Phoenix Chapter of the Construction Specifications Institute

Cactus Comments

CSI PHOENIX NEWSLETTER NOVEMBER 2007

Why Earn a CDT?
The Construction Documents Technology (CDT) Program provides a comprehensive overview for anyone who writes, interprets, enforces, or manages construction documents. Project architects, contractors, contract administrators, material suppliers, and manufacturers' representatives are all realizing the advantages of the Construction Documents Technology Certificate program. Learn more.

INSIDE THIS ISSUE:

Chapter News

Knowledge for Creating & Sustaining the Built Environment
CSI*Net* - Home of The Construction Specifications Institute

Monthly Chapter Meeting

The November Chapter Meeting will be held on Wednesday, November 14, 2007 at 5:30 p.m. at the Airport Hilton, 2435 S. 47th Street, Phoenix, AZ. Special guest speakers will be Dick Bauer, CTRC, CSI, and Jesse Wolf Corsi Henson, AIA, LEED AP. Read their bios on page 3. **For dinner reservations, call 602-258-7499 by November 12 at noon.** Dinner is served at 6:30 p.m. and the Program begins at 7:30 p.m.

Monthly Technical Meeting

If you would like to join the CSI Technical Committee, their next meeting is November 13th from Noon until 1:00pm at FM Solutions; 4001 N. 3rd St., Ste. 250; Phoenix, AZ 85012; 602.824.5347. The topic of discussion is The Urban Heat Island Effect.

President's Message

Ronald L. Geren, CSI, CCS, CCCA, AIA, SCIP
RLGA Technical Services
Phoenix Chapter President

Going, going, gone

This past month we said farewell to longtime Phoenix Chapter member Bob Sears. Arriving in Phoenix in 1988 from Seattle, Bob, who was active in his former chapter, immediately joined the Phoenix chapter. But Bob didn't sit still; he became active in the Phoenix Chapter as newsletter editor and, eventually, chapter president. Additionally, he was a frequent contributor to the chapter's newsletter with his op-ed articles titled "As I See It." Bob will be moving to Kansas, but will continue writing specifications for SASC via long-distance for some time. We'll miss Bob, but wish him and his wife well as they head northeast to cold country (I'm sure Arizona will be in his thoughts come January).

(Continued on page 2)

FEEDBACK PLEASE!

We welcome your feedback on our new format of the Phoenix Chapter Newsletter. To comment or make suggestions for improvements, articles, features, etc., please contact Darlene Moore at dablmo@hotmail.com or Alex Devereux at adevereux@itt-tech.edu.

President's Message

The Southwest Region Conference is set for April 24-25, 2008. More to come at a later date

(Continued from page 1)

But Bob is not the only one leaving us…

Steve Wadding, son of George Wadding (chapter immediate past president) and brother of Mike Wadding (Mr. Raffle), is leaving us for the Las Vegas chapter, which is where his job is taking him. We wish him well, and lots of luck (you can guess for what).

And finally, Andrea Stephan, Academic Liaison, is leaving us for Charlotte, North Carolina, to be with family. Although she was only with the chapter a short time, she has given the position of Academic Liaison the adrenalin boost it needed to make things happen. In the brief period she held the position, she has contacted several community colleges and other educational institutions. Her work with ITT-Tech's construction management program has set the foundation for a potential student chapter at the school. The positive side of all this, she's going to be a specifications writer for a Charlotte architectural firm. Best wishes, Andrea, and happy writing (don't forget CSI's four C's)!

The date is set, but not the location

The Southwest Region Conference Committee has met and set the dates for the conference for April 24th through the 26th. The committee has a potential location and discussions are in progress, but other locations are also being considered. A final selection should be made by the November Chapter meeting.

And, fortunate for me, we have two committee co-chairs: George and Mike Wadding. However, they can't do it all themselves. We have several members who've expressed an interest, but more assistance will only make things easier for everyone. If you have not already expressed an interest in helping, but would like to, please contact George (gwadding@staroof.com) or Mike (mwadding@henry.com).

