

GARTH L. WILSON  
ENGINEERING AND CONSTRUCTION INSIGHTS

August 18, 2009

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Reference: CDOT Project IM-0253-160  
FCI Job No. 4106

Dear Chris and Justin,

In response to your requests to the Disputes Review Board (DRB) to determine merit and quantum relative to Dispute #3 on the referenced Project, we enclose our recommendation herewith. In accordance with Subsection 105.22(g), one original signed copy of the recommendation is provided to each party.

We await further direction in this matter.

As discussed during the meeting on August 14, 2009, review of the pre-hearing documents for Dispute #2 was deferred and that matter will be included in the next Hearing on September 16, 2009. Pre-hearing documents for Dispute # 11 are to be submitted to the DRB no later than September 4, 2009 in anticipation of the same Hearing.

Sincerely,



Garth L. Wilson, Chairman  
For the DRB

Enclosures

cc: Bill Ashton  
Dick Fullerton

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**DISPUTE #3 – Removal and Replacement of Structure D-17-EA Abutments - \$139,368.03  
and 25 Working Days**

**Documents Reviewed:**

**A. Contract and Bond:**

1. Project No. IM 0253-160 Contract;
2. Special Provisions (Standard and Project);
3. Standard Specifications for Road and Bridge Construction (2005);
4. Supplemental Specifications;
5. Plans (Standard and Detailed);
6. Flatiron's Proposal;
7. Contract Modification Orders 1 through 7.

**B. Correspondence:**

1. CDOT Speed Memo #192 dated 11-28-07 with Concrete Core Test Report;
2. CDOT Speed Memo #196 dated 12-3-07 with Concrete Core Test Report;
3. CDOT Speed Memo #198 dated 12-7-07 with Concrete Core Test Report;
4. FCI letter dated 12-7-07 to Ready Mixed Concrete Co (RMCC) w/Speed Memo #198;
5. CDOT Speed Memo #199 dated 12-13-07 with Concrete Core Test Report;
6. CDOT Weekly Time Count No. 69 for 1-6-08 through 1-12-08 w/FCI protest noted;
7. CDOT Weekly Time Count No. 70 for 1-13-08 through 1-19-08 w/FCI protest noted;
8. FCI letter dated 1/31/08 w/January 26, 2008 Schedule Narrative;
9. CDOT Speed Memo #228 dated 2-11-08 regarding Time Charges;
10. CDOT Weekly Time Count No. 71 for 1-20-08 through 1-26-08 w/FCI protest noted;
11. CDOT Weekly Time Count No. 72 for 1-27-08 through 2-2-08 w/FCI protest noted;
12. CDOT Weekly Time Count No. 73 for 2-3-08 through 2-09-08 w/FCI protest noted;
13. CDOT Weekly Time Count No. 74 for 2-10-08 through 2-16-08 w/FCI protest noted;
14. CDOT Weekly Time Count No. 75 for 2-17-08 through 2-23-08 w/FCI protest noted;
15. CDOT Weekly Time Count No. 76 for 2-24-08 through 3-1-08 w/FCI protest noted;
16. RMCC letter dated 3-3-08 to FCI;
17. FCI letter dated 5-1-08 w/Notice of Dispute for Working Day Charge;
18. CDOT Speed Memo #267 dated 5-2-08 w/letter regarding Working Day Charge;
19. FCI letter dated 5-15-08 w/REA;
20. CDOT letter dated 5-15-08 regarding meeting for REA;
21. CDOT Speed Memo dated 5-23-08 with letter denying merit;
22. FCI letter dated 6-9-08 rejecting denial;
23. FCI Pre-Hearing Position Paper dated 8-4-09 (with attachments);
24. CDOT Pre-Hearing Position Paper dated 8-4-09 (with attachments).

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**Discussion:**

**A. Sequence:**

North Abutment:

FCI placed Class D concrete (4500 psi @ 28 days) for the north abutment (No. 2) of bridge D-17-EA (southbound) on 11-8-07. According to their pre-hearing statement, "several issues gave CDOT cause for concern that concrete placed within the abutments would not reach the required compressive strength". Both "acceptance" and "field" cylinders were cast during this placement. Based on the CDOT report of compression tests on "field" cylinders, at 4 days (11-12-07) the concrete strengths were 3360 and 3120 psi (average 3240 psi) and, at 7 days (11-15-07), strengths were 3480 and 3160 psi (average 3320 psi).

