

12/27

December 17, 2003.

DISPUTE REVIEW BOARD

State of California - Department of Transportation

Contract Number 04-012024 - East Span Skyway Project

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Gentlemen,

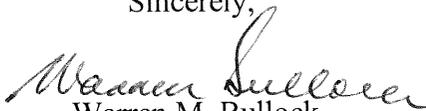
Re: Contract Number 04-012024
Notice of Potential Claim ##4

Dispute Review Board Recommendation

Transmitted herewith is the hard copy of the Dispute Review Board's unanimous Recommendation to assist the parties in the resolution of Dispute No.2 - Notice of Potential Claim No. 4 - Radiographic Testing of Hinge Pipe Beams. This recommendation was transmitted electronically to the parties on December 17, 2003.

The DRB has diligently reviewed the information provided to it, has deliberated over the issues, and agreed unanimously to the Findings and Conclusions and the Recommendation submitted herewith. Your attention is drawn to the requirements of Section 5-1.12 DISPUTES REVIEW BOARD of the Special Provisions regarding requests for Clarification and/or Reconsideration as well as DRB notification as to whether or not the dispute has been resolved. The date when the various specified time periods begin to run will commence upon receipt by the parties of the attached signed hard copy of the Recommendation.

Sincerely,


Warren M. Bullock
DRB Chairman

cc

Mr. F.Graebe, DRB Member
Mr. R. Lewis, DRB Member
Mr. Ken Darby, Caltrans DRB Program Manager

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DISPUTE REVIEW BOARD

State of California- Department of Transportation

Contract Number 04-0 12024 – East Span Skyway Project

Dispute No. 2 – Notice of Potential Claim No. 4 – Radiographic Testing of Hinge Pipe Beams.

Hearing Date: December 4, 2003.

Hearing Attendees: Caltrans Representatives: Peter Siegenthaler
Douglas Coe
Don Ross

Contractor Representatives: Tom Skoro
Chris Villa
John Hassard

BACKGROUND

The East Span Skyway Project consists of two superstructures (Eastbound and Westbound) consisting of precast segmental concrete box girders utilizing balanced cantilever construction, for a total of four rigid frames including fourteen piers per superstructure. Stainless steel clad hinge-pipe beams connect the four frames of the Skyway superstructure together. HPS70W grade steel hinge-pipe beams incorporate a grade 50 steel pipe beam fuse that is designed to deform and dissipate energy during a seismic event while at the same time preserving the structural integrity of the precast concrete hinge segments surrounding them.

The California State Department of Transportation (hereinafter referred to as the “Department”, the “State” or “Caltrans”) awarded the East Span Skyway Project (Contract Number 04-0 12024) to Kiewit/FCI/Manson, JV, (hereinafter referred to as “KFM” or “Contractor”). At time of bid KFM relied on a quotation from Struthers Industries, Inc. (hereinafter referred to as “Struthers”) to furnish the steel hinge pipe beams.

DISPUTE

On April 17, 2003, KFM forwarded to the State a Request for Information (RFI) from Struthers, seeking clarification on two specification sections that appeared to them to be in conflict with one another. The Contract Special Provisions Section 10-1.44 Revised Page #243 required “complete joint penetration welds to be examined 100% by UT [Ultrasonic Testing] and MT [Magnetic Particle Testing]” whereas on Revised Page #254 all butt welds (partial joint penetration “PJP” and complete joint penetration “CJP”) for fracture critical members (FCM’s) butt joint were also to be 100% radiographic test (RT) inspected by the Contractor. Since Struthers had not allowed for RT in its quotation at time of bid a requirement to do so would add considerable cost and time to the hinge beam work. On June 4, 2003, the State advised KFM that 100% Radiographic (RT), 100% Ultrasonic (UT) and 100% Magnetic Particle (MT) Testing would be required for the inspection of butt welds on the FCM pipe beams. The State held that these were specification requirements and therefore believed there would be no additional costs or time impacts. On June 27, 2003, KFM advised the State that imposing RT inspection on pipe beams would constitute a change to the contract and requested the issuance of a contract change order to compensate KFM for the additional cost and time of performance. On July 2, 2003, the

