

COMMONWEALTH OF PENNSYLVANIA

THE GREAT LAKES CONSTRUCTION : BEFORE THE BOARD OF CLAIMS
COMPANY :
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 VS. :
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 :
 COMMONWEALTH OF PENNSYLVANIA, :
 DEPARTMENT OF TRANSPORTATION : DOCKET NO. 1311

FINDINGS OF FACT

I. THE PARTIES

1. Plaintiff, The Great Lakes Construction Company (hereinafter referred to as “Great Lakes”), is a corporation engaged in the business of highway construction, whose corporate headquarters is 6600 Schaaf Road, Cleveland, Ohio 44131. (Amended Complaint, para. 1)

2. Defendant, Commonwealth of Pennsylvania, Department of Transportation (hereinafter referred to as “the Department”, “DOT” or “PennDot”) is an executive agency of the Commonwealth which was located at the time of this claim, with headquarters at the Transportation and Safety Building, Harrisburg, PA 17120. (Answer & New Matter, para. 2)

II. THE CONTRACT

3. Great Lakes and DOT entered into a contract which is the subject of the instant claim on May 12, 1986, designated at number 012027, for the construction of a section of Legislative Route 1126, Section C05, also known as Traffic Route 17, in Erie County, Pennsylvania and Chautauqua County, New York. The actual Notice to Proceed date was May 19, 1986. (Amended Complaint, para. 3; N.T. 709, 770; Exhibit P-1, P-43)

4. This project was a part of the construction of the “Southern Tier Expressway”, a major east-west highway running through the southern tier of counties in New York State and Erie County in Pennsylvania, and involved the construction of over three (3) miles of roadway, including the construction of four (4) small concrete bridges and a set of interchange ramps. (Exhibit P-1)

5. Based on the estimate contract item quantities, Great Lakes would receive \$11,477,482.11 in exchange for performing the work required by the contract. The contract incorporated the Publication 408 Specifications, 1983 edition. (Exhibit P-1)

6. Primarily at issue in this claim is the fact that the contract required completion of all work within 478 calendar days from the notice to proceed, establishing an anticipated completion date of September 1, 1987, which was later changed to September 8, 1987 to allow for a Notice to Proceed of May 19, 1987 versus May 12, 1987. (Exhibit P-1; Exhibit P-5)

7. The project involved building a two-lane highway and required a large quantity of excavation and embankment construction which William G. Petit¹, the project engineer for DOT on the instant claim, described as “basic west-to-east type”, with the western end of the project being primarily a “cut section” and the eastern end of the project being primarily a “fill section”. Approximately 80,000 cubic yards of Class 1 Excavation was required to be moved from the area between traffic Route 89 to just west of German Road at the eastern end of the project for the construction of embankments. (N.T. 1656-1658)

8. Class 1 Excavation from the area just west of German Road to the west side of French Creek also involved the removal of approximately 240,000 cubic yards, which had to be moved to the eastern end of the project for embankment construction. The largest cut on the job was internal to German Road and Ashton Road, located just between the two roads. (N.T. 1656, 1657)

9. The project also included embankment construction, undercut and then subsequent embankment construction on the westbound lanes, approximately 1,000 feet west of French Creek, and about 600 or 700 feet to the east of French Creek. The last 2,000 or so feet on the far east end of the job also was designated to have the embankment in place. The embankment on the westbound lanes was designed for the future expansion of the roadway into a four-lane highway. (N.T. 1657, 1658)

10. The project also required an extensive amount of Class 1A Excavation. Class 1A Excavation involved the removal of unsuitable material and its replacement with suitable granular material. In an embankment situation, Class 1A Excavation included removal of the underlying soils and the subsequent replacement up to the old existing ground line. Beyond that, in an embankment area, additional granular material would be paid for as select borrow excavation material. In a cut situation, where Great Lakes would be removing Class 1 Excavation materials, once the subgrade elevation was reached, if the contractors found unstable or unsuitable materials in the underlying soils, that also would be excavated and paid for as Class 1A Excavation. (N.T. 1668, 1669; Exhibit P-3)

11. The project also required construction/replacement of approximately 12 ½ acres of wetland in the French Creek area. There were two (2) wetland construction efforts that had to take place, one on the north side of the roadway, approximately 4 ¼ acres in size, and one on the south side of the roadway, approximately 8 ¼ acres in size. The predominant soil feature in this area was

¹William G. Petit was the Project Engineer for DOT. Mr. Petit received an Associates Degree in math/science from Hudson Valley Community College and a Bachelor of Science Degree from Clarkson University in Civil and Environmental Engineering. He received a Masters in Business Administration from Gannon University and was initially hired by DOT as a construction inspector. After intensive training with DOT, he served as an Assistant Project Engineer and was eventually promoted to Civil Engineer 2, and later, Civil Engineer 3/Senior Civil Engineer Supervisor. Since the project, which is the subject of this claim, Mr. Petit has been promoted to Civil Engineer Manager and Senior Civil Engineer Manager. Mr. Petit is a Professional Engineer licensed in both Pennsylvania and New York, certified with the National Institute of Construction Engineering Technologies and a member of the American Society of Civil Engineers, the American Society of Highway Engineers, the National Society of Professional Engineers, and the Pennsylvania Society of Professional Engineers. (N.T. 1638-1647, 1744)

A-4 (referred to throughout interchangeably as "A-4" or "A4") material, which is silt with some sand. The soil was "moisture sensitive". The whole area of activity to the east of Ashton Road for approximately 1,500 feet would be considered in the flood plain of French Creek. (N.T. 1658, 1665, 1666)

12. The contract contained four (4) major restrictions as to Great Lakes' performance of the work:

a. In several of the grading areas, before any significant earthwork operations could begin, the contractor was required to construct certain erosion and sedimentation controls, such as interceptor ditches, silt fencing, diversion ditches, rock basins, sedimentation ponds, etc.;

b. Neither German Road nor Ashton Road could be closed simultaneously, thereby affording local residents a way of traveling through the project site while construction was on-going;

c. The north wetlands had to be completed prior to the contractor performing any undercut and subsequent backfill on the west side of the French Creek and, correspondingly, the south wetland had to be completed prior to any subsequent undercut and backfill on the east side of the French Creek;

d. The surcharge on the French Creek embankment required the work performed there to remain in place ninety (90) days before it could be removed and construction of the bridge that carried the mainline over French Creek could begin.

(N.T. 203, 204, 206, 252, 278, 1658-1662, 1694; Exhibit P-1)

13. The ninety (90) day surcharge time (or waiting period) pertinent to the embankment to be built in the French Creek area was necessary because of unstable soils. The surcharge involved the placement of three (3) feet of additional fill that was placed to basically induce settlement at the quickest rate possible. Settlement platforms and pizometers were placed at varying locations and varying depths to monitor the settlement. (N.T. 1661, 1662; Exhibit P-1)

14. Great Lakes undertook a site inspection in order to prepare their estimate, wherein representatives of the company drove to the project and physically inspected the areas encompassed by the project. Personnel from Great Lakes looked at the adjoining project for the possibility of utilizing a batch plant from that site. Great Lakes' personnel also physically walked portions of the project, including near where the marshy wetlands area was located. Great Lakes' representatives also reviewed the borings that were in the plans as far as the type of soils that would be encountered in the cuts, which indicated an A-4 type of soil which was known to Great Lakes to be silty clay material. (N.T. 77-82)

III. FACTUAL AND EXPERT WITNESSES

15. Kenneth G. Kling², the Chief Estimator for Great Lakes, established that approximately 10% of the length of the mainline ran through the French Creek area. Mr. Kling also established that Great Lakes had experience in working with silty clay type of soil because most of the projects in and around the Cleveland area have the same type of water susceptible material. (N.T. 36, 81-83)

16. Mr. Kling testified that after obtaining the contract documents, Great Lakes began a take-off and started with the plans and specifications in conjunction with a proposal which lists all of the quantities. Mr. Kling indicated that Great Lakes goes through the proposal, making a take-off of the items that Great Lakes would perform work on. Great Lakes reviewed the labor rates for the area they were bidding, determined what subcontractors would be needed for items of work that Great Lakes did not perform and investigated who was bidding those particular items. Great Lakes also investigated the costs of the various materials that were being utilized on the project. Once this information is compiled, Mr. Kling testified that he sits down with the estimator and begins pricing out the project. (N.T. 37, 38)

17. Mr. Kling acknowledged that there were two items of borrow excavation, those being common borrow and select borrow. Mr. Kling also acknowledged that Great Lakes anticipated obtaining the borrow material that was going to be used to replace the unsuitable soil from an offsite location. Mr. Kling testified that Great Lakes anticipated paying \$7.80 per cubic yard for select borrow material. (N.T. 120-124)

18. Mr. Kling acknowledged, under cross-examination, that during the job he visited the site "at least one time while the project was in progress." (N.T. 131, 136, 137)

19. Mr. Kling testified that the equipment component for Great Lakes bid was arrived at by looking at historical costs from other projects and by also reviewing costs associated with the operating and maintenance costs, the depreciation costs, and the insurance costs on the equipment. For a category of work such as earthwork, Great Lakes develops a percentage that relates to that kind of work. That percentage, because the equipment involved, is much higher than the percentage of overhead for equipment that is associated with, by way of example, a bridge project, due to the fact that a bridge project would not have as expensive types of equipment as you might have with an earthmoving fleet. (N.T. 150, 151, 177, 178)

²Kenneth G. Kling has been employed by Great Lakes Construction Company for approximately 23 years, 15 of which he has been the Chief Estimator for the company. Mr. Kling has a Bachelor's Degree in Civil Engineering and also has a Master's Degree in Civil Engineering that he obtained in 1972. Mr. Kling has been estimating 22 of the 23 years he has been employed by Great Lakes Construction Company and takes responsibility for the full pricing of projects. (N.T. 36)

20. Vincent A. Strazzo was called as Great Lakes' second witness. Mr. Strazzo was Vice President of operations for the company at the time the instant project came under his control. Mr. Strazzo has worked for Great Lakes as a full-time employee since he graduated from college in 1967. (N.T. 194, 195)

21. Mr. Strazzo established that Great Lakes's first order of business was to establish the erosion control as laid out in the plan. He indicated that the plan was very specific as to what you had to do before you could move into certain areas on the project and the emphasis was at the wetland area. Mr. Strazzo testified that Great Lakes went in, cleared the area and immediately began work in the French Creek area, re-establishing the wetland. From there, Great Lakes kept branching out their order of operation developing the job. Once the wetlands had been completed, Great Lakes started the embankment for the French Creek bridge and as the job was progressing, the clearing was proceeding and Great Lakes was trying to get established as far as getting the earthwork operation going. In that regard, Mr. Strazzo testified that there was a considerable cut area between German Road and Ashton Road and a fill area west of German Road. (N.T. 203-205)

22. Mr. Strazzo testified that prior to making any embankment, there was designated undercut areas on the plans and once Great Lakes had undercut the designated areas, they had to be filled back up with granular material. Once the granular material was in, Great Lakes could establish permanent drainage in those areas, and then start the embankment areas. Mr. Strazzo testified that at the same time that the job was unfolding, Great Lakes closed German Road. Mr. Strazzo felt that, although the plans specified that the contractor could close either German Road or Ashton Road, but not both, Great Lakes really did not have much option due to the fact that they were trying to get the embankment built for the French Creek bridge. (N.T. 205, 206)

23. Mr. Strazzo established that Great Lakes thought the project was a "relatively simple job" and a lot less complicated than other projects Great Lakes had performed in years past. He testified that Great Lakes thought the job was a "simple dirt operation" and that the company was familiar with the restrictions that were built into the job. (N.T. 278)

24. Mr. Strazzo testified that, despite the fact Great Lakes had originally viewed the project as a "relatively simple job" and a "simple dirt operation", as the job progressed, the Claimant became concerned about the "lack of productivity" and the fact that they seemed to be losing ground as each week went by. The Minutes of a progress meeting held at a field site on August 13, 1986, indicate that Great Lakes felt there was no way they could complete the project on time and the company started discussing a time extension with DOT. Mr. Strazzo indicated that Great Lakes never got an extension of time until the very end of the project and, while the extension at that point in time did not enable Great Lakes to alter its schedule in any way, it did eliminate liquidated damages for the remainder of the work that Great Lakes had to perform. (N.T. 278, 281-284; Exhibit P-24)

25. Mr. Strazzo testified that he felt PennDOT's project engineer, Mr. William Petit, was a "very intelligent, dedicated employee to PennDOT", however, he also felt Mr. Petit lacked field experience. (N.T. 287)

26. Mr. Strazzo also testified that a report prepared by Jose Ramirez from the Federal Highway Administration indicated that, with regard to the project, the earthwork activity observed appeared overall in compliance with the Specifications and good construction practices. (N.T. 285, 286, 289; P-25)

27. Mr. Strazzo testified, although he was not on the project everyday, that Great Lakes had problems with rain which curtailed the earthwork drastically. He indicated that the weather on the project in May and June of 1986 was miserable and that DOT had agreed to pay for seeding topsoil piles due to the difficulties with the rain. Great Lakes became very concerned about their lack of progress and, although they felt that they had manned the job with sufficient equipment and manpower, they initiated a night-shift. However, Great Lakes attempted to build embankment on the night-shift which did not work due to heavy dew and problems with material drying, so the night-shift was abandoned. Great Lakes did receive permission to go to "four tens" on all activities except for bridges, although the carpenter union had an objection and would not work four ten-hour days rather than five eight-hour days. After receiving permission to work four ten-hour days, all other operations went to a "four-ten" schedule. In conjunction with the change of scheduling, Great Lakes began to work on off-days occasionally. These changes in scheduling, depending upon the type of activity involved, occurred approximately at the end of June, 1986. (N.T. 291-297; Exhibit P-19)

28. Mr. Strazzo testified that he believed the work performed by Great Lakes concerning the relocation of the wetlands, so that the embankments could be built and the bridge over French Creek could be accomplished, went "extremely well". Mr. Strazzo also testified that Magoon Pit, a source of granular fill, did not interfere with the project at all because Great Lakes had access to other sources of fill, such as Weise, Wroblewski and Hoover Sand and Gravel. However, Mr. Strazzo acknowledged, under cross-examination, that at the time Great Lakes was performing this project, he was, on average, able to visit the job site one and one-half days per week throughout the course of the project. (N.T. 318-320, 332)

29. Mr. Strazzo admitted, under cross-examination, that the Magoon Pit was going to be used for select borrow material to fill up the undercut areas and for making embankment, although he maintained that Great Lakes' bid price was not predicated upon the use of the Magoon Pit. The price paid to the Magoon's was 95 cents per cubic yard. Mr. Strazzo also acknowledged that Great Lakes did not obtain a mining permit for the Magoon Pit until August 13, 1986. During the three months Great Lakes was on the job prior to August of 1986, Great Lakes used other sources of supply for select borrow material from the Weise and Wroblewski sites. Mr. Strazzo estimated that the material from the Magoon Pit might have been a dollar and a half to two dollars per yard cheaper than the other sites. Mr. Strazzo could not recall whether or not any material from the Magoon Pit had been placed before November 13, 1986, and indicated the permitting process and preparation of the pit prohibited use of the material initially. (N.T. 361, 362, 367, 368, 372-375, 416, 600-602; Exhibit D-3)

30. Mr. Strazzo acknowledged, under cross-examination, that the Department did not require Great Lakes to perform work that was above and beyond what was required by the Publication 408 Specifications. He testified that Great Lakes was committed to performing this project in accordance with the Publication 408 Specifications. (N.T. 379)

31. Mr. Strazzo also acknowledged that Ed Culbertson, the District Engineer in charge of the project, permitted Great Lakes to deviate from the requirements set forth in the contract by permitting Great Lakes to start the east embankment immediately, although Great Lakes was only approximately 50 percent finished with the south wetlands work. Mr. Strazzo could not recall whether or not Great Lakes waited two weeks to start the work, despite receiving permission to do so by DOT. Mr. Strazzo described Mr. Culbertson as “a very knowledgeable individual with a lot of good hands-on working experience.” Similarly, Mr. Strazzo felt that both Doug Stewart and Robert Fulmer, both DOT employees, were knowledgeable in the construction business. (N.T. 380-382, 396-398)

32. Mr. Strazzo testified, under cross-examination, that according to a Meteorology Report, that while June had approximately four inches more precipitation than usual in 1986, the second half of June was a relatively dry month. Similarly, July of 1986 had .74 inches less rain than the historical average and August of 1986 has 2.02 inches less than the historical average. September of 1986 had over four inches more than the historical average; however, 3.91 inches of rain fell on one day, i.e. September 26, 1986. Mr. Strazzo also testified that the number of “clear” days, when the ground could dry out faster, may have affected Great Lakes’ progress on the project. (N.T. 406-410, 603-606; Exhibit P-12 A)

33. Both Mr. Strazzo and other witnesses for Great Lakes acknowledged, under cross-examination, that Great Lakes was given a twenty-nine (29) day reduction of the 90-day surcharge period related to the French Creek embankment. Mr. Strazzo and other Great Lakes’ witnesses acknowledged that this gesture on the part of DOT was a “relief” from the restrictions or requirements imposed by the contract. (N.T. 417-419, 854, 872; Exhibit P-21)

34. The next witness called by Great Lakes, under subpoena, was Richard E. Harley³. Mr. Harley was formerly employed by the Pennsylvania Turnpike Commission as well as the Pennsylvania Department of Transportation. Mr. Harley was employed by the Department at the time the instant project was bid. (N.T. 433 - 435, 441, 442)

³Mr. Harley was employed by the engineering firms of Glace & Glace, Grof & Myers and Robert W. Lowry. He was also employed by a contractor, Joe Spera, as an estimator. While employed by the engineering firms, Mr. Harley performed structural detailing work, particularly related to bridge work. He became employed by the Pennsylvania Department of Transportation in 1974, when he was employed with the bridge unit, PS&E (Plans, Specifications and Estimates) Section. While employed by the bridge unit for five years, Mr. Harley reviewed the estimated costs and the construction time required for the construction of structures. He was then moved to the Contract Management Unit at DOT where he reviewed roadway and bridge projects for approximately eight years involving numerous projects, both big and small. Mr. Harley left the DOT in 1987 and became employed by the Pennsylvania Turnpike Commission as a Bridge Program Manager. (N.T. 548-556)

