

# SURVEYOR

California

Spring 2012

Issue #169



## Safety First!



### **Railroad Safety and Roadway Worker Protection**

Article by Jim Drenon, PLS  
on page 14

### **Surveying's Hidden Dangers**

Article by Robert Fredricks, PLS  
on page 12

### **Abandoned Mining Site Dangers**

Article by Carl C. de Baca, PLS  
on page 20

### **Close Encounter with Lyme Disease**

Article by Theresa Lynn Burritt, PLS  
on page 22

CHANGE SERVICE REQUESTED  
The California Surveyor  
526 So. E. Street, Santa Rosa, CA 95404

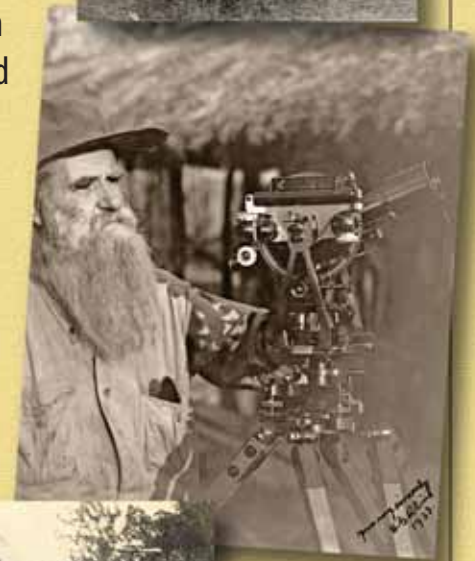
# Land Surveying Photo Gallery

Unique Historic Photos Now Available for Purchase! Order Today!



Proceeds from the sale of photos benefit California Land Surveyors Association Education Foundation (CLSA EF) and will be used to fund scholarships for land surveying students.

CLSA would like to thank Bryant Sturgess for generously donating his collection of historic images.



Order online at: [CLSAphotos.smugmug.com](http://CLSAphotos.smugmug.com)



## TRIMBLE BUSINESS CENTER

Absolute accuracy is what you expect from our hardware.  
Handoff ready in record time is what we deliver with our software.



In cities, underground, and across all types of terrain, Trimble hardware leads the world's survey capabilities.

Today that hardware expertise is matched with a new generation of software that drives easy and customizable workflows. This improves accuracy and efficiency by enabling your field teams to share information with the office and turns raw field data into handoff-ready deliverables in hours—or even minutes.

- Process GNSS and Optical Control Surveys
- Prepare Field Data for CAD and GIS
- Finalize Design Data for Stakeout
- Review and Report As-Staked Surveys

This is the latest step in our commitment to find efficiencies that increase your capabilities, decrease your costs, and help you provide maximum value for your customers.

To see how this new software is helping survey businesses worldwide, follow Trimble Business Center Software on Facebook.



To learn more, visit Trimble Business Center Software on Facebook.



SUCCESS FOUND HERE



© 2012, Trimble Navigation Limited. All rights reserved. Trimble and the Globe & Triangle logo is a trademark of Trimble Navigation Limited, registered in the United States and in other countries. Trimble Access is a trademark of Trimble Navigation Limited. All other trademarks are the property of their respective owners. SUR 2012

**FOR MORE INFORMATION  
CALL YOUR  
TRIMBLE DEALER**

**Allen Instrument**  
Anaheim, CA  
714-238-3434

**California Survey and Drafting**  
Sacramento, CA  
916-344-0232

# GET SPECIAL DISCOUNTS at Office DEPOT with your CLSA Membership

The program includes:

- Savings of up to 70% on commonly used items
- FREE next-business-day delivery
- Thousands of products in stock
- Unparalleled expertise
- Ultimate shopping convenience by phone, fax or online
- The latest in office technology
- Office Supplies, Furniture and More!

**OFFICE DEPOT  
IS YOUR  
ONE STOP SHOP!**

**CALL CLSA  
at 707-578-6016  
FOR MORE INFO**

**Office  
DEPOT** *Taking Care of Business*

## 2012 BOARD OF DIRECTORS

### CLSA Officers 2012

Frank R. Lehmann, President  
Thomas A. Taylor, President-Elect  
Rolland VanDeValk, Secretary  
Jay K. Seymour, Treasurer  
William R. Hofferber, Immediate Past President  
Dorothy Calegari, Executive Director

### Directors

#### BAKERSFIELD CHAPTER

Ronald J. Nelms

#### CASCADE CHAPTER

Leslie J. Gross

#### CENTRAL COAST CHAPTER

Linda M. Richardson

#### CENTRAL VALLEY CHAPTER

Jon Scarpa • Keith W. Spencer

#### CHANNEL ISLANDS CHAPTER

Marta Alvarez • Jim Pilarski

#### DESERT CHAPTER

Douglas E. Redlin

#### EAST BAY CHAPTER

Harold B. Davis • Steven J. Martin

#### GOLD COUNTRY CHAPTER

Marc R. Van Zuuk

#### HUMBOLDT CHAPTER

Pete Jackson

#### LAKE/MENDOCINO CHAPTER

Michael Gilmore

#### LOS ANGELES CHAPTER

Camden Cabrinha • Mark Danielson • Stephen M. Hughey  
• Mark Price • Steven Steinhoff • Diane W. Wells

#### MARIN CHAPTER

Lionel K. Vincent

#### MONTEREY BAY CHAPTER

Christopher Bateman

#### MOTHER LODGE CHAPTER

John P. Gnipp

#### NORTHERN COUNTIES CHAPTER

Roger K. Hanlin

#### ORANGE COUNTY CHAPTER

Anthony Cuomo • Peter Fitzpatrick • Thomas Propst • Gregory Sebourn • Joshua Tatman

#### RIVERSIDE/SAN BERNARDINO CHAPTER

James A. Drenon • Ryan Versteeg • Peter Wiseman

#### SACRAMENTO CHAPTER

Timothy Case • Jerome Jones • Jill Van Houten • Ian Wilson

#### SAN DIEGO CHAPTER

David W. Ambler • Anne L. Hoppe • Gary L. Hus  
David Johnson • Patrick A. McMichael

#### SAN JOAQUIN VALLEY CHAPTER

Kevin Nehring

#### SANTA CLARA/SAN MATEO CHAPTER

Paul W. Lamoreaux • Jay Wright

#### SONOMA COUNTY CHAPTER

Mike Ford

# Surveyor *California*

The quarterly publication of the California Land Surveyors Association, Inc. and is published as a service to the land surveying profession of California. It is mailed to all Licensed Land Surveyors in the State of California as well as to all members of the California Land Surveyors Association, Inc. The California Surveyor is an open forum for all Surveyors, with an editorial policy predicated on the preamble to the Articles of Incorporation of the California Land Surveyors Association, Inc. and its stated aims and objectives, which read:

“Recognizing that the true merit of a profession is determined by the value of its services to society, the California Land Surveyors Association does hereby dedicate itself to the promotion and protection of the profession of land surveying as a social and economic influence vital to the welfare of society, community, and state.”

“The purpose of this organization is to promote the common good and welfare of its members in their activities in the profession of land surveying, to promote and maintain the highest possible standards of professional ethics and practices, to promote professional uniformity, to promote public faith and dependence in Land Surveyors and their work.”

## PERSONNEL

### OWNER

California Land Surveyors Association, Inc.

### CENTRAL OFFICE

526 So. E Street  
Santa Rosa, CA 95404

E-Mail address: [clsa@californiasurveyors.org](mailto:clsa@californiasurveyors.org)  
CLSA Homepage: [www.californiasurveyors.org](http://www.californiasurveyors.org)

### EDITOR

John P. Wilusz, PLS, PE

### ASSISTANT EDITORS

Paul M. Brown, PLS – Jill Van Houten, PLS

### CONTRIBUTING WRITERS

Michael P. Durkee, Esq.  
Richard R. Hertzberg, CPUC, ARM  
Ian Wilson, PLS

### DESIGN AND PRODUCTION

Tony Monaco

### ADVERTISING

Commercial advertising is accepted by The California Surveyor. Advertising rates and information can be obtained by contacting CLSA 526 So. E Street, Santa Rosa, CA 95404, Tel. (707) 578-6016 - Fax (707) 578-4406. Circulation: 4,800.

### EDITORIAL MATERIAL

All articles reports, letters, and contributions are accepted and will be considered for publication regardless of the author's affiliation with the California Land Surveyors Association, Inc. Contributions should be emailed to [clsa@californiasurveyors.org](mailto:clsa@californiasurveyors.org). We can accept WordPerfect or Microsoft Word files. We can accept ASCII text files or word processor files from the following programs: WordPerfect or Microsoft Word.

### EDITOR'S ADDRESS

John P. Wilusz, PLS, PE  
E-mail: [johnwilusz@gmail.com](mailto:johnwilusz@gmail.com)

### DEADLINE DATES

Spring ..... February 1      Summer ..... May 1  
Fall ..... August 1      Winter ..... November 1

Articles, reports, letters, etc., received after the above mentioned date will be considered for the next edition.

Opinions expressed by the editor or individual writers are not necessarily endorsed by the California Land Surveyors Association Officers or its Board of Directors. Original articles may be reprinted with due credit given to the source and written notification to the California Land Surveyors Association, unless otherwise noted.

## Inside This Issue:

### Features:

<b>CLSA Awards</b> .....	10
<b>Surveying's Hidden Dangers</b>	
By: Robert Fredricks, PLS .....	12
<b>Railroad Safety and Roadway Worker Protection</b>	
By: Jim Drenon, PLS .....	14
<b>Abandoned Mining Site Dangers</b>	
By: Carl C.de Baca, PLS .....	20
<b>Close Encounter with Lyme Disease</b>	
By: Theresa Lynn Burritt, PLS .....	22

### Columns:

<b>Professional Outreach Events</b> .....	19
<b>Risk Management: Get Your CLSA Safety Tailgate Meeting Guide, Use it and Keep Down Your Insurance Costs</b>	
By: Richard Hertzberg, CPCU, ARM .....	34
<b>Tech Tips: Railroad R/W Centerline May Not Be the Center of the Tracks in a Curve</b>	
By: Michael McGee, PLS .....	36
<b>SMA Expert Q&amp;A</b>	
By: Michael P. Durkee, Esq. ....	38
<b>The BPELSG Chronicles: Responsibilities of Providing Professional References</b>	
By: Raymond Mathe, PLS .....	40

### Departments:

From the Editor .....	6
Kid's Korner .....	7
President's Message .....	8
San Francisco Treats .....	19
Geography Quiz .....	24
Conference 2012 Review .....	26
Conference 2012 Photo Highlights .....	28
Conference 2012 Special Thanks to the Auction Donors ..	30
Index of Advertisers .....	32
Welcome New CLSA Members .....	33
Conference 2012 Special Thanks to the Sponsors .....	35
Postcards .....	35
CLSA Remembers: William David Hobbs, PLS .....	37
Crossword Puzzle .....	42
Sustaining Members .....	44
Cartoon Captions .....	45
Publication Order Form .....	46

Cover Photo by Jim Drenon, PLS

*John works in the Delta Levees Program at the California Department of Water Resources in Sacramento, CA.*



## From the Editor

In March I visited the Bay Model, a working hydraulic model of the San Francisco Bay Estuary. The model is about 1.5 acres in size and is located in a World War II-era warehouse in Sausalito. It is administered by the United States Army Corps of Engineers (USACE, Corps) and the visitor center is open to the public free of charge. If you are interested in California water issues the Bay Model is well worth a visit.

### Background on the Model

In the mid-1950's a business man by the name of John Reber came up with the idea of building freshwater reservoirs in San Francisco Bay to serve the Bay Area population. The Reber Plan, as it came to be known, included building dams to impound the waters of San Pablo Bay and South Bay and separate them from tidal influence. The gist of his idea was to capture fresh water flowing from the Sacramento - San Joaquin River Delta before it was "wasted" by flowing uselessly out to sea.



*Skaggs Island and San Pablo Bay*



*Sherman Island*

The United States Congress was so attracted to the Reber Plan that it appropriated \$2.5 million to study it, and in 1957 the United States Army Corps of Engineers completed the first iteration of the Bay Model at a cost of about \$400,000. The Reber Plan ultimately turned out to be flop because the model predicted that the project would have had profound negative impacts on the natural environment. The Corps enlarged the model in the late 1960's to study potential impacts of the proposed Peripheral Canal, an idea that also flopped but for different reasons. The Peripheral Canal

was a proposal to divert Sacramento River water around the periphery of the Delta on its way to the pumping plants of the California Aqueduct and Delta-Mendota Canal. It was defeated by California voters in a 1982 ballot initiative.

Over the years the Bay Model has been used for predicting the impacts of a variety of human activities. These activities include dredging and realigning channels, filling mud flats, building breakwaters and discharging effluents. It has also been useful to predict the impacts of unplanned activities, like flooding, oil spills, and other accidental discharges of pollutants into the estuary. The Delta section of the model has been used to study the effect island failures would have on the interaction of fresh and salt water. This issue is vital because if fresh water in the Delta becomes too salty it cannot be used by the millions of Californian's who rely on it.

### Technical Information

The Bay Model is made out of precast concrete slabs that fit together like a giant jigsaw puzzle. The slabs are mounted on adjustable jack screws and the whole model is re-surveyed and adjusted periodically to ensure the accurate movement of water. It represents an area roughly bounded by San Francisco, Sacramento, and Stockton at a horizontal scale of 1:1,000 and a vertical scale of 1:100. The vertical scale is exaggerated so flows can be measured accurately in shallow areas. Thousands of copper strips placed strategically throughout model increase flow resistance to account for the vertical distortion. One "day" in the model lasts about 15 minutes and includes California's semi-diurnal tide cycle of two high tides and two low tides. The building that houses the model has a story in its own right. During the Second World War it was part of a ship-building complex known as Marinship. At its peak, Marinship operated around the clock, seven days a week, and produced a completed vessel for the war effort every thirteen days. There are many interesting and informative displays that tell the story of Marinship's important role in winning the war. Emerging technologies and computer models eventually made the Bay Model obsolete and in 2000 it was retired from active service. It has since been revamped as a visitor center and educational facility that focuses on California's water resources.

*Continued on next page*

## Docents Give Guided Tours

I arrived on a Saturday afternoon for a scheduled one-hour tour and dye demonstration by USACE employee, Ranger Linda. Approximately 70 people showed up for the tour and about 20%



Ranger Linda of the USACE

of them were kids with their parents. The Bay Model makes for a great family outing. Ranger Linda began the tour by using the visitor center's diorama's, murals, and interpretive materials to give us a general overview of California's hydrology:

Sierra Nevada snowpack during the winter; spring runoff is captured in reservoirs and subsequently released into rivers for the benefit of the State's people and the environment. Throughout her

presentation she also touched on geology, plate tectonics, California's Native Americans, the gold rush, flood havoc created by 19th century hydraulic mining (we still feel the effects of hydraulic mining in the form of mercury-contaminated soils throughout the estuary), the history of levee building in the Delta, and the phenomena of subsidence. By the time we arrived at the star attraction, the model itself, Ranger Linda had a given us a very thorough introduction. The dye demonstration consisted of her squirting red dye into the water in various locations and explaining the results; we watched how the currents dispersed the dye differently in different parts of the model. It was an effective demonstration of the complex dynamics of the San Francisco Bay Estuary.

The Bay Model is a fun place to learn about water issues that affect the lives of all Californians. Admission is free and tours are conducted regularly by USACE staff. Self-guided audio tours are also available. The model is located at 2100 Bridgeway, Sausalito, CA. See the web for more: <http://www.spn.usace.army.mil/bmvc/> ❖



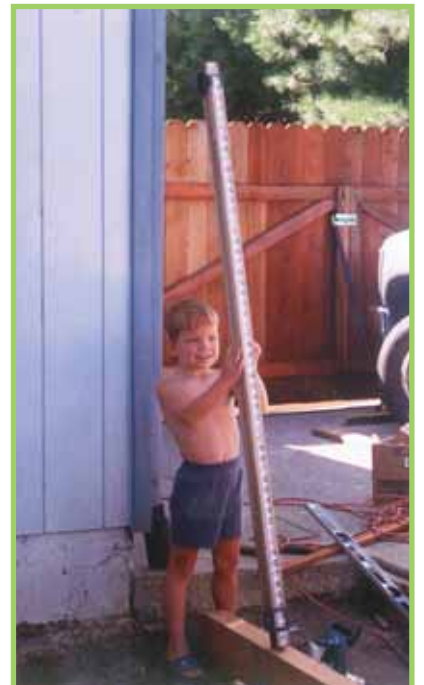
## Kids Korner

Do you have a picture of a "junior surveyor" in your family that you would like to share? Send it in and we will put it in the Kids Korner.



Left: **Max Tirapelle**, son of Aundrea Tirapelle, turning angles.

Right: **Barrett Juhrend**, in 1998 at age 5, holds a survey rod steady for his father while building a wood deck at home in Cameron Park, California. Barrett, now almost 19, is attending Fresno State majoring in Geomatics Engineering and interns with Mark Thomas & Company in Sacramento. Submitted by proud parents John and Lisa.





## President's Message

This period has had me slowing down a little in my travels compared to the more intense statewide traveling which I had done in the period wrapping up 2011. During those statewide travels, I was able to hear and see many concerns of our profession.

During this past quarter, I had the pleasure of attending the Professional Land Surveyors of Oregon conference in Portland, Oregon at the invitation of the PLSO Board. The conference was well attended as Oregon has a requirement for continuing education, but beyond that, the topics, seminars, and general discussion which came forward were mirrored a week later by our own joint CLSA/NALS conference in Reno. Lightsquared (LS) and its attempt to modify the use of a frequency originally identified as a low power band adjacent to our GPS frequencies, into a high power terrestrial—read cell phone—frequency, was a topic of discussion in both conferences. I believe that this is not yet put to rest, as LS will most likely not sit quietly on the sidelines and only observe, as they have invested billions of dollars over the past 10 years to get to this point. LS will continue to be on CLSA's radar for the future.

