



DIRECTOR'S CLAIMS BOARD
ODOT Project 1041(10)
Claim 12-101041-03
Delay Costs Shop Coating Defects
Decided: November 28, 2012

On Friday, September 14, 2012 at ODOT's Central Office in Room 4A, the Director's Claims Board ("Board") heard oral presentations of The Ruhlin Company ("Ruhlin" or "Contractor") and ODOT District 12 ("District" or "ODOT") relative to the subject claim on Project 1041(10), CUY-Willow Avenue ("Project"). Prior to the oral presentations and in accordance with the Dispute Resolution and Administrative Claim Process set forth in the contract, the Board received written documentation from the Contractor on June 29, 2012 and from the District on August 28, 2012.

The Board consisted of: Megan O'Callaghan, P.E., Deputy Director, Division of Construction Management; James Young, P.E., Deputy Director, Division of Engineering; Dave Ley, P.E., District Construction Administrator, D-7.

The District 12 representatives at the hearing were: Greg Kronstain, P.E. and Randy Over, P.E.

The Ruhlin Company was represented by Ben Neal; Chuck Fisher and Justin Alaburda, Esq.

Rick Switalsk, P.E. represented the City of Cleveland.

Pam Clawson, P.E., Dispute Resolution Coordinator, Division of Construction Management served as Secretary of the Board. Jim Welter, P.E., Structures Engineer, Division of Construction Management observed the hearing.

PROJECT DESCRIPTION:

This project rehabilitated the roadway and sidewalk of the Willow Avenue vertical lift bridge in the City of Cleveland, over the Cuyahoga River. The mechanical and electrical components that control the bridge were also rehabilitated.

The Ruhlin Company was awarded the contract which was executed on May 12, 2010. The original bid price was \$3,913,242.50. The original contract completion date was June 30, 2011. The completion date was subsequently revised to August 31, 2012. Approximately 95% of the project is complete. The current value of the contract amount of the contract is \$4,123,512.71.

This was an ARRA funded project. ODOT is administering the project for the City of Cleveland.

CLAIM OVERVIEW:

Ruhlin received and installed structural steel from September 2010 to July 2011. These stringers were to include a three (3) coat paint system applied in the shop. Once the steel was erected ODOT and Contractor's QC personnel noted defects and deficiencies in the three (3) coat paint system. On August 22, 2011 the Department ordered The Ruhlin Company to field repair the shop deficiencies. To date, this repair work has not been done. At the time of the submission of its claim on June 28, 2012 Ruhlin estimated the cost to do the repairs would be \$115,048.09.

SUMMARY OF THE CONTRACTOR'S POSITION

The contract documents are clear that the new steel was to be supplied with three (3) coats of shop paint from the fabricator. The Ruhlin Company hired a fabricator from ODOT's Prefabricator List. A pre-fabrication meeting was held on July 12 between the fabricator and ODOT's Office of Materials Management (OMM). In a letter dated July 16, 2010 OMM issued an IOC stating it would perform the quality assurance rating listed in Appendix II of Supplement 1078.

Shipments of the new steel were released to the project beginning September 27, 2010 and continued through June 3, 2011. C&MS 513.04 states "The fabricator shall not ship fabricated members performed under 513, UF Level or Levels 1 through 6 from the shop without prior hold point inspections unless the Office of Materials Management waives the inspection." Ruhlin noted it was not aware of any such waiver. Supplemental 1078 states that the quality control specialist is to present the member and all documentation from check points 1 thru 15 to the QA for acceptance by OMM at Hold Point 16 prior to shipment.

Plan sheet 21/94 states the new steel will be shop painted according to C&MS 514. C&MS 514.04 states "Quality control consists of designating quality control specialists to control the quality of work in each phase established by Quality Control Points (QCPs). Control quality by inspection, tests, and cooperation with inspection and testing performed by the engineer and inspector." The fabricator designated a QCS as required by C&MS 514. C&MS 514.04.B defines QCPs as "points in time when one phase of the work is complete and approved by the QCS and ready for inspection by the engineer or inspector before commencing the next phase of work." It further defines the QCPs as numbers 1 – 11. The engineer/inspector did not perform these inspections during the shop coating. They were inspected at completion, prior to shipping in accordance with C&MS 513 and Supplement 1078.