Department reiterated that 100%MT, 100%UT and 100%RT were required by the contract's Special Provisions and advised KFM that a contract change order would not be issued. The Contractor filed Notice of Potential Claim No. 4 - Pipe Beam RT Testing, on July 24,2003, and the State responded on October 2, 2003, confirming the State's position that it was KFM's responsibility to perform 100% RT inspection of butt welds on the pipe beams. The Contractor objected to the State's response by letter on October 6, 2003 and the matter was referred to the DRB on the same date.

In its NOPC of July 24,2003, the Contractor stated that the 100% RT requirement caused additional costs estimated to exceed \$300,000, but testified during the hearing that the cost would now exceed \$800,000. Additionally in its - position papers, the Contractor estimated that the 100% RT requirement had In its NOPC of July 24, 2003, the Contractor stated that the 100% RT requirement caused additional direct a time impact of up to 50 days with a resulting value of over \$10.4 million.

The DRB has been requested to address only the merits of the claim at this time.

CONTRACTOR'S POSITION

This dispute centers on the interpretation of the testing requirements for the hinge pipe beam CJP welds. At bid time, Struthers interpreted the specifications to require only UT and MT inspection. Following award of the contract, the State has directed that RT inspection will be required.

A contractor who acting reasonably, is misled by incorrect plans and specifications issued by the State as the basis for bids and who, as a result, submits a bid which is lower than he would have otherwise made, may recover for extra work or expenses necessitated by the conditions being other than as represented. (*Souza & McCue Construction v Superior Court*, Cal 2d 508, 5 10-511(1962))

The applicable contract documents are contained in Special Provisions Section 10-1.44 "STEEL STRUCTURES". These specifications must be read as a whole and in their sequential order to determine the intent of the drafter. On revised page #242, under the heading "FABRICATION", sub-heading "Pipe Beams", the first sentence in this section states the following:

"The Contractor shall fabricate pipe beams in accordance with the approved fabrication procedure conforming to the requirements of these special provisions."

Paragraph 8 of the "Pipe Beams" subsection explains the inspection requirements and states:

"Complete joint penetration welds shall be examined 100% by UT and MT. (Emphasis added)

Fillet and partial joint penetration welds shall be examined 100% by MT. Acceptance shall be based on the criteria for tension welds in primary members. Final visual and non-destructive examination of weld shall be after stress relief and before cladding. Finish machined stainless steel surfaces, plus 100mm of the pipe beam on either side of the stainless steel surfaces, shall be examined 100% by liquid penetrant testing (PT) in accordance with AWS D1.6 for cyclically loaded welds in tension."

Struthers relied on this language when submitting their quote and should not be required to perform RT inspection without fair and equitable compensation.

The next applicable section for inspection on the hinge pipe beams is Section 10-1.44 “Welding of HPS70W Steels for Pipe Beams”. This section does not address the type of inspection required and addresses only welding procedures and processes. It provides no additional insight into the inspection requirements other than the previously stated, 100%UT and 100%MT.

The State’s direction to perform RT relies on a table in Special Provision 10-1.44 “ Structural Steel” under the sub-heading “Shop Welding”. This table applies only to orthotropic tubs. The State argues that Struthers is required to perform 100% RT inspection because the requirements of the table are additive to the fabrication requirements. This interpretation is incorrect for the following reasons:

1. It is clear from the fabrication section that Struthers is only required to provide UT and MT inspection.
2. The table in the “Shop Welding” section is not applicable because the State has a duty to ensure that the words reasonably convey their meaning.
3. The “Inspection and Testing” section under “Shop Welding” was not intended to include 100% RT inspection for the hinge pipe beams.
4. The requirements of the table in the “Shop Welding” section are limited to CJP welds where only UT inspection has been required.