Institute is looking to make a few changes

Like this past year, Institute is putting a new governance proposal in front of the membership for voting next spring. This new proposal is a revised version of the proposal that failed to pass this last spring. Although the comment period has ended, it is important that all members understand the proposed changes and what they mean for the future of CSI.

To read what the Institute is proposing this time around, Click Here. The link will take you to a PDF document that gives a brief background why the change is needed and what each of the proposed changes includes. From my reading of the proposal and the webinar I participated in, it appears the Governance Task Team took to heart the many concerns that came out of the Team's previous attempt.

I don't want to tell you how to vote, but a change is necessary at the national level to keep CSI a viable professional organization for years to come. Please read this proposal and the revised one that will be made public some time following the November Institute board meeting, and take part in CSI's future by voting during the 2008 ballot.

Speaker Bios

To become a guest speaker, please contact Angie France, CSI, at angie.france@sherwin.com.

Jesse Wolf Corsi Henson, AIA, CSI, LEED™ AP

Jesse Henson combines his sixteen years of professional experience as an architect with his expertise in sustainable design to develop Kyocera photovoltaic products and services. Jesse was born and graduated high school with honors in Gainesville, Florida. Jesse received his Bachelor of Architecture from Rhode Island School of Design in 1991 and his Masters of Science in Energy Performance and Climate Responsive Architecture from Arizona State University in 2004. Jesse gained his professional experience from major architecture firms in Providence, Rhode Island, Baltimore, Maryland, and Washington, DC. Jesse became a registered architect in 1996 and a LEED™ Accredited Professional in 2002. Jesse's research on Building Integrated Photovoltaics has been published. and presented at the following annual conferences: American Solar Energy Society 2003, 2004, 2005, 2006 and Kyocera North American Technical Conference 2004. In addition he presented on the topic of commercial building energy metrics at US Green Building Council's 2005 GreenBuild. Jesse's comments have been published in the following publications: Refocus (5/2005) and Architecture Record (9/2006). Since 2004 Jesse has developed and taught an AIA Continuing Education Seminar titled "Introduction to Photovoltaic Systems: Integrated & Applied Solutions for Buildings". Jesse is co-editor of the Construction Specification Institute, Phoenix Chapter's publication "Photovoltaic Systems for Commercial & Institutional Buildings". Among his local activities Jesse serves on the City of Scottsdale Green Building Committee.

Dick Bauer, CTRC, CSI

In 2001 Dick was a charter member of ASU Renewable Energy Task Force which meets monthly on campus. He has worked for cleaner air and the requirement of a greater use of renewables by the utilities regulated by the Corporation Commission, speaking before the Commission on three occasions. Dick attempted to get a specifiers' handbook on P.V. published thru ASU's School of Architecture but it didn't materialize. Dick took the project to the CSI Technical Committee, where after two years of research and hard work, the 38 page Technical Paper was published earlier this year.

Dick is a professional member of CSI, a licensed Roofing Contractor and a Certified Technical Roof Consultant. Dick has specified large commercial and industrial roofing and waterproofing projects in Oregon, Hawaii, Florida and Arizona over the past 31 years. His firm B & B Contracting and Consulting does spec work, plan and specification review, jobsite inspections, mediation and expert witness work when he isn't golfing, hunting or doing volunteer work for Rotary.

Dick taught roofing maintenance for the US Navy at the Monteray Command School, Yukosuka, Japan, Guam, Pearl Harbor, Newport News, Charleston and several other locations. He wrote and published the technical manual for Neste Thermo as their National Sales Manager and edited two product technical manuals for another national manufacturer. He is past president of his Rotary Club and currently is chairman of a blue ribbon Revenue Commission study for the Town of Fountain Hills.

