



# THE TEST REPORT

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## PRESIDENT'S CORNER –

By Corey Dare

The year 2004 appears to be a turning point for the California economy, upon whose health our industry closely follows. With the change in leadership in Sacramento last November, let us hope a more business-friendly climate



in our state follows, with a resulting positive effect on our economy, and our member companies.

For CCTIA, the theme in 2004 I would like to extend from 2003 is *member involvement*. In the two years I have been associated with CCTIA, I have seen how an organization like ours has the capability to effect significant positive growth of the California testing and inspection industry, as well as to defend our industry against excessive or nonsensical regulations and code requirements. CCTIA provides our industry a united voice in helping to develop or eliminate regulations, codes, and certification requirements that

affect the integrity of our business, as well as the costs of doing business. Our voice becomes stronger as more of our members participate in our activities, and take advantage of what CCTIA has to offer.

With that theme in mind, I would like to note that we are expanding the frequency of our meetings in the greater Sacramento and Southern California regions in 2004 and into 2005. Our goal is to foster greater participation from our member companies in those areas, as well as to promote expansion of our membership in those areas to help CCTIA to become a stronger statewide organization. Our June meeting will be held on Friday the 18<sup>th</sup> at the Marriott Ontario Airport, with Messrs. Jeffrey Enzler and Eric France of the Division of the State Architect as guest speakers. On September 23, our monthly meeting will convene at the Clarion Hotel in downtown Sacramento. November 18 will find us at the Sheraton Harbor Island Hotel in San Diego, and in March 2005, we will return to Sacramento. As always, our Annual Business Meeting will be held in Las Vegas after the start of the

New Year, to be held next on January 21 and 22, 2005 at Bally's Las Vegas. The ABM will afford our participants a chance to take in the 2005 World of Concrete convention as well, which will take place immediately prior to our ABM. It's never too early to start making plans for the ABM, which also affords our members an opportunity for good fellowship with other members, and good food and fun, in addition to our meeting and an excellent guest speaker or presentation.

In an effort to promote greater participation and interest in our meetings, I would also like to hear from you, our readers, what you feel the most important issues in our industry are, and what topics would interest you most at our monthly meetings. Our Vice President for this year, Dave Chippero, will soon be distributing an e-mail survey on this topic, to which I hope that you will respond. Or, please feel free to drop me an e-line anytime at

## VA will Reimburse Veterans for ICC Exam Fees

By Michelle Craig, (DCI, President)

Veterans who take the ICC Reinforced Concrete, Pre-Stressed Concrete, or Structural Masonry exams are now eligible for reimbursement of test fees. The benefit, available through the U.S. Department of Veterans Affairs (VA) under the Montgomery G. I. Bill, repays qualified veterans for the cost of ICC exams taken after January 2003.

Education benefits cover the cost of the exam, whether the recipient passes or fails. Applicants can request reimbursement for multiple certifications. Unfortunately, the Structural Steel and Welding and Field Applied Fire Resistive Materials certifications

are not on the VA's approved list for reimbursement at this time.

To obtain more information on education benefits for veterans and to submit an application online, visit [www.gibill.va.gov](http://www.gibill.va.gov), or call 1-888-442-4551. A list of the ICC certification exams currently covered and reimbursable under the G. I. Bill may be found at [www.gibill.va.gov/Education/Lcweb/search.asp](http://www.gibill.va.gov/Education/Lcweb/search.asp). Type in the keyword: International Code Council

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## A Case Study of Corrosion in Piping for Fire Protection Sprinkler System

By Hossein Arbabi, PhD. P.E. @ TESTING ENGINEERS, INC.

A phenomenon that has received a great deal of attention in corrosion studies in recent years is “Microbiologically Induced Corrosion” (MIC). One might ask, do microbes really eat metals? The short answer is No. But microbes can create the chemical environment that may in turn lead to corrosion of piping systems. This phenomenon occurs almost entirely in stagnant or slow moving water. The most common cases of corrosion where MIC is involved are fire protection systems and piping systems in new construction, where standing water may be present.