Apparently as a result of those tests, on 11-20-07 CDOT directed FCI to take core samples for further testing. Three cores were taken on 11-26-07, tested and reported on 11-28-07 (20 days) with strengths of 3303, 3766 and 4309 psi (average of 3790 psi). The Specifications require concrete to have a minimum strength of 3600 psi (80% of 4500 psi) to set girders (planned at this time for installation on 11-28 and 11-29-07). On 11-28-07, CDOT advised that girders could not be set because "there are portions of abutment #2 which have yet to reach this value" [3600 psi]. CDOT obtained three more core samples on 11-29-07, tested them on 11-30-07 (22 days) and reported results on 12-3-07 with strengths of 2995, 2756 and 2711 psi (average of 2820 psi).

The CDOT report of compression tests on the "acceptance" cylinders at 7 days (11-15-07) showed concrete strengths of 4160 and 4330 psi (average 4245 psi – within expectations) and, at 28 days (12-6-07) the strengths were 5590, 5650 and 5600 psi (average 5615 psi).

On 12-3-07, CDOT notified FCI via Speed Memo #196 that it planned to take additional core samples on 12-6-07, and "If these cores do not meet strength requirements as per section 601.17, the concrete will be rejected." Three cores were removed by CDOT from Abutment No. 2 on 12-5-07, tested on 12-6-07 (28 days) and reported on 12-7-07 with strengths of 2849, 3235 and 3151 psi (average 3078 psi). On the basis of these core results, CDOT notified FCI on 12-7-07 that the concrete in Abutment 2 was rejected.

FCI removed and replaced the structure between 12-12 and 12-19-07. On 1-3-08 (cure day 15 for the new structure), the strengths of the concrete in the new structure were 6105, 6415 and 6290 psi (average 6256 psi).

South Abutment:

FCI placed concrete for the south abutment (No. 1) of bridge D-17-EA (Southbound) on November 13, 2007. Only "field" cylinders were cast during this placement because the "acceptance" samples made for Abutment No 2 were deemed by CDOT to represent the Abutment No. 1 concrete also. Based on the CDOT report of compression tests on "field" cylinders at 6 days (11-19-07), the concrete strengths were 4380 and 4190 psi (average 4285

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psi). For reasons not explained, no further tests were performed on the remaining "field cylinders".

Because of concerns "regarding the possibility of dirty aggregate and poor consolidation", CDOT took core samples for Abutment No 1 on 12-5-07, tested them on 12-6-07 (23 days) and reported strengths of 3930, 4599 and 3928 psi (average 4152 psi). CDOT took another set of cores from Abutment No. 1 on 12-10-07, tested them at 28 days (12-11-07) and reported strengths on 12-13-07 of 4193, 3637 and 3778 psi (average 3869 psi). On the basis of these core tests, Abutment No 1 concrete was determined to be unacceptable and FCI was so advised on 12-13-07.

FCI removed and replaced the structure between 12-18-07 and 1-2-08. On 1-7-08 (cure day 5 for the new structure), the strengths of the concrete in the new structure were 3850, 3670 and 3760 psi (average 3760 psi) – adequate for placement of girders. FCI placed the girders on 1-10 and 1-11-08.

Independent Tests:

1. In response to a suggestion from FCI, RMCC had three cores taken from Abutment No. 2 on 12-5-07 and tested on 12-6-07 (day 28) by CTS/JA Cesare. The results show strengths of 4010, 4090 and 4420 psi (average 4170 psi); a strength adequate to allow the structure to remain with a pay reduction. However, the earliest indication of when this result was distributed to the parties was 3-3-08 – well after that abutment was removed.
2. RMCC also had six cores (three horizontal and three vertical) removed from Abutment No. 1 on 11-13-07 and tested on 12-20-07 (day 37) by CTC-Geotek, Inc. The results of the vertical tests show strengths of 4730, 4120 and 4960 psi (average 4600 psi) while the horizontal cores tested at 5400, 5740, and 5540 psi (average 5560 psi). Here again, strength results were sufficient to have allowed the structure to remain. The sample that tested at 4120 psi contained voids/honeycombing. Once again, there is no indication that results of these tests were distributed to the parties until 3-3-08, well after that abutment was removed.
3. As part of its investigation, on 12-7-07 CDOT sent four cores and two cast cylinders to DRP Consulting, Inc. (DRP) for petrographic analysis. A report dated 1-10-08 was provided by Dr. David Rothstein.