The Code Corner

By Ronald L. Geren, AIA, CSI, CCS, CCCA, SCIP

Exterior Walls

In 1943, American psychologist Abraham Maslow proposed his "Hierarchy of Needs" motivational model. At the base of the five-stage model are the biological and physiological needs, or, in other terms, the basic life needs; and found within that first stage is the need for shelter. Growing from that basic need came man-made structures for sleeping and eating, and eventually, for work and play. The elemental feature of these structures is the physical separation between interior and exterior space, commonly referred to as the building enclosure, which typically includes the roof and exterior walls. Over time, exterior walls (and in some cases, roofs) have expanded from their basic purpose of separating interior from exterior to providing a medium for architectural expression by incorporating unique shapes, fenestration, and a variety of materials.

However, an exterior wall's purpose goes well beyond the fundamental need described above. As a barrier against the elements of weather, exterior walls need to endure what Mother Nature can inflict upon them, such as water, wind, and earthquakes. With the increase of sustainability in building design, energy efficiency has elevated to an almost equal footing with architectural aesthetics--in some cases, aesthetics have taken a position behind energy efficiency in wall system design. And lastly, fire-resistance cannot be ignored if exterior walls are located in close proximity to other structures or property lines. All of these characteristics of exterior walls are directly affected to some degree by the provisions of the building code.

Weather Protection

Chapter 14 of the 2006 *International Building Code* (IBC) addresses the performance of weather-resistant envelopes. Much of the content of this chapter is on the installation of materials as "exterior wall coverings," such as veneers (wood, masonry, stone, metal and glass), fiber cement siding, vinyl siding, doors, windows, and metal composite materials. Additionally, Table 1405.2 specifies minimum thicknesses for weather covering materials. For example, natural stone veneer requires a 2-inch minimum thickness of material. But underlying the requirements for each of these wall coverings is the all important need to keep water out.

In Section 1403.2, the IBC emphasizes this minimum performance requirement by stating that exterior walls "shall be designed and constructed in such a manner as to prevent the accumulation of water within the wall assembly…and a means for draining water that enters the assembly to the exterior." The only exceptions to this requirement are assemblies that have been tested in accordance with ASTM E 331, *Test Method for Water Penetration of Exterior Windows, Skylights, Doors and Curtain Walls by Uniform Static Air Pressure Difference*, and concrete and masonry walls designed in accordance with their respective chapters in the IBC.

The only problem with this, especially for masonry, is that those chapters do not address any type of flashing. The *IBC Commentary* states that the water resistive barrier and means of drainage can be omitted from masonry and concrete walls because "the penetration of moisture behind the exterior wall finish is not detrimental to concrete and masonry substrates." Fortunately, architects and contractors are keenly aware that moisture, although not detrimental to those materials themselves, can create other problems such as mold. Therefore, flashing and drainage are still essential elements of these wall types, even though they are not explicitly required in the building code. An important note is that these exceptions do not apply to masonry veneers unless the veneer is

(Continued on page 5)

The 2008 NEC Handbook is available for purchase at Construction Book Express (constructionbook.com)

The Code Corner

(Continued from page 4)

over a concrete or masonry wall designed as stated above.

For veneers, a water-resistive barrier is required between the veneer and the substrate, such as studs or sheathing. Section 1404.2 establishes one layer of No. 15 felt complying with ASTM D 226 for Type 1 felt as an acceptable water-resistive barrier. The Section also allows "other approved materials," so the designer can utilize many of the other materials that are on the market for such an application. To be considered "approved," the International Code Council Evaluation Service (ICC-ES) has prepared AC38, *Acceptance Criteria for Water-Resistive Barriers*, that is utilized by the service to evaluate products submitted for an Evaluation Service Report (ESR). The criteria permits products complying with UBC Standard 14-1 (Fed. Spec. UU-B-790a) for paper-based barriers and ASTM D 226 for felt-based barriers. Polymeric-based barriers, such as Tyvek and other comparable products, are evaluated based on tensile strength (ASTM D 828 or D 882), water resistance (ASTM D 779), water-vapor transmission (ASTM E 96), and cracking at freezing temperatures.