The following case study involved the corrosion of a fire protection system through a microbiological process. Three steel pipe sections three inches in diameter were submitted to our laboratory for evaluation. The sections were from horizontal lines in a fire protection sprinkler system where leaks had been detected.

The scope of our work was to establish the cause of leaks in the piping system based on our evaluation of the three pipe sections.

The exterior of the pipe sections were visually examined. There was evidence of metal loss along the edge of the pipe sections.

The pipe sections were sectioned longitudinally to expose their interior. Photo #1 is an overall view of the interior of a typical pipe section. The interior of the pipe was partially covered with thick irregular deposits. The deposits covered approximately half the circumference of the pipe.

Cleaning of the deposits revealed the presence of shallow pits on the entire pipe surface.

Close view of a pit, that was exposed fol-

lowing the removal of the deposits, is shown in photo #2.

The wall thickness of the pipe was measured in a clean area and was found to be approximately 0.092”, making the pipe a Schedule 5. The depth of pitting was measured on the cross section and the maximum depth in the areas examined was found to be up to 40% of the wall thickness.

The most severe corrosion, however, was observed along the edges where pipe sections are joined by victaulic couplers.

A close view of a typical edge and a cross section showing the degree of metal loss are shown in photo #3.

In order to determine the possible source of corrosion, the interior surface of the pipes were analyzed for their chemical composition. The analysis was performed using “Energy Dispersive X-Ray” (EDX). This technique is qualitative, and has the capability to determine compositions within local areas of the corroded surface.

A clean area (area with no deposit) was analyzed for reference purposes, and was found to contain only iron (Fe). Typical deposits and the surfaces of the pits under the deposits both contained sulfur (S), as evident in EDX in photo #4.

The deposits in the pipes, which covered approximately 50% of the pipe’s circumference, are indicative of the level of water in the piping system. The major loss of metal in the pipes was found to be predominantly along the edges where two pipes are joined together. There was evidence of additional damage (to a lesser extent) away from the edges in areas where deposits were concentrated. In these areas the damage was more extensive under the thicker deposits (mounds).

A common phenomenon in sprinkler piping systems is “Under-Deposit” corrosion (corrosion

under the deposits). The main contributing factor in this type of corrosion is stagnant water in pipes. The corrosion occurs mostly in horizontal sections of the piping, where water is allowed to stand. One of the most common sources of under-deposit corrosion in stagnant water is micro-organisms in the water which build up deposits and create a corrosive environment. This mechanism is known as “Microbiologically Induced Corrosion” (MIC). The presence of sulfur detected by EDX analysis is an indication of MIC. Sulfur is the main by-product with this type of corrosion, since the bacteria is a sulfate reducing or sulfur oxidizing bacteria, depending on the environment. The mechanism of MIC is complex, but it basically involves the production of a corrosion cell between the local areas under deposits and the surrounding areas. This in turn will result in the formation of pits under the deposits. The air in the pipe supplies the oxygen necessary for the corrosion process to initiate and continue. The location of the deposits, which is an indication of the water level in the pipes, showed the water level to be approximately 50% of the pipes volume (50% air).

Based on our observations the following recommendations were made:

- Ultrasonic thickness gauging on the entire system to determine the general condition of the pipes.
- Properly maintain the water chlorination system to ensure adequate chlorination to mitigate MIC.

