THE PRISM
Central Valley Chapter

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2013 Chapter Committees

By-Laws Committee:
Keith Spencer

Construction Committee:
Landon Blake (Chairman)

Education Committee:
Kevin Genasci (Chairman)

Membership Committee:
Keith Spencer (Chairman)

Monument Preservation Committee:
Mike Quartaroli (Chairman)

Newsletter:
Rich Brown (Editor)

Professional Practices Committee:
Josh Elson (Chairman)

San Joaquin County Liaison Committee:
Kevin Genasci (Chairman)

Stanislaus County Liaison Committee:
Rich Fultz (Chairman)

Website Committee:
Keith Spencer (Web Master)

2013 Chapter Programs

Boy Scout Merit Badge:
Scott DeLaMare (Coordinator)

TrigStar:
Bill Koch (Coordinator)

Workshops:
Chris Martin (Coordinator)

Up Coming Meetings!

Date: January 23, 2013
Time: 6:30 p.m.
Location: Perko's @ 901 North Carpenter Road, Modesto
Speaker: Wayne Sutton, Stanislaus County Surveyor
Topic: "Two Monuments at the Township Corner and What the Judge Said"

Date: February 27, 2013
Time: 6:30 p.m.
Location: Perko's @ 901 North Carpenter Road, Modesto
Speaker: Landon Blake, PLS, CFedS
Topic: 180 IBLA 388—Hillstrom
Attachments: **Click for Landon's Article in American Surveyor Magazine**

Announcements

2013 Laws & Regulations now available on Board's Website

Regular sections and Annotated with the changes from 2012 shown are available for download on the BPELSG website. **Click for BPELSG website**

2013 Membership Payments are Due

You should have received your 2013 membership bill from State CLSA. When you send in your dues, please don't forget to send in your Central Valley Chapter dues. You can also pay **online through the chapter website.**

Real Estate Fraud Protection Trust causes fee increase

Due to updates in California Government Code 27388, Senate Bill 1342 covering the Real Estate Fraud Prosecution Fund, starting January 1, 2013, the recording fees for most documents will be increasing. Please check with your local County Recorder's Office for current fees.

Chapter Waives 2013 Dues for Unemployed Members

At the October, 2012 meeting the Central Valley Chapter voted to waive chapter dues for any members (or new members) who have become victims of the current economic downturn and are unemployed. Please fill out the Membership Application, enter "Unemployed" on Line 7 for the Name of Firm, Agency or College, submit your application, and your 2013 chapter dues are waived.

Click here for the 2013 Membership Application

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March 23-27

CLSA NALS CONFERENCE 2013

Silver Legacy Resort & Casino, Reno NV

Mark Your Calendars

Silver Legacy Resort & Casino,
Reno, NV - March 23-27, 2013
• OSHA 10 Hr. Construction Training Cert.
• LS Review Seminar
• Mining Survey Seminar
• Technical Sessions
• Business Sessions, and More!

Classes, training, and continuing education

CAD Masters — Civil 3D Introduction — **Register here**
 February 11, 2013, Walnut Creek
 February 12, 2013, Sacramento
 March 11, 2013, Walnut Creek
 March 25, 2013, Sacramento

CAD Masters — AutoCAD Level I — **Register here**
 February 4, 2013, Walnut Creek
 February 19, 2013, Sacramento
 March 4, 2013, Walnut Creek
 March 18, 2013, Sacramento

CAD Masters — AutoCAD Level II — **Register here**
 February 19, 2013, Walnut Creek
 March 11, 2013, Sacramento

CAD Masters — AutoCAD Level III — **Register here**
 February 7, 2013, Walnut Creek

Central Valley Chapter, CLSA — L.S. Instructional
 DVD Class — **Register here**
 Thursdays, 6:00pm to 8:30pm
 November 8, 2012 — March 28, 2013, Modesto

