



# THE TEST REPORT

A Newsletter of the California Council of Testing and Inspection Agencies

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## PRESIDENT'S CORNER –

By Kurtis K. Siggard with BSK and Associates, Inc.

Welcome to the fall 2001 edition of "The Test Report". Our heart is heavy and indeed we have become quite retrospective following the terrorist attack on our country September 11, 2001. Our thoughts are



with those who have suffered great personal loss.

As more municipalities are establishing special inspection programs throughout the State, we have seen an increase in the requests for copies of our "Guidelines for Special Inspection in Construction". We are very pleased to see those requests coming from southern California and

the interior valley region. Due to a short supply of our Guidelines, CCTIA will be printing more copies soon.

Jeff Enzler, with the Department of the State Architect, has provided an article for this newsletter in an effort to help our inspectors prepare for the DSA masonry exam. In his article you will find that DSA has contracted with ICBO to provide a "Title 24 Masonry Examination". This will potentially eliminate the headaches or member firms are having getting inspectors certified by a field engineer at a DSA regional office. DSA is currently accepting applications for the masonry examination review committee. You may submit your resume to DSA at the address found in Jeff's article if you are interested in participating.

DSA is also negotiating with ICBO to provide laboratory evaluation and acceptance services to the state. DSA will be having an open forum meeting in early November with ICBO and interested firms to discuss the direction of the program and the content of our laboratory evaluations.

The date for our annual business meeting has been set for January 25<sup>th</sup> and 26<sup>th</sup> 2002, in Las Vegas, Nevada. The location will be at Bally's. We trust it will be as enjoyable as ever. Mark your calendars and plan on having a great weekend with us.

## What the heck is Petrography?

By Jon Asselanis

We've all seen it. Cracks in concrete sidewalks, white powdery deposits on foundations and little cone-shaped depressions on slabs on grade. Ever wonder what causes these sometimes-troublesome defects in concrete? The key to understanding what's behind these and other problems can be microscopic. A Petrographic analysis is the study and examination of very thin (< 30 microns thick) sections of concrete and other cementitious materials using a polarizing light microscope. The techniques are the same as those used by geologist to identify rocks and minerals. Concrete petrography focuses on the binder portion of the material, usually portland cement, and its interaction with the fill material, usually naturally occurring rock, sand and aggregate.

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Many causes of concrete cracking and deterioration can be traced to aggregate particles that shrink, expand or alter in the presence of highly alkaline cement paste. With moisture, reactions between the alkalis in the cement and susceptible particles can produce gel-like reaction products that can exert enough internal pressure to crack concrete. Harmful ionic species, such as sulfate, can react with cement hydration products to produce expansive chemical reactions. An analysis of concrete thin-sections is often the quickest way to determine what harm reaction is occurring.

A petrographic examination can also yield valuable insight into the

concrete mixture. The proportions of aggregate, sand, cement paste and mineral additives and be determined, along with how well these materials were mixed and placed. The amount of mix water, as it relates to the cement content, can be estimated by a petrographic examination. Are the amounts of the materials listed in a concrete ready-mix batch ticket really in the concrete? Did the supplier add fly ash to the mix? If so, how much? These questions and many others can be answered by examining the concrete with petrographic techniques.

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

## Why Welding Needs Inspection

By Greg Smith

### Why Welds Need Inspection

Modern building Codes often require the continuous presence of a welding inspector while structural steel welding is being performed. Contractors routinely question this practice. After all, isn't the contractor in business to provide a quality product in the first place? Couldn't they save the inspection fee and have just as good a product? While there are many fine contractors that do their best to provide a quality product, this does not occur all of the time. A qualified welding inspector can help the welders perform their work to Code requirements.

