

DISPUTE REVIEW BOARD RECOMMENDATION

January 02, 2012

E-Mailed January 02, 2012

Bob Beland
Kamminga & Roodvoets, Inc.
5219 Cone Road
Tampa, Florida 33610
bbeland@kandrincfl.com

Harold I. Dubón, P.E.
AECOM
920 Magnolia Avenue
Auburndale, FL 33823
Harold.Dubon@aecom.com

RE: FPN: 197701-4-52-1
Contract No: T1393
SR 559 Ext. over CSX RR & SR 655
Polk County
Disputes Review Board Recommendation

Issue: Kamminga & Roodvoets, Inc.'s (on behalf of Denson and Case) entitlement to payment for overcoming differing subsurface conditions and fulfilling FDOT's requirements for acceptance of End Bent 4, Shaft No. 1

Gentlepersons:

The Owner, Florida Department of Transportation (Department), and Contractor, Kamminga & Roodvoets, Inc. (K&R), requested a hearing on the above issue in accordance with the Dispute Review Board (DRB) Operating Procedures:

K&R stated in its November 7th 2011 request:

On behalf of Denson Construction and Case Atlantic, please accept this letter as a formal request for a DRB Hearing concerning the attached issues.

Denson Construction's (K&R's bridge subcontractor) attached letter to K&R of November 3rd 2011 transmitted Case Atlantic's (Denson's drilled shaft subcontractor) request stating:

Please accept this letter as Case Atlantic's formal request for a DRB hearing regarding Case Atlantic's claim for change in condition for drilled shaft# 1 at end bent #4. Case Atlantic has accept (sic) the date establish at the last DRB meeting.

On November 7th 2011, the DRB e-mailed the CEI inquiring:

The Board is in receipt of the Contractor's request for a hearing on the subject issue. Please confirm that the issue has been escalated pursuant to the Partnering agreement and is ripe for a hearing on entitlement. If so, please also confirm that the dates for submittals and hearing remain agreeable.

The CEI stated in its November 18th 2011 response:

We will be following the dates set by the board for the DRB presentation and submittal requirements.

On November 22nd 2011, the DRB e-mailed the CEI stating:

The Board understands that both Parties are in agreement that the issue is ripe for a hearing before the DRB.

Pertinent issues, correspondence and other information relating to the Department's and the Contractor's positions were forwarded to this Board for review and discussion at the hearing that was held on December 20th 2011. Should entitlement be established, the DRB was not to decide

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the quantum of such entitlement at this time, as the parties would attempt to negotiate the value of entitlement.

CONTRACTOR'S POSITION:¹

I. SUMMARY

*Case Atlantic Company ("Case") constructed drilled shafts on the SR 559 Extension Project (the "Project") under a subcontract (the "Subcontract") with Denson Construction, Inc. ("Denson"). Denson was a subcontract to Kamminga & Roodvoets, Inc. ("K&R"), the prime contractor to the Florida Department of Transportation ("FDOT") for the Project. The Subcontract called for Case to construct a total of 19 drilled shafts, including one test shaft and 18 permanent shafts, which were aligned within four (4) pier locations (2 end bents and 2 intermediate piers) (**EXHIBIT 1**).*

During the construction of drilled shafts, Case encountered subsurface conditions which differed materially from those indicated in the Contract and of an unusual nature differing materially from those ordinarily encountered in drilled shaft work. Specifically, following the placement of concrete in a shaft within the easternmost end bent on the Project (End Bent 4 – See Figure 1 below), the entire shaft, including the reinforcing steel cage, inexplicably dropped approximately 2.5 feet. The drop did not occur during the construction of the shaft or upon removal of temporary casing used to excavate and construct the shaft. As a result of the drop, cross-hole sonic logging ("CSL") tubes incorporated within the shaft were damaged and rendered unusable.

With the unusable CSL tubes, the only practicable means of proving conformance of the shaft were taking core samples or performing a load test. FDOT's engineer of record (the "Engineer"), however, indicated that it would not accept coring results to demonstrate conformance. Case was left with no option other than performing a full scale load test. Case notified FDOT (via letter to Denson) of Case's intent to submit a claim, as the repairs to the shaft and the proposed load test were a result of the differing site condition. Case successfully performed the load test on March 24, 2011, the results of which proved conformance and culminated in FDOT accepting the shaft.

On May 2, 2011, Case submitted a claim in the amount of \$62,162.57 for costs incurred to repair End Bent 4, Shaft 1 and to perform a full scale load test. K&R, on behalf of Denson and Case, now seeks payment of this amount from FDOT.

¹ For exhibits or pages referenced the reader should refer to the Parties full position papers.

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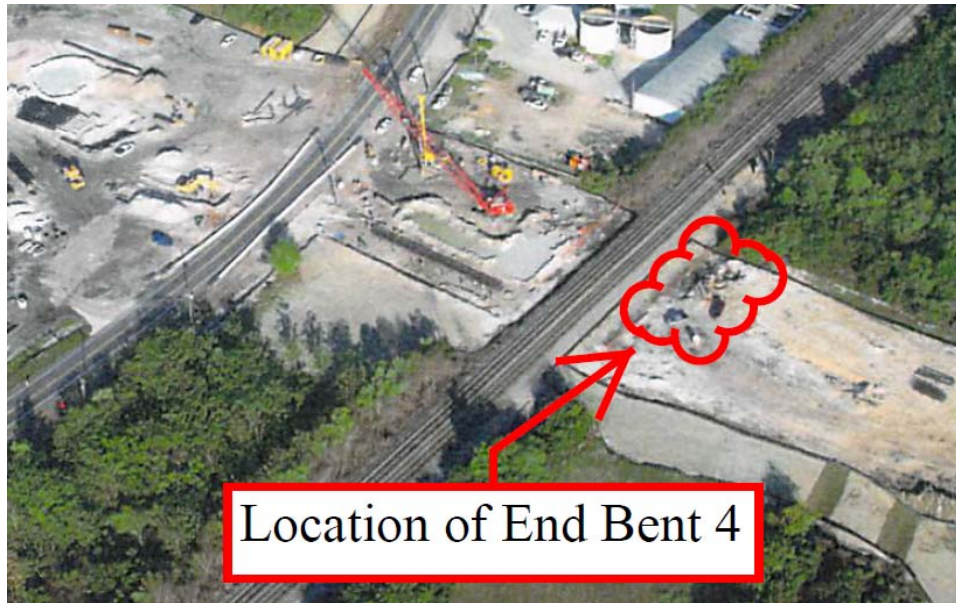


Figure 1: Photo of Project site during drilled shaft construction

II. EVENTS GIVING RISE TO THE CLAIM

On February 15, 2011, Case commenced construction of Drilled Shaft No. 1 in End Bent No. 4 by driving approximately 86 feet of 60-inch diameter temporary casing at the designed shaft location. Case commenced excavation following installation of the casing and completed the excavation to a depth of 118.9 feet on February 17, 2011, all without incident. Case installed the reinforcing cage and placed concrete in the afternoon on the same day. Upon completion of concrete placement, Case extracted the temporary casing and confirmed that the concrete and reinforcing steel were stable. Case proceeded with construction of the next shaft, Drilled Shaft No. 2 in Bent No. 4, located 16 feet away from Drilled Shaft No. 1. During the construction of Drilled Shaft No. 2, Case discovered that the concrete and cage in Drilled Shaft No. 1 had dropped approximately 2.5 feet. Case verified with FDOT's field inspector that the drop took place well after the removal of casing at Shaft No. 1 (**EXHIBIT 2**). Case inspected CSL tubes within the shaft and found that they were damaged, creating a blockage at a depth of approximately 55 feet.