35. While Mr. Harley had never taken any construction management courses and had never taken courses concerning preparation of CPM's, he had extensive experience working for various consulting engineer firms performing such work as bridge detailing, roadway work and right-of-way work. When Mr. Harley was first employed by DOT in 1974, he worked in the bridge unit, in the Plans, Specification and Estimating Section. In 1978 he became a Construction Cost Specialist and began evaluating quantities and time necessary to complete projects. While he acknowledged that he spent little time in the field, he evaluated productivity through Department documentation and history. (N.T. 435, 436, 438, 439)

36. Mr. Harley explained that his work with DOT involved the sequencing of operations on projects and converting working days to calendar days. He established that his work was very similar to preparing a CPM. (N.T. 440, 441)

37. At the time the instant project was bid, Mr. Harley was working for DOT under the supervision of V.C. Shaw, a Civil Engineer for DOT. Mr. Harley acknowledged that in general, when he received schedules, he would either shorten or lengthen the schedule, because the schedule did not sequence the operation and did not take into account, e.g. the necessity to order supplies, that had a delay time. The remainder of Mr. Harley's testimony appears in the following section of these Findings of Fact. (N.T. 442, 445, 446)

38. Great Lakes next produced Randal R. Radel⁴ as their next witness. Mr. Radel, at the time of the instant project, was employed by Great Lakes as part of the estimating crew preparing quantity take-off, calling subcontractors, getting material prices for the estimating team and creating a flow chart for the project. Mr. Radel was specifically involved in the creation of a flow chart for this project and, from the flow chart, inputting information activities and durations and floats into a CPM program. The remainder of Mr. Radel's testimony also appears in the following section. (N.T. 220, 223, 224)

⁴ Mr. Radel, subsequent to high-school graduation, attended the State University of New York at Alfred and received an Associate Degree in Applied Science, Civil Engineering Technology, in 1981. He continued his education at Rochester Institute of Technology, receiving a Bachelor's Degree in Civil Engineering Technology in 1985. His past construction experience includes working for Herbert F. Darling, Inc., where he worked as a Surveyor, a Draftsman and an Engineer. He was hired by Great Lakes Construction in May of 1985 and worked for them for three years doing engineering work, estimating work and quantity take-off for projects. While employed by Great Lakes he also worked as a Field Engineer. Subsequently, he was employed as a Superintendent Regional Manager, doing estimating, construction management and PR work. On May 1, 1995, Mr. Radel became re-employed by Great Lakes Construction as a Project Superintendent. (N.T. 221-223)

39. Great Lakes also produced Donald Rooney⁵ as a witness. Mr. Rooney indicated that he has prepared CPM's and is familiar with their preparation. He testified that when preparing a flow chart, you start out with a basic logic of how the job should be done in conjunction with all of the restrictions within the contract, plans and specifications and plan your work accordingly. He testified that you plan the sequence of work in different activities to accomplish those items within the sequence. Mr. Rooney testified that he had prepared flow charts on one or two various projects. (N.T. 630, 642, 643)

40. Mr. Rooney, who was the Project Superintendent for this project, testified that "Run 23" was an attempt to make a schedule but was not a schedule and certainly was not a tool that could be used in the field. He acknowledged that it very possibly remained in the field. Because Mr. Rooney was recovering from major back surgery, he assigned the process of constructing the schedule to his assistant, Harley Cohen. Mr. Rooney acknowledged that he was not part of the bid process for this project. (N.T. 648-650, 708; Exhibit P-14)

41. Mr. Rooney discussed the inter-relationship between different elements of work that had to be done on the project. He testified that one of the major areas was the German Road Bridge and the Ashton Road Bridge involving the wetlands. According to Mr. Rooney, the German Road Bridge was critical for the simple reason that it had to be done before the Ashton Road Bridge. Mr. Rooney indicated that it was "cut and dry" as to sequencing certain portions of the project, not only because the contract mandated some of the sequencing, but also from an erosion and an environmental standpoint. (N.T. 651-654)

42. Mr. Rooney testified that there were access problems on this project due to the A4 material and the erosion control ditches which restricted the area for trucking. Mr. Rooney indicated, for example, that you could not place a Class 1 Excavation crew east of the interchange at the west end of the project, then place another excavation crew a thousand feet east of that and a third one a thousand feet east of that. He testified that you have one excavation project and one granular backfill process and you could do it no other way because your hauling units, in and out, could not pass one another in such a narrow corridor with ditches dug on both sides. He added that you could not put a haul road, even if you wanted one, in the swamp area. (N.T. 660, 661)

43. Mr. Rooney testified that an erosion control plan restricts the way Great Lakes schedules labor and equipment. He established that you have to accomplish the erosion control plan, which might generally involve diversion ditches, sediment ponds, silt fence, etc., all of which affects how much and where you can place equipment. (N.T. 667, 668)

⁵Mr. Rooney, subsequent to high-school graduation, attended Washington State University, Lakeland Community College, Kent State University and Wheeling College in Wheeling, West Virginia. His career in the construction industry began in 1958, when he began working as a laborer and a grade checker. Mr. Rooney also worked with the Operating Engineers and became closely involved with maintaining different types of earthmoving equipment. He eventually became a heavy equipment operator and eventually became employed by Great Lakes Construction Company. With Great Lakes, Mr. Rooney began as a Grader Operator, worked as a Night-Shift Foreman, was promoted to Dirt Superintendent, Project Superintendent, and Assistant Project Manager on various jobs where he coordinated all of the earthwork activities and supervised all of the manpower relating to earthwork activities. (N.T. 630-641)

44. Mr. Rooney established that Great Lakes always stays late and works overtime when performing certain earthwork activities such as compacting, shaping and sealing the final lift. (N.T. 677)

45. Mr. Rooney acknowledged, under cross-examination, that he was aware, before work started on the project, that he could not “flood” the project with men and equipment due to the nature of the soil being of the A4 type. (N.T. 787)

46. Mr. Rooney acknowledged, under cross-examination, that Great Lakes had intended, in the bid, to use five fifty-ton trucks for the 10,000 foot haul from the Route 89 Bridge area, Ramp C and D to the west end of the project. In reality, Mr. Rooney acknowledged that Great Lakes used 35 cubic yard bottom dumps to perform the 10,000 foot haul which would indicate a change in the type of equipment. Mr. Rooney did indicate that Great Lakes never made the full 10,000 foot haul. (N.T. 821-824)

47. Mr. Rooney acknowledged, under cross-examination, that DOT permitted Great Lakes not to perform embankment work on the west bound lanes at the eastern end of the project. Essentially, Great Lakes was not required, as per the contract and the specifications, to make the total fill at that location. (N.T. 834, 835)

48. Mr. Rooney, under cross-examination, could not explain why Great Lakes did not opt to proceed with a schedule that they felt was reasonable and sustain liquidated damages at \$1,000 per day, totaling approximately \$375,000 instead of completing the contract as per the mandated time frame and incurring alleged damages of approximately \$3.9 million. (N.T. 847, 848)

49. The next witness called by Great Lakes Construction Company was Joseph W. Allen⁶. Mr. Allen testified that it was not Great Lakes policy to prepare a schedule prior to bid, due to the fact that you have a very limited amount of bid time and by the time you go through several hundred items in the bid, evaluate all those items, such as labor costs, equipment costs, material cost and subcontractors, you do not have the time or the physical capacity to sit down and write up a schedule. (N.T. 902, 903)

⁶Joseph W. Allen received a Bachelor’s Degree in Civil Engineering from the University of Kentucky. He received an MBA from Case Western Reserve University and is a license Professional Engineer in the State of Ohio. Mr. Allen has worked for highway departments as an Assistant Resident Engineer on large interstate level-type projects and began his employment in 1970 with Great Lakes Construction Company. He began with Great Lakes as an Assistant Superintendent and worked both inside the office as well as outside the office as an Estimator/Engineer on different projects. He was eventually promoted to Project Coordinator and then Project Manager for the company. He has also served in the capacity of Contracts Manager and Vice-President of Projects Management involving him in all aspects of project management including purchasing duties, engineering, etc. He currently holds the title of Senior Vice-President. At the time of the instant project, he was the Contracts Manager for Great Lakes Construction. (N.T. 896-901)

50. Mr. Allen testified that as of late March, 1987, Great Lakes either implemented and/or would implement actions to recover the maximum schedule time possible. In a letter dated March 27, 1987, directed to DOT's William Jones, Mr. Allen indicated that Great Lakes would, "[t]hough economically unattractive . . ." continue to work the French Creek area throughout the winter, undercutting and placing granular backfill. He also indicated in his letter to Mr. Jones that Great Lakes would, instead of allowing frost to thaw naturally, remove frozen ground with the backhoe and import premium material and replace frozen material in selected critical areas to expedite the project. (N.T. 918-920; Exhibit P-46)

51. While Mr. Rooney could not explain why Great Lakes did not opt to proceed with a schedule they felt was reasonable and sustain liquidated damages at \$1,000 per day, Mr. Allen opined that such an option could affect Great Lakes bonding capacity, its financing, and its reputation. (N.T. 939)

52. Mr. Allen testified extensively concerning requests for extensions of time tendered by Great Lakes to DOT which were either denied outright or by implication, but acknowledged that ultimately DOT did extend the project. In a letter dated November 23, 1987, from William R. Jones to Great Lakes Construction, DOT's Mr. Jones indicated that the project time would be extended until November 25, 1987, at which time work would be suspended due to temperature restrictions. The letter further indicated that time charges would resume on May 2, 1988, with a revised completion date of May 11, 1988. (N.T. 905-938, 941-943; Exhibit P-54)

53. Mr. Allen acknowledged that as per his letter of March 27, 1987, Great Lakes was not receiving an adequate number of deliveries from the Wroblewski Borrow Source which prohibited the Claimant from placing granular material at French Creek. This reference applied to August of 1986 when Great Lakes had yet to secure the Weise Source or the Magoon Source. (N.T. 1027-1030; Ex. P-46)

54. Mr. Allen repeatedly refused to acknowledge that any of the CPM "runs" created by Great Lakes actually constituted a "schedule". Rather, he referred to them as a "plan". (N.T. 972, 973, 975, 976, 978, 1018, 1027, 1032)

55. Mr. Allen was also called to testify on behalf of the Claimant concerning damages. In that regard, Mr. Allen identified a number of Change Orders which were paid by DOT and explained how the information on the Change Orders was calculated. Mr. Allen acknowledged that the "Blue Book" or "Form" 408 Specifications, was used in calculating many of the figures. The work contemplated by the various Change Orders was performed on a force account basis. (N.T. 1223-1231; Exhibit P-66, P-67)

56. Mr. Allen also identified a copy of a voucher for payment rendered on the project, which again identified work which was performed on a force account basis according to the Force Account Formula under the 408 Specifications. Mr. Allen also identified a summary sheet titled "Class 1 Excavation" which indicated the actual costs of performing Class 1 Excavation. This

document listed the actual amount paid by DOT and the Claimant's actual cost of accelerating the Class 1 Excavation work on the project. (N.T. 1232-1237; Exhibit P-68, P-69)

57. Mr. Allen also identified as an Exhibit for the Claimant a Labor Cost Report which was generated from Great Lakes payroll records. Mr. Allen explained that this document was created initially from foreman's reports that are turned in in the field to project superintendents who review the report and insure that the man hours listed have been allocated to the proper reference numbers. The reports are then turned over to the Claimant's on-site timekeeper, who keys it into a remote terminal that is at the job site. This information then is transmitted to the Claimant's home office and becomes part of the payroll report. The Labor Cost Report identified by Mr. Allen summarizes the labor costs for the various reference number units of work on the job. By way of example, Mr. Allen indicated that the total labor dollars spent by Great Lakes on Class 1 Excavation totaled \$663,053.75. That number included 41.38 percent for insurance and taxes. Mr. Allen explained that the percentage for paving was higher at 50.16 percent. (N.T. 1228, 1237-1239, 1241; Exhibit P-70)

58. Mr. Allen also identified a number of other documents including a break down of insurance and taxes for the various years and items, copies of material invoices and delivery tickets illustrating payments tendered by Great Lakes for Class 1 Excavation and cement work, a summary of costs associated with portable toilet rental costs, a summary of how Great Lakes calculated equipment rental rates/Blue Book rates, and a listing of equipment and labor for different types of excavation generated by Great Lakes' Data Processing Department. (N.T. 1240-1263; Exhibit P-71, P-72, P-73, P-74, P-75)

59. The totals contemplated by the various exhibits identified by Mr. Allen, mentioned in the previous paragraphs, are as follows:

a. Exhibit P-69 and P-70=	\$663,053.75
b. Exhibit P-71 =	\$885,217.00
c. Exhibit P-72 =	\$31,422.85
d. Exhibit P-73 =	(not summarized by Claimant)
e. Exhibit P-74=	(Summary of Blue Book Rate calculations)
f. Exhibit P-75=	(i) \$387,365.36 (1986)
	(ii) \$1,343,452.71 (1987)

(N.T. 1237-1263; Exhibit P-69, P-70, P-71, P-72, P-73, P-74, P-75)

60. Mr. Allen also identified invoices from R. Wiese, directed to Great Lakes, as well as invoices from Penn Line Service, also directed to Great Lakes, as well as other invoices for subcontracted costs. These invoices total \$17,086, already included in the computations identified as a Summary Sheet for Class 1 Excavation. To this amount, Mr. Allen testified that a 2 percent mark-up was added in accordance with the Publication 408. Mr. Allen acknowledged that DOT paid Great Lakes \$1,536,001.95 for Class 1 Excavation, taking into consideration a credit due DOT

because Great Lakes was not required to make the embankments for the west bound lanes at the east end of the job. Mr. Allen testified that the total additional costs for Class 1 Excavation were \$1,769,390.69. (N.T. 1264-1268; Exhibit P-76, P-77)

61. Mr. Allen also identified a Summary of Invoices which, he explained, illustrated three different areas of costs, i.e. subcontract, material and equipment rental. Mr. Allen proceeded to explain why Great Lakes used Blue Book Rates rather than internal rates for equipment. He explained that while Great Lakes has a document titled "Internal Rates for Equipment", those figures do not really reflect their internal rates. While the Great Lakes internal rates include depreciation costs divided by the economic use for life of the equipment, insurance costs and major maintenance items, not included in the rates are replacement costs, shop overhead, financing costs, operating costs, and other items such as transportation to and from the job-site and mobilization and demobilization costs. Also excluded from the Great Lakes rate is warehouse costs. (N.T. 1280-1283; Exhibit P-100)

62. Mr. Allen also explained that while he never actually sat down and compared his actual costs for internal rates to the actual costs for Blue Book Rates, he would not be surprised to find out that Great Lakes actual costs may exceed Blue Book Rates. He testified that Blue Book Rates are developed from larger contractors that have larger fleets of equipment and a better utilization of their equipment. He acknowledged that Great Lakes does rent some of their equipment to selected contractors, and in those instances, Great Lakes charges rates comparable to the Blue Book Rates. In justifying Great Lakes use of force account rates and calculating their equipment costs, Mr. Allen indicated that Great Lakes felt that the force account was a reasonable method, otherwise, the Department would not have incorporated those rates into the Form 408 Specifications as a method of calculating costs. (N.T. 1286-1289)

63. Mr. Allen also identified an exhibit entitled Cost of Acceleration for Class 1A Excavation. Under the summary, Mr. Allen explained that the total acceleration labor cost for Class 1A Excavation (including insurance, taxes and fringes) was \$273,879.38. The accelerated cost for equipment totaled \$544,576.04. Mr. Allen also identified a summary of subcontract material and equipment rental invoices which Great Lakes allegedly incurred under the Class 1A Excavation as well. However, Mr. Allen acknowledged that actually there was no equipment rental on Class 1A and also there were a few invoices for trucking services that could not be located anywhere. Mr. Allen also identified a series of exhibits relating to invoices for pump rentals, trucking expenses and material expenses. The total suggested due by Mr. Allen pursuant to these various exhibits for Class 1A Excavation was \$848,710.86. (N.T. 1289-1308, 1310; Exhibit P-78, P-79, P-80, P-81)

64. Mr. Allen also identified calculations for the cost of subbase equipment. Interestingly, these figures were calculated by comparing "as-bid" days versus actual use. Mr. Allen also converted work days to calendar days because the equipment was rented on a calendar day basis. Mr. Allen indicated that the subbase equipment claim resulted from "discontinuities in the operation" because Great Lakes started actually placing subbase before one would in a normal operation. Mr. Allen unilaterally applied what he "thought" was realistic production rates in computing this

portion of Great Lakes' claim. The total claim for rented and owned subbase equipment was \$189,589.05. (N.T. 1311-1317; Exhibit P-84)

65. Also identified by Mr. Allen as part of Great Lakes' claim were checks and invoices to Ohio Machinery for the rental of an AP 800 paver (\$12,067.86), claim for additional equipment in the form of a pavement base drain (\$15,064.79) and a series of invoices from Vermeer Sales & Services for the rental of a trencher (\$15,297.50). (N.T. 318-326; Exhibit P-85, P-86, P-87)

66. Mr. Allen also identified a concrete claim for eleven-inch concrete, concrete shoulders, subcontracted batch plant costs and additional concrete materials. This claim totaled \$563,515.23. In conjunction with this aspect of the claim, Mr. Allen identified paving equipment costs for the eleven-inch pavement and shoulders. The total claim pertinent to eleven-inch concrete paving for both rented and owned equipment was \$185,569.38. The total claimed by Great Lakes for equipment, both rented and owned for the cost of the concrete shoulder was \$74,046. Also included in Great Lakes' concrete claim was the cost of curing concrete after September 1, 1987. Although DOT paid for linseed oil placement, Great Lakes also claimed entitlement to acceleration costs for other items associated with curing the eleven-inch concrete pavement and shoulders. These costs included, for the eleven-inch concrete pavement, the following: (a) Labor cost of polyethylene curing labor - \$13,410.55; (b) Additional cost of curing labor - \$12,630.27; (c) Equipment cost of polyethylene curing - \$1,216.40; (d) Additional cost of curing equipment - \$546.58; (e) Additional cost of curing material - \$1,464.92; (f) Twenty-five percent overhead and profit - \$3,660.44; for a total of \$18,302.21. The total costs associated with curing the concrete shoulders as set forth by Great Lakes are as follows: (a) Additional cost of equipment - \$3,162.64; (b) Additional cost of labor - \$18,662.16; (c) Twenty-five percent overhead and profit - \$5,456.20; for a total of \$27,281.00. Also, identified as part of the overall concrete claim was the subcontracted batch plant claim in the amount of \$173,056.69 and the cost of additional concrete materials in the amount of \$85,260.00. (N.T. 1327-1380; Exhibit P-88; P-89, P-90, P-91, P-92, P-93, P-94, P-95, P-96)

