California Council of Testing and Inspection Agencies

THE TEST REPORT

A Newsletter of the California Council of Testing and Inspection Agencies

Summer 2009

This Issue

We're on the Web!
http://
www.cctia.org

President's Corner

By Michael Parker, Testing Engineers, Inc.

Well, we are already half way through 2009 and work is finally picking up in the industry! I would like to ask again for more member involvement. We have the ability to effect industry issues in a positive manner. In getting involved, CCTIA unites all members under one roof and speaks with one voice. When all of us work together, we are unstoppable!

We have a fantastic meeting planned with David Thorman, State Architect who will also be bringing Eric France, and members of the AFEST team. This ground breaking meeting is scheduled in Anaheim for our Southern California team members for October 29, 2009 at the Sheraton Park Hotel across from Disneyland. CCTIA has planned a lunch style meeting and we are asking for your comments and issues to be supplied prior so that DSA can respond accordingly. PLEASE GET YOUR ISSUES, QUESTIONS, IDEAS INTO US SO THAT THIS MEETING WILL BE EFFECTIVE. Remember, you can only be heard if you speak up! And, together we can effect positive change. Please check the website for the complete details.

Just prior to that meeting, ASFE will be holding their Fall Meeting in Austin,Texas. We will have our RO Liasion at this meeting in order to bring back the details for our industry. Meeting is scheduled for October 1 – 3, 2009.

Coming up as well is our Annual Business Meeting which will be held again at the popular Treasure Island Resort & Casino in Las Vegas, NV. The venue will be on January 29th and 30th, 2010. This will allow the attendees to take in the 2010 World of Concrete which will follow our ABM. We have some fantastic things in the works and have even booked Kurt Siggard, Director of the Concrete Masonry Association of California and Nevada (CMACN). Many of you remember that Kurt Siggard was a former member and Past President of our Association. This is just the beginning of some great speakers planned throughout the event.

This newsletter needs your input and news stories! Please consider sending in an article that will benefit your fellow member. And, as always, I would love to hear from you about how we can increase membership, provide better services, or if you think that we are doing a great job! I look forward to seeing all of you at our next meeting!

FAQ 10.017

UT ACCEPTANCE CRITERIA, FEMA–353 VS AWS D1.1

Q: I need some advice on the UT acceptance criteria for CJP welds. The welding inspector for the project that I'm working on claims that the acceptance criteria specified in AWS D1.1 differs from that specified in FEMA–353, and he is asking us to specify which criteria they should use. Our project uses special moment resisting frames, so the welds at the connections and the column splices are critical elements. The project specifications state the following: *"Ultrasonic testing (UT) shall be conducted by the Owner's Testing Agency for the percentage of joints designated in Table 2-1. UT shall be performed in accordance with AWS D1.1."* FEMA-353 is cited elsewhere in the specifications but not in regards to UT. I looked at AWS D1.1 and cannot determine if or how it differs from FEMA–353. I also reviewed AWS D1.8 and it appears to match FEMA-353 and thus adds to my confusion.

What concerns me about the specification is that I'm sure that the differences between AWS D1.1 and FEMA-353/D1.8 were not taken into account when the provision was written. That's why I need the clarification. Should we be using D1.8 or D1.1 or both?
Submitted by a S.E. from Oakland, CA.

Response Submitted by Dave Palfini, Testing Engineers, Inc.

A: AWS D1.1 has two ultrasonic testing procedures and acceptance criteria. The primary one, used for decades and most commonly accepted, is contained in Section 6, Part F.

Annex K, referenced in FEMA 353, *UT Examination of Welds by Alternate Techniques*, is relatively new.

Since FEMA-353 was not specified for ultrasonic testing in the project documents, AWS D1.1, Section 6, Part F would be the procedure to be used. Some reasons for this are as follows:

FEMA-353, Section 5.8.3 allows the engineer the option of either AWS D1.1 Annex K or Table 6.2 (Section 6, Part F).
Annex K (moved to Annex S in 2006), states, "This annex is non-mandatory unless specified in the contract documents."