The new steel arrived with a TE-24. C&MS 106.02 states: "The engineer will inspect and determine whether the materials comply with the specified requirements before they are incorporated into the Work." Supplemental 1078.61 states that "After shop inspection acceptance, the fabricator will ship members to the construction project and supply a TE-24 to the engineer. Final acceptance will be based upon the engineer's approval that the structural member can be successfully incorporated into the structure." At no time was Ruhlin prevented from installing new structural steel over the course of the project.

C&MS 513 states "When the steel arrives on the site and prior to erection it should be inspected for damage and quality of fabrication as thoroughly as time and conditions permit" and "If corrective work is obvious, advise the contractor immediately so that the responsible party can be notified and correction can be performed in the most advantageous location". At no time did the engineer request to inspect the steel upon delivery. The claimed damage was visible and identified by the QCS and QA during touch up painting.

Due to the failure of inspection by the Department, the repair of the shop coating deficiencies will now require a marine closure if the repairs are made with the structure in the down position or the complete closure of the vehicular traffic if the members are repaired in the raised position. Neither option is allowed by contract. Further, the cost impact of either scenario is estimated to exceed the total cost of the structural steel supplied to the project. Had the deficiencies been identified prior to erection, The Ruhlin Company would have had the option of withholding payment to the fabricator until the material complied with the contract documents.

Ruhlin pointed out in its presentation ODOT made progress payments for the structural steel in accordance with the contract as the steel was delivered. The Ruhlin Company is bound by C&MS 107.21 to make payments to subcontractors or suppliers within 10 calendar days after

receipt of payment. Although Ruhlin received and installed structural steel from September 2010 until July 2011 it was not until August 22, 2011 the ODOT Project Engineer ordered Ruhlin to correct all defects that originated from the plant, a year after installation of some of the steel.

In its Step 2 decision the DDRC directed The Ruhlin Company to:

...hire an agreed to coatings expert to evaluate the coating system's useful life, in particular the extent of the damage caused by the off-gasing of one or more layers of paint into the top coat. The coatings expert will also recommend appropriate cost-effective repairs that maintain the expected life of the coating system. The cost of repairs as well as the hiring of a coatings expert will be borne by the Contractor.

Both ODOT and Ruhlin agreed to Dwight Weldon of Weldon Laboratories, Inc. as the coatings expert.

In its rebuttal statement during this September 14, 2102 hearing Ruhlin pointed out it notified ODOT several days before Weldon was coming in for the inspection. Ruhlin had secured a boat to allow Mr. Weldon access to the spans in the river. No one from ODOT attended this inspection. After inspecting the accessible portions of the bridge Mr. Weldon asked "does everything else look about the same?" The Ruhlin people answered "Yes" so no inspection was done of the steel over the water. ODOT did not direct the scope of this inspection report.

In his report Mr. Weldon explains these defects are not "pinholes", which expose the steel surface; but "fisheyes" which show up in the topcoat. "There were no holes or cavities going down to the intermediate coat, to the primer, or to the steel." His report concludes that the defects would cause little or no loss of the coating's useful life.

At this time, Ruhlin estimated in its presentation, the cost of the claim is approximately \$4,000.00 to cover the expert report ordered by ODOT. To date the cost impact of the claimed defects is unknown. No work has been done on the steel to repair the alleged paint defects. The recommendation by ODOT's structural steel expert to correct the alleged paint defects which occurred in the fabrication process is to abrade the surface down to the zinc prime coat cratered areas and re-apply the intermediate and finish coats. Ruhlin stated it has incurred over 4,000 man-hours for the touch up paint it is performing under the structural steel bid reference. Ruhlin calculates the cost for this work to be \$402,463.56 to date. It estimates the repair work ODOT is demanding will result in a similar cost.

Ruhlin stated in its presentation it has not received any notice from ODOT that the District Construction Engineer has determined the paint is not in reasonably close conformity with the contract documents. Ruhlin does not accept ODOT's determination that this paint fails to meet the specifications. ODOT still has not pointed out areas that must be repaired.