1. It is clear from the fabrication section that the provision of only UT and MT is required.

The fabrication section states in part:

“Complete joint penetration welds shall be examined 100% by UT and MT.”
(Emphasis added)

A reasonable fabricator would look to the fabrication section for fabrication and inspection requirements. This section specifically told Struthers that only 100% UT and MT was required. To clearly and unambiguously provide language that would require RT inspection, the State could have easily rephrased the fabrication specification as follows:

“ Complete joint penetration welds shall be examined 100% by UT, MT and RT.”

This minor language change would have made the requirement clear and avoided this dispute.

2. The table in the ‘Shop Welding’ section is inapplicable because the State has a duty to ensure that that the words reasonably convey their meaning.

In addition to the MT requirements for PJP welds, and the UT requirements for CJP welds, all butt welds (PJP and CJP) shall be RT inspected by the Contractor as follows:

LOCATION	FREQUENCY OF TESTING
Orthotropic box section butt joints: deck and soffit plates and ribs	<p data-bbox="789 236 1326 300">Transverse Plate Seams: 10% in lieu of FCM requirements</p> <p data-bbox="720 336 1392 400">Longitudinal Plate Seams: Minimum of 10% at locations selected by the Engineer</p> <p data-bbox="736 436 1376 500">Transverse Rib Seams: Minimum of 10% at locations selected by the Engineer</p>
Orthotropic box section: One-sixth of web and wing plate depth starting from the deck and soffit plates	Minimum of 10%, at locations selected by the Engineer
Orthotropic box section: Central 2/3 of web and wing plate depth transverse seam	Minimum of 5%, at locations selected by the Engineer
For FCM's butt joint, except as noted above, and repairs to butt joints	100%

This table applies only to the orthotropic box. The first three location headings in the table start with “Orthotropic box”. They are specific and pertain to certain specified portions of the box. The last heading pertains to the other portions of the box not noted above and explains that “For FCM’s butt joint, except as noted above, and repairs to butt joints” shall be 100% RT inspected. This heading is clearly referring to the other portions of the orthotropic box that were not covered by the table in the first three location headings.

KFM and Struthers made the reasonable interpretation that the table applied only to the orthotropic box because the table only discusses the box. If the State wanted to include the hinge pipe beams, they had a duty to clearly include this requirement in the fabrication section for the hinge pipe beams.

3. The “Inspection and Testing” section under “Shop Welding” was not intended to include 100%RT inspection for the hinge pipe beams.

The pipe beams are not specifically mentioned anywhere in the entire “Inspection and Testing” section for “Shop Welding”. We read this section to address only the orthotropic tubs and footings.

Every new paragraph, except the last one before the chart, references the orthotropic tub. The last paragraph discusses the footings. The State appears to be trying to include inspection requirements in a section unrelated to the hinge pipe beams. In this instance, the inspection are clearly provided in the fabrication section for hinge pipe beam, but the State is now trying to apply a table for orthotropic boxes to the hinge pipe beams. This is inconsistent with the logical reading of the specifications or the table. Consistent with Struther’s previous interpretation and the contract documents, the shop welding specification and the table was not drafted to include the pipe beams.

4. The requirements of the table in the “Shop Welding” section are limited to CJP welds where only UT inspection has been required.

The sentence just prior to the table states:

“In addition to the MT requirements for PJP welds, and the UT requirement for CJP welds, all butt welds (PJP and CJP) shall be RT inspected by the Contractor as follows:” (Emphasis added)

This statement indicates that the inspection requirements for the table applies only to butt welds with MT requirements for PJP welds and only to butt welds with UT requirements for CJP welds. This limits which butt welds need to be inspected and does not apply to the pipe beams. The pipe beam welds are CJP and require both UT and MT inspection.

If the intent was for all butt welds to be RT inspected, then why was the limiting instruction included in the table. The State could simply have stated that all butt welds need RT inspection.

KFM and Struthers made a reasonable and prudent interpretation based on the contract documents in order to provide the most competitive bid. Only after the State responded to Struthers’ RFI did it become evident that the inspection requirements for the pipe beam were not clear.