AISC 341s1-05 and AWS D1.8-06 specify AWS D1.1, Section 6, Part F unless alternative procedures are approved by the engineer.

Response Submitted by Doug Williams, P.E.

A: If given the choice, I prefer the D1.1 criteria, primarily because there are precious few UT technicians that can accurately and reliably size flaws in 3 dimensions. As the welding inspector suggests, in his original request, the FEMA-353 criteria may not be as conservative as D1.1, particularly considering the lower probability of detection and accuracy of sizing for technicians whose experience is predominantly with the D1.1, Sec. 6, Parts C & F criteria and methods.

Doug Williams is a consulting metallurgical and welding engineer with over 35 years of experience in metal working industries. He can be reached at Doug@WeldEngineers.com

Tribute to Dave Palfini

Dave Palfini, a long time employee, owner, and friend of Testing Engineers, passed away on June 25th, 2009. He was 57 years old. As a principle owner and key player in TEI's long-term success, Dave was the spirit and core of our NDT business.

After completing his training at Contra Costa College, Dave became a junior member of the American Society of Non-Destructive Testing (ASNT), later becoming a Level III and holding local offices of Treasurer and President. Dave started his career in the non-destructive testing industry with X-Ray Engineering Company. For two years he performed field radiography before moving to TEI in 1974.

Dave was instrumental in the reorganization of TEI in 1995, and became a principal member of the management/ownership team at that point. With his wisdom and foresight he built a reputation for having unparalleled knowledge and a demeanor for resolution. Combining these attributes with his sideways glance and sly smile, Dave often nudged adversarial parties to a peaceful outcome.

Dave has made a long career in our industry teaching and mentoring students and professionals alike. Starting in the early days of this industry, Dave learned the "old-school" ways, including a sense of camaraderie that transcended business. A long-time staple of Testing Engineers was the "505 Club". Every evening at 5:05 pm, the conference room was transformed into a cross between a college debate hall and an Irish pub. Tales were told, battles were fought, and conflicts ebbed and flowed. But, friendships never wavered.

Dave Palfini touched many lives during his career. He was always available to counsel or mentor others through their own struggles, while never complaining about his own pain. May we always remember Dave as "The Man of Quality".

FAQ10.016

SOME RUST ON REBAR IS ACCEPTABLE

Q: There is some question on our project whether rust on the reinforcing steel is acceptable. I've been told that rust was not a reason for rejection, do you know of some authoritative document that takes account of cleanliness of the bar?

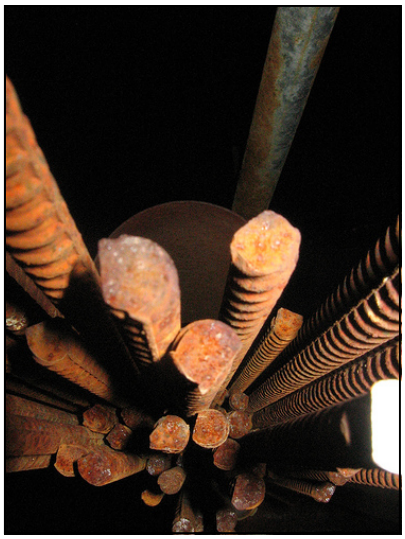
A: According to the Concrete Reinforcing Steel Institute CRSI in a similar FAQ they state "Rust actually improves bond because it increases the roughness of the surface. However – and this is the exception – if there is so much rust that the weight of the bar is reduced or the height of the deformation is reduced, then the rust is considered harmful."

