# California Council of Testing and Inspection Agencies

**July 23, 2015**
**Four Points by Sheraton**
**5115 Hopyard Road**
**Pleasanton, CA 94588**

## Minutes - General Business Meeting

1. Call to Order – Tim Rodriguez
   a. Time
      - *The meeting was called to order at 3:13 p.m. by Vice President Tim Rodriguez.*
   b. Self-introductions
      - *The following members and guests were in attendance:*

*Jim Auser (BSK Associates)*
*Jeffry Cannon (Youngdahl Consulting Group)*
*Tim Casey (Construction Testing Services)*
*Dave Chippero (Testing Engineers, Inc.)*
*Cliff Craig (Structure Materials Group)*
*Miki Craig (CCTIA)*
*Seth Dilles (ENGEO Incorporated)*
*Oscar Duckworth (Guest Speaker)*
*Terry Egland (Testing Engineers, Inc.)*
*Dan Inferrera (MatriScope Engineering Labs, Inc.)*
*Tim Rodriguez (BSK Associates)*
*Ruchil Shah (Ninyo & Moore)*
*August Smarkel (Mid Pacific Engineering, Inc.)*
*Colin Stock (Neil O. Anderson & Assocs.)*

2. Program – Oscar Duckworth, Certified Shotcrete Nozzleman (0.2 CEUs)
   a. Roundtable Discussion – Shotcrete Training, Certification, and Core Grading
      - *Vice President Rodriguez introduced Guest Speaker, Oscar Duckworth, and briefly described his background. Mr. Duckworth explained that CCTIA Honorary Member Merl Isaak got him involved in the American Concrete Institute "way back when". He is still working as a nozzleman, and was appointed as an ACI nozzleman examiner about nine years ago.*
      - *Mr. Duckworth distributed dishes of blueberries, which he had picked that morning from his organic farm. He explained that it was impossible to tell from the outside of the blueberry whether it was organic, had been sprayed with malathion twice a month, or even if it would taste any good. Shotcrete is much the same until it is cored.*
      - *Mr. Duckworth described the best practices for shotcrete application, identified reference documents available, and stressed the importance of the special inspector understanding the forty critical items for obtaining a satisfactory product. He fielded several questions pertaining to the application of the 85% rule for cores, rebar placement criteria, and production panel requirements.*
      - *Member Jeffry Cannon opened the discussion on shotcrete core grading. He provided an excerpt from ACI 506.2-5, and a redacted copy of his firm's grading report for some cores taken to qualify a nozzleman. Based on the acceptance criteria, he graded the cores as 5, 5, and 3. Another testing agency graded them as 1, 1, and 2. He provided data for a third test panel for the same nozzleman, which he graded as all fives. The other testing agency graded the cores as 2, 2, and 3. In lieu of pictures, he provided the actual cores from the fourth panel along with the issued report. Discussion ensued as those present also evaluated each of the cores.*
      - *Mr. Duckworth noted the core grading system has been removed from ACI 506. This has created a void, as there has been no replacement for the process. A much higher testing element has been attached to shotcrete than to CIP concrete. The grading system may only be used for nozzleman qualification as referenced in ACI 660. The purpose of prequalification testing is to identify if the most congested design area can be properly applied in order to mitigate moisture paths, which can lead to corrosion. Cores removed from prequalification test panels should be evaluated by the Engineering of Record for the project.*
      - *The roundtable wrapped up with a discussion about industry's needs and best recommendations for action by the 506 committee at ACI.*

3. Approval of Minutes
   a. June 18, 2015
      - *The minutes were approved as corrected (minor typographical errors on page 1 and 2).*

4. Financial Report
   a. Income Statement *(handout)*
      • *Executive Secretary Miki Craig provided a copy of the Income Statement through June 30, 2015, evidencing receipts totaling $13,035.00 and expenses of $4,473.06, leaving net reserves of $8,561.94.*
   b. Balance of Account
      • *The balance of the checking account at June 30th was $17,922.97.*