Sacramento Chapter, CLSA —
 L.S. Review Class — **Register Here**
 Thursday, 6:00pm to 9:00pm
 December 20, 2012—April 4, 2013, Sacramento

CLSA/NALS Conference 2013
 March 23-27, 2013
 Silver Legacy Resort & Casino, Reno NV

Land Use Navigators — Subdivision Map Act in California
 Seminar — **Register Here**
 2013 Schedule Coming Soon

If you have information about a training or class, please submit to: **editor@californiacentralvalleysurveyors.org**

Editor's Message

MISSING YESTERDAY, FOUND TODAY

You are out in the middle of nowhere. You could work in this spot for days and never see another person in the area. Looking for that elusive monument. Positive that one of your predecessors has done a survey before you. You search, and search, and search, but to no avail. The day prior was spent doing your field research. Combing every file possible. You found reference to your corner on a couple recorded maps, but could not find the document you needed. It was unrecorded. You make a few calls to some of your Survey Associates, and you check the County's database. Still no luck.

This situation happens a lot. The documents are out there, you just can't find them. For the most part, they are usually in a filing cabinet somewhere collecting dust. It should be the goal of every surveyor to help the profession. Share the information and information will be shared with you. I feel that we need to make every effort to get these documents out there, making them available to the public, for public use. Not keep them stored in a drawer some where for no one to use. Maybe these documents can be shared with the local government agency or chapter of CLSA. It can only make the profession more efficient.

If you would like to comment on this topic or suggest another, please submit it to:
editor@californiacentralvalleysurveyors.org

CAD Tips & Tweaks
An Introduction to AutoLISP—Part 3: Basic Data Types, *By Landon Blake, PLS*

Introduction
Welcome to the third installment of *CAD Tips and Tweaks*. *CAD Tips and Tweaks* is a new regular feature of the *PRISM,* the CLSA CVC Newsletter.

As a reminder, all of the source code we discuss in this column will be released under open source licenses. All of the media content for the column will be released under a Creative Commons license.

In this article we are going to look at the built-in data types, or basic building blocks, used to create AutoLISP programs. After a short discussion of the data types, we will briefly demonstrate how to store basic data type values in a named variable, or storage container, so the values can be accessed by your AutoLISP program.

How Basic Data Types are Used in AutoLISP
Basic data types play an important role in the AutoLISP programming language. They are used in 4 primary ways:
(1) To store simple data values (numbers or chunks of text).
(2) To pass data into a function.
(3) To store data used for calculations or execution of program logic within a function.
(4) To obtain and store values provided by the user through the command line or through a graphical user interface.
(5) To build more complex data types representing entities in a CAD drawing.

We will discuss the first way basic data types are used in AutoLISP in more detail in this article. A future article in this series of articles will discuss the remaining ways basic data types are used.

Storing Simple Data Values in Basic Data Types
Variables and symbols are used in AutoLISP to store simple data values. To help us understand this system for storing simple data values, imagine for a minute a company that produces and ships Teddy Bears. Each type of teddy bear has its own box with a unique size and color. The smallest Teddy Bear goes in the small blue box. The medium sized Teddy bear goes in a medium sized red box. The biggest Teddy bear goes in the large green box. When an employee of the teddy bear company works to ship customer orders, he has to select the appropriate box based on the type of Teddy bear being sent to the customer. Once the correct box has been selected and the teddy bear has been placed inside, the customer sticks on an address label that clearly shows who the package belongs to and where it is being sent.

A similar process occurs in AutoLISP. When storing a simple data value in an AutoLISP program you provide the AutoLISP interpreter with (1) the name that will be assigned to the variable (the owner name and address from our example), and (2) the value to be placed in the variable (the teddy bear ordered by the customer in our example). The AutoLISP interpreter will automatically select the correct data type for your variable based on the value you provide (the correct type of box based on the type of teddy bear in our example). The value "Coast Trail" will be placed in a text or string data type, while the value 132.55 will be place in a real number data type. This automatic selection of the data type for a variable based on the value being stored in it is one characteristic that makes AutoLISP a dynamic programming language, and not a static programming language.