Fire Resistance

For fire resistance, Chapter 14 redirects the user to Chapter 7, "Fire-Resistance-Rated Construction," in which Section 704 specifically addresses the fire-resistance requirements of exterior walls. However, this Section does not determine the conditions under which an exterior wall is required to be protected; that is determined in Chapter 6, "Types of Construction."

Tables 601 and 602 determine the fire-resistance rating for exterior walls based on construction type, occupancy, and fire separation distance. These ratings vary from no rating at all to 3 hours. However, there is a slight difference between the fire-resistance rating for exterior walls and other types of fire-resistance-rated walls, such as fire barriers and fire walls. Exterior walls are only required to have a rating based on exposure from the inside, with one exception: exterior walls that are 5 feet or less from the property line are required to have a fire-resistance rating for exposure from both sides.

For fire-resistance-rated (and even non-fire-resistance-rated) exterior walls, openings, including both windows and doors, are required to be protected in accordance with Section 704.8. Fortunately, this Section does not necessarily require all openings to be protected; a mix of both protected and unprotected openings may be permitted. Table 704.8 sets the allowable percentages of protected and unprotected openings based on fire separation distance for each story. Yet, if a mix of protected and unprotected openings is considered, the allowable opening areas cannot be based solely on the percentages in the Table; the sum of the ratios for actual areas to allowable areas cannot exceed one.

For example, the exterior wall of a story for a building is 1,000 s.f. The fire separation distance is between 10 and 15 feet. According to Table 704.8, the building can have 15% unprotected openings or 45% protected openings; but how much area of each is allowable? That can only be determined by using the actual areas in the design. For our example, the design includes an 8 foot by 6 foot specialty window that has no fire-resistance rating. The rest of the openings, which are protected, have a total area of 360 s.f. Is the design in compliance?

The answer is "no." The unprotected opening is 48 s.f.; divide that by 150 s.f. (15% of 1,000 s.f.) to get a ratio of 0.32. Next, divide the actual area of protected openings, 360 s.f., by 450 s.f (45% of 1,000 s.f.) to get a ratio of 0.8. Add the two ratios together and you get a total of 1.12, which is greater than 1, therefore the design is unacceptable. To be in compliance with the code, the area of protected openings will have to be 306 s.f. or less.

(Continued on page 6)

The Code Corner

(Continued from page 5)

If you are still scratching your head about non-fire-resistance-rated openings having to comply with Table 704.8, do not fret…read the fine print in footnote "i," which is applicable to unprotected openings having a fire separation distance greater than 5 feet. This footnote allows unprotected openings to be unlimited if exterior walls (bearing and nonbearing) and the exterior structural frame are not required to be fire-resistance-rated per Tables 601 and 602.

The last area to cover regarding fire-resistance of exterior walls is the provision in the code that permits wall assemblies that do not comply with the unexposed surface temperature rise requirements of ASTM E 119, *Test Methods for Fire Tests of Building Construction and Materials*. Since thermal exposure to adjacent properties and buildings are a concern during a structure fire, an exterior wall that doesn't reduce the temperature on the unexposed surface as required by ASTM E 119, must be taken into consideration. Section 704.7 allows wall assemblies that have exceeded the 250 deg. F (121 deg. C) limitation by applying a portion of the wall area to the opening area. To determine that area, Figure 704.7 is used to find the equivalent opening factor. To use the Figure, two items are required: the required hourly rating and the average unexposed surface temperature of the wall assembly that has been determined through testing at the required rating.

To illustrate how this is applied, let us assume a building has an exterior wall with an area of 500 s.f. The wall is between 15 and 20 feet from the nearest property line and is required to have a 1-hour fire-resistance rating. Within that wall are 190 s.f. of protected openings. The assembly used has an average unexposed surface temperature of 1,200 deg. F. determined through testing in accordance of ASTM E 119. Using Figure 704.7, the equivalent opening factor is 0.35. The wall area (500 s.f.) is multiplied by the factor (0.35) to obtain an equivalent area of 175 s.f. This is added to the area of actual protected openings to achieve the full equivalent area of 365 s.f. If no unprotected openings are in the wall assembly, then according to Table 704.8, 75% of the wall area may have protected openings, which equates to 375 s.f. Therefore, since the equivalent area (365 s.f.) is less than 375 s.f., then the wall assembly is acceptable.