67. Mr. Allen identified Great Lakes' cost of working capital which was an analysis of several items together comprising a claim for finance costs. Included in those items were the actual per project profit and loss statement, the cost of working capital, projected forecast of revenue, project cash flow and cost of borrowing, and the impact on cost of capital. According to this analysis, prepared by Mr. Allen, Great Lakes lost \$436,011.00 in total monthly interest. This figure represents the impact on cost of capital after comparison of actual impact versus projected impact. (N.T. 1381-1392; Exhibit P-97)

68. The total claim amount was identified by Mr. Allen in a Summary of Acceleration Cost and was \$3,822,281.67. (N.T. 1392, 1393; Exhibit P-98)

69. Mr. Allen acknowledged under cross-examination that some of the figures in the claim filed by Great Lakes were different than those introduced in the damages analysis, causing

counsel for the Claimant to amend Great Lakes' claim. Mr. Moskowitz indicated that there were changes to "most of the numbers in the complaint, resulting in a net decrease of about \$100,000.00." (N.T. 1406-1409)

70. Mr. Allen also acknowledged under cross-examination that DOT never agreed that acceleration costs were force account costs. (N.T. 416, 417)

71. Mr. Allen acknowledged under cross-examination that there was no back-up documentation for the labor costs associated with Class 1 Excavation. Although the payroll records were reviewed by the Project Superintendent and/or Project Engineer for correctness, as far as which pay items the time had been charged to, the process starts with foremen's reports. Great Lakes' workers do not "punch in" because Great Lakes has no punch clock, rather, the foreman is responsible to make sure the workers get there on time, work the full eight hours and make sure the workers are working on the proper reference numbers. The foreman verifies these facts in writing in a foremen's report; however, Mr. Allen could not locate any of the foremen's reports and surmises that they may have been destroyed in a flood which damaged many of Great Lakes' records. (N.T. 1489-1492)

72. Mr. Allen acknowledged under cross-examination that Great Lakes originally planned on paving a total of ten working days which equates out to fourteen calendar days, as illustrated by the Claimant's bid recapitulation sheets. Mr. Allen admitted that Great Lakes' original anticipated paving schedule would be "pretty aggressive." (N.T. 1583, 1585, 1608; Exhibit D-1)

73. Mr. Allen acknowledged under cross-examination that Great Lakes' claim for financing costs is not contained in either the first complaint filed by Great Lakes or the amended complaint filed by Great Lakes. (N.T. 1596-1598; Exhibit P-97)

74. Michael W. Leary⁷ was next called as a witness for the Claimant. Mr. Leary, as District Manager for Buric Consultants, is responsible for the day-to-day operations of the office, marketing, procuring work, client relations and reviewing work products before they are issued. On a professional level, Buric Consultants assists general contractors with CPM scheduling and bidding on projects. (N.T. 1052, 1053, 1057, 1058)

⁷Mr. Leary graduated in 1981 from Case Western Reserve University with a Bachelor of Science Degree in Civil Engineering, with a major in construction management. He also has a Bachelor of Arts Degree from Baldwin Wallace College in Engineering. Mr. Leary has been a Professional Engineer in the State of Ohio since 1986 and his firm specializes in construction management services and CPM scheduling, construction claims and surety projects. Mr. Leary initially worked for a firm called S & M Constructors where he was involved primarily as an estimator engineer. In 1984, Mr. Leary left S & M Constructors and became employed by Buric Consultants. Mr. Leary began working for Buric as an Associate, was promoted to Project Consultant, then Senior Project Consultant, and in 1992, became District Manager. Mr. Leary has served as an arbitrator for the American Arbitration Association, is a member of the American Society of Civil Engineers, the Associated General Contractors of America and the American Institute of Constructors. (N.T. 1052-1059)

75. Mr. Leary testified that he has created CPM schedules for at least 50 different projects, maybe 100 different projects, over the past 15 years. He indicated that he has prepared CPM schedules for the Gateway Arena, Jacobs Ball Field, Cleveland Indians Ball Park (concrete schedule), Greater Pittsburgh International Airport (precast schedule), numerous waste water treatment plants, AT&T World Headquarters in Chicago, and two or three highway projects a year. Mr. Leary estimated that Buric Consultants probably does a CPM schedule for one bridge structure a year. (N.T. 1060, 1061)

76. After explaining how he would prepare a CPM schedule, Mr. Leary testified that Run No. 23 was not something you would typically use in the field. He indicated that Run No. 23 is something that would be generated as a step towards finalizing a CPM schedule because it gives a listing of each one of the activities, of what the predecessor/successor activities are and what the dependent relationships are, as well as the durations and rough time parameters of the work. Mr. Leary indicated that if you were to use Run No. 23 on a job site, he felt project managers would have a very difficult time following Run No. 23. (N.T. 1072-1075; Exhibit P-14)

77. Mr. Leary produced a Primavera Schedule from the PennDot Contract D-476 Form. He also performed a work-day/calendar day schedule conversion and a summary of the information he obtained when he prepared the Primavera Schedule from the PennDot Form D-476. (N.T. 1076-1083; Exhibit P-32, P-56, P-59, P-60)

78. Mr. Leary also prepared an exhibit titled Great Lakes Construction Company Run 23 Predecessor/Successor, wherein he listed what calendar were non-work days, or holidays specified in the project. (Exhibit P-60)

79. Great Lakes Construction Company Run 23 Predecessor/Successor Schedule was based upon a five-day work week and utilized only holidays as non-work days. All other days were considered work-days. Mr. Leary testified that the reason Run No. 23 was utilized for this purpose was because Run 23 was the only schedule that allowed him to recreate the schedule with logic, the durations and the activities, such that he could recreate it and take a look to see exactly what was contained in the schedule. However, Mr. Leary testified that Run No. 23 did not comply with all of the contract requirements in that it did not contain a winter shutdown and also did not contain any expected non-work days due to weather. (N.T. 1086-1088; Exhibit P-60)

80. Mr. Leary also prepared a graphic exhibit, Plaintiff's Exhibit P-61, wherein the actual weather and contractual winter shutdown period were programmed into the Primavera. The actual weather utilized for this graphic came from daily reports and correspondence that was outlined by Great Lakes, which identified various weather days. Those weather days were put into the analysis and were weather days that would be considered critical work days, which would have an impact on the project completion. This graphic was prepared by Mr. Leary because it summarized the same operations, representing start and finish dates of the operations for the PennDot Schedule, showing actual weather impact and could be compared to Run No. 23. (N.T. 1088-1092; Exhibit P-56)

81. Mr. Leary also prepared Great Lakes Construction Company As-Built Schedule Summary which contained information from the daily reports on a day-by-day basis. Mr. Leary testified that by going through the daily reports on a day-by-day basis, he was able to ascertain what days were not worked because of weather and which days were not worked because of impact due to weather. This information was then laid out on a time scale, with input from Mr. Don Rooney, and summarized into thirteen operations as represented by the PennDot Contract Document. (N.T. 1094, 1095; Exhibit P-62)

82. Mr. Leary testified that his involvement with the prosecution of Great Lakes' claim began "months ago, quite possibly a year ago, in that time frame." Counsel for DOT objected to Mr. Leary's testimony in its entirety, due to the fact that supplemental responses to interrogatories regarding experts were not provided to the Department until approximately two or three weeks prior to Mr. Leary's testimony of May 16, 1995. Mr. Alsher, counsel for DOT, maintained that DOT's defense of the claim was severely prejudiced because DOT was not apprised of Mr. Leary's involvement in the case until the eve of trial. This objection was overruled by Chairman Clipper at the time of trial. (N.T. 1129-1131)

83. The first witness called by DOT was William G. Petit. Mr. Petit explained that his function on this project was administration of the contract. He was assigned Construction Inspectors to various operations based on their expertise, although some of that work was done in consultation with the Assistant Construction Engineer. He was responsible for any change orders that might be generated from the project and day-to-day field condition adjustments. Mr. Petit also indicated that he kept a "FID", i.e. a field inspector's diary, which is a summation of all of the individual inspectors' reports in summary form. Mr. Petit explained that his office manager, Jean Zarger, copied the field inspector diaries and his diary into the Master Diary. (N.T. 1638, 1651-1653)

84. After summarizing the features of the project and the work involved with the instant project, Mr. Petit explained that the contract had several restrictions. Those restrictions included how earthwork was to be performed based upon the Erosion and Sedimentation controls, cutting tow slope ditches as soon as possible in an effort to lower or depress the water table, a significant amount of silt fence, specified areas where diversion ditches had to be set up along with rock basins and sedimentation ponds, the prohibition of working on German Road and Ashton Road simultaneously, the north wetlands had to be completed prior to the contractor performing any undercut and subsequent backfill on the west side of French Creek, the South wetland had to be completed prior to any subsequent undercut and backfill on the east side of French Creek and the ninety-day surcharge time relating to the French Creek Basin. (N.T. 1655-1661)

85. Mr. Petit testified that Great Lakes' use of heavy scrapers created a problem with "overstressing" the underlying soils in areas where the underlying soils were poor. He also indicated that in 1987 Great Lakes brought in lighter scrapers than the heavier 637 scrapers that were conveying material in 1986. (N.T. 1708-1709)

86. Mr. Petit established that Great Lakes' construction on the German Road embankment did not go well because DOT asked Great Lakes to remove material and replace it with dryer material during Class 1 Excavation. Mr. Petit also indicated that he witnessed heavy lifts being placed without a foreman being present. Mr. Petit informed Great Lakes' Mr. Rooney, that DOT felt that Great Lakes needed additional foremen on the grading operations. (N.T. 1711, 1712, 1718-1720)

87. Mr. Petit also indicated that after Mr. Rooney was absent from the project, due to a back injury, Great Lakes' Mr. Cohen was "less than cooperative". Mr. Petit testified that at times Mr. Cohen took certain liberties concerning strict compliance with the 408 Specifications. (N.T. 1716, 1717, 1721, 1722)

88. Mr. Petit recalled instances when water would enter the undercut areas through the north wetlands. In those areas, the undercut was below the existing water table and although this was according to plan, Mr. Petit recommended bringing the elevation of the granular material and subsequent embankment up to a point whereby the area would not be flooded out any time it rained. Great Lakes did not follow Mr. Petit's recommendation in 1986 despite the fact that nothing prevented them from doing so. (N.T. 1729-1732)

89. Mr. Petit identified various photographs taken by PennDOT inspection personnel that depicted pooling water in subgrade areas. Other photographs indicated material for a haul road appearing approximately one foot above subgrade and water pooled throughout the grade. (N.T. 1736-1738; Exhibit D-22, D-23, D-24)

90. Mr. Petit also recalled problems necessitating the removal of a footer on a pier on the 89 Bridge, a similar problem with regard to the German Road Bridge abutment to back wall, an incident where a pier column pour was postponed for clearance reasons, an incident where laborers showed up and an operator did not, then the operator showed up and insufficient laborers were present to complete work on a random stone slope wall and complaints from the carpenter labor force concerning management of Great Lakes. (N.T. 1724, 1725, 1755-1757)

91. Mr. Petit confirmed, as acknowledged by Great Lakes, that Great Lakes, contrary to contract specifications, was permitted by DOT to waste material on the west end of the construction project in late 1986. This allowed Great Lakes to eliminate hauling the material from the west end of the job all the way to the east end of the job. (N.T. 1760, 1761)

92. Mr. Petit testified that it was a continual effort on the part of his inspection staff to keep reminding Great Lakes to make sure that their fill and cut areas were graded to drain and that they had a proper crown in the exposed areas. He noted that these comments by the inspection staff were "perpetual" through the life of the entire project. There appeared specified entries in Mr. Petit's Master Diary concerning discussions which took place between DOT officials and Great Lakes' people regarding the need to grade and drain work areas, particularly subgrade areas. (N.T. 1762-1764)

93. Mr. Petit also acknowledged other deviations from the contract specifications that were permitted by DOT. He testified that Great Lakes asked to eliminate a portion of their contracted work effort, i.e. not placing fill on the westbound lanes at the New York State line and approximately 1,000 to 2,000 feet to the west of that. DOT granted this request allowing Great Lakes to focus their attention on the completion of the eastbound lanes so they did not have to allocate men and equipment to that effort or bring in additional material to make the fill itself. In essence, this affected the common borrow, the material that was going to be brought from an outside source onto the project. Mr. Petit also confirmed that DOT granted a request by Great Lakes to reduce the surcharge period from a 90-day period to a 61-day period. (N.T. 1766-1768)

94. Mr. Petit identified a FHWA Inspection Report relative to the second construction season which indicated that he was a young civil engineer that had “demonstrated sufficient maturity to handle this project.” This was in contrast to an FHWA Inspection Report which voiced concerns regarding Mr. Petit’s experience. (N.T. 1778, 1779; Exhibit D-28)

95. Mr. Petit testified that Great Lakes productivity during the second year was better than the first year in part due to the fact that the contractor utilized lighter earth hauling equipment and did not damage and overstress the subgrade as much. Mr. Petit also testified that other than several major rain falls during the first year, he did not recall a substantial difference in weather between the first construction season and the second construction season. (1783-1785)

96. Mr. Petit established that Great Lakes never informed him that they were going to pursue a claim for accelerating the job. (N.T. 1785, 1786)

97. Mr. Petit testified that Ed Colbertson and Robert Fulmer, both Assistant Construction Engineers, visited the project site, along with other DOT representatives, such as the District Soils Engineer, the District Construction Control Engineer and the District Engineer. These facts were borne out by visitor lists known as Site Visits. (N.T. 1788-1791; Exhibit D-29, D-30)

98. Mr. Petit acknowledged, under cross-examination, that he did not specifically recall Mr. Ramirez from the Federal Highway Administration indicating that he did not like the finishing grade operation, complaining about the drainage on the project or indicating that he had a problem with the subbase operation. (N.T. 913, 914)

99. The second witness called by the Commonwealth was Mr. Richard Smith.⁸ Mr. Smith reviewed the soils information that was available to perspective contractors at the time of bid. This information was contained in the project plans. (N.T. 1925, 1934, 1935)

100. Mr. Smith testified that the Soil Report and Profile indicated that the project was to be constructed with A4 type soils which are defined as low bearing capacity or poor support type soils. He testified the profile indicated that there was an extremely high water table throughout a large portion of the project and there was a high water table in the cut areas. He acknowledged that although he had not actually performed a field review of the project, the indications of 1.54 miles of undercut, or 1/3 of the entire grade on the project would reflect that there was going to be some problems as far as the soil to be used and problems on the grade constructing and fills. (N.T. 1934, 1935)

101. Mr. Smith indicated that in preparation for his testimony, he reviewed the recapitulation of the contractor's bid and read through every page of the project's Master Diary. He also acknowledged visiting the project twice, once in 1986 and once in 1987. Mr. Smith opined that on this particular project, he would have used the lightest construction equipment, consistent with adequate ability to move earthwork, perhaps something in the neighborhood of 621 or 627 scrapers. Mr. Smith indicated that with the soils encountered on this project having extremely low bearing capacities, the soils do not have the ability to support heavy loads. (N.T. 1936-1943; Exhibit D-1)

102. Mr. Smith explained that the use of 637 scrapers on the instant project probably caused a good deal of rutting due to the almost 50% increase in weight as between a 637 scraper and a 627 scraper. (N.T. 1943, 1944)

103. The next witness called by DOT was Mr. David Williamson.⁹ Mr. Williamson works for the Construction Management Division of D & L and assists contractors in developing

⁸Mr. Smith graduated in 1958 from the University of North Carolina at Chapel Hill with a Bachelor's Degree in Geology and upon graduation was awarded both a Graduate Assistantship and the Ford Foundation Scholarship to go on to become a Doctor in Geology. Due to family reasons, Mr. Smith could not take advantage of the Scholarship and went to work for the Pennsylvania Department of Transportation as a Soils Engineer. Subsequently, he was transferred to the Field Material Section, and joined the Pennsylvania Department of Transportation, Bureau of Construction, in 1969. Mr. Smith eventually became the Western Division Engineer and was responsible for administering all of the contracts in Western Pennsylvania, where he stayed from 1972 to 1988. In 1988 he was transferred to the Office of Chief Counsel and became a Claims Engineer. His background includes training at MIT and North Western University. He is a licensed Professional Engineer in the State of Pennsylvania. (N.T. 1925-1934)

⁹Mr. Williamson graduated from Carnegie Mellon University in 1972 with a Bachelor of Science Degree in Civil Engineering. He continuing his education and received a Master's of Science Degree in Civil Engineering and was registered as a Professional Engineer in the State of Pennsylvania in 1976. He has worked for Draveau Corporation as a Design Engineer, for Babcock Contractors as a Project Engineer and now works for D & L. D & L provides engineering services and construction management and Mr. Williamson is in the construction management division of the company. (N.T. 1964-1967)

schedules for large jobs. He has assisted the American Bridge Company, to develop a schedule for a large bridge built in New York City, and H.J. Snyder and Trumbull for large highway construction projects. He has also been hired by the Pennsylvania Department of Transportation to analyze claims and perform schedule analysis. He is familiar with critical path method scheduling, including computer programs such as Primavera. He has previously been acknowledged by the Board of Claims as an expert in construction project scheduling. He was retained by DOT to review Great Lakes' claim and specifically review the documents obtained through discovery, to review DOT records, and to do an analysis of the project from a schedule point of view to determine what happened and why there were delays on the project. He was qualified as an expert by the Board. (N.T. 1968-1970; 1977)