Check out the following references:
CRSI Engineering Data Report #54 ***Field Inspection of Reinforcing Bars*** Page 3 Surface Conditions of Bars "A light surface coating of rust on reinforcing steel should not be a cause for rejection by the inspector"

ACI 318 ***Building Code and Commentary*** - Section 7.4.2 - "Except for prestressing steel, steel reinforcement with rust and mill scale, or a combination of both shall be considered satisfactory, provided the minimum dimensions and weight of a hand-wire-brushed test specimen comply with applicable ASTM specifications."
7.4.3 – "Prestressing steel shall be clean and free of oil, dirt, scale pitting and excessive rust. A light coating of rust shall be permitted."

ASTM A 615 ***Standard Specification for Deformed and Plain Carbon Steel Bars for Concrete Reinforcement*** – Section 12.2 "Rust, seams, surface irregularities, or mill scale shall not be cause for rejection, provided the weight, dimensions, cross-sectional area and tensile properties of a hand wire brushed test specimen are not less than the requirements of this specification."

ASTM A 706 ***Standard Specification for Low-Alloy Deformed and Plain Bars for Concrete Reinforcement*** – Section 11.2 "Rust, seams, surface irregularities, or mill scale shall not be cause for rejection, provided the weight, dimensions, cross-sectional area and tensile properties of a hand wire brushed test specimen are not less than the requirements of this specification."



CALTRANS – ***Standard Specifications*** *May 2006* Section 52 -1.05 CLEANING

"Before concrete is placed, the reinforcement to be embedded shall be free of mortar, oil, dirt, excessive mill scale and scabby rust and other coatings of any character that would destroy or reduce the bond."

CONCLUSION

As noted in documents issued by ASTM, ACI, CRSI, and Caltrans, some rusting of the reinforcing steel is acceptable and advantageous. The difficulty in addressing this issue is the subjectivity of a visual evaluation as suggested by CRSI ("A light surface coating…") and Caltrans ("…free of …excessive mill scale and scabby rust and other coatings of any character…"). Common sense and fabrication tolerances should be used. Where there is readily visible pitting or scale associated with rust (not mill scale) and where the engineer or inspector have cause for concern that the deformations and/or cross sectional area of the bar have been reduced, the degree of rusting may need to be determined by laboratory testing. As always, the project specifications, where more stringent than the published standards, shall prevail over all else.

Terry Egland is a principal at Testing Engineers, Inc. and a registered engineer in California. He can be reached at Terry@Testing-Engineers.com

Got a question?
Send it to Q&A,CCTIA, 2811 Teagarden St. San Leandro, Ca.94577 or email terry@testing-engineers.com.
Responses to questions are the author's opinion, not necessarily that of CCTIA

San Francisco Building Code AB-046

By David Chippero
Testing Engineers, Inc.

The City of San Francisco is one step closer to approving Administrative Bulletin AB-046 which will redefine special inspection guidelines within the City and County. The final draft has been sent to the Code Advisory Committee and the Structural Subcommittee for review. If AB-046 is approved as written there are several items that will affect Special Inspectors, Special Inspection Agencies, and Material Testing Laboratories who perform work in the City and County of San Francisco.

Below is a brief summary of the major changes:

Special Inspectors (SI):

- Documents such as "shop drawings" that do not carry the DBI approval stamp may only be used as an aid to inspection. If approved documents are not on the premises at the time of the inspection the Contractor shall be notified and a non-compliance report shall be written and immediately submitted to the Building Official.
- The SI shall submit to the Building Official a Record of Correction upon completion of corrective actions to bring non-compliant construction into conformance with approved documents.
- The SI shall leave a copy of his/her hand written daily report at the jobsite.
- To perform special inspections in the City and County of San Francisco a SI will need a minimum of 3 years experience for structural steel and reinforced concrete inspections and a minimum of 5 years experience for projects requiring structural observation.

