



# THE TEST REPORT

A Newsletter of the California Council of Testing and Inspection Agencies

April 2006

Volume 7, Issue 2

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## PRESIDENT'S CORNER –

By Michelle Craig

Once again, the city of Las Vegas welcomed our membership for a weekend of entertainment, fine dining, and terrific brainstorming.



A special note of thanks to Dave Chippero and Elizabeth Levi for their considerable efforts in making the 2006 Annual Business Meeting such a success!

Friday night opened the festivities with a cocktail reception for the attendees, their spouses, and our guest speakers. Great conversation, extraordinary views of the Las Vegas skyline, and an attentive bar staff made this relaxed evening affair enjoyable for all.

Saturday began with a continental breakfast followed by the annual meeting. Of special note this year was the round table discussion with representatives of three Las Vegas testing and inspection agencies who have recently completed the daunting task of obtaining IAS AC-291 accreditation. Our thanks to Sam Palmer (Terracon), Bill Taylor (GeoTek), Nick Oana (Kleinfelder), and Michael Olson (Kleinfelder) for taking the time to discuss the process, accreditation criteria, and cost of participation in this newly developed program.

Also in attendance this year was Paul Matera (PSI), representing industry from Oregon and Southern Washington. His experience in the approval processes utilized in other jurisdictions provided additional insight for all of us.

The round table was instrumental in identifying the need for our various industry associations to develop a united front in addressing the multiple accreditation requirements that

have been imposed on our firms throughout the four represented states. This unnecessary duplication of effort places a significant strain on our management and financial resources. Together, as a "Western States Coalition", we have a greater ability to get our voices heard and have an impact on the regulations that continue to be forced upon our industry.

Saturday evening found our group once again looking out over the evening skyline for our Installation Dinner and Awards Ceremonies. Retiring President, Dave Chippero, opened the program and thanked the 2005 officers and directors for their hard work and dedication to CCTIA. Certificates of Appreciation were presented to Vice President, Bill Cale; Secretary/Treasurer, Elizabeth Levi; Director, Jim Backman; and Director, Corey Dare. Not in attendance, but certainly no less appreciated, were Directors Rob Ryan and Greg Ruf.

The program was turned over to Cliff Craig, who was honored to present a Lifetime Achievement Award to Merl Isaak on behalf of CCTIA. As a founder and life-long supporter of CCTIA and our industry, it was a privilege to recognize Merl's considerable efforts throughout his illustrious career. At one time or another, he has mentored most of those in attendance, and we will all miss his extensive knowledge, insight and practicality. Merl, we wish you and Faye every happiness and joy in your retirement!

Upon accepting the gavel as this year's President, I was pleased to introduce the remaining 2006 Officers and Directors: Vice President, Dan Cherrier; Secretary/Treasurer, Elizabeth Levi; and Directors Jim Backman, Bill Cale, Greg Ruf and Dave Chippero. With much work ahead of us, I am gratified to be supported by these hard working and talented individuals.

So, what is on the horizon for CCTIA? The Competency Advisory Program is up and running, gaining momentum each day. As a replacement to the former Tri-Chapter SIC Recognition Program, we need to extensively promote and expand this program among the eight-county Bay Area jurisdictions. It may also be of benefit to industry and jurisdictions alike in other areas of Northern and Southern California.

IAS's push for adoption of their AC-291 accreditation program remains a great concern. Although we are not opposed to accreditation requirements in principal, it is imperative our industry has input with regard to its policies, requirements and implementation. This can best be achieved through active participation by our membership, in conjunction with the Oregon Council of Engineering Laboratories (OCEL), Washington's Northwest Council of Engineering Laboratories (NCEL), and the developing Nevada association. Combining our collective experiences, strategies and resources will provide the momentum and energy so clearly needed for us to influence the direction this program takes. CCTIA has proven the effectiveness of this strategy for two decades with its activity in the ICC certification program. This new coalition can only be stronger and more influential.

Also on the horizon is the development of the new CBC, based on the International Building Code (IBC), scheduled for adoption sometime in 2008. For the 1st time in history, our industry has been given an opportunity to have an impact in the code adoption process. Many members are participating in the "stakeholder" program, a task that will extend over the next two years.

We're on the Web!  
[http://  
www.cctia.org](http://www.cctia.org)



## President's Corner Continued

By Michelle Craig

There has never been a more important time to be a member of CCTIA. With so many issues directly impacting our firms, as well as the

industry as a whole, the benefits of being a part of this organization are clearly evident. I am profoundly grateful for the trust you have placed in me

to represent our industry as your President, and look forward to working with all of you to our mutual benefit.

Let's bring it on!

