

SURVEYOR

California

Fall 2006 Issue #148

CAREER DAY with

“RAMONA” the ROBOT

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**The Santa Ana River
Interceptor Emergency Design**
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“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.”

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On The Cover:

David A. Crivelli, PLS with
assistant Ramona



From the Editor



Passing the baton...

Well, it's football season again. If you want to split a bottle with a friend, talk about football. If you want to split a friend with a bottle, talk about the L.S. exam. At least that's my take on things. We're on the eve of getting this year's exam results and once again we are on the edges of our seats. How many more sub-10% pass rates can we, as a group of California professionals endure before we insist on drastic changes to the licensing process?

Our neighbors to the east in Nevada and Idaho have instituted a mandatory bachelor's degree in Surveying in order to qualify for licensure. Some here in California advocate a similar strategy for us. Is that the answer? I suggest that most of us would say no, at this point, and rightfully so. I predict that mandated degrees will only exacerbate the shortage of licensed professional surveyors and we will be able to observe whether my prediction holds water in the next few years by looking next door.

Is the answer a three strikes and you're out policy whereby an applicant must re-qualify to take the exam after three failed attempts? Debate on this topic can be most vigorous and can lead to the aforementioned friendly confrontation involving a bottle.

Is the exam testing beyond minimal competency? Should it? Should the examinees be studying beyond minimal competency levels? Or is that where mentoring comes in? Are we doing our part as mentors? Pass rates below 10% would make that seem unlikely.

In any case, the Board of Professional Engineers and Land Surveyors and CLSA should engage immediately in some meaningful dialog and come to an accord. If a different direction should be taken, then we the CLSA should lead the way. Remember, the Board exists to protect the consumer from us much more so than to help and protect us. The responsibility for protecting and advancing our profession falls on you and me through the CLSA. So what are we going to do about it?

All questions and no answers - for right now, that's where I am going to leave this commentary.

Speaking of leaving, I have finally confronted the obvious and do hereby concede that editing this fine magazine from my remote CLSA foreign legion post is just too difficult. You deserve an editor with his finger on the pulse of California surveying and lately my fingers have come up somewhat short. Fortunately for all of us, a distinguished and dedicated California surveyor has stepped up to take my place and I expect the transition will be seamless and the continued excellence of this magazine is virtually assured. You probably haven't heard the last me however. When the mood strikes, I hope to blurt out my opinion in these pages if for no other reason than just to get a rise out of you. Thanks for putting up with me.

Without further ado, let me introduce your new California Surveyor editor, John Wilusz:

On August 5, 2006 the CLSA Board of Directors approved me as incoming Editor of the California Surveyor. This is truly an honor and I am grateful to all, particularly President Robert Reese and out-going Editor Carl C.deBaca, who have faith in my potential. Truth be told, as I write this I don't really know what I'm in for. The one thing I do know, however, is that the success of the California Surveyor rests upon many shoulders. Central Office provides first-rate administration, the membership contributes the articles we look forward to reading, and volunteers provide the technical support essential for keeping this ship afloat.

Speaking of ships, I am reminded of the old saw "a rising tide lifts all boats". The boat we Land Surveyors are in could use a little lifting, and it will take a group effort to do it. There are many challenges ahead. Why are the ranks of new surveyors dwindling? What can we do to promote enrollment in land surveying curriculums? How can we mentor future surveyors in this age of one-man crews? Will Model Law proposals ultimately succeed in splintering our profession? Why does the public tend to perceive us as tradesmen rather than professionals?

An excellent way to address such pressing issues is to contribute to the California Surveyor. The California Surveyor is many things. It's a means by which we can disseminate useful and educational information. It's an opportunity to get to know, at least through their writing, fellow professionals across the state. It's an opportunity to learn about and share news relevant to CLSA and professional practice in California. It's an open forum for discussion and the voicing of opinions. Above all, it's a medium through which we can promote our common good, raise the tide so to speak, and confront the challenges ahead.