In talking about the future, it cannot be overlooked that the average age of the survey community is in the 58 to 59 year old range and that we need to bring more people into the profession. At both conferences it was clear that efforts are being made to encourage students to look into, and hopefully join us, in the profession of surveying. Statewide and regional efforts in conducting events and programs such as Trig-star, Twist, Scouting Merit Badge, high school Career Days, as well as the staking of soccer and baseball fields, all reach out to and hopefully plant the seed of interest in today's youth. We can't afford to underestimate the impact that a single action that **you**, as a surveyor, may have on an individual or a group in their thinking of the survey profession as a whole. During a lunch conversation at the Portland conference I had the opportunity to visit with several OIT students and recent graduates who had joined our table. It turns out that one of them had been to Sacramento to sit for the LSIT test and had been treated to the lunch which the local Sacramento CLSA Chapter has been sponsoring. Even though he was a resident of Oregon, and planned to eventually get licensed in both states, he stated that he was convinced he had chosen the right career, and that he was now also going to join CLSA because of that lunch experience. At the same table was Erielle Lamb. We recognized each other from past conferences when, as a student from Fresno, she had helped at the

CLSA scholarship auctions, as well as having been awarded several scholarships herself. Now having graduated, she had been hired by the State of Oregon and was attending as a PLSO member. I commented that Oregon's gain was California's loss, but that she was an asset to the survey profession as a whole. I was encouraged to see these students so involved in the profession. The same goes for our own Conference, as many students and recent graduates from Fresno State and other colleges were also in attendance and participated in the various seminars and convention events offered. All of these students have benefited from CLSA and the many programs it sponsors. It is, as President, that I would like to task these newest members of the survey community, in particular, to reach out to and use their youth and enthusiasm to spark an interest in the youth of their community. Please get involved in the Career Days of your area and utilize the outreach materials that CLSA has to offer.

*I want to thank the following for having put together a great 2012 conference; Conference Chairs Nancy Almanzan and Dorothy Calegari, as well as our Conference Program Committee of Ray Hebert, Matt Vernon and Crissy Willson.*

In closing, I want to also address a theme that was brought up in both conferences and in several of the seminars that "professional" is not just a title one gets automatically, because it is stated on our registration stamp, or included in the Business and Professional Code. It is the entirety of who we are, what we do, what we say, how we say it, and how we present and conduct our daily business, ultimately it is earned. One of our speakers commented that, whether we like or not, it is true that we are evaluated and decisions made about us within the first four seconds of an encounter. Keeping in mind that each of us individually represents the profession of surveying, project our Profession the way you wish it to be perceived by the public at large. Often I hear surveyors lament that they are not looked at as a professional such as doctors, engineers, attorneys, and that even realtors are held in more esteem than surveyors. Well, perhaps it is time that we think globally about our profession, but act locally in trying to change that perception one contact at a time. Whether that contact is you in a business meeting with a new client, or by your crew in the field when they meet with the client, or the neighbors of the client, you have an opportunity to influence that perception. ❖





# Leica TS02 5" Total Station Package

- Increase your flexibility in data handling by:
  - Bluetooth wireless technology
  - Removable USB stick
  - Mini-USB stick
  - RS232 port
- Accuracy available from 2" - 7"
- Long range reflectorless

**Special: \$7,595\***

Package Includes:

Wood tripod, 8' pole, and single tilting prism

## We Carry a Full Stock of Supplies and Accessories!

**Bipod Special**

- 8209711 - Bipod
- 8228073 - Prism Pole

**\$249.95**



**Mag Nails - ALL SIZES**

**25% off MSRP** Starting at \$3.95 per box

**3/4" to 2 1/2"**

**MAG NAIL**

"Pound it Harder, Find it Farther."



**Leica 25' Self Lock Engineers Tape**

- 8232154

**Special Price!** **\$9.95**



## Rentals Available

- GPS, Total Stations, Levels and accessories
- Daily, weekly, and monthly rates
- Full line of newer models available in stock

**Test drive the latest technology today!**



Local presence ■ National reach ■ Global resources

Visit our California locations:

2942 Century Place  
Costa Mesa, CA 92626  
800-938-0606  
(Formerly Surveyors Service Company)

1447 Rollins Road  
Burlingame, CA 94010  
650-348-7247  
(Formerly Haselbach Surveying Instr.)

\*Pricing subject to change



*Congratulations to the following award winners that were recognized at the CLSA/NALS Conference.*

## Member of the Year



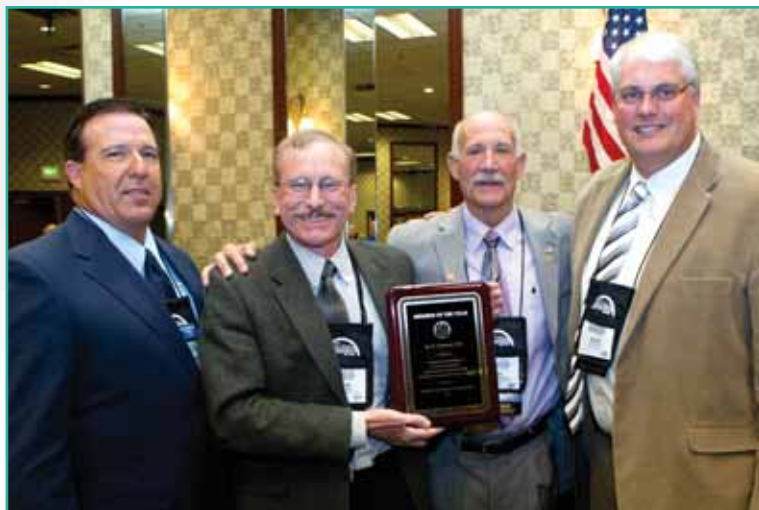
*Annette Lockart, PLS receives Member of the Year (top left)*

*Jay Seymour was unable to attend the Conference due to health related issues. His award was accepted on his behalf by Rolland VanDeValk, Frank Lehman, Bill Hofferber, and Aaron Smith (top right)*

The CLSA Member of the Year Award is given to an individual who has best supported and promoted the objectives of CLSA and who has contributed most to CLSA activities at the state level. This year several worthy nominations were received and the committee was unable to select just one member. Jay Seymour provides his time and talent to educate surveyors throughout the state providing seminars for CLSA chapters and at colleges and universities. He has also been active in outreach programs such as the AYSO Soccer Field Layout program. In addition, Jay has served on the CLSA Board of Directors and Executive Committee since 2009 and is currently serving as CLSA Treasurer.

Another stand-out member this year deserving of recognition was Annette Lockhart. Annette has volunteered time to provide presentations to CLSA members throughout the state. Through programs such as lunches for examinees, TrigStar and American Association of University Women's Annual Science and Math Expo, Annette has dedicated time to provide information about a career in surveying to young people and reach out to up-and-coming surveyors. She has served as GIS Committee Chair for several years where she developed an tri-fold brochure providing information on GIS and Surveyors and also represents Land Surveyors each year at the CalGIS and ESRI Conference.

Annette Lockhart and Jay Seymour support and promote the objectives of CLSA and contribute unselfishly to CLSA activities.



## Dorothy Calegari Distinguished Service Award



*Pat Tami, PLS received The Dorothy Calegari Distinguished Service Award*

It is important that we take the time to recognize individuals that go above and beyond the call of duty. The Dorothy Calegari Distinguished Service Award is CLSA's highest service recognition and as such, the recipient must demonstrate exemplary service to the profession extending beyond the local level and do this for an extended period of time. Pat Tami has done just that. Pat has made many contributions to the advancement of the profession. His resume is vast and includes activities with a national reach. He began his involvement with CLSA as a student volunteer and eventually served as CLSA President. In addition, he has served as NCEES Western Zone Vice President, President of BPELSG and LS Member of BPELSG. Thank you Pat for all you have done for our profession!

## Chapter of the Year



Chapter of the Year is awarded to a Chapter that develops programs, provides services to its members, and promotes the goals and objectives of CLSA for the good of the profession. This year the winning Chapter, Riverside/San Bernardino, worked diligently throughout the year to raise funds for scholarships, provide educational opportunities for members and actively participated in outreach programs including TrigStar and AYSO Soccer Field Layout .

## Chapter Newsletter of the Year



*Rich Brown, Prism Editor received the award on behalf of the Central Valley Chapter.*

The Central Valley Chapter was recognized for their outstanding work in publishing their monthly newsletter The Prism. The Prism is chock-full of great information about the chapter and state activities.

## Chapter Website of the Year



*Mike Jones, Sonoma County Chapter President received the award on behalf of the Sonoma County Chapter.*

The Sonoma County Chapter received Chapter Website of the Year. The website, [www.sonoma-county-clsa.org](http://www.sonoma-county-clsa.org) is a great resource for chapter members providing valuable information for local surveyors.

## Photo of the Year



Palm Springs Tram Station, elevation 8516 feet  
Photo Taken by Doug Redlin, PLS



*By: Robert Fredricks, PLS*

*Bob has 32 years of surveying experience; the last 22 have been with California Department of Transportation (Caltrans) and he was in the private sector prior to that. He presently works as Field Surveys Supervisor in District 5, San Luis Obispo. He is a past president of Central Coast Chapter of CLSA. His previous articles for the California Surveyor are "Surveying Merit Badge," Issue #145 (he started the CLSA/Boy Scout Merit Badge Program), and "Building a Calibration Baseline," Issue #157 (he helped build a baseline for use by San Luis Obispo and Santa Barbara surveyors).*

## Surveying's Hidden Dangers



On the afternoon of May 18<sup>th</sup>, 2011, my phone rang. A strained voice said, "Neal has been electrocuted! He is conscious and seems OK, but the paramedics are getting ready to "Life Flight" him as a precaution...he's fighting with them, he doesn't want to be put in the helicopter." The call was from Chris Bateman, Neal Dickey's Party Chief. What I was told in the next few minutes was the call you hope you never get. The 25-foot sectional Hixson rod Neal was using had come into contact with a 12KV power line, he had been electrocuted, burned, and was disoriented. Neal asked that his wife be contacted.

Chris had called our Department Safety Officer and Neal's wife, Yvette, before calling me. I asked Chris to get Yvette at home and drive her to the hospital. Chris was in Prunedale, Yvette was in Marina, and the hospital was in Santa Clara. It would take some time to get to the hospital but I knew Chris was the best person to drive her; he could talk with her about Neal's condition, since he was one of the two first responders.

Caltrans surveyors in District 5 go through First Aid and CPR training annually. We train for the worst and hope it never happens. Most will have to call on that training at some time in their career. When you work on the highway, you see a lot of accidents. Most are minor, but a few of our people have had to deal with very serious situations. The training just "kicks-in", there is no time think about it.

Chris and the instrument person, Tim Hughes, were on the opposite side of the highway when they heard screaming. From their instrument set-up point they could not see the heavy oak-covered area Neal was working in. They keyed the microphones on their hand held radios and called to Neal. They weren't even sure who was screaming. The voice that came back on the radio could not be understood. Neal had been able to key his mic while lying on the ground. It was clear he needed help. Tim was the first to get to Neal and immediately saw he was in bad shape. Tim took off his coat and vest and covered Neal and began to look for signs of shock. He checked for injuries and saw burns on Neal's arm. Chris called 911. Later Neal would tell us that Tim's confident, assuring voice had a strong calming effect. Neal had been electrocuted and then thrown down a hill. The paramedics arrived within minutes of Chris' call.

*Continued on next page*

That night, I was sent pictures of the area one of the other survey crews had taken that afternoon. I saw a heavy oak canopy of trees completely hiding the power lines above. Ironically, the crew was staking a location for a new power pole. Hundreds of poles were being relocated for a very large construction project. New interchanges are part of that project and Chris' crew was finishing the last of 18 months of utility relocation.

In the morning I called Yvette to see how Neal was doing. I was driving to the hospital in Santa Clara. She said, he had a good night and was being discharged that morning. I asked about the extent of the injuries. I understood his arm had been burned. What I didn't know and was told, his leg had burns and the electricity had blown a hole in his toe exiting his body. She was positive and sounded relieved Neal was coming home.

Because of his early release, I changed direction and went to Watsonville to sit down with the crew and see how they were doing. The whole way while driving to Watsonville I looked at the power lines, they were everywhere. Hidden and standing out, a mixture of so many lines, something you just stop noticing. They camouflage in life's scenery to where they almost don't exist. We called for a "stand down" that day. I looked at all the pictures again and we talked about what we could have done differently. It was clear

what had happened. Neal had raised the rod through the heavy brush so it could be seen from the instrument. Something a lot of us have done hundreds of times. This time the rod came in contact with a 12KV power line. The rod stayed in contact and P.G. & E. had to cut power to get the rod off the line. Neal was lucky to be alive.

All this has led to a new way we approach our work. We now reconnoiter every project. We look for overhead electric and phone lines, vaults and cabinets, underground utilities, poison oak, steep and slippery terrain, animals, traffic hazards, and construction equipment among other things. We have a hazard checklist we complete as part of a Tailgate Safety Meeting each crew conducts. High speed highway traffic is still the biggest danger to our surveyors. But, we also have to be conscious of the hidden dangers our surveyors face every day.

Neal Dicky returned to work three weeks after his accident. A fellow surveyor gave him a t-shirt with a big number "12KV" and the name "Sparky" on the back. At an "All Hands Meeting," Neal showed our roughly forty surveyors his burned shirt, sweatshirt, and jacket. He talked about what it is like to be electrocuted. He described it as, "a million bees inside you, all going off at once." Nobody in that room will ever forget his descriptions of the day. ❖

**QUALITY - PRODUCTS - SERVICE**  
**SUPPORT - FINANCING**



Automatic Levels  
Transits  
Lasers and accessories  
Robotic Total Stations  
Total Stations



**BUILD A PACKAGE**  
Buy a Total Station and we will Discount the Accessories.... (Data Collector, Tripods, Prisms, Poles, etc.)

**You decide what you need.**

- Complete Line of Topcon Total Stations, Robotic and GPS systems.
- PLUS Topcon Transits, Levels, Lasers and accessories.
- NEW, DEMO & USED

**NEW, DEMO & USED EQUIPMENT SPECIALS**  
Topcon Special...

- FREE Tripod, Prism & Prism Pole with Purchase of a New Topcon Total Station
- While Special or Supply Lasts... Call for Info.



**LEWIS & LEWIS ENTERPRISES**  
1800 CALLENS ROAD  
P. O. BOX 1328 - VENTURA, CA 93002-1328  
TELEPHONE (805) 644-7405

**TOLL FREE**  
(800) 235-3377  
sales@lewis-lewis.net

**WEB SITE**  
www.lewis-lewis.net

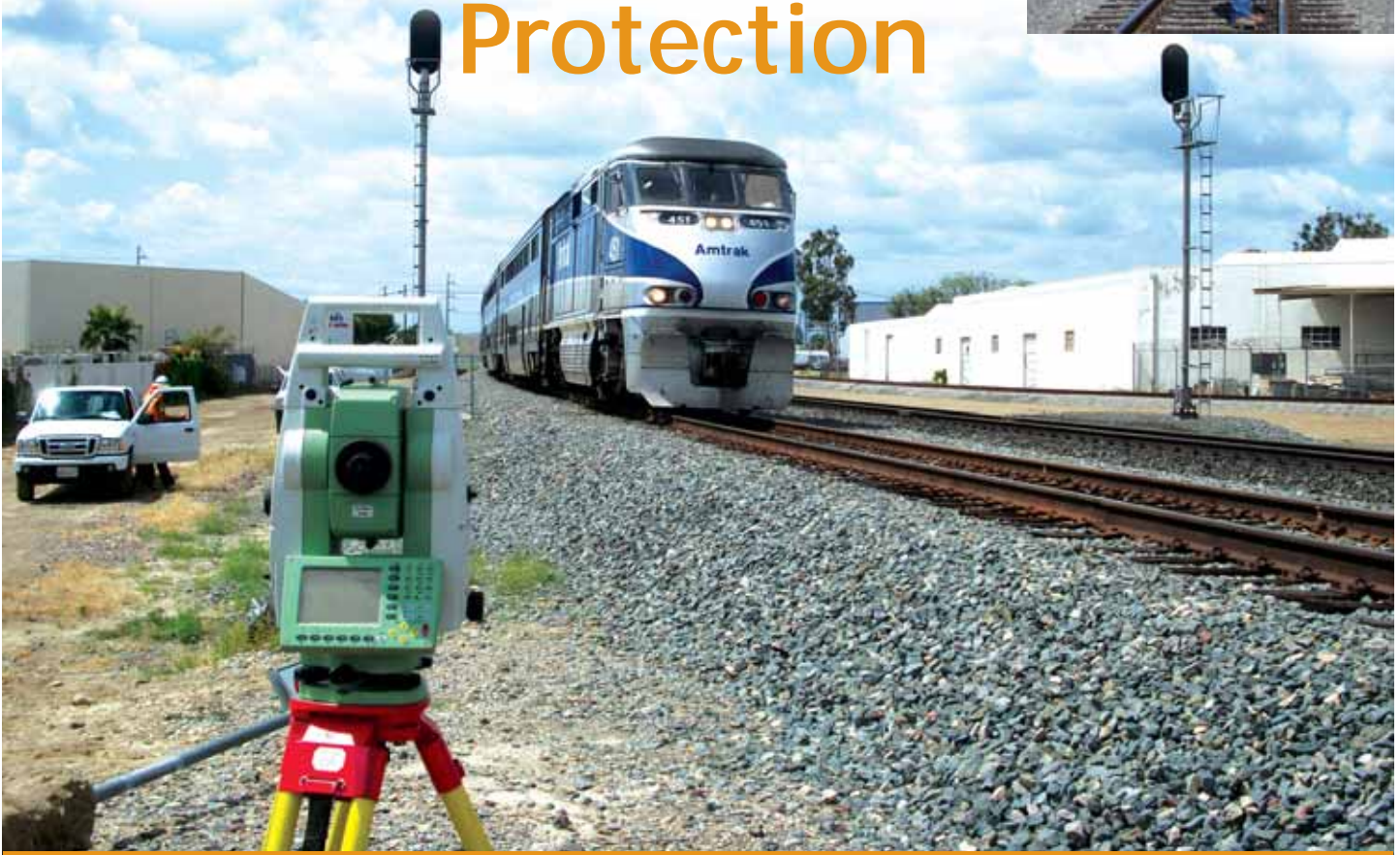




By: *Jim Drenon, PLS*

*Jim is licensed in California and Idaho and is a member of the original Certified Federal Surveyor (CFEDS) class of 2007. Jim began his surveying career in 1979 with the Survey Department of Riverside county as a survey technician. In 1987 he accepted a position in the private sector. Jim is currently project surveyor for Rail Surveyors and Engineers, Inc. (RSE) headquartered in Belmont, CA. RSE specializes in railroad engineering design, planning, data management, construction management, and surveying on railway projects in the San Francisco Bay Area and Southern California. Jim is a member of the CLSA Board of Directors and is CLSA Workshop Committee chairman.*

# Railroad Safety and Roadway Worker Protection



Sam the Surveyor's day started out just like any other Monday. The alarm went off WAY too early at 4:30 a.m. so he could get up, get ready and be on the road at 5:30 to be at the office by 6:30. He let the cat and dog out and headed back up stairs to kiss his wife goodbye and look in on his two kids fast asleep and warm in their beds. He smiled as he went back downstairs remembering how much fun they all had this past weekend.