III. BASIS OF CLAIM: DIFFERING SITE CONDITIONS

A. Contract Provisions

The Contract incorporates by reference FDOT's 2010 "Standard Specifications for Road and Bridge Construction" ("Standard Specifications"). Section 4-3.7 of the Standard Specifications states in part as follows (Figure 2 below and **EXHIBIT 3**):

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4-3.7 Differing Site Conditions: During the progress of the work, if subsurface or latent physical conditions are encountered at the site differing materially from those indicated in the Contract, or if unknown physical conditions of an unusual nature differing materially from those ordinarily encountered and generally recognized as inherent in the work provided for in the Contract are encountered at the site, the party discovering such conditions shall promptly notify the other party in writing of the specific differing conditions before the Contractor disturbs the conditions or performs the affected work.

Upon receipt of written notification of differing site conditions from the Contractor, the Engineer will investigate the conditions, and if it is determined that the conditions materially differ and cause an increase or decrease in the cost or time required for the performance of any work under the Contract, an adjustment will be made, excluding loss of anticipated profits, and the Contract will be modified in writing accordingly. The Engineer will notify the Contractor whether or not an adjustment of the Contract is warranted.

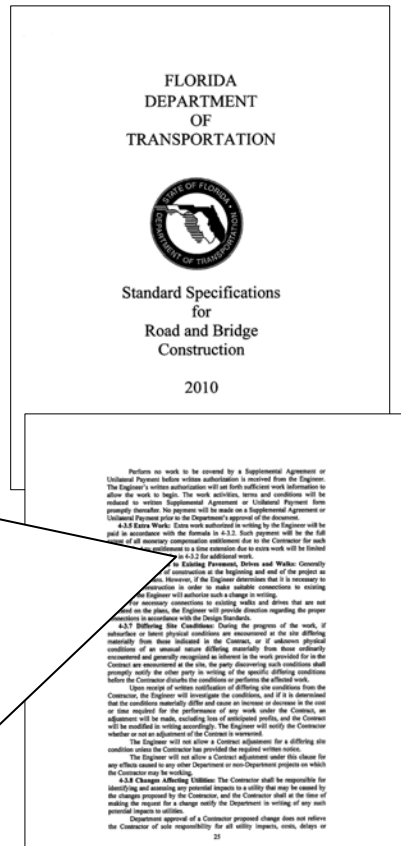


Figure 2: Section 4-3.7 of the Standard Specifications

B. "Type I" Differing Site Conditions

The subsurface conditions encountered by Case differ materially from those indicated in the Contract Documents. The Contract drawings contain the reports of seven (7) soil/core borings (numbered DB-1, DB-2, and B-1 through B-5) performed on behalf of FDOT for the Project (**EXHIBIT 4**). The locations of the borings are shown on Drawing B1-8 (**EXHIBIT 1**).

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Boring B-5 is located at Station 22+65, seven (7) feet away from End Bent No. 4. There is no indication in this boring of large voids or other conditions which would cause a drilled shaft to drop substantially well after removal of casing following completion of concrete placement (see Figure 3 at right and **EXHIBIT 4**). Similarly, none of the other borings indicate or suggest that such large voids would be present.

C. "Type II" Differing Site Conditions

The subsurface conditions encountered by Case are unusual and differ materially from those ordinarily encountered in drilled shaft work. It is unusual for concrete to drop suddenly after it has stabilized following completion of placement. Any voids created during the excavation of a drilled shaft are filled by the fluid concrete during placement. Little or no voids would be expected in the upper portion of the shaft where temporary casing was in place during the excavation of the shaft. Nevertheless, to the extent voids did exist in that portion, these too would be filled by concrete when the casing is extracted. The fact that Case constructed the other 18 drilled shafts, following the same approved means, methods, and sequence, without the collapse condition demonstrates that the conditions present at End Bent 4, Drilled Shaft No. 1 differ from those ordinarily encountered. Note that the test shaft² and two other shafts were constructed at or near End Bent No. 4.

D. FDOT's Direction

Case discussed the differing site conditions with FDOT's inspector immediately upon observance of the condition and at weekly progress meetings (**EXHIBIT 2**). Despite damage to the shaft and CSL tubes caused by differing site conditions, FDOT directed Case to submit CSL test results and a proposed repair procedure for the shaft, as well as an engineering analysis report ("EAR")³. FDOT further stated that it would not pay for Shaft No. 1 until the shaft was accepted (**EXHIBIT 5, page 3**)⁴. Via e-mail dated February 21, 2011 (**EXHIBIT 6**), the Engineer informed K&R that FDOT would not approve Shaft No. 1 without a load test, stating:

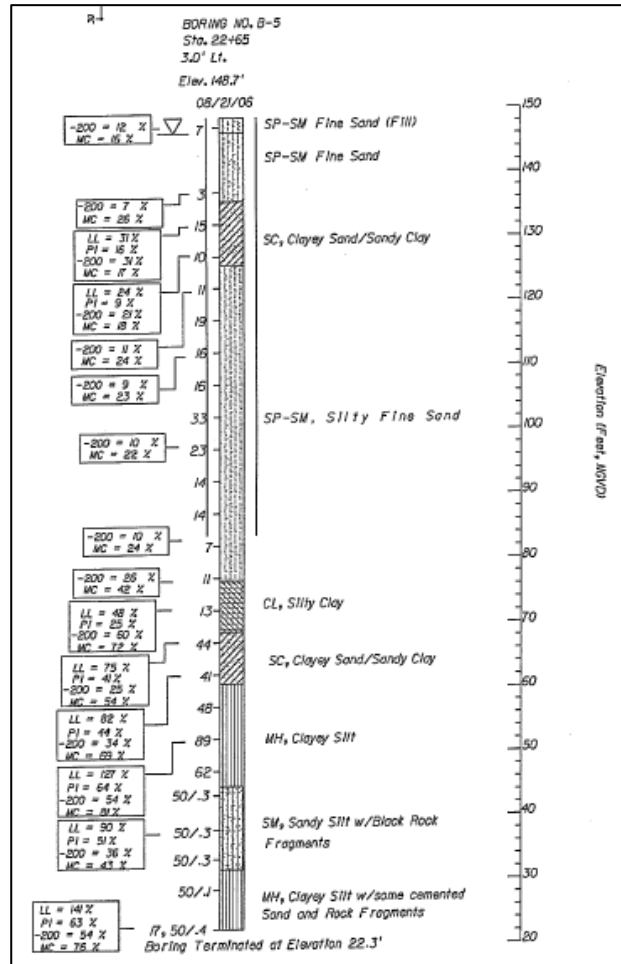


Figure 3: Report for Boring B-5 from Drawing B1-6

² The test shaft was originally planned to be constructed at Station 20+47.00 (between Piers 2 and 3, but was relocated to the east of End Bent No.4. The approximate revised location of the test shaft is shown by an arrow on Exhibit 1.