The timeline for this claim shows:

- ODOT denied Ruhlin's request for payment for the paint repair at Step One on September 9, 2011.
- Ruhlin requested a Step Two hearing on September 15, 2011.
- Ruhlin submitted its Step 2 documentation on October 7, 2011.
- On April 4, 2012 the fabricator enters into receivership. Receiver is unable to pay debts predating April 3, 2012.
- Step 2 hearing was held on April 19, 2012 (195 calendar days following Ruhlin's document submittal).
- The Step 2 decision, of May 4, 2012, denies Ruhlin's request for payment for the paint repair. In this decision Ruhlin is told to hire and independent coatings expert to inspect and analyze the coatings useful life.

- July 5, 2012 Weldon Laboratories is chosen and agreed upon by ODOT as the coating expert.
- Ruhlin advised ODOT the inspection would take place on July 18, 2012.

As part of its rebuttal, in response to ODOT's statement its QA identified deficiencies in the fabrication shop previously, Ruhlin pointed out it is only aware of two instances where shipments were delayed due to deficiencies in the fabrication process. In one of these cases 12 stringers were found to have major deficiencies and delayed delivery of the steel by one week. The defect here was a paint related issue. The result of the inspection led to the removal of all paint on the 12 stringers and they were repainted in accordance with C&MS 514. ODOT inspectors failed to perform a complete review of the documentation on several occasions.

C&MS 514.04.A states: "The quality control specialist will be immediately removed from the work and disqualified from future work if any quality control failure occurs." Even though ODOT had knowledge of failures by this quality control specialist nothing has been done to remove him from ODOT's approved list nor had ODOT removed the fabricator until its bankruptcy.

SUMMARY OF THE DISTRICT'S POSITION:

Supplemental 1078 states that the fabricator will perform the quality control (QC) and that the fabricator's quality control specialist (QCS) shall be responsible for the final acceptance of the structural steel members at the painter's facility. This requirement includes providing documentation validating that the quality control points in the specification have been adhered to and that the product quality meets the contract requirements.

The Contractor has argued that the structural steel paint system was approved by ODOT, OMM, prior to release and shipment. They have stated that the repairs are extremely difficult and costly now that the steel has been erected. C&MS 105.01 states "The Engineer's acceptance does not constitute a waiver of the Department's right to pursue any and all legal remedies for defective work or work performed by the Contractor in an unworkmanlike manner."

The work has been deemed to be not in reasonably close conformity by the District Construction Engineer and as per C&MS 105.03 this work shall be replaced at no cost to the Department. C&MS 105.03 states: "If the DCE determines the Work is not in reasonably close conformity with the Contract Documents and determines the Work is inferior or unsatisfactory, remove, replace or otherwise correct the Work at no expense to the Department."

The Contractor argues that the Department had several opportunities to identify deficiencies in the coating steel prior to erection and failed to detect any deficiencies. However, the Contractor and the QC is responsible for the work. Both had the opportunity to identify deficiencies and perform corrective work prior to erection.

C&MS 105.10 states: "The Department shall have the discretion to dictate the level of inspection for any item of work. The Contractor bears sole responsibility for the quality of work and compliance with the contract regardless of the Department's level of inspection."

QC is the responsibility of the Contractor and the Fabricator. QA is the responsibility of ODOT. The Department did identify defective work in the fabrication on several occasions that required corrective work. These corrections were remedied prior to release of the steel. It was apparent that the QC was lacking and problems existed in the Contractor's facility that ultimately delayed the material shipment. There was no evidence the Contractor did their due diligence to resolve any quality issue with their chosen fabricator nor did they make any effort to direct the fabricator to adhere to the QC procedures defined in Supplement 1078.

As part of the District's Step 2 response the Department directed the Contractor to hire a coatings expert to evaluate the coating system's useful life and the extent of the defects. In addition, a recommendation was to be made for appropriate cost effective repairs that maintain the expected life of the coating system.

Weldon Laboratories report, provided on July 27, 2012 identified one particular paint defect, shallow craters ("fisheyes"), in the intermediate coat. These areas contain minimal paint thickness (1 mil) in the intermediate coat and are considered holidays, as defined in C&MS 514.17.G. The holidays are a result of very small amounts of contaminants either in the paint or on the surface. Weldon Laboratories inspection report stated that the shallow craters in the paint system will have little to no effect on the performance of the painted bridge steel.