104. Mr. Williamson also analyzed the progress of Great Lakes in the north wetlands area, the area of the west embankment (west of French Creek) and its impact on French Creek. Mr. Williamson noted that Great Lakes' effort on the west embankment area was "spotty". Mr. Williamson also felt that Great Lakes was not able to meet anticipated productivity according to Run 23, for other earthmoving work as well. (N.T. 2007-2012, 2015-2019; Exhibit D-34)

105. Mr. Williamson testified that he specifically recalled a letter from Great Lakes to DOT, dated March 27, 1987. In that letter, Great Lakes indicated that they switched Wroblewski material hauling to the French Creek embankment area to hauling for granular blankets, since Wroblewski did not have sufficient hauling units to permit simultaneous placement of granular material at the French Creek area. This letter "stuck" in Mr. Williamson's mind because the French Creek area was on the critical path and according to the letter, Great Lakes voluntarily chose to move to another area, even though they were behind in their schedule, and ignore the critical path. (Emphasis added) (N.T. 2013, 2014; Exhibit D-34)

106. Mr. Williamson also compared precipitation records taken from the National Oceanographic and Atmospheric Administration Records for Erie, Pennsylvania, summarized on a per month basis. Mr. Williamson compared the actual rainfall during the course of this project with 10-year and 30-year averages. He found that the month of June, 1986, was above both the 10 and 30-year averages; however, about 5 inches of that all came during the second week of June. He also found that July, 1986 was lower than both averages and August was lower than both averages as well. He noted that September, 1986 was higher; however, 3.91 inches of that came on one day, i.e. September 27, 1986. October, 1986 was very close to the 10-year average and higher than the 30-year average, while November, 1986 was less than both averages and December, 1986 was higher than both averages. He noted that in summarizing the information, overall the rainfall during the critical period in question was higher than the 10-year and 30-year averages, although approximately 9 inches of the actual precipitation was received over two brief periods. (N.T. 2022, 2023; Exhibit D-33)

107. Mr. Williamson also disputed Great Lakes' claim that one type of activity was dependent upon another and Great Lakes could not proceed due to unforeseen circumstances such

as weather, flooding, etc. Mr. Williamson indicated that Great Lakes' work was sporadic in certain activities even when the work "in front of them" was done. (N.T. 2028-2031)

108. Mr. Williamson did not waive concerning his expert testimony despite extensive cross-examination. (N.T. 2052, 2054, 2069, 2094, 2116, 2155-2157, 2180)

109. The final witness called by the Defendant was Frederick R. Miller.¹⁰ Mr. Miller was offered by DOT as an expert in the field of calculation of damages regarding construction claims, construction claim pricing, construction claims methodology and costs analysis of construction claims and was admitted as an expert by the Board. (N.T. 2199, 2205)

110. Mr. Miller was asked by DOT to analyze the claims submitted by Great Lakes and this analysis included an in-depth view of the substantial documentation utilized in the substantiation of their claim. Mr. Miller reviewed the methodologies used in their calculations and recalculated the methodologies that were used, to determine if they were appropriate and to come to a judgment or an opinion as to the appropriate amounts in those particular claim items. He prepared a report concerning these matters. (N.T. 2206, 2207; Exhibit D-35)

111. Mr. Miller was specifically involved in the supervision and direction of members of his team who went to Great Lakes and executed a work plan. Mr. Miller or representatives of his team met with Mr. Allen and Mr. Milgac at Great Lakes and reviewed job cost records and a supporting level of detail behind those records. Mr. Miller and his team reviewed the project minutes, correspondence, and have discussed the same with the scheduling expert hired by DOT. Mr. Miller and his team were involved in the defense of this claim since the beginning of 1990. (N.T. 2208-2212)

112. Mr. Miller opined that it was very clear that Great Lakes' damages were calculated as a "total cost claim." Mr. Miller testified that clearly all of the damages claimed by Great Lakes were not reasonable which is a basic element of sustaining a total cost claim. He also testified that there were inefficiencies "on both sides of the fence" and in order to substantiate a total cost claim, the Claimant must demonstrate that no other entity caused the problems other than the owner. He also testified that the Claimant has several other methods they could have used to calculate their

¹⁰Mr. Miller is a partner with Coopers/Lybrand, LLP. He received an Undergraduate Degree (B.A.) in Economics from Rutgers College and an MBA in Finance Accounting from Cornell University, Graduate School of Management. He has taken a number of graduate level courses in subjects such as Operations, Management CPM Scheduling. He has worked for such firms as Author Anderson & Company, SC and Peterson and Company, specializing in Construction Industry Consulting. He has done an extensive amount of work in the area of construction project claims, highway and bridge and road claims. He has testified regarding construction project acceleration claims and has authored and co-authored a number of articles and chapters in text books in regard to the theory of construction claim damages, the appropriateness of methodologies used in construction claims analysis and how to put together claims. He has also lectured extensively and taught extensively in those areas. Mr. Miller is a certified Public Accountant, licensed in the District of Columbia and is a member of the American Institute of Public Accountants and a member of the D.C. Institute of Public Accountants. Mr. Miller has been admitted as an expert with regard to construction claims in both State and Federal Courts. (N.T. 2199-2205)

damages and as such, they did not qualify to use the total cost claim method because you must prove, under that method, that you have no other way to calculate your claim. He also testified that he did not believe it was appropriate for Great Lakes to use force account methodology and blue book rates. (N.T. 2212-2218)

113. Mr. Miller analyzed particular aspects of Great Lakes' claim, such as general and administrative costs and found that not only did their claim exceed their loss on the project, but it also exceeded the projected profit for the bid for the item claimed. His analysis of the claim relating to equipment owned by Great Lakes indicated that there was a 1.3 million dollar difference between the amount claimed and the amount that was in their own cost records. With regard to profit and overhead, Mr. Miller testified that the use of a 25 percent markup was unreasonable and lacking in support. (N.T. 2225-2227; Exhibit D-35)

114. Mr. Miller also did an analysis of Great Lakes' methodology regarding insurance and payroll taxes and found that the contractor, for 1986, indicated their rates and the breakout of these particular insurance and payroll taxes were 31.69 percent and 32.25 percent as illustrated by Great Lakes' own documents. Mr. Miller then testified that Great Lakes, however, employed a methodology that resulted in a 43.19 percent labor rate for insurance and payroll taxes and Mr. Miller opined that he did not believe that rate was justified based upon Great Lakes' actual and contemporaneous records. Mr. Miller also performed an analysis regarding Great Lakes' methodology with respect to their claim for material and material handling costs. In this regard, Mr. Miller testified that he found erroneous information in both of these areas, both in the weight area and in the amount of tonnage and that applying Great Lakes' own records, there was an error or overstatement of claim of approximately \$51,000.00. Mr. Miller noted that the Claimant made a comparable deduction by way of an amendment of their claim before the Board. (N.T. 2227-2229; Exhibit D-35)

115. Mr. Miller also performed an analysis of Great Lakes' claim for 11 inch concrete pavement and testified that after he reviewed the bid and the support for the amount included in the claim, he found what appeared to be a mathematical or transposition error between their detail bid and their summary bid, wherein the cost figure that should have been used was much higher than the figure actually used. Mr. Miller pointed out that when the difference was multiplied by the amount of paving quantity, quantity installed, it resulted in a \$236,000 amount that was "left on the table." Mr. Miller opined that this was a bid error on the part of Great Lakes of approximately \$236,000. (N.T. 2230, 2231)

116. Mr. Miller opined that after taking into consideration all of the adjustments to the damages portion of Great Lakes' claim, and assuming Great Lakes was entitled to payment of their claim, their net cost overruns totaled \$686,956.00. (N.T. 2232, 2233; Exhibit D-35)

117. Mr. Miller also performed an analysis of the total monthly interest which was an interest calculation related to the cost of working capital. Mr. Miller testified that Great Lakes had presented no documentation as to true interest costs nor any supporting documentation that the

interest was actually incurred. Mr. Miller opined that it is not sufficient in damage methodology and construction cost methodology to demonstrate that you simply incurred overall interest, but rather you must demonstrate that the interest was incurred on a given particular project and because of that project. Mr. Miller testified that he had not seen any indication that Great Lakes had incurred financing costs due to, for example, the contractor not paying monies due under a contract in a timely manner. (N.T. 2244, 2245)

118. Mr. Miller, under cross-examination, accurately outlined his understanding of the claim, although he was not familiar with the amended complaint. (N.T. 2254, 2255; 2257, 2344)

119. Mr. Miller testified, under cross-examination, the he did not believe it was reasonable to charge Blue Book rates under certain scenarios, e.g., where a contractor tries to recover three and four times the value of a particular asset during a long delay because the Blue Book has certain calculations and certain adjustments that do not compare to the actual cost of the item to the contractor. (N.T. 2365)

120. Mr. Miller testified credibly and consistently despite extensive cross-examination by Claimant's counsel. (N.T. 2291, 2294, 2295, 2302, 2309, 2313, 2327, 2328, 2351, 2363, 2368, 2369, 2377, 2423, 2433, 2434, 2444, 2450, 2451, 2454, 2462)

IV. REASONABLENESS OF THE DEPARTMENT'S SCHEDULE

121. The contract provides at page 7, paragraph 4, as follows:

The contractor covenants and agrees that all work (including, but limited to, all labor performed and materials supplied) on this project shall be performed and completed to the satisfaction of the Chief Highway Engineer of the Department of Transportation four hundred seventy eight consecutive (478) calendar days after written notice to proceed with work has been given by the Department. If, for any reason, except as provided in the contract, the contractor fails to complete all work on this project to the satisfaction of the Chief Highway Engineer within the aforementioned time allowed, the Department shall deduct from any sums due or which may become due the contractor the amount indicated in the Specifications for each calendar day used in excess of the aforementioned number of days allowed, or, in case a completion date is fixed, for each calendar day elapsing between that completion date and the actual date of completion. If no sums are due the contractor, the

contractor agrees to remit to the Department the aforementioned sum for each day used in excess of the time allowed for completion of the contract. The amounts deducted or remitted under this paragraph are liquidated damages and not penalties.

(Exhibit P-1, page 7)

122. The contract between the parties also indicates on Page 7, at paragraph 5, the following:

The Contractor further covenants and warrants that he has had sufficient time to examine the site of the project; that he has examined the site of the project; that he has had sufficient time to examine the site of the project to determine the character of the subsurface materials and conditions to be encountered; that he is fully aware and knows of the character of the subsurface materials and conditions to be encountered; and that he has based the within contract prices on his own independent examination and investigation of the project site subsurface materials and conditions and has not relied on any subsurface information furnished to him by the Commonwealth of Pennsylvania, Department of Transportation, its agents or its consultants.

(Exhibit P-1, page 7)

123. The claimant's George Kling testified, with regard to the D-476 bar chart, as follows:

Q: Do you use the D-476 bar chart in the contract in any way?

A: The bar chart that was in the contract, we did look at. It indicated to us that the completion time was 478 days.

It indicated a winter shutdown because of the weather conditions there. It also indicated that the schedule was based on an eight-hour day.

Q: And did you use that in preparing your estimate?

A: We did use that in (sic) the extent that, to us, it meant that an eight-hour day would not require any extraordinary overtime or weekend work or any unusual fast track operation.

(N.T. 39)

124. Mr. Kling testified that in the preparation of Great Lakes' estimate he did not expect to schedule overtime, although Great Lakes does not create schedules for the estimates, but rather refer to the contract documents. He established that in this particular case Great Lakes reviewed the bar graph and "it looked reasonable". (N.T. 39, 45)

125. Mr. Kling acknowledged, under cross-examination, that he had one course while attending the University of New Mexico regarding CPM schedules. Mr. Kling described how a critical path method is arrived at as follows: "[t]he critical path method is arrived at by creating a flow chart for a project which is a sequence of activities which have a duration on them. And by making a forward pass and a backward pass on those activities, you can determine which items are critical. Generally, the forward pass and the backward pass dates will be the same, and those have what is called a zero float, and those are the critical items in the schedule." (N.T. 57, 58)

126. Mr. Kling testified that he had experience with regard to the type of work (e.g. building bridges, making cuts and fills, construction of highway ramps, construction of embankments, etc., that was required to be performed by Great Lakes during the course of the instant project. (N.T. 59-63, 65)

127. Mr. Kling also testified that Great Lakes normally subbed out guardrail work, asphalt work, lighting work, signing work, bridge painting and bridge structural steel. He established that Great Lakes normally did all of the concrete work. (N.T. 66)

128. Mr. Kling also testified that Great Lakes did an analysis whereby historical costs were used in preparing estimates. These costs were obtained from all projects that the company is working on and the costs are grouped on a monthly basis by a particular item of work. By reviewing these historical costs, Great Lakes could see the range of pricing for particular items and use that as a guide to formulate the pricing for the project under consideration, taking into account the location of the project, the type of project and the quantities involved as they relate to that project. These historical costs are generated by the projects that are active at a particular time. (N.T. 39, 40, 69)

129. Mr. Kling testified that he had not prepared the Great Lakes' bid for this particular project, but rather had the help of Randy Radel and Steve Lehr, both of whom are on the Great Lakes estimating staff and graduate engineers. Mr. Radel did a lot of the take-off on the roadway items, drainage items and earthwork items and prepared "recapitulation sheets" for those particular items. Recapitulation sheets are an estimating form utilized by Great Lakes, that are used to denote where the particular items are in the plans on the various plan sheets, how they are broken down and also

contain a summary of the materials that are required for each of those particular items. Mr. Lehr was involved primarily with the bridge take-off. Mr. Kling also indicated that Mr. Kaplin was involved in the project and supervised his work and worked with Mr. Lehr in pricing out the bridges. (N.T. 72-75)

130. Mr. Kling acknowledged, under cross-examination, that the instant project was the first project where Great Lakes ever had to replace wetlands.¹¹ He also acknowledged that Great Lakes did not undertake any steps to determine the accuracy of the estimated quantities in DOT's bid proposal because they did not find any obvious errors in the estimated quantities. Mr. Kling also acknowledged that Great Lakes undertook a site inspection in order to prepare the estimate, wherein Mr. Radel and Mr. Kling drove to the project and performed a site inspection. Mr. Kling acknowledged that he noticed a number of "little creeks" that run through the project and would have culverts in them. Mr. Kling also acknowledged that they walked out towards French Creek from Ashton Road, which he described as a "wetlands area". He also acknowledged that approximately 10%, or 1,800 feet, of the mainline for the overall project ran through the French Creek area. (N.T. 76-81)

131. Mr. Kling also acknowledged that Great Lakes reviewed the borings that were in the plans, as far as the types of soils that they would encounter in the cuts, and those borings indicated an A-4 (silty clay material) type of soil. He acknowledged that most of the projects that Great Lakes has performed around the Cleveland area generally have the same type of silty clay soil. Mr. Kling acknowledged that A-4 material is not an easy material to work with because it is a water susceptible type of material, it holds water and tends to frost heave in the winter. (N.T. 82, 83)

132. Mr. Kling testified that there is a difference between working with A-4 material in the summer weather and working with it in the winter weather. He indicated that the material dries out much quicker in the summer and that your efficiency is much better in the summer when your working with that type of material. Mr. Kling also indicated that when Great Lakes bid that particular job, he did not expect to be working with that type of material in the winter. (N.T. 134)

133. Mr. Kling acknowledged, under cross-examination, that a bar graph is a simpler type of schedule than a CPM schedule. He indicated that a bar graph "just denotes time periods" where as a CPM schedule has durations of activities which are more defined than the activities might be in a bar graph. He acknowledged that a bar graph does not indicate dependencies between one activity and another, whereas a CPM schedule does indicate dependencies between one activity and another. (N.T. 84, 85)

¹¹Mr. Allen also acknowledged, under cross-examination, that the instant project was Great Lakes' first PennDOT project as well. (N.T. 1518)

134. Mr. Kling, again under cross-examination, acknowledged that the D-476 bar chart schedule looked reasonable with respect to the time of year that things were taking place and taking into account the quantities that were involved on the project, it also looked like what the schedule indicated needed to be done could be done in those time periods. (N.T. 85)

135. With regard to the D-476, Mr. Kling also acknowledged that although there were four sites that had structures on them, the D-476 bar chart had no indication how many structures required work on the project. Mr. Kling also acknowledged that the D-476 did not indicate whether all four structures were going to be worked on simultaneously for the durations indicated in the bar chart, or otherwise. Mr. Kling acknowledged that a CPM schedule would normally indicate whether all four structures were going to be worked on simultaneously or not, because it would have a sequence of operations. (N.T. 86, 87)

136. Mr. Kling testified that he believed that the schedule did not indicate that Great Lakes would have to work any extraordinary overtime or double-shifts and that the time allotted looked reasonable on the D-476 bar chart. Mr. Kling based this opinion on his experience and the limited amount of time he had to prepare an estimate. He acknowledged that he made the evaluation that the D-476 looked reasonable knowing the physical particularities of this job, in addition to the requirements of the contract plans. When asked, under cross-examination, if the D-476 looked reasonable, “knowing that this was a silty clay soil, knowing that you had to build a mainline roadway through a marsh, knowing that you had to build four structures in 478 calendar days, knowing the estimated quantities in the contract, or in the bid proposal. . .” , Mr. Kling replied simply, “yes”. (N.T. 87-89)

137. Mr. Kling acknowledged, under cross-examination, that the D-476 bar chart shows a winter shutdown period and that Great Lakes “generally” did not plan on doing anything other than “minor items” during the winter shutdown periods. (N.T. 117-119)

138. Mr. Kling acknowledged, under cross-examination, that he did not anticipate pouring concrete in the winter and that was something that he did not normally anticipate doing. When asked what might cause him to anticipate pouring concrete in the winter, Mr. Kling responded that it would depend on the “criticalness” of the job schedule. He acknowledged that there was nothing on the bar chart that would show him that the job schedule was critical. He acknowledged, that in general, you would have to look at a critical path to determine what portions of the schedule were critical and that, with regard to this particular project, no critical path was provided. (N.T. 134-141)

139. Mr. Kling established that no schedule at all was produced by Great Lakes prior to bid. Mr. Kling also established that Great Lakes did not attend the pre-bid meeting. Mr. Kling also acknowledged that he did not attend the pre-construction meeting. (N.T. 180, 182, 184)