### The Welding Code

Project specifications for most buildings refer to the AWS D1.1 Structural Welding Code as the governing document for welding quality. The Code was developed over many years of input from many different players in the construction field. It includes provisions for weld and material quality such that a designer specifying Code quality welds will be able to rely upon their performance as designed. Although the Code does not specifically address safety, the lack of as-designed weld performance could result in a big safety problem if a structural failure occurs. In order to avoid quality issues that could lead to structural failure, welding inspections are required in addition to prescriptive welding performance criteria. One of the noteworthy provisions in the Code is that it provides for fabrication/erection inspection and verification inspection. The fabrication/erection inspection is exclusively the responsibility of the manufacturer or contractor. The project owner may also perform verification inspection in order to be sure that the contractor has done all of the specified quality procedures. If the contractor has done all of the welding and inspections in accordance to Code, the verification inspector would not be able to find any discrepancies. This does not always occur, however, as productivity concerns of the contractor sometimes outweigh their ability to complete related Code issues. This is where a welding inspector can aid both the contractor/manufacturer and the owner in making sure that all Code requirements are met. In any case, there must be no conflict of interest; the inspector for the owner cannot also perform inspection for the contractor and they must be paid by their respective clients in order to maintain integrity.

### Specialization Concerns

Welding contractors most always state that they are experts at welding. They feel that they can weld most carbon steels successfully

based on their hands-on experiences without any knowledge of welding Codes. While this is often true, the importance of material identification, joint preparation and fitup, electrode storage and protection, welding procedures and qualifications, metallurgy, etc. is not very well understood by welders in the majority of cases. This is where an inspection expert can greatly aid in the successful completion of a project governed by AWS D1.1. Just as each welder must pass a physical qualification test to determine if a sound weld can be made, the welding inspector is specifically trained and must pass an examination demonstrating a high level of competence in interpreting and applying the requirements of the welding Code. A welding inspector is not required to know how to weld at all, but they are experts at applying a specific set of quality requirements to a welded product. The inspector places a great deal of emphasis on quality requirements that the welder may not feel is related to his job, because they are not directly related to metal joining. The welders and the welding inspectors need to work together to accomplish a completed project, because they are not usually capable of doing it all themselves due to their unique specialized knowledge.

### Contractual Concerns

Unfortunately for the welder, joining of metals alone does not complete the contract requirements for most projects. There is usually a requirement for verification inspection. This is not required because of some inherent distrust of contractors, but because there is not enough well trained welders that can perform inspections and Code interpretations as well as an inspector. Also there is a conflict of interest issue that can arise when the welder is the only one responsible for inspecting his own work. Sometimes, a permit authority may allow an 'approved fabricator' to supply welded components to a job. In this case, the fabricator has demonstrated to the permit issuers that they have the ability to produce and inspect their own work and a verification inspector is not required. Either of these inspection processes can make a Code compliant project, but there must be a specialist in Code interpretation to compete the process in addition to the production welders.

### Recommendations

There is a clear need in our ever-increasing world of specialization to be sure that enough of the right kind of expertise is employed to complete a successful project. While the welding inspector may not actually build anything, their input as to when and how the process is done is a virtual necessity to address quality and contractual concerns in the vast majority of projects. Inspection can prevent costly rework and assure that the designers' objectives have been met on weld quality. It is important to

understand that the inspection process is just as important as the welding to be done. The welding inspectors should be included as part of the team of people employed to complete any welded project and their expertise should be used from the earliest stages of material procurement to final acceptance.

## CCTIA 2002 Meeting Schedule

The following is our meeting schedule for  
the next six months.  
Please mark your calendars.

January 25th and 26th  
Annual Business Meeting  
Las Vegas, Nevada  
at BALLY'S

Feb. 28th  
Concord\*

March 28th  
Concord\*

April 25th  
Concord\*

May 23rd  
Concord\*

June 27th  
San Diego

\*Sheraton Concord Hotel  
45 John Glenn Drive  
Concord, California (925) 825-7700



## How to Prepare for the DSA Masonry Inspector Exam

By: JeffENZler, SE with Department of the State Architect

### General Background:

State law requires that public school construction comply with special code requirements contained in Title 24 of the California Code of Regulations. Sections of Title 24 of interest to masonry inspectors are contained in Title 24, Part 1, Chapter 4 (commencing with Section 4-301) as well as Title 24, Part 2, Chapters 14A and 21A.

