the amount claimed here to have been established with reasonable certainty and will make no award on same.

With regard to its claim for labor inefficiency associated with disbursement of labor to other projects, we see no factual or causal basis for such a claim. There was no improper termination of Lyons (and, hence, Structural) to supply a basis for this claim. Any other disbursement of labor to other projects prior to termination could only have occurred during standby time, which claim has already been made and addressed separately by this Board.

Finally, we find that Structural did indeed incur an extra-contractual cost when it was forced by the demands of the University to engage Mr. Triplett to review and defend its drilling procedures. This, like the costs incurred by Lyons, was due to incorrect assertions by the University and Professional regarding Structural's drilling methods and equipment previously approved by these same parties.

All the remaining pass-through claims regarding consultant, expert and attorneys' fees made for use and benefit of Structural would be collectible only in the event we were to find bad faith on the part of the University in this case. We have not so found, and these remaining claims are denied.

To summarize, we find Structural incurred a total of $289,703 in legitimate extra costs as a result of the differing site condition (sinkholes) encountered on the Project. These are itemized as follows:

Standby costs	$247,200
Demobilization and remobilization costs in Jan./Feb. 2007	17,000
Cost of drilling consultant (Butch Triplett)	25,503
TOTAL	$289,703

Having found that Structural did incur extra-contractual work costs of $289,703, we turn our attention to the terms of the Litigation Cooperation Agreement executed by Lyons and Structural to determine the pass-through award to be made in this case. In this regard, the agreement provides that any damages based on Structural's claims which Lyons may recover are to be paid by Lyons to Structural, "[s]ubject to the provisions of Paragraph 7" of the agreement. Paragraph 7 of the Litigation Cooperation Agreement provides as follows:

> 7. In the event that Structural is successful in the prosecution of its claim, Lyons is unsuccessful in the prosecution of its claim and Shippensburg is successful in the prosecution of its claim against Lyons (***and Structural is not the cause of the breach by Lyons that is the basis for any such decision by the Board of Claims***), Lyons agrees that Structural will be paid the amount awarded on its claims regardless of any offset or award against Lyons in favor of Shippensburg that is ***not based on the actions and conduct of Structural***.

Ex. J-601. [Emphasis added].

Thus, under the plain terms of the Litigation Cooperation Agreement, if 1) Structural is successful in the prosecution of its claim (which it has been here to the extent of $289,703); and 2) Lyons is unsuccessful in the prosecution of its claim (which it has been here except for minor extra-contractual costs); and 3) Shippensburg is successful in the prosecution of its claim against Lyons (which Shippensburg has largely been), then Lyons agrees to pass through to Structural any recovery it may receive on Structural's claims. However, as the highlighted provisions of the paragraph also make clear, Lyons will not be required, nor liable, to pass-through such amounts to Structural if Structural is determined to be the cause of Lyons' breach which forms the basis for the Board's decision (against Lyons).

As we discussed more fully above, Lyons' 257 day delay in progressing the Project (i.e. the delay that was not caused by sinkholes) constituted a material breach of the Contract which justified the University's termination of Lyons as prime general contractor. This 257 day delay was not caused by sinkholes as a differing site condition, but was instead due to Structural's slow progress in installing the micropiles pursuant to its subcontract with Lyons. From the time it began its micropile drilling in July 2006, Structural experienced slow going with its drilling efforts, broken drill bits and casings, and lost or damaged drill equipment. These problems and its slow progress, we have determined, were caused by the existence of steeply pinnacled rock formations accompanied by multiple rock seams over bedrock at variable depths underlying the

Project. We further concluded that the presence of these pinnacle rock seam and bedrock formations was clearly and adequately disclosed in the Gannett Fleming Geotechnical Report.

As Lyons' micropile subcontractor, Structural was responsible for the installation of the approximate 22,300 LF of micropiles in sufficient time to allow Lyons and all other contractors to complete the Project on time in accordance with the Contract. To accomplish this, Structural was required to complete micropile installation in approximately 84 days, by September 29, 2006. Although Structural's progress was delayed beyond this time by the sinkhole activity on the Project site, resulting in 109 days of delay to the overall Project, the larger portion of the Project delay (i.e. the 257 additional days of delay) was not due to sinkholes but to Structural's unexcused inability to drill the necessary micropiles through the pinnacled/seamed rock in a timely manner. It was also this 257 days of overall Project delay, caused by Structural, for which Lyons was properly terminated.