140. Mr. Kling, during cross-examination, reviewed a CPM schedule which had previously been marked as Exhibit No. 10 during an earlier deposition and established that the CPM schedule was prepared through the Primavera program. The CPM schedule indicated a completion date of

September 8, 1987, which was the same completion date for the project, based on a notice to proceed date of May 19, 1986. This CPM schedule had an indication that it was "Run No. 23". Mr. Kling testified that Run No. 23, marked as Exhibit P-14, contained certain contract scheduling requirements, among them, the restriction that you could not work both German Road and Ashton Road at the same time, the restriction of the fills at French Creek, because they had to be done before you could make the cut at Ashton Road, and the restriction that the wetlands had to be done before the embankment was constructed at French Creek, all of which were reflected in Run No. 23. (N.T. 166-168, 172, 173, 187, 188; Exhibit P-14)

141. Mr. Kling acknowledged that Run No. 23 was a CPM schedule. (N.T. 186)

142. Mr. Kling acknowledged under cross-examination that when Great Lakes prepares a bid, they do not rely on DOT's production rates, but rather rely on their own production rates to prepare a bid. Similarly, Mr. Kling acknowledged that when Great Lakes prepares a bid, although there may not be a conception of a schedule written on paper, there is some conception of how Great Lakes is going to schedule that job in reference to the sequence of work. (N.T. 189, 190)

143. Mr. Strazzo, although he could not recall who the question came from or ever being told any such thing from a representative of PennDOT, acknowledged that, in the Progress Meeting Minutes of November 13, 1986, the following notation appears, under section IV Outstanding Problems: "f) Weather Days - PDOT agrees with our assessment of lost days within two days. Whether they will actually extend the contract period for these days is unclear. Due to the desire of the Department to have this road opened in 1987, they set this job up with calendar days in lieu of working days for performance. When this action is taken, they feel that the contractor must do whatever is necessary to get the job done on time." Mr. Strazzo testified that he recalled being told numerous times that Great Lakes must do whatever is necessary to get the job done on time. (N.T. 298-301; Exhibit P-20)

144. Mr. Strazzo established, in an effort to try to expedite the job, that Great Lakes requested permission to "waste" Class 1 Excavation and received permission to do so by PennDOT pursuant to a letter dated January 2, 1987 from William R. Jones, A.D.E. for construction on the project. Mr. Strazzo acknowledged the prospect of wasting Class 1 Excavation was ". . . not the way the job was initially set up." (N.T. 314-317; Exhibit P-40, P-41)

145. Mr. Strazzo acknowledged that the CPM schedule prepared by Great Lakes, marked as Exhibit P-14, could be considered an "early start/late start schedule", but later recanted. (N.T. 327, 328, 599, 600, 608)

146. Mr. Strazzo, under cross-examination, denied that Great Lakes ever had a CPM schedule for this project. He acknowledged that Great Lakes had a "sequence of events" for the project; however, he testified that Great Lakes never really had a schedule because they could never

get one to fit within the time allotted for this job. Mr. Strazzo also acknowledged that the planned sequence of operations, which was marked as Exhibit P-14, was utilized at the beginning of the job and reviewed with individuals in the field. (N.T. 334-336; Exhibit P-14)

147. While under cross-examination, Mr. Strazzo refused to acknowledge that Exhibit P-14 was a schedule; however, he did acknowledge that the “planned sequence of operations” indicated that all of the substructure work for the French Creek Bridge was to be performed during the winter time. Mr. Strazzo also testified from Exhibit P-14 as to a number of early start/early finish and late start/late finish dates for various activities. (N.T. 334, 335, 347-351; Exhibit P-14)

148. Mr. Strazzo acknowledged, under cross examination, that Great Lakes anticipated, as the job went forward, placing three cast concrete beams on structures during the winter time. (N.T. 356-358)

149. Mr. Strazzo, with some difficulty, did a comparative analysis at the time of trial concerning “weather days” which were noted in a “weather schedule” that PennDOT has developed over the years. This weather schedule was to be incorporated into Great Lakes’ CPM schedule. Mr. Strazzo testified that if PennDOT sent a workday/calendar day conversion chart to use, he never personally saw it, although he thought PennDOT did send it to Great Lakes later in the project. Mr. Strazzo acknowledged, under cross-examination, that no one from the Department ever told him that he could not work a given number of days in any particular month. (N.T. 305-307, 359; Exhibit P-11, P-21)

150. Mr. Harley testified that generally he did not contact a consultant who may have been involved in the preparation of a design schedule and specifically did not remember contacting the consultant pertinent to the instant project. However, Mr. Harley did indicate that contacts with the consultant would be made through the district office. He indicated that it was “very common” to go to the district and have officials at the district office inquire as to issues concerning design schedules. While he could not recall specifically speaking with the consultant on the instant project, he assumed that contact would have been made by the district due to the fact that the project duration was shortened. (N.T. 446-449)

151. Mr. Harley testified that he made a determination that the D-476 on this project was realistic. He testified that the determination was based upon sound engineering judgment and experience. While Mr. Harley candidly acknowledged that he never worked in the field doing roadway work, and never had anything to do with supervising the construction of a roadway project, he indicated that it is possible to evaluate the experience of others and to make determinations from information that has been provided. He also indicated that other DOT employees, such as Mr. Shaw, worked with him in revising the consultant schedule and had field experience. (N.T. 459-462)

152. Mr. Harley, due to the length of time that had passed from when he originally worked for DOT relative to this project and the time of trial, could not recall many aspects of the work he performed for this particular project. However, he was certain that he would have reviewed

documents that established items of work, quantities, the rate of production or at least the anticipated rate of production and the work days required to complete a particular project item. He testified that that type of information would be utilized in coming up with a schedule. He testified that he would look at the productivity rates to make certain that they were accurate. Mr. Harley candidly acknowledged while he could not remember comparing the productivity rate, with another job, although that was something he generally did. Similarly, he testified that he would generally examine the quantities to make certain they match the proposed plans. (N.T. 471-474; Exhibit P-32)

153. Mr. Harley also acknowledged the fact that a schedule was based upon eight hours a day and was significant in that it indicated a job was going to be constructed with a normal schedule. Mr. Harley established, with respect to “calendar days” and “work days” that there was often “confusion between the consultants and the district” regarding DOT requirements. Mr. Harley established that often times there was confusion between calendar days and work days and they were often misrepresented. (N.T. 476, 477)

154. Mr. Harley acknowledged that the consultant on the project, Dalton-Dalton-Newport, believed the project was going to require 355 work days. As such, the project would have been approximately a three and a half year project. (N.T. 470, 477, 478)

155. Counsel for the Plaintiff specifically asked Mr. Harley if he had added 129 days, which were set aside under the D-476 for winter suspension, to the 355 days which had been listed as “work days” by the consultant. Mr. Harley responded that he had absolutely not based his schedule on any such calculation and that he had never worked a project in that manner. Rather, Mr. Harley established that he went back and re-worked the working day schedule and it calculated out for the numbers contemplated by the D-476. (N.T. 478-481; Exhibit P-32)

156. With regard to the number of days provided for structures work, Mr. Harley explained that the 301 days provided by the D-476 was calculated by using a computer program that Mr. Harley and another person wrote. This computer program converted work days to calendar days and added additional days when required for the end of the project. The computer program also involved the payment and figured out the information necessary for the contract documents. (N.T. 483-488)

157. Mr. Harley, when asked by Claimant’s counsel why he allotted 159 days for structures work, when the consultant allotted 215 days for one structure, indicated that he was familiar with complete bridges being built in less than 60 days, including fabrication of concrete beams necessary for the project. Mr. Harley testified that the fact that a consultant says it takes 215 days for a structure does not necessarily mean that that is the actual time it should take to build that structure. Mr. Harley testified that at the time he reviewed the consultant’s estimate as to completion of the structures, he probably considered the estimate “an awful long time to build the structures. . . for this particular project.” (N.T. 490-492, 496, 497)

158. With respect to the structures work for the project, Mr. Harley testified that consultants do not always provide correct and accurate working time schedules, particularly where

structures are involved. He indicated that he felt at the time that 159 working days was certainly adequate for structures work on this project. (N.T. 496, 497)

159. Mr. Harley also candidly acknowledged that he had made some errors in calculations during his deposition concerning the calculation of working days and calendar days for the project. However, Mr. Harley explained how he calculated the number of working days for excavation by utilizing a chart prepared for trial. Mr. Harley acknowledged that, while the number of calendar days is not suspended during the winter shutdown for the total project, DOT did not expect any productive work to be completed during the winter suspension. (N.T. 523-536, 541, 561-567; Exhibit D-4)

160. Mr. Harley testified that in the “large majority” of time, design consultants are not asked to account in any way for the conversion of working days to calendar days, because they have no idea when the project is going to be let or construction is to begin. He indicated that essentially it would be a waste of time for a design consultant to go through a work day to calendar day conversion and that the conversion is a responsibility that starts with the district level and then comes to the central office of DOT. (Emphasis added) (N.T. 570, 571)

161. Mr. Harley testified that Mr. Monago, the design consultant from Dalton-Dalton-Newport, who actually prepared the work submitted to DOT, may have been confused regarding the 90 days provided for in the contract with respect to the settlement and monitoring of embankment. Mr. Harley indicated that Mr. Monago, due to the fact that his entire document represented work days, may have provided for 90 “work days”, when the contract requires 90 calendar days, thus adding to the confusion surrounding Mr. Monago’s report. (N.T. 573-576)

162. Mr. Harley testified that he felt this particular project was a “structure controlled project”. (N.T. 564, 586)

163. It is extremely significant to note that Mr. Harley did not change the number of days suggested by the design consultant for earthwork. (N.T. 562, 563, 587, 588)

164. Mr. Harley testified that 215 working days for a structure of the type contemplated by the instant project, when you have an embankment settlement period, seemed like a very long time. Mr. Harley testified “I have a problem with a two-year structure of that size.” (N.T. 597, 598)

165. Mr. Radel testified that when Great Lakes attempted to put all of the contract restrictions into a CPM program, the completion date was way beyond the scheduled contract completion date. Mr. Radel candidly acknowledged that the instant project was the first project that he was on for Great Lakes Construction. (N.T. 224, 225)

166. Mr. Radel testified that it was not unusual for his first several attempts at a CPM schedule to be way off; however, usually after a number of attempts, you begin to at least approach those conditions you were trying to meet. However, when Mr. Radel was attempting to produce a CPM schedule for the instant project, irrespective of the fact that he had reviewed potential

mistakes as to logic, typos, etc., there was no way to make the completion date work without taking out the winter shutdown. This schedule included 5 days a week with no input for days which might be lost for weather conditions. Mr. Radel could not recall whether or not this schedule allowed for holiday breaks. (N.T. 225-230; Exhibit P-14)

167. Mr. Radel explained that Run No. 23 did not necessarily reflect the fact that 22 Runs had been prepared prior to that particular CPM schedule. On the contrary, the number “23” was indicative of only the fact that the computer had printed out that many schedules, even if a number of them had been the same. Similarly, the schedules could have been changed in the computer without the run number reflecting that fact. (N.T. 234; Exhibit P-14)

168. According to Mr. Radel, Great Lakes never came up with a workable CPM schedule that met the contract conditions. He indicated that “[t]here was nothing that I saw that could meet everything 100 percent” (N.T. 236, 237)

169. When asked by the attorney for Great Lakes why his company did not run a CPM schedule prior to May 1, 1986 (also prior to the notice to proceed date) Mr. Radel responded “[i]t was just a time problem. From the time you get awarded the project or that you know you are the low bidder to the time you usually have a pre-con meeting is usually a short period of time. And a lot of times this isn’t the only particular project that you have to work on. It’s just a time restraint and manpower restraint.” (N.T. 243)

170. Mr. Radel acknowledged, under direct examination, that during the course of preparing a bid for this project, in putting the numbers together and getting material prices and subprices, a contractor may have two weeks, a month, or two months to put the bid together and totally analyze everything. Mr. Radel also acknowledged that it would take two to four weeks to reasonably put together a CPM schedule for the instant project. (N.T. 244)

171. Under cross examination, Mr. Radel acknowledged that none of his CPM work in his undergraduate career involved roadway CPM work. He also acknowledged that the CPM work in his undergraduate career was “very simple” CPM work. He similarly acknowledged that the instant project was the first time he ever became involved in preparing a schedule for a highway construction project and was unfamiliar with Great Lakes’ software used in preparing CPM schedules. (N.T. 247, 248)

172. Mr. Radel also acknowledged, under cross-examination, that he did not have any input in terms of the schedules with regard to durations of activities when the various CPM schedules were prepared for this project. He acknowledged that the information was provided to him by an individual named Mark Bacon and that the logic for the CPM schedule was also not performed by him. He acknowledged that the original logic of an activity was done by Mr. Bacon and where that logic could be duplicated, Mr. Radel copied it. Similarly, in preparing the flow chart which was used to prepare the CPM, Mr. Radel utilized information provided by Mr. Bacon for a good portion of the flow chart preparation. (N.T. 248-251)

173. Mr. Radel admitted, under cross-examination, that the only restriction the Run No. 23 CPM schedule did not meet was the winter shutdown. Thus, all of the other restrictions, such as Great Lakes' inability to close both Ashton and German Roads, at the same time, the 90-day surcharge period before you could build the French Creek embankment, construct wetland before you could start embankment and the other restrictions in the contract were included in the schedule. (N.T. 252, 253)

174. Under cross-examination, Mr. Radel acknowledged that the date of the contract was March 27, 1986, and the date of the first pre-construction meeting was May 1, 1986. Counsel for the Commonwealth asked Mr. Radel whether a period of roughly 5 weeks would be enough time to prepare a CPM schedule for this project and Mr. Radel responded; “[p]er my previous statement, two to four weeks, so five weeks would be enough time, yes.” (N.T. 258, 259; Exhibit P-1, P-23)

175. Under cross-examination, Mr. Radel acknowledged that he was not aware of anyone from Great Lakes ever communicating to DOT, while they were preparing their CPM schedule, that Great Lakes felt that the job could not be completed in 478 calendar days with a winter shutdown. However, Mr. Radel also testified that he did not know whether or not the contract was awarded prior to April 17, 1996 and that Great Lakes was bidding other projects at that time. (N.T. 261, 262, 266)

176. Mr. Radel also acknowledged, under cross-examination, that he did not completely read the bid material, nor did he review all of the plans that were included in the bid package, at the time he was helping to prepare the bid for this project. He also acknowledged that he did not review the structure drawings nor the erosion and sedimentation control contained in the narrative portion of either the bid package or the contract. (N.T. 269-271, 275)

177. Mr. Rooney, when asked questions concerning progress meeting minutes, acknowledged that during a meeting where only Great Lakes personnel was in attendance, the minutes reflected the following statement: “Presently, our schedule shows work one month behind.” Mr. Rooney was quick to explain, at the time of trial, that the term “schedule” was utilized in a generic sense. He testified “[t]hat’s what we had planned on doing. We did not - not referring to any particular schedule on the job.” The progress meeting minutes containing these statements were dated July 7, 1986. It should be noted that this testimony from Mr. Rooney was elicited under direct examination. (N.T. 681, 684, 685; Exhibit P-16)

178. Mr. Rooney testified that in his opinion the D-476 schedule was an “impossible schedule” and that the durations and the time-frames just do not work out right. He indicated that Great Lakes could not have “thrown” enough men and equipment to accomplish the schedule, given the restricted access, sequencing and A4 material that were inherent to this project. (N.T. 692-694)

179. Mr. Rooney testified that while it did not assist Great Lakes with regard to their schedule during their project, Great Lakes did receive a twenty (20) day extension of time for the completion date from September 1, 1987 to September 21, 1987. (N.T. 709-711; Exhibit P-43)

180. Mr. Rooney testified concerning a letter from DOT, dated March 10, 1987, to Great Lakes from William R. Jones, A.D.E. for construction. Mr. Jones indicated in his letter that structure work on the project was well behind schedule in accordance with Form D-476 and that possible reasons for the schedule being behind were:

- (A) Late start on structure work.
- (B) Pier footer S-15460A improperly placed and had to be removed and replaced.
- (C) Back wall S-15458 improperly placed and had to be removed and replaced.
- (D) Abutment embankment for S-15458 was not properly placed and had to be removed and replaced (approximately 4') causing delays.

Drainage is also well behind schedule and possible reasons are:

- (A) Late starting of drainage work.
- (B) Rock base in German Road had to be removed and replaced due to improper geotextile being used.
- (C) D-W end wall footers, Sta. 302+ Lt. and Rt. - left footer was removed and replaced twice. Right footer was removed and replaced due to improper placement.
- (D) Spillway in north wetland was removed once for improper geotextile; once for improper rock size. Also, R-6 buffer was placed without geotextile and had to be removed and replaced.

Also, earthwork is well behind schedule and the possible reasons are:

- (A) Late starting of earthwork operations.
- (B) Improper shaping for drainage of embankment and excavation work areas.
- (C) Improper drying and compacting of embankments.
- (D) Late placement of drainage limiting size of work areas.
- (E) In the critical area of the French Creek embankment area, work was progressing at a steady pace until 8/14/86, at which time work ceased until 9/3/96 causing a delay of approximately 3 weeks.