5. Committee Reports
   a. ICC/Local Jurisdictions – Miki Craig, Chair
      • *No report*
   b. ASTM – Jeffry Cannon, Chair
      • *No report*
   c. SEAONC CQA – Ross Esfandiari, Chair
      • *Member Terry Egland provided a couple of copies of the draft of special inspection guideline to be submitted to the SEAONC Board. He went on to report the structural wood guideline would be a few months away, and a task force was being formed for the City of Berkeley to review best practices coming out of the recent balcony failure. He noted San Francisco already has an ordinance in place for these types of appendages, which calls for an evaluation of existing conditions on a regular basis.*
   d. DSA – Augie Smarkel, Liaison
      • *Member Augie Smarkel reported he had summarized last month's discussion in an email to Executive Secretary Craig prior to sending it to Eric France.*
   e. Caltrans – Jim Backman, Chair
      • *No report*
   f. Membership – Jim Backman/Mike Parker, Co-Chairs
      • *No report*
   g. Newsletter – Miki Craig, Editor
      • *No report*
   h. Standard of Practice – Miki Craig, Chair
      • *No report*
   i. Education – Elizabeth Clarke, Chair
      • *No report*
   j. FAQ's – Terry Egland, Chair
      • *No report*
   k. Programs – Elizabeth Clarke, Chair
      • *Continuing our discussion of shotcrete, Mr. Chris Zynda, with JJ Albanese, will be the guest speaker next month.*

6. Old Business
   a. 2016 CCTIA Annual Business Meeting
      • *Executive Secretary Craig reported the contract should be finalized next week, and she will begin accepting rooming reservations soon. Those wishing to upgrade or extend their stays should contact her early.*

7. New Business
   a. *None*

8. Adjournment
   a. Time
      - *There being no further business, the meeting was adjourned at 5:16 p.m. by Vice President Tim Rodriguez.*
   b. Next meeting
      - *The next meeting will be held August 27, 2015, at the Four Points by Sheraton in Pleasanton.*

Respectfully submitted,
Miki Craig
Executive Secretary

C 1116 Specification for Fiber-Reinforced Concrete and Shotcrete
C 1140 Standard Practice for Preparing and Testing Specimens from Shotcrete Test Panels
C 1141 Standard Specification for Admixtures for Shotcrete

**1.4.3** *SSPC Standards*

SP6 Surface Preparation Specification No. 6, Commercial Blast Cleaning

## 1.5—Submittals

Submit proposed mix characteristics including:

- Proportions by weights or volumes
- Strength
- Water-cementitious materials ratio
- Aggregate source and grading
- Cement type and brand
- Water source if other than potable
- Proportions
- Admixtures data sheets
- Test results

Submit preconstruction test panel results when required.

## 1.6—Quality assurance

**1.6.1** *Preconstruction testing*

**1.6.1.1** Prepare preconstruction test panels for examination by Architect/Engineer prior to job shotcrete placement. Preparation and testing shall comply with ASTM C 1140.

**1.6.1.2** Produce test panels for each proposed mix proportion, each anticipated shooting orientation, and each proposed nozzleman. Mixes shall meet requirements of Section 2.7—Proportioning. In half of the test panels provide reinforcement of the same size and spacing required for the work. Obtain six test specimens from each panel, three nonreinforced specimens and three with reinforcing steel.

**1.6.1.3** Test the nonreinforced specimens for compliance with the specified physical properties in accordance with ASTM C 42.

**1.6.1.4** Visually grade the reinforced specimens for compliance with specified core grade (Section 1.7—Shotcrete core grades).

**1.6.1.5** Test admixtures for compatibility with cement in accordance with ASTM C 1141.

**1.6.1.6** Unless otherwise specified, only nozzlemen with a test panel mean core grade less than or equal to 2.5 (Section 1.7) shall be allowed to place job shotcrete. When the prequalification test panel is rejected, a second panel may be shot. When the nozzleman's second mean core grade is greater than 2.5, the nozzleman shall not be permitted to shoot on the project.

**1.6.2** *Construction testing*

**1.6.2.1** Produce a material test panel for each mix and each work day or every 50 cubic yards placed, whichever is less. Test panel shall be kept moist and at 70 F ± 10 F until moved to test laboratory. Obtain test specimens either from job site material test panel or from in-place shotcrete. Test specimens from test panels in compliance with ASTM C 1140.

**1.6.2.2** Test specimens from in-place shotcrete in compliance with ASTM C 42.

**1.6.2.3** Grade cores that include reinforcement in accordance with Section 1.7—Shotcrete core grades.

**1.6.2.4** The mean compressive strength of a set of three cores shall equal or exceed $0.85f_c'$ with no individual core less than $0.75f_c'$. The mean of a set of three cubes shall equal or exceed $f_c'$ with no individual cube less than $0.88f_c'$.