Energy Efficiency

Chapter 13 of the IBC addresses energy efficiency; however, when reviewing that chapter you will find little in the way of requirements. What you will find is a reference to the *International Energy Conservation Code* (IECC). The IECC establishes requirements for two building types: residential and commercial. However, this article will only address the commercial requirements located in Chapter 5. Additionally, for commercial buildings, the IECC gives the designer two options: comply with the requirements of the IECC or ASHRAE/IESNA Standard 90.1, *Energy Standard for Buildings Except for Low-Rise Residential Buildings*; but, for brevity, this article will focus only on the IECC requirements.

Section 502 addresses the building envelope, and Section 502.2.3 specifically addresses above-grade walls. The provisions of this Section require a minimum thermal resistance (R-value) in accordance with Table 502.2(1). To use this Table, the climate zone in which the project is located must be determined. The climate zone can be determined in Chapter 3 using either the map in Figure 301.1 or the listing by state, county, and territory in Table 301.1. For example, Maricopa County in Arizona is Zone 2. Returning to Table 502.2(1) and using climate zone 2, there is no required R-value for mass walls*, but metal, metal-framed, and wood-framed buildings must have an R-value of 13. Opaque swinging doors must have a maximum U-value (thermal transmittance, which is 1/R) of 0.70, whereas opaque roll-up or sliding doors must have a maximum U-value of 1.45.

Building fenestration, which includes windows and doors (except opaque doors), must comply with the provisions of Section 502.3. This Section establishes the maximum area

(Continued on page 7)

The Code Corner

(Continued from page 6)

of vertical fenestration (40% of above-grade wall area) and skylights (3% of gross roof area). Additionally, Table 502.3 establishes the minimum U-value and solar heat gain coefficient (SHGC) based on climate zone and window projection factor (PF). The PF is calculated by dividing the horizontal distance of the furthest edge of a shading device from the vertical surface of glazing by the vertical distance of the underside of a shading device to the bottom of glazing.

Other mandatory requirements of the IECC include air leakage of windows, doors, storefront, curtain walls, penetrations, and other exterior openings. Also, if exterior walls are framed, and the cavities are not vented to allow moisture to escape, a vapor retarder having a permeance rating of 1 perm or less is required. All of these additional provisions are contingent upon the climate zone in which the project is located or other exceptions.

The Future

Our shelters have matured from simple structures to the advanced and complex systems of interconnected components and materials found in today's buildings. However, this process of improvement will continue long into the future. But this constant development is not limited to physical building elements; it also applies to the research and learning processes connected with environmental, life safety and fire science issues that also affect the products we develop and the codes we write. As we develop new building components and materials, the building code will continue to evolve to address these new technologies--and the problems that may follow (exterior insulation and finishing systems and the subsequent mold epidemic come to mind).

To comment on this article, suggest other topics, or submit a question regarding codes, contact the author at ron@specsandcodes.com.

About the Author: Ronald L. Geren, AIA, CSI, CCS, CCCA, SCIP, is an ICC Certified Building Plans Examiner, and is the principal of RLGA Technical Services located in Scottsdale, Arizona, which provides specifications and code consulting services to architects, engineers, owners, and product manufacturers. A 1984 graduate of the University of Arizona, Ron has over 22 years of experience with military, public, and private agencies.

National CSI News

Subject: **SpecGuy Announces CSI Certification Webinars**

Specification and education consultants **SpecGuy** announced they are launching a series of webinars to assist candidates preparing for Construction Specifications Institute certifications. These live web-based classes are intended for candidates who are not able to attend local CSI chapter review classes.