In AutoLISP you use the setq function to store simple data values in AutoLISP. The syntax, or format, of the setq function is:

(setq variable_name variable_value)

"setq" is the name of the function, and appears after the opening parentheses. The name of the variable appears next, followed by the value that is being stored in the variable. Here is an example of this type of statement, that stores an integer value of 12 in a variable named "dozen":

(setq dozen 12)

Let's look at one more example. In this example we will store the length of a sewer pipe segment in feet:

(setq plif 120.00)

In this example the name of our variable is "plif", an abbreviation for "pipe length in feet". The value being stored in the variable is the length of the sewer pipe, 120.00. Because we include the two [2] zeros right of the decimal, our variable will have a data type that stores real numbers, not integers.

Sneak Peek
In our next installment of CAD Tips and Tweaks will look at some more functions that can be used to manipulate basic data types, and we will use what we've learned in this column so far to write our first code for working with route alignments and stationing.

National News

Narrowbanding
The FCC's Narrowbanding Regulations

On 1 January 2013, you must transmit data in one of two narrowbanding modes:

- In 12.5 kHz channels (at any link rate)

- In 25 kHz channels at 19,200 bps

What does it mean?
ALL radios will remain legal and all licenses will remain valid as long as you transmit data in either of the above narrowbanding modes. Transmitting at 19,200 bps in the 25 kHz channel achieves the equivalent technology of transmitting at 12.5 kHz, according to the FCC. Operating in either of these narrowbanding modes will significantly reduce performance unless you use one of the new radio protocols developed for narrowbanding. The narrowbanding regulations do not affect receivers, so you can use a 25 kHz receiver with a 12.5 kHz transmitter.

Why did the FCC mandate Narrowbanding?
Public safety communications continue to evolve as more challenging user requirements and technology considerations put pressure on municipalities and their local public safety organizations to enhance and improve their systems. This evolution to other services such as data and video applications is increasing the demand for higher capacity channels and is driving the need for improved spectral efficiency for public safety spectrum allocations.

This was accomplished by reducing the single voice channel bandwidth from the traditional analog value of 25 kHz to 12.5 kHz. Data radios used in commercial applications must remain secondary to voice radios used for public safety. Not only must they operate with CSMA, on 1/1/13 they will be required to transmit either in 12.5 kHz channels ("narrow") or at 19200 bps in 25 kHz channels ("fast"). In this way, the availability of usable channels is effectively doubled or quadrupled in the same equivalent bandwidth. Narrowbanding, as the process has become known, is being used to improve spectrum efficiency especially in the crowded VHF high (150-170 MHz) and UHF (421-512 MHz) land mobile radio (LMR) frequency bands.

All 25 kHz radios will be illegal on 1/1/13?
This is true for voice radios, but is not true for data radios. You can continue to transmit data in 25 kHz channels if you use a link rate of 19,200 bps or higher.
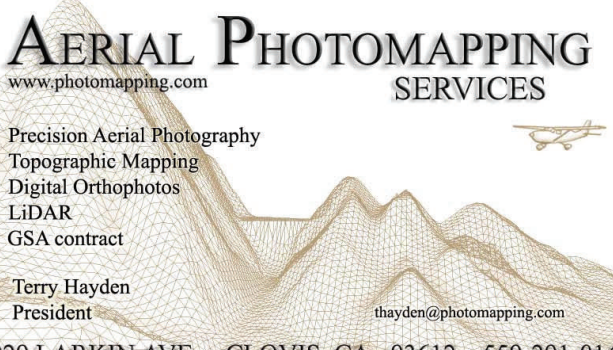
Does your radio operate in the 25 kHz narrowbanding mode?
Check with your supplier to determine whether your existing radio is narrowband-capable or needs replacement.