So get on board if you're not already. Our readership constitutes an immense reservoir of experience, expertise, and talent. Share your own unique insights with us and we'll all be the better for it. Pertinent news, educational essays, interesting photographs, amusing anecdotes, spirited opinions - they're all welcome. As for me, I'll do my best to carry on where Carl C.deBaca left off. It won't be easy. Carl has been working tirelessly, in many roles and for many years, for the advancement of our profession. For that we owe him a mountain of gratitude. Thanks, Carl. — *John P. Wilusz, PLS, PE - Editor* ♦



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President's Message

...take two



Some past presidents of CLSA told me about how time seems to go into warp speed during a year of presidency. "It will go by fast!", they say. Nobody can accuse them of exaggeration.

In the four months since I prepared the last president's message, we have had some new issues emerge and some old ones evolve...

OPSPOT - CLSA's Operation Spotlight and the "Choose Your Path, Make Your Mark" video is just about ready for distribution. CLSA can be very proud about the interest generated by the video from other organizations and from many surveyors and chapters in California. CLSA's Central Office has been working very hard to get the additional materials ready for distribution to college career counselors, high schools and other sources of guidance for young people looking for a career. The whole package is very impressive (contacts, info, DVD, book covers, poster...wow!) and should be available by the time this goes to print. CLSA is also developing a program whereby other organizations can acquire a "tailored" copy for their use. We hope to see our video and recruitment/promotional program grow and provide the awareness needed - and much deserved - for the profession of land surveying.

COMMITTEES - Committees and liaisons are the pistons in the engine of CLSA. Our committees provide information and member review for consideration by our Executive Committee and Board of Directors. Our liaisons provide a pipeline into and out of the groups with which they meet. We are constantly looking for qualified individuals among our membership to help with all the work that our committees and liaisons do. If you have a desire to contribute and would like to get involved, don't be shy, please let us know. Since the Board of Directors meetings are held in various locations throughout the state, we encourage you to attend as a guest, to see how it operates and to get a sense of what the Representatives do.

To date, our committee chair and liaison assignments have been filled and all are up to their elbows in another year of work. Some chairmen are returning, some are new. My intent with committee chair and liaison assign-

ments this year was to have an individual, capable and willing, fill one committee chair, without additional assignments that might dissipate energy and focus. Of course, those with multiple responsibilities have also proven themselves up to the task and challenge. Visit www.californiasurveyors.org/files/committ.htm for a list of CLSA's committees, chairpersons and liaisons.

NAFTA - Our work with NSPS on the NAFTA issue has come back for reconsideration. Last year's NSPS President Goodsen promised a white paper on the NAFTA Mutual Recognition Document (MRD), which this year's President Dolan has forwarded to CLSA for review. There are many considerations when contemplating international reciprocity and comity, particularly given the array of state regulations across the US. Once our Board has reviewed the information, CLSA will have a response for NSPS.

BOARD OF REGISTRATION - One of CLSA's most important connections is with the Board for Professional Engineers and Land Surveyors (BPELS). Governor Schwarzenegger appointed Mr. Pat Tami, present member and past president of CLSA, as the new Land Surveyor member to BPELS, successor to Mr. Michael Welch. Our proud congratulations to Pat.

As a result of the appointment, Mr. Tami resigned as our BPELS Liaison, in whose place Mr. William "Bill" Hofferber of Riverside/San Bernardino Chapter will now represent CLSA. Congratulations to Bill, we look forward to his work with BPELS.

AMICUS CURIAE BRIEF - As a professional organization recognized by California's law community, CLSA is sometimes invited to contribute its opinion to court cases. Recently, CLSA was asked to file an amicus curiae brief on behalf of plaintiffs/appellants in the Knerr vs Mauldin case, for the 5th Court of Appeals, 6th Circuit, Ventura County. The case, a boundary dispute with many complexities and nuances of boundary law, was decided originally by the Superior Court for the defendants. The recent judgment in the appeals case affirmed - upheld - the lower Court's ruling. However, there may

be further action, and initial indications are that if this case is accepted by the State Supreme Court, CLSA may once again be invited to contribute information for the Court.

CHANGES - Sometimes, CLSA's business includes matters that we would prefer to ignore, but cannot be ignored.

Our President-Elect, Jas Arnold (San Diego), has tendered his resignation. He did so because of some health issues that will require his and his family's focus in the coming year. But, typical of his dedication, Jas' reason for stepping down was motivated primarily by concern for CLSA, and how his absence may affect his ability to fulfill the office of President in 2007.