Sam met his chairman at the office and handed him the keys to the truck for him to load up their equipment. Sam looked at the white board with the crews' scheduled tasks for the day and saw

he had two assignments. His first job for the day was a boundary survey on a commercial piece of property which bordered on the railroad right-of-way. He was also expected at a construction site later that afternoon for some re-stakes and he would get a call from the site superintendent later to let him know what he needed. Sam poured himself a cup of coffee and headed out to the truck thinking it was going to be a great day, even though it was a Monday.

The boundary survey was actually going well. They found most of the front corners and had them tied in with his GPS in

*Continued on next page*

*Continued from previous page*

what he thought was record time. They did not have as much luck on the rear corners. A new wall had been erected and what monuments might have existed were now gone, so much for monument preservation. Sam decided that they would have to locate the center of existing track to determine the right of way line of the railroad which was the same as the rear property line of the subject property.

Sam noticed that there was no easy way onto the right of way other than climbing over the wall. He went over first and his chainman handed over the GPS unit and followed him over. When Sam looked the area over, he noticed that at least their frontage was in tangent, although there was a curve that began just ahead of them but it did not affect their property. He was glad he did not have to mess with any of those railroad curves and spirals.


The property fronted along the railroad approximately 500 feet, so Sam decided to take shots on the center of track every 100 feet. He told his chainman to wait at the starting end and keep a look out. As Sam completed his last shot his phone rang. He answered it still standing at the center of the track with the GPS unit leaning against his shoulder and his back to the curve. It was the phone call from the superintendant he was expecting. As he was talking on the phone a commuter train was rolling toward Sam at 70 MPH which was the allowed track speed for that area. Because of the reduced sight distance due to the curve, Sam's chainman did not realize a train was coming until it was nearly on

him. He turned towards Sam and saw he had his back to him and the train. He tried in vain to get his attention but Sam was too involved in the phone conversation. A train travelling 70 MPH takes approximately 4.9 seconds to traverse 500 feet. Sam never saw what hit him. His chainman watched in horror as his boss and his friend simply disappeared in an instant...

This story is fictional but it brings home a point. How many of us surveyors have had to complete a survey that bordered on a railroad and got out there on the tracks to take those centerline shots? Even though we have the "Right of Entry," if you did not get permission or authority to be out there on those tracks, you were in violation of trespassing. Did you know that you were also endangering your life and any other person you might have had with you out there? That is what this article is about, opening our eyes to on-track safety or Roadway Worker Protection.

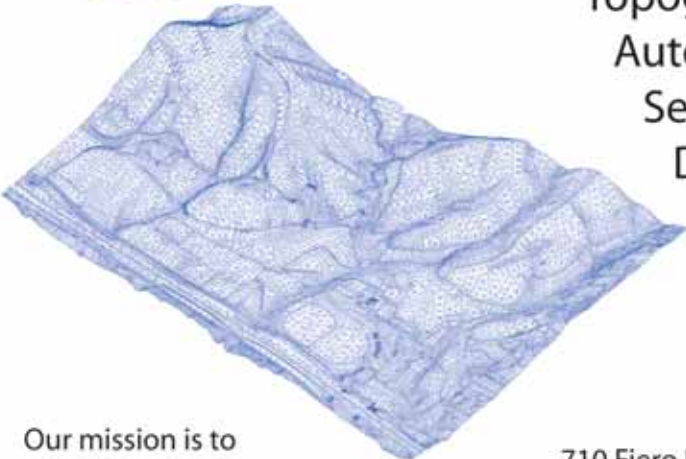
I have had the great opportunity, for the past two and one-half years, to be working with the company, Rail Surveyors and Engineers, Inc.. In that time I have spent many hours working on railroad rights-of-way belonging to BNSF, and Metro Link/SCRRRA and received the necessary safety training allowing me, and our crews, to work within those properties. This has opened MY eyes to the many potential dangers of working within the railroad properties. The Federal Railroad Administration has mandated that all railroad employers have a Roadway Worker Protection Program in place to train and educate railroad employ-

*Continued on next page*




# Central Coast Aerial Mapping, Inc.

Topographic Mapping  
AutoCAD/Microstation/ArcGIS Formats  
Seamless Color Digital Orthophotos  
Digital Terrain Models (DTM)  
Photogrammetric Scanning  
SMBE/SWBE Certified



Our mission is to provide high quality, cost-effective services to our clients.

710 Fiero Ln. #24  
San Luis Obispo, CA 93401  
P(805) 543-4307 F(805) 543-7257  
mail@aerial-maps.com www.aerial-maps.com



ASPRS Certified



Trespasser is someone entering the property illegally without proper notification or permission. Generally they are pedestrians taking a shortcut or engaged in loitering, hunting, bicycling, riding ATV's, and even surveying. The Federal Rail Administration reports that approximately 500 trespassing deaths occur each year throughout the US. Did you know that California has law specifically pertaining to railroad trespass? California Penal Code Section 369i states in part:

*(a) Any person who enters or remains upon the property of any railroad without the permission of the owner of the land, the owner's agent, or the person in lawful possession of whose entry, presence, or conduct upon the property interferes with, interrupts, or hinders, or which, if allowed to continue, would interfere with, interrupt, or hinder the safe and efficient operation of any locomotive, railway car, or train is guilty of a misdemeanor.*

**So, keep that in mind when you decide to take on the survey along the rail line.**



As I stated earlier, the Federal Railroad Authority has put in place statutes regulating worker safety and training. These rules put the burden of providing Roadway Worker protection on the employer whether they are a railroad or contractor. Most of the time the actual training and supervision of contractor employees is undertaken by the operating railroad, but responsibility for this still lies with the employer. California has many operating railroads and hence, many safety training programs each requiring the contractor to partake in their training program yearly prior to any work commencing.

On-Track Safety is defined in the Metro Link Safety Manual as "a state of freedom from the danger of being struck by a moving train or equipment provided by operating and safety rules that govern track

occupancy by personnel, trains, and on-track equipment." On-Track Safety is provided by a number of protection procedures some of which are:

**Train Approach Warning (TAW):** This is a method of establishing On-Track Safety, provided by watchmen, of warning workers of the approach of trains in ample time for them to move to or remain in a place of safety. (A watchman is an employee who has been annually trained and qualified to provide warning to roadway workers of approaching trains or on-track equipment).

**Track and Time:** This method gives the authority to occupy track within specified limits for a given amount of time. The authority must specify track designation, time limits, and track limits.

ees and contractors that will be working within railroad properties. The Roadway Worker Protection regulation has been in effect since January 1997 and since that time there have been a total of 41 roadway worker fatalities. In the one year period from February 2008 to February 2009 a total of 11 roadway workers died while working on the rails. Compared to the thousands of people employed by the railroad and contractors this is a small percentage, however, one person injured or killed is too many. Let it be known that the railroad environment can change rapidly and one must remain focused to recognize those changes. On the railroad, SAFETY is a way of life.

I want to take this opportunity to note the difference between a Roadway Worker and Trespasser. A Roadway Worker is any employee of a railroad, or of a contractor to a railroad, whose duties entail them to work on or near the track or with the potential of fouling the track. A Roadway Worker will not be allowed to work without proper safety training and proper on-track safety. A

*Continued on page 18*



# SRX

## PRECISION

AND RELIABILITY



### Site Resources, LLC

North Kingstown, RI

"Having (Sokkia's SRX total station) has helped us grow at a pace that was way beyond our projections. We got to the point that we needed another unit to keep things going. We started looking at Sokkia's SRX Total Robotic Station.

While the GRX is irreplaceable on larger jobs and open skyline, we needed something for our smaller projects and those jobs in really wooded areas. The SRX really doesn't care about trees—it works no matter where it's sitting. It was the obvious choice for us, we made it, and it's been paying dividends almost since Day 1.

The Sokkia SRX is much faster than shooting it manually—which means we can get into and out of projects quicker. On a typical job, we can probably get 200-300 shots in the same time it takes to get only 100 with a manual station, and accuracies are much better."

**Glen Skurka**  
Project Engineer for Site Resources, LLC

Read more about the SRX:

<http://www.sokkia.com/testimonials>

# SOKKIA

www.sokkia.com  
800.4.SOKKIA

**Track Bulletin Form B:** This method allows exclusive track occupancy with the authority for train passage being with the Employee In Charge (EIC) with specific limits marked on track and trains cannot pass beyond a red flag or marker without permission from the EIC.

Here are a few terms to keep in mind if and when you sign up for any railroad safety training:

**Employee In Charge (EIC):** A roadway worker designated to provide On-Track Safety for one or more roadway work groups.

**Flagman:** An employee designated to direct or restrict the movement of trains past a point on a track to provide On-Track Safety for roadway workers, while engaged solely in performing that function.

**Fouling a Track:** Placement of an individual or a piece of equipment in such a proximity to a track that the individual or equipment could be struck by a moving train or on track equipment, or in any case is within eight (8) feet of the field side (outside edge) of the nearest running rail.

**Working Limits:** A segment of track with definite boundaries upon which trains and engines may move only as authorized by the roadway worker having control over that defined segment of track.

### These definitions are taken from the Metro Link On-Track Safety Manual.

In light of the fact that California has many operating railroads with their safety programs and rules, I will not try to list them all in this article. The Federal Railroad Administration does, however, have a listing of safety rules that they have deemed “Roadway Worker Protection Life Tips” which they issued following an increase in fatalities in 2003. Here is a listing of ones that apply to surveyors:

1. A current copy of the railroad’s on-track safety rules must be readily available.
2. Never foul a track unless it’s necessary in the performance of duty. In other words do not walk or stand in the fouling space to conduct work unless you are absolutely certain that on-track safety has been positively established.
3. You have the right to challenge the on-track safety procedures applied at the job location if you believe that they do not comply with rules of the railroad. All workers should remain clear of the track until the challenge is resolved.
4. An on-track safety job briefing must be conducted before fouling the track, and you should understand all aspects of your on-track safety to ensure that you are adequately protected. The on-track safety briefing must be appropriate for the work that you are about to perform and you must acknowledge that you understand the briefing.

5. Remind the person providing you the on-track safety job briefing that you must be notified of any changes in the on-track safety procedures or conditions that may occur throughout the day.

6. You must know the identity of the worker who is in charge of the on-track safety procedures.

7. It is critical to know the type of on-track safety for the track(s) you are going to foul.

8. The specific working limits must be clearly defined. Otherwise, train approach warning must be provided and when clearing the track, the designated place of safety must be known by all in the work group. It is imperative that you are clear of the track before any train is no less than 15 seconds from your work position.

9. If the work activity is likely to foul adjacent track(s) or it is large scale, you must know what type of on-track safety is provided on those adjacent track(s).

12. The required on-track safety training and/or qualification must be completed before you perform your duties.

13. If required, railroad communication must be available.

14. Stop, look, and listen before crossing any track, regardless of the on-track safety status of the track(s).

One important safety item not mentioned in the flyer BUT is a requirement mentioned in every safety manual for the California railroads is, when working on the rail, each workman must wear personal protective equipment or PPE. Your PPE should include: Hard hat, safety glasses, orange reflective vest, and work boots with distinctive heel and protective toe area, NO RED.

So, let’s look at what the survey crew in our story did wrong. First and most important of all, they were working without proper authority or notice to be on the property. Second, they did not hold a job briefing to discuss any type of on-track safety allowing for the limited sight distance. Third, they did not have any form of communication available with the railroad or between themselves. Last of all, Sam was fouling the track when he did not have to be there AND was using his cell phone within 25 feet of the field side of track, which is prohibited by all California railroads. Remember, the most important lesson to this is that they were out there without authority. Even if they did the other steps correctly, they still should not have been out there without the proper authority.

Hopefully, this article has opened your eyes to the fact that surveying within the limits of an operating railroad involves a lot more than just showing up and getting the shots. Remember, before stepping foot onto that property, contact the agency, or owner of the railroad and ask them about their requirements for working as a contractor on their property. And always, when all else fails, when on the tracks, expect the movement of trains, engines, cars or other moveable equipment at ANY TIME, ON ANY TRACK, FROM EITHER DIRECTION. Always BE SAFE. ❖

## Professional Outreach Events

### The 18<sup>th</sup> Annual El Dorado County Map Drawing Contest

Over 400 El Dorado County students from grades K through 12 submitted maps for the 18th Annual El Dorado County Map Drawing Contest. In honor of National Geography Awareness Week, the map contest was introduced to promote a better understanding of the importance of geography in our world and to encourage the creative talents of young people in the community. The event is sponsored by local professional association "S.A.G.E.," (Surveyors, Architects, Geologists, and Engineers), which this year donated over \$2,500 in prizes. Learn more on the web: <http://eldoradorcd.org/sage/welcome.htm>



Each map is evaluated by about a dozen judges. The plastic bags pictured here are for holding ballots. Judges vote by placing ballots into the envelopes stapled to the maps.

### Engineers Day

In commemoration of Engineers Week (February 19 - 25, 2012) the Sacramento Chapter of CLSA partnered with the Sacramento Section of the American Society of Civil Engineers (ASCE) for its annual Engineer's Day at the Mall outreach event at Sunrise Mall in Citrus Heights, CA. Over 600 people attended the day-long event, which featured fun, free, hands-on activities that allowed kids of all ages to learn about career and educational opportunities in engineering and surveying.



Submitted by Annette Lockhart, PLS (Annette is CLSA 2011 Member of the Year - Editor).

Let us know about your local professional outreach events so we can share the good news. - email: [clsa@californiasurveyors.org](mailto:clsa@californiasurveyors.org)

## San Francisco Treats



By: Dane Ince, PLS

One of the early San Francisco surveyors was Jasper O'Farrell. In 1846 he re-surveyed earlier work of Juan Vioget dating from 1839. One cool evening in November, at the age of 58 Mr. O'Farrell departed this realm while sitting on a saloon stool in San Francisco. Fortunately, O'Farrell's daughter donated the chain he used in the early layout of San Francisco to the Society of California Pioneers, in 1934. Thanks to Patricia Keats, Director of Library and Archives, I was able to see O'Farrell's chain and take way more pictures than one ought to admit. My guess is that the true length of the chain was meant to be 68.75 feet long. This is a convenient 25 varas, a common width of many streets in San Francisco.





By: Carl C.de Baca, PLS  
With contributions from Dylan Angus

*Carl is Principal of Alidade Surveying in Elko, Nevada, the current NSPS Area 9 Director, and a past editor of the California Surveyor. He can be reached at: alidade.nv@sbcglobal.net.*

*Dylan is a surveyor for Newmont Mining Corporation, and also a member of the Phoenix Mine Rescue Team that was called in on the Devin Westenskow rescue efforts.*

# Abandoned Mining Site Dangers

## Tragic Accident

On March 2, 2011, three off-duty employees working for a contractor building a new geothermal power plant some forty-five miles south of Battle Mountain, Nevada were taking in some recreational exploration in the hills west of Jersey Valley. The men were probably exploring the surface remnants of the long-abandoned Rex mine, part of what the Nevada Bureau of Mines and Geology, and the U.S. Bureau of Land Management refer to as the Murphy Mine complex. The area was first mined for copper in narrow underground tunnels or “stopes,” as far back as 1895. This particular mine had been dormant and abandoned since approximately 1945.

Sometime in the afternoon, the three men discovered an old opening into the mine. The opening was dug back into the hillside, with a shaft entrance clearly visible from the surface. The shaft itself was approximately 3’x5’, and was “shored up” with timbers about every 6-8’ down to a depth of ± 100’. The men were on the edge of the shaft peering down into it, trying to decide if they could climb down and explore it. Suddenly, 28-year old Devin Westenskow lost his footing and fell into the shaft, plunging headlong down a steep decline some 190 feet and coming to rest on the floor of a long-forgotten tunnel. After he fell, the other two men attempted a rescue mission, using a man basket and a length of 1.5” manila rope tied to a tree outside the shaft. They did not have the proper safety gear to attempt a descent into the shaft; i.e., climbing rope, safety harness, etc., so they went for help. As anyone reading this knows, once you leave the narrow corridor bracketing Interstate 80, cell phone coverage is negligible throughout northern Nevada. There is virtually no cell coverage in Jersey Valley.