The Board, therefore, concludes that "the actions or conduct of Structural" were the substantial cause of the 257 day delay on the Project not caused by sinkholes, which was the University's proper basis for terminating Lyons from the Project. Because Structural was responsible for the delay which led to Lyons' termination, Lyons' contingent liability to pass-through amounts claimed here by Structural is extinguished under the plain terms of their Litigation Cooperation Agreement. Structural is not entitled to, nor is Lyons liable to Structural for, any pass-through award. Accordingly, we make no pass-through award to Lyons for the use and benefit of Structural. See e.g. Pearson, Dickerson, Inc. v. U.S., 115 Ct. Cl. 236, 264 (1950); George Hyman Const. Co. v. U.S., 30 Fed. Cl. 170, 177 (1993).

Liberty Mutual's Liability

In addition to its complaint against Lyons, the University alleges that Liberty Mutual breached its obligations under the bond issued on the Project (the "Contract Bond") to indemnify the University for losses incurred as a result of Lyons' breach of the Contract. The University seeks judgment against Liberty Mutual in the amount of $3,326,147, the same amount it sought against Lyons. This represents the University's claimed cost to complete Lyons' work on the Project plus damages incurred as a result of Lyons' breach, reduced by the unpaid Contract balance. This amount also includes the cost of settling the delay claim the University paid to Herre Brothers. Interest is then added to both amounts.

Liberty Mutual does not appear to dispute that, with a finding that Lyons was properly terminated for cause, it is liable to the University for the cost to complete Lyons' work on the Project, less the unpaid Contract balance. Liberty Mutual, however, does dispute its liability under the Contract Bond for $417,785 of the University's total damage claim. Specifically, Liberty Mutual denies that it is liable under the bond for the $298,415 in "Project delay" damages claimed by the University. This amount includes the University's direct costs from the delay as well as the $100,000 settlement paid to Herre Brothers. Liberty Mutual also contests liability for the $119,370 in extra Professional and consultant costs the University claims it spent to "respond" to alleged deficiencies in Lyons' work prior to Lyons' termination.

Liberty Mutual's primary argument for elimination of this $417,785 amount from its liability assessment is based on a two-part premise: 1) that the extent of a surety's liability under a construction performance bond is limited to, and determined by, the language of the bond itself rather than the language set forth in the construction agreement; and 2) that the language of the Contract Bond here at issue is not broad enough to cover delay or any other damage to the

University except for the direct costs of completing Lyons' work.[69] Liberty Mutual cites the case of Downingtown Area School District v. Int'l Fidelity Ins. Co., 769 A.2d 560 (Pa. Cmwlth. 2001) as support for this argument.

We agree fully with the first part of Liberty Mutual's premise (i.e. that the surety's obligation is determined by the bond language itself). See e.g. North American Specialty Ins. Co. v. Chichester School District, 158 F. Supp. 2d 468, 471-472 (E.D. Pa. 2001)(surveying Pennsylvania case law, including Downingtown, with regard to bond surety liability principles). However, we specifically disagree with Liberty Mutual's second premise (i.e. that the bond language here limits its liability to only direct costs of completion).

To begin our analysis of this issue, we start with the language of the Contract Bond. The Contract Bond, signed and executed by both Lyons' (as principal and contractor) and Liberty Mutual (as surety) states, in relevant part, as follows:

> NOW, THEREFORE, the joint and several conditions of this obligation are such:
>
> > B. That if the above bounden Principal as Contractor shall well and faithfully do and perform the things agreed by him to be done and performed according to the terms of said contract and general provisions, including the plans and specifications therein referred to and made part thereof, and such alterations as may be made in said plans and specifications as therein provided, and which are hereby made part of this bond the same as though they were fully set forth herein, and shall indemnify and save harmless the State System of Higher Education and all of its officers, agents and employees from any expense incurred through the failure of said Contractor to complete the work as specified and for any damages growing out of the manner of performance of said contract by said Contractor or his Subcontractors, or his or their agents or servants including but not

[69] In addition to its interpretation of the Contract Bond language and legal arguments surrounding same, which we discuss in this section of the Opinion, Liberty Mutual also raised a number of factual issues/objections to the University's calculation of its net costs of completion. These were substantially the same as Lyons' and have already been addressed.

> limited to patent, trademark and copyright infringements, then this part of this obligation shall be void; otherwise, it shall be and remain in full force and effect.

Ex. J-4. [Emphasis added].

We further note, in our analysis, that there are different types of construction performance bonds which may be required or given, and that such types include traditional performance bonds (such as that offered by the AIA); indemnity bonds; completion bonds and manuscript bonds. See Bruner & O'Connor on Construction Law, Vol. 4A, § 12:14. Traditional performance bonds appear to be the most common and typically allow the surety options in dealing with a contractor's default. Such options include arranging for completion by the existing contractor, taking over and completing the contract itself and/or substituting a replacement contractor to complete the work. Completion bonds, as their name suggests, usually limit the surety's option to taking over the work and completing the contract at its sole expense. Indemnity bonds, on the other hand, typically limit the surety's obligation to reimbursing the obligee (owner) up to the penal sum (i.e. total face value) of the bond for any cost of completion of the bonded contract in excess of unpaid contract amounts. Manuscript bonds are a hybrid of one or more of the above. Id. at §§ 12:13 – 12:20.