Radio license status on 1/1/13
You do not need to contact the FCC regarding existing licenses. Their expiration dates will remain unchanged and existing radios will remain legal as long as you transmit in either of the above narrowband modes. Note that on January 1, 2013, the Narrowbanding requirements will supersede the terms of any license and you will not be permitted to transmit in 25 kHz channels with a radio link rate less than 19,200 bps.

(Click for Complete Article)

State News

Caltrans Builds Right of Way Mapping System Using Google Earth

By Christopher Urkofsky, P.L.S.

How do I find the Right of Way?

George Carlin used to tell a joke; "If I went to a bookstore and asked the salesperson, 'Where's the self-help section'? Wouldn't it defeat the purpose?" When entering the Caltrans District 4 Right of Way Records prior to 2010, there was often no way to quickly locate the required information. Instead of a smooth process, a confusing labyrinth of maps, deeds, and other data awaited. Frequently assistance was required for what should have been the relatively easy task of determining the State's Right of Way. This defeated the purpose of a 'Records' service. A new approach was required to move forward.

How did it become so complex?

Caltrans District 4 is comprised of the nine counties of the greater San Francisco Bay Area. Like many other regions within the state, District 4 has a diverse political and geographic environment. Our map collection features a variety of documents dating from the periods before, during, and after the principle construction of the Interstate Highway System. That means that a person who needed to visualize or understand the development of the right of way usually had to wade through a stack of maps created in different decades, which employed different coordinate systems or units of measure and often depicted intersecting or adjoining streets that had been realigned or no longer existed (Figure 1).

Like solving a puzzle.

Relating these maps to one another, to the adjoining street networks, to structures or other pertinent spatial data was a lot like solving a jigsaw puzzle. It was common to see clusters of individuals huddled around a layout table strewn with maps, deed descriptions and aerial photos as they pieced the right of way together. However, because we lacked the means to effectively preserve the results of these puzzle solving sessions, there was minimal return on the time and effort invested. Worse still, Caltrans, like most public agencies, is disproportionately staffed with post World War II Baby Boom generation workers who are at or nearing retirement age. As these workers retire, a unique body of institutional knowledge accumulated from decades of service is lost.

How do we become more efficient?

In 2003, as part of a statewide effort, District 4's entire collection of over 7,000 Right of Way maps were scanned and the resulting images saved to compressed formats. Metadata on each map was also collected and cataloged within a database. The completed system supported digital search and retrieval of map documents based on their location (county, route, post mile), map name or other user queries of the metadata. Scanned maps held additional benefits. Within CAD programs, scanned maps can be overlaid upon aerial imagery in a digital 'mash up.' This combination of aerial imagery and scanned maps made it possible to view the right of way and other mapped elements relative to features on the ground (Figure 3). While visually effective, these mash ups were created for onetime-use, were rela-

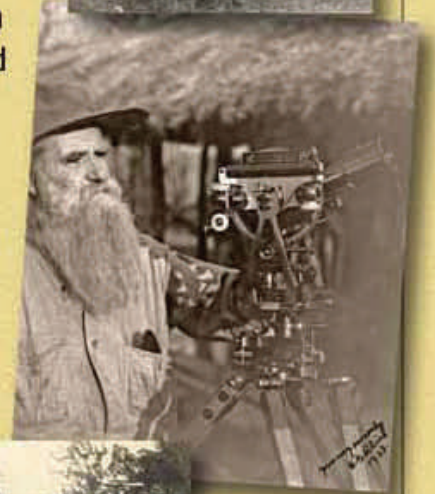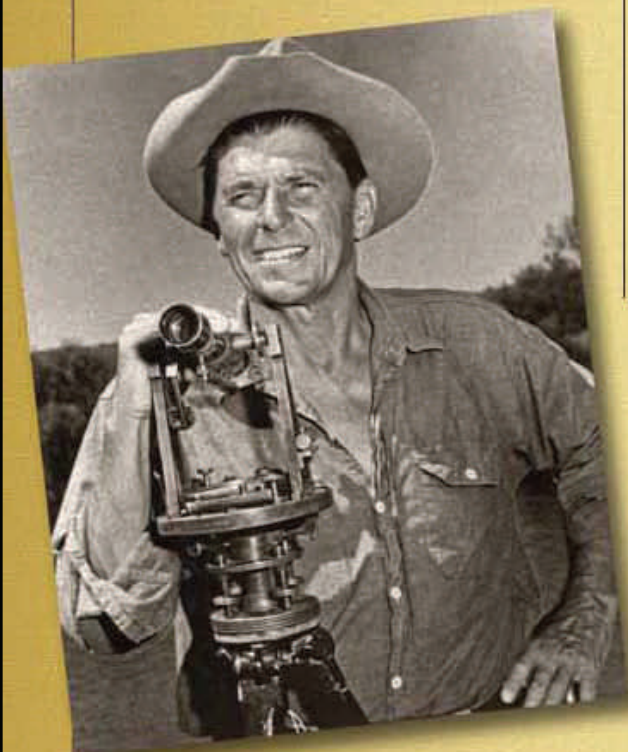## Caltrans Builds Right of Way ... *cont. from page 5*