Special Inspection Agencies (SIA):

- Upon the Building Official's request, the SIA shall submit a list of special inspector dispatch assignments performing work within the San Francisco City and County.
- Upon satisfactory completion of an area of work, the SIA shall submit to the Building Official an Area Acceptance Report. (Area consists of soil compaction, piles, concrete, steel, etc., as assigned by the structural engineer.)
- Upon satisfactory completion of all work requiring special inspection, the SIA shall submit to the Building Official a Final Report. The Final Report shall indicate each area of work, and include all daily reports, non-compliance reports, and records of correction.
- Upon satisfactory completion of all work requiring special inspection, the SIA shall submit to the Building Official a Special Inspection Certificate of Compliance. The Special Inspection Certificate of Compliance shall indicate that all work requiring special inspections have been constructed in conformance with the approved construction documents.

Material Testing Laboratories (MTL):

- The MTL shall notify the Building Official of any non-compliant test results within 24 hours.
- The MTL shall submit to the Building Official a Record of Correction upon completion of corrective actions to bring non-compliant testing into conformance with approved documents.
- The MTL shall submit to the Building Official a Final Report. The Final Report shall include the scope of work, all test reports, non-compliance reports, and record of corrections.
- Upon satisfactory completion of all work requiring sampling and testing, the MTL shall submit to the Building Official a Structural Testing Certificate of Compliance.
- The MTL performing structural testing for projects in the City and County of San Francisco must be accredited by either the Division of the State Architect, the International Accreditation Service, American Association of State Highway and Transportation Officials, or a third party accreditation agency per ISO/IEC 17025 standards, and be approved by the Building Official.

If you have not reviewed the final draft of AB-046 dated 6-16-2009, I suggest that you do so today. You can download a copy by logging onto CCTIA's website at www.cctia.org. I will continue to keep the membership updated on any new information and I urge all members to attend the next meeting with the City of San Francisco. An e-mail to the membership will be sent when the next meeting is scheduled.

FAQ10.046

STANDARDIZATION RECORDS

Q: Recently, we were in the process of installing a new temperature recorder for our curing room. During this period we experienced a CCRL inspection. They correctly noted a footnote of deficiency. "The accuracy of the temperature recorder for the moist storage facilities was not verified at six month intervals as required by Section 5.2.1 of C511. Subsequently AMRL is requesting our *current standardization records.* Could you enlighten us to what is meant by this terminology (verify standardization)?

A: **Response Submitted by Peter Holter**

"The standardization record for the recorder is a record that details the comparison made between the recorder and a reference thermometer as described in C-511, and adjusting the recorder if it is outside the allowable tolerance. There are six items of information you'll want to include on the record."

1. *Unique identification of the recorder.*
2. *Unique identification of the reference thermometer.*
3. *Name of the person who performed the standardization.*
4. *Reference to the procedure used, for example, "Procedure used: C511".*
5. *Date the standardization was performed.*
6. *Detailed results including temperature indicated by both thermometer, and indication of adjustment made and new temperature reading if necessary.*

Response Submitted by Terry Egland

According to Section 5.2.1.3 of ASTM C511-06 the laboratory is to verify the accuracy of the temperature recorder with that of the reference temperature-measuring device and adjust the temperature recorder if the difference is greater than 1° C. This process is considered ***Standardization***, which is a simplified form of calibration. The process determines the correction to be applied to the result of a measuring device when compared to a reference standard. Standardization does not address all of the elements of uncertainty and does not lead to traceable measurements.

According to ASSHTO PP57-06 this process is termed ***verification of standardization*** a process that establishes whether the results of a previously standardized measurement device are in control.

