

## Schedule

### Mark Your Calendar (2003)

#### General Membership Meetings

(Breakfast 7:30 a.m.)

January 16  
March 13  
May 8  
July 17  
September 11

#### Business Practice Committee Meetings

(Breakfast 7:30 a.m.)

February 13  
April 10  
June 12  
August 14  
October 9

#### SEAC Board of Directors Meetings

(7:30 a.m.)

January 9  
February 6  
April 3  
June 5  
August 7  
October 2

#### Annual Dinner Meeting

November 6  
6 - 9 p.m.

## JULY GENERAL MEETING

### “Current Trends in Economical Concrete Construction”

Concrete is one of the most durable and readily-available materials used in building construction. It is unique because it is delivered to the site in an unfinished state. There are numerous ways to mix it, form it, place it, and reinforce it. Designers and builders have flexibility in designing and building with concrete. “Trends” in concrete construction are dictated by this flexibility. As with all construction materials and systems, designers and builders are continually looking for new ways to build with concrete for less money and in less time. This presentation discusses current “trends” in economical concrete construction concentrating on the areas of formwork, reinforcement, and concrete.

**Rolfe Jennings**  
**Regional Manager**  
**Greater Southwestern Region**  
**Concrete Reinforcing Steel Institute**  
**Based in Dallas, TX**

Registered Professional Engineer with over 30 years experience in structural engineering; engineering education; project engineering & management; 3-D CAD development, training and implementation; and technical marketing/promotion in the concrete industry.

He served as Lead Structural Engineer and Project Engineer on major engineering and construction projects at design/construction firms such as Brown & Root, RUST

International, Farnell & Associates, and Lurgi/Process Systems Inc. In addition to leading design effort, implemented 3-D CAD integrated solutions on major projects. Served as Regional Engineer for the Portland Cement Association.

Currently serves as Regional Manager of the Greater Southwestern Region of CRSI, marketing reinforcing steel in concrete structures.

### Don't Miss Out

**IMPORTANT**

### Upcoming General Meeting

**Date:** Thurs. July 17 @ 7:30am  
**Speaker(s):** Rolfe Jennings  
**Location:** Renaissance Denver Hotel  
3801 Quebec Street (south of the I-70 and  
Quebec intersection)

Please e-mail your reservations to Caryn Bauer at:  
[cbauer@martinmartin.com](mailto:cbauer@martinmartin.com), or phone in at  
303-431-6100x403. **Reservations MUST be  
made By 12:00 noon on Friday, July 11,  
2003.**

## Officers & Board Members



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*Information for inclusion in the newsletter must be received one month prior to the next general meeting.*

*Caryn L. Bauer*  
SEAC Executive Assistant

## President's Message

*SEAC* enjoyed great attendance for our May general meeting as many of you turned out to hear attorney **Phillip Card** present his thoughts on how we get ourselves into trouble in the design business. It is always good to be reminded of all the details we need to think about when negotiating and signing contracts! If you have not visited our website lately ([www.seacolorado.com](http://www.seacolorado.com)), please do so soon. We have updated the roster to reflect the many additions and deletions from our membership over the last year. In addition, we have added a link to a site that is surveying structural engineering professionals on their thoughts on technical peer review. If you do a lot of peer review work, or want to share your opinion please hit on the site. Finally we are in the process of testing a "master calendar" for the web site, that will indicate upcoming seminars and events that may be of interest to *SEAC* members. The calendar will include links to other web sites that offer additional information. If you have information regarding a seminar or other event you believe other *SEAC* members would benefit from, please forward them to **Caryn Bauer**, the *SEAC* director at [cbauer@martinmartin.com](mailto:cbauer@martinmartin.com). Last but not least, please forward any comments regarding our newsletter distribution to Caryn or any Board Member in the next couple of months. It is the goal of the Board of Directors to eliminate the cost of printing and mailing paper newsletters by this time next year.