Summary of Activities and Tests: - see the following table

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Structure D-17-EA Southbound Abutments – Concrete Placement, Testing, Removal & Replacement							
Date	North Abutment (#2)			South Abutment (#1)			Comments
	Activity	Day	Value	Activity	Day	Value	
11-8-07	Placed	0	32.5 cy				12:55 to 3:00 pm
11-12-07	Field cyl	4	3240 psi				3360 & 3120 psi
11-13-07				Placed	0	32.5 cy	8:20 to 11:40 am
11-15-07	Field cyl	7	3320 psi				3480 & 3160 psi
	Accept. cyl		4245 psi				4160 & 4330 psi
11-19-07				Field cyl	6	4285 psi	4380 & 4190 psi
11-20-07				Accept. cyl	7	4245 psi	Inferred from set for #2
	CDOT ordered FCI to take cores						
11-28-07	Core tests	20	3790 psi				3303, 3766, & 4309 psi
CDOT disallowed girder placement							
11-30-07	Core tests	22	2820 psi				2995, 2756 & 2711 psi
12-6-07	Accept. cyl	28	5615 psi				5590, 5650 & 5600 psi
				CDOT core	23	4152 psi	3930, 4599 & 3928 psi
	Accept. core	28	3078 psi				2849, 3235 & 3151 psi
	RMCC core	28	4170 psi				4010, 4090 & 4420 psi
12-7-07	Concrete rejected by CDOT						
12-11-07				Accept. cyl	28	5615 psi	Inferred from set for #2
				Accept. core	28	3869 psi	4193, 3637 & 3778 psi
12-12-07	FCI removed structure						
12-13-07				Concrete rejected by CDOT			
12-18-07				FCI removed structure			
12-19-07	FCI placed new structure						
12-20-07				RMCC core	37	4600 psi	4730, 4210 & 4960 psi
				RMCC core	37	5560 psi	5400, 5740 & 5540 psi
1-2-08				FCI placed new structure			

During the period that the southbound bridge was under construction, up to the date when girders were set (1-10-08), working day charges were not assessed for bridge construction activities because they were not on the critical path. With its Weekly Time Count Report No. 69, CDOT began recording working days when, in its opinion, bridge work was affected. Flatiron disputed these time charges and submitted a Request for Equitable Adjustment (REA) after being unable to reach agreement for consideration.

Apparently, through meetings and further exchanges, resolution was not obtained so the matter was referred to the DRB.

**B. Procedures:**

Subsection 105.21 *Dispute Resolution* (as revised by CMO No. 3) provides specific steps to be taken when a dispute arises and before the issue is presented to the Dispute Review Board (DRB).

1. The DRB is proceeding on the basis that those prescribed steps have been followed.

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2. No indication is made on either Pre-Hearing submittal that a copy of the Position Paper was provided to the other party as required by subsection 105.22(e) but the parties confirmed by e-mails prior to the Hearing that the documents were exchanged.
3. In many respects the presentations are incomplete but clarifications obtained during the Hearing have been used by the DRB to make the recommendation.

**C. Positions:**

1. CDOT directed the removal of the North Abutment after tests on 3 cored samples indicated 28 day strengths of less than 4500 psi. A similar order was issued for the South Abutment also based on 3 cored samples with 28 day strengths less than 4500 psi.

CDOT advised during the Hearing that working days were assigned for bridge work because its evaluation of the schedule showed that the bridge activities would not be completed before the earthwork activities were to begin, and therefore were on the critical path. 25 working days were assigned from January 10 through February 20, 2008 associated with bridge work.

CDOT considers all costs associated with the removal and replacement of these abutments to be for the account of FCI; and that no time is due FCI for the resultant delay to the Project.