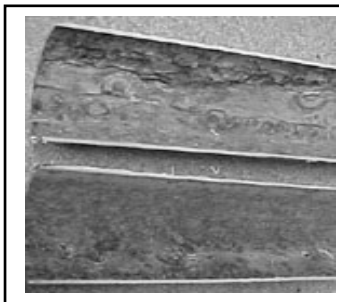


Photo 1

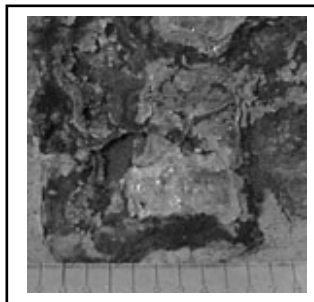


Photo 2

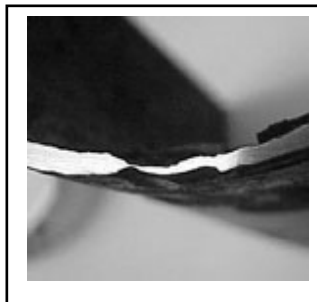


Photo 3

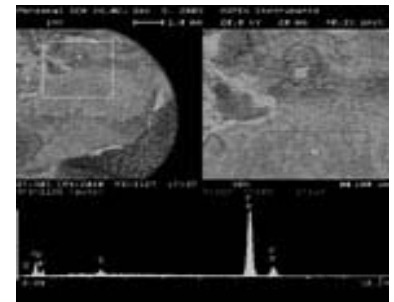


Photo 4

## CCTIA Special Inspectors Enjoy Continuing Education

By Jim Cook, CEL

This spring, CCTIA member inspectors joined a few other Structural Steel and Welding Inspectors at a seminar in Fremont, CA put on by Steel Structures Technology Center, Inc. of Novi, Michigan. The presenter was Mr. Robert Shaw, who provides consulting services and performs Fabricator Audits in addition to writing and publishing a number of handbooks and study guides on the general subject of structural steel fabrication, erection and welding. The seminar covered 8 sub-topics in depth, including the ICC Code, Structural Steel, Welding, Metal Deck, Bolting, Bar Joists, Shear Studs and Fabrication Plant Qualification Programs. This in-depth and informative seminar covered not only basic information, but covered the topics in great depth, to the extent of answering every inspector's questions on any given subject. The subject of High Strength Bolting, for example, was scheduled to cover 3 hours, but we actually ran over 5 hours total on the subject, in order to fully explain all the details and Code changes now involved in this complicated Special Inspector duty. We learned that the latest edition of the Research Council on Structural Connections now requires the *Erector* to provide a Skidmore, and the inspector only witnesses

pre-installation tests. This should be a welcome change for Test Labs when it becomes generally accepted practice. As Mr. Shaw sits on a number of AISC and AWS advisory committees, he was able to inform us on the status of many upcoming Code changes, including the introduction of AWS D1.8, the Seismic Welding Code supplement to AWS D1.1, now scheduled for publication in 2 – 3 years. We learned also that the 2003 ICC is fully acceptable to the State of California for its seismic provisions, but that NFPA is still in the running, as it has strong Trade Union backing, since NFPA prohibits plastic water pipe, among other things that favor Building trade unions. Lastly, the two-day seminar is worth 1.5 CEU's, which makes it very desirable for Special Inspectors seeking to renew their certifications. The Seminar is making a return visit to the Bay Area later this year, in early December. It is highly recommend.

Education is at the core of CCTIA. Recently, CCTIA has endorsed a series of other continuing education programs. Knowledge is the key to keeping up with the ever changing ICC Code requirements and our members providing knowledgeable Special Inspectors. More programs are on the horizon.

## 2004 Annual Business Meeting

By David Chippero

A good time was had by all at the 2004 Annual Business Meeting (ABM) in Las Vegas, Nevada on February 7, 2004 at Bally's. The weekend kicked-off with a cocktail reception on Friday evening where members and their significant others had a chance to relax and participate in good conversations. The ABM was held on Saturday morning and the attendance included 14 representatives from 11 CCTIA member firms. In addition to our regular business agenda the meeting included a presentation from Lonnie and Pat Oswalt with Mobile frame Technologies. Mobile frame provides software that allows field inspectors with no IT background to complete inspection reports, timesheets, and transfer digital signatures electronically. The software gives companies the flexibility to configure templates of their report forms using a drop down menu. The software also allows security restrictions to be set for required information which will force the field inspector to enter the proper data before he/she can move on to the next menu.

On Saturday evening an awards dinner was held at Bally's for members and their significant others. The evening concluded with a heart-felt thank you to all of the members who worked so hard during the 2003 year from Al McManus. Then the gavel was passed to the new president Corey Dare who asked for continued support from all the members and the new 2004 officers were installed. Vice President - David Chippero, Secretary / Treasurer - Bill Cale, Past President - Al McManus, Board Member - Jim Backman, Board Member - Gordon Woodard, Board Member - Greg Smith.