So, at our August meeting, our Board approved a "move-up" for the remainder of 2006 by the present officers into their elected office for 2007. Now, Mr. Steve Shambeck (Orange County Chapter) is our current President-Elect, Mr. James Herrick (Northern Counties Chapter) is our current Secretary and Mr. Matthew Vernon (Channel Islands Chapter) is our current Treasurer. The Treasurer-Elect is Mr. Aaron Smith (Sonoma County Chapter) and Mr. Ron Moreno (Desert Chapter President) will replace Mr. Vernon as Board member to the Executive Committee. Mr. Ian Wilson continues as the other Board member to Executive Committee.

Certainly, for those who have had the opportunity to observe, Jas Arnold's dedication and ability are self-evident, and it is with regret I sent him a letter of acceptance. CLSA offers its premier support and understanding of what is best for Jas. We are, however, very happy to report that Mr. Arnold will continue in his capacity as CELSOC Liaison, an important role to which his talents are suited very well.

CLSA's remaining cadre of officers will continue to perform its new roles as leaders of a very strong state organization of professional land surveyors, in which I am, indeed, honored to participate.

So, with warp drive still online, we will "Engage" ♦

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[DEEDS]

[ASSESSOR MAPS]

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The Santa Ana River Interceptor Emergency Design



Taking Survey cross sections of the riverbed covering the SARI Line, August 2004.

In Southern California during the winter, moist Pacific air rises along the west facing slopes of the San Gabriel and San Bernardino mountain ranges creating or enhancing rainfall from the orthographic lift. During seasons when conditions are right, the resulting run-off can be intense. The western slopes of these mountains drain across the inland plains of Riverside and San Bernardino counties and then through a narrow gap in the Santa Ana Mountains known as the Santa Ana Canyon. Carved over the millennia by the Santa Ana River, this twelve-mile long valley is less than two hundred yards wide in places. The State Route 91 Freeway and the curving channel of the Santa Ana River wind their way through commercial districts and residential neighborhoods that crowd the valley floor.

Prado Dam rises above the canyon entry and regulates the flow of the lower Santa Ana River. This structure provides flood protection for over two million Orange County residents living in the heavily urbanized coastal plain just downstream.

The entire drainage area of the Santa Ana River is known as the Santa Ana River Watershed (SARW) and includes portions of four Southern California Counties; Orange, Riverside, Los Angeles and San Bernardino. Five million people live within SARW's borders. If the SARW were a separate nation, it would rank twenty-third in the world in terms of total economic output.

Continued on next page

The Santa Ana Watershed Protection Agency (SAWPA) is responsible for water quality concerns within the SARW. As urbanization and industrial enterprise grew in the inland portion of the region over the past thirty years, higher and higher levels of highly corrosive saline waste were generated. SAWPA dealt with the "Inland Empire's" high saline industrial wastewater by transporting it through underground pipelines to several desalter facilities where it underwent primary treatment. The primary desalting process generated large amounts of non-reclaimable wastewater. The non-reclaimable effluent was handled by transporting it through a large diameter underground pipeline known as the "Santa Ana River Interceptor (SARI) Line" through the Santa Ana Canyon and into Orange County to a secondary treatment facility located at the Orange County Sanitation District (OCSD) headquarters in the city of Fountain Valley. There a secondary treatment process made the effluent clean enough to be released into the ocean as treated salt water.

Since 1975, an average of thirty million gallons per day (30 MGD) of industrial wastewater and desalter content has been transported to the OCSD secondary treatment facility through the SARI line. An interruption in service of the line would result in a difficult and extremely expensive trucking operation lest thirty MGD of non-reclaimable high saline waste be discharged into the Santa Ana River just upstream of the densely populated Orange County coastline.

The local hydrology the SAWR was indeed a threat to the underground SARI Line in the canyon. It was feared that enough erosion could occur in the Santa Ana River during major flood releases below Prado Dam to damage the pipe. This danger was deemed to be especially prevalent in upper Santa Ana Canyon where the SARI Line crosses under the channel of the river in four locations.