In its presentation the District explained the expert report did not address everything it had hoped for. The expert only looked at a small percentage of surface area (15' on each end of the 310' bridge) and did not address life of the steel due to these "fisheyes". It also did not fully analyze the coating system or indicate any other known defects such as fins, tears or slivers. The report also did not contain any findings or recommendations on repair methods, as requested.

The District pointed out that the report does show that in places it did not get the paint thickness it is paying for and the report did refer to the "fisheyes" as "defects". The holidays could impact the long term adherence and performance of the paint system when the steel is exposed to freeze-thaw conditions or movement.

ODOT's State Construction Structures Engineer, Jim Welter, stated something in the application of the intermediate coating, probably something in the sprayer, caused these discontinuities called "fisheyes" that are not supposed to be there (a defect). He stated defects are likely to reduce the life of the paint system lower than the 30 year expected life but pointed out it is difficult to quantify that number. The recommendation of ODOT's expert is to abrade the surface down to the zinc prime coat crated areas and re-apply the intermediate and finish coats.

DIRECTOR'S CLAIMS BOARD FINDINGS:

Facts

After careful review of the submitted documents and with due consideration of the information provided at the hearing, the Board determined the following to be significant findings relevant to the issue of entitlement:

1. C&MS 105.03 reads:

It the DCE determines the Work is not in reasonably close conformity with the Contract Documents and determines the Contractor produced reasonably acceptable Work, the DCE may accept the Work based on engineering judgment. The DCE will document the basis of acceptance in a Change Order that provides for an appropriate adjustment to the Contract Price of the accepted Work or Materials.

If the DCE determines the Work is not in reasonably close conformity with the Contract Documents and determines the Work is inferior or unsatisfactory, remove, replace, or otherwise correct the Work at no expense to the Department.

2. C&MS 106.02 states: "The Engineer will inspect and determine whether the materials comply with the specified requirements before they are incorporated into the Work."

3. C&MS 105.10 states: "The Department shall have the discretion to dictate the level of inspection for any item of work. The Contractor bears sole responsibility for the quality of work and compliance with the contract regardless of the Department's level of inspection."
 4. In an IOC of July 16, 2010 ODOT's Office of Materials Management notified ODOT District 12 it would perform the quality assurance rating listed in Appendix II of SS 1078. The Ruhlin Company and its fabricator, Comm Steel, were copied on this IOC.
 5. Supplemental 1078.04.A. reads in part: "The Fabrication QCS shall have the following duties: ...2. Be responsible for documenting and accepting all inspection points listed in (Appendix II) for each main material piece showing conformance with the requirements of 513, 514, this supplement and other contract documents..."
 6. Supplemental 1078.061.A. reads in part: "The fabricator shall be responsible for the following: ...3. Performing QC and providing documentation at specified check hold or witness points according to Appendix II and as defined below."
 7. 1078.061.B defines Check Points as requiring "QC inspection and documentation by the fabricator before the fabrication process continues." It defines Hold Points as requiring "QC inspection and documentation by the fabricator before QA inspection can be performed. The fabrication process can continue only after the QA inspection has been performed." And Witness Points "require concurrent QC inspection by the fabricator and QA inspection by the OMM to physically witness the welding or nondestructive testing." Check Points 12, 13, 14, 15 and 16 involve painting structural steel.
 8. In its Step 2 decision the DDRC directed The Ruhlin Company to:
...hire an agreed to coatings expert to evaluate the coating system's useful life, in particular the extent of the damage caused by the off-gasing of one or more layers of paint into the top coat. The coatings expert will also recommend appropriate cost-effective repairs that maintain the expected life of the coating system. The cost of repairs as well as the hiring of a coatings expert will be borne by the Contractor.
- Both ODOT and Ruhlin agreed to Dwight Weldon of Weldon Laboratories, Inc. as the coatings expert.
9. Ruhlin and the District did not discuss the DDRC's intended scope of service of the independent coatings expert. Although invited, no one from the District showed up for the inspection and after the report was provided the District did not ask for clarification.
 10. In his Summary Dwight Weldon of Weldon Laboratories, Inc. concluded:
The defects on the Willow Avenue Lift Bridge which have been complained about are not due to pinholes through the coating system or outgassing from lower coats of paint. Instead, they are due to shallow craters (sometime termed "fish-eyes" in the coatings industry) in the paint system. These craters have actually originated in the white intermediate coat of epoxy. It is expected that the shallow craters in the paint system will have little or no effect on the performance of the painted bridge steel.
 11. In his Discussion section Dwight Weldon stated:
The craters are visible to the naked eye because both the shop applied polyurethane topcoat and the field-applied polyurethane topcoat flowed into the craters in the white epoxy, but did not completely fill them up, leaving slight depressions.
 12. Dwight Weldon continued:
Craters or fisheyes are the result of surface tension factors. They are usually caused by minute amounts of some contaminant either on the surface being painted (the zinc-rich primer in this case), or in the coat of paint being applied (the epoxy). If this contaminant, such as a droplet of oil, has a lower surface tension than the paint being applied on top of it, the paint can not "wet" the surface, and will pull away from it.