2. FCI contended that CDOT was wrong in using the test results of cored samples to determine the acceptability of the concrete. FCI believe the strength of the concrete in the abutments should have been judged based on the "acceptance" cylinders cast on 11-8-07. The tests of those cylinders showed concrete strengths over 4100 psi at 7 days so the abutments should not have been removed and the girders should have been set as scheduled. FCI states that CDOT has held the Contractor to a standard not supported by the Specifications or by industry standards. FCI has claimed all costs associated with the removal and replacement of the abutments, including incidental costs and overhead.

FCI also has claimed that 25 working days were inappropriately assessed by the CDOT Engineer because it maintains that the bridge work, even with the improperly ordered abutment replacements, was not on the critical path as evidenced by the bridge work being completed on April 28, prior to completion of earthwork on April 30, 2008.

**D. Contract Provisions:**

1. Subsection 101.85 *Working Day* is defined as: "Any day, exclusive of Saturdays, Sundays and holidays on which weather and other conditions not under the control of the Contractor will permit construction operations to proceed with the normal working force engaged in performing those items controlling the completion of the work."
2. Subsection 105.03 *Conformity to the Contract* states in part:

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“When the Engineer finds the materials furnished, work performed, or the finished product are not in conformity with the Contract and has resulted in an inferior or unsatisfactory product, the work or materials shall be removed and replaced or otherwise corrected by and at the expense of the Contractor.”

“Materials will be sampled and tested by the Department in accordance with the sampling and testing schedules and procedures contained in the Department’s Field Materials Manual. The approximate maximum quantity represented by each sample will be as set forth in the schedules.”

“Materials or work will be evaluated for price reduction only when deviations from specifications occur on any of the several individual tests for the lot. The several individual test values will be averaged and the percent of price reduction for the lot will be determined by applicable formula.”

“Material which is obviously defective may be isolated and rejected without regard to sampling sequence or location within a lot.”

3. Subsection 105.15 *Inspection and Testing of Work* states in part:

“All materials and each part or detail of the work shall be subject to inspection by the Engineer.”

“All inspections and tests conducted by the Department are for the convenience and benefit of the Department. These inspections and tests do not constitute acceptance of the materials or work tested or inspected, and the Department may reject or accept any work or materials at any time prior to the inspection pursuant to subsection 105.20(b)...”

4. Subsection 105.16 *Removal of Unacceptable Work and Unauthorized Work* states in part:

“Unacceptable work, resulting from any cause, ... shall be removed and replaced in an acceptable manner at the Contractor’s expense.”

5. Subsection 105.22(e)3 *Pre-Hearing Submittal* states: “When the scope of the hearing includes quantum, the requesting party’s position paper shall include full cost details, calculated in accordance with methods set forth in subsection 105.23(b).”

6. Subsection 106.03 *Samples, Tests, Cited Specifications* states in part: “All materials or the finished product in which the materials are used, will be inspected and tested by the Engineer....”

Sampling and testing will be done in accordance with the Department’s minimum sampling and testing, and inspection schedule; the special notice to contractors; and the Colorado procedures; all contained in the Department’s Field Materials Manual.”

7. Subsection 108.03(c) *Critical Path Method* states in part: “The critical path is that path through the schedule which, if delayed, will cause a delay to project completion.”

8. Subsection 108.07(a)1 *Working Day Contract* states in part: “When the work is on a working day basis, one whole day of contract time will be assessed for each working day on which the work can be effectively prosecuted during six hours or more of the

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day. One-half day will be assessed for each working day on which the work can be effectively prosecuted for at least two hours but less than six hours of the day.”

9. Subsection 601.12(l) *Loading Piers and Abutments* provides in part:  
“Superstructure dead loads shall not be applied until piers and abutments have attained a compressive (sic) strength of  $0.8f'_c$ .”
10. Subsection 601.13 *Curing Concrete Other Than Bridge Decks* states in part:  
“The Engineer shall review for adequacy, the Contractor’s determination of the curing period.”

“The minimum curing period shall be from the time the concrete has been placed until the concrete has met a compressive strength of 80 percent of the required field compressive strength. The Contractor shall cast information cylinders on the final portion of a placement and store [them] as close to the structure as possible. The information cylinders shall receive similar thermal protection as the structure. ... In place strength shall be determined by at least two cylinders. If the information cylinders are destroyed in the field, the minimum curing period shall be 120 hours.”