Mindful of the potential for pipeline cover degradation in this region, the operators of the SARI Line, the Orange County Sanitation District (OCSD), requested that an ongoing program of accurate and up to date surveys be undertaken to bolster their comprehensive protection program for this critical wastewater pipeline. In the late 1990s OCSD selected the Irvine based firm of RBF Consulting to perform a series of field surveys with the intention of documenting the continuous river course migration in this area. RBF was also charged with monitoring ongoing changes in SARI line cover where the pipeline extended under the actual flow of the river.

RBF Consulting created a highly innovative approach in Survey methodology to obtain meaningful data of the river bottom contours. The process was both unique and physically

challenging. It combined traditional methods with the best survey instrument technology available. The riparian environment within the study area was characterized by dense to extremely dense stands of willow tree groves, arundo (bamboo) and other types of thick undergrowth. It was not possible to obtain survey information in certain areas with traditional methods because it was too thickly vegetated. Additionally, environmental regulations for the sensitive riparian habitat did not allow for extensive vegetation removal.

The river flows with a considerable current through much of the study area. It was not always possible to wade the river in the places where the District requested survey cross sections because the water was often more than six feet deep. Small boats or dinghies with oars could not hold their location in the shifting currents and there was no place suitable for launching motorized boats. Even if motorized watercrafts could have been launched, there were underwater obstructions and shoals that would most likely have rendered them useless. The volume and rate of the water stream could also vary considerably according to the requirements of the operators of Prado Dam, the Army Corps of Engineers (COE).

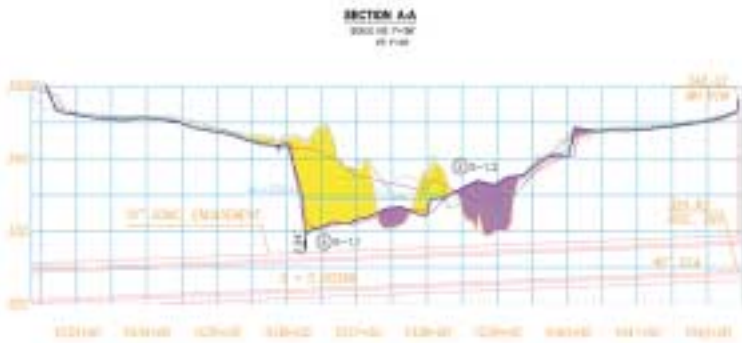
RBF discovered that the most effective method for performing waterway cross sections was to establish coordinate control with GPS observations in open areas then survey to the cross section sites with traditional traverse methods. Once the location of a cross section was determined, the survey

crew would string a nylon rope across the width of the river and fix each end to the bank. A surveyor would then don a wet suit, tie onto the nylon line spanning the channel and wade into the river with a rod and prism. Alternately wading and swimming, the amphibious surveyor forced the rod down to the river bottom while attempting to maintain plumb. The instant that the rod was plumbed, the prism would be shot with an auto-tracking total station instrument set up along the bank. Often, several measurements were needed in the same place to establish a minimal rod reading because it was difficult to keep the rod vertical in the current while at the same time compensating for the pull of the river. This proved to be exhausting work and not without an element of danger, although redundant safety features were put into place. The data captured directly was extremely important since an accurate analysis of the cover condition could then be performed.



*Crane setting RipRap for stabilizer structures
November 2004 with minimal vegetation removal.*

The Santa Ana River Interceptor Emergency Design



Cross sections shown in RBF report showing SARI Line cover with riverbed erosion and accretion.

River bottom monitoring campaigns were conducted by RBF in 1998, 2001, 2003 and 2004. The results of each survey was catalogued and published in a detailed, illustrated report and submitted to OCSD for use in maintaining the integrity of the SARI line.

The August 2004 RBF scour study revealed two areas within the riverbed where cover over the SARI line had become unacceptably thin. When a moderately large early season storm occurred in late October, OCSD asked RBF Consulting to perform an additional riverbed survey campaign with emphasis on the two areas of concern. This survey indicated that there was a worsening of the already substandard cover condition. OCSD moved quickly to design two riprap grade stabilizers to protect their line. These were both constructed in November.