### CCTIA 2004 Meeting Schedule

**July 22nd, 3pm, Oakland\***

**August 26th, 3pm, Oakland\***

**September 23rd, 3pm, Sacramento\*\***

**October 28th, 3pm, Oakland\***

**November 18th, 2pm, San Diego\*\*\***

**\*Holiday Inn Oakland Airport**

**\*\*Clarion Hotel Mansion Inn, Sacramento**

**\*\*\*Sheraton Harbor Island, San Diego**

Al  
McManus  
passes the  
gavel to  
Corey Dare





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#### Current Members:

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Capitol Engineering Laboratories	Geocon Geotechnical & Environmental	Southern CA Soil & Testing, Inc.
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Construction Testing and Engineering, Inc.	Kleinfelder, Inc.	Twining Laboratories of Southern CA
Construction Testing Services	Krazan & Associates, Inc.	URS/D&M Consulting Engineers
Dynamic Consultants, INC.	Matriscope, Inc.	Youngdahl & Associates, Inc.

## Field Applied Fire-Resistive Materials (FAFRM) Special Inspector Exam

By Clifford N. Craig, (DCI, VP/Tech Operations)

This exam is required by the local Special Inspection Committee (SIC) to qualify as a fireproofing special inspector within their jurisdiction. There have been some significant changes made to this exam this year that are important to special inspectors.

The exam title was changed to “Field Applied Fire-Resistive Materials Special Inspector Exam” in order to update the nomenclature to be consistent with the latest industry standards. The use of thin-film intumescent fire-resistive materials (TFIFRM) has become more commonplace, and the exam development committee decided to include questions about intumescent coatings in the exam.

The Association of Wall and Ceiling Industries Intl. (AWCI) publishes a “Technical Manual 12-B” (First Edition), which is considered to be the standard of practice for testing and inspection of TFIFRM. This manual was added to the list of required references for the exam, which also includes the AWCI “Technical Manual 12-A” (Third Edition) standard of practice for the testing and inspection of field applied sprayed fire-resistive materials and the 2003 IBC (or 1997 UBC used for Legacy Exam).

**It turns out that the standard practice for testing and inspection of the thin-film intumescent fire-resistive material (TFIFRM) is similar to the sprayed fire-resistive material (SFRM). The major difference relates to the thickness measure equipment and thickness testing procedures. However, both standards have the same frequency of testing, which requires random testing in at least one bay per floor, or each 10,000 sq.ft. of floor area, which ever provides the greater number of tests.**

After considerable discussion, the committee agreed that the special inspector should not be the one to determine (calculate or extract from tables) the specified thickness of fire-resistive materials. The thickness specifications should be provided to the special inspector, and it was then the inspector’s task to measure the thick-

ness and verify compliance. This conclusion resulted in the plan reading portion of the exam being modified and greatly simplified. The committee updated the existing question bank for the exam, and added some more questions about thin-film intumescent procedures from Technical Manual 12-B.

The exam still contains 40 questions, but now some are about the intumescent procedures. It is still an hour and a half, but now it is open book not closed book as before. The acceptable references include one of the building codes and both the AWCI Technical Manuals 12-A and 12-B. The exam may still be taken in either 1997 UBC or the 2003 IBC version.

The committee recommended that all persons with current Spray-Applied Fireproofing Special Inspector certifications be recognized as certified to the “Field Applied Fire Resistive Material Special Inspector” certification. Current certs holders will be grandfathered in under the new title.

Let me know if anyone has comments about the new exam and I will pass it along to the exam committee.

Please Contact Issam Makdissy at Terrasearch Inc. By Phone At (408) 362-4920 or Email at: [issamm@terrasearchinc.com](mailto:issamm@terrasearchinc.com) or fax at (408) 362-4926 With Any Articles Or Questions Regarding This Newsletter Or The Upcoming Newsletter.