³ Please note that Case submitted CSL results for the upper portion of End Bent 4, Shaft 1. CSL testing could not be performed below a depth of 51 feet due to blockage of one of the CSL tubes.

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“The contractor needs to come up with a remedial plan. They need to establish there are no defects in this shafts. They also need to show, the shaft can carry the design load specified in the plans and accepted by the Department. These steps needs (sic) to be taken before anything is done with this shaft.”

E. Notice of Claim

Following FDOT’s demand for a repair procedure and indication that it would not pay for the Shaft No. 1 without load-testing and approval of the shaft, Case proposed performing a load test on the shaft. Via letter dated March 17, 2011, Case notified Denson that the load test is additional work resulting from differing site conditions and that Case intended to submit a claim for damages associated with such differing site conditions (**EXHIBIT 7**). Case submitted the repair procedure requested by FDOT along with the load test procedure (**EXHIBIT 8**).

On May 2, 2011, Case submitted a claim for \$62,162.57 and an extension of the Contract time of 22 days for costs and time incurred in adhering to FDOT’s directives (**EXHIBIT 9**).

IV. DAMAGES

Case’s claim includes time, corresponding direct costs, and time associated with supporting the load test performed by Case’s subcontractor, AFT, along with costs for repairs to the shaft. Please refer to Exhibit 8 for a breakdown and documentation of costs included in Case’s claim.

Please note that Case has also claimed for delays (without additional compensation) for time during which Case awaited the Engineer’s direction regarding Case’s request to core shafts to confirm shaft conformance following anomalous CSL results on other shafts in End Bent 4. While Case is entitled by the Specifications to perform coring if a shaft is rejected based upon CSL results (**EXHIBIT 10**), the Engineer initially rejected Case’s request to core the shafts. Case lost time awaiting the Engineer’s approval.

V. CONCLUSION

Kamma & Roodvoets, Inc. (on behalf of Denson and Case) is entitled to payment in the amount of \$62,162.57 for overcoming differing subsurface conditions and fulfilling FDOT’s requirements for acceptance of End Bent 4, Shaft No. 1.

DEPARTMENT’S POSITION:

RE: Ruling Request on Specification Entitlement for Drilled Shaft Load Test

Issue:

The Prime Contractor, Kamminga and Roodvoets, Inc. (K&R) has submitted a request for additional contract time and compensation for the costs associated with the performance of a drilled shaft load test. The request is on behalf of their second tier subcontractor Case Atlantic. The issue statement to be addressed by your board is; “Is the Contractor entitled to additional contract time and compensation for a drilled shaft load test that

⁴ Via letter dated March 17, 2011 (Exhibit 2), Case corrected FDOT’s record of the timing of the drop of the shaft.

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was performed to verify the integrity of a drilled shaft that dropped (Shaft #1 at EB #4) during the drilled shaft installation?”

Background of Issue:

Shaft #1 at EB #4 is the shaft that dropped approximately 2.64' after it was filled with concrete. Case Atlantic was vibrating the 86' temporary casing at shaft #2 (which was adjacent to shaft #1) immediately following the completion of shaft #1. After the shaft dropped, The CSL tubes were checked and there was an obstruction in the CSL tubes approximately 55-60' below ground and readings could not be performed below this level. By Specification 455-17.6.1.5, “drilled shafts with velocity reductions exceeding 30% are not acceptable without an engineering analysis. Since the CSL readings could not be performed the entire length of the shaft, Case Atlantic proposed a load test as part of their engineering analysis to accept this shaft. K&R, on behalf of Case Atlantic, has submitted an “Unforeseen Ground Condition” claim. Following is a chronology of the drilled shaft installation for shaft # 1 at EB # 4.

On 2/15/2011, the drilling for Shaft #1 at EB #4 started at approximately 3PM and proceeded for approximately 45 minutes to a depth of approximately 40'. At approximately 5:30 PM Case Atlantic proceeded with vibrating the 86' temporary casing into the ground before stopping for the day. Drilling continued the next day. (Exhibit # 1 – Page 22)

(2/16/2011) – Drilling continued from about 8AM until about 1:30 PM to a depth of approximately 105'. (Exhibit # 1 – Page 22)

(2/17/2011), drilling continued from about 7AM and continued until about 1:10PM when the final soundings to the bottom were checked and the final shaft measuring approximately 119' long. Concrete Placement began after the final sounding at approximately 1:25PM and continued until approximately 4:29PM using a total of 88CY of concrete. (Exhibit # 1 – Pages 23-24)

At approximately 4:45PM Case Atlantic proceeded with removing the temporary 86' casing from shaft #1 and began vibrating the 86' temporary casing into the ground at shaft #2. At approximately 4:55PM, with the temporary casing being approximately 20' into the ground, it was noticed that shaft #1 had dropped approximately 2.64'. After seeing this, the 86' temporary casing was removed by Case Atlantic and laid down; the drilling operation ceased for the day. The CSL tubes were checked and four of the five were found to be blocked at approximately 55' below ground and the fifth CSL tube blocked at approximately 60' below ground. (Exhibit # 1 – Page 29)

(3/1/2011) – CSL testing was performed on Shaft #1 at EB #4 and showed a significant loss (>30%) in velocity between 36.0 and 40.9 feet below the top of the shaft. It should be noted that CSL testing could not be performed past the 55' depth of the shaft due to obstructions. Based on this information, the contractor's specialty engineer, Applied Foundation Testing (AFT) recommended that a statnamic load test be performed for acceptance of the drilled shaft. (Exhibit # 2 – Page 179)

(3/19/2011) – A concrete cap was constructed over the shaft in preparation of a statnamic load test. An EAR was submitted by Case Atlantic requesting to perform the statnamic load test on this shaft. Since the CSL test

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results showed excessive velocity loss, Case Atlantic requested to perform a statnamic load test for acceptance of the shaft.