The **live weekly** webinar series:

- ☐ **A Walk Through the AIA A201 - Starting November 27, 2007**
- ☐ **CDT One Week at a Time! - Starting January 7, 2008**
- ☐ **CCCA One Week at a Time! - Starting January 15, 2008**

These webinars are in preparation for the national exams held at the end of March. Continuing education credit is available.

SpecGuy is an AIA/CES Passport Provider and an authorized MASTERSPEC® Trainer. They provide specification consulting and education program development to design firms and building product manufacturers.

For more information on SpecGuy's webinars: www.SpecGuy.com

For information and registration for CSI certification: www.CSINet.org

Board Minutes

MEETING MINUTES - Board of Directors

GENERAL

DATE: October 10, 2007
TIME: 4:00 PM
LOCATION: Airport Hilton, Phoenix

ATTENDANCE (P = Present; A = Absent)

COMMITTEE CHAIRPERSONS

Programs	Angie France	P
Membership	Alan Minker	P
Publications	Alex Devereux	A
Education	Joe Volinsky	A
Certification	Neil Davison	A
Technical	Tim Garver	A
Awards	Carlos Murrieta	A
Academic Liaison	Andrea Stephan	A
Kenn Lockhart Fund	Neil Davison	A
Fundraising	David Spice	A
Imagination Cube	Tim Garver	A

OFFICERS AND DIRECTORS

President	Ron Geren	P
President Elect	Clark Benson	P
1st Vice President	Cary Stoneman	P
2nd Vice President	Andrea Grum	P
Secretary	Mary Grace Maglio	P
Treasurer	Teri Hand	P
Director P 06-08	Steve Smith	P
Director I 06-08	Tim Garver	A
Director P 07-09	Jorge Pierson	P
Director I 05-07	Bob Trimble	A
Past President	George Wadding	P

PROCEEDINGS

Meeting Opening: 4:20 PM by Ron Geren

Adoption of Agenda: Motion to accept by Teri Hand, second by Mary Grace Maglio. Motion carried.

Minutes of Previous Meeting: Motion to accept September minutes by Teri Hand, second by George Wadding. Motion carried.

(Continued on page 9)

The next Board Meeting will be held on November 14, 2007 at 4:00 p.m. at Airport Hilton, 2435 S. 47th Street, Phoenix, AZ.

Board Minutes

(Continued from page 8)

Treasurer's Report: Teri Hand

There are some changes to the budget – the expenses for Academic Affairs were modified. Funds will be added to the Golf Tournament expenses to offset the amount which will be credited to the Kenn Lockhart Fund. A stop payment will be issued on check to Az Historical Society for balance of 50th Anniv party, new check will be issued. No educational programs are currently scheduled this quarter. The application for membership in The Reference Library will be submitted. Payment for the annual fee for NFPA has been made. Sales of the PV Green Sheet are doing well. Signatories for account need to be updated. Motion to accept report by George Wadding, second by Cary Stoneman. Motion carried.

Committee Reports

Programs: Angie France

Looking at Moon Valley club for December Holiday party; have reviewed deposit and minimum requirements. Other locations have also been suggested. Venue needs to be confirmed. Bob Johnson has been confirmed to present in March on Uniformat. Looking for speaker for Stress/Time Management in May.

Education: Joe Volinsky

Committee is looking at educational tracks for SW Regional Conference. Committee met last month. Will be doing Habitat for Humanity project in 1st qtr, 2008. Master Format class planned for this quarter.

Certification: Neil Davison

No report

Fundraising: David Spice

$4000 has been pledged for Golf Tournament. If tournament is held in conjunction with SW Region Conference, may be an issue with splitting funds with CSI National. Would not be promoted as 'official' Conference event.

I-Cube: Tim Garver

In search of a product sponsor.

Academic Liaison: Andrea Stephan

Three potential student members will attend tonight's meeting.