In this case, it now appears that the State failed to provide the plain and unambiguous language that could have avoided the current dispute. By applying the general rule that ambiguities in the language are construed against the party that drafted a document, the risk of any ambiguity here would lie with the State as the drafter of the contract documents.

The State drafted the plans and specifications for the weld inspection requirements for the hinge beams. KFM and Struthers relied on the State as the drafter to provide full, complete and accurate plans and specifications in this regard. Only after the State responded to a Struthers RFI did it become evident that the inspection requirements were unclear and a dispute over RT inspection existed.

The fabrication section for pipe beams requires only 100% UT and MT inspection for the CJP welds. Under the welding section and fabrication section for the hinge pipe beams there is no indication of any inspection other than UT and MT. If the State wanted to include RT inspection for the pipe beams, they have a duty to clearly provide for that requirement within the relevant inspection requirements. In this case, the state failed to provide the necessary clarity. The burden for any impacts resulting from the imposition of the RT inspection requirements rests solely on the State. Therefore, for the reasons set forth above, KFM is entitled to an equitable adjustment associated with RT inspection of the pipe beams.

STATE’S POSITION

The Contractor’s assertion that requirements in one section of the contract special provisions governs or overrules other sections of the special provisions is incorrect. Certainly, a special provision governs over a standard specification or plan, and even governs over the contract plans or detail. But a special provision does not govern over another special provision, unless it is expressly stated otherwise in the contract documents. In an attempt to reduce the size and volume of contract documents, as advertised, the Department eliminates redundant provisions, to the extent possible so as to minimize the contract documents while still describing a complete work.

The hierarchy among contract documents is established in Section 5-1.04, "Coordination and Interpretation of Plans, Standard Specifications, and Special Provisions," of the Standard Specifications. It states, *Project plans shall govern over Standard Plans; Standard Plans and project plans shall govern over these Standard Specifications; the special provisions shall govern over both these Standard Specifications and the plans.* Although the requirements in the Special Provisions govern over the Standard Specifications, the Standard Plans, the contract plans, as well as any revised Standard Specifications contained in the Special Provisions, they do not obviate requirements contained in other parts of the contract documents or in other Special Provisions. They are intended to complement one another. Section 5-1.04 of the Standard Specifications further states, *These Standard Specifications, the Standard Plans, project plans, special provisions, contract change orders, and all supplementary documents are essential parts of the contract, and a requirement occurring in one is as binding as though occurring in all. They are intended to be complementary, and to describe and provide for a complete work.* So unless a special provision is contradictory or averse with another special provision, it is intended that they would both apply and one would complement the other.

In that regard, Section 10-1.44, "Steel Structures" of the Special Provisions, describes various aspects of hinge-pipe beam construction through its various subsections, and makes reference to other Special Provisions as well as other contract documents. They specify requirements for the fabricators of the hinge-pipe beams, the kind of material to be used in the hinge-pipe beams, the welding requirements for the hinge-pipe beams, and the testing requirements for the hinge-pipe beams. These requirements are all essential and binding parts of the contract. They are intended to be complementary and describe a complete work.

Pertinent excerpts from the above sections and references are as follows;

The hinge-pipe beams are designated on the Contract Plan sheets 785, 791, 813 and 835 of 978 as fracture critical members (FCM). Section 10-1.44 requires that, *Fabricators and suppliers shall be certified under the AISC Quality Certification Program, Category Cbr, Major Steel Bridges, with endorsement F, Fracture Critical members.*

The "GENERAL" Section of 10-1.44 requires that, *Steel for members shown on the plans as fracture critical members, shall conform to the requirements in ANSI/AASHTO/AWS D1.5, Section 12, AASHTO/AWS Fracture Control Plan (FCP) for Non-Redundant Members.*

The "MATERIALS" Section of 10-1.44 requires that, *Steel designated as Pipe Beam Grade 70 on the plans shall conform to the requirements in ASTM Designation: A 709, Grade HPS70W with Supplementary Requirements S5, " Ultrasonic Examination", Supplementary Requirement S84 'Fracture Critical, F, Material; Toughness Testing and Marking" tested for Zone 3; and Supplementary Requirement S93, Limitations on Weld Repair (Fracture Critical Material Only),"*