Mr. Rooney acknowledged that a number of the statements contained in William R. Jones' letter of March 10, 1987 were accurate; however, he denied that Great Lakes had any responsibility for an overall delay of the schedule. Quite to the contrary, Mr. Rooney indicated that the various problems outlined in Mr. Jones' letter of March 10, 1987, took "a day" to correct "2, 3, 4 hours" etc., when the entire project was more than a couple of months behind. (N.T. 712-737; Exhibit P-44)

181. Mr. Rooney acknowledged, under cross-examination, that virtually all of the items mentioned as possible reasons for the project being well behind schedule in accordance with the Form D-476 as outlined in DOT's William R. Jones' letter of March 10, 1987, to Great Lakes Construction, other than the "late start" allegation, were the responsibility of the Claimant. Mr. Rooney indicated that, although the spillway in the north wetland region had to be removed once for improper geotextile materials, once for improper rock size and the R-6 buffer was placed without geotextile and had to be removed and replaced, all of this was corrected in one day, despite the fact that the spillway is constructed with large rocks. (N.T. 855-866; Exhibit P-44)

182. Mr. Rooney, under cross-examination, acknowledged that he had never participated in the construction of wetlands prior to the instant project. (N.T. 757)

183. Mr. Rooney, under cross-examination, could not explain why there appeared a notation in the "piledrivers" section of the Pre-job Meeting Minutes of May 2, 1986, that: "[t]he French Creek bridge will have sheet piling for the two cofferdams on the piers. It is anticipated that this work will be performed in the fall." Mr. Rooney acknowledged that Butch Boyer, the Vice-President of operations at that time, ran this particular meeting. The Pre-job Meeting Minutes, under the same section, also contained the notation: "It is anticipated that the piling will start in the month

of June for a couple of weeks and then will begin again in late fall.” Mr. Rooney acknowledged that the work for two cofferdams would be one of the first items or activities to be performed on that bridge, although he could not conceive any way that Great Lakes’ Director of Operations figured he could work in the French Creek area in the winter time. Mr. Rooney testified: “I don’t understand why he would think that if he did.” (N.T. 800-802; Exhibit P-15)

184. Under cross-examination, Mr. Rooney acknowledged that no one from Great Lakes informed DOT in writing that Great Lakes could not come up with a workable schedule early in the project. (N.T. 882)

185. Mr. Allen testified that as of October 27, 1986, he did not have “any opinion” as to whether or not the schedule itself was defective. Mr. Allen also testified that as late as March 27, 1987, he did not know about the “defective schedule.” (N.T. 907, 918-920)

186. Mr. Allen initially indicated that he relied on the information contained on the D-476 as being reasonably accurate and correct, however, on cross-examination he acknowledged that the D-476 was not a schedule that Great Lakes relied on in the field and also could not be utilized to base construction operations. Mr. Allen also acknowledged that there was no inter-relationship between operations on the D-476 Schedule such as would appear on a CPM Schedule. (N.T. 903, 961, 964, 965; Exhibit P-1)

187. Mr. Allen acknowledged, under cross-examination, that only one or two days of Class 1 Excavation, as indicated by pay quantity submittals, was performed between September 11, 1986 and January 28, 1987. Mr. Allen indicated that it was not unusual to have work performed on an item without having a pay quantity to turn in and that although excavation may be completed, you still have to shape slopes, shoulders, finish up ditch lines, waste areas and borrow areas; however, he could not dispute the fact that Great Lakes’ own records indicated that only one or two days of Class 1 Excavation Pay Quantity was performed between September 11, 1986 and January 28, 1987. (N.T. 1456-1461, 1464; Exhibit D-17)

188. Mr. Leary opined, in comparing Plaintiff’s Exhibit 62 (Great Lakes Construction Company As-Built Schedule Summary) and Exhibit 61 (Graphic showing PennDot Contract Schedule actual weather shutdown days) that there was a considerable amount of excavation work performed in the winter. He also was of the opinion that there was a considerable amount of overtime work done, approximately twice as much as originally anticipated. Mr. Leary also indicated that the consolidation period was shortened from the specified 90 days to approximately 60 days and Great Lakes wasted select material at the west end of the project and borrowed material at the east end, both of which saved time on the project. Great Lakes also brought some significant pieces of equipment into the project in 1987. Great Lakes also worked, according to Mr. Leary, through the winter, working weekends and shift work. Mr. Leary testified that all of these things indicated that the project was “accelerated” by Great Lakes. (N.T. 1098-1100; Exhibit P-62)

189. Mr. Leary also prepared a URS Design Schedule wherein he took PennDot's Consultant's Schedule and put it into Primavera utilizing the appropriate work-day calendar. Mr. Leary compared the URS Design Schedule as placed on the Primavera program, with the conversion of working days to consecutive calendar days as prepared by DOT's Rich Harley. Mr. Leary acknowledged that the comparison applied to the "structure calendar" but nevertheless opined that earthwork items in the earthwork schedule would have been impacted and "possibly extended". (N.T. 1100-1102; Exhibit P-63)

190. Mr. Leary compared his analysis of the URS Design Schedule converted to calendar days (Plaintiff's Exhibit 63) and plotted that information into the summary he prepared marked as Exhibit P-56, which was a comparison of overall start and finish dates of Great Lakes Run 23 to that of the PennDot contract document. According to Mr. Leary, the URS's schedule consistently showed completion dates later than that contemplated by DOT's schedule. Counsel for DOT and Mr. Leary consistently attempted to illustrate a connection between Plaintiff's Exhibit No. 63 and earthwork items, despite the fact that the exhibit was an analysis of the structure calendar only. (N.T. 1088, 1089, 1102-1105; Exhibit P-56, P-63)

191. Mr. Leary also prepared additional trial exhibits which showed changes made to earlier exhibits by the inclusion of the PennDot calendar conversion of working days to calendar days, the anticipated work-day schedule and a shutdown period for winter work. Durations were adjusted based on input and analysis by Mr. Don Rooney of Great Lakes Construction Company. Another exhibit prepared for trial showed Run No. 23 as modified for correct weather calendar and the durations having been changed from input from Mr. Rooney. According to the graphs and analysis performed by Mr. Leary, the last item to be done on the project (guardrails) would have been performed June 21, 1989, rather than October 19, 1986, as indicated on the DOT contract. Changes indicated by Mr. Leary's graphs and analysis applied to Great Lakes Run 23. (N.T. 1106-1109, 1111-1113; Exhibits P-64, P-65)

192. Mr. Leary also prepared Plaintiff's Exhibit No. 58 which he referred to as a "milestone date comparison." Mr. Leary explained that this particular exhibit was a summary of the various schedules that were presented and prepared for trial summarized in conjunction with the various operations and start and finish dates of the various operations. Mr. Leary also prepared Plaintiff's Exhibit No. 57 which was a single bar summary of the start and finish dates of the various schedules summarized on Exhibit P-58. The single bar summary (P-57) illustrated the different start and finish dates for the PennDot contract schedule versus various Great Lakes' and URS' schedules and the difference in time indicated by the various completion dates. The total difference in time, according to Mr. Leary, between PennDot contract schedule and the URS (design consultant) schedule was 20.2 months. (N.T. 1114-1121; Exhibits P-57, P-58)

193. Under cross-examination, Mr. Leary acknowledged that he did not review, in preparing the various trial exhibits, Great Lakes' bid, their recapitulation sheets for the bid, nor did he actually ever visit the project. He also acknowledged that he did not review the PennDot master

diaries, nor did he review the PennDot field inspector's diaries. Similarly, he did not review the PennDot field survey books, nor did he meet with any of DOT's personnel to discuss the project. (N.T. 1122-1124)

194. Mr. Leary acknowledged, under cross-examination, that Exhibit P-14 (Run 23) provided information that would have allowed him to ascertain average production rates, although he did nothing to determine whether or not the quantities given on Run No. 23 were accurate. Mr. Leary acknowledged that he also did not verify whether or not the durations indicated on Run No. 23 were consistent with Great Lakes' bid. (N.T. 1143-1146; Exhibit P-14)

195. Mr. Leary, admitted, under cross-examination, that he could have used the Primavera program to sort the information on Run 23 in a number of ways, including by activity number, by early start dates, chronologically, by available float, and by late start dates chronologically. (N.T. 1148; Exhibit P-14)

196. Mr. Leary also acknowledged, under cross-examination, that there is nothing contained in the DOT D-476 Schedule which prevented Great Lakes from performing winter work. He also agreed that the D-476 is a suggested schedule, according to the contract documents. (N.T. 1150, 1151; Exhibit P-1)

197. Mr. Leary acknowledged that he saw no indication that Great Lakes notified DOT early on in the project that the project was "unconstructible" as designed, despite his review of the Great Lakes' daily reports, correspondence and through his discussion with Mr. Rooney. Mr. Leary refused to acknowledge that Run No. 23 should have indicated to Great Lakes that the project was "unconstructible" as designed. Instead, he indicated that the schedule, Run 23, was not complete and that the weather "masked" the "unconstructible" nature of the project, as did the fact that "unconstructible" design in the project is something that you would not normally experience. (N.T. 1163-1168)

198. Despite his testimony on direct examination, that there was approximately twice as much overtime work performed by Great Lakes as originally anticipated, Mr. Leary admitted under cross-examination that he had no personal knowledge of what Great Lakes actually anticipated, having received his information from Joseph Allen of Great Lakes Construction Company. Mr. Leary also acknowledged that he did not know if the amount of overtime anticipated by Great Lakes was indicated on Run No. 23. However, Mr. Leary admitted that the computer program used by Great Lakes, Primavera Project Planner, only allows you to show, as programmed by Great Lakes, work days in a schedule and does not allow for overtime or double shifts; thus, time was not broken down into hours. (N.T. 1099, 1178-1181)

199. Mr. Leary also acknowledged that in his representation of the schedule prepared by URS Design Consultants versus DOT's (Richard Harley's) schedule, a number of the non-structure items were either the same in working length of time or DOT's schedule actually allowed more time. Mr. Leary acknowledged that structures were not part of Great Lakes' claim. In fact, Mr. Leary

acknowledged that before the subbase item, Run No. 23 estimated 26 working days while DOT's estimate allowed 65 working days for subbase. URS Dalton estimated 90 working days for the subbase items. (N.T. 1183-1185, 1187-1191; Exhibit P-14, P-29, P-63)

200. Mr. Petit specifically recalled Great Lakes' Project Engineer, Mr. Cohen, saying that the contractor could complete the project within the specified time allotted as indicated on the form D-476. Mr. Cohen said this at a pre-construction meeting and that fact is confirmed by the minutes of the pre-construction meeting. (N.T. 1671-1674; Exhibit D-19)

201. Mr. Petit also recalled receiving Great Lakes' "flow chart schedule" early on in the project (early in June of 1986) and upon receiving the flow chart schedule from Great Lakes, Mr. Petit put it on the wall in the DOT field office. (N.T. 1674, 1675)

202. Mr. Petit confirmed that DOT "relieved" Great Lakes from the restriction that the south wetland had to be completed prior to the undercut and subsequent backfill and embankment construction on the east side of French Creek. This was of great benefit to Great Lakes, according to Mr. Petit, because the south wetlands had just gotten underway in August of 1986. Mr. Petit indicated that this area was the "critical area" on the whole project. (N.T. 1693, 1694)

203. Mr. Petit did not agree with the testimony of Mr. Strazzo with regard to Mr. Strazzo's contention that all of the equipment needed for the job was on the site the first day of the work. On the contrary, Mr. Petit testified that Great Lakes did not have an appropriate trailer for DOT, did not have a soils lab and did not have scrapers for a couple of weeks after the Notice to Proceed. Mr. Petit indicated that Great Lakes did have some pieces of equipment on the job, but they certainly were not "geared up for a major shot" on May 19, 1986. (N.T. 1694, 1695)

204. Mr. Williamson testified that he visited the job site twice, had quite a few conversations with William Petit, reviewed the field inspector diaries, which were augmented by the master diaries, the daily reports offered by Great Lakes, Great Lakes' recapitulation sheets, correspondence, and a stack of seven specific schedules obtained through discovery from Great Lakes. Mr. Williamson prepared a report after reviewing this information. (N.T. 1977-1980; Exhibit D-33 and D-34)

205. In his report, Mr. Williamson outlined the various contract scheduling constraints, and the fact that "Run 23" was, in his opinion, "a schedule". Mr. Williamson testified, in regard to Run 23, "[i]t has a start date, it has a finish date, it has float, it has early start, late start, it has durations, it has predecessors, it has successors. If this document was given to anyone that knew the least bit about computerized scheduling, all the information that you could possibly want is on this schedule." When asked if, in his opinion, Run 23 was a CPM Schedule, Mr. Williamson replied, "[y]es, it definitely is." (N.T. 1984, 1988, 1989)

206. Mr. Williamson testified that with regard to the embankment work (Activity 210 on Run 23), although the work was scheduled over the winter months, the activity had an 80-day activity and had 70 days of float, which meant part of the work could have been done in November and December and then another portion of the work could have been done in April or May. (N.T. 1992, 1993)

207. Mr. Williamson opined that according to Run 23, it took Great Lakes quite a bit longer to do the erosion and sediment control and thus when it did rain, there was nowhere for the water to go. Mr. Williamson pointed out that this was true for a number of activities, including earthwork activities. (N.T. 2000, 2001; Exhibit D-34)

208. Mr. Williamson also compared what he termed as Great Lakes' "as planned" (Run 23) with the "as-built" information from the field inspector's diaries. According to Mr. Williamson, Great Lakes intended to do the stream crossing, the silt fence, the perimeter ditch and then spend four days to grade 6,000 cubic yards in the north wetlands. After analyzing the actual as-built information, according to Mr. Williamson, Great Lakes' production was much less than they had planned according to Run 23. (N.T. 2004-2006; Exhibit D-34)

209. Mr. Williamson opined, after doing an analysis of Class II Excavation, Class IV Excavation, in conjunction with Great Lakes' daily records, that Great Lakes did not follow their own plan in that during the first summer there was no concentrated work anywhere. He indicated "[t]he work is all over the main line." Mr. Williamson also testified that the undercutting activity, according to Run 23, was to have taken Great Lakes approximately 5 weeks, yet they began some undercutting in mid July and did not finish until March of the following year, a period of approximately 8 months. He also noted that the erosion and sediment control was, according to Run 23, to be done by the end of June, yet Great Lakes' records show that as of mid September, they were only 28 percent completed for Class II work and 18 percent completed for Class IV work. (N.T. 2024, 2025; Exhibit D-33)

210. Mr. Williamson made it extraordinarily clear to the Board how he felt about the Claimant's acceleration claim and theory that the job was "unconstructible" as set forth on DOT's Form 476. In this regard, Mr. Williamson testified: "[t]his is the schedule that Great Lakes bid. Great Lakes has been in business for many years. They know what they are doing. They bid this job saying they could do it and they put a schedule out saying they could do it. . . . They saw the project start and finish date. They bid it and scheduled it accordingly. They knew what they were getting into." (N.T. 2089, 2111, 2112)

211. Mr. Williamson's testimony concerning the Claimant's Exhibit P-65 was in direct contradiction of that of the testimony of Mr. Rooney and Mr. Leary. Both Mr. Rooney and Mr. Leary felt that Exhibit P-65 was the best case scenario for building the job, while Mr. Williamson called Exhibit P-65(a) "manipulation of URS's schedule." According to Mr. Williamson, Exhibit P-65 is a schedule that takes 80 days, applies a PennDOT conversion calendar and "blows it out" into a whole additional year. (N.T. 2119, 2120)

CONCLUSIONS OF LAW

1. The Board of Claims has exclusive jurisdiction over the parties and over the subject matter asserted in this Claim pursuant to the Act of May 20, 1937 P.L. 728, as amended by the Act of October 5, 1978, P.L. 1004, 72 P.S. 4651-1, et seq.

2. The Claimant, Great Lakes Construction Company, is an experienced contractor familiar with the type of A-4 silty clay soil encountered on the instant project having encountered the same soil conditions in the Cleveland, Ohio and Erie, Pennsylvania areas.

3. The Claimant, although generally familiar with the type of work contemplated by this project, bid the project despite never having previously replaced wetlands.

4. Great Lakes conducted a site inspection, reviewed borings, the D-476 Bar Chart, their own production rates, the Plans, Specifications and Contract bid materials and chose to bid the project, concluding it was “a relatively simple job.”

5. Great Lakes’ Claim pertains to earthwork items only and does not relate to the structures work.

6. We find DOT’s former employee, Richard E. Harley, to be a credible witness. Mr. Harley reduced the design consultant’s period for completion of the Project, but did not change the number of days suggested by the design consultants for earthwork. Mr. Harley’s changes and reduction of the design consultants’ schedule related to structures, which work was not part of this claim. To the extent that the testimony of Mr. Harley and Mr. Leary conflict, we find the testimony of Mr. Harley more credible than the testimony of Mr. Leary.

7. Great Lakes was responsible for some delay on the project, e.g. as outlined by DOT’s William R. Jones in a letter dated March 10, 1987, and the Board finds the testimony of the Claimant’s Donald Rooney, denying any responsibility for delay, incredible.

8. The Board finds that the Claimant was given a number of permitted “deviations” from the clear contract provisions which served as “effective extensions” of time, including reducing the mandatory ninety (90) surcharge time by 29 days pertinent to the embankment in the French Creek area, being permitted to “waste” Class 1 Excavation and being excused from performing embankment work on the west bound lanes at the eastern end of the project.

9. Great Lakes received a formal extension of time for completion of the project from September 1, 1987 to September 21, 1987, and for “additional work”, until May 11, 1988.

10. The Board finds the Bar Chart, Form D-476, to be reasonable under the facts and circumstances of the instant project, and we reject the Claimant’s theory that the schedule as modified by DOT was “unconstructible”.

11. The Board finds the issue as to whether or not the Claimant's Exhibit P-14 constituted an actual CPM schedule moot because we reject the Claimant's "unconstructability" theory; however, based upon the testimony of Kenneth Kling and David Williamson, we find that P-14 (Run 23) constituted the most "workable" CPM Schedule created by the Claimant. The Commonwealth was not obligated to provide the Claimant with a CPM Schedule and the schedule created by the Claimant contained start, finish, early start, late start, durations, float, predecessor and successor information, all of which is information normally found in a CPM Schedule.

12. The Board rejects the "total cost" methodology utilized by the Claimant in the preparation of its damages, particularly the use of Blue Book rates, force account calculations and damages based upon alleged discontinuities. The Board accepts the testimony of Frederic R. Miller as credible with regard to the damages issue, and to the extent the testimony of Joseph Allen and Mr. Miller conflict, we find the testimony of Mr. Miller to be more credible.

13. While the Claimant did experience some delays due to inclement weather, those delays were offset by concurrent delays caused by the Claimant or reduction in specified contract work, changes in the contract work which inured to the benefit of the Claimant, formal extensions of time and reductions in contract mandated waiting periods.