## Replacing Fema 353

By Dave Palfini

In the aftermath of the Northridge earthquake, a joint venture was formed to address performance problems discovered with welded steel moment-frame connections. With majority funding by FEMA (the Federal Emergency Management Agency), the joint venture, known as SAC, was a collaboration of the Structural Engineers Association of California (SEAOC), the applied Technology Council (ATC), and California Universities for Research in Earthquake Engineering (CUREE). The primary outcome of this joint venture was the *Program to Reduce the Earthquake Hazards of Steel Moment-Frame Structures*.

FEMA publication 353, dated July, 2000, *Recommended Specifications and Quality Assurance Guidelines for Steel Moment-Frame Construction for Seismic Applications* is the part of the program that most testing and inspection laboratories are familiar with. These recommended specifications and guidelines were intended to be used by the design team and the authorizing jurisdiction, as deemed necessary, and to be tailored for each individual project.

After funding ran out, the SAC Joint Venture was dissolved. Leaving no one to address corrigendum, technical inquiries, or revisions. AISC and AWS have stepped in to fill this void. AISC has revised some of their publications and added a new publication (available free for download at [www.aisc.org](http://www.aisc.org)).

- Code of Standard Practice for Steel Buildings and Bridges, AISC 303-05 (revised);
- *Seismic Provisions for Structural Steel Buildings, ANSI/AISC 341-05* (revised);
- *AISC/RCSC Specification for Structural Joints Using ASTM A325 or A490 Bolts*, (revised, also available free on line at [www.boltcouncil.org](http://www.boltcouncil.org)).
- *Prequalified Connections for Special and Intermediate Steel Moment Frames for Seismic Applications, AISC 358* (new, available soon)
- *ANSI/AWS D1.8 – Structural Welding Code – Seismic Supplement* (new, available soon, for a price)
- *Specifications for Carbon Steel Elec-*

*trodes for Flux Cored Arc Welding, AWS A.20-05*, (revised to include new maximum atmospheric exposure and maximum diffusible hydrogen requirements.)

Welding (including structural steel, high strength bolting and NDT) Inspectors need to become familiar with all of the changes in the AISC 303-05 code, the AISC/RCSC bolting specifications as well as the new AISC 358. We also need to examine and study the revised ANSI/AISC 341-05 provisions and the new AWS D1.8 supplemental code.

The purpose of this article is to highlight some of the changes in ANSI/AISC 341-05 and ANSI/AWS.D1.8-06. While this newsletter will only "scratch the surface", we encourage you to review these codes and standards thoroughly and share that information with your peers and management.

As required by the UBC and the IBC, the Engineer Of Record is to develop a Quality Assurance Plan. This QA plan will designate protected areas (plastic hinge areas) where non-detailed attachments cannot be made. Instead of *Quality Categories of Demand, Consequence and Stress Direction* as specified in FEMA 353, there are now only *Demand Critical* welds (to be inspected in accordance with AWS D1.8) and *Non-Demand Critical* welds (to be inspected in accordance with AWS D1.1).

As was required by FEMA 353, the Quality Assurance Agency is required to submit:

- The QA Agency's written practice for the monitoring of the agency's operations;
- The qualifications of management and QA personnel designated for the project;
- The qualification records for Inspectors and NDT Technicians designated for the project;
- NDT procedures and equipment calibration records for NDT to be performed and equipment to be used for the project;
- Daily or weekly inspection reports;
- Nonconformance reports

As was required by FEMA 353, Supplemental Ultrasonic Technician Testing is required, as well as procedures and qualification tests for magnetic particle testing (MT) and high strength bolt inspection.

NDT is required as follows:

- k-area – MT of the k-area base metal within 3" of any welding;
- CJP Groove welds – UT of 100% of all CJP welds 5/16" and greater and MT of 25% of all beam to column CJP welds;
- Base Metal for Lamellar Tearing and Laminations – similar to UBC requirements;
- Beam Cope and Access Holes – same as AWS D1.1;
- Reduced Beam Section Repair – MT is required on any weld and adjacent area of the RBS plastic hinge region that has been repaired by welding, or on the base metal of the RBS plastic hinge region if a sharp notch has been removed by grinding; Weld Tab Removal Sites – MT shall be performed on the end of welds from which the weld tabs have been removed, except for continuity plate weld tabs;
- Reduction of Percentage of Ultrasonic Testing – same as UBC-97;
- Reduction of Percentage of Magnetic Particle Testing – If permitted by the engineer of record and the authority having jurisdiction, the MT rate for and individual welder may be reduced to 10%, provided the reject rate is demonstrated to be 5% or less after a sampling of at least 20 welds is made. This reduction is not permitted on welds in the k-area, at repair sites, weld tabs and backing removal sites and access holes.

For Demand Critical bottom flange welds, welders still need to pass a Supplemental Welder Qualification Test, similar to the one in FEMA 353. However, the plate thickness has been corrected from 1½" thick to 1" thick. (Yes, members of the SAC Joint Venture have admitted that the 1½" thickness was a clerical error.)

