**DISPUTE REVIEW BOARD REPORTAND RECOMMENDATION**

**SH 96 BRIDGES KIOWA, OTERO, & CROWLEY COUNTIES, CO**

**CDOT PROJECT NO. FBR 096A-039**

**DISPUTE 1B CONCERNING OFFSET OF STRUCTURE POSITION**

**Hearing Date:** June 17, 2013

**Hearing Location:** CDOT Region 2 Office 1480Quail Lake Loop Colorado Springs, CO

**Hearing Attendees:** Tom Jackson – Structures, Inc. - President Shawn Horton – Structures, Inc. – Project Manager Ken Hawkins – S/I Parsons Brinkerhoff – Director of Engineering Karen Rowe – CDOT – Region 2 South Program Engineer Paul Westoff – CDOT – Resident Engineer Tom Bronniman – CDOT Project Engineer John Sabo – CDOT/AECOM – Highway Deputy Dept. Manager Beth Sprague – CDOT/Atkins – Scheduler Leo F. Milan, Jr. – CDOT – Sr. Assistant Attorney General

**Background:** On June 30, 2010, Structures, Inc. (Contractor) was awarded a Contract by CDOT for $2,908,694 for a Modified Design/Build Project for the replacement of four bridge structures on SH 96 in Kiowa, Otero, & Crowley Counties, Colorado. A Notice to Proceed was issued on July 28, 2010. (**NOTE:** The Pay Estimates show a Notice to Proceed Date of August 18, 2010.) The Contract was a Completion Date Contract with a completion date of May 27, 2011.

The Project required the design and replacement of bridge structures and the associated earthwork and paving of approximately 100 feet for the approaches. The Contractor chose to use precast concrete boxes for the structures. The Contractor’s design consultant was Parsons Brinkerhoff (PB).

The Contract included the Standard Specifications for Road and Bridge Construction dated 2005 and any Special Provisions for this Project and Revised Standard Specifications along with technical provisions for the Modified Design/Build features of the Project.

After two of the Concrete Box Culverts (CBC) had been constructed at Sites 1 and 2, it was discovered that the actual field conditions showed that the CBC’s were not centered on the existing roadway centerline and were approximately one foot out of alignment. This resulted in the shoulders on one side of both CBC’s to be too narrow and the headwalls encroaching on the shoulders.

**Joint Statement of Dispute:**

The horizontal center line of the box culverts at Sites 1 and 2 did not match the existing centerline of the roadway. CDOT and Structures, Inc. dispute whether the construction of the structures meets the contract requirements and which party is responsible for time and costs due to the delay associated with CDOT’s request for further information and justification prior to critical path work resuming.

It is desired that the Dispute Review Board (DRB) provide a recommendation on merit regarding the contract requirements for the location of the two structures, and the responsible party for time and costs associated with the delay. It is also desired that if the DRB recommends that CDOT in the responsible party then the DRB provide a recommendation on the amount of time and compensation that is owed for the work.

**Pre-hearing Submittal:**

In addition to the Bid Plans and Specifications for the Project,both parties provided the DRB with Pre-hearing Submittals per Spec. Section 105.23(e) which included but were not limited to documentary evidence relevant to the issues, serial letters, e-mails, speed memos, daily logs, handwritten notes and schedules. Both parties provided the DRB with their lists of attendees. The Contractor also provided supplemental information at the hearing. The DRB allowed the use of any supplemental information that had been used in previous negotiations but did not allow the use of the resource loaded schedules since they had not previously been submitted to CDOT.

The DRB pointed out that neither Party had complied with all the requirements of Spec. Sections 105.22 (d) and (e) in that the pre-hearing submittal documents were incomplete.