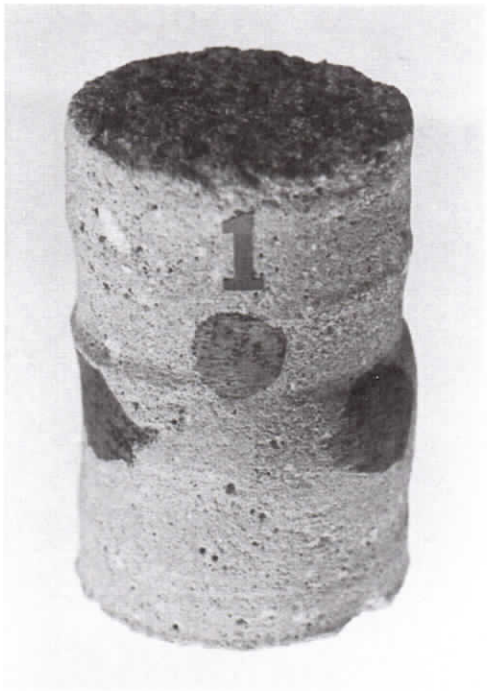
## 1.7—Shotcrete core grades

**1.7.1** Grade 1: Shotcrete specimens are solid; there are no laminations, sandy areas or voids. Small air voids with a maximum diameter of 1/8 in. and maximum length of 1/4 in. are normal and acceptable. Sand pockets, or voids behind continuous reinforcing steel are unacceptable. The surface against the form or bond plane shall be sound, without a sandy texture or voids.

**1.7.2** Grade 2: Shotcrete specimens shall have no more than two laminations or sandy areas with dimensions not to exceed 1/8 in. thick by 1 in. long. The height, width and depth of voids shall not exceed 3/8 in. Porous areas behind reinforcing steel shall not exceed 1/2 in. in any direction except along the length of the reinforcing steel. The surface against the form or bond plane shall be sound, without a sandy texture or voids.

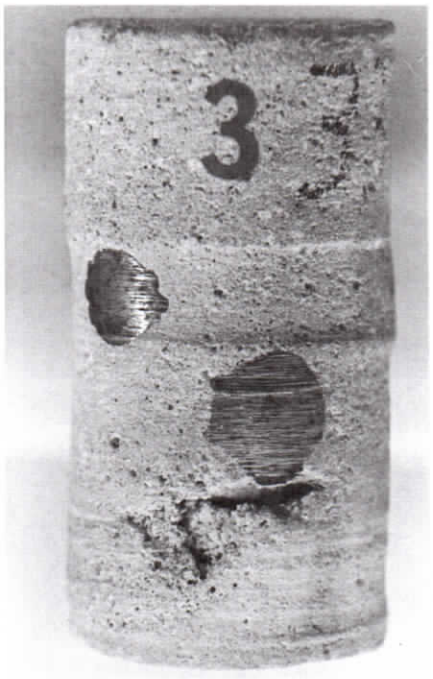
**1.7.3** Grade 3: Shotcrete specimens shall have no more than two laminations or sandy areas with dimensions exceeding 3/16 in. thick by 1-1/4 in. long, or one major void, sand pocket, or lamination containing loosely bonded sand not to exceed 5/8 in. thick and 1-1/4 in. in width. The surface against the form or bond plane may be sandy with voids containing overspray to a depth of 1/16 in.

**1.7.4** Grade 4 core: The core shall meet in general the requirements of Grade 3 cores, but may have two major



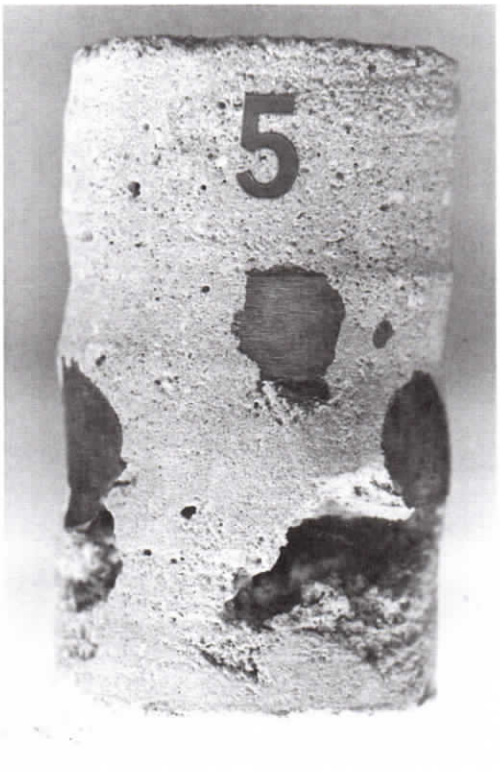

*Grade 1*


*Grade 2*




*Grade 3*


*Grade 4*




*Grade 5*

flaws such as described for Grade 3 or may have one flaw with a maximum dimension of 1 in. (25 mm) perpendicular to the face of the core with a maximum width of 1-1/2 in. The end of the core that was shot against the form may be sandy and with voids containing overspray to a depth of 1/8 in.