I am pleased to report on the progress of our many committees. The Denver Building Department Liaison Committee working with the building department has recommended that *SEAC* support the adoption of the IBC by the City and County of Denver. This recommendation was made based on working towards all of the jurisdictions in Colorado working with a single code, and the preferences of the CCD. The *SEAC* board accepted this recommendation and voted to formally endorse adoption of the IBC by the CCD. Thanks to **Jerry Maly** for spearheading this effort as the Chair of the committee. Jerry also continues to serve *SEAC* tirelessly as our membership chair. *SEAC's* Steel Committee, working with RMSCA, the local steel association, has also made the news by having their work on Architecturally Exposed Structural Steel (General meeting, May 2002) published in its entirety in Modern Steel Construction. The program will also be presented at the 2004 North American Steel Construction Conference next spring. If you have not tried the AESS spec on one of your projects please download it from our website and give it a try. A brief report of the Steel Committee's current projects is included in this newsletter.

Our Architectural Committee is gaining steam as they continue with a series of monthly meetings. If you are interested in working with this committee, please contact chair **Julian Lineham**. The Education Committee has been polling our local Universities regarding curriculum requirements of the NCSEA model certification program. We hope to expand this contact and open discussions on how *SEAC* can support our local schools at a lunch meeting this fall.

In closing, there are a few other items to report. The appeal of the Dufficy case has been filed with the Colorado Supreme Court. However, there has been no indication if the Court will hear the case in their next session. A copy of the appeal is available from any *SEAC* board member upon request. The program for the fall NCSEA meeting in Denver is set and the conference is being promoted in structure magazine. We should know what volunteers will be needed in the next month or so and will send out an email to all of you. Please join our Vice President, **Natalie Mozer-Renn** for our next breakfast meeting on Thursday, July 17, as I will be vacationing.

## COMMITTEE REPORT FOR THE SEAC STEEL LIAISON COMMITTEE - JEFF JANAKUS, CHAIR

Over the last year, the SEAC Steel Liaison Committee has met on a monthly basis (one Wednesday morning of each month at Martin/Martin's office). The committee is comprised of Structural Engineers and Fabricators, Erectors, Detailers, and Suppliers from the Rocky Mountain Steel Construction Association (RMSCA). This provides balancing points of view for discussion of topics relevant to steel design and construction in our region. The projects that have been completed are as follows:

- "Value Added to AISC Fabricator and Erector Quality Certification through Alignment with IBC Testing and Inspection Requirements" paper. This paper that was submitted to AISC addresses the issues concerned with the alignment (or lack there of) of the AISC Quality Certification Programs and the 2000 IBC Testing and Inspection Provisions. More specifically, it addresses the prospect of adding value to the AISC Quality Certification Programs by aligning them with IBC provisions to reduce project testing and inspection costs.

- "OSHA Subpart R - Awareness Guide fro Structural Engineers" paper. This paper that was submitted to the SEAC Board addresses the issues that the Structural Engineer should be aware of pertaining to the requirements of OSHA Subpart R. It also gives tips/suggestions on how Structural Engineers of Record can aid in improving the erection safety conditions for their projects.

We are currently working on the following project:

- "Drawing Set Requirements for Pricing/Information" document. This document attempts to define the level of completeness and content for Structural Steel Drawing Sets for various levels of pricing and/or information categories (i.e. Preliminary Budget, Bid, GMP, Mill Order, etc. documents). The goal is to provide a mechanism by which the Structural Engineer knows what is required of his drawings based on what they are to be used for and the Contractor knows what is to be expected on the drawings and what he is to do with them.

The committee will break for the next couple of months and will resume monthly meetings in September. If you are interested in participating, please call **Jeff Janakus** at 303-431-6100.

Please see the attached summaries from the Steel Liason Committee on pages 4 and 5.

### PUBLICATIONS FOR PURCHASE

#### **GUIDE: RECOMMENDED STANDARD OF PRACTICE**

price: \$15 (members) and \$20 (non-members)

Contact: Bruce Wolfe,

Structural Consultants, Inc. 303-399-5154

#### **1997 SURVEY OF COLORADO BUILDING DEPARTMENTS**

price: \$25 (CD)

Contact: Henry Lopez

303-447-2813

#### **1971 COLORADO SNOW LOAD REPORT**

price: \$10

Contact: Henry Lopez

303-447-2813



1999 Seminar Proceedings:

#### **SUGGESTED LOCAL STANDARD OF PRACTICE IN THE PRECAST AND STEEL INDUSTRIES**

price: \$15

Contact: Bruce Wolfe,

Structural Consultants, Inc. 303-399-5154

2001 Semiar Proceedings:

#### **PRE-ENGINEERED TRUSSES: WHAT THE DESIGNER NEEDS TO KNOW AND SHOW**

Price \$15

Contact: Bruce Wolfe,

Structural Consultants, Inc. 303-399-5154

**OSHA Subpart R – Awareness Guide for Structural Engineers**  
**Structural Engineers Association of Colorado**  
**Steel Liaison Committee**  
**January 6, 2003**