14. To the extent the testimony of DOT's expert, David Williamson, and Claimant's expert, Michael W. Leary, conflict, we find the testimony of David Williamson more credible. The Board also views the testimony of the Claimant's expert witness Michael W. Leary, as somewhat prejudicial, in part, due to the fact that the Claimant failed to provide DOT information concerning Mr. Leary's testimony in sufficient time for DOT to prepare for and/or refute his testimony. We find it remarkable that Mr. Leary neither reviewed the Claimant's bid and/or recapitulation sheets for the bid, nor did he ever visit the project site, given the nature of the Claimant's theory of entitlement.

15. With regard to the reasonableness of contract schedule and to the extent the testimony of Great Lakes' Vincent A. Strazzo, Joseph W. Allen and Kenneth G. Kling conflicts with the testimony of DOT's William Petit, we find the testimony of William Petit to be more credible than that of the Claimant's witnesses.

16. With regard to the reasonableness of the contract schedule and to the extent the testimony of Claimant's witnesses Randall R. Radel, Vincent A. Strazzo, Kenneth G. Kling and Joseph W. Allen and DOT's expert, David Williamson, conflict, we find the testimony of Mr. Williamson to be more credible than the testimony of the Claimant's witnesses.

OPINION

This matter originated by the filing of a Complaint on October 31, 1988, on behalf of the Claimant, The Great Lakes Construction Company, (“Great Lakes”), a corporation engaged in the business of highway construction from Cleveland, Ohio. On December 27, 1988, the Commonwealth of Pennsylvania, Department of Transportation (“DOT” or “the Department” or “PennDOT”) filed an Answer and New Matter. Great Lakes filed a Reply to New Matter on January 18, 1989 and extensive discovery ensued. On November 30, 1993, a Motion to Amend Complaint was filed by the attorney for the Claimant. On December 16, 1993, this Board rendered an Opinion and Order granting the Motion to Amend Complaint and on January 14, 1994, an Answer to Amended Complaint and New Matter was filed by DOT. On February 4, 1994, Plaintiff filed a Reply to New Matter and after additional discovery, trial on the matter commenced before the Board on May 9, 1995. The trial concluded on May 23, 1995, and the parties filed their respective proposed Findings of Fact and Conclusions of Law and supporting Memorandums to the Board. DOT’s Findings of Fact, Conclusions of Law and Brief in Support thereof was filed on March 8, 1996, thereby setting the matter for decision.

This case involved a contract entered into by Great Lakes and DOT on May 12, 1986, for the construction of a section of Legislative Route 1126, Section C05, also known as Traffic Route 17, in Erie County, Pennsylvania, and Chautauqua County, New York. The actual Notice to Proceed Date was May 19, 1986. This project was part of the construction of the “Southern Tier Expressway”, a major east-west highway running through the southern tier of counties in New York State and Erie County, Pennsylvania. The project involved the construction of over 3 miles of

roadway, including the construction of four small concrete bridges and a set of interchange ramps. The contract incorporated the Publication 408 Specifications, 1983 edition, and based on the estimated contract item quantities, Great Lakes was to receive Eleven Million Four Hundred Seventy-Seven Thousand Four Hundred Eighty-Two Dollars and Eleven Cents (\$11,477,482.11). The contract required completion of all work within 478 calendar days from the Notice to Proceed, establishing an anticipated completion date of September 8, 1987.

Let us begin by referencing a paragraph in the original Complaint filed on behalf of Great Lakes. Paragraph 12 of the original Complaint reads as follows:

12. Because of the threat of substantial liquidated damages, and the acceleration demanded by the Department, Great Lakes was forced to abandon the efficient and orderly schedule and work sequence with which it intended to perform its work and upon which the contract prices were based.

The original Complaint frequently refers to “acceleration” allegedly demanded by the Department, out of sequence operations and extraordinary weather conditions. The original Complaint demands recovery in the amount of Three Million Nine Hundred Forty Thousand Four Hundred Fifty-Three Dollars and Seventy-Eight Cents (\$3,940,453.78).

On November 30, 1993, Great Lakes filed a Motion to Amend Complaint, which was granted by this Board on December 16, 1993. Attached to the Motion to Amend Complaint was an Amended Complaint which set forth a different, and to an extent perhaps incongruent, theory of recovery. Paragraph 12 of the Amended Complaint reads as follows:

12. Unbeknownst to Great Lakes at the time, the schedule would have been impossible to perform even were it not for the weather conditions.

Admittedly, the Amended Complaint still references orderly schedules and work sequences, acceleration and bad weather; however, clearly the Claimant had decided to pursue its theory of recovery from a “different angle”. Essentially, the Claimant has alleged that the bar chart (Form D-476) as modified by DOT from the schedule originally prepared by a consultant, rendered the project “unconstructible”. We disagree.

The project involved building a two-lane highway and required a large quantity of excavation and embankment construction, with the western end of the project being primarily a “cut section” and the eastern end of the project being primarily a “fill section”. Approximately 80,000 cubic yards of Class 1 Excavation was required to be moved from the area between traffic Route 89 to just west of German Road at the eastern end of the project for construction embankments. The largest cut on the job was internal to German Road and Ashton Road, located just between the two roads. Class 1 Excavation from the area just west of German Road to the west side of French Creek also involved the removal of approximately 240,000 cubic yards, which had to be moved to the eastern end of the project for embankment construction. The project included embankment construction, undercut and then subsequent embankment construction of the west bound lanes, approximately 1,000 feet west of French Creek and about 600 or 700 feet to the east of French Creek. The last 2,000 or so feet on the far east end of the job was also designated to have embankment in place. The embankment on the west bound lanes was designed for the future expansion of the roadway into a four-lane highway.

The project also required an extensive amount of Class 1A Excavation, which involved the removal of unsuitable material and its replacement with suitable granular material. In embankment situations, Class 1A included removal of the underlying soils and the subsequent

replacement up to the old existing ground line. Beyond that, in an embankment area, additional granular material would be paid for as select borrow excavation material and in a cut situation, where Great Lakes would be removing Class 1 Excavation materials, once the subgrade elevation was reached, if the contractors found unstable materials in the underlying soils that also would be excavated and paid for as Class 1 Excavation.

The project also required construction/replacement of approximately 12 ½ acres of wetland. There were two wetland construction efforts that had to take place, one on the north side of the roadway, approximately 4 ½ acres in size, and one on the south side of the roadway, approximately 8 ¼ acres in size. The predominant soil feature in this area was A-4 material, which is silt with some sand. It was abundantly clear to Great Lakes, prior to bidding the job, that the soil was “moisture sensitive”. It was also clear that the whole area of activity to the east of Ashton Road, for approximately 1,500 feet, would be considered in the flood plane of French Creek.

The contract contained four (4) major restrictions as to Great Lakes’ performance of the work:

- a. In several of the grading areas, before any significant earthwork operations could begin, the contractor was required to construct certain erosion and sedimentation controls, such as interceptor ditches, silt fencing, diversion ditches, rock basins, sedimentation ponds, etc.;
- b. Neither German Road nor Ashton Road could be closed simultaneously, thereby affording local residents a way of traveling through the project site while construction was on-going;

- c. The north wetlands had to be completed prior to the contractor performing any undercut and subsequent backfill on the west side of the French Creek and, correspondingly, the south wetland had to be completed prior to any subsequent undercut and backfill on the east side of the French Creek;
- d. The surcharge on the French Creek embankment had to remain in place ninety (90) days before it could be removed and construction of the bridge that carried the mainline over French Creek could begin.

Great Lakes undertook a site inspection in order to prepare their estimate. Representatives of the company drove to the project and physically inspected the areas encompassed by the project, and looked at the adjoining project for the possibility of utilizing a batch plant from that site. Personnel from Great Lakes physically walked portions of the project including areas near the marshy wetlands. Great Lakes representatives reviewed the borings that were in the plans as far as the type of soils that would be encountered in the cuts and it was abundantly clear to Great Lakes that the soil was a silty clay material, i.e. an A-4 type of soil. Both Kenneth G. Kling, the Chief Estimator for Great Lakes and Vincent A. Strazzo, the Vice-President of Operations for Great Lakes, established that Great Lakes was an experienced contractor that had a specific plan for completing the project. Mr. Kling established that Great Lakes had experience in working with silty clay type soil because most of the projects in and around the Cleveland area have the same type of water susceptible material. Mr. Strazzo outlined, in detail, the plan Great Lakes had established to complete the job, which included following the contract restrictions as the job was progressing. Mr. Kling testified concerning the technical basis upon which Great Lakes' bid was based, including review of historical costs from other projects and a review of costs associated with operating a

maintenance cost, depreciation costs, insurance costs, overhead, etc. Mr. Strazzo indicated that Great Lakes' plan was very specific as to what you had to do before you could move into certain areas on the project and that the emphasis was at the wetland area. Mr. Strazzo testified that Great Lakes went in, cleared the area, and immediately began work in the French Creek area, re-establishing the wetland. Great Lakes then kept branching out their order of operation developing the job. Once the wetlands had been completed, Great Lakes started the embankment for the French Creek Bridge, and as the job was progressing, the clearing was proceeding and Great Lakes was trying to get established as far as getting the earthwork operation up and running. Mr. Strazzo testified that there was a considerable cut area between German Road and Ashton Road and a fill area to the west of German Road. Mr. Strazzo indicated that there was designated undercut areas on the plans and once Great Lakes had undercut the designated areas, they had to be filled with granular material. Once the granular material was in, Great Lakes could establish permanent drainage in those areas and then start the embankment areas. Mr. Strazzo testified that as the job was unfolding, Great Lakes closed German Road and although the plans specified that the contractor could close either German Road or Ashton Road, but not both, Great Lakes did not have much option due to the fact that they were trying to get the embankment built for the French Creek Bridge.

We view it as significant that Great Lakes' Vice-President of Operations, Mr. Strazzo, viewed this project as a "relatively simple job" and a lot less complicated than other projects that Great Lakes had performed in years past. Mr. Strazzo testified that Great Lakes thought the job was a "simple dirt operation" and that the company was familiar with the restrictions that were built into the job. We find it somewhat ironic that Great Lakes could view the project as a "simple dirt operation" and "relatively simple job" and then base their claim before this Board on the theory that

the job was “unconstructible” due to the fact that the Department reduced the amount of time to complete the job under the Form D-476 bar chart. To say that the Claimant’s theory of entitlement is contrary to the testimony of Mr. Strazzo and Mr. Kling would be an understatement.

There is little question that Great Lakes had problems with rain which curtailed the earthwork at times. There is also no question that the permitting process for the Magoon Pit took somewhat longer than it probably should have; however, Mr. Strazzo testified that because Great Lakes had access to other sources of fill, such as Weise, Wroblewski and Hoover Sand and Gravel, that the source of granular fill was not really an issue. These problems aside, Mr. Strazzo acknowledged, under cross-examination, that DOT did not require Great Lakes to perform work that was above and beyond what was required by the Publication 408 Specifications. The weather difficulties encountered by Great Lakes must also be viewed in conjunction with the fact that the Claimant’s witnesses, Mr. Strazzo among them, readily admitted that DOT permitted Great Lakes to deviate from the requirements set forth in the contract. Great Lakes was permitted to start the east embankment immediately, even though they were only approximately 50 percent finished with the south wetlands work. Great Lakes was also given a twenty-nine (29) day reduction, of the ninety-day surcharge period, related to the French Creek embankment. And of course, Great Lakes was not charged liquidated damages despite the fact that the job was not finished on the anticipated completion date of September 8, 1987. Admittedly, DOT did not advise Great Lakes that they would not charge Great Lakes liquidated damages until the job was complete, but nevertheless, the Commonwealth still afforded Great Lakes additional “relief” from the restrictions or requirements imposed by the contract, according to Mr. Strazzo. Mr. Strazzo also acknowledged that the Commonwealth gave Great Lakes additional “relief” from the restrictions of the contract in other

instances, such as when DOT permitted Great Lakes to “waste” Class 1 Excavation pursuant to a DOT letter dated January 2, 1987, from William R. Jones, A.D.E. for construction on the project. Other witnesses for Great Lakes also testified to additional facts which did not bode well for the Claimant.

Donald Rooney, the Project Superintendent for Great Lakes, testified that there were access problems on the project due to the A-4 material and the erosion control ditches which restricted the area for trucking. Mr. Rooney testified that you could not place a Class 1 Excavation crew east of the interchange at the west end of the project, then place another excavation crew 1,000 feet east of that and a third one 1,000 feet east of that. Mr. Rooney testified that on this project, you would have one excavation project and one granular backfill process and you could do it no other way because your hauling units, in and out, could not pass one another in such a narrow corridor with ditches dug on both sides. He also noted that you could not put a haul road, even if you wanted one, in a swamp area. Mr. Rooney acknowledged, under cross-examination, that he was aware, before work started on the project, that he could not “flood” the project with men and equipment, due to the nature of the soil being of the A-4 type. With regard to the inter-relationship between different elements of work that had to be done on the project, Mr. Rooney indicated that the German Road Bridge was critical for the simple reason that it had to be done before the Ashton Road Bridge and that such sequencing was “cut and dry” both due to contract mandates and also from an erosion and environmental standpoint. Mr. Rooney also acknowledged, under cross-examination, that DOT permitted Great Lakes not to perform embankment work on the west bound lanes at the eastern end of the project as required per the contract and specifications.

Joseph W. Allen, Great Lakes' Contracts Manager, also testified on behalf of Great Lakes, primarily with regard to the issue of damages. Mr. Allen also testified extensively concerning requests for extensions of time tendered by Great Lakes to DOT which were either denied outright or by implication; however, he also acknowledged that DOT did ultimately extend the project. The Department, in a letter dated November 23, 1987, from William R. Jones, to Great Lakes, indicated that the project time would be extended until November 25, 1987, at which time work would be suspended due to temperature restrictions. That letter further indicated that time charges would resume on May 2, 1988, with a revised completion date of May 11, 1988. Accordingly, Mr. Allen, as with the other Great Lakes' witnesses, were obliged to acknowledge that DOT did contribute significantly to moving the project forward and attempted to assist the contractor by allowing deviation from the mandates of the contract and specifications, refusing to assist upon liquidated damages, etc. It is precisely for that reason that we are unconvinced that the weather significantly impacted this project. We believe that, to the extent the weather did impact the project, DOT's actions more than off-set schedule delays due to inclement weather. The 29 days reduction of the 90-day surcharge period related to the French Creek embankment alone acted as an off-set of nearly a month of bad weather over the course of the project. Furthermore, most of the delay came during the first year of the project, during 1986, and this makes the 29 day reduction all the more persuasive from an "off-set" perspective.

We have reviewed the testimony of Mr. Strazzo and DOT's David Williamson concerning the weather. Mr. Williamson compared the actual rainfall during the course of this project with 10-year and 30-year averages and found that while the months of June, 1986 and September, 1986 had higher averages, five inches during the month of June came in during the

second week of June and 3.91 inches fell on one day in September, 1986. Mr. Williamson found the months of July, 1986 and August, 1986 actual rainfall lower than both averages, while October, 1986 was very close to the 10-year average and higher than the 30-year average. November, 1986 was less than both averages. These statistics also lead us to the conclusion that the weather was less of a factor than the Claimant would have us believe.

Also problematic for the Claimant is the fact that we find Great Lakes contributed to certain delays which impacted the project schedule as well. These concurrent delays included, as established by DOT's Project Engineer, William G. Petit, Great Lakes' use of heavy scrapers creating a problem with "overstressing" the underlying soils in areas where the underlying soils were poor. During the second year of the project, Great Lakes used lighter scrapers, although the heavier 637 scrapers were utilized for conveying material during the 1986 year. Mr. Petit also established that Great Lakes' construction of the German Road embankment did not go well because DOT asked Great Lakes to remove material and replace it with drier material during Class 1 Excavation. Mr. Petit's testimony concerning Great Lakes' need for additional foremen on the grading operations was credible and essentially uncontroverted. Mr. Petit testified that he witnessed heavy lifts being placed without a foreman being present and that after Mr. Rooney sustained a back injury, Great Lakes' Mr. Cohen was "less than cooperative." Mr. Petit also recalled instances when water entered the undercut areas through the north wetlands where the undercut was below the existing water table. Although this arrangement was according to plan, Mr. Petit had recommended bringing the elevation of granular material and subsequent embankment up to a point whereby the area would not be flooded out any time it rained and Great Lakes simply refused to follow Mr. Petit's recommendation in 1986.

Mr. Petit also established that Great Lakes had problems necessitating the removal of a footer on a pier on the 89 Bridge, a similar problem with regard to the German Road Bridge abutment to backwall, an incident where a tier column pour was postponed for clearance reasons, an incident where laborers showed up and an operator did not, then the operator showed and insufficient laborers were present to complete the work on a random stone slope wall, and complaints from the carpenter labor force concerning management of Great Lakes. He established that it was a “continual effort” on the part of his inspection staff to keep reminding Great Lakes to make sure their fill and cut areas were graded to drain and that they had a proper crown in the exposed areas. We find the testimony of Mr. Petit to be credible and to the extent that the testimony of Great Lakes’ witnesses conflicts with Mr. Petit’s testimony, we find Mr. Petit’s testimony to be more credible.

Mr. Richard Smith also testified on behalf of the Commonwealth and echoed Mr. Petit’s testimony. Mr. Smith testified that the Soil Report and Profile indicated that the project was to be constructed with A-4 soils which are defined as low bearing capacity or poor support type soils. He testified that the Profile indicated that there was an extremely high water table throughout a large portion of the project and there was a high water table in the cut areas. Mr. Smith opined that on this particular project, he would have used the lightest construction equipment, consistent with adequate ability to move earthwork, perhaps something in the neighborhood of 621 or 627 scrapers. Mr. Smith opined that the use of 637 scrapers on the instant project probably caused a good deal of rutting due to the almost 50 percent increase in weight as between a 637 scraper, utilized by Great Lakes in the first year of the project, and a 627 scraper.

David Williamson also testified on behalf of DOT and analyzed the progress of Great Lakes to determine what happened and why there were delays on the project. Mr. Williamson testified that the progress of Great Lakes in the north wetlands area, the area of the west embankment (west of French Creek), was “spotty”. Mr. Williamson established that Great Lakes was not able to meet anticipated productivity according to Run 23, for other earthmoving work as well. Mr. Williamson testified that Great Lakes chose to focus on areas of the project, even though they were behind in their schedule, ignoring the critical path, and he disputed Great Lakes’ claim that one type of activity was dependent upon another and that Great Lakes could not proceed due to unforeseen circumstances such as weather, flooding, etc. Mr. Williamson testified that Great Lakes’ work was sporadic in certain activities even when the work “in front of them” was done.