13. Dwight Weldon concluded:

While it is true that there is only 0-1 mil of epoxy intermediate coat immediately at the base of the crater (which is even a smaller area than the entire crater itself), the zinc-rich primer and two coats of polyurethane should provide more than adequate protection in these areas, especially when keeping in mind the very small size of these craters, and their relatively low frequency.

14. ODOT's State Construction Structures Engineer, Jim Welter, was asked by District 12 to review the Weldon Laboratories, Inc. report and he offered the following comments:

- a. If the "holes" in the epoxy intermediate coat did not go all the way through the coat, from the zinc prime coat to up through the top of the urethane top coat, the "holes" or "craters" are probably not "pinholes" caused by the outgassing of the solvent in the inorganic zinc.*
- b. Fisheyes, as defined by the National Association of Corrosion Engineers, (NACE), are localized thin areas of coating, or craters distributed randomly over the surface...*
- c. Fisheyes are caused by the application of a coating over oil, dirt, silicone, or incompatible coating, or by oil in the spray-atomized air.*
- d. Fisheyes are holidays...and are a paint defect as defined in 514.17.G.*
- e. My concern involves the fact that contaminants... which caused the voids or discontinuities...could impact the long term adherence/performance of the urethane top coat in these craters when the steel in (sic) exposed to freeze-thaw, and the movement of this bridge during operation.*
- f. My recommendation, would be to abrade, (roughen), the surface of the paint down to the zinc in the crated (sic) areas, apply epoxy intermediate and urethane finish coats as per the specification. Or accept the work with an appropriate adjustment to the Contract per 105.03.*

Conclusions

ODOT's expert (Mr. Welter) and the independent expert (Mr. Weldon) agreed the defects in the I.Z.E.U. painting system are "fisheyes" and not "pinholes". Both referred to these anomalies as "defects" and agreed the cause is some kind of contaminate. The Board accepts the DCE's determination that defects are present in the paint system.

The Board then must determine whether Ruhlin or ODOT is responsible for the quality of the paint system. Ruhlin argued because the fabricator and the fabricator's QCS were on ODOT's approved lists ODOT is responsible for the quality. C&MS 105.03 directs the Contractor to: "Perform all Work and furnish all Materials in reasonably close conformity with the lines, grades, cross-sections, dimensions, and material requirements as shown in the Plans and as specified."

Ruhlin further argued because ODOT "waived its right to inspect the work" at designated hold points ODOT is responsible for the quality of the paint system. Following the hearing the Board asked ODOT's Office of Materials Management for an explanation of its shop paint inspection process. OMM stated this fabricator, based on its past performance, was a prequalified fabricator. In the past the fabricator demonstrated it was capable of producing quality work and as such did not require monitoring by ODOT. Therefore, there should be no expectation that ODOT would perform QA at every hold point. ODOT did not "waive" its inspection, it followed its process. C&MS 105.10 states: "The Department shall have the discretion to dictate the level of inspection for any item of work. The Contractor bears sole responsibility for the quality of work and compliance with the contract regardless of the Department's level of inspection."