Jeff Janakus – Martin/Martin, Inc.; Bill Zimmerman – Zimkor Industries, Inc.; Maynard Trostel – Puma Steel; Richard Huddleston – Zimkor Industries, Inc.; Rex Lewis – Puma Steel; Jim Ness – Monroe Newell Engineers, Inc.; John Stodola – Derr and Gruenewald; Dave Schroeder, Martin/Martin, Inc.; Rocky Turner – LPR Construction Co.; Dennis Tripp – Derr and Gruenewald; Tom Skinner – JVA Consulting Engineers, Inc.; Jeff Borger – Jirsa Hedrick & Associates; Dave Henley – Vulcraft; Bruce Wolfe – Structural Consultants; Ron Stevens – Anderson & Hastings; Stan Welton – Martin/Martin, Inc.

#### Executive Summary

This document is written to be a guide for increasing the level of awareness for Structural Engineers concerning the requirements contained in the Occupational Safety and Health Administration (OSHA) Safety and Health Standards for the Construction Industry, 29 CFR 1926, Part R – Safety Standards for Steel Erection (OSHA Subpart R) written by the Steel Erection Negotiated Rule-making Advisory Committee (SENRAC), which took effect in the summer of 2001. This document does not define, clarify, or interpret in any way the requirements for the Structural Engineer concerning OSHA Subpart R. It is written only to inform the Structural Engineer of issues that may be relevant to their practice and/or that may aid in improving the overall safety of the project.

In typical practice, Structural Engineers design a structure to function as a complete unit upon completion of construction and thus, do not consider construction means, methods, techniques, sequences, procedures, or temporary supports or bracing in the design. Further, Structural Engineers do not have control of and are not responsible for construction means, methods, techniques, sequences, or procedures or for safety precaution methods, sequences, or programs during fabrication or erection. The Structural Drawings shall not convey or be construed as eliminating any requirements specified by OSHA Subpart R. Further, items specified on the Structural Drawings as shop installed that may be considered trip hazards shall be brought to the attention of the Structural Engineer and shall be field attached.

There are several requirements specified in OSHA Subpart R in which the Structural Engineer may offer assistance and/or guidance to the Detailer, Fabricator, and Erector. Further, the Structural Engineer may be able to provide consistent and/or clear requirements that can aid in the clarity during the bidding process. Ultimately it is in the best interest of all parties involved in the project to point out when details, methods, situations, etc. are known to not conform with OSHA Subpart R and to correct them appropriately and in a timely manner. Coordination between the General Contractor, Detailer, Fabricator, and Erector and proper communication with the Structural Engineer are critical.

#### Issues for the Structural Engineer to be Aware of Concerning OSHA Subpart R

1. Tripping Hazards:
  - A. **EXAMPLES:** shop attached deformed anchor studs or headed anchor studs on beams, plates, edge angles/bent plates, etc.; shop attached threaded studs on beams, cap/base plates, etc.; shop attached deck support plates, angles, etc.; upturned angle legs for opening frames.
  - B. **GUIDE:** Specify all items that may be considered as tripping hazards as field attached and be watchful of OSHA violations of this nature on the Shop Drawings.
  - C. **NOTES:** If fall arrest protection is in place, tripping hazards are acceptable – if fall arrest protection is not in place, tripping hazards are a violation of OSHA Subpart R.
2. Slippery Paint:
  - A. This provision does not take effect until at least 2006. For now the requirements are not well defined – more testing/research of paints, steel surfaces, shoes, weather conditions, etc. is required.
3. Minor Metal Deck Openings:
  - A. **EXAMPLES:** Small mechanical, plumbing, electrical, etc. openings – not large openings such as elevator shafts, stair openings, etc.
  - B. **GUIDE:** Provide opening frames that allow the metal deck to run continuously over the opening frame – eliminate upturned angles for opening frames. The intent is for the deck openings to be cut out at a later date when sufficient fall arrest protection is installed.
4. Column Base Plate and Anchor Bolt Design:
  - A. **GUIDE:** Each column is required to have a minimum of 4 anchor bolts/rods. The foundation, base plate, and anchor bolts/rods shall be designed to withstand the stresses induced by a 300-pound vertical load located 18” horizontally from the face of the column flange and from a plane connecting the tips of the column flanges. It is recommended that the anchor bolts be located outside the column shape at the corners of the base plate. See the AISC LRFD Manual of Steel Construction for minimum embedment lengths for anchor bolts. No additional design considerations for erection, wind, seismic, temperature, etc. forces are required.