**Contractor Presentation on the Offset of Structure Position:**

The Contractor disagreed with the following statements in CDOT’s Position Paper:

*The field conditions indicated that the CBC was not centered on the roadway centerline as designed by Structures Inc. Site 1 was approximately 16” out of alignment in that the CBC was not centered about the center or control line.*

The Contractor stated this is not true. As-built survey shots conducted by the Contractor’s surveyor, Able, and referenced by PB in the engineer stamped *As-Built* drawing set indicate that the CBC’s at locations 1 and 2 were installed per plan, with a tolerance of +/- 0.01’ and were centered on the control line/centerline designed by PB.

*The amount of time Structure’s Inc. took to provide the revised engineering drawings to meet the contract requirements prior to constructing the change was about a month (the exact time will be verified).*

The Contractor said this excerpt suggests that the Contractor is somehow indifferent to the development at hand. The Contractor then referred to a chain of communications indicating that the problem was discovered on 4/7/11 and on 4/13/11 PB elaborated on tapers so that field staking could begin. This is the point when the issue should have been resolved – a period of six days. On 4/19/11, CDOT verbally requested an explanation of the alignment differences which was provided to CDOT. On 4/29/11, the Contractor forwarded PB plans to CDOT who issued a Form 105 on 5/2/11 stating the alignment tapers are acceptable with provisions. On 5/3/11, the Contractor offered clarifications to CDOT and CDOT allowed the implementation of the proposal to begin. This resulted in 26 days of delay.

*If the existing striping was incorrect, usually the new design would still take into account the edge of roadway and determine lane widths and new shoulder widths.*

The Contractor said this was not true. The striping as shown on the digital survey files provided by CDOT is what was used to establish the new control line at the survey limits. The new design was predicated on this control line and the typical sections provided by CDOT.

*If the CBC was designed symmetrically about a straight line, it is not affected by the previously surveyed line.*

The Contractor stated that the design would be affected if the survey line provided misrepresentative tie-in points.

*Also if it was laid out and constructed as the plans indicate, it should not have been off center.*

The Contractor stated the box was not off center in reference to the control line established by PB from data provided by CDOT.

*When the design control was re-established in the field after the CBC’s were in place, field measurements indicated that the CBC’s were not symmetrical about the control line*.

The Contractor said this is false. By design control what CDOT is referencing is the local centerline stripe and the CBC’s were not symmetrical about the local centerline stripe. Based on the as-built survey data, the CBC’s were symmetrical about the design control line, not the local yellow centerline stripe.

*The attached (not to scale) sketch indicates that regardless of the initial center stripe, if a tangent alignment was designed and the box was to be built symmetrically about that line then the original center stripe has no bearing on the design.*

The Contractor stated that the flawed logic of this statement is that it does not take into account that the initial centerline stripe provided in CDOT’s survey data dictates the tie-in points for a tangent alignment to be designed in the first place.

*If the design was correct, then the field layout would subsequently need to be correct and the final construction would match the original design.*

The Contractor stated it agreed and the final construction matched the original design.

The flawed logic CDOT is using is that they are dismissing the fact that the existing centerline stripe information provided by CDOT in the digital survey files contributes to the best fit control line established by PB. The Project Showing Q and A states *The design team will need to determine the best geometric solution to create an acceptable alignment at the adjoining roadway segments for each structure.*  This response by CDOT mandates that the engineer designed control line provide the best fit at the adjoining roadway tie-in points, not necessarily at the bridge locations.

PB’s design basis was the original CDOT survey which had no control. They used the CDOT information to set the control line. There was concern with the right-of-way. The design used the tangent section.

**CDOT Presentation on the Offset of Structure Position:**

At Sites 1 and 2 there was no change to the existing alignment. Technical Requirements, Section 13 – Roadways states, *The horizontal alignment of SH 96 shall not be modified by the Contractor.* This is also called out in the Project Showing Q and A.

The sketch included in the pre-hearing submittal indicates that regardless of the initial center stripe, if a tangent alignment was designed and the box was to be built symmetrically about that line then the original center stripe has no bearing on the design. If the design was correct, then the field layout would subsequently need to be correct and the final construction would match the original design.