tively expensive to compose (usually requiring at least one hour per scanned map) and difficult to categorize for efficient subsequent reuse.

A 'sticky' solution.

It became apparent that there was a need for a system that facilitated quicker merging of scanned right of way maps and aerial imagery. To ensure that the completed system would be attractive to the broadest possible group of customers, the software platform needed to be inexpensive and user friendly, with abundant reference resources. Most importantly, to ensure that users would return to and come to rely on the system (the 'stickiness' factor), the system would have to facilitate timely and frequent updating of the digital map content. Employing a synthesis of software applications including AutoCAD, ArcGIS, and Google Earth, the real earth locations of thousands of map images were established ('georeferenced') creating a visual fabric of District 4 Right of Way maps. This was accomplished using several existing Caltrans resources. First, the Department has built and maintains a linear reference system (LRS). Linear referencing is a system in which the locations of features are identified by a relative measure along a linear element; in this case, a mile point along a state highway route. Employing the metadata generated during the right of way map scanning project, we were able to quickly create points corresponding to the location of the center point of each map. Other ArcGIS tools were used to convert these points to polygons which corresponded to the map foot prints. The next step involved the use of a feature within AutoCAD – Feature Data Objects (FDO). Using FDO, AutoCad operators can connect to an ArcGIS shape file and natively edit elements; in this instance, the positioning of the map foot prints (Figure 6). The stronger editing tools within AutoCAD and abundance of skilled CAD users dramatically increased map sheet processing rates. Using the vertices of the map footprint polygons, world files were automatically generated for each of the scanned maps, resulting in the rapid georeferencing of over 7,000 Right of Way map images. Lastly, the footprints were converted to ".kml" and the georeferenced map images to ".kmz" overlays, for display with Google Earth.

(Click for Complete Article)

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Technology & Info
Machines, Models, & Mobile Data

Winds of Change

3D site plans and models combined with fine grading control facilitate success in construction of a major wind-turbine assembly plant.

How do you construct something really big, meet a demanding timeline, and do so to exacting specifications? "State-of-the-art solutions" is buzz-terminology that might come to mind. In the case of the new Siemens wind-turbine assembly plant recently completed in Hutchinson, Kansas, two state-of-the-art solutions in particular were key to the project's success: 3D site plans and grade control systems.

Part of the back-story is the boom in wind generation, which has seen a twentyfold increase since 1999 (2,400 to 48,000 megawatts), making the United States the largest wind-producing country in the world. The demand for towers and their components does not abate. Get up close to one of these thousands of huge towers (upwards of 300-feet high), and their sheer immenseness is revealed. Perched atop each tower is a huge nacelle containing the drive train, gearbox, and generator, all weighing in at more than 88 tons. You better have a big plant to assemble nacelles, with a beefed-up floor to handle the weight.