**1.7.5** Grade 5 core: A core that does not meet the criteria of core grades 1 through 4, by being of poorer quality, shall be classified as Grade 5.

**1.7.6** Determination of grade shall be by computing the mean of a minimum of three test specimens.

**1.7.7** A mean grade of 2.5 or less is acceptable unless otherwise specified. Individual shotcrete cores with a grade greater than 3 are unacceptable.

**1.7.8** The above core grades are based on cores with a surface area of 50 in.$^2$ For cores with greater or lesser area than 50 in.$^2$, adjust allowable flaws relative to 50 in.$^2$

## 1.8—Evaluation of in-place shotcrete

Remove and replace shotcrete that is delaminated, exhibits laminations, voids, or sand pockets exceeding the limits for the specified grade or shotcrete. Remove and replace shotcrete that does not comply with the specified material properties.

Repair core holes in accordance with Chapter 9 of ACI 301. Do not fill core holes by shooting.

## 1.9—Acceptance

**1.9.1** Shotcrete work that meets applicable requirements will be accepted.

**1.9.2** Shotcrete work that has previously failed to meet one or more requirements, but which has been repaired to bring it into compliance, will be accepted.

**1.9.3** Shotcrete work that fails to meet one or more requirements and which cannot be brought into compliance may be accepted or rejected. Modifications may be required to assure that remaining work complies with the requirements.

# DRILLED SHOTCRETE CORE GRADING - TEST RESULTS

**ACI 506.2-95, ASTM C42, ASTM C1140**

| | | | | | |
|---|---|---|---|---|---|
| **Project:** | | **Material:** | Shotcrete | **Date Cast:** | 3/31/15 |
| **Address:** | | **Location:** | Preconstruction Test Panel | **Date Rec'd:** | 4/3/15 |
| | | **Panel by:** | | **Design Strength:** | 4000 @ 28 days |
| **Project No.** | E92216.028P | **Mix No.:** | Prestige Gunite 753802 | **Lab Technician:** | D. Nava |
| **Sample No.** | Panel 1 | **Cored by:** | Youngdahl Consulting on 4/7/15 | **Date Tested:** | 4/7/15 |

| Core No. | Dia. (in.) | Core Length (in.) | | Flaws Detected | Core Grade |
|---|---|---|---|---|---|
| | | Rec'd | Trim'd | | |
| Panel 1-1 | 3.01 | 5.7 | NA | 5 Laminations: 2-1/2" long x 1/8" wide, 2-1/2" long x 1/2" wide, 3-1/2" long x 3/8" wide, 3/4" long x 1/16" wide, 1-1/4" long x 1/8" wide | 5 |
| Panel 1-2 | 3.01 | 5.7 | NA | 2 Laminations: 1-1/4" long x 1/8" wide, 2-1/2" long x 1/4" wide | 5 |
| Panel 1-3 | 3.01 | 5.7 | NA | 1 Lamination: 1-1/4" long x 3/8" wide | 3 |

**Average Core Grade = 4.3**

**ACI 506.2 indicates average core grade of 2.5 or less is acceptable. Individual cores with a grade greater than 3 are unacceptable.**

**Notes:**

1. Nominal maximum size of concrete aggregate: **3/8"**

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*Building Innovative Solutions*
30 YEARS

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Jeffry Cannon, Laboratory Manager

Date: 4/8/15

**Panel 1 Cores**

CCTIA
Operating Statement

| | 2015 Actual YTD 6/30/15 | 2015 Budget YE 12/31/15 |
|---|---|---|
| ***Revenues*** | | |
| Dues & Initiation Revenues | $13,000.00 | $16,250 |
| ABM Registrations | | 900 |
| ABM Sponsorships | | 500 |
| General Meeting Guest Registrations | 35.00 | 250 |
| Education Programs | | |
| *Total Revenues* | *13,035.00* | *17,900* |
| ***Expenses*** | | |
| Education Programs | | |
| Executive Secretary Services | | 500 |
| Hemsley Award Expenses | | 200 |
| ABM Expenses | 127.00 | 9,500 |
| General Meetings | 4,346.06 | 10,500 |
| Newsletter | | 500 |
| Office Supplies | | 500 |
| Postage | | 500 |
| S I Guidelines | | |
| Stationary & Printing | | 250 |
| Taxes & Licenses | | 20 |
| Website | | 120 |
| *Total Expenses* | *4,473.06* | *22,590* |
| ***Net Reserves/Losses*** | ***$8,561.94*** | ***$4,690*** |

Year-to-Date Through
June 30, 2015