### Masonry Inspection:

Chapters 14A and 21A of Title 24, Part 2 are based on chapters 14 and 21 of the Uniform Building Code however, they contain many amendments to the UBC that are applicable only to public school construction. As an example, one such amendment is contained in Section 2105A.7, which states, "All masonry work shall be continuously inspected during laying and grouting by an inspector specially approved for that purpose by the enforcement agency."

Prior to being approved for a project the proposed inspector must pass a special masonry inspection examination. A DSA field engineer administers this examination at one of the four DSA regional offices. Upon successful completion of the examination the inspector's name is posted on DSA's web site as a certified masonry inspector. Certified masonry inspectors must submit form SSS-5 (Project Inspector Qualification Record) and be approved by DSA for each specific project.

### DSA's Special Masonry Examination:

The examination contains four parts: Code, Masonry, Veneer and Plan Reading. Most of the questions are multiple-choice or fill-in-the-blank type questions. The 'Code' portion of this examination deals with administrative requirements pertinent to inspections contained in Title 24, Part 1. The 'Masonry' portion deals with typical masonry construction requirements contained in Title 24, Part 2, Chapter 21A. The 'Veneer' portion deals with veneer requirements found in Title 24, Part 2, Chapter 14A. The 'Plan Reading' portion deals with plan reading ability; a typical set of construction drawings is provided; questions relate to details on the plans.

The code portion of the examination tests im-

portant aspects of the inspection process that are relevant to the applicant's ability to effectively carry out inspections as required by the code. For example, an inspector must understand the code requirements for issuing progress, and deviation, reports. Although the masonry inspector may perform excellent inspections, his or her performance would be unsatisfactory if deviations were not reported in accordance with the procedures required by the code. In addition the hypothetical inspector might utilize approved 'shop drawings' or directions from the architect which were not approved by DSA unless he or she was aware of the code requirement that all work must be performed in accordance with DSA stamped approved documents.

To pass the test applicants must score at least 70% on an aggregate of the 'Code', 'Masonry' and 'Veneer' portions as well as a minimum of 70% on the 'Plan Reading' portion.

### Proposed Changes to the Program:

DSA has negotiated a contract with ICBO wherein ICBO will provide a 'Title 24 Masonry Examination.' This examination will test applicants on the special Title 24 requirements pertinent to schools.

Advantages of this new program will be: ICBO will create a committee of subject matter experts to assist with the development of the test question pool for use in the examination. The California Council of Testing and Inspection Agencies (CCTIA) will be involved with this effort.

The committee will make sure that test questions are pertinent and unambiguous. All questions will be 'multiple-choice' so that interpretation of answers will not be required. The examination will be available at ICBO sponsored computer testing centers. Hard-to-schedule appointments with DSA field engineers will no longer be required. Applicants will no longer need to have a prospective school project to be accepted for the examination.

To apply for the examination applicants will be required to submit the following to the DSA headquarters office in Sacramento: An experience record documenting three years of experience in masonry construction or

inspection.

Evidence of successful completion of the ICBO 'UBC' Masonry Examination. A non-refundable application fee of \$75.00. DSA will verify acceptable experience and forward authorization for testing to ICBO. The applicant will then arrange to take the 'Title 24' Masonry Inspector Examination with ICBO. The examination fee will be \$130.00 payable at the time of the examination.

DSA and ICBO are currently accepting applications for the examination review committee; interested parties may submit resumes to:

Masonry Examination Review Committee  
c/o DSA  
1130 K street, Suite 101  
Sacramento, CA 95814

Related information is available on the DSA website at [www.dsa.ca.gov](http://www.dsa.ca.gov). Questions may be sent via 'e-mail' to [jenzler@dsa.ca.gov](mailto:jenzler@dsa.ca.gov).

### In Conclusion:

DSA strives to ensure that only highly qualified special inspectors are approved for school construction projects. DSA listens to CCTIA and is committed to working together with the testing and inspection community to ensure that California schools are constructed safely.

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.



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## Letter to the Editor-Current Report on Laboratory Evaluation and Acceptance.