11. Subsection 601.17(c) *Strength (When Specified)* states in part:  
“The concrete will be considered acceptable when the running average of three consecutive strength tests is equal to or greater than the specified strength and no single test falls below the specified strength by more than 500 psi. A test is defined as the average strength of three test cylinders cast in plastic molds from a single sample of concrete and cured under standard laboratory conditions prior to testing.”

“For concrete having specified strength of 4500 psi or greater, when the compressive strength test is below the specified strength by more than 500 psi but not more than 1000 psi, the concrete represented will be evaluated by the Department for removal, corrective action, or acceptance at a reduced price. All costs of the evaluation shall be at the Contractor’s expense. When the compressive strength test is below the specified strength by more than 1000 psi, the concrete represented will be rejected.”

“The Contractor may take cores at its own expense and in accordance with Colorado Procedure 65 to provide alternative determination of strength. Price reduction for strength will be based on 28 day compressive strength of acceptance cylinders or corresponding cores strength, whichever is greater.”

12. Subsection 601.18 states: “Unless otherwise stated in the plans or specifications, tolerances for concrete construction and materials shall be in accordance with ACI 117.”
13. Colorado Procedure (CP 65) describes what appears to be the only allowable method for re-evaluating low strength results of concrete cylinders (molded and cored) and includes the following provisions:  
“1.1 Field test procedures and strength test results for standard molded and cured cylinders shall be evaluated separately for each class of concrete. Such evaluation shall be conducted to determine if tests have been conducted in accordance with the AASHTO standards and/or approved CDOT procedures and specifications....”



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“3.2 After the investigation outlined in Section 1.1 is completed and no warranted reasons are found to have caused the low breaks, the concrete required for in-place investigation shall be tested by taking cores. Coring and testing shall be at the expense of the contractor.”

“6.1 Where required and within 45 days after placement, cores with a diameter of at least 3 times the nominal maximum size of the coarse aggregate used in the concrete shall be obtained in accordance with the latest revision of AASHTO T 24 (ASTM C 42)....”

“6.4 Concrete in the area represented by a core test will be considered adequate if the average strength of the cores is equal to the specified strength.”

14. Chapter 600 in the CDOT Field Materials Manual includes the following descriptions:

i. **“Acceptance/Verification (QA) Cylinders**

Test cylinders made for determination of compliance with strength specifications are referred to as “acceptance cylinders”....

ii. **Design Cylinders**

Test cylinders made for checking the adequacy of laboratory mixture proportions for strength are referred to as “design cylinders”

iii. **Information Cylinders**

Test cylinders made for determining form removal time or when a structure may be put into service are referred to as “information cylinders”. After the first +/- 24 hour initial cure period, information cylinders shall be cured, insofar as possible, as a structure. ... Information cylinders are for the purpose of determining relative structure strength and are not to replace design cylinders.”

15. AASHTO Designation: T 23-08 (ASTM Designation: C31-06) *Making and Curing Concrete Test Specimens in the Field* states in part:

“4.2 If the specimens are made and standard cured, as stipulated herein, the resulting strength test data where the specimens are tested are able to be used for the following purposes:

4.2.1 Acceptance testing for specified strength,

4.2.2 Checking the adequacy of mixture proportions for strength,

4.2.3 Quality control.

4.3 If the specimens are made and field cured, as stipulated herein, the resulting strength test data when the specimens are tested are able to be used for the following purposes:

4.3.1 Determination of whether a structure is capable of being put in service,

4.3.2 Comparison with test results of standard cured specimens or with test results from various in-place test methods,

4.3.3 Adequacy of curing and protection of concrete in the structure, or,

4.3.4 Form or shoring removal time requirements.

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13. AASHTO Designation: T24M/T24-07 (ASTM Designation: C 42/C 42 M-04)  
*Obtaining and Testing Drilled Cores and Sawed Beams of Concrete* states in part:

“3.5 There is no universal relationship between the compressive strength of a core and the corresponding compressive strength of standard-cured molded cylinders.... Historically, it has been assumed that core strengths are generally 85 percent of the corresponding standard-cured cylinder strengths.... The acceptance criteria for core strength is to be established by the specifying authority.”