(3/23/2011) – K&R submitted Notice of Intent on behalf of Case Atlantic claiming an “Unforeseen Ground Condition.” (Exhibit # 3 – Page 533 - 536)

(3/23/2011) – DDM submitted for shaft acceptance with attached EAR scope requesting to perform a Statnamic load test. (Exhibit # 4 – Page 537 - 559)

(3/24/2011) – Two Statnamic load tests were performed on shaft #1 at EB #4. The first load test was equivalent to 565 tons and the second load test was equivalent to 845.5 tons. Shaft was accepted based on Statnamic load test results. (Exhibit # 5 – Page 564 - 621)

After the shaft was accepted based on the Statnamic load test results, per the approved EAR scope, the DME gave concurrence on 3/23/2011 and the DCE gave concurrence on 4/1/2011. (Exhibit # 4 – Page 560 - 563)

(5/19/2011) – K&R submitted back-up documentation on behalf of Case Atlantic for this claim. The back-up includes timesheets and details for performing the load test on drilled shaft #1 at EB #4. K&R is requesting \$74,297.77 in additional monies and 43 days of additional contract time. The letter from Case Atlantic was dated 3/17/2011 and requested \$62,162.57 for the performance of the load test and 10 days of additional contract time. To date, Case Atlantic has not provided any investigative proof to substantiate their claim. As part of their EAR/testing procedure, Case Atlantic proposed performing a load test on this shaft. (Exhibit # 6 – Page 622 - 706)

(5/23/2011) – AECOM sent a letter to K&R denying their claim. (Exhibit # 7 – Page 707 - 708)

(7/8/2011) – K&R submitted a revised cost estimate for this claim. The revision included additional costs that Case Atlantic was charged by Denson Construction. The revised cost includes an additional \$2100.00 in engineering costs to review and redesign the cap at EB #4, \$653.96 for additional steel re-bar required as part of the cap redesign and \$329.00 for material testing (grout cubes) of the cap poured over the shaft for the load test. With the allowable mark-ups, the total revised cost of this claim is \$78,481.73. (Exhibit # 8 – Page 709 - 717)

Statement of the Department’s Position:

The department’s position is that the contractor is not entitled to additional contract time or compensation for performing a load test on the drilled shaft that dropped. The contractor has claimed that there was a differing site condition that caused the shaft to drop. The department has reviewed the available contract documents and found no information that would substantiate this claim. By specification, a shaft is not acceptable without adequate CSL readings throughout the length of the shaft. Since the proper CSL readings could not be provided, the contractor proposed a load test as part of their proposed Engineering Analysis Review (EAR).

The contractor submitted a Notice of Intent on 3/23/11 claiming an Unforeseen Ground Condition at shaft 1, end bent 4. According to specification 4-3.7, Differing Site Conditions:

“During the progress of the work, if subsurface or latent physical conditions are encountered at the site differing materially from those indicated in the Contract, or if unknown physical conditions of an unusual

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*nature differing materially from those ordinarily encountered and generally recognized as inherent in the work provided for in the Contract are encountered at the site, the party discovering such conditions shall promptly notify the other party in writing of the **specific** differing conditions before the Contractor disturbs the conditions or performs the affected work. Upon receipt of written notification of differing site conditions from the Contractor, the Engineer will investigate the conditions.” (Exhibit # 9 – Page 718)*

Although, the contractor neglected to follow the contract specifications by not identifying a specific differing site condition, the department met its contractual obligation by investigating the related project documents.

The departments’ investigation consisted of evaluating the available project information composed of the original plan borings, the pilot hole results as well as the drilling logs during the shaft installation.

- *Prior to letting, borings were taken as part of the bridge design plans and included in the original contract documents. Boring #B-5 (less than 15 feet from the shaft in question) at EB #4 showed hard sandy clay/silt materials in the area of the drilled shaft construction. (Exhibit # 10 – Page 722 - 724)*
- *During construction, pilot core hole were performed in the center of shaft # 1 and #3 of EB #4, prior to the drilled shaft installation, which showed hard sandy clays in the drilled shaft area. It should be noted that the pilot holes extended past the plan bottom elevation of the drilled shafts. (Exhibit # 11 Pages 753-758 and 765-770)*
- *During construction, the drilled shaft excavation logs for shaft #1 on EB #4 showed hard sandy clays throughout the shaft. (Exhibit # 1 – Pages 22-24)*

The pilot core holes and drill shaft excavation logs validate the boring log information provided in the plans and demonstrate like site conditions to those identified in the plans. Furthermore the contractor has provided no information supporting a differing site condition. Therefore, the claim of a differing site condition is invalid and unsupported.

It is the department’s position that Case Atlantic’s installation methods are what contributed to the shaft dropping. Case Atlantic experienced installation issues at EB #4 that may have contributed to the shaft dropping rather than a differing site condition. Case Atlantic addressed these issues by implementing different construction installation methods at subsequent drilled shafts.

The three shafts at EB #4 had similar issues as reflected in the CSL test results. The segregation was caused by Case Atlantic’s concern for production versus proper protection of shaft integrity during installation. (Exhibits # 2 Pages 211 and 242)

CSL testing at the other shafts at EB #4 showed excessive velocity reduction near the bottom of shafts # 2 and # 3 at EB # 4. (Exhibits # 2 Pages 211 and 242)

A core sample was taken from shaft #3 at EB #4 as part of an EAR to accept that particular shaft. The core sample taken from the shaft showed segregation in the bottom several feet. (Exhibit # 12 - Page 771 - 782)

At EB #4, Case Atlantic had issues with the concrete pours during the shaft installation. Case Atlantic had trouble getting the initial load of concrete to release through the bottom of the tremie pipe. The taped cover at the bottom of the tremie pipe would not release to initiate the flow of concrete. Case Atlantic proceeded to

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shove the tremie into the bottom of the shaft excavation and vibrate the top of the tremie pipe in an effort to get the cover to release. (**Exhibit # 1 – Page 25**)

Another issue was the speed in which Case Atlantic removed the tremie pipe during the installation of the concrete at EB #4. The shafts at EB #4 averaged 118' -119' in length and the concrete at these shafts was placed in approximately 2 hours time. In contrast, the shafts at EB#1 averaged 106' – 107' (approximately 10' shorter) yet the time that it took to place the concrete was closer to 2.5 hours. (**Exhibit # 1 – Pages 10, 25, 36, 49, 57 and 66**)

After the issues encountered at EB #4, Case Atlantic changed their means and methods to avoid similar issues on subsequent shafts at EB #1 and the intermediate piers.