As the fact finder, this Board has to judge the credibility of the witnesses and weigh their testimony. See Miller v. C.P. Centers, Inc., 334 Pa. Super. 623, 483 A.2d 912 (1984); Kaplan v. Redevelopment Authority of Philadelphia, 44 Pa. 149, 403 A.2d 201 (1979). Having weighed the credibility, demeanor and testimony of the witnesses, we find the testimony of DOT’s William G. Petit, Richard Smith and David Williamson to be credible. To the extent their collective testimony conflicts with the testimony of the Claimants’ Kenneth G. Kling, Vincent A. Strazzo, Donald Rooney and Joseph W. Allen, we find the Department’s witnesses to be more credible as to the issue of concurrent delay. The Claimant, throughout the course of the presentation of their claim, attempted to persuade us that any problem which arose throughout the course of the project at the hands of Great Lakes was of no consequence. While a contractor is “entitled to recovery of its additional costs incurred by reason of the acts and omissions of the Defendant”, Burrell Const. and Supply Co., Inc. v. Com. of Pa., Dept. of Transportation, Board Docket No. 715 (1983), where no

such acts or omissions are present or a contractor must address problems caused by their own acts or omissions, we will not award damages. We are not persuaded that the contractor performed the work on the contract without responsibility for any delays that were incurred, although it is apparent that Great Lakes made an honest effort to finish the contract in a timely manner. It is also apparent to us that DOT attempted to “work with” the contractor in its efforts to finish the project in a timely fashion by allowing Great Lakes to deviate from the strict mandates of the contract in several instances, to allow for heavy rainfalls, flooding, etc. Having said that, and given our finding that the schedule established by the Commonwealth was not “unconstructible”, our analysis of the damages issue is academic, but nevertheless, set forth below.

The primary witness to testify on behalf of Great Lakes with regard to the damages issue was Joseph W. Allen. Obviously, the damages portion of Great Lakes’ claim was tied directly to the contractors’ theory that the project was “unconstructible” and that Great Lakes was never able to prepare a “schedule” and was therefore forced to accelerate the entire project. Mr. Allen repeatedly refused to acknowledge that any of the “runs” created by Great Lakes actually constituted a “schedule”, and instead, referred to them as a “plan”. These semantics aside, Mr. Allen identified a number of Change Orders which were paid by DOT and explained how the information on the Change Orders was calculated. Mr. Allen acknowledged that the “Blue Book” or “Form” 408, as he referred to them, was used in calculating many of the figures in the work contemplated by the various Change Orders which were performed on a force account basis. While it was certainly proper for the Claimant to charge “Blue Book” rates on Change Orders performed on a force account basis, the Claimant’s use of Publication 408 Specifications (Blue Book) throughout the analysis of

their damages, was clearly improper. In addition, we view the testimony of DOT's Frederick R. Miller as credible and agree that portions of Great Lakes' damages were calculated, for all intents and purposes, pursuant to a total cost method. The total cost method of calculating damages is rather simplistic in theory in that a Claimant simply subtracts the estimated costs from the total costs incurred on the project. The Courts of this Commonwealth have established four requirements before the total cost method may be applied. The requirements are as follows: (1) the nature of the particular losses make it impossible to determine them with a reasonable degree of accuracy; (2) the contractor's bid or estimate was realistic; (3) the contractor's actual costs were reasonable; and (4) the contractor was not responsible for the added expenses. Commonwealth of Pennsylvania, Department of Transportation v. Dubrook, Inc., Board's Docket No. 1011 (Opinion not reported); Glasgow v. Commonwealth of Pennsylvania, Department of Transportation, 108 Pa. 48, 529 A.2d 576 (1987); John F. Harkins Co., Inc., v. School District of Philadelphia, 313 Pa. Super. 425, 460 A.2d 260 (1983).

In the instant case, had we awarded damages, we would be compelled to reject the Claimant's damages in those instances where the total cost method was utilized by the Claimant. Mr. Allen's calculations, for example, concerning subbase equipment wherein the figures were calculated by comparing "as-bid" days versus actual use would have been problematic for the Claimant. The fact that Mr. Allen applied what he "thought" were realistic production rates in computing the subbase portion of Great Lakes' claim clearly was inappropriate. In addition, Mr. Allen's use of force account rates, absent the Commonwealth's consent to the application of such rates, was also inappropriate. We reject Mr. Allen's simplistic explanation that utilizing force account rates was reasonable because Great Lakes felt the Department would not have incorporated

those rates into the Form 408 as a method of calculating costs if the Department itself thought the rates were unreasonable. Mr. Allen himself specifically acknowledged under cross-examination that DOT never agreed that acceleration costs were force account costs. He also agreed that Great Lakes' claim for "financing costs", which we view with a particularly jaundiced eye, was not contained in either the first Complaint filed by Great Lakes or the Amended Complaint filed by Great Lakes. Because we reject Great Lakes' theory of entitlement, we will forego our complete analysis of Great Lakes' methodology of calculating damages. Suffice to say that we reject Great Lakes' use of the total costs method of calculating portions of their damages, the use of force account costs and Publication 408 Specification rates and question the basis for portions of the claim such as "cost of capital" claim which totaled Four Hundred Thirty-Six Thousand Eleven Dollars (\$436,011.00), purportedly lost in total monthly interest. We have said repeatedly that losses claimed have to be substantiated by reliable evidence. See Acchione and Canuso, Inc. v. Commonwealth of Pennsylvania, Department of Transportation, 501 Pa. 337, 461 A.2d 765 (1983); Standard Pipeline Coating Company, Inc., v. Solomon & Teslovich, Inc., 334 Pa. Super 367, 496 A.2d 840 (1985); Larry Armbruster & Sons, Inc. v. Public School Building Authority, 90 Pa. Cmwlth.310, 505 A.2d 395 (1986). To the extent the testimony of DOT's expert, Frederick R. Miller, conflicts with the testimony of the Claimant's Joseph W. Allen, with regard to the damages issue, we find the testimony of Mr. Miller more persuasive and more credible than that of Mr. Allen. See Miller v. C.P. Centers, Inc., supra.

We devote the last portion of this Opinion to the all-important issue concerning the reasonableness of the Department's schedule. There is no question that when a contractor performs work above and beyond that called for in the contract, the contractor must be paid for the additional work performed. J.C. Orr & Sons, Inc. v. Commonwealth of Pennsylvania, Department of General Services, Pa. Bd. of Claims, Docket No. 908 (March 7, 1986), Exton Drive-In v. The Home Indemnity Co., 436 Pa. 480, 261 A.2d 319 (1969), cert. denied, 400 U.S. 819 (1970). In the instant case, virtually all entitlement to damages flows from the Claimant's theory that the Form D-476 Bar Chart contained in the Department's bid documents was unrealistically reduced and therefore, the project was "unconstructible" as bid out by the Department, forcing Great Lakes to accelerate the project. The Claimant, having postulated that theory, was essentially forced to prove that the work contemplated by the contract was impossible to perform within the time constraints of the Form D-476 Bar Chart prepared by the Commonwealth. We do not believe the time allotted to complete the project by the Commonwealth was unreasonable and, therefore, Great Lakes' claim must be denied in its entirety.

It is significant to note at the on-set of the discussion of the reasonableness of the Department's Form D-476 that there is specific language in the contract which applies to this very issue. The contract provides at Page 7, Paragraph 4 as follows:

The contractor covenants and agrees that all work (including, but limited to, all labor performed and materials supplied) on this project shall be performed and completed to the satisfaction of the Chief Highway Engineer of the Department of Transportation four hundred seventy eight consecutive (478) calendar days after written notice to proceed with work has been given by the Department. If, for any reason, except as provided in the contract, the contractor fails to complete all work

on this project to the satisfaction of the Chief Highway Engineer within the aforementioned time allowed, the Department shall deduct from any sums due or which may become due the contractor the amount indicated in the Specifications for each calendar day used in excess of the aforementioned number of days allowed, or, in case a completion date is fixed, for each calendar day elapsing between that completion date and the actual date of completion. If no sums are due the contractor, the contractor agrees to remit to the Department the aforementioned sum for each day used in excess of the time allowed for completion of the contract. The amounts deducted or remitted under this paragraph are liquidated damages and not penalties.

The contract also indicates on Page 7, at paragraph 5, the following:

The Contractor further covenants and warrants that he has had sufficient time to examine the site of the project; that he has examined the site of the project; that he has had sufficient time to examine the site of the project to determine the character of the subsurface materials and conditions to be encountered; that he is fully aware and knows of the character of the subsurface materials and conditions to be encountered; and that he has based the within contract prices on his own independent examination and investigation of the project site subsurface materials and conditions and has not relied on any subsurface information furnished to him by the Commonwealth of Pennsylvania, Department of Transportation, its agents or its consultants.

Irrespective of the above contract language, Great Lakes points to the fact that they “relied upon” the Form D-476 Bar Chart as being a reasonable representation of the amount of time necessary to complete the project; however, even if that is true, it does not prove that the D-476 was “unreliable”. There is no question that the Form D-476 Bar Chart provided by the Commonwealth is a rather rudimentary schedule that can not be utilized by a contractor in completing a project to the same

extent as a CPM Schedule. There is also no question that Great Lakes reviewed the Bar Graph and found “it looked reasonable”, as per Mr. Kling. It was established that Great Lakes is a sophisticated and experienced contractor that had the benefit of performing an analysis utilizing their historical costs when preparing estimates. Great Lakes undertook a site inspection in order to prepare their estimate and their personnel physically walked portions of the project and reviewed borings that were in the plans as far as the type of soils that would be encountered throughout the project. Great Lakes was cognizant of the fact that the soil was a silty clay type of soil known as “A-4”. It must again be noted that the instant project was the first where Great Lakes ever had to replace wetlands. It is also significant to note that the instant project was Great Lakes’ first PennDOT project as well. Mr. Rooney also acknowledged that he had never participated in the construction of wetlands prior to the instant project.

Great Lakes almost immediately found themselves struggling to meet their own “schedule”, which of course is another issue in and of itself. We find it somewhat disturbing that Great Lakes’ original Complaint references an acceleration, or possibly a constructive acceleration, but never sets forth a theory based upon “unconstructability” resulting from an impossible schedule. Quite to the contrary, Paragraph 21 of the Claimant’s original Complaint indicates that Great Lakes was unable to utilize their “logical sequence oriented schedule with minimal interference. . . .” It was not until November 30, 1993, that a Motion to Amend Complaint was filed on behalf of the Claimant and the issue of “impossibility” was first set forth by the Claimant. In the original Complaint, the Claimant references poor weather conditions, acceleration or constructive acceleration of the project and the Department’s insistence that the Claimant meet the original completion date as the basis of entitlement, whereas in the Amended Complaint, the Claimant talks

about first learning of a “misrepresentation and contract design error” which made the project “unconstructible”. Obviously, we respect the fact that Great Lakes first learned of the Commonwealth’s change in the design consultant schedule through the discovery process; however, that fails to negate the fact that it never occurred to the Claimant, despite allegations of acceleration and/or constructive acceleration, that the schedule might have been defective in the first instance. It seems to us that the theory of “unconstructability” came to the Claimant almost as an afterthought.

A great deal of time and money was spent by all concerned analyzing whether or not Exhibit P-14, infamously known as “Run No. 23”, constituted a CPM Schedule. The problem with this issue, from the Claimant’s perspective, is the assumption that if Run No. 23 was not a CPM Schedule, then this Board was somehow obligated to conclude that it was impossible for any contractor to create a CPM Schedule for this project. Notwithstanding Mr. Rooney’s testimony that the D-476 Schedule was an “impossible schedule” and the testimony of Mr. Randel R. Radel who claims Great Lakes never came up with a workable CPM Schedule that met the contract conditions, we remain unpersuaded that the D-476 was an “impossible” schedule. This is true for a number of reasons.

The first reason has been discussed previously in this Opinion in regard to the inefficiencies and problems Great Lakes created for itself. We also note that while DOT may have insisted upon “strict” adherence to the contract completion date, when the project was said and done, the actual adherence was not so strict in that the time frame for completion of the contract was extended and numerous deviations from the strict requirements of the contract were permitted in an effort to assist Great Lakes in their efforts to complete the project in a timely fashion. Third, Richard E. Harley, the DOT employee who reduced the schedule prepared by Dalton-Dalton-

Newport, felt this particular project was “structure controlled” and did not change the number of days suggested by the design consultant for the earthwork. There is no portion of Great Lakes’ claim related to the structures, yet it was the time allotted to the structures that Mr. Harley felt compelled to reduce. Fourth, Great Lakes’ Mr. Radel was involved in the creation of a flow chart for this project and claimed he was unable to put all of the contract restrictions into a CPM program. However, Mr. Radel acknowledged that the instant project was the first project he was on for Great Lakes Construction and, under cross-examination, he also acknowledged that none on his CPM work in his undergraduate career involved roadway CPM work. More disturbing is the fact that Mr. Radel also acknowledged that the instant project was the first time he ever became involved in preparing a schedule for a highway construction project and that he was unfamiliar with Great Lakes’ software used in preparing CPM Schedules. In fact, Mr. Radel had no input whatsoever when the various CPM Schedules were prepared for this project with regard to duration of activities and that information was provided by an individual named Mark Bacon. Mr. Radel acknowledged that the majority of the logic for the CPM Schedule was not provided by him, but rather by Mr. Bacon, who never testified on behalf of the Claimant. Finally, we were equally unpersuaded by the Claimant’s witness, Michael W. Leary, who opined that the completion dates would be later than that contemplated by DOT’s schedule according to his analysis. Unfortunately, Mr. Leary’s analysis resulted from a URS Design Schedule wherein he took DOT’s consultant’s schedule and put in into Primavera utilizing the appropriate work-day calendar. Mr. Leary compared the URS Design Schedule as placed on the Primavera Program, with the conversion of working days to consecutive calendar days as prepared by DOT’s Richard Harley. Mr. Harley established, with respect to “calendar days” and “work days” that there was often confusion between the consultants and the

district regarding DOT requirements. Mr. Harley viewed the 355 work days, recommended by Dalton-Dalton-Newport, as considerably too long for the instant project and testified that he re-worked the working day schedule utilizing a computer program that he and another person wrote. Mr. Harley testified that consultants do not always provide correct and accurate working time schedules, particularly when structures are involved, and he felt that 159 working days was certainly adequate for the structures work on this project. We find Mr. Harley's testimony in this regard to be more credible than Mr. Leary's testimony. Mr. Leary acknowledged that the comparison applied to the "structure calander" but nevertheless felt the earthwork items in the earthwork schedule would have been impacted and "possibly extended". According to Mr. Leary, the total difference in time between the DOT contract schedule and the URS Design Consultant Schedule was 20.2 months. Remarkably, Mr. Leary acknowledged that he did not review, in preparing his various trial exhibits, Great Lakes' bid, or their recapitulation sheets for the project. He also acknowledged that he never actually visited the project, did not review the DOT master diaries, field inspector diaries, or field survey books. Mr. Leary also acknowledged that he did not verify whether or not the durations indicated on Run No. 23 were consistent with Great Lakes' bid. We thus find Mr. Leary's testimony less than credible and of little value to the Claimant's theory concerning Run No. 23 and the alleged "unconstructability" of the project as designed and scheduled. In reality, while the Claimant may have convinced us that they were unable to prepare a CPM Schedule that they deemed satisfactory, we remain unconvinced that such a schedule could not be prepared. We also remain unconvinced that Run No. 23 was of little or no value to the Claimant.

Mr. Leary acknowledged, under cross-examination, that Run No. 23 could be utilized to sort information by activity number, by early start dates, chronologically, by available float and

by late start dates chronologically. Mr. Petit recalled receiving Great Lakes' "flow chart schedule" early on in the project and upon receiving the schedule from Great Lakes he put it on the wall in the DOT field office. DOT's David Williamson testified that Run No. 23 was, in his opinion, "a schedule" and that it contained a start date, a finish date, float, early start, late start, durations, predecessors and successors. He indicated that if that document was given to anyone that knew the least bit about computerized scheduling, all the information you could possibly want was on this schedule. When asked if, in his opinion, Run No. 23 was a CPM Schedule, Mr. Williamson replied "[y]es, it definately is." We view Mr. Williamson's testimony in this regard far more credible than Mr. Leary's testimony. The fact that Run No. 23 showed work being performed during the winter months, whereas the Form D-476 Bar Chart suggested no work, does not persuade us that either schedule was inherently problematic. It is apparent that Great Lakes knew early on in the project that winter work would be required, assuming Run No. 23 was at least somewhat accurate. Taking into consideration Great Lakes' concurrent delays, productivity problems, use of improper equipment and other various and sundry factors which may have impacted the schedule, the winter work may have been necessitated more as a result of the Claimant's own actions than any information contained on a CPM Schedule.

In the final analysis, we are obliged to reject Great Lakes' acceleration theory based upon the alleged "unconstructible" nature of the DOT schedule. No one "obligated" Great Lakes to bid this particular project and we believe Great Lakes is certainly an experienced contractor. It may be that on this particular project, being unfamiliar with wetlands work, the Claimant simply found themselves "in over their head". DOT's David Williamson testified "[t]his is the schedule that Great Lakes bid. Great Lakes has been in business for many years. They know what they are doing.

They bid this job saying they could do it and they put a schedule out saying they could do it
They saw the project start and finish date. They bid it and scheduled it accordingly. They knew
what they were getting into.” We concur.

ORDER

AND NOW, this day of , 1997, we find in favor of the
Defendant, Commonwealth of Pennsylvania, Department of Transportation, and against the Plaintiff,
The Great Lakes Construction Company. The Plaintiff’s claims are hereby **DENIED** in full. All
costs are to be borne respectively by the parties to this litigation.

BOARD OF CLAIMS

David C. Clipper
Chief Administrative Judge

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

Opinion Signed

James W. Harris
Citizen Member

October 6, 1997