The new 277,000-square-foot Siemens plant built on a 108-acre site was designed for such weight and capacity considerations. "The amount of concrete will exceed one million square feet, so we need to make certain the grade is accurate," says Martin Howard, field engineer with Bob Bergkamp Construction of Wichita, Kansas. Bergkamp was awarded the contract for site prep work by Gray Construction, a nationally ranked design-build firm selected by Siemens for the design and construction of their new facility. "The plan called for a 12-inch base of fly-ash, so you can see this is designed for extreme weight," adds Howard.

Machines, Models...cont from page 8

"This is a design-build project so we needed to quickly adapt as changes were made and the project evolved," states Howard, who explained that, upon receiving the site plan from the civil engineer for the project, "I built a complete digital model using Trimble software, and we used that to guide our motor grader to achieve consistent grade throughout the project."

Bergkamp Construction had numerous grading concerns for the project. The site contract included constructing the building pad, the 1.2-million-square-foot storage areas (including a large outdoor lot), the employee parking lot, three detention ponds, and service roads leading to and from the facility.

"Every subcontractor on site that had anything to do with layout, dirt, concrete, or asphalt—even down to the surveyors and Gray Construction, the Siemen's design-build firm—was using my information, my model, which is actually a first," states Howard. "I've never been this in-depth with a project." Howard used several software programs to add layers to the Trimble core software programs.

Connecting Multiple Sites
Two-way data transfer capabilities reduce travel time, improve design responsiveness, and make a company competitive.

In Wisconsin and the upper Midwest, Edgerton Contractors is known as a leader in earthwork and environmental contracting services. From heavy highway construction projects with the Wisconsin Department of Transportation to environmental site remediation to road building for wind farm development, Edgerton Contractors has an exceptional track record for meeting clients' design and build requirements with a focus on efficiency and sustainability.

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Classifieds

Surveyor II Needed

Hatch Mott MacDonald has several openings for a Survey related workers

Surveyor I — Rodman: Pipeline surveying experience preferred. Will assist in the collection of surveying data needed to complete different types of survey work assignments for pipeline projects

Surveyor II — Instrumentman: Must have a minimum of 2 years pipeline surveying experience. Survey Instrumentman will operate and maintain all technical surveying instruments and measuring devices needed to complete different types of survey work assignments for pipeline projects

Surveyor III — Party Chief: Must have a minimum of 5 years pipeline surveying experience. Survey Party Chief will plan, organize, and direct work of survey crew for pipeline projects.

For more information or to apply go to **http://www.hatchmott.com/**

Have equipment to sell? Looking for a great deal? Check out the CLSA Forums!

Picture of the Issue

The Forgotten Monuments by Mike Quartaroli, L.S.

Land Leveling Action San Joaquin County. San Joaquin County Benchmark South Side Eight Mile Road at Micki Grove Road
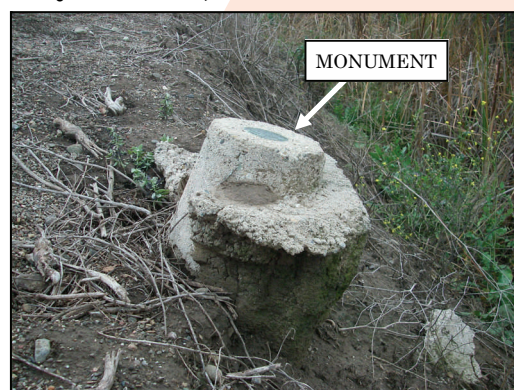
USCE Monument "SJ 6 RM 1" North Side Critchett Rd. San Joaquin County