We believe it to be clear from the language of the Contract Bond set forth above, as well as the conduct of the parties, that the type of bond here at issue is an indemnity bond. We further acknowledge, as noted by Liberty Mutual itself in citing to the Bruner & O'Connor treatise, that an "indemnity bond" typically requires the surety to reimburse the obligee (owner) up to the total value on the face of the bond for any cost of completion, less the unpaid Contract balance. Liberty Mutual Brief at p. 7 citing Bruner & O'Connor, Vol. 4A, § 12:18. However, we also note that this same section of the treatise, recognizing the principle that the language of the bond

itself is controlling, further states that broad indemnity language is sometimes found in an indemnity bond which may then be construed to require the surety to indemnify the obligee (owner) for a variety of consequential damages, including delay damages and lost profits. See Bruner & O'Connor, Vol. 4A at § 12:18. We believe this to be the case in the current matter.

Specifically, we find that the plain and express language of the Contract Bond here at issue requires both Lyons (as contractor) and Liberty Mutual (as surety) to "indemnify and save harmless the State System of Higher Education . . . from any expense incurred through the failure of said contractor [Lyons] to complete the work as specified and for any damages growing out of the manner of performance of said contract by said contractor. . . ." Ex. J-4. We thus conclude from this express statement that the surety's obligation is to indemnify and save harmless the University from any expense it incurs by reason of Lyons' failure to complete the work as specified (e.g. in a timely manner) and for any damages growing out of Lyons' manner of performance on the Contract (i.e. its failure to progress its work on the Project in a timely manner which resulted in a material breach of the Contract).

Moreover, we are not persuaded otherwise by Liberty Mutual's narrow interpretation of the Commonwealth Court's holding in Downingtown. There are several reasons for this. First of all, the Dowingtown case dealt only with the language of a traditional performance bond with its sole focus on job completion not with an indemnity bond. The indemnity bond here, and its language, is substantively different from Dowingtown. See Bruner & O'Conner, Vol. 4A at §§ 12:13 to 12:20. More importantly, we believe our holding here complies fully with the principle enunciated in Downingtown in that the language of this indemnity bond is clear, direct and express in its statement that Liberty Mutual is to indemnify and hold harmless the University for

any expenses and/or damages incurred by Lyon's failure to complete its Contract as specified and/or growing out of the manner of its inadequate performance.

In regard to our reading of the specific language contained in this Contract Bond, we note that our survey of Pennsylvania case law (including Downingtown) has revealed no cases involving an indemnity bond of the type here at issue nor any language similar to that in this Contract Bond. However, those cases which we have found dealing with indemnity bond language (language very similar to that contained in the Contract Bond) have held that delay and other consequential damages arising from the contractor's breach are included within the surety's liability on the bond. See e.g. Bossier Medical Property v. Abbott and Williams Construction Co. of Louisiana, Inc., 557 So.2d 1131, 1133-1134 (La. Ct. App. 2d Cir. 1990)(holding surety liable to compensate the obligee for lost rents caused by construction delays where the bond obligated the surety to "fully indemnify and save harmless the Obligee from all costs and damage which the Obligee may suffer by reason of" the Contractor's failure to "faithfully perform the work.").

Finally, we believe our literal reading of the Contract Bond obligations to be fully in line with prior Pennsylvania Supreme Court case law to the effect that, when a bond contains a broad expression that would include "all claims and demands incurred" such performance bond may be held to include damages beyond the mere cost of completion. See Pittsburgh v. Parkview Constr. Co., Inc., 23 A.2d 847, 849-850 (Pa. 1942) compared to Commonwealth v. Fidelity and Deposit Co. of Maryland, 50 A.2d 211, 212-213 (Pa. 1947). Our plain reading is also in keeping with the long-established principles of interpretation that corporate surety bonds be strictly construed in favor of the obligee and in a manner so as to favor public over private interests. See e.g. Purdy v. Massy et al., 159 A. 545, 547 (Pa. 1932); Pennsylvania Turnpike Commission v.

Andrews & Andrews, 47 A.2d 220, 221 (Pa. 1946). See also Pritchard v. Wick, 178 A.2d 725, 727 (Pa. 1962).