For Heavy Sections (plate over 2" thick and shapes with flanges over 1½" thick),



## Replacing Fema 353 Continued

By Dave Palfini

thick to 1" thick. (Yes, members of the SAC Joint Venture have admitted that the 1½" thickness was a clerical error.)

For Heavy Sections (plate over 2" thick and

shapes with flanges over 1½" thick), specifiers may continue to require ultrasonic testing of material prior to welding. Plates are to be tested in accordance with ASTM A435, using the back reflection of the plate for calibration. Shapes are to be tested

in accordance with ASTM A898, using a calibration standard with a ½" diameter flat bottom hole for calibration.

## IAS AC291 Round Table Discussion

By Clifford N. Craig, (Dynamic Consultants, Inc., Vice President Tech Operations)

CTTIA's Annual Business Meeting, held January 21, 2006, included a round table discussion with three firms that recently completed the AC291 accreditation program conducted by the International Accreditation Service, Inc. (IAS). AC291 is the new accreditation program for IBC Special Inspection Agencies, developed by IAS, that became available in June 2005.

The round table was represented by Sam Palmer, Senior Vice President with Terracon; Bill Taylor, Regional Manager with GeoTek; and Mike Olson, CM Department Manager, and Nick Dana, Project Manager, with Kleinfelder. These representatives were from the first three firms in the Las Vegas area to request participation in the new program. This was prompted in direct response to the City of Las Vegas Building Department's (CLVBD) recent mandate requiring all private special inspection agencies desiring to remain on the CLVBD approved special inspection agency list to be IAS AC291 accredited. As of this date, all three firms have completed the application process and office/field reviews. Two of the firms have completed its responses to the audits and are now listed on the IAS website; while the third firm is waiting for acceptance of its responses.

As background, the following historical perspective was offered as to the motivation behind the program's development. The Las Vegas metropolitan area has been experiencing rapid growth over the past twenty years. This rapid growth has taxed the local building departments' resources, including manpower to service the rising number of building permits. It quickly became obvious that to keep up with this growth, the local building departments' inspection programs would have to staff up to meet the needs. To provide the need for additional special inspectors, the Clark County Building Department (CCBD) developed the first special inspection program for the Las Vegas metropolitan area in the early 1980's, electing to use private special inspection agencies rather than trying to greatly increase its public staff. The CCBD special inspection program has been evolving

over the past years, and has been a model program for other building departments to follow. The CCBD Special Inspection Program is a rigorous process requiring a complete quality system manual, inspector qualifications and certifications, etc.

Several years ago, the City of Las Vegas was involved in a retaining wall failure, which created questions and concerns about all its building and special inspection programs. As a result, and after a great deal of internal discussions, one of the outcomes was to revamp how it qualified special inspection agencies and special inspectors. Unfortunately, the CLVBD's ideas about how to qualify special inspection agencies and the way Clark County qualifies them are not the same. So, the CLVBD has declined to recognize the County's existing recognition program, and is instead mandating AC291 accreditation.

Many of the leading special inspection agencies in and around Las Vegas objected to this additional qualification being mandated to them with little consideration or participation in the program. Their basic concern was that the City's desire to improve quality of special inspection service was not going to be met. The agencies were first given approximately six months to apply and get accredited by IAS. This was not feasible from both the firms' point of view and the availability of IAS to produce the program. The firms were then given an extension to about a year. There are now more than 35 firms in the greater Las Vegas area providing special inspection services. Only two firms are currently AC291 accredited at this time. The City of Las Vegas has now given the industry until June 1, 2006 to become IAS accredited, or cease providing special inspection services in the jurisdiction.

During the original accreditation process for the first three firms, applications were submitted to IAS along with each firm's QA/QC manual, other experience and qualification information as required for review, and an initial application fee of \$2,500 each. Financial records were not requested, although a business license was. This initial review process took IAS a couple of months to accomplish. Once completed, IAS arranged its on-site audits to encompass all three applicants at the same time.

The actual site inspection process took about a

week. It involved a team of 4-5 people from IAS, with expertise related to different types of materials. It took 2 or 3 days at each company. Chuck Ramani evaluated the lab and office operations, Dr. Fitzpatrick evaluated the concrete and masonry, Sandi McCracken covered the steel and welding, and one or two others covered other disciplines. They visited job-sites and interviewed 4 or 5 inspectors from each firm. Each interview took about 15 to 30 minutes. There appeared to be little, if any, impact to the ongoing project. In addition, a few of the engineering and supervisory staff were interviewed, but no administrative staff. It was necessary to have someone available to assist and coordinate, and perhaps explain company procedures. Non-compliant issues, if present, were discussed, and there was a debriefing at the conclusion of the audit.