By Chuck Fries

DSA held a meeting at their Sacramento office on November 9<sup>th</sup> to present possible changes to the LEA program. Eight representative CCTIA member labs and four non-member labs were invited to attend.

After introductions, Jeff Enzler produced an agenda with the primary item being an explanation of the I.C.B.O. Evaluation Service lab accreditation program. Mr. Chuck Ramini, a 29-year veteran with I.C.B.O., with prior independent lab work engineering experience, explained the I.C.B.O. program in considerable detail. I.C.B.O. has a long time commitment and has invested heavily to indeed obtain their own accreditation among most worldwide quality control authorities. I.C.B.O. is recognized by I.S.O., European, Australian and Asian groups and continues to seek recognition worldwide. Such recognition is essential to product approval and trade with other nations. This applies to all types of labs including medical, product development, automotive, etc. For construction material testing and special inspection laboratories the demanding criteria of I.S.O. 17025 appears less important. Although worldwide operations and international credentials may be meaningful to a few CCTIA members, the accreditation is simply non-existent for most building and public works construction in California. In fact, the pride of ownership attached to an I.C.B.O. E.S. report quickly evaporates for a lab seeking work on Caltrans, Corp of Engineers and similar work.

Many of the calibration, documentation and proficiency requirements of I.S.O. 17025, and other references used for accreditation (ie, ASTM E329 and other referenced ASTMs) are essential to good lab operations. Compliance offers some legal protection and, frankly,

just plain good business. (Note: I.S.O. 17025 will become mandatory in January 2002.)

In open discussion after the presentation, the meeting participants estimated the cost of E.S. at about \$3500 per year per office, plus the cost of staff preparations and documentation. More cost still must be added for calibration and proficiency participation.

The eleven-year-old LEA program has two areas that prompt the current need for changes.

First, the current LEA requirement for CCRL review does not result in an accreditation. DSA is thus sometimes presented with a footnote list of deficiencies or non-compliance. The LEA review becomes time consuming in a program that is already understaffed and under budgeted.

Second, due to staff-budget priorities, the LEA program updates have fallen behind schedule. Eleven years ago the program required a \$1000 deposit for a 2-year evaluation. The actual fee was increased or partially refunded depending on actual DSA costs. Later the fee was changed to a flat \$1000. As time went on there were several extensions granted with or without fees and probably some reissuance of approvals without site visits. DSA time was consumed with approval of new applications critical to labs that obtained school work without an LEA or labs who were unhappily precluded from school work while their application was pending. DSA had other priorities like IOR exams. If memory serves me right, Capitol Labs probably paid about \$3800 for four LEA approvals in the eleven-year history of the program.

At this date, DSA's website shows 62 laboratories expired and 52 currently accepted labs. Not all of the expired labs have reapplied but a considerable percentage of them are continuing

school services with an expired acceptance. Among the 52 accepted labs most will expire on 12/31/01, leaving the program badly in need of creative extensions and more importantly an injection of new vitality (manpower, alternative, staff and money).

Mr. Enzler explained that it was DSA's conceptual plan to contract with I.C.B.O. E.S. or some other accrediting agency to take over the lab evaluation tasks. The accrediting agency would be charged with the additional task of conducting DSA's portion of the lab evaluation. This task would include California Building Code review as it applies to schools (and differs from UBC), review of school-house fundamentals, procedures, report style, report content, administrative items, relations with other project people (architect, DSA, engineer, school district, IOR, contractors, etc). The task would include a mini-presentation of DSA requirements. There would further be a review of the lab applications, responsible engineers duties and the list of approved special inspectors. Altogether, this added task is really the substance and purpose of LEA, ASTM E329 compliance is the other half. Mr. Ramani was asked about this other task and opined that his evaluators could be quickly trained and that the task would not add to I.C.B.O.'s fee. Currently, E.S. has about 10-lab accreditation issued, not all in California.

The meeting ended without any conclusions and certainly without concurrence or approval by the labs in attendance.

This topic is scheduled as a primary agenda item for the November 15<sup>th</sup> CCTIA meeting. Hopefully CCTIA can suggest some alternative to DSA which would inject both efficiency and effectiveness into the program.