The installed stabilizers were designed to allow natural siltation to occur and during the next several weeks, the pipeline cover increased at a gradual but steady rate. The scour in this area seemed well under control as 2004 came to a close. Then, at the very end of December a type of weather pattern known as a "Rex Block" became established over the Pacific Ocean between central California and southeastern Alaska. This condition ushered in a major hydrological event for the West Coast and began what would become the rainiest winter on record within the SARW drainage region.

The Rex Block triggered a series of storms lasting from December 26 to January 4 that dropped over five inches of rain throughout the Southern California region. More than ten inches of precipitation was recorded in the San Bernardino Mountains that lay within the SAWR. A more ominous situation occurred a few days later as the Rex Block moved north. Between January 6th and 11th an additional six inches of rain fell at Prado Dam. Three times that amount fell in the upstream foothills. The resulting runoff was enormous and filled the Prado Basin to its maximum capacity of 100,000 acre-feet. The full reservoir pool breached a temporary cofferdam that was in place to allow the construction of spillway improvements at the main dam. The possibility of uncontrolled run-off

became a grave concern. The Army Corps of Engineers (COE) reacted quickly, electing to release the maximum sustainable flood release flow of 10,000 cubic feet per second (cfs) for seven straight days beginning in the second week of January. As predicted by the hydrologic models, localized flooding and significant erosion occurred in the downstream Santa Ana River basin.

The integrity of the SARI Line became a matter of the highest priority. In mid-January of 2005, OCSD and RBF Consulting geared up rapidly for an emergency work effort officially entitled, "The Santa Ana River Interceptor Emergency Design". The overall goal of this emergency project was twofold; first to protect the SARI line from the effects of short term erosion and second, to perform a comprehensive analysis of the floodplain conditions and produce a permanent SARI pipeline protection design capable of withstanding prolonged flood releases of up to 10,000 cubic feet per second from Prado Dam. The first project task was to accurately document all changes in the Santa Ana River topography that had occurred because of the massive flood releases. Fresh cross-sectional data of the SARI line river crossings was required immediately. Comprehensive aerial topographic to map changes in river courses and floodplain features was also necessary. Timing was of the essence since the protective structures were scheduled to be in place by the following winter.

OCSD and RBF Consulting faced a daunting and complex task as they met to determine a focused course of action. Because of the massive flood releases below the maxed-out Prado reservoir, performing cross section of the river bed appeared to be out of the question. Moreover, scouring of the riverbed would occur continuously during the high releases. Even if data could be obtained, the ongoing erosion in the channel would soon make it out of date. For meaningful survey data to be obtained, the water level needed to drop substantially below the flood release threshold and remain there.

OCSD and RBF convinced the Corps of Engineers of the urgency of the situation and on January 20th the Prado Dam release rate was temporarily reduced to a mere 100cfs. Multiple RBF Consulting survey crews descended on the one-day low flow conditions and conducted emergency cross sections of the four SARI line crossing sites.

RBF recommended that aerial photography be taken of the entire upper canyon reach during the low flow event and OCSD gave their approval. A hastily prepared flight plan was drawn up and Air Photo Services flew the site in stereo during the draw down, flying on short notice during an extremely brief and highly fortuitous break in the cloud cover. There was no time to set ground aerial targets but RBF was fully prepared to run survey control on photo ID points as soon as the film was developed. Vertical Mapping, Inc. later compiled several topographic maps as they were requested by OCSD. The timeliness of their efforts was critical to the overall success of the project.

Continued on page 22

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CAREER DAY with

“RAMONA” the

ROBOT



David A. Crivelli, PLS



Dylan Kolstad, PLS

We're a dying breed, more people are retiring than entering land surveying careers and the demand for our work has never been greater. You can't find any qualified help and enrollment in surveying programs is down. You've all heard it before; but what can you do to help?

Last May I got an opportunity by introducing careers in land surveying to my son's eighth grade class at Pacific Union School. The presentation was part of a weekly "career day" unit in the Junior High School he attended. When Sam asked me to present my profession to his class, I was happy and excited to participate. The next thought I had was "What am I going to say?"

This task was made easier by the 5 minute DVD entitled "Choose Your Path...Make Your Mark" on land surveying careers recently released by the CLSA Central Office. This DVD, introduced by our President, Robert Reese, at the March 2006 CLSA Conference in Reno, made my job much easier.