Though the accident site was actually in Pershing County, it was very close to the Lander County line. A Sheriff’s rescue team from Lander County, stationed in Battle Mountain, was much closer than any stationed in Lovelock, and was therefore dispatched to the site. A mine rescue team was also sent from the somewhat nearby Phoenix mine, an open-pit gold and copper mine owned and operated by Newmont Mining Corporation. The Phoenix team brought a camera designed to be lowered down shafts and boreholes.

The Newmont mine rescue team tried to reach the victim by rope descent but the narrow and unstable shaft, being 18 to 36 inches wide and containing much loose rock, prevented the rescuers from getting any more than 150 feet down. One climber’s helmet was split by a falling rock during the descent. The camera was lowered down the hole during this attempt and Westenskow was not spotted and the camera was destroyed by falling rock. The rescuers made a second attempt but that failed again.

Arriving later, a Washoe County search and rescue team brought a camera with them that was designed to work in sewers. This camera was lowered in the shaft to a point where Westenskow’s prone body was spotted. The video camera determined that the man was still breathing, and some motion of his hands was discernable, but the images also revealed serious head injuries. A decision was made to call off rescue attempts and monitor the victim with the camera. Tragically, there was no way to reach Westenskow; the team monitoring the video camera had become a death vigil. On March 4 the man succumbed to his injuries and passed away. Members of his family by then had arrived on the scene and a priest had given last rites. His body has not been retrieved.

## Hazards and Safety Precautions

The Nevada Bureau of Mines estimates there are between 265,000 and 350,000 abandoned mines in throughout the state. Just the spread between the low and high ends of this estimate should give one pause to think. The foothills of the Sierra Nevada mountain range are similar to Nevada in that they too are riddled with old abandoned mines.

A report issued in 2000 following a nearly three-year study by the California Department of Conservation’s Office of Mine Reclamation concluded that there are at least 39,000 abandoned mine sites in the state. After further field investigations, the estimate was increased to 46,900. Prior to the report, the estimated number of abandoned mines in California was based on old data and ranged from a low of 7,000 to a high of 20,000. Of the 46,900 abandoned mines, it is estimated that about 84 percent present physical safety hazards. The DOC also estimates that approximately 5,200 (11 percent) of California’s abandoned mine sites present environmental or chemical hazards. *(Thanks to the DOC’s website for this information)*

There are numerous small communities in the foothills, most originally founded by people in search of minerals and the wealth that finding them brings. Many of these are ringed with abandoned mines. Towns such as North San Juan, Nevada City, Angels Camp, Murphys, Placerville, Plymouth, Jackson, Markleeville and a hundred others owe their birth to miners, and the forested hills surrounding each are veritable pincushions of old tunnels, shafts, adits, stopes, diggings, tailings and other hazards. Each of these old mines poses real danger to California citizens and more specifically to our surveyors. What happened to Devin Westenskow could happen to any one of us.

*Continued on next page*

*Continued from previous page*

When out in the hills and valleys of mining country performing cadastral, topographic, water rights, archeological or mining-related surveys, you have probably been much nearer to an abandoned mine than you know. And if you are working on boundary or construction-related surveys in any of the above-mentioned towns, plus scores of others, you have undoubtedly been in proximity to such mine hazards. Only a few have been fenced off, plugged up or otherwise dealt with. No real funding mechanism exists for hunting these down and eliminating the hazards. Recently the BLM received 1.5 million in federal stimulus dollars to spend on abandoned mine closures in a few Nevada locations; a good start but not nearly enough.

I can testify that the dangers these old mines pose are legion. Underground there are falling hazards like the one that befell Mr. Westenskow; also, tunnels supported by rotting timbers that could collapse at any time, toxic fumes, pockets of gas, pockets of deep water, rattlesnakes and occasionally, boxes of long-forgotten explosives that have become phenomenally unstable. On the surface you can encounter unstable and unsafe buildings, toxic waste dumps, still-liquefied tails with a consistency of quicksand, and more rattlesnakes.

When surveying in remote areas we may not be completely aware of the dangers around us. Whether out enjoying the great outdoors or having no choice in the matter because that is where your current sur-

vey project has taken you, keep safety at the front of your mind as you traipsing around through the trees and the underbrush. I have literally almost stepped into shafts of unknown depth on several occasions while gazing about for some sign of a section corner or property corner. These holes don't all have head frames, spoils piles or other tell-tale signs, and some are only a couple of feet across. So be vigilant, look for signs of old diggings, and if you find yourself among them, for whatever reason, suppress the urge to enter any old adits or tunnels, even just a few feet in is too far with all the possible things that can go wrong. ❖

### **Plan Ahead for Safety**

Are you out surveying? Make sure your office knows where you will be working, at least generally, and when you are expected back. Have a plan for calling in at the end of the day (if you are lucky enough to find cell service). While the latest generation of survey equipment makes it easy to work alone, it's not a good idea to hike around old mining sites by yourself.

Are you out hiking, rock-hounding, taking photos? Make sure someone knows where you are headed. Carry food, water, first aid supplies, a length of sturdy rope and navigation tools: handheld GPS, maps, compass, etc.



**Seafloor**

# HydroLite-TM™

**Hydrographic Surveying Made Simple.**

The rugged HydroLite-TM from Seafloor Systems looks and feels like your traditional survey rod, but this state-of-the-art system makes the tedious, automatic. It quickly measures and logs depths more accurately than standard systems, making fast work of ponds, rivers, lakes and more. Compatible with Trimble, Leica, Topcon, Carlson, Sokkia, Magellan, Spectra, and more.

**Visit [Seafloorsystems.com](http://Seafloorsystems.com) or call (530) 677-1019 today.**

HydroLite-TM is a trademark of Seafloor Systems, Inc. All other brand names, product names, or trademarks are property of their respective owners.



By: Theresa Lynn Burritt, PLS

*Theresa has worked in the Land Surveying Profession for 28 years in private and public agency service. Her work experience has included working for California Surveying Corporation, Department of Transportation (Caltrans: District's 11, 3, 4 and Headquarters), Department of Water Resources (Field and Geodetic Branch), and Nevada Irrigation District as the District Land Surveyor.*

## Close Encounter with Lyme Disease



My marathon journey with Lyme disease began on Friday, May 22, 2009 at 8:30 pm. I was lounging on my couch after a week of working in the field and reached back to scratch an itch on my back. I felt a small lump and I vaguely remembered the area had been bothering me for a couple of days. So, I hauled my butt up off the couch to see what was going on back there. I saw a reddened area with a small black dot in the center. I could not get a direct view at it. I took a picture with a camera to get a better look. Sure enough, it was a tick.

I immediately started calling people to get the tick removed since I could not get at it. A close friend of mine is a RN and she stepped up to the plate. She removed the tick and placed it in a baggie with a wound tape she had used to measure the reddened area with. The tick itself was a bit less than 2 millimeters and the rash was 4 by 14 centimeters. She suggested I go to the emergency room to get antibiotics because she had a family member that had a very serious bout with Lyme disease. At first, I resisted the idea because I did not perceive a tick bite to be a life-threatening event. I compromised with her and phoned the local hospitals advise nurse call center. After describing the size of the rash, admitting I did not know exactly how long the tick had been attached and verifying the tick was consistent with a deer tick, the nurse directed me to go immediately to the emergency room and no, I shouldn't wait until the next day.

I went and waited the usual 3 to 4 hours and finally saw the doctor. He numbed up the area and dug around to make sure all of the tick was removed and then he patched me up. When he was done, he came around to talk to me. I asked him specifically about Lyme disease. I explained my friend knew someone with Lyme and had recommended a course of antibiotics as well as the hospital's own advice nurse. He stated that Lyme disease doesn't exist in California and not to worry about it. He was very reassuring about the whole matter. Finally, I asked him what he would do in my situation. He told me he would not think about it again. I had less than a "one in a million chance of contracting the disease." That was good enough for me, so I got dressed and left.

I went about my work and my life and did not think anymore about the bite. I did carry the tick around and showed a few people

*Continued on next page*

because it looked more like a spider than a tick. I had removed a few ticks from my dogs over the years and this did not look anything like big, fat dog ticks. On July 15th, 2009, while I was at work, I became aware that I was feeling irritation in the same area of the bite. I went to the restroom and pulled up my shirt. The rash was back and bigger than ever! I asked my Human Resource person how to handle it, and she sent me to the District's industrial injury doctor.

When I relayed the story to the doctor, he was taken aback at the emergency room doctor's attitude. The doctor explained that the "rash" was most likely an Erythema Migrans and Nevada County was extremely endemic for Lyme. Most likely I had contracted the disease when I had been bitten. He also explained that if I had received a course of antibiotics at the time I was bitten, it probably would have killed the bacteria. He prescribed Doxycycline and ordered specific blood tests to confirm his suspicions. Immediately after taking the "doxy", I became violently ill with a high fever, blinding headaches, body aches, nausea and profound fatigue. It felt like the worst flu I had ever had multiplied by ten and I did not know what hit me. I was bed ridden and completely unable to go to work.

Three weeks later my blood work came back from the lab and I had tested positive for Lyme. I also tested positive for ehrlichiosis, anaplasmosis, and rickettsia, to name a few of the many co-infections that ticks can pass on to you. Thankfully, the doctor knew a Lyme literate physician in San Francisco and referred me to him. I have been on heavy duty antibiotics for almost three years now, over 20 different types to kill the various bacteria and parasites the sewer of a tick injected into my body. At the time of the bite, I did not know anything about Lyme disease. I have since had to become a Lyme literate patient. The purpose of this article is to educate and hopefully raise awareness of the serious nature of tick borne illnesses. To that end I will provide a few Lyme disease facts, but please bear in mind that this information is not to be taken as medical advice.

### **Lyme Disease Background**

Lyme disease is an infection caused by a spirochete that humans can get from the bite of an infected deer tick. The spirochete's scientific name is *Borrelia burgdorferi*. Lyme disease is called "The Great Imitator" because its symptoms mimic many other diseases. This is the cause of many people, that do not recall being bitten, not getting an accurate diagnosis or effective treatment. It can affect any

*Continued on next page*

## **Proudly Supporting CLSA Since 1978**



**Custom orders your way ... when you need them.**

**When your name is on it, our name is behind it.**

**Berntsen delivers.**

**The professional's choice in survey products • [www.berntsen.com](http://www.berntsen.com) • 877.686.8561**

*Continued from previous page*

organ of the body, including the brain and nervous system, muscles and joints, and the heart. The nymphal, or immature, form of the tick causes most human cases and is about the size of a poppy seed. As their bite is painless, many people do not realize they have been bitten. This is what happened in my case.

The medical community has not yet agreed upon the best treatment for Lyme disease and the debate has been heated. There are two schools of thought on Lyme treatment. One is promoted by the Infectious Disease Society of American (IDSA), the Center for Disease Control (CDC), and insurance companies. This school of thought recommends two weeks of treatment for early Lyme and does not recognize chronic Lyme. The other school of thought is promoted by the International Lyme and Associated Diseases Society (ILADS) and it recommends individualized treatment, based on patient response to treatment. The primary cause of this debate is the lack of an accurate diagnostic test that can determine whether the disease has been eliminated from the body in patients who have persistent symptoms.

The debate has been so contentious the Attorney General of Connecticut successfully pursued an antitrust investigation that has uncovered serious flaws in the IDSA process for writing its 2006 Lyme disease guidelines. Insurance companies have denied coverage for long-term antibiotic treatment relying on these guidelines as justification and thousands of patients have suffered. The guidelines are also widely cited for conclusions that chronic Lyme disease is nonexistent. This serious debate has been extremely well-documented in an Oscar nominated documentary, "Under Our Skin." If you have any interest in learning about Lyme disease, I highly recommend viewing it.

This disease has dramatically changed my life. It has devastated me physically, financially and it has taken quite an emotional toll as well. Please take the time to learn about tick-born illnesses to prevent yourself, or anyone you care about, from having to learn about it the hard way, like I did.

### **Additional Lyme Disease Trivia**

Lyme disease gets its name from Lyme, Connecticut. In 1975, a cluster of children and adults residing in the Lyme, Connecticut area experienced uncommon arthritic symptoms that were misdiagnosed as "adult and pediatric rheumatism." By 1977, the first 51 cases of Lyme arthritis were described, and the Ixodes scapularis (black-legged) tick was linked to the transmission of the disease. Lyme disease has since been found on every continent except Antarctica. The ticks that carry Lyme disease have been found in all but two counties in California. Infected ticks have been found in 42 of 58 counties.

*Continued on next page*


# Hydrographic Surveying Services


**Hydrographic Surveying Services:**

- single beam bathymetry
- sidescan imaging
- ROV underwater video imaging

**featuring:**


- Trimble™ TerraModel® software for benthic surface models & reservoir volumes
- HyPack® Max for hydro surveys
- Imagenex Win881 for sidescan imaging





For more information:  
Tel/Fax: 805-543-5375 robert@reesesurveying.com  
San Luis Obispo, CA

*Geodetic & Land Surveying Services also available*




## Geography Quiz

by: Anne Hoppe, PLS  
and Gernar Berhhard, Ph.D.

The ground surface at the location we are seeking moves northwesterly approximately 10 meters per year relative to the bedrock, which is more than 2000 meters below. The exact location is measured and monumented annually by the USGS on 1 January. Where are we?

*Answer on page 38*





# Close Encounter with Lyme Disease

## Reduce Your Chances Of A Tick Bite

- Avoid tick-infested areas, such as leaf litter under trees. Avoid brushing against long grasses and brush on edges of paths. Don't sit on stumps or fallen logs.
- Wear light-colored long pants and long sleeves so you can easily see any ticks.
- Tuck shirt into pants and tuck pants into socks.
- Use DEET on skin and treat clothing with spray containing Permethrin.
- Do a thorough tick check upon returning inside and for several days following exposure.
- Check bedding for several days following exposure for ticks that drop off.
- Ticks, especially nymphal ticks, are tiny. Find and remove them before they bite

### How to prevent tick bites when working outdoors

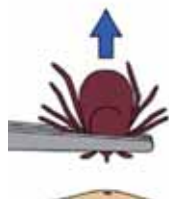
Ticks can spread disease, including Lyme disease. Protect yourself:

- Use insect repellent that contains 20 - 30% DEET.
- Wear clothing that has been treated with permethrin.
- Take a shower as soon as you can after working outdoors.
- Look for ticks on your body. Ticks can hide under the armpits, behind the knees, in the hair, and in the groin.
- Put your clothes in the dryer on high heat for 60 minutes to kill any remaining ticks.

### How to remove a tick

1. If a tick is attached to you, use fine-tipped tweezers to grasp the tick at the surface of your skin.
2. Pull the tick straight up and out. Don't twist or jerk the tick—this can cause the mouth parts to break off and stay in the skin. If this happens, remove the mouth parts with tweezers if you can. If not, leave them alone and let your skin heal.
3. Clean the bite and your hands with rubbing alcohol, an iodine scrub, or soap and water.
4. You may get a small bump or redness that goes away in 1-2 days, like a mosquito bite. This is not a sign that you have Lyme disease.

**Note:** Do not put hot matches, nail polish, or petroleum jelly on the tick to try to make it pull away from your skin.



If you remove a tick quickly (within 24 hours) you can greatly reduce your chances of getting Lyme disease.

and Zoonotic Infectious Diseases  
ases | Bacterial Diseases Branch



## What To Do If You Are Bitten

- Use fine-point tweezers or a special tick-removing tool. Grasp the tick as close to the skin as possible. If you don't have tweezers, protect your fingers with a tissue. Pull the tick straight out with steady, even pressure.
- Avoid squeezing the tick, breaking it, or allowing any blood to remain on your skin.
- Place the tick in a small plastic bag or vial with blades of grass, leaf, or moist (not wet) piece of tissue.
- Label the bag with your name, date, site of bite and how long tick was attached.
- Have the tick identified and tested by a lab, health department or veterinarian.
- Wash your hands; disinfect the tweezers and bite site.
- Educate yourself about tick-borne diseases and consult a doctor to see if treatment is warranted.
- Experts agree that the earlier you are treated, the better; and early treatment is often successful. ❖



By: Carl C. de Baca, PLS

*Carl is Principal of Alidade Surveying in Elko, Nevada, the current NSPS Area 9 Director, and a past editor of the California Surveyor.*

# Conference Review



The 2012 CLSA/NALS conference at the Silver Legacy Resort and Casino in Reno was a resounding success! Over 500 attendees from 21 different states got together for four and a half days of fellowship and education. A well-populated exhibitors' hall and an excellent staff of CLSA and NALS folks, together with a group of eager and helpful students from Cal Poly Pomona, California State University Fresno and Great Basin College ensured that every event and every workshop went off without a hitch. The opening ceremonies were outstanding with the Galena High School Junior ROTC striking the colors as we recited the Pledge of Allegiance followed by a beautiful rendition of the National Anthem performed by Galena High School freshman LaNissa Money. Curt Sumner, the Executive Director of ACSM and NSPS gave the keynote address in his unfailingly eloquent way. He discussed several challenges to our profession and expressed many ideas about how we should adapt to these challenges.

Highlights of the workshops included: Saturday's *Evidence, Exhibits and Testimony* by Chuck Karayan, Sunday's *Charm School for Surveyors* and *Thinking Beyond Technology* by Dennis Moulard, Monday's *Surveying the Comstock* by Steve Parrish and *Communications Skills for Surveyors* by Candice Bauer, Tuesday's *Easements* by Gary Kent, *FEMA* by Kim Davis and Cynthia McKenzie and *Water Rights* by Michael Buschelman; and, Wednesday's mock trial moderated by Gary Kent and featuring David Hardy, Esq. (a real judge) and attorneys Michelle Stone, Esq., and Agnes Hanley, Esq. All of these workshops were well attended and met with great enthusiasm.