**E. Other References:**

1. Paragraph 5.6.4 of the American Concrete Institute (ACI) Code 318-95 *Building Code Requirements for Structural Concrete* states in part:

“5.6.4.1 - If any strength test of laboratory-cured cylinders falls below specified value of  $f_c'$  by more than 500 psi ...or if tests of field-cured cylinders indicate deficiencies in protection and curing..., steps shall be taken to assure the load-carrying capacity of the structure is not jeopardized.

5.6.4.2 – If the likelihood of low-strength concrete is confirmed and calculations indicate that load-carrying capacity is significantly reduced, tests of cores drilled from the area in question shall be permitted.

5.6.4.3 - ....

5.6.4.4 – Concrete in an area represented by core tests shall be considered structurally adequate if the average of three cores is equal to at least 85 percent of  $f_c'$  and no single core is less than 75 percent of  $f_c'$ . Additional testing of cores extracted from locations represented by erratic core strength results shall be permitted.

5.6.4.5 – If criteria of 5.6.4.4 are not met and if the structural adequacy remains in doubt, the responsible authority shall be permitted to ... take other appropriate action.”

2. Chapter 7 *Investigation of Low-Strength Test Results in New Construction Using ACI 318* states in part:

“In new construction, low cylinder strength tests are investigated in accordance with the provisions of ACI 318. The suspect concrete is considered structurally adequate if the average strength of three cores, corrected for  $l/d$  in accordance with ASTM C 42/C 42M, exceeds  $0.85 f_c'$ , and no individual strength is less than  $0.75f_c'$ .... ACI 318 recognizes that the strength of cores are potentially lower than the strengths of cast specimens representing the quality of concrete delivered to the project.”

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**F. Evaluation:**

1. The provisions of Subsection 601.17(c) clearly state that the “acceptance cylinder” test results are to be used to determine whether concrete strength is adequate. The only instance when tests on cored samples may be used in lieu of the “acceptance” tests is when the “acceptance” tests show failing strength. In that event, under Colorado Procedure CP-65, the Contractor is given up to day 45 from the pour date to take and test cored samples. The greater strength from the “acceptance” or Contractor-cored sample is to be used for final determination of concrete strength. In the case of the D-17-EA Abutments, results of the “acceptance” tests were well above the specified strength so FCI should not have been directed to make tests on cored samples. This procedure is reinforced by the respective descriptions contained in the CDOT Field Materials Manual and AASHTO Designation T 23-08.
2. On that basis alone, CDOT’s rejection of both abutments was inappropriate, bearing in mind that “acceptance” cylinders tested at 4245 psi at 7 days and 5615 psi at 28 days. If the results of “acceptance” tests are used for Abutment #1, inferred strengths of both abutments were suitable to set girders (3600 psi) on November 20, 2007.
3. Although no tests were performed on cored samples at 45 days, the tests made by RMCC on cores from Abutment #1 at 37 days show 4600 psi for vertical cores and 5560 psi for horizontal cores – both greater than the specified 4500 psi.
4. CDOT stated that concerns were raised by “several issues” observed during the placement and initial testing of the concrete; leading to its decision to have core samples made to verify the concrete strength. It is curious to note why CDOT did not advise FCI of their “concerns” until after the results from tests on the “information cylinders” were produced. In any case, the DRB was not convinced that the issues presented in the pre-hearing submittal and described during the Hearing were noteworthy. It is not uncommon to place concrete using a loader/bucket arrangement; Abutment #2 was placed over a reasonable time period of 2 hours; concrete trucks were emptied in 92, 104, 109 and 123 minutes from time of batching; no dirty aggregates were found during inspection of the batch plant; and water was added to the mixes in the trucks on four occasions – all within specified times prior to placement.
5. The DRB concurs that CDOT had every right under several provisions of the Specifications, the Field Materials Manual as well as the AASHTO and ACI Codes, to require additional testing by coring. However, it is clear from the Specifications that results of tests on cored samples do not overrule the results from “acceptance” tests. CDOT was in error in making a determination based on tests of cores as to the acceptability of the structures’ strength – specifically the decision to remove and replace both structures using that determination.
6. It is the DRB’s judgment that core strength results may be used by CDOT only to establish applicable price reductions. In this case, a price reduction would have been applicable to Abutment No. 2 only, using the results of the RMCC strength tests performed on 12-6-07 (4170 psi at 28 days) to establish the reduction factor as provided for in Subsection 601.17(c).
7. The DRB did not feel that the petrographic examination performed by DRP provided sufficient evidence of improper retempering of the concrete, primarily because the