I decided to build my presentation around the DVD. The quality of this production is impressive; it includes special effects, informs the students of all aspects of modern surveying, and introduces several career paths to enter the profession. I also thought it would be fun to dress up my Leica robotic total station (we've nicknamed her "Ramona") with a mop wig and red lips to demonstrate a state of the art surveying instrument, and to interject some humor into my presentation.

Before the kids arrived in class, Dylan Kolstad and I set up the instrument and various prisms around the class room. As the kids filed in, Dylan manipulated "Ramona's" viewpoint from behind a podium using the Allegro remote control data collector. Whenever someone would comment on her funny wig or large red lips, Dylan would direct her to "look" at them. This proved very entertaining and also got all the kids attention as the class started.

I started by talking about the need for land surveyors and that my goal was to convince at least two people in the class to become land surveyors. I told them if they like math, history, computers, and being outside "it's the only job for you". I went on to give a brief description of the contributions to surveying by the Egyptians, the Romans, and Napoleon's self proclaimed greatest achievement in civilization, the first European Cadastre. I then talked about the creation of the United States Public Land Surveying System, and what our earlier surveyors accomplished. Using the DVD, I discussed what was shown in the DVD on what surveyors do, opportunities in land surveying, and the various career paths.

We ended the presentation by having Ramona the robot double some angles and demonstrate how she follows the

Continued on next page

Continued from previous page

prism around the room. We then played a guessing game by using the laser pointer and reflectorless distance measuring function to shoot distances to the corner of the ceiling. Loli Pops were awarded to those who guessed the correct horizontal and vertical distances.

I was surprised that many people in the class had no clue as to what land surveyors do; my son's teacher included. She had the students write thank you notes. The students thanked us for teaching them about the land surveying profession. Many included sketches of Ramona and one, my favorite, with a surveyor jumping in the air, clicking his heels, with dollar bills floating around him. The presentation to these sixty kids proved to be very rewarding.

We brought some pictures and a few of the thank you notes to the Humboldt Chapter June meeting and discussed the presentation. Several members of our chapter expressed interest in continuing this effort into this coming school year. We formed a committee and met in July to discuss career day talks and how to incorporate Trig Star into the high schools. We have divided up into teams of two and will be contacting career counselors at every high school in the County. We plan on informing career counselors of the opportunities in surveying, doing career day talks, and contacting Math teachers this September to set up a Trig Star program. We will also be contacting the local Junior College and State College for career day presentations.

We must reach out to our youth to begin bringing in more surveyors into our profession. I encourage all Chapters to take advantage of the new DVD, "Choose Your Path.. Make Your Mark" and set up presentations to inform young people about our exciting profession. ❖

David A. Crivelli, PLS, is a graduate of Fresno State's Surveying and Photogrammetry program and owner of Crivelli Surveying Company.



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Black Hill Reset 2006

The morning broke calm and overcast, the weather not so much threatening rain as trying to decide what to do. There was a slight drizzle in San Luis Obispo, but I decided to go to Morro Bay to see if anybody else shows up for our planned event. The announcement for the effort to reset a monument at the top of Black Hill in Morro Bay did say weather permitting, so it would be chance to find out if the weather really would issue us a permit.

The ride to Morro Bay got really rainy at one point, but upon arrival at the parking lot below the hill it was apparent that there had been little or no precipitation in the area, and it looked like the ground wouldn't be very muddy, so I parked a while, just before 8 a.m., in the parking lot at the trail head up to the top. I reviewed the research materials I had acquired on the NGS monument BLACK HILL RESET (PID FV1654) with all the various descriptions and recovery notes, starting from 1881, when the station was established, up until 2002, when it was reported as possibly missing.

First, a little background. The original mark was established by United States Coast and Geodetic Survey (USC&GS) in 1881, as part of the control network for the coast survey work. The mark is located at the summit of Black Hill in Morro Bay, San Luis Obispo County, and commands a wide (and spectacular) view of the coast and much of Los Osos Valley extending to the east. It is a good vantage point from which to turn angles for the triangulation control work that the USC&GS performed.