In addition to these longer workshops, there were numerous shorter workshops on subjects as diverse as: the *California Environmental Quality Act* and *General Plan, Specific Plan, Zoning* by Michael Durkee, Esq., *Laser Scanning* by Jeremy Evans, *Future Changes in the NSRS and NGS* by Marti Ikehara and Bill Stone; *How to Prepare an Effective RFQ/RFP* by Ray Mathe; *Tahoe Regional Planning Agency* by Gary Midkiff and Nick Exline; *San Joaquin Valley Subsidence & Beyond* by Tim Case; *Solar Energy and Surveying* by Fareed Nader and *Eminent Domain* by Bill Hofferber. That's a lot of hours of mind expanding discussion!

LS members of the Nevada Board of Professional Engineers and Surveyors Alan Riecki and Robert LaRiviere and Executive Director Noni Johnson hosted a Q&A session on NV enforcement issues. From California, LS Board Member Pat Tami, Executive Officer Ric Moore, Senior Registrar Land Surveyor Ray Mathe and Senior Enforcement Officer Nancy Eissler hosted a similar talk employing a game show format. Using Family Feud as a template emphasizing competition between CLSA chapters, the group took us through a variety of enforcement issues. It was great fun and very enlightening too.

A multiple-day LS Review tract was also featured at the conference. Many thanks to Debbie Naves, Jim Pilarski, Mike Hart, Kevin Akin, Ian Wilson, Neil King, Dave Woolley, Robert Reese, David Paul Johnson and Jeremy Evans and anyone else involved in this great endeavor toward helping the next generation of Land Surveyors come along. This is a noble cause indeed. In addition to the numerous educational opportunities available throughout the conference, several events provided the opportunity to get together and enjoy each other's company or to celebrate the profession or a little of both. First up was the CLSA Education Foundation bowling tournament, held this year at the Grand Sierra Casino on Saturday night. While few of the participants are getting their PBA cards anytime soon, I did see Jim and Barbara Herrick getting back to back strikes at one point! Tasty beverages and gutter balls flowed with equal vigor and awards were handed out before the bus ride back to the Silver Legacy. Attendance was terrific and it took two buses to ferry the bowlers back to the host hotel.

Sunday saw the Icebreaker Reception in the Exhibit Hall followed by packed rooms as both the NALS and CLSA presidents hosted hospitality suites. This was a great chance to meet new people and have interesting conversation, although with NALS President Ray Hebert providing live music featuring himself (wicked harmonica) and his way too talented guitarist son Tyler, conversation was sometimes difficult. At one point Curt Sumner was coerced into picking up a guitar and he serenaded the room with four or five songs he has written. Donny Sosa from ESRI joined the Heberts and Curt for a jam as well.

*Continued on next page*

Continued from previous page

The Monday luncheon featured a performance by the Laughingstock Comedy Company whose 'improv' style poked, prodded and parodied the profession to great effect. On a couple of occasions they took volunteers from the audience including a Jeopardy-like skit involving 8 volunteers in three groups doing silly things and making funny noises. The comedians' take on surveying was definitely one of the highlights of this year's conference! The live scholarship auction was an incredibly fun way to spend Monday evening. The list of donated items was tremendous this year and auctioneer Lightnin' Williams worked the room with his usual humor and zeal. We raised over \$33,000 in the live auction and at the close of the last silent auction table the next day we saw another \$12,000, for a total of \$45,000.

During the Nevada portion of the awards banquet on Tuesday, Tom Foote's family was in attendance and in a touching speech his son Ryan awarded the Thomas A. Foote memorial scholarship to Jolene Hoffman of Great Basin College. Savannah Winans received the Roger P. Monsen Memorial Scholarship for 2011. Paul Pace took home two awards: the first for Article of the Year for his two part series on the life of Butler Ives which appeared in the Traverse, and he also was honored as Surveyor of the year. Robert Carrington received the Meritorious Service award. Monsen Engineering received the Sustaining Member of the year

award. NALS recognized two longtime members with Life Member status: Walt Neitz and Les McFarlane. During the California portion of the awards banquet on Tuesday Annette Lockhart and Jay Seymour received the CLSA Member of the Year awards, the Riverside/San Bernardino Chapter received the Chapter of the Year award, the Central Valley Chapter received the Chapter Newsletter of the Year award, the Sonoma Chapter received the Chapter Website of the Year award, Doug Redlin received the award for Photo of the Year and the Dorothy Calegari Distinguished Service award went to Pat Tami. Congratulations to all the recipients from both states!

The Conference wrapped up on Wednesday with the mock trial that was based on a script written by Gary Kent who also moderated the proceedings, followed by the closing ceremonies where the winners of the grand prize drawing walked away with an iPad and a digital camera. I want to give a special thanks to the vendors, sponsors, representatives of the Silver Legacy, the NALS and CLSA officers, the Conference Chairs Dorothy Calegari and Nancy Almanzan and CLSA Central Office who put this conference together – Great job everybody! This was another terrific conference. If you were unable to attend, you should plan to catch the 2013 conference as we are again holding joint conference in Reno in March. See you there! ❖

# THE SUBDIVISION MAP ACT

*A One-Day Seminar in Several Locations*

**This seminar provides guidelines for effective use of the Subdivision Map Act.**

- New Legislative and Judicial developments in 2012
- Relationship of Map Act to other planning, zoning and development laws, and to CEQA
- When the Map Act applies (and when not)
- What kind of Map (tentative/final or parcel map) to use
- Certificates of Compliance, Lot Line Adjustments, Contiguity, Remainder Parcels
- Exemptions and Exceptions under the Map Act
- Life of Tentative Map
- Getting the most out of Vested Rights (incl. Vesting Maps, Development Agreements and Common Law Vesting)
- Conditions of Approval/Exactions/Dedications/Fees
- Creative mapping approaches
- Appeals/Judicial Actions

**WHO SHOULD ATTEND?**

Public and private planners, surveyors, engineers, public works and utilities staff, developers, builders, environmentalists, attorneys, project managers, architects, planning commissioners, city council and board members, property managers, zoning board members, neighborhood groups, and all others involved with the land use process.

Qualifies for 6.0 hours of California MCLE Credit.

**\$195** - Discounts available for Groups & CLSA members  
Time 9:00 am - 4:30 pm • Registration opens at 8:30 am  
Includes: **the Map Act Navigator 2012 a \$49.95 value**

**April 19 - Redwood City**  
Redwood City Woman's Club 149 Clinton St

**May 17 - Marina**  
Marina Airport Conference Room 761 Neeson Rd

**June 21 - Bakersfield**  
Bakersfield Marriott 801 Truxton Ave

**July 19 - Costa Mesa**  
Neighborhood Community Center 1845 Park Ave

**September 20 - San Diego**  
San Diego Concourse 202 C St Copper Room

Register by calling 415-273-0310  
or at [LandUseNavigators.com](http://LandUseNavigators.com)  
or register and pay at the door

**LAND USE NAVIGATORS** | Allen Matkins  
*in association with*

# CLSA/NALS CONFERENCE 2012 *Highlights*

Special thanks to Steve Shambeck, PLS Photography





# Thanks the Scholarship Auction Donors



## Special Thanks to Those that Donated Items to the Scholarship Auction

Mark Adams	Lake/Mendocino Chapter, CLSA
Ross Ainsworth	Layton Printing
Alidade Surveying	Frank Lehmann
Nancy & Ray Almanzan	Kurt Lehnhardt
Assurance Risk Managers	Marin Chapter, CLSA
John Atwood	Elyse H. Mackenzie
Berntsen International, Inc.	Armand & Chris Marois
BHA, Inc.	Steve Martin
Boomers Fountain Valley	McPheeters & Associates
Boomers Modesto	Monsen Engineering
Brenner & Assoc.	Ric Moore
Dorothy Calegari	Ron Nelms
California Surveying & Drafting	Keith Nofield
Linda Carruthers	Norco College
Cascade Chapter, CLSA	Northern Counties Chapter, CLSA
Cashe Creek Casino	Omni Means
Carl CeDeBaca	Paul Pace
Cheesecake Factory	Michael Pallamary
Martin & Rhonda Crook	Ron Parker
Steve Danner	Steve Parrish
Hal Davis	Reno Convention & Visitors Bureau
Diamondback Surveying	RO Anderson Engineering
Disneyland	Sacramento Chapter, CLSA
Larry Durfee	San Diego Chapter, CLSA
East Bay Chapter, CLSA	San Francisco 49ers
Dr. James Elithorp	San Francisco Giants
Vic Erickson	Ed Schillinger
Peter Friedman	Silver Legacy Resort & Casino
Great America	Skateland Northridge/Mountasia Fun Center
Great Basin Chapter, NALS	Brian Smith
Engineering Supply Company	Randy Smith
Hall & Foreman, Inc.	Snoopy's Home Ice
Janine Hampton	Stantec Consulting Services
Darrel Harness	David Stanton Sugar Bowl
Jim & Barbe Herrick	Curt Sumner
Bill Hofferber	SurvKap
Claude Hoffman	Rich Stinchfield
Marti Ikehara	Tiffany Tatum
Infineon Raceway	Jerry Tippin
In-N-Out Burger	Rolland VanDeValk
Byron Johnson	Vista International Insurance
Joost Land and Cattle Co.	John Wilusz
Stan King	

## Special Thanks to Those that Purchased Items at the Scholarship Auction

Kristie Achee	John Harrison	Michael Pulley
Adrian Aguirre	Jeffrey Henkelman	Timothy Rayburn
Raymond Almanzan	James Herrick	Norman Rockwell
Tom Ames	William Hofferber	Richard Roper
John Baffert	Derek Hood	Michael
Allan Baird	Ronald Holverson	Schlumpberger
Mark Boge	Edward Hunt	Karl Sharlette
Travis Bohan	Thomas Hunt	Aaron Smith
Phillip Bray	Gary Hus	Brian Smith
Chantel Brown	Beau Immel	Lance Smith
Richard Brown	Michael Jalbert	John Snee
Howard Brunner	Ross Kinnie	Donald Solheim
John Burgess	Vincent Kleppe	Keith Spencer
Dorothy Calegari	Ralph Koehne	Matthew Stringer
Charles Capp	Lynn Kovach	Tiffany Tatum
Robert Carrington	Michael Kidd	William Telling
Carl CdeBaca	Charles Krepp	Aundrea Tirapelle
John Coffey	Frank Lehmann	Jeffrey Thompson
Sean Corkill	Kurt Lehnhardt	James Turner
Marty Crook	Robert MacKenzie	Ronald Turner
James Crossfield	Armand Marois	Matthew VanDeValk
Harold Davis	Steven Martin	Rolland VanDeValk
Stephen Dean	Alfredo Mijango	Marc Van Zuuk
Steve Dillon	Mark Molini	Adrian VerHagen
John Dodrill	Richard Moore	Ryan Versteeg
Larry Durfee	Mark Morberg	Matthew Webb
Shawn Eaton	Chad Moser	Richard Widmer
Victor Erickson	Walter Neitz	Crissy Willson
Peter Friedmann	Keith Nofield	Ian Wilson
Donna Fujihara	Evan Page	John Wilusz
Roger Frank	Bruce Parker	Peter Wiseman
Bruce Gandelman	Steve Parrish	Russell Wood
Matt Gingerich	Peter Perazzo	Jonathan Wooten
Ramon Gonzalez	Eric Phillips	Li Zhang
Andrew Hammond	Joe Pacheco	
Steven Hampton	Larry Perkins	



Viva TPS



Viva GNSS & TPS



Viva GNSS



Viva Controllers & Software



## Leica Viva – It does not get more versatile.

Leica Viva – is a **new generation measurement system** that combines the latest state-of-the-art technologies into an unrivalled portfolio of total stations, GNSS receivers, system controllers and onboard software. Encompassing innovative, feature-rich functionality with a new, modern and ergonomic design, Leica Viva is easier and more intuitive to use than any of its predecessors, yet it does not compromise on speed and precision.

Visit [www.leica-geosystems.us](http://www.leica-geosystems.us) or contact your local Leica Geosystems representative for more information:  
**Hans Haselbach – Northern CA**  
C. 650-544-7247  
Email: [hans.haselbach@leicaus.com](mailto:hans.haselbach@leicaus.com)

**Jason Paris**  
C. 831-247-1881  
Email: [jason.paris@leicaus.com](mailto:jason.paris@leicaus.com)

**James Yaccino – Southern CA**  
P. 714-308-3889  
Email: [james.yaccino@leicaus.com](mailto:james.yaccino@leicaus.com)

- when it has to be **right**

**Leica**  
Geosystems

## Santiago Canyon College

### SURVEY/MAPPING SCIENCES PROGRAM



Preparing for California LSIT or LS exams? Need to upgrade your skills? New surveyor? We offer:

- Affordable classes with certified instructors
- Survey/mapping certificate and degree programs
- Computer labs equipped with GPS, ESRI-GIS, and AutoDesk software
- Total Stations and GPS for field exercises
- Evening classes in City of Orange
- Career training for new surveyors

For more information call (714) 628-4883 or visit [www.sccollege.edu/survey](http://www.sccollege.edu/survey)



**Santiago Canyon College**  
8045 East Chapman Avenue  
Orange, CA 92869

## Index To Advertisers

Allen Precision Equipment	41
Berntsen International, Inc.	23
California Property Specialists, Inc.	43
California Surveying & Drafting	48
Cartwright Aerial Surveys, Inc.	33
Central Coast Aerial Mapping, Inc.	15
Engineering Supply Company	39
First American Data Tree	47
Leica Geosystems Solutions Center	9 / 31
Lewis & Lewis	13
Office Depot (Member Benefit)	4
Reese Water & Land Surveying	24
Santiago Canyon College	32
Seafloor Systems, Inc.	21
Sokkia	17
Subdivision Map Act Seminar	27
Surv-Kap	25
Total Merchant Savings (Member Benefit)	33
Trimble	3
Tri State Photogrammetry, Ltd	35
Vista International Insurance Brokers	32

# MANAGE YOUR RISK

*Insurance Products From Vista International*

- ✓ **Professional Liability**
- ✓ **Office Package**  
(Property, General Liability, Equipment)
- ✓ **Business Auto**
- ✓ **Workers Compensation**
- ✓ **Personal Insurance**



**Vista International Insurance Brokers**  
1318 Redwood Way, Suite 250  
Petaluma, Ca 94954  
Call (707) 796-7180 or  
(800) 819-8808  
[www.vistainternational.com](http://www.vistainternational.com)  
License No. 0F64200



# Welcome *New CLSA Members*

## CORPORATE

Douglas Banks, Lodi  
 Charles Camarillo, Redlands  
 Shawn Eaton, Auburn  
 Donna Fujihara, Bakersfield  
 David Garrett, Fairfield  
 David Grassel, Camarillo  
 Geoffrey Grounds, Santa Clarita  
 Mark Heimbürger, Roseburg, OR  
 Aleksander Jevremovic,  
 Santa Barbara  
 Christopher Knowlton, Bakersfield  
 Glenn Lake, Laguna Hills  
 Frank Lucido, Del Rey Oaks  
 Melvin McQuarrie, Herber City, UT  
 Robert Neathamer, Medford, OR  
 Francelina Neto, Pomona  
 Michael O'Dell, Sunnyvale  
 Kathy Pugh, Santa Cruz  
 John Schmidt, Meadow Valley  
 Joe Story, Santa Rosa  
 Walter Thomas, Fresno  
 Joseph Thompson, Sunnyvale  
 Wade Weaver, Orange

## ASSOCIATE

Rebecca Auerbach, Berkeley  
 George Ball, Soulsbyville  
 Daniel Beever, Roseville  
 Timothy Boone, San Ramon  
 Alex Caragay, Pittsburg  
 Drexyl Ekparian, Prather  
 Christopher Fassett, Rocklin  
 Januario Garces, San Jose  
 Stuart Hagerman, Vacaville  
 Aaron Jenks, Vista  
 Kass Kozloski, South Lake Tahoe  
 Juan Lopez, Silver Lake  
 John Meyer, Reno, NV  
 Ryan Michalak, Sacramento  
 Tony O'Rourke, Willow Creek  
 Eric Phillips, Redding  
 Kris Puthoff, Morgan Hill  
 James Remele, Lakeside  
 Robert Robinson, La Mesa  
 Jeff Sheldon, Redwood Valley  
 Jason Simmons, San Jose  
 Andrew Sipila, Fort Bragg  
 Matthew Tanner, Oakland  
 Richard Terrazano, Riverside  
 Scott Thompson, Anaheim  
 Adrian VerHagen, Sacramento  
 Frederick Woods, Castro Valley

## AFFILIATE

Robert Bigelow, Sacramento  
 Ken Elwin, Merced  
 Daryl Jordan, Merced  
 Dennis Layton, Las Vegas, NV  
 Audrey Louis-Enstrom, Castro Valley  
 Joesph Neunzig, San Jose  
 Jimmie Pallares, Antelope  
 Tim Reyes, San Jose  
 Freddy Torrez, Palm Desert  
 Kheng Vang, Madera  
 Robert VanHorn, Shingletown  
 Vincent Zakrzewski, New York, NY

## STUDENT

Matthew Arrington, Porter Ranch  
 Peter Binz, Fresno  
 John Hennon, La Canada Flintridge  
 Scott Kandarian, Sanger  
 Matthew Laninovich, Pomona  
 Jake Lappert, Riverside  
 Jannet Loera Gutierrez, Riverside  
 Eric Metz, Corona  
 Richard Moreno, Santee  
 James Riahy, Long Beach  
 Pantalion Sanchez, Sacramento  
 Bereket Segid, San Jose  
 James Thornton, Auburn  
 Van Tran, West Covina  
 Matthew VanDeValk, Bakersfield  
 Ronald Ver, West Covina  
 Gnoui Yengoian, Pasadena

**CLSA**  
 CALIFORNIA LAND SURVEYORS ASSOCIATION



- Topographic & Planimetric Mapping
- Orthorectified Photography
- Volume Calculations
- Aerotriangulation
- Historic Film Library
  - most northern and central California counties
  - as early as 1959
- Established in 1946



**Cartwright Aerial Surveys, Inc.**  
 5999 Freeport Blvd., Sacramento, CA 95822  
 www.casmap.com  
 916-421-3465 866-421-3465  
 916-421-3469 Fax

## MERCHANT SERVICES PAYMENT SOLUTIONS



## Credit Card Processing for Land Surveyors

**OPEN A NEW MERCHANT ACCOUNT AND RECEIVE  
 A FREE CREDIT CARD TERMINAL**

- Credit and Debit Cards Processing
- **VERY COMPETITIVE RATES**
- Gift Card and Electronic Check Processing
- Fast Turnaround for Processing Visa/MC, American Express and Discover
- Wireless and Internet Processing Solutions

**FREE**  
 Credit Card  
 Terminal

(No set up charge. \$75 yearly maintenance fee.)