The "FABRICATION" section of 10-1.44 in the "Pipe Beams" subsection requires that, *Complete joint penetration welds shall be examined 100% by UT and MT. Fillet and partial joint penetration welds shall be examined 100% by MT. Acceptance shall be based on the criteria for tension welds in primary members.*

The "SHOP WELDING" Section of 10-1.44 requires that, *Steel fabrication shall conform to the requirements of AWS 01.5, except FCM's shall be fabricated to Chapter 12 of the AWS 01.5,*

“AASHTO/AWS Fracture Control Plan (FCP) for Non –Redundant Members”, except as modified in these special provisions.

The AWS D1.5 Section noted above refers to Chapter 12, “Fracture Control Plan for Nonredundant Members.” The type of weld and NDT required for the CJP tension butt welds specified for the hinge-pipe is stated in AWS D1.5, Section 12.16.2.1, *Butt welds in tension and repaired groove welds in buttjoints shall be QC inspected by both radiographic (RT) and ultrasonic test (UT).*

The “INSPECTION AND TESTING” subsection of 10-1.44 requires that, *In addition to the MT requirements for PJP welds, and the UT requirement for CJP welds, all butt welds (PJP and CJP) shall be RT inspected by the Contractor as follows: For FCM’s buttjoint, except as noted above, and repairs to buttjoints 100%*

The “ACCEPTANCE” subsection of 10-1.44 requires that, *For purposes of acceptance, all welds shall be considered to sustain tension.*

AWS D1.5, Section 6.7.1, states, *Complete joint penetration groove welds in main members shall be QC tested by nondestructive testing. Unless otherwise provided, radiographic testing shall be used for examination of complete joint penetration groove welds in buttjoints subject to calculated tension or reversal of stress.*

AWS D1.5, Section 6.7.1.2(1) states, *Radiographic or ultrasonic testing of welds shall be performed in accordance with the following frequency requirements: (1) One hundred per cent of each joint subject to calculated tension or reversal of stress.*

It is noted that Fracture Critical and complete joint penetration butt welds in tension requires 100% RT testing by both the AWS D1.5 welding code and the “SHOP WELDING” subsection of the Special Provisions. 100% UT and 100% MT testing are additional requirements included in the “FABRICATION” subsection of the Special Provisions. The requirement for 100% RT testing contained in the AWS D1.5 welding code and the “SHOP WELDING” subsection of the Special Provisions does not obviate the requirements for 100% MT testing contained in the “FABRICATION” subsection of the Special Provisions. The converse of this is also true that the 100% MT testing in the “FABRICATION” subsection does not obviate the requirement for 100% RT testing in the AWS D1.5 welding code and the “SHOP WELDING” subsection of Section 10-1.44 of the Special Provisions. They do not preclude one another. They are intended to be complementary.

Summary

1. Contract Plan sheet no’s 785, 791, 813 and 835 specify that the pipe beams are fracture critical members (FCM’s)
2. The Special provisions, Section 10-1.44, “Steel Structures,” subsection “MATERIALS,” specifies that the HPS70W steel shall conform to fracture critical requirements.
3. The Special Provisions, Section 10-1.44, “Steel Structures,” subsection “SHOP WELDING,” specifies fracture critical members be fabricated in accordance with Chapter 12 of AWS D1.5,

specifies that all welds shall be considered to sustain tension, and that FCM members with CJP welds require 100% RT testing.