This prequalified fabricator was responsible to provide specification material. Ruhlin chose to use this fabricator from a list of prequalified fabricators. The Board finds that as the prime contractor the ultimate responsibility for the quality of ALL work on this project rests on Ruhlin

regardless of the level of ODOT inspection.

Following the hearing the Board requested ODOT's State Construction Structures Engineer, Jim Welter, visit this project site and investigate the condition of the shop applied I.Z.E.U. coating system on the replacement stringers and channels. Mr. Welter's commented:

My investigation on September 19, 2012 did not find that these fisheyes were widespread over the surface of the coating on the new steel supplied by Comm Steel. I agree with Mr. Weldon's statement that the extent of these craters was minimal. Only a handful of small localized areas, with five to ten fisheyes per square foot were found (approximately 1/16 inch diameter, 2 to 3 mil deep). These areas were mainly found on the west fascia stringer on the north side of the bridge. Dry film thickness readings of the coating systems near these fisheyes were within tolerance...

Mr. Welter concluded:

...the extent of these defects on the portions of this bridge with the new steel is minimal. ...It would be a better use of resources to repair and repaint other areas of this forty seven year old bridge before trying to repair these small areas of fisheyes. These small scattered areas of fisheyes should not appreciably impact the long term performance of the three coat I.Z.E.U. painting system.

C&MS 105.03 allows "If the DCE determines the Work is not in reasonably close conformity with the Contract Documents and determines the Contractor produced reasonably acceptable Work, the DCE may accept the Work based on engineering judgment." Based on the engineering judgment of Mr. Welter and Mr. Weldon the Board, acting in the place of the DCE, accepts this work as reasonably acceptable. C&MS 105.03 continues "The DCE will document the basis of acceptance in a Change Order that provides for an appropriate adjustment to the Contract Price of the accepted Work or Materials." Again, acting in place of the DCE, the Board must make an appropriate adjustment to the Contract Price.

In Section 4.1 of its claim documentation Ruhlin quotes the total cost paid to the fabricator for the structural steel with the three coat paint system as \$251,078. It further estimates that of this total cost about 10% or \$25,108 represents the cost of the paint system. Mr. Welter estimates approximately 1% or less of the surface area of the new steel was affected by the "fisheyes". Based on this estimate the Board calculates \$251.08 as the appropriate adjustment to the Contract Price. ODOT's Standard Procedure 510-009(SP), Acceptance of Nonspecification Material on Construction Projects stipulates a minimum administrative fee of \$300 shall be applied, unless a higher appropriate deduction is established. Because the Board only calculated the adjustment to be \$251.08 the \$300 minimum adjustment will apply.

Ruhlin was directed by District 12 to hire Weldon Laboratories to inspect the paint and provide an expert opinion on the quality of the work, expected life of the steel and potential corrective action. The District is not provided authority by the Contract to force a Contractor, at its own expense, to hire a consultant to evaluate its workmanship. The Board directs the District to reimburse the Contractor the price it was invoiced by Weldon Laboratories, with no markups applied. The District argues it did not get all the information it expected. However, the Board was not convinced the District provided Ruhlin with an adequate scope for the work.


DAMAGES:

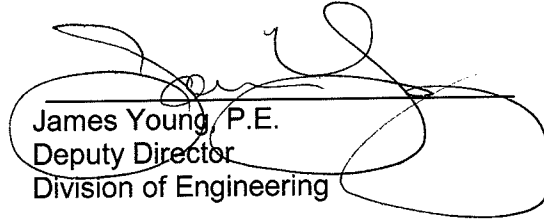
Based on the above findings no corrective work is needed to repair the "fisheyes". Since it has been determined this Work is not in "reasonably close conformity" with the Contract Documents the District will process a change order accepting the structural steel based on engineering judgment and assess the minimum adjustment of \$300 for nonspecification material.


The District will reimburse Ruhlin for Weldon Laboratories' report based on its invoice with no markups.

This recommendation is submitted this 28th day of November, 2012.


Director's Claims Board:


Megan O'Callaghan, P.E.
Deputy Director
Division of Construction Management


James Young, P.E.
Deputy Director
Division of Engineering


Dave Ley, P.E.
District 7 Construction Administrator

Approval of this recommendation:


Jerry Wray
Director, Ohio Department of Transportation

11-30-2012
Date