Over the years, the BLACK HILL evolved from a stub (stake), to a bronze monument in concrete set over a glass bottle in concrete, to BLACK HILL RESET, a California State Lands Commission (CSLC) brass cap set in concrete over a bottle without concrete. The reference marks multiplied over the years, from four leads and copper tacks first described in 1883 to two standard USC&GS bronze disks in 1919, to an additional disk recovered in 1978. The notes from the data sheets posted by the National Geodetic Survey (NGS) only pick up from the 1950s, so fortunately I was able to locate some of the paper recovery notes by USC&GS that compiled the preceding 75 years of recovery work.

Throughout the various intervening years, some of the reference marks were described as missing, only to mysteriously reappear in later recovery notes. Looks like the diligent search has been implemented with varying levels of energy for quite some time.

In January of this year, a client asked to have some points, shown as ordinary high water (OHW) line on a CSLC map located on the ground. The CSLC map was dated 1957, and was based on NAD27. It listed many points and their NAD27 state plane coordinates, but set no physical marks on the points along the line, so the only way to recover those points was by locating their coordinate positions. Additionally, the map showed several local control points with NAD27 SPC values, and so provided enough data for a good control scheme and layout. Time to break out the GPS and stakeout, with RTK, some of the points to see how well I could verify the control system and then to see where the OHW points fell. Three or four centimeters was good enough for the client, and the NAD27 coordinates were given to the nearest foot, anyway.

So, after finding an appropriate local base monument (WHITE RESET, PID FV0403), and armed with the coordinates for several other control points, I set off in search of check points. The first, about half a kilometer away, was indicated on a very brushy hillside in shoulder-high sage and poison oak. Clearly, that check point was Plan C, or even D. The next point lay atop Black Hill, a moderately steep 10-minute hike up a well-worn path. But the recovery notes from 2002 weren't promising, as the description said DID NOT FIND THE STATION MARK BUT IT MAY BE COVERED WITH DIRT. DID NOT SEARCH FOR RM3. Now, I'm all for submitting recovery notes, but if I have to break out a shovel, hey, that's going a bit far, don't you think? Besides, it's much easier to submit recovery notes that tell the world I didn't really look for the monuments, anyway.

After some field preparation, off I go to the top of Black Hill, with shovel (I know, above and beyond the call) and detector, looking for a dirt covered mass of concrete with a brass cap and several reference marks.

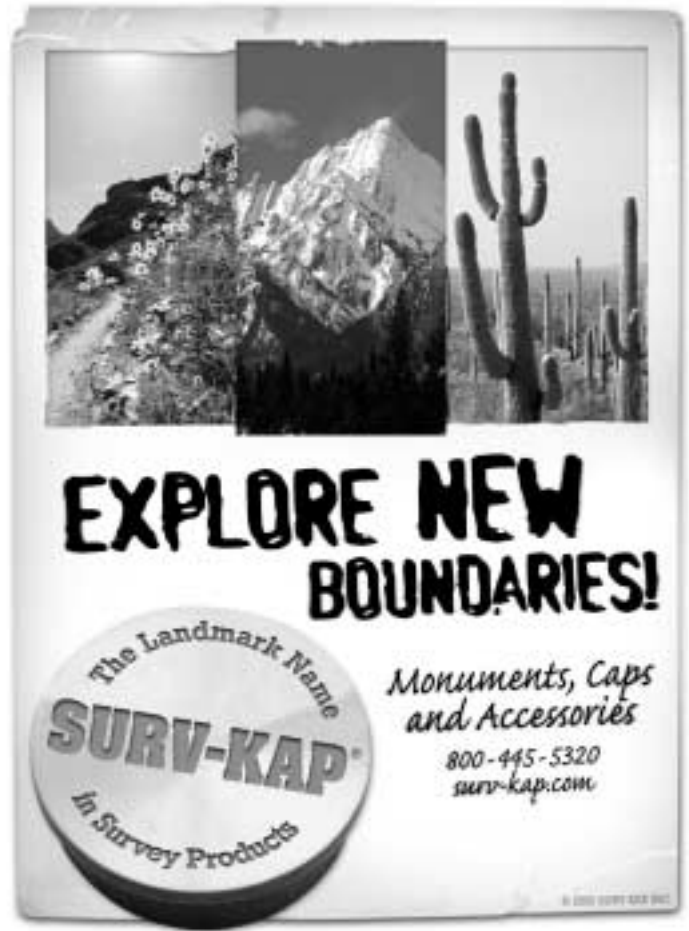
After a short search atop a bouldered summit at the stake out position, I dug a shallow pit in a soft earth. No concrete, no brass cap. However, about 10 inches down, I heard a tink and was rewarded with a glass bottle! The bottle neck, I was told, was typical of 19th century glassware, and the bottle body was firmly planted in the earth, upright and surprisingly empty, as there was no cover or stopper in the bottle. Verification of its position with my RTK rover showed it was within 1 cm of the published NAD