It is for all the foregoing reasons that we believe Liberty Mutual's limited interpretation of its obligations under the Contract Bond, which is an indemnity bond containing broad language, is less than persuasive. Accordingly, we find that Liberty Mutual's liability and obligation on the Contract Bond extends to the University's cost of completing Lyons' work on the Project and to the delay damages the University incurred as a result of Lyons' breach of Contract.

That said, we find no basis to include in these delay damages any liability for the settlement amount paid by the University to Herre Bros. With regard to this last item, the Board has previously dismissed the University's claim for indemnification of this amount because of the University's inability to establish that it was secondarily liable to Herre Bros. for the actions of Lyons.[70] Instead, the only remaining basis for Lyons' liability to the University for Herre Bros.' delay depends on a direct claim by Herre Bros. against Lyons, which claim has been assigned to the University. The Contract Bond does not cover any damages caused by one prime contractor to another on the Project. Accordingly, we find Liberty Mutual jointly and severally liable on the Contract Bond to the University for the amount of $2,316,842. This is comprised of the University's cost to finish Lyons' work on the Project plus damages incurred on the Project by the University due to Lyons' breach, reduced by the unpaid Contract balance.

[70] See Footnote 53, supra.

Costs and Attorneys Fees

Given, inter alia, the different causes of delay and split responsibility for same, the Board did not find either the University, Lyons or Liberty Mutual to have acted in bad faith in this matter. Accordingly, no penalty or attorney fees will be awarded pursuant to 62 Pa.C.S. § 3935(a) and (b). Each party shall bear its own costs. 62 Pa. C.S. §1725(e).

OFFSETS AND FINAL AWARDS

The University's award against Lyons pursuant to Section 13.2.101 of the Contract has been determined to be $2,316,842. To this award must be added the $135,374 due from Lyons to the University as assignee of Herre Bros.' claim against Lyons. Against this amount, we offset the award to Lyons from the University for extra-contractual work on the Project in the sum of $137,697. This results in a net award due to the University from Lyons in the final principal amount of $2,314,519.

With regard to the University's claim against Liberty Mutual, we have determined Liberty Mutual to be jointly and severally liable with Lyons to the University on the Contract Bond in the final principal amount of $2,316,842 (the same amount as we have found due from Lyons to the University on the Contract). Liberty Mutual's bond obligation does not extend to claims between co-primes on the Project, so there is no addition to this amount for the Herre Bros.' claim assigned to the University. Similarly, Liberty Mutual did not incur the extra-contractual costs of $137,697 incurred by Lyons (and did not join in Lyons' counterclaim), so there is no offset or deduction of this amount to be applied to the University's claim against Liberty Mutual.

We have made no award on the "pass-through" claim made by Lyons for the use and benefit of Structural. This result is based on the reasons stated above dealing with the nature of Structural's pass-through claims and the Litigation Cooperation Agreement between the two.

The University is further entitled to pre-judgment interest on the final principal awards made against both Lyons and Liberty Mutual from the date Lyons filed its claim for wrongful termination with the University (i.e. March 14, 2007) until the date of this judgment. 62 Pa. C.S. § 1751. Accordingly, we find for judgment in favor of the University and against Lyons in the total amount of $3,126,924. We further find in favor of the University and against Liberty Mutual in the total amount of $3,130,063. These liabilities are several not cumulative. The University is further entitled to post-judgment interest on the outstanding balance of these final awards until paid at the legal rate of six percent per annum. Id. Each party shall bear its own costs. 62 Pa. C.S. § 1725.

ORDER

AND NOW, this 18th day of January, 2013, **IT IS ORDERED** and **DECREED** that judgment be entered in favor of the Commonwealth of Pennsylvania, State System of Higher Education, Shippensburg University ("University") against Lyons Construction Services, Inc. ("Lyons"), in the sum of $3,126,924. This sum consists of $2,314,519, the net principal amount owed to the University for damages after resolution of the multiple claims between the parties, and $812,405 in prejudgment interest on that amount. No award is made to Lyons for the use and benefit of Structural Group, Inc.

IT IS FURTHER ORDERED and **DECREED** that judgment be entered in favor of the Commonwealth of Pennsylvania, State System of Higher Education, Shippensburg University ("University") against Liberty Mutual Insurance Company ("Liberty Mutual") in the sum of $3,130,063. This sum consists of $2,316,842, the net principal amount owed to the University by Liberty Mutual as performance bond surety on the Project and $813,221 in prejudgment interest on that amount.

The foregoing awards are several, not cumulative. The University is further awarded post-judgment interest on the outstanding amount of each judgment at the statutory rate for judgments (6% per annum) beginning on the date of this Order and continuing until said judgment is paid in full. Each party herein will bear its own costs and attorney fees.

ORIGINAL ORDER FOR SIGNATURE NOT ATTACHED TAMI HAS ORIGINAL