- Case Atlantic brought in a Shaft Inspection Device (SID) to perform shaft integrity inspections . Specifically, EB #1 was composed of similarly constructed 60" diameter shafts.
- Case Atlantic began casting concrete cylinders for testing to see if they had achieved a minimum of 500 psi strength prior to installing subsequent shafts.
- Case Atlantic added an additional five foot section to the existing 86' casing used during the drilled shaft installations at EB #1. The 91' casing, along with shorter shafts that were required at EB #1 (approximately 106'), added to the stability of the shaft walls during construction. This left only a 15' section of unsupported shaft length during installation.
- Case Atlantic brought in a different superintendant (sic) to oversee the subsequent drilled shaft installations. This superintendant ensured that the concrete installation process was at a slower pace to avoid the segregation issues encountered at EB # 4. (**Exhibit # 13 – Page 783 - 784**)

The department's second argument is that regardless of the shaft dropping, the CSL tubes were blocked at approximately 55' and the contractor could not provide favorable CSL test results.

According to Specification 455-17.6.1.4 the Evaluation of CSL Test Results:

"it is up to the contractor to provide the Department proof that a shaft is acceptable. This section states that "Drilled shafts with velocity reductions exceeding 30% **are not acceptable** without an engineering analysis." (**Exhibit # 9 – Page 721**)

Since the contractor was unable to provide CSL readings to the bottom of the shaft, an EAR was required detailing the contractor's proposed testing method prior to the shaft being accepted. The contractor submitted an EAR requesting that a statnamic load test be performed. **It should be noted that the CSL reports showed excessive velocity reductions at all three shafts in EB #4. The contractor elected to address the issues of the shaft dropping and the inadequate CSL results in their EAR by proposing a load test for shaft acceptance.**

K&R is not due any additional time or money and the department has denied their claim. Per the contract specifications, it is the contractor's responsibility to provide the department with an acceptable shaft. Per Specification 455-17.6.1.5, Coring and/or Repair of Drilled Shafts, it clearly states:

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“Perform all work described in this Section at no additional cost to the Department, and with no increase in contract time.” (*Exhibit # 9 – Page 721*)

*In addition, Under Section 5-12.2.1 (Claims for Extra Work) of the Standard Specifications, “the contractor shall notify the Engineer in writing of the intention to make a claim for additional compensation **before beginning the work on which the claim is based**, and if seeking a time extension, the contractor shall also submit a preliminary request for time extension pursuant to 8-7.3.2 **within ten calendar days** after commencement of a delay”. Preparation for the load test and the associated costs were taking place prior to the Notice of Intent being submitted. (*Exhibit # 9-page 719*)*

Conclusion:

The department is requesting for the DRB to rule that K&R is not entitled to any additional contract time or monetary compensation for performing the load test on the drilled shaft. It is the department’s position that Case Atlantic’s installation methods are what contributed to the shaft dropping.

Firstly, various references within the documents listed above put the burden on the contractor to provide the department with an acceptable shaft. K&R/Case Atlantic could not prove that Shaft #1 at EB #4 was an acceptable shaft without performing the load test recommended by their own specialty engineer.

Secondly, from the information obtained from the CSL results and by coring shaft #3 at EB #4, it is obvious that Case Atlantic was having issues with installation of the drilled shafts. The issue of having segregated concrete at the bottom several feet of the shaft, along with the vibration during construction of the adjacent shaft, is what contributed to the shaft #1 at EB #4 dropping 2.64’, not a “differing site condition.”

*Finally, if K&R/Case Atlantic regarded this as a “Differing Site Condition” they should have given proper notice with a **specific differing condition** as stated in the Specifications. The department reviewed the original plan borings, the pilot hole results as well as the drilling logs during the shaft installation and found no materially different conditions to those identified in the plans.*

CONTRACTOR’S REBUTTAL:

I. SUMMARY

Case Atlantic Company (“Case”) responds herein to the position paper submitted by AECOM on behalf of the Florida Department of Transportation (“FDOT”). In its position paper, AECOM asserts that (1) Case Atlantic has not proven its differing site condition claim because shaft excavation logs and pilot-hole samples show conditions as indicated in the borings; (2) the segregation of concrete or some other alleged defect in the drilled shaft caused the drop of the concrete; and (3) irrespective of the cause of the drop or damage to CSL tubes, Case was responsible for performing the load test because CSL tests could not be performed in the shaft. Case addresses these arguments in the order in which they are presented in AECOM’s position paper.

II. SPECIFIC RESPONSES

1. Proof of Differing Site Conditions

In asserting that Case did not demonstrate differing site conditions, AECOM fails to acknowledge or address that differing site conditions include not only subsurface conditions that differ from those indicated in the

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contract documents (commonly referred to as “Type 1” differing site conditions), but also “unknown physical conditions of an unusual nature differing materially from those ordinarily encountered and generally recognized as inherent in the work” (“Type 2” differing site conditions) (see EXHIBIT 3 of Case’s Position Paper). Moreover, AECOM fails to recognize that a contractor does not need to show a difference in the constituency of subsurface materials in order to establish differing site conditions.

Courts and boards of appeals have long recognized and held that a contractor may prove differing conditions by showing the unanticipated behavior of subsurface materials. Rumsey v. U.S., 88 Ct.Cl. 254, 1939 (“The behavior of the material on the site of the cofferdam ... was materially different from what had been anticipated.”) (see also J. Lawson Jones, ENG-BCA, 86-1 BCA P 18,719 (“unanticipated characteristic or behavior of a material have been recognized as a category II differing site condition”); Municipality of Anchorage v. Frank Coluccio Const. Co., 826 P.2d 316, Alaska 1992 (“The panel concluded that the unexpected ground behavior “constitute[d] a differing site condition as provided in the Differing Site Conditions Clause set forth in the contract.”)). In Rumsey v. U.S., the court found that a differing site condition existed because of the behavior of the material even though the “ground materials encountered by the contractor throughout the entire project have been practically as shown by the test borings, and as shown and described in the plans and specifications.”

Case contends that the behavior of the subsurface materials at Bent 4, Shaft 1, specifically a substantial drop after the placement of concrete and stabilization of the shaft, demonstrates the presence of large subsurface voids not indicated in the borings⁵. Drilling logs and soils sampled in pilot holes (as referenced by AECOM) do not provide an indication of voids that may exist outside of, but in close proximity to, the drilled shaft. Additionally, such a drop evidences an unknown physical condition of an unusual nature differing from the behavior of subsurface soils ordinarily encountered, a type 2 (or “Category II”) differing site condition. As recognized by the courts, a differing site condition may be present even if the sampled soils (as referenced by AECOM) appear to be consistent with those indicated in the borings.

2. AECOM’s Alleged Causes of the Shaft Drop

AECOM alleges that “Case Atlantic’s installation methods are what contributed to the shaft dropping.” AECOM’s argument, however, has two obvious flaws. First, AECOM fails to allege, much less show, a deficiency in the shaft in question. Instead, AECOM points to alleged deficiencies in other shafts as evidence that a deficiency may have existed at End Bent 4. Second, even if one or all of the alleged deficiencies occurred at Pier 1, which Case denies, AECOM fails to explain how any of the alleged deficiencies, if true, would cause the drop. For example, even if concrete at the bottom of Pier 1 was segregated, this would not explain a drop in the shaft. Segregation of the concrete does not result in a net loss of concrete volume in the shaft. Case experienced a loss of 1.8 cubic yards of concrete that was initially stable.