15 YEARS OF PAYMENT PROCESSING EXPERIENCE!



**Call or e-mail Julie Today**  
**707-548-3086**

juliemonaco@gmail.com www.totalmerchantsavings.com



## RISK MANAGEMENT FOR LAND SURVEYORS

# Get Your CLSA Safety Tailgate Meeting Guide Use it and Keep Down Your Insurance Costs

**G**ood safety practice is the loss control portion of a good risk management program that will save you money, time, and even your life. By following the advice, instructions and format of the CLSA Safety Tailgate Meeting Guide, which you can obtain online from CLSA, you will keep yourself and your workers strong, happy, healthy, and safe from harm on the job. You will also keep your workers compensation and general liability insurance costs under control.

The Guide is easy to follow and use. It gives advice on safe driving, personal worksite protection and how to avoid office and job site injuries. Bad driving, improper lifting, slips and falls are cited by workers compensation and general liability underwriters as frequent and costly claim producing events. When you coordinate risk management, loss control and safety you make it safer for yourself, your workers, your clients, and the general public. You also save money for your company and on your insurance.

### Chapters and Checklist

The 174 page Tailgate Meeting Guide has 77 brief and easy to follow chapters along with an attendance and meeting report page. Information is included about how to conduct effective meetings and presentations. Tailgate meetings comply with Cal OSHA safety orders and many insurance company injury and illness prevention guidelines.

Even if you are a small proprietor or a small surveyor, it is worthwhile to review the Guide. Knowing that automobile accidents are the leading cause of workers compensation claims will help you and your workers avoid speeding, aggressive and distracted driving. Stressing personal protective gear will make you wear your hard hat, safety shoes, gloves, hearing and eye protection.

### In the Field

You're often in the woods, on the roads, hiking hills and you need to watch out for snakes and spiders, mountain lions and traffic. In varied terrain and situations you need to avoid poisonous bites and blisters, sunburn and poison

oak, collisions and falls. There's a lot to think about, to be aware of the need to exercise caution. The Guide tells you how to avoid heat stroke: drink water and keep in the shade if possible. Seek medical help if you get weak and clammy. Protect your skin with adequate sun screen. You learn what to do about burns, choking, blisters, and CPR. Watch your back and pay attention to how you lift heavy objects that can result in big workers compensation claims. When surveying on the roads and highways wear bright clothes, face traffic, and have spotters and signs and flagmen as necessary.

### At the Job Site

Don't work above exposed rebar, be aware of open trenches, open floors, construction equipment. Watch out for other workers. It's all in the Guide.

And of course, avoid slips and falls, tools on the floor or ground, tripping on stairs. Know who is around you and who you're working with. Remember to report unsafe working conditions. Tie off, wear fall protection, ear plugs, gloves and whatever you need to be happy and healthy. Follow good housekeeping rules for yourself and whatever is required on the job site. Be orderly and clean up every night. Keep your equipment out of the way. Be careful lifting and shoveling,

### In the Office

What applies in the field applies in the office, so watch how you lift, remove tripping hazards, pay attention to ergonomics to avoid back, arm and wrist, especially carpal tunnel syndrome, injuries. Get up from your computer and walk around. Stretch. Wash your hands. Be ready for emergencies and know what to do in event of fire, burns, shock, earthquake, flood or auto accident.

Practice safe working habits to avoid close calls. Good safety keeps you alive and financially fit. Bad safety can bring ruin. Money can not alleviate pain and suffering, disability, lost work time or death. It's all in the CLSA Safety Tailgate Meeting Guide. Get it. Use it. Be happy. ❖

## *Special Thanks to the 2012 Conference Sponsors*

Nancy & Ray Almanzan, NALS  
Members  
Bakersfield Chapter, CLSA  
Central Valley Chapter, CLSA  
CFA, Inc.  
Channel Islands Chapter, CLSA  
Diamondback Surveying  
First American Data Tree  
Lahontan Chapter, NALS  
Leica Geosystems  
Los Angeles Chapter, CLSA  
Northern Counties Chapter, CLSA  
NV Energy

Riverside/San Bernardino  
Chapter, CLSA  
Sacramento Chapter, CLSA  
Santa/Clara San Mateo Chapter,  
CLSA  
Southern Nevada Chapter, NALS  
Sonoma County Chapter, CLSA  
Spencer B. Gross  
Stanley Consultants  
Syntech  
VTN  
Wallace Morris  
Li Zhang, NALS Member

**TRI STATE  
PHOTOGRAMMETRY**  
*Land Information Solutions*

**Tri State Photogrammetry**

**Northwest Region Office**  
1925 E. Prater Way  
Sparks, Nevada 89434  
(775) 358-9491  
Fax: (775) 358-3664

**Southwest Region Office**  
3471 W. Oquendo Rd., Ste. 102  
Las Vegas, Nevada 89118  
(702) 222-0986  
Fax: (702) 895-9652

**Topographic & Planimetric Mapping For Design Engineering**

**Digital Orthophotography & Cadastral Mapping**

**GPS/RTK Surveys**

**Image Matched DTM/DEM & Contouring**

**1-800-411-3752**  
**www.TriStateLtd.com**



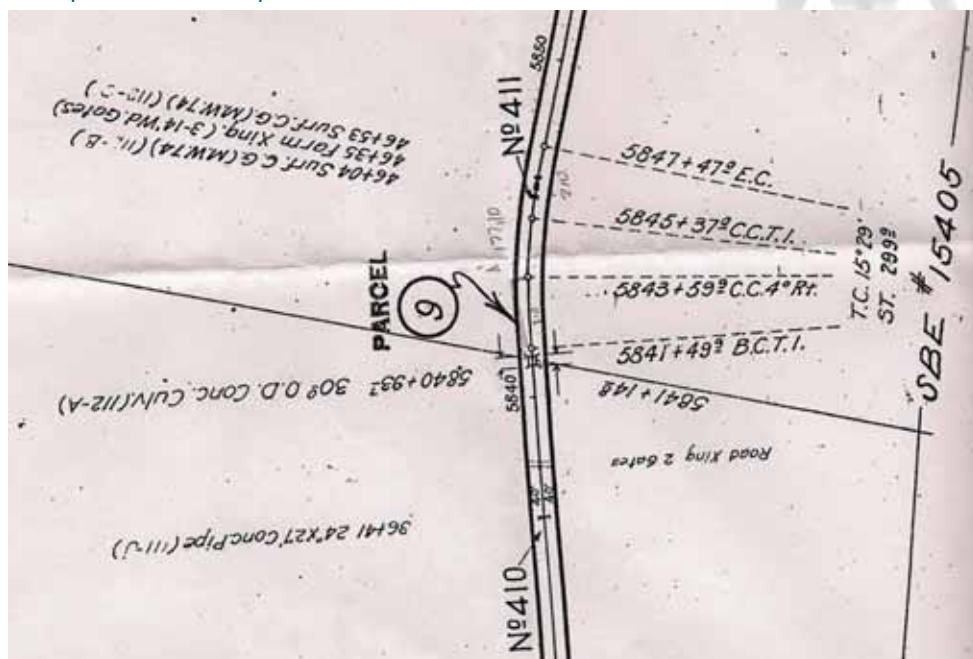
By: Michael McGee, PLS

Michael obtained professional licensure in 1971, served as State President of the California Land Surveyors Association in 1985 and obtained a Bachelor of Science Degree in Surveying Engineering from the California State University at Fresno in 1990. He has extensive experience in boundary, geodetic, and forensic surveys. He is a GNSS Specialist and Consultant providing Project Management Support, performing Quality Assurance-Quality Control Surveys, and Expert Witness Services. He recently completed a LiDar and mapping QAQC control network along the entire coastline of California.

## Railroad R/W Centerline May Not Be the Center of the Tracks in a Curve

While working on a project for the Union Pacific Railroad in Santa Barbara County in 2000, I was requested to stake the railroad R/W. I was advised by the Omaha, Nebraska office of the Union Pacific Railroad that the center of the R/W in our location followed a circular curve as defined in the "Southern Pacific Taper Tables" and not the spiral curve that defines the center of the tracks as shown on the track map. I was supplied a copy of the Tables and an explanation of how they are used to establish the circular center of the R/W. At a CLSA Seminar in October 2009, titled "Railroad Surveying 101", speaker Charlie Tucker reiterated this concept numerous times during the day.

### Example Railroad Map



The curve shown on the Example Railroad Map is a "Simple Curve – Equal Tapers at Both Ends" (see below diagram taken from Page 2 of the SP Taper Curve Tables). The begin of curve station "5841+49.9 B.C.T.1" is the begin of a No. 1 Taper spiral curve (B.C.T.1) which is defined as changing 30 minutes of arc for each 30 foot chord (a No. 2 Taper would change 60 minutes for each 30 foot chord). The length of the spiral is 210 feet or 7, 30 foot chords ending at a point of compound curve at station "5843+59.9 C.C.4° Rt.". At this point the spiral becomes a 4 degree circular curve (C.C.4° Rt.). In this case, a 4 degree curve is defined by two 50 foot chords enclosing 4 degrees of curvature (see Example Curve Definitions).

The radius "R" of the track circular curve (NOT the same curve as the center of the right of way) is given in the Taper Curve Tables on Page 13 and 19 as 1432.467' (=25/sine (degree of curve/4)). The radius "D" of the center of the R/W (NOT the same curve as the center of the track circular curve) is given in the Taper Curve Tables on Page 19 for a No. 1 Taper with 7 chords as 1434.116'. The offset between the two curves is given as "d" in the same Taper Curve Tables as 1.649'. The Begin and End of the circular curve for the center of the R/W (again, NOT the same curve as the center of the track circular curve) is located 104.969' towards the PI on the semi-tangent from the Begin Curve and from the End Curve, respectively, listed as "t" in the Taper Curve Tables on Page 18 for a No. 1 Taper with 7 chords. The total semi-tangent shown on the map is 299.9' which agrees with the sum of 104.969 plus the semi-tangent of 194.96 (=D\*tan(15°29'/2)).

The following interpretations of the Example Railroad Map (below) are made with reference to the Southern Pacific Taper Curve Tables titled "S.P. Taper Curve Tables, Corrected March 1924." The table is available in the member's area of the CLSA website under "Articles."

Continued on next page

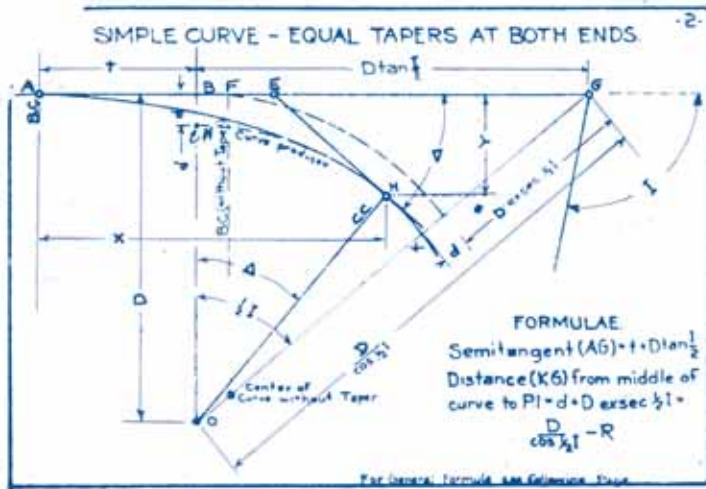
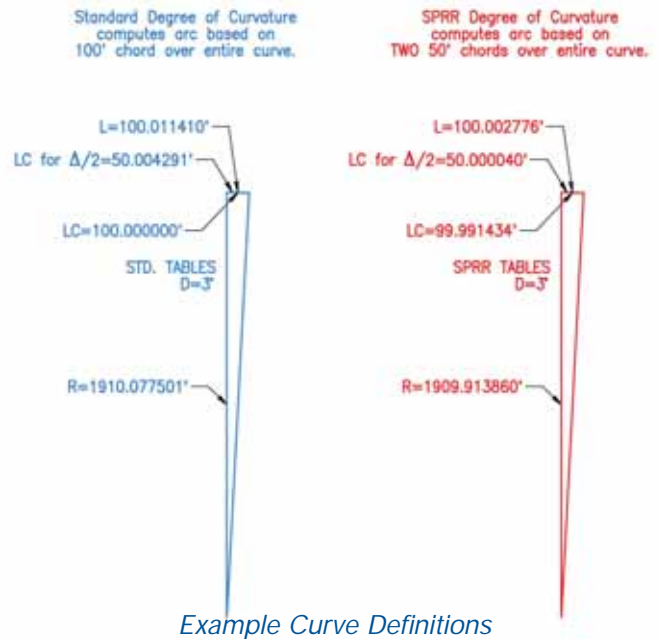


Diagram from Page 2 of SP Taper Curve Tables

Assuming there is nothing in the deeds to the contrary, using the track centerline for the R/W centerline would result in a 1.649 foot error in the R/W location in the circular portion of the curve.

The following link was offered up by Steve Martin in March 2010 as part of a CLSA Forum Thread, and by Evan Page, PLS in a 2008 Thread titled Spirals who stated "The definitive reference on these curves was written by Lee

Perkins, a SPRR field engineer, in 1915. A PDF version of this book can be found here: <http://www.archive.org/details/railroadtaperthe00perkrich>". A cursory inspection found the Tables in this publication to be in agreement with the Southern Pacific Taper Tables referred to above. ❖



Example Curve Definitions

## CLSA Remembers... By: Michael Libott



### William David Hobbs, PLS

As I sit down to begin writing this, the office is in disarray not unlike my own and the lives of dozens at the moment. Slowly, from out of the chaos, I'm taking stock, assessing what really matters and what I can do without. Stepping away from the past is never easy, but life is a continuous series of leavings. A week ago someone left my life - William David

Hobbs; my employer, my captain, my mentor, my best friend and my brother in spirit.

I first met Dave some twenty years ago. I recall the first time he demonstrated for me how to plot a flight line for a mapping job. I also recall some sharp looking suits and a gigantic Galaxy 500, later to be replaced by the signature, long gray goatee and brick red Range Rover that most will remember him by. We crossed paths several times over the years and I eventually ended up back with Mr. Hobbs where I've worked side-by-side with Dave for the past ten years.

Why it should take something dramatic like a death for us to truly come to awareness I'll leave to the philosophers to decide. All I know, at this moment the survey industry in is reeling from a loss whose breadth and depth I'm only now coming to understand.

Dave, for good or for ill, impacted everyone he came in contact with. He would bend over backwards for anyone, but would lie down for no one. I've seen Dave leap from his office chair to run outside and rescue a stray dog in the street. He selflessly gave back to his profession, one that truly was his bliss and his passion. Talking with people this past week has been both an awful chore and the single largest honor of my life. The sobs from grown men upon hearing the news has been both heart wrenching and a confirmation of my belief in the general humanity of us all.

On a more personal level I now see I lost one of the single largest influences in my life. We never said it to one another, but now I understand that Dave and I loved each other like brothers do and were bonded by that affection. We fought like brothers do; the irresistible force meets the unmovable object. Just like brothers we could nearly come to blows, then ten minutes later we were happily back to the task at hand. Dave, I love you and will miss you. Make certain you check the plumb on those pearly gates. Oh and put on your vest dammit. ❖

# Q&A SMA Expert



**Michael P. Durkee**, a partner in the Walnut Creek office of Allen Matkins, represents developers, public agencies and interest groups in all aspects of land use law. Mike is the principal author of *Map Act Navigator* (1997-2011), and co-author of *Ballot Box Navigator* (Solano Press 2003), and *Land-Use Initiatives and Referenda in California* (Solano Press 1990, 1991).

415.273.7455 [mdurkee@allenmatkins.com](mailto:mdurkee@allenmatkins.com)

## Question

Would you please explain the different time periods applicable to the vested rights available under the Subdivision Map Act?

## Discussion

**Great question! It is important to understand that the life of the vested rights relates to, but does not always strictly follow, the life of the map itself. There are three (3) distinct time periods, each with its own beginning and end:**

- **Vesting Tentative Maps.** Vested rights under the Map Act arise through the approval of a vesting tentative map (even though the laws "vested" are those in place at application completion). Vesting tentative maps have the same "life" as regular tentative maps. As discussed in prior articles, the life of a tentative map can be broken into two general categories: "initial life" and "extension life." Upon approval of the vesting tentative map, the Map Act grants an initial life of two years; a local ordinance can then extend that initial life for one additional year. Gov't Code § 66452.6(a). As also discussed in prior articles, there are many opportunities under the Map Act to secure "extension life" for a tentative map, and hence its vested rights.
- **Vesting Final Maps.** Although the portion of a vesting tentative map that is not included in a final map may be extended by the filing of the final map (using phasing to extend the tentative map), the life of the vested rights for the property included in that final map itself is very short. The life begins to diminish with the recording of the final map. Gov't Code § 66498.5. The life of the vested rights of that final map is only 1 to 2 years, depending on

local ordinances. *Id.* However, before that life expires, the applicant may request an additional 1-year extension. *Id.*

• **Building Permits.** If a building permit for the project is granted before the expiration of the final map's vested rights, then the limited life of the vested rights given to the vesting final map is retained and automatically extended for the life of the building permit, even if by then the vested life given under the tentative and final maps is about to or has expired. Typically, building permits would be issued for different construction throughout the life of the final map. Any active building permit at the expiration of the final map will retain the final map's vested rights until the expiration of the building permit. In the author's opinion, the building permit extends the vested rights for the entire final map ("the rights conferred by this chapter shall continue until the expiration of that permit . ." (§ 66498.5)), not just the building permit's vested rights.