- B. NOTES: Posts (defined as structural members with longitudinal axes that are essentially vertical and are: a. 300-pounds or less and axially loaded or b. Not axially loaded, but laterally restrained by the above member) are required to have only 2 anchor bolts/rods.
5. Double Connections:
- A. EXAMPLES: At beam to column web connections or at beam to cantilevered girders over column connections where the connections for the beams on either side share common bolts. The Erector commonly sits on the first beam of the connection and connects in the second beam. Thus, the common bolts would have to be removed and reinserted to achieve connection of the second beam for double connections. No special provisions are required at standard beam to girder connections. The Erector can sit on the girder (which is safely supported at each end) while inserting/removing/reinserting the bolts for the beam connections.
- B. GUIDE: Specify or allow for the use of connections that accommodate the OSHA Standards. Provide alternating direction single angle (horizontal angle legs pointing opposite directions for each beam) connections, staggered double angle (angles on one side of the connection have an extra row of bolts or are staggered one bolt row vertically) connections, or erection seat connections. Be watchful for OSHA violations of this nature on the Shop Drawings.
- C. NOTES: Examples of double connections are given in Appendix H of OSHA Subpart R.
6. Column Splices:
- A. GUIDE: At the building perimeter, extend the column to a height of 48" above finished floor to allow the Erector to install perimeter fall arrest protection (perimeter cable). Column splices shall be designed to withstand the stresses induced by a 300-pound vertical load located 18" horizontally from the face of the column flange and from a plane connecting the tips of the column flanges. Specify that field welded splice connections require OSHA compliant bolted temporary connections and look for OSHA violations of this nature on the Shop Drawings. Consider holes required for temporary cable support in column design.
7. Joist/Joist Girder Stabilizer Plates:
- A. GUIDE: For joists/joist girders centered on columns, stabilizer plates that slide between the bottom chord angles of the joist/joist girder must be provided. These stabilizer plates must be a minimum of 6" x 6" and extend 3" below the joist/joist girder bottom chord with a 13/16" diameter hole for guying/plumbing cables. For conditions where no joist/joist girder is centered on a column, equivalent stability must be provided (usually by the joist manufacturer without the use of stabilizer plates) to the two joists near the column. Be watchful that the joist manufacturer has designated a separate piece mark for the joists/joist girders at columns. Where the joist/joist girder is required to provide lateral support for the column at the bottom chord of the joist, the bottom chord of the joist shall be connected to the stabilizer plates – the joist/joist girder must be appropriately designed for the forces induced by this requirement. This arrangement is not recommended.
- B. NOTES: For joists/joist girders at or near columns (column joists) with spans of 60 feet or less, the joist/joist girder shall be designed with sufficient strength to allow one person to release the hoisting cable without the need for erection bridging. OSHA currently has a moratorium on the strength requirements for joists/joist girders at columns.
8. Joist/Joist Girder Seats:
- A. GUIDE: Bolt connections to columns. Specify when welded or bolted connections to beam/girders are required. Joists at or near columns not framed in two directions with solid web beams and joists with spans over 40' (unless panelized) must be bolted to the beam/girder. Check the top flange of the beams/girders at bolted joist seat connections for the net area considering the holes in the flange. Typically the hole in the joist seat is slotted to allow for erection tolerances and thus, is not adequate to be considered a permanent connection for the joist seat – field welding is typically provided to accommodate permanent connections.
9. Joist Bridging:
- A. GUIDE: Specify the need for bridging of joists and look for bridging on the Shop Drawings. Consider gravity loads (more than just bracing loads) induced in joist bridging for sloped or curved roofs. Be watchful of joist bridging terminus points on the Shop Drawings.
- B. NOTES: Examples of bridging terminus points (anchor end points for bridging) are given in Appendix C of OSHA Subpart R.
10. Pre-Erection Meetings:
- A. Meetings with the Architect, Structural Engineer, Detailer, Fabricator, Erector, and General Contractor are integral in catching and addressing most erection concerns and problems. Each issue listed above as well as all other issues covered in OSHA Subpart R should be thoroughly addressed.