In its conclusion, AECOM further asserts that vibration of casing in an adjacent shaft, combined with alleged segregated concrete, “contributed to” the shaft dropping. AECOM fails to acknowledge that (i) Case’s vibrating/installation of casing in the adjacent shaft, Pier 2 of End Bent 4, was performed in accordance and

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conformance with FDOT specifications; and (ii) the exact method, sequence, and timing of concrete placement, casing extraction, and vibration of casing was performed by Case in another shaft at End Bent 4 without a drop in the shaft.

- (i) FDOT Specifications: FDOT Standard Specifications Subsection 455-1.4 establishes criteria for ensuring that freshly-placed concrete is not damaged or otherwise negatively affected by vibrations from drilled shaft (or piling) operations in close proximity to such freshly-placed concrete. Under this specification, a contractor is restricted from installing drilled shafts near newly-constructed drilled shafts if such subsequent drilled shaft work subjects the in-place shaft to vibrations of greater than 1.5 inches per second before final set of the concrete. Beyond this limitation, there is no restriction on follow-on work. Case monitored vibrations during the installation of casing at End Bent 4, Pier 2 in accordance with Subsection 455-1.4. Case did not encounter vibrations exceeding the 1.5 inch/second threshold at End Bent 4, Pier 1 during the installation of casing at Pier 2.
- (ii) Method followed at other shafts: Case placed concrete at Pier 3 in End Bent 4 beginning at 2:30 pm on February 15, 2011. After placing concrete at this shaft, Case extracted the temporary casing at Pier 3 and immediately began vibrating casing at Pier 1 at 4:30 pm on the same day (**REBUTTAL EXHIBIT 1**). Despite the deficiencies claimed by AECOM in Pier 3 and vibration of casing in a nearby shaft, Case did not experience a drop in Pier 3.

Case notes that AECOM does not actually provide a complete explanation of the cause of the shaft drop. In fact, AECOM stops short of alleging that the drop was caused by Case. Instead, AECOM qualifiedly asserts that Case's means and methods "contributed to" the drop. One must assume that AECOM acknowledges, albeit implicitly, that the drop was caused at least in part by some other factor or condition. To the extent AECOM alleges that Case "contributed to" the drop, AECOM's theory is unfounded and lacks a reasonable engineering rationale. Absent a substantial void (not indicated in the borings), the shaft would not have dropped.

3. Damage to CSL Tubes

AECOM's last basis for rejecting Case's claim is that Case is responsible for performing additional testing at no cost to FDOT, regardless of the cause of the shaft drop and resulting damage to the CSL tubes. This position has no contractual or legal support. While Case does not deny FDOT's right to request additional testing to confirm conformance of the drilled shaft, Kamminga & Roodvoets, Inc. (on behalf of Denson and Case) is entitled under the Contract to additional compensation if such additional testing was necessitated by damage caused by differing site conditions. The CSL tubes were damaged by a drop in the shaft resulting from differing site conditions.

III. CONCLUSION

Kamminga & Roodvoets, Inc. (on behalf of Denson and Case) is entitled to payment in the amount of \$62,162.57 for overcoming differing subsurface conditions and fulfilling FDOT's requirements for acceptance of End Bent 4, Shaft No. 1.

⁵ Case notes that the borings did not indicate voids or a loss of water/circulation during drilling, a telltale of voids.

DISPUTE REVIEW BOARD RECOMMENDATION

DEPARTMENT'S REBUTTAL:

Issue:

The Prime Contractor, Kamminga and Roodvoets, Inc. (K&R) has submitted a request for additional contract time and compensation for the costs associated with the performance of a drilled shaft load test. The request is on behalf of their second tier subcontractor Case Atlantic. The issue statement to be addressed by your board is; "Is the Contractor entitled to additional contract time and compensation for a drilled shaft load test that was performed to verify the integrity of a drilled shaft that dropped (Shaft #1 at EB #4) during the drilled shaft installation?"

Rebuttal:

Case Atlantic has submitted a position paper regarding their differing site condition claim for shaft # 1 at EB # 4. Shaft # 1 at EB # 4 is the shaft that dropped approximately 2.64' within approximately 15 minutes of it being filled with concrete.

Background:

Case Atlantic was vibrating the 86' temporary casing at shaft # 2 (which is adjacent to shaft # 1) immediately following the completion of shaft # 1. After the shaft dropped, The CSL tubes were checked and there was an obstruction in the CSL tubes approximately 55-60' below ground and readings could not be performed below this level. By Specification 455-17.6.1.5, "drilled shafts with velocity reductions exceeding 30% are not acceptable without an engineering analysis. Since the CSL readings could not be performed the entire length of the shaft, Case Atlantic proposed a load test as part of their engineering analysis to accept this shaft. K&R, on behalf of Case Atlantic, has submitted an "Unforeseen Ground Condition" claim.

Contractor's position/FDOT rebuttal

In their position paper, Case Atlantic states that "During the construction of the drilled shafts, Case encountered subsurface conditions which differed materially from those indicated in the contract and of an unusual nature differing materially from those ordinarily encountered in drilled shaft work."

To date, Case Atlantic has yet to provide any proof to substantiate this claim.

In section B of their position paper, Case admits that "there is no indication in the boring of large voids or other conditions which would cause a drilled shaft to drop." And that "Similarly, none of the other borings indicate or suggest that such large voids would be present."

*As stated in the department's position paper, we reviewed the contract documents which included the plan borings and compared them with the information obtained from the pilot holes. The pilot holes were drilled approximately 15' deeper than the plan bottom elevation of the drilled shafts identified in the plans as needing pilot holes. We reviewed the pilot hole information that was performed at the drilled shaft location in question and the drill logs. Our review showed that the material from the borings was consistent with that of the pilot holes and the drill logs and that **there was no differing site condition.***

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Case Atlantic made the statement that “the entire shaft, including the reinforcing steel cage, **inexplicably** dropped approximately 2.5 feet.” and “that the drop took place **well after** the removal of casing at shaft No. 1”

The department’s position is that the contractor’s means and methods are what may have caused the shaft to drop due to concrete segregation within the approximately 119’ long shaft. CSL results at Shaft # 2 and Shaft # 3 indicated segregation within the bottom several feet of the shafts at EB # 4. It is our position that concrete consolidation took place during the vibration of the 86’ casing within 16 feet of the freshly poured drilled shaft # 1 at EB # 4. The concrete segregation was caused by Case Atlantic’s concern for production versus proper protection of shaft integrity during installation. **(Exhibit # 2 Pages 211 and 242 of our position paper)**

Case Atlantic had issues getting the initial load of concrete to release from the bottom of the tremie pipe. After the final soundings to check the bottom of the shafts were performed, not only did Case push the tremie into the bottom of the shaft but also vibrated the top of the tremie in an effort to get the concrete to release.