Membership: Alan Minker

1 new member this month. Current membership is at 189. There are 5 people interested in the CDT training who may be potential members.

Board Minutes

Technical: Tim Garver

Committee has scheduled a meeting for October 23.

Awards: Carlos Murrieta

Seeking some help among new members of CSI for Distinguished membership, Honorary membership and Institute awards. Will continue to look for support on 4 more pending categories. Deadlines for nominations are due on the first days of January. Plan to coordinate with Publications to post information about the awards overall and deadlines in the next publications. Would like to present in the November meeting a few slides to all members, to explain the awards program and information to submit. Will prepare a weekly email reminder and basis of the awards submittals for all members.

Publications: Alex Devereux

Working on a new website with developer. A template will be available shortly for review. The newsletter is on schedule, with assistance from a student. Planning banner ads. Newsletter submittals are due the 3rd Friday of each month.

Kenn Lockhart: Neil Davison

No report.

Old Business

2008 SW Regional Conference – Date needs to be established, probably last week of April (April 24-26). Wild Horse Pass being considered as venue. Meeting is scheduled for October 17 @ 11:30 at the Reference Library.

Bob Sears Farewell – A plaque has been purchased and will be presented to Bob at this evening's meeting.

New Business

Student/Retirement Membership Dues need to be determined. Looking into what is being done is other regions.

Governance changes – voting will be done on-line for 4 distinct changes.

NEXT BOARD MEETING

November 14 at 4:00 P.M. at Airport Hilton, 2435 S. 47th St, north of University, west of 143 Hohokam Expressway.

Adjournment

Meeting adjourned at 5:00

Certification of Minutes

I certify that the Minutes presented here are a true and accurate representation of the proceedings to the best of my knowledge, information, and belief.

Respectfully presented

_____ Mary Grace Maglio, Secretary

END OF MINUTES

The Reference Library

The Reference Library conducts regular weekly breakfast and lunch meetings offering a wide range of information on various products and companies in the industry. Check out their website at www.thereferencelibrary.com for more information. The Reference Library is located in Phoenix, Mesa, and Scottsdale.

Phoenix November Lunch Schedule:

November 9: ARDEX, Bruce Newburgh, will discuss understanding and measuring moisture in concrete.

November 14: A speaker from McNICHOLS will discuss architectural applications for perforated metal, expanded metal, and wire mesh.

November 28: A Tnemec speaker will discuss the upcoming changes for the new year as LEED requirements become more prevalent.

Mesa November Breakfast Schedule:

November 1: A National Gypsum speaker will discuss the different sound resilient assemblies available for design and construction of high STC wall partitions.

November 15: A Noble Company speaker will discuss how to prevent failures in ceramic tile and stone installations.

Scottsdale November Lunch Schedule:

November 8: A Madrid speaker will discuss curved plywood and its practical uses.

November 29: A Bobrick/Delta speaker will discuss ergonomics and its impact on faucet design.

Chapter Officer Points of Contact

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Have a Little Fun!

Horizontal:`

1. A measure of force per unit area within a body.
2. The clockwise angle between a reference direction (or a datum line) and the direction to an object.
3. Someone who installs or repairs piping systems, plumbing fixtures and equipment such as water heaters.
4. A usually solid structure that defines and sometimes protects an area.
5. A measure of an object's or circuit's ability to conduct an electric current between two points (Acronym)
6. File format that is a popular data compression and archival format.
7. The hard, solid rock formation at or below the surface of the earth.
8. Adjusting the level of the ground on a site.

Vertical:

1. The location of a place on Earth north or south of the equator.
2. The psychological process of thinking about the activities required to create a desired future on some scale.
3. A structural element that carries load primarily in bending.
4. A term used in urban planning for a system of land-use regulation in various parts of the world.
5. The science of measuring positions and distances on Earth
6. A hypertext system that operates over the Internet.
7. A two-dimensional manifold.
8. The bottom edge of a window or door.

Special Thanks to Tishiane Perto

Answers in December Newsletter