#### References

1. "New OSHA Erection Rules - How They Affect Engineers, Fabricators, Contractors", *Modern Steel Construction*, May 2001, Barry L. Barger and Michael A. West.
2. *Federal Register, Part VI, Department of Labor, Occupational Safety and Health Administration, 29 CFR Part 1926, Part R – Safety Standards for Steel Erection, Final Rule*, January 18, 2001.
3. "Detailing Guide for the Enhancement of Erection Safety", *National Institute of Steel Detailing and Steel Erectors Association of America*, 2001.
4. "The Steel Joist Institute's Position on the new OSHA Regulation 29 CFR Part 1926.757 – Open Web Steel Joists", Revised May 15, 2002.

**Value Added to AISC Fabricator and Erector Quality Certification through Alignment  
with IBC Testing and Inspection Requirements  
Structural Engineers Association of Colorado  
Steel Liaison Committee  
September 16, 2002**

Jeff Janakus – Martin/Martin, Inc.; Jack Petersen – Martin/Martin, Inc.; Rex Lewis – Puma Steel; Bill Zimmerman – Zimkor Industries, Inc.; Maynard Trostel – Platte River Steel; Richard Huddleston – Zimkor Industries, Inc.; Jeff Borger – Jirsa Hedrick & Associates; Jim Ness – Monroe Newell Engineers, Inc.; Nick Miller – LPR Construction Co.; John Stodola – Derr and Gruenewald; Tom Skinner – JVA Consulting Engineers, Inc.; Dave Schroeder – Martin/Martin, Inc.; Lutfar Khandaker – KBK Structural Design.

#### Executive Summary

This document addresses how the American Institute of Steel Construction (AISC) Quality Certification (AISC Certification) for Fabricators and Erectors relates to the testing and inspection requirements of the International Building Code (IBC). It is the experience of this committee that AISC Certification tends to focus on quality assurance (QA) and the IBC requirements tend to focus on quality control (QC). With this difference in focus, AISC Certification does not preclude the IBC requirements and thus, Owners are required to contract independent testing and inspection services, adding cost to projects. In this current system, no financial benefit related to testing and inspection can be realized for Owners or General Contractors selecting AISC Certified Fabricators and Erectors. By achieving alignment of AISC Certification and the IBC requirements, financial value can be realized by Owners and General Contractors using AISC Certified Fabricators and Erectors. Further, such an alignment creates opportunity to increase steel frame market share by eliminating independent testing and inspection service costs that are currently also required for concrete frames. Suggestions on how to achieve this alignment are given.

#### Current Process for AISC Pre-Qualification

The current AISC Certification for Fabricators and Erectors certifies the fabrication and erection processes – fabrication and erection procedures and record keeping processes are examined and certified by AISC. The AISC Certification does not however certify the product – the actual pieces departing the fabrication shop or as erected in their completed state are not examined and certified by AISC. This function is performed by both the in-house QA/QC personnel of the Fabricator and Erector and by an independent testing agency typically contracted and directed by the Owner. The independent testing agency is required because the in-house QA/QC personnel alone do not satisfy the testing and inspection requirements of the IBC (the testing and inspection requirements of the IBC are attached). Thus, an overlap of testing and inspection occurs and the Owner is forced to pay for the independent agency regardless of whether the Fabricator and Erector are AISC Certified or not. No qualifier/exemption for AISC Certified Fabricators and Erectors is given and the AISC Certification program does not completely satisfy the IBC requirements.

The consensus among the Fabricators and Structural Engineers of this Committee is that AISC Pre-Qualification does add value in terms of quality of work to projects. The Fabricators feel that it helps them to be better organized and more efficient and thus, improves the quality of their product. The Structural Engineers feel that it helps bring a better quality of product and service to projects. However, both groups are currently questioning the value in terms of financial benefit to Owners or General Contractors of projects.