Case Atlantic also began vibrating the 86’ casing into drilled shaft # 2 at EB # 4 **within fifteen minutes** of removing the casing from drilled shaft # 1 at EB # 4. **This took place at approximately 4:45 PM, near the end of the work day of 2/17/2011.** Case Atlantic’s concern for production and not a differing site condition is what led to the shaft dropping 2.64’

Case Atlantic also stated that “As a result of the drop, cross-hole sonic logging (“CSL”) tubes incorporated within the shaft were damaged and rendered unusable.” and “With the unusable CSL tubes, the only practicable means of proving conformance of the shaft **were taking core samples or performing a load test.** FDOT’s engineer of record (the “Engineer”) however, indicated that it would not accept coring results to demonstrate conformance.”

The department’s position is that **the above statement is false.** At no time did the department direct the contractor to perform a load test. According to Specification 455-17.6.1.4 the Evaluation of CSL Test Results:

This section states that “Drilled shafts with velocity reductions exceeding 30% **are not acceptable without an engineering analysis.**” It is up to the contractor to provide the Department proof that a shaft is acceptable. It should be noted that the contractor continues to refer to the 2007 specifications (their exhibit # 10) regarding this issue instead of the correct 2010 specifications section which refers to needing an engineering analysis. **(Exhibit # 9 – Page 721 of our position paper)**

At several progress meetings and several e-mails following the shaft dropping, the department requested that the contractor submit an Engineering Analysis Review (EAR) detailing their proposed method of proving that the shaft was acceptable. At our progress meeting held on 3/8/2011 Case Atlantic made the comment that they might propose to load test all of the shafts at EB # 4. **(Attachment # 1 and # 2 of our rebuttal)**

Case Atlantic chose not to perform any physical investigation to substantiate their claim. It was brought to Case Atlantic’s attention that any investigation would have to take place prior to MSE wall construction commencing. At the DRB meeting held on 6/28/2011, K&R reiterated that they had put Case Atlantic on notice of when the MSE wall construction would commence. K&R told Case Atlantic that if they were going to perform any investigation to substantiate their claim, it needed to take place prior to that date. **(Attachment # 3 of our rebuttal)**

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The contractor had several options that could have been proposed as part of their EAR as well as their ultimate decision to perform a load test as recommended by their specialty engineer, Applied Foundation Testing (AFT).

By specification 455-17.6.1.2 “If the access tubes do not provide access over the full length of the shaft, repair the existing tube(s) or core additional hole(s), as directed by the Engineer, at no additional cost to the Department. (Attachment # 4 of our Rebuttal)

*By specification 455-17.6.1.5, since the CSL results could not be performed throughout the length of the shaft, **the contractor could have taken core samples for further evaluation.** At several progress meetings following the shaft dropping, the contractor was asked to submit their EAR detailing their proposed method for analysis of the shaft. (Attachment # 4 of our rebuttal)*

This specification also clearly states:

“Perform all work described in this Section at no additional cost to the Department, and with no increase in contract time.” (Exhibit # 9 – Page 721 of our position paper)

It was Case Atlantic’s decision to perform a load test at Shaft # 1 EB # 4, not the direction given from the department.

On 3/31/2011 a Disposition of Defective Material (DDM) was submitted for shaft acceptance with an attached EAR scope requesting to perform a Statnamic load test. (Exhibit # 4 – Page 537 – 559 of our position paper)

It should be noted that the CSL reports showed excessive velocity reductions in all three shafts at EB # 4. The contractor elected to address the issues of the shaft dropping and the inadequate CSL results in their EAR by proposing load tests for shaft acceptance.

In Section C of their position paper, Case Atlantic states that they “constructed the other 18 drilled shafts, following the same approved means, methods, and sequence, without the collapse condition”.

***Case Atlantic’s installation methods are what contributed to the shaft dropping.** Case Atlantic’s concern for production versus proper protection of shaft integrity during installation caused concrete consolidation in the shaft. Case Atlantic experienced installation issues at EB # 4 that contributed to the shaft dropping rather than a differing site condition.*

At EB # 4, Case Atlantic had issues with the concrete pours during the shaft installation. Case Atlantic had trouble getting the initial load of concrete to release through the bottom of the tremie pipe. The taped cover at the bottom of the tremie pipe would not release to initiate the flow of concrete. Case Atlantic proceeded to shove the tremie into the bottom of the shaft excavation and vibrate the top of the tremie pipe in an effort to get the cover to release. (Exhibit # 1 – Page 25 of our position paper)

Another issue was the speed in which Case Atlantic removed the tremie pipe during the installation of the concrete at EB # 4. The shafts at EB # 4 averaged 118’ -119’ in length and the concrete at these shafts was placed in approximately 2 hours time. In contrast, the shafts at EB # 1 averaged 106’ – 107’ (approximately 10’

DISPUTE REVIEW BOARD RECOMMENDATION

shorter) yet the time that it took to place the concrete was closer to 2.5 hours. (*Exhibit # 1 – Pages 10, 25, 36, 49, 57 and 66 of our position paper*)

Case Atlantic did change their means and methods. Case Atlantic addressed the issues encountered at EB # 4 by implementing slower, more methodical, construction installation at subsequent drilled shafts. Additionally, Case Atlantic implemented the following:

- Case Atlantic brought in a Shaft Inspection Device (SID) to perform shaft integrity inspections. Specifically, EB # 1 was composed of similarly constructed 60” diameter shafts.
- Case Atlantic began casting concrete cylinders for testing to see if they had achieved a minimum of 500 psi strength prior to installing subsequent shafts.
- Case Atlantic added an additional five foot section to the existing 86’ casing used during the drilled shaft installations at EB # 1. The 91’ casing, along with shorter shafts that were required at EB # 1 (approximately 106’), added to the stability of the shaft walls during construction. This left only a 15’ section of unsupported shaft length during installation.
- Case Atlantic brought in a different superintendant (sic) to oversee the subsequent drilled shaft installations. This superintendant ensured that the concrete installation process was at a slower pace to avoid the segregation issues encountered at EB # 4. (*Exhibit # 13 – Page 783 – 784 of our position paper*)

In addition, Under Section 5-12.2.1 (Claims for Extra Work) of the Standard Specifications, “the contractor shall notify the Engineer in writing of the intention to make a claim for additional compensation **before beginning the work on which the claim is based**, and if seeking a time extension, the contractor shall also submit a preliminary request for time extension pursuant to 8-7.3.2 **within ten calendar days** after commencement of a delay”. Preparation for the load test and the associated costs were taking place prior to the Notice of Intent being submitted. (*Exhibit # 9 - Page 719 of our position paper*)

The shaft issue occurred on 2/17/2011 yet the contractor’s notice was not submitted until 3/23/2011. In their position paper, the contractor has made reference to an e-mail dated 2/21/2011 and has made the claim that the “FDOT would not approve Shaft No.1 without a load test.” **This is an untrue statement**, and based on the referenced e-mail of 2/21/2011, the contractor did not provide notice of intent for performing the load test, **for over 30 days**, until they were well underway with the preparations to perform the load test.