All work and time to correct the alignment problem is the responsibility of the Contractor and therefore CDOT is not responsible for either time or cost. CDOT did finally agree with the Contractor’s proposed corrections once the proper submittals were received.

CDOT stated that once the problem was reviewed in the field after the CBC’s were constructed, CDOT did agree to make an adjustment to the alignment by adding a series of PI’s. However, CDOT requested an engineer designed layout rather than utilizing any rudimentary field changes to ensure that the revision complied with all design requirements. The delay resulting from this request and the subsequent submittal by the Contractor was again under the control of the Contractor.

CDOT went through the sketches and drawings included in the pre-hearing submittal that reflect the offset of the boxes and the lack of an 8 foot shoulder on one side of the boxes. CDOT said the roadway centerline and the box centerline should match. The as-built drawings included in the pre-hearing submittal show how the structures are offset.

CDOT’s Consultant (AECOM) said the CBC as-built drawings based on CDOT’s post-construction survey show how the structures are offset and questioned if the design centerline was staked correctly. Since there was no horizontal alignment change allowed, there should have been no shift in the roadway. Plan Sheet 106 that was prepared by PB shows the box centered on the design centerline. If the box was constructed per the design, no additional taper would have been required.

CDOT said the Contractor stated that the change in the alignment required “minimal tapers” and that it was a “minor adjustment, not a modified alignment” and could be documented in the as-built drawings. As a standard practice as the Engineer, the Resident Engineer said he would have investigated and determined an engineering design change to ensure that the solution (in this case 4 PI’s on the centerline) would meet minimal design standards and not require a horizontal curve.

CDOT did not, as the Contractor stated in its Position Paper, overstep its role in the Design Build process by directing the work. CDOT has a standard of care set forth in the Specs (2005 Standard Specifications for Road and Bridge Construction) to make decisions related to acceptability of the Contractor’s work and to interpret the plans. Spec. Section 105.01 requires that all work conform to the lines, grades, cross sections, dimensions, and material requirements, including tolerances as shown in Spec. Section 105.03. Thus it was CDOT’s responsibility to make any final decisions regarding this realignment and any questions that arose on the project.

Had the CBC been constructed to the design plans provided by PB, then no problem would have arisen and no delay would have been caused. However, due to factors that were under the control of the Contractor, CDOT bears no responsibility for the error or delay.

**Contractor Rebuttal on the Offset of Structure Position:**

The Contractor said AECOM’s comments were comparing apples and oranges. PB designed the Project correctly setting the design centerline and yellow centerline as shown in the original engineering. The final design was based on the revised survey information provided by CDOT.

PB questioned CDOT’s comment that the boxes were not in the correct position. This would have to be determined by a survey. The Contractor commented that the surveyor had taken shots to verify the location.

The final fix should have taken only six days and not the 26 days which included submittals and review by CDOT.

The change in horizontal design and the yellow line appear to be the problem. The CDOT tangent line ties in at both ends. CDOT questioned if the Contractor’s surveyor had done an as-constructed survey.

**CDOT Rebuttal on the Offset of Structure Position:**

The AECOM as-builts show the box is more than a foot off of the design centerline. Where the box is located does not tie into the original roadway centerline.

The fix and the delay are the Contractor’s responsibility. The as-built plans that the Contractor submitted were nothing more than the design plans stamped “As-Built”. The structures were constructed on long tangents. (The Contractor stated the yellow centerline of the original roadway weaves.)

AECOM said either the design centerline was incorrect or the structures were either laid out incorrectly or constructed in the incorrect locations.

**Questions by the DRB on the Offset of Structure Position:**

1. **To Contractor:** What wasused for the design centerline?

Using the corrected CDOT survey, the centerline was established by wiggling the centerline so that it would be on a tangent.

1. **To Contractor:** Why were such long tangents used?

The Contractor’s consultant said the tangents were long to account for the length of the full depth reconstruction at the structure and the repaving limits.

**3. To Contractor:** Explain the difference between the design centerline and the as-built centerline?

The actual box centerline is off from the design centerline. To make the box work where it was located required adjusting the design centerline by adding four P.I.’s to the centerline.