Two monuments destroyed in road cleaning action, San Joaquin County. USCE Monument shown at 4 ft. lath and USC&GS Benchmark "45 1910 7"
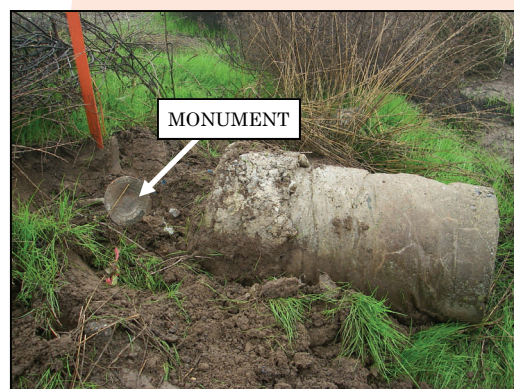
Road Widening Action. USC&GS Benchmark "S 906" at the Southwest corner of Highway Rt. 4 and Inland Drive,

SAVE A MONUMENT. FILE A CORNER RECORD ON ALL CONTROL MONUMENTS WHENEVER YOU CAN!

If you have a historic or interesting photo you would like to see in a future edition of The Prism, please submit to: **editor@californiacentralvalleysurveyors.org**

Puzzle Page

Just for Laughs

Two engineering students were walking across campus when one said, "Where did you get such a great bike?"

The second engineer replied, "Well, I was walking along yesterday minding my own business when a beautiful woman rode up on this bike. She threw the bike to the ground, took off all her clothes and said, "Take what you want."

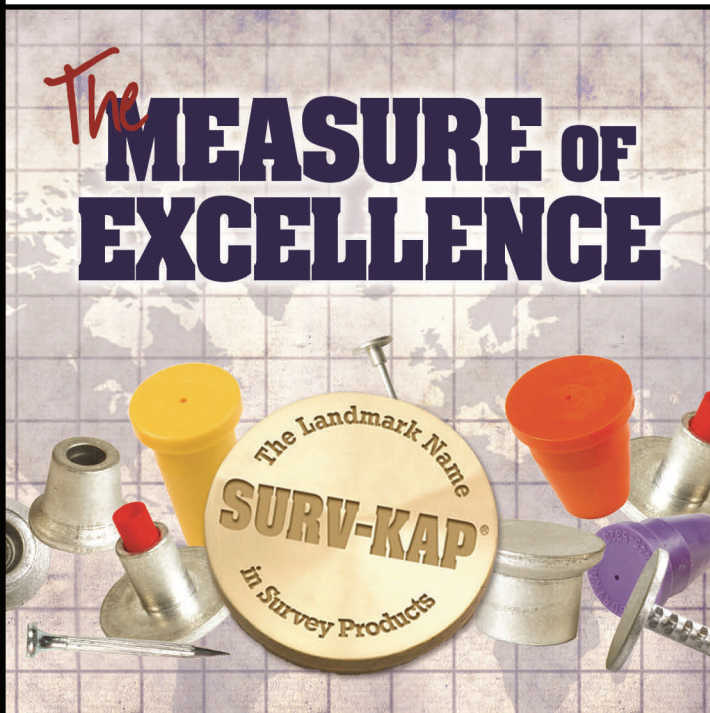The second engineer nodded approvingly, "Good choice; the clothes probably wouldn't have fit."

To the optimist, the glass is half full.
To the pessimist, the glass is half empty.
To the engineer, the glass is twice as big as it needs to be.

Answers to last months "Survey Firsts"

1. Who was the first licensed Land Surveyor in the State of California? Charles T. Healey
2. What year was the first license issued for a Land Surveyor in the state of California? 1891
3. Who was the first President of CLSA? Richard S. Hogan
4. Who was the first County Surveyor of Stanislaus County? Silas Wilcox
5. Who was the first US Surveyor General? Rufus Putnam
6. What was the first college in the new world to issue Surveying Examinations? William and Mary
7. Who was the first "Life Time Member" of the Central Valley Chapter of CLSA? Tom DeLaMare
8. When was the first issue of The Prism released? December 2010
9. What two companies were the first to sponsor The Prism? KSN & NorthStar
10. When was the first Subdivision Map Act released? 1893