4. The Special Provisions refer to Chapter 12 of AWS D1.5, Section 12.16.2.1, specifies the requirement of both RT testing and UT testing if the member is in tension.
5. Chapter 6 of AWS D1.5, Sections 6.7.1 and 6.7.1.2 (1) requires CJP welds in tension to be tested with 100% RT testing.
6. The Special Provisions, Section 10-1.44, "Steel Structures," subsection, "FABRICATION," requires 100% MT and 100% UT testing in addition to the 100% RT testing above.
7. Section 5- 1.04 of the Standard Specifications specifies the complementary roles of the Contract Plans, Special Provisions and AWS D 1.5 (a supplementary document)

DRB FINDINGS AND CONCLUSIONS

The Contractor is required to consider and take into account the contract documents as a whole and should not rely on isolated sections to the exclusion of other sections of the documents. The Standard Specifications, Section 5- 1.04 Coordination and Interpretation of Plans, Standard Specifications, and Special Provisions, in referring to the contract documents, state, "They are intended to be complementary, and to describe and provide for a complete work." The DRB concluded that the Contractor erred in preparing its bid in not taking into account the documents as a whole, including AWS D 1.5. AWS D 1.5 Chapter 12 has a clear requirement that butt joints in tension are to be QC inspected by both radiographic and ultrasonic testing.

Although the language in the Special Provisions with respect to UT, RT and MT of CJP welds in the hinge pipe beams could have been written or organized more explicitly by the Department, the Board did not find the language in the contract documents either ambiguous or conflicting. Furthermore, the Board finds no qualifying language in the specifications (such as "only" or "in lieu of") that would indicate any of the specified weld tests were intended to be used exclusive of or as substitutes for any other weld test specified elsewhere in the Special Provisions or AWS D1.5.

The hinge pipe beams are clearly identified as fracture critical members on Contract Plan Sheet 785 of 978. Section 10-1.44 STEEL STRUCTURES, of the Special Provisions, requires that "Fabricators and suppliers shall be certified under the AISC Quality Certification Program, Category Cbr, Major Steel Bridges, with endorsement F, Fracture Critical Members." Section 10-1.44 STEEL STRUCTURES, subsection SHOP WELDING, General Provisions, state " Steel fabrication shall conform to the requirements of AWS D 1.5, except FCM's shall be fabricated to Chapter 12 of AWS D 1.5, "AASHTO/AWS Fracture Control Plan (FCP) for Nonredundant Members", except as modified in these special provisions."

AWS D1.5 Chapter 12, Clause 12.16.2 Type of Weld and NDT Required, subclause 12.16.2.1 Tension and Repaired Butt Welds, states " Butt joints in tension and repaired groove welds in butt joints shall be QC inspected by both radiographic (RT) and ultrasonic test (UT)."

The Special Provisions at Section 10-1.44, subsection SHOP WELDING, Acceptance, state "For purpose of acceptance, all welds shall be considered to sustain tension."

Struthers, being certified under the AISC Quality Certification Program, had to have been familiar with the requirements that Fracture Critical Members containing welds sustaining tension are to be QC inspected by **both radiographic and ultrasonic tests**. If the Contractor or its supplier was unsure whether this important standard testing requirement for FCM's on welds sustaining tension was still applicable under these Special Provisions, it had a duty to seek clarification from the State, but in this case it did not. There was adequate time, after the final revisions to the Special Provisions (per Addenda 4 and 6) that addressed the testing issue, to request and receive a clarification prior to the actual bid date.

The Board finds that the Special Provisions confirmed the requirement for 100% RT testing of butt joint welds on FCM's (other than on certain specified Orthotropic box sections) under the "SHOP WELDING" subsection of 10- 1.44. The DRB believes that a contractor or supplier bidding on fabricating the hinge pipe beams had the burden of fully reviewing and understanding all the pertinent parts of Section 10- 1.44 "STEEL STRUCTURES," including but not limited to the subsections "FABRICATION", "WELDING OF HPS70W STEELS FOR PIPE BEAMS" and "SHOP WELDING."

DRB RECOMMENDATION

The DRB unanimously finds Notice of Potential Claim No. 4 to be without merit and recommends denial of the Contractor's claim to be compensated for performing 100% Radiographic Testing of the butt welds on the hinge pipe beams.

Respectfully submitted,


Warren M. Bullock
DRB Chairman


Frederick Graebe
DRB Member


Richard A. Lewis
DRB Member

Dated: *December 17, 2008*