Published August, 2009

Terry Egland is a principal at Testing Engineers, Inc. and a registered engineer in California. He can be reached at terry@Testing-Engineers.com

CCTIA C/O ELIZABETH LEVI 1181 QUARRY LANE BUILDING 350 PLEASANTON, CA 94566

Current Members

Apex Testing Laboratories
Applied Materials & Engineering, Inc.
BSK Associates
BTC Laboratories (Bureau Veritas)
John R. Byerly, Inc.
CHJ, Inc.
Condor Earth Technologies
Consolidated Engineering Laboratories
Construction Testing Services
Dynamic Consultants, Inc.
ENGEO, Inc.
Fugro West, Inc.
HP Inspections
Heider Engineering
Holdrege & Kull
Inspection Services, Inc.
KC Engineering Co.
Kleinfelder, Inc.
Krazan & Associates, Inc.
Leighton Consulting, Inc.
Matriscope Engineering Laboratories Inc.
Nova Engineering
RES Engineers, Inc.
Raney Geotechnical
Signet Testing Laboratories
Southern California Soil and Testing, Inc.
Terracon Consulting Engineers & Scientists
Terrasearch, Inc.
Testing Engineers, Inc.
Youngdahl Consulting Group

FAQ10.023

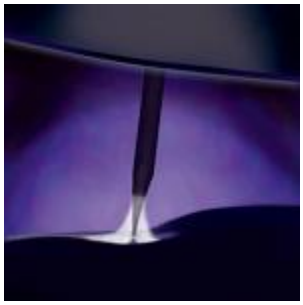
What is Pulsed Arc Wire?

Q: I'm working on project where the welding inspector and the fabricator are recommending that for complete penetration welds, the root pass to be 3/32 inch stick and the rest of the passes will be pulsed arc wire. Can you tell me something about pulsed arc wire?

Submitted by a S.E. in Oakland

Response Submitted by Greg Ruf

A: The two most common types of Gas Metal Arc Welding (GMAW) metal transfer are short-circuit and spray transfer. Both processes use constant voltage and direct current. In the short-circuit process, which uses both a constant voltage and constant current, the filler wire contacts the base metal causing a short-circuit. The short circuit processes sufficient heat to melt the filler wire where the wire is in contact with the base metal. Spray transfer is a process where the filler metal wire melts above the base metal and is projected across the arc as globules or as fine droplets of molten metal. Spray transfer can be accomplished using conventional constant voltage constant current or pulse current techniques and equipment. Pulsed arc welding, also known as pulsed spray welding, is a spray-transfer form of GMAW. Pulsed arc welding process is also a constant voltage direct-current process where the current is not held constant but is pulsed. Melting of the filler wire occurs at the higher current associated with the electrical pulse wave, with the droplets of molten filler metal projected across the arc from the wire to the weld puddle. Thus the spray-transfer of the filler metal. The spray transfer process has the ability to make high-deposition welds on thick carbon steels when using larger diameter filler wire. The current AWS Welding Code D1.1 precludes the use of short-circuiting for welding of structural steel and stipulates that the spray transfer method be used for GMAW. An advantage of the pulse method of GMAW versus that of conventional spray transfer GMAW as cited by suppliers of the equipment is that the average current of pulse arc is equal to and often less than that of conventional spray transfer. The pulse method of welding can result in increased penetration with less heat buildup in the joint. Spray transfer, and in particular the pulsed arc method, is also identified with better root fusion than the short circuit method of GMAW. Another advantage of the pulse



method of GMAW is the reduction in spatter over that of the steady current short-circuit method.

References:

RobotWorx
370 W. Fairground St.
Marion, OH 43302
www.robots4welding.com

Considering The Benefits Of Pulse Spray Transfer GMAW
By Paul Niskala, Contributing Writer
Practical Welding Today®
www.thefabricator.com
October 25, 2002

Greg Ruf is the Managing Engineer for Krazan & Associates' San Francisco Bay Area operations, with over 25 years of experience in providing special inspection services. He can be reached at gregruf@krazan.com

UPCOMING MEETINGS & SEMINARS

ASFE Fall Meeting	CCTIA—Southern CA Meeting with DSA	CCTIA Annual Business Meeting
Austin, Texas	Anaheim, CA	Las Vegas, NV
October 3-5, 2009	**October 29, 2009**	**January, 29-30 2010**