The higher quality product and service achieved by AISC Certified Fabricators and Erectors can translate into higher bids than for Non-Certified Fabricators and Erectors. This is due to more conscientious efforts of these companies coupled with the added costs to implement and maintain the procedures necessary to retain AISC Certification. Owners and General Contractors do not always perceive enough value added in terms of quality to justify the higher bids. This is particularly true if independent testing and inspection costs are required for certified or non-certified either Fabricators and Erectors. The Structural Engineer of Record for the project can recommend that the Fabricator and Erector be AISC Certified, but ultimately the Owner and/or General Contractor has the final say if the Building Department does not specifically mandate it. Most Building Departments (exceptions include governmental agencies) do not mandate and hold to such requirements and thus, for many projects, the requirement for AISC Certified Fabricators and Erectors is non-existent in the project specifications or waived.

#### Proposed New Process

Many Owners and General Contractors perceive value in terms of financial gain rather than in terms of quality of the product. A way for these Owners and General Contractors to realize value in AISC Certification is for the program to certify the product in addition to

certifying the process in a manner that is aligned with the testing and inspection requirements of the IBC. Under such a process, the testing and inspection requirements of the IBC could be waived and associated costs eliminated for AISC Certified Fabricators and Erectors, allowing the total cost to the Owner for the fabrication, erection, and testing and inspection of the steel to be decreased. Similar testing and inspection service requirements are also required for pre-cast and cast-in-place concrete structures. By eliminating the costs of these services for steel structures, opportunity to grow steel market share is created by offering a more cost-effective choice for Owners and General Contractors.

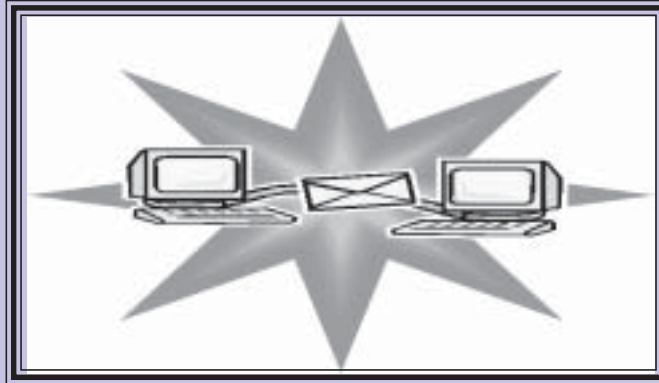
#### Suggestions on How to Implement the New Process

First, AISC could open continuous discussions with IBC on this topic. Establishing a line of communication between the two entities to come to an agreement on how AISC Certification can align with the IBC testing and inspection requirements is advantageous. One method of achieving this alignment is for AISC to perform or contract an independent company to perform unannounced spot inspections (independent of the current ASIC Certification audit inspections performed by AISC) of fabrication shops and project sites to certify the product. For fabrication shop inspections, perhaps 2 to 4 times per year would suffice. For project sites, perhaps once or twice every two weeks would suffice. The repetition of the inspections would likely depend on a number of factors including the size and complexity of projects and what IBC finds satisfactory. Another method is to have QA/QC personnel that are paid for by the Fabricator and Erector but that are qualified/certified/monitored by AISC or their auditing company. Perhaps the "Structural Inspector" or a new position developed by AISC could be utilized in this manner.

To offset the additional time constraint and inevitable increases in AISC Certification fees to obtain this product certification, perhaps the current yearly audits are adjusted to be every other year. Further, to solve testing and inspection disputes, perhaps an arbitration process that does not directly involve the main office of AISC could be developed.

Additionally, based on this committee's experience, a general education for Owners, General Contractors, Architects, and Structural Engineers on how AISC Pre-Qualification is obtained and what it means to fabrication and erection procedures and product quality currently seems to be lacking in the industry. If such education can be delivered along with an alignment of the AISC Pre-Qualification process and the IBC testing and inspection requirements, both the quality and financial values offered to projects can become more evident and in turn, make steel more competitive and grow market share.

***CHANGE OF ADDRESS?  
NEW E-MAIL INFORMATION?***



If you have a change of address, phone, fax, or e-mail. Please e-mail Caryn Bauer at [\*\*\*cbauer@martinmartin.com\*\*\*](mailto:cbauer@martinmartin.com)

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***SEAC*** Newsletter

Structural Engineers Association of Colorado

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