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- report was based on a single test sample from a single core from an unconfirmed location in Abutment #2.
8. Because test results from “acceptance cylinders” were satisfactory, the DRB believes that no price reduction would be applicable to Abutment #1 concrete.
  9. The DRB understands the aggravation of CDOT relative to the late development of an approved Project Schedule. However, after a satisfactory schedule had been approved, the source of that aggravation should have been alleviated. From data submitted to the DRB, it is apparent that the bridge structure was not on the critical path for timely completion of the Project. This would be even more apparent had CDOT not directed the removal and replacement of southbound Abutments #1 and #2.
  10. From discussions during the Hearing it was established that certain elements in FCI’s cost presentation had not been accepted during the independent audit because of a coding issue. Costs for all work items associated with the removal and replacement of the abutments should be reevaluated.
  11. Once again with this Dispute, the DRB was advised during the Hearing that payment was made for the replacement Abutments under the Contract Pay Item so costs for the new abutments should not have been claimed with this submittal. More correctly, costs to remove the old and reconstruct the new abutments should have been presented. It was noted during the Hearing that cost differences because of unlike equipment and procedures, as well as changed weather conditions would have impacted the costs of doing the original versus the replacement work. Furthermore, as explained during the Hearing, since discrete records were not kept during the original construction, both parties have accepted the process as presented, subject to a review of some miscellaneous items. In other words, FCI should be paid per plan for the original work and settlement of this Dispute includes the demolition and reconstruction costs as additional expense inappropriately required by CDOT.
  12. Several incomplete, illegible and/or garbled documents were in the pre-hearing submittals.

**Recommendation:**

The DRB recommends that payment be made to FCI relative to this matter based on the following:

- a) The DRB deems that CDOT’s use of the cored samples was not a valid means of sampling to establish concrete acceptability because results from “acceptance cylinders” indicated satisfactory strengths.
- b) Consequently, without valid reasons to take core samples for acceptance determinations, CDOT was not contractually justified under the specifications to direct FCI to remove and replace the Abutments.
- c) However, results from cored samples should have been used to establish a price reduction factor for Abutment #2.
- d) The DRB believes the assessment of Working Days against the bridge construction activities during the 2007/2008 winter weather constraint period is unjustified because, according to FCI’s accepted schedule of December 3, 2007, that structure was not on the critical path; even after the abutments were removed and

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replaced. As such, 25 Working Days should be removed from the respective Weekly Time Count Reports for the period from January 10 through February 20, 2008.

- e) Insufficient data are available for the DRB to accurately calculate the compensation due to FCI. However, based on discussions during the Hearing, the DRB believes the parties understand the process outlined in Subsection 105.22 and should proceed with a joint recalculation of the costs.


This recommendation may be taken under consideration with the understanding that:

1. The DRB Recommendation was a proceeding based on presentations by the parties.
2. No fact or expert witnesses presented sworn testimony or were subject to cross-examination.
3. The parties to the DRB were not provided with the right to any discovery, such as production of documents or depositions.
4. There is no record of the DRB hearing other than the Recommendation.

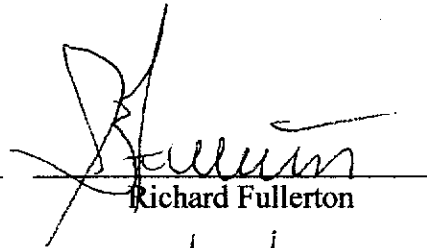
Respectfully Submitted:

  
\_\_\_\_\_  
Garth L. Wilson

8/18/09  
Date

  
\_\_\_\_\_  
William D Ashton

8/18/09  
Date

  
\_\_\_\_\_  
Richard Fullerton

8/18/2009  
Date