• **Vesting Parcel Map.** The vested rights of a vesting parcel map normally have a life equal to the life of a vesting final map – 1 to 2 years, with a 1-year extension. However, under Government Code section 66428(c), when a parcel map is otherwise required under the Map Act (for example, four or fewer parcels are being created), the subdivider can nonetheless apply instead for a tentative map, thereby maximizing the time of the map's vested rights (as discussed above). This is a very effective, but little known, strategy where the subdivider is creating four or fewer parcels but wants to maximize the map's vested rights (by having the 3 lives discussed above, instead of just 1).

In these volatile economic times, preserving ones vested rights is essential! ❖

## Geography Quiz Answer from page 24

We are at the South Pole. Surveying of the Geographic South Pole is conducted every year on 1 January using static GPS techniques. These surveys indicate that the icecap is moving at a constant speed of approximately 10 meters per year in a direction of between 37° and 40° west of grid north towards South Georgia Island in the South Atlantic. Each year, a different artistic monument is designed, fitted to a 1-inch pipe, and placed at latitude 90°S during a ceremony. The photo shows the monument chosen for 2005.



# ENGINEERING SUPPLY COMPANY

THE LEADER IN PRECISION POSITIONING SYSTEMS SINCE 1985

Call Toll Free: 800-788-3307

Two Full Service Locations To Serve You!

Concord, California  
5700 Imhoff Dr., Suite J

W. Sacramento, California  
1030 Riverside Pkwy., Suite 150

 **TOPCON** Sales - Service - Training - Rentals



## There's No Limit To Your Productivity!

With Quality Topcon Products And World Class Customer Service!

Imaging and Scanning  
Solutions



Advanced Robotic  
Systems



RTK and Network  
GPS Solutions



 **TOPCON**  
UNIVERSITY

Factory Trained and Certified Sales, Service and Training!

Call Toll Free: 1-800-788-3307  
[www.escsurvey.com](http://www.escsurvey.com)



By: *Raymond Mathe, PLS*

*Ray is Senior Registrar Land Surveyor of the California Board for Professional Engineers, Land Surveyors, and Geologists (BPELSG). Prior to his appointment in February of 2012, he served as County Surveyor of the County of Orange. His experience includes project management in private practice and he also served as the Deputy County Surveyor for the County of Riverside. Ray obtained a Bachelor of Science degree in Workforce Education and Development from Southern Illinois University at Carbondale in 1995.*

## The BPELSG Chronicles

### Responsibilities of Providing Professional References

**B**PELSG is part of the alphabet soup that makes up yet another state agency – it wouldn't be a bureaucracy without an acronym. These letters represent the merger of two boards, the one most of us are familiar with: BPELS (California Board for Professional Engineers and Land Surveyors) and BGG (California Board for Geologists and Geophysicists). The Board for Professional Engineers, Land Surveyors, and Geologists is the answer to the letters and the Board that, among other duties, regulates the licensure of Land Surveyors

Over the next few issues the *California Surveyor* will publish a series of articles for the CLSA membership to provide a glimpse into what is happening at the Board and answer many of the questions surveyors have relating to the Board and some of its practices. Today I want to take a look at one step potential land surveyor examination candidates take towards licensure - the professional references provided to the Board.

The four required references for an applicant for the land surveying exam are a critical component to licensure. Many professionals have one of two attitudes about this requirement, either "I'll give anyone a positive reference - just let the exam determine if the candidate is ready to become a land surveyor" or "I don't want to give anyone a reference, so I'll just mark the engagement form negative". Both positions do our profession a severe disservice. Since the days of our first president, George Washington, surveying has been a journeyman profession that required practicing professionals to provide training of apprentices within their own practice and a record of the readiness of those that could possibly work as a principle surveyor under their own shingle.

What you do in California when you sign and seal an Engagement Record and Reference Form for Land

Surveyor Applicants is certify the applicant's "...qualifications, professional integrity, ability, and fitness to be licensed as a Professional Surveyor..." At first glance this certification seems fairly innocuous and unfortunately that is the position some professionals take. However, this is the critical point in the licensing process that assures protection to the public in areas that cannot be tested in an academic test setting. Is this candidate fit to be licensed as a Professional Land Surveyor? This is when your opinion about whether or not this person can walk a mile (or ten thousand miles) in your boots comes into play. Professional integrity is a subjective analysis of the fortitude of someone to do the right thing when no one is looking.

The ability to be a Professional Land Surveyor is much more than a checklist of qualifications; it is the capability of the person to integrate an understanding of the laws, regulations, local codes and ordinances with various court rulings; local, regional and national practices; and the academics of surveying. The professional reference is the one step along the path to licensure that allows those already in the field to provide an assessment to the Board of the synergistic and subjective traits of the person who is working towards having their own practice. Enough beating around the bush, does this person have the legitimacy to be a professional in this industry? You are the only one to answer this question. It is you who will build the public's confidence with your actions. Not just as you do your job, but as you mentor and build the next generation of Professional Land Surveyors. This noble profession is built on the shoulders of many trusted icons of American history. When you certify to someone's qualifications it is another crossroad in our profession and a responsibility that each of us need to consider as we build tomorrow. ❖





# Allen Precision Equipment & Supplies

## Leica TPS 1200+



### FEATURES:

- **PINPOINT REFLECTORLESS MEASUREMENT:** Built-in telescope measures with laser dot (2Cm At 150Ft.) more than 3,000 feet away without reflectors with accuracy up to 2 mm.
- **AUTOMATIC TARGET RECOGNITION:** One prism has a guaranteed measurement range of 1.8 miles, angle accuracy of 2, 3, or 5 second and base positioning accuracy of 1mm.
- **TWICE AS FAST:** Achieves angle measurements in 1 to 5 seconds, 50% faster than competition.



**TRADE-IN  
TRADE-UP**  
"CALL FOR DETAILS"

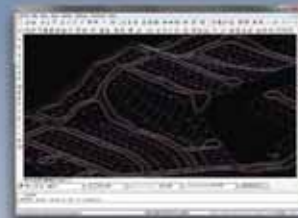
**Special  
Financing  
Available!**  
Call for details.

### With Your Choice of Data Collectors



## Allen Precision now offers MicroSurvey CAD FieldGenius and STAR\*NET

- **MicroSurvey CAD** - Powered by IntelliCAD, field to finish has never been this easy. Available in 4 different levels, MicroSurvey CAD is the design solution engineered especially for Surveyors.
- **MicroSurvey Fieldgenius 2011** - The best choice of data collection software for land surveyors. Code-free linework, smart points and HD graphics make FieldGenius the choice of organizations that value productivity.
- **MicroSurvey STAR\*NET V7** - An easy-to-use Windows application that adjusts 2D/3D survey networks using rigorous Least Squares techniques.



Order at 1-800-241-6223 | [www.allenprecision.com](http://www.allenprecision.com)



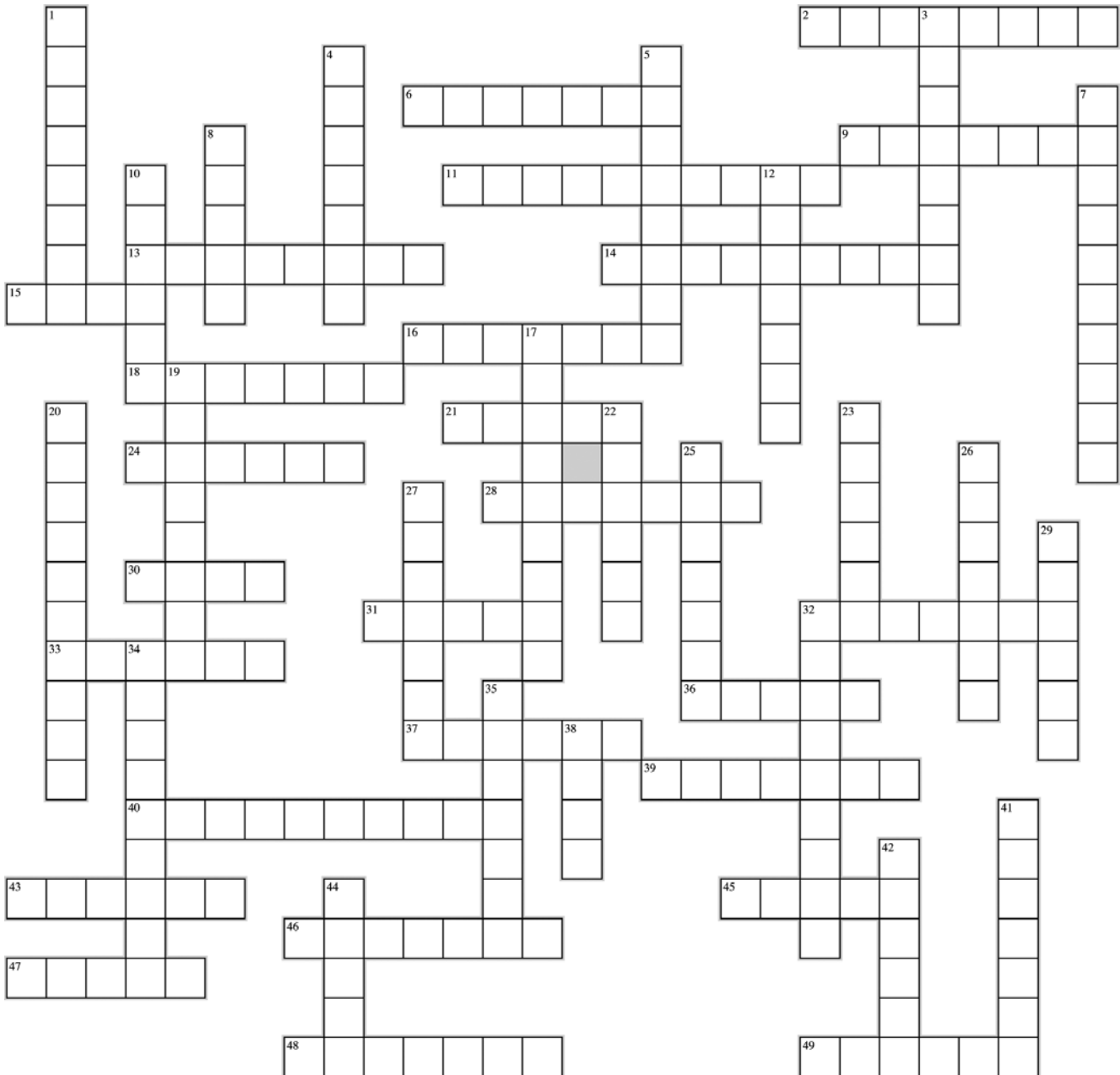
# Crossword Puzzle

By: Ian Wilson, PLS

*Ian Wilson, PLS is the Director of Survey for Cardno WRG, Inc. in Roseville, CA. He started surveying in 1988 in Southern California and is now enjoying life in Northern California. Ian enjoys hearing from fellow members about the crossword puzzle and is always looking for clue ideas and input. He is licensed in California and Nevada and has specialized in boundary, topographic and Land Title surveys. His expert witness practice in boundary and easement issues is growing. Ian has been a member of CLSA since 1988.*

## CLSA Crossword Puzzle #22

If you have an idea for a puzzle theme or a clue you would like to include in an upcoming puzzle, email to [clsa@californiasurveyors.org](mailto:clsa@californiasurveyors.org)



EclipseCrossword.com

## Across

2. REAL PROPERTY RESTRICTION
6. MALE SURVEYOR OF THE YEAR
9. PROPORTION WHEN NO OTHER SOLUTION EXISTS
11. WATER RIGHTS PROGRAM PRESENTER
13. NOT LAMBERT
14. ANGLE BETWEEN TWO MERIDIANS
15. CONTINUOUS BODY OF ORE
16. CHARM SCHOOL PROGRAM PRESENTER
18. MARKED CROSS
21. OLD SURVEYING STAFF
24. DAVID HOBBS
28. STREAM CHANNEL
30. MOCK TRIAL BAILIFF
31. COMMUNICATION PROGRAM PRESENTER
32. SQUARE MILE
33. SURVEYOR CREATED GAP
36. 3D SCANNING PROGRAM PRESENTER
37. PERPENDICULAR
39. FORTY POLES
40. LAND SET ASIDE FOR PUBLIC USE
43. CLSA/NALS NUGGET COLOR
45. RFQ PROGRAM PRESENTER
46. MISTAKE
47. MAPPING ANGLE
48. MINE ACCIDENT SITE
49. NEAL DICKEY'S NICKNAME

## Down

1. COMPLETE A COURSE OF LEARNING
3. BAR OR IMPEDIMENT
4. SUCCESSIVE RELATIONSHIP RIGHTS
5. INHERITABLE ESTATE
7. LIGHT ON A BENDER
8. ARC CONECTOR
10. KEYNOTE SPEAKER AT CONFERENCE
12. SIGHTING PART OF A SURVEY INSTRUMENT
17. FEMALE SURVEYOR OF THE YEAR
19. A LAND OWNERS INTEREST
20. TYPE OF BACTERIA THAT CAUSES LYME DISEASE
22. 2011 CLSA RESORT
23. CEQA PROGRAM PRESENTER
25. 2.471 ACRES IN EUROPE
26. COMSTOCK PROGRAM PRESENTER
27. SATURDAY PROGRAM PRESENTER
29. MORE RECENT
32. DEGREE OF STREAM WANDER
34. WRITTEN DECLARATION OF FACTS
35. OBJECT OF A GRANT
38. MINE ENTRANCE
41. ABOUT THE SIZE AND SHAPE OF IT
42. STATE OF NALS
44. MARK ON A TRUNK



**California Property Specialists, Inc.**

*YOUR projects*    *our solutions*

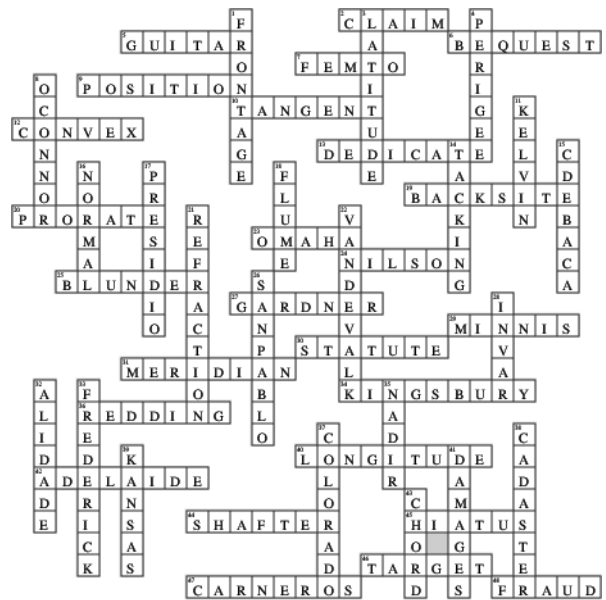
**Our services:**

- Real Estate Services
- Project Management
- Right of Way Engineering
- Cost Studies
- Report Preparation
- Property Acquisition
- Relocation Plans
- Relocation Assistance
- Property Management



**Teri Kahlen, PLS**  
 tkahlen@cpsi-row.com | www.cpsi-row.com  
 (949) 407-6217 direct | (949) 407-6215 main

**Key to CLSA puzzle #21** (Surveyor Issue # 168)



©2012 Crossword.com



# Sustaining Members

**LEJA SURVEYING CORP.**  
Land Surveying & Mapping • Court Diagrams  
Legal Descriptions

**Steve Leja**  
P.L.S. 5933

Telephone (909) 797-3043  
Cell (909) 709-6861 • Fax (909) 797-3876  
13642 Highland Oaks Dr. • Yucaipa, CA 92399

**ALLEN Instruments & Supplies**

**Dan McMahon**  
Sales Representative  
760.271.4681 Mobile  
714.238.3434 Office

800.215.2737 • Fax 714.238.3441  
2940 E. La Palma Ave., Suite F  
Anaheim, CA 92806  
www.alleninstruments.com

**Trimble**  
dan@alleninst.com

**TRI STATE SURVEYING, INC.**

**MICKI J. JEFFERSON, P.L.S., W.R.S.**  
PRESIDENT - CHIEF EXECUTIVE OFFICER  
**(775) 358-9491**

Boundary Surveys • Water Rights  
Land Division Mapping • Aerial Mapping  
Construction Surveys  
Global Positioning Surveys  
Design/Topographic Surveys

**Land Information Solutions**

1925 E. PRATER WAY  
SPARKS, NV 89434-8938  
Email: MJJefferson@TriStateLtd.com

www.TriStateLtd.com  
FAX (775) 358-9664

**SURV-KAP®**

520-622-6011  
1-800-445-5320  
FAX: 520-792-2030  
www.surv-kap.com

**John G. Baffert**  
President

PO. Box 27367 • Tucson, AZ 85726 • 3225 E. 47th Street • 85713

**FIRST AMERICAN**

**First American Data Tree**

The Nation's Single Largest Digital Provider of  
Recorded Land Documents and  
Property Information Online, Anytime

**www.DataTree.com**

**Trimble**

Trimble Navigation Limited  
5475 Kellenburger Rd.  
Dayton, OH 45424-1099

800.538.7800  
937.233.8921  
937.233.9441 fax

**SECO**  
www.surveying.com

4155 Oasis Road • Redding CA • 96003  
(800) 824-4744 or (530) 225-8155

**PACIFIC LAND SEMINARS**

**TONY CUOMO**  
PRESIDENT

538 Aliso Avenue  
Newport Beach, CA  
92663

tony@pacificland.com (562) 980-6160  
www.pacificland.com (949) 548-4472

**ENGINEERING SUPPLY COMPANY**  
THE LEADER IN PRECISION POSITIONING SYSTEMS SINCE 1980

Two Full Service Locations  
To Serve You! 800-788-5307

Concord, California  
5700 Inland Dr., Suite 2  
West Sacramento, California  
4000 Franklin Hwy., Suite 100

**TOPCON** Sales Service Training Rentals

There's No Limit To Your Productivity!  
With Quality Topcon Products And World Class Customer Service!