**4. To CDOT:** The sketch in the pre-hearing submittal from CDOTshows thedesign centerline offset from the wiggly existing centerline. How does this compare to the as-built prepared by AECOM?

On the AECOM drawings, the design centerline by PB is shown in blue. The black line shows the as-built location. The sketch shows that the box is offset from the design centerline.

**Notes:**

1. There were discussions concerning the various centerlines that were being discussed.
2. The Contractor said it would contact its surveyor and get information on the design centerline and the box centerline and submit the information to the DRB by June 24, 2013.
3. The Contractor submitted a letter dated June 24, 2013 from PB which states, *The outside face of the headwall for structure L-22-CJ is shown to be 21.56’* **left** *and 21.37’***right (locations added)** *from the centerline of the* ***as-built roadway******control line***(emphasis added)*. The as-built roadway centerline is 1.18” (0.098’) offset from the design control line. This structure was designed to be centered 21.50’ to the outside face of the headwalls from the design control line, which makes this structure only .75” to 1.5” out of center. The AECOM as-built analysis shows the CBC to be approximately 1’ out of center.*

**Summation Statements and Quantum Presentations** **the Offset of Structure Position:**

Neither party made a summation of their presentation.

Both Parties agreed to the CDOT Audit daily extended jobsite overhead rate of $1,202.42 per day which would be applied to any delay time decided by the DRB.

**Findings:**

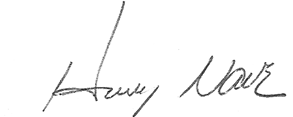
1. It appears that the *design* centerline fits the existing roadway centerline based on the use of a tangent centerline.
2. PB did not perform a field check of their design to make sure the alignment would work prior to releasing the plans for construction.
3. The construction plans prepared by PB (Sheet No. 103 and 106) show that the CBC’s were to be symmetrical about the designed roadway centerline.
4. The drawings prepared by AECOM show that the CBC’s are not centered about the designed roadway centerline and are off by approximately one foot.
5. The post-hearing survey data provided by the Contractor (PB letter of June 24, 2013) confirms the CBC’s are not centered on the designed roadway centerline. The sketch attached to the PB letter shows the CBC is only off the centerline between 0.75” and 1.5”. It is assumed the newest as-built survey data submitted June 24 is using the revised centerline with the series of PI’s to correct the alignment problem and not the designed roadway centerline based on tangents.
6. The CBC’s are not constructed per the design plans. Either the layout of the CBC’s was incorrect or the CBC’s were not constructed where they were laid out.
7. TECHNICAL REQUIREMENTS SECTION 9 – SURVEY requires all survey data to be submitted to the CDOT Project Engineer at the completion of the Work. There was nothing in the pre-hearing submittals or that was presented at the hearing to indicate that this had been done. This could quite possibly indicate where the error in the CBC locations occurred.
8. There was nothing in the pre-hearing submittals or that was presented at the hearing to explain why the Contractor did not attempt to move its resources to Sites 3 and 4 once the offset problem was discovered at Sites 1 and 2 and minimize delay to the overall project.
9. Since the survey work was under the control of the Contractor, it is responsible for any errors and resulting delays. Accordingly, the delay due to the Offset of Structure Position is considered Nonexcusable Delay.
10. TECHNICAL REQUIREMENTS SECTION 3 – QUALITY MANAGEMENT under Submittals requires the Contractor to submit as-builts for the review and approval of the CDOT Project Engineer. TECHNICAL REQUIREMENTS SECTION 9 – SURVEY states *The Contractor shall plan, schedule and perform all surveys to document the location of as-built features on the Project.* Based on comments by CDOT at the hearing, the as-builts do not comply with these requirements.

**Recommendation:**

1. The Contractor’s request for excusable delay is without merit.

Respectfully submitted, this 23rd day of July 2013.

**Dispute Review Board**

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**Henry J. Nave**

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