Conclusion:

The department is requesting for the DRB to rule that K&R/Case Atlantic is not entitled to any additional contract time or monetary compensation for performing the load test on the drilled shaft that dropped. It is the department’s position that Case Atlantic’s installation methods are what contributed to the shaft dropping.

Firstly, various references within the documents listed above put the burden on the contractor to provide the department with an acceptable shaft. K&R/Case Atlantic chose to prove that Shaft # 1 at EB # 4 was an acceptable shaft by performing the load test recommended by their own specialty engineer Applied Foundations Testing (AFT).

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Secondly, from the information obtained from the CSL results and by coring shaft # 3 at EB # 4, it is obvious that Case Atlantic was having issues with installation of the drilled shafts. The issue of having segregated concrete at the bottom several feet of the shaft, along with the vibration during construction of the adjacent shaft, is what contributed to the shaft #1 at EB # 4 dropping 2.64', not a "differing site condition."

Finally, if K&R/Case Atlantic regarded this as a "Differing Site Condition" they should have given proper notice with a **specific differing condition** as stated in the Specifications. The department reviewed the original plan borings, the pilot hole results as well as the drilling logs during the shaft installation and found no materially different conditions to those identified in the plans. The pilot core holes and drill shaft excavation logs validate the boring log information provided in the plans and demonstrate like site conditions to those identified in the plans. Furthermore, the contractor has provided no information supporting a differing site condition. Therefore, the claim of a differing site condition is invalid and unsupported.

BOARD FINDINGS/EXPLANATION:

The Section 4-3.7 of the 2010 Standard Specifications for Road and Bridge Construction states:

4-3.7 Differing Site Conditions: *During the progress of the work, if subsurface or latent physical conditions are encountered at the site differing materially from those indicated in the Contract, or if unknown physical conditions of an unusual nature differing materially from those ordinarily encountered and generally recognized as inherent in the work provided for in the Contract are encountered at the site, the party discovering such conditions shall promptly notify the other party in writing of the specific differing conditions before the Contractor disturbs the conditions or performs the affected work.*

Upon receipt of written notification of differing site conditions from the Contractor, the Engineer will investigate the conditions, and if it is determined that the conditions materially differ and cause an increase or decrease in the cost or time required for the performance of any work under the Contract, an adjustment will be made, excluding loss of anticipated profits, and the Contract will be modified in writing accordingly. The Engineer will notify the Contractor whether or not an adjustment of the Contract is warranted.

The Engineer will not allow a Contract adjustment for a differing site condition unless the Contractor has provided the required written notice.

The Engineer will not allow a Contract adjustment under this clause for any effects caused to any other Department or non-Department projects on which the Contractor may be working.

The Board finds:

The Board's review of the borings and pilot holes drilled for this project did not show evidence of anomalies, large voids or site conditions that would account for the drop experienced. The contractor did not identify a specific site condition that caused the top of the shaft to drop.

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The drilled shaft log (FDOT Exhibit 1 page 22 of 784) for Shaft 1 Pier 4 indicates that a significant portion of the original 40 feet of shaft excavated had to be removed again after driving the 86 foot casing. Where a portion or all of this material came from is in question. If this material came from outside the shaft area, a weakened area or void may have been formed, providing an area for displaced shaft concrete to move into. No borings around the perimeter of the shaft 1 were taken by either Party.

During the regular DRB meetings K&R was asked whether there were any issues for which they would be requesting time and/or money which had not been so far addressed. Some effort in preparation for the load test was commenced prior to submittal of notice.

The contractor alleges that shaft #1, end bent #4 dropped 2.64 feet due to unforeseen or differing site conditions which differed materially from those indicated in the Contract, but offers no details nor theory on the identity of these conditions. No exploratory work was performed nor proposed to identify those conditions. The Department did review the original plan borings, the pilot hole results as well as the drilling logs during the shaft installation and found no materially different conditions to those identified in the plans. The Parties agree that the top of the shaft including the rebar cage did drop approximately 2.64 feet. It remains undetermined whether the bottom of the shaft dropped as well or whether a void existed adjacent to the shaft that might have caused concrete to flow into it.

Four of the five CSL tubes were unusable in the lower half of Shaft 1 (below approximately 55 feet - due to blockage). An engineering analysis was required by the specifications to prove structural adequacy. Since the CSL tubes could not provide the required information, Case proposed a statnamic load test to measure structural adequacy.

Case provided notice of intent on March 17th to Denson alleging that the proposed load test was additional work and was a result of differing site conditions. On March 23rd K&R submitted the NOI to the FDOT. The statnamic load test was performed March 24, 2011. Specifications required the contractor to submit an EAR to identify solutions to the problem. The EAR proposed a load test which was performed. Nothing presented to the Board showed that differing site conditions were present or caused the problem.

It is the Department's position that Case Atlantic's installation methods are what contributed to the shaft dropping. Additionally, segregation was shown in the core taken from shaft #3 end bent #4.

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The Board finds that the Contractor has not substantiated his claim.

It is sometimes argued that a DRB will provide a recommendation that ignores the contract or is somewhere in between the positions taken by each party; in effect, a compromise. **It is not the DRB's prerogative to substitute its own ideas of fairness and equity for the provisions of the contract. ...**⁶

BOARD RECOMMENDATION:

Therefore, based on the materials supplied to the Board and presentations to the Board at the DRB hearing, the Board recommends no entitlement for payment for alleged differing subsurface conditions or for fulfilling FDOT's contract requirements.

This Board sincerely appreciates the cooperation of all parties and the information presented for its review in making this recommendation.

Please remember that a response to the DRB and the other party of your acceptance or rejection of this recommendation is required within 15 days. Failure to respond constitutes an acceptance of this recommendation by the non-responding party.

I certify that I have participated in all of the meetings of this DRB regarding this issue and concur with the findings and recommendations.

Respectfully Submitted
Disputes Review Board

John H. Duke Sr.; DRB Chairman
Charles Wegman P.E.; DRB Member
David A. Donofrio P.E.; DRB Member

SIGNED FOR AND WITH THE CONCURRENCE OF ALL MEMBERS:

A handwritten signature in black ink, appearing to read "JH Duke", written over a horizontal line.

John H. Duke, Sr.
DRB Chairman

⁶ DRBF Practices and Procedures Section 1 – Chapter 6