**MOUNT DIABLO SURVEYORS HISTORICAL SOCIETY**  
A CALIFORNIA NON-PROFIT PUBLIC BENEFIT CORPORATION (885 5118X3)

Burt's Solar Compass

**COLLECT, PRESERVE & DISPLAY ARTIFACTS of the LAND SURVEYING PROFESSION**

5042 Amethyst Ct, San Jose, CA 95136 www.mdshs.org

SALES • RENTALS • SERVICE • TRAINING

**CALIFORNIA SURVEYING & DRAFTING SUPPLY**

SACRAMENTO • DUBLIN • FRESNO • LAS VEGAS  
LOS ANGELES • SAN DIEGO

**800.243.1414 • www.cdsinc.com**

**TOPCON Quality Product - Service - Support**

**Lewis & Lewis**  
(800) 342-3607

Sales - Rental - Repair - Financing  
www.lewis-lewis.net

VENTURA: 1600 Callens Rd. Ventura CA 93003 (805) 644-7403  
FAX (805) 642-3970 Email: sales@lewis-lewis.net  
SAN DIEGO: 340 S. Andreasen Dr., Suite A Escondido, CA 92029  
(760) 747-8823 FAX (760) 480-5778 Email: jim@lewis-lewis.net

**CARTWRIGHT AERIAL SURVEYS, INC.**

**BILL CALMES**  
PRESIDENT

EXECUTIVE AIRPORT  
5979 FREEPORT BLVD.  
SACRAMENTO, CA 95822

CALMES@CASHMAP.COM  
WWW.CASHMAP.COM  
(916) 421-3465  
FAX (916) 422-9631

**Leica Geosystems Solutions Center**

GPS Systems Total Stations 3D Laser Scanning  
GNSS RTK Network Field Supplies Stakes & Lath

2942 Century Place Costa Mesa, CA 92626 800-938-0606  
1447 Rollins Road Burlingame, CA 94010 650-348-7247

Local presence ■ National reach ■ Global resources

**EngineerSupply.com**  
Your Resource for Engineering Tools and Supplies.

BluePrint Storage  
Laser Measuring Devices  
Measuring Wheels  
Surveying Equipment  
Calculators  
Digitizers  
Hand Trucks  
Metal Locators

CALL TOLL-FREE 800-591-8907  
Visit Us on the Web at www.EngineerSupply.com

**Sustaining Members**

**VERTICAL MAPPING RESOURCES, INC.**  
An Evolution in Land Information

San Diego, CA 4424 Avenida Comrade, CA 92118 Ph: 619-435-7330 Fax: 619-435-1205

Sacramento, CA 191 Blue Skies Blvd., #110 Colton, CA 95920 Ph: 916-223-1486 Fax: 916-223-1487

**Mira Solutions, Inc.**  
Photogrammetric Services

**Jan Gill**  
Accounts Manager

29300 Kohoutek Way, Unit 130  
Union City, CA 94587  
Tel: 510-487-9688  
Fax: 510-477-9019  
Cell: 510-543-5950  
jen.gill@mira-solutions.com  
www.mira-solutions.com

### SUSTAINING MEMBERSHIP

Membership in the California Land Surveyors Association, Inc. as a Sustaining Member is open to any individual, company, or corporation who, by their interest in the land surveying profession, is desirous of supporting the purposes and objectives of this Association. For information regarding Sustaining Membership, contact:

#### CLSA Central Office

526 So. E Street, Santa Rosa, CA 95404  
Tel: (707) 578-6016 Fax: (707) 578-4406

**Berntsen**  
Custom Identification Products

Berntsen International, Inc.

PO Box 8670

Madison, WI 53708-8670

www.berntsen.com

tklaben@berntsen.com

**Tim Klaben**  
Marketing Manager

Tel. (608) 249-8549

Fax (608) 249-9794

Tel. (800) 356-7388

Fax (800) 249-9794

Marking the Infrastructure of the World.



**Seafloor**

Manufacturer of the HydroLife-TM & Sonarmite-B1  
Hydrographic Survey Systems  
Sales • Rentals

Call (530) 677-1019 or visit [Seafloorsystems.com](http://Seafloorsystems.com)  
3941 Park Drive, Suite 20-218, El Dorado Hills, CA 95762

## Top Captions for issue #168 Cartoon



### The Legend of the Bulls Eye Raptor

*Twas a day to be remembered  
I was out standing in the field  
Closing in on the horizon  
Declinations tightly sealed*

*When swoopin' came an eagle  
He done struck a buzzard flat  
Then with lightning speed and bulls eye aim  
He soiled my coonskin hat*

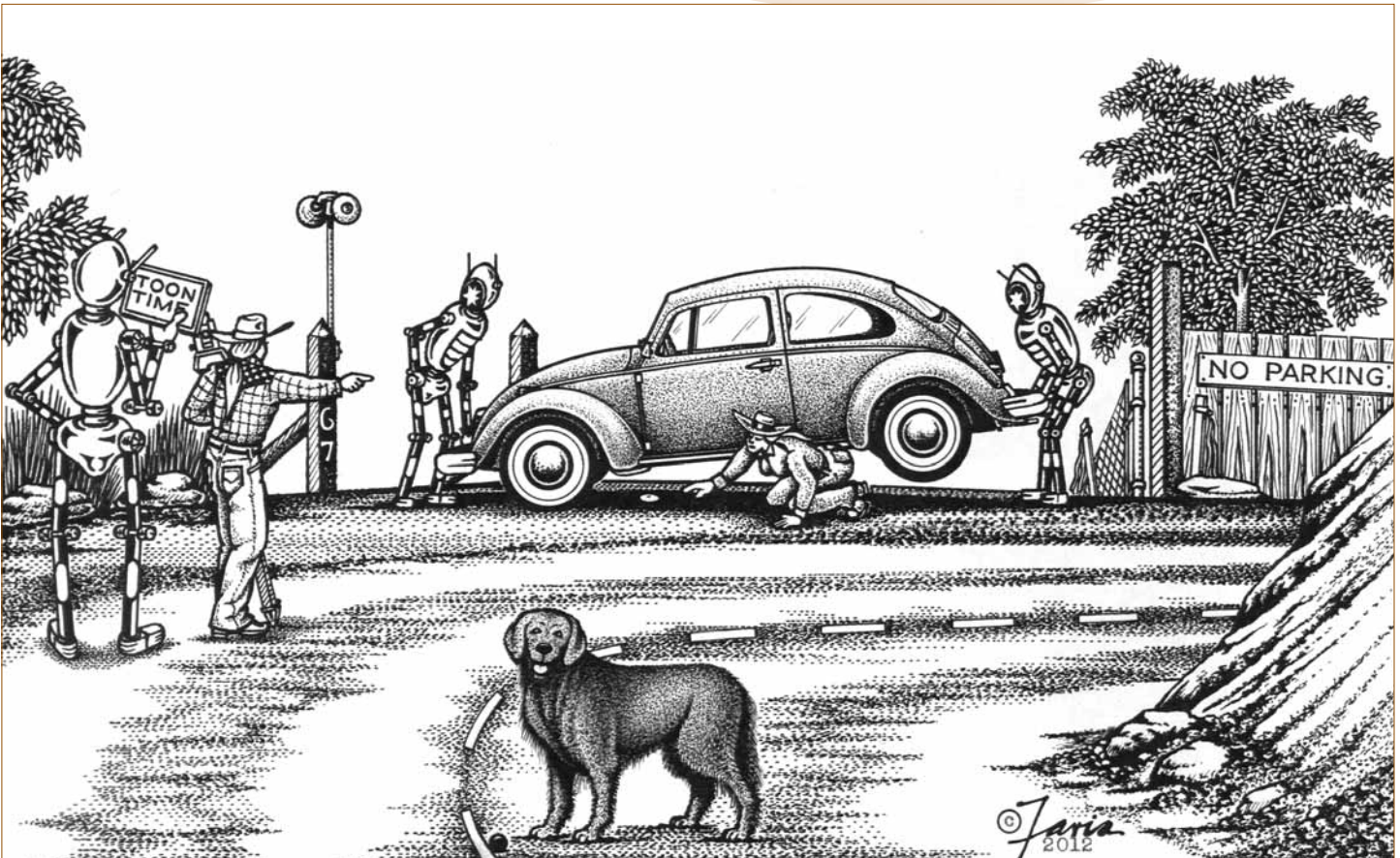
- John Wilusz, Editor

*If your head is in the clouds, don't wear  
animal skin*

- Larry Canuti

*Focusing on the site, Daniel Boone  
capped off the day by "Cillen aagle".*

- Ron Nelms



Submit your caption for the cartoon above to [clsa@californiasurveyors.org](mailto:clsa@californiasurveyors.org) by June 1st.  
Our favorite captions will be published in the next issue of the California Surveyor.

<b>CLSA PUBLICATION ORDER FORM</b>	<b>CLSA MEMBER</b>	<b>PUBLIC AGENCY</b>	<b>NON MEMBER</b>	<b>NO. OF COPIES</b>	<b>TOTAL</b>
<b>2012 Complete Package:</b> PLS Roster, Pre '82 CE Numerical Listing, PE & PLS Act, Board Rules, Subdivision Map Act and Index, Misc. Statutes & Binder (Includes CD with searchable PDFs)	\$35.50	\$49.00	\$71.00		
<b>2012 Refill Package</b> includes: PLS Roster, PE & PLS Act with Board Rules, Subdivision Map Act and Index and Misc. Statutes (Includes CD with searchable PDFs)	\$27.00	\$37.00	\$54.00		
<b>2012 PE Act &amp; PLS Act with Board Rules (5 ½ x 8 ½ )</b>	\$10.50	\$15.00	\$21.00		
<b>2012 Subdivision Map Act and Index (5 ½ x 8 ½ )</b>	\$10.50	\$15.00	\$21.00		
<b>2012 SMA Navigator:</b> by Mike Durkee, Esq.	\$42.00	\$45.95	\$49.95		
<b>2009 Manual of Survey Instruction</b>	\$55.00	\$65.00	\$75.00		
<b>California Coordinate Projection Tables – NAD '83</b>	\$10.00	\$15.00	\$20.00		
<b>Chaining the Land, Second Edition</b>	\$65.00	\$72.00	\$95.00		
<b>Right of Entry Package</b> 50 brochures, 10 flyers, 5 cards, 50 door hangers	\$22.50	\$32.50	\$45.00		
<b>Right of Entry Cards</b> (minimum order is 2)	\$1.50/ea.	\$2.00/ea.	\$3.00/ea.		
<b>Right of Entry Door Hangers</b> (Pkg. of 50)	\$5.00/Pkg.	\$7.00/Pkg.	\$10.00/Pkg.		
<b>Right of Entry Brochures</b> Info for law enforcement & land owners (Pkg. of 50)	\$10.00/Pkg.	\$15.00/Pkg.	\$20.00/Pkg.		
<b>Right of Entry Flyers</b> Info for Land Surveyors (Pkg. of 25)	\$5.00/Pkg.	\$7.00/Pkg.	\$10.00/Pkg.		
<b>Monument Conservation Brochures</b> (Pkg. of 50)	\$10.00/Pkg.	\$15.00/Pkg.	\$20.00/Pkg.		
<b>Corner Record Forms – BORPELS 1297</b> (Pkg. of 25)	\$10.00/Pkg.	\$15.00/Pkg.	\$20.00/Pkg.		
<b>Land Surveying Brochures</b> (Pkg. of 50)	\$15.00/Pkg.	\$18.00/Pkg.	\$30.00/Pkg.		
<b>CLSA Exam Guide</b>	\$25.00	\$35.00	\$50.00		
<b>Standard Contract Forms</b> Agreement for Professional Services (Pad of 25)	\$4.00/Pad	\$6.00/Pad	\$8.00/Pad		
<b>Land Surveying for the Land Owner &amp; Real Estate Professional</b> , by Daniel E. Beardslee, PLS	\$8.00	\$12.00	\$16.00		
<b>CLSA Safety Tailgate Meeting Guide</b>	\$25.00	\$35.00	\$50.00		
<b>CLSA Decal/Bumper Sticker</b> (___Decal or ___Bumper)	\$1.50/ea.	N/A	N/A		
<b>Land Surveying Story/Coloring Books</b> (Pkg. of 10)	\$24.00/Pkg.	\$28.00/Pkg.	\$48.00/Pkg.		
<b>CLSA Baseball Cap</b>	\$12.00	\$17.00	\$24.00		
<b>CLSA Padfolio</b>	\$8.00	\$12.00	\$16.00		
<b>CLSA Lapel Pin</b>	\$6.00	N/A	N/A		
<b>"Choose Your Path...Make Your Mark" DVD</b>	\$3.00	\$5.00	\$6.00		

- Member prices are only available to State members of CLSA.
- Please allow 2 weeks for delivery.
- Orders must be received by 1:00 PM for next day FedEx Delivery.
- **Mail your order form and payment to:**  
CLSA Central Office  
526 South E Street  
Santa Rosa, CA 95404  
Phone: (707) 578-6016 Fax: (707) 578-4406
- Difference between member & non-member price may be applied toward membership.

<b>Shipping Information</b> (Publications will be shipped FedEx Ground. Please provide physical address)	
Name _____	CLSA Member # _____
Company (if company is mailing address below) _____	
Address _____	
City/State/Zip _____	
Phone _____	Email _____

<b>Subtotal</b>	
<b>Shipping &amp; Handling</b> Up to - \$19.99 add \$9.50 \$20.00 - \$40.00 add \$12.50 \$40.01 - \$60.00 add \$14.50 \$60.01 - \$14.50 plus 3% of total	
<b>Next Day Shipping provide FedEx Account Number</b> # _____ <b>Add \$10.00 Handling fee.</b>	
<b>Subtotal – Include Shipping &amp; Handling</b>	
<b>CA Sales Tax</b> Outside Sonoma County Tax - 7.25% Sonoma County Tax - 8% Santa Rosa - 8.5%	
<b>TOTAL</b>	
<b>Payment Enclosed:</b> <input type="checkbox"/> Check <input type="checkbox"/> MasterCard <input type="checkbox"/> Visa	
<b>Account #</b>	
<b>Expiration Date</b>	<b>CID#</b>
<b>Billing Zip Code</b>	
<b>Authorized Signature</b>	

# When You Demand Documentation



Rely on a brilliant source.

Turn to the original.

Today's real estate market demands decisions supported by documentation. With a database of over 4.6 billion original documents, First American Data Tree is the trusted source for reliable nationwide property information.

With intelligent search capabilities through various platforms such as DocEdge.com®, you can quickly search for property characteristics and historical transactions with the ability to link directly to deeds, maps, reports and more by street address, owner name, assessor parcel number, legal description, or document ID.

**When you need to be certain, turn to the original.**

To learn more, visit us at [www.DataTree.com/CLSA](http://www.DataTree.com/CLSA) or call 800.708.8463.



*First American  
Data Tree*

Be Certain.™

# Limitations are for the competition!

## Don't limit yourself... CSDS has a Trimble GPS solution for all budgets and survey levels.

### GPS SYSTEMS

Systems starting as low as \$2,995!

#### TRIMBLE R3

##### Key Features



- A unique integrated survey-grade L1 GPS receiver and rugged PDA solution
- Field-proven and robust for tough surveying conditions
- Trimble GPS technology for quality and confidence
- Microsoft® Windows Mobile™ for Pocket PC operating system, the industry standard

#### TRIMBLE R4

##### Key Features



- Accurate, reliable and rugged system
- Built on proven, dependable Trimble technology
- Scalable from postprocessing to VRS to multi-constellation RTK configurations
- Cable-free for convenience

#### TRIMBLE R5

##### Key Features



- Flexible configurations put you in total control
- Rugged, high-performance hardware is built to last
- Trimble Integrated Surveying Ready

#### TRIMBLE R6

##### Key Features



- Flexible, integrated system design
- Scalable to add capability as your business needs change
- Industry-leading GPS positioning including L2C
- Trimble Integrated Surveying™ Ready

Upgradable to GNSS



### GNSS SYSTEMS

Network rovers available for under \$13,000!

#### TRIMBLE GEOXH CENTIMETER EDITION

##### Key Features

- Advanced Network Rover solution
- Centimeter accuracy in a handheld form factor
- Optimized for Trimble Access field software
- Sunlight readable color display with unmatched clarity in bright sunlight
- Capture high quality photographs and link directly to measured points

NEW



**FREE 6-month network subscription with all network rover purchases. Limited time only.**

#### TRIMBLE R7

##### Key Features

- Trimble R-Track technology for comprehensive GNSS support
- A modular system with external antenna for maximum flexibility
- Advanced receiver technology and proven system design combined
- An important component of the Trimble Connected Site



#### TRIMBLE R8

##### Key Features

- Advanced Trimble R-Track technology Unmatched GNSS tracking performance
- Includes Trimble Maxwell 6 chip with 220 channels
- Remote configuration and access
- Base and rover communications options to suit any application



Explore the possibilities...contact a CSDS GPS Specialist today to put a Trimble solution to work on your next project:



**CALIFORNIA SURVEYING & DRAFTING SUPPLY**

www.cdsinc.com

Fresno	Chris Bardon	559.708.8593	chris@cdsinc.com
Sacramento/N. CA	Tom Cardenas	916.806.2860	tomc@cdsinc.com
Bay Area	Ben Scholes	510.909.7695	ben@cdsinc.com
Outlying Areas	Mike Woodel	916.847.8351	mike@cdsinc.com