The consensus from the three agencies was that the evaluators were highly qualified and competent in their various areas of expertise. It was unclear if any were recently active as special inspection practitioners; however, they were cordial and professional.

The process was very similar to AASHTO accreditation, which requires demonstration of testing procedures and a strong QA/QC program in written format. The agencies were able to convince IAS to accept AASHTO, albeit reluctantly, for the lab performance verification. (Apparently, there is disagreement within IAS as to whether AASHTO is, or is not, an acceptable accreditation.) It was accepted in this case, which likely reduced the cost and IAS manpower needed to complete the on-site audit process.

The companies indicated the cost of just the application and reimbursement fees to IAS ranged from \$8,000 to \$10,000. This does not include any material and personnel costs associated with preparing for the on-site audit, nor time and materials related to the actual audit process.



CCTIA  
C/O TERRARESEARCH INC.  
6840 VIA DEL ORO  
SAN JOSE, CA 95119

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## IAS AC291 Round Table Discussion Continued

One company estimated it took at least 50 to 60 man-hours to prepare for the accreditation, even though it already had the documentation that was consistent with the ISO standards utilized as a base for the accreditation. It was necessary to commit 1 or 2 people full-time to the process while the IAS team was inspecting. As the program is still too new, none of the firms were able to provide information concerning the process or cost of the annual unannounced audits required to maintain the accreditation.

One firm estimates that the City of Las Vegas represents about 20% of the typical T&I market in the area. Clark County provides the other 80%. At this time, it is reported that the City of Las Vegas continues to allow other firms to practice special inspection, and yet there are only three firms that participated in the AC291 accreditation process when it was originally mandated. [At the time of CCTIA's round table, no one was aware of any other firms attempting to obtain accreditation. IAS now reports that 16 other firms in the Las Vegas area are in the approval process.]

While IAS is clearly expending considerable effort to make AC291 a credible program, its significant expense, and complex, time consuming procedures remain of great concern to the industry it may impact. It is likely that many small firms will not be able to meet its stringent criteria, let alone financial burden.

Presented to the San Francisco Bay Area jurisdictions at a meeting last year, IAS's program appears to have only minimal interest in the area. Also proposed last year as a replacement to its existing recognition program, Washington Building Officials (WABO), have expressed no interest in adopting the accreditation. In concurrence with industry practitioners from Oregon, Washington and Nevada, CCTIA continues to take the position the program is an unnecessary, expensive duplication of other established programs that are already in use, and that adequately verify the qualifications of special inspection and testing agencies.

## FAQ: Substitution of Specified Anchor Bolts

**Q:** The contractor has substituted ASTM A307 Grade C anchor bolts where ASTM A36 anchor bolts are specified. Is this acceptable?

**A:** A quick look at the "Scope" of ASTM A307 *Standard Specification for Carbon Steel Bolts & studs, 60,000 psi Tensile Strength*, indicates that Grade Cs are non-headed anchor bolts, either bent or straight, & having properties conforming to Specification A36. This seems to answer our question in a very straightforward manner.

If we look at the *Standard Specification* ASTM A36 for *Carbon Steel* the mechanical properties listed in Table 3 for *bars* are as follows:

Tensile strength, ksi	58 - 80
Yield point, min, ksi	36
Elongation, in 2 inch, %	23

Section 3.1 of A36 states "*When components of a steel structure are identified with this ASTM designation but the product form isn't listed in the scope of specification, the material shall conform to one of the standards listed in Table 1 unless specified by the purchaser.*"

So, in Table 1 of A36, for anchor bolts, we find the designated specification of ASTM F1554 *Standard Specification of Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength* with the following Note:

*"The specifier should be satisfied of the suitability of these materials for the intended application. Composition and/or mechanical properties may be different that specified in A36/A36M."*

The mechanical property requirements for ASTM F1554 Grade 36 anchor bolts are identical to A36 and A307 Grade C.

**Conclusion:** ASTM A307 designates F1554 as the controlling specification and the mechanical properties of A307 Grade C are identical to that specified for F1554 Grade 36.

**Discussion:** ASTM F1554 *Standard Specification of Anchor Bolts, Steel, 36, 55, and 105-ksi Yield Strength* was introduced in 1999. It marked the first time that hooked, headed and threaded and nutted rods in multiple grades were fully addressed in one specification. F1554 grades 36, 55, and 105 are essentially the anchor-rod equivalent of the generic rod specification ASTM A36, A572 Grade 55, and A193 Grade B7, respectively. The benefits of F1554 are clear: there is no other specification that brings all requirements for anchor-rods together into one place – mechanical, chemical, threading, manufacturing, and dimensional. Compared to older "material-only" specifications like A36, F1554 eliminates confusion about what product is required.