Continued on next page

27 coordinates. One of the 1919 reference marks was measured and the inverse from it to the bottle was also within 1 cm. Not trusting results this good, another couple of marks shown on the CSLC were recovered and verified, also within 1-2 cm. I felt reasonably sure that the control system and positions on the CSLC map were good to go, and so continued on with the project at hand. But that's another story.

A recounting of the experience at a dinner meeting of the Central Coast Chapter of CLSA led to interest by some of the members, for doing a re-monumentation project. Although BLACK HILL wasn't really worth preserving as a present day geodetic position, it did have some historical value with its ties to other surveys on older, superseded datums. So, with more than a few hands raised in support of the effort, the chapter decided to reset something to preserve the mark. This time we would set a monument that would offer more resistance against visitors looking for memorabilia.

Back to Saturday morning. Around 8 a.m., first one truck, then another, then another appear at the remote parking lot, bearing survey company logos. Skip Touchon showed up, ready, willing and able, followed shortly by Michael Stanton and son Conner. Leonard Lenger, who contributed greatly in preparing a check list of stuff for the project and in designing the monument, arrived with concrete and other materials. I had a couple of buckets filled with tools, compasses, steel tapes and other stuff, as well as notebook and camera to memorialize the effort. With everybody shouldering some of the burden, off we go. The morning, still overcast, only drizzled on us briefly, but looked like it was going to issue our permit after all.



Everybody arrived at the summit breathing hard after the climb, with the concrete and tools and water necessary. We hoped to make it in one trip, and almost did. We set about uncovering the bottle (which I covered back up after my departure in January), and found it as I had left it, along with some additional spikes and flagging set as guides to its location.

The top of the bottle neck, which was broken away from the body of the bottle during my prior search, slid right into place and

was epoxied onto the body. A rubber stopper and brass tack was centered in the neck and we set some spikes as temporary offsets from which we would reset a bronze cap on the top of the monument. We had decided to build a monument that would leave the bottle intact, but still provide a durable mark directly above the center. The plan was to set a PVC sleeve over the bottle (but not attached to it), cap the sleeve and then set a form around the sleeve into which we would pour concrete and set the bronze cap. The concrete would be anchored to the rock below by form stakes

Continued next page

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Black Hill Reset 2006



driven into the rock, with some reinforcement in it, and provide enough resistance to discourage any would-be souvenir hunters from taking this one home.

All went well, with only a couple of trips back down to the trucks for more concrete and for a plumb bob to use for distance ties to the found reference marks. The bronze cap, donated by the County of San Luis Obispo Surveyor's Office, was set. It had been pre-stamped with COUNTY OF SAN LUIS OBISPO SURVEY MONUMENT, BLACK HILL RESET 2006 CLSA. All the reference marks, starting back in 1883, were recovered and all that was left was to measure with a steel tape the distances to those marks. We even used a spring balance for tension and made sure of horizontal distance with a hand level. One of the more painful



parts of the project wasn't packing concrete or water up the hill, it was trying to remember how to pull a good distance with a tape, spring balance and plumb bob.

We were visited, during our project, by several folks making the short journey up the hill for the vista it provided. They would

ask about what we were doing, and after a polite look of interest would say That's nice, and move on. With the cleanup done the final thing to do was to get a photo, and pack back down the hill.



It was now noon, and everybody was hungry and thirsty. Lunch and a beer was had in town and the event was done.

Many thanks to those who contributed time, tools, materials and effort, and most of all to the Chapter for the support. When it is posted, you will be able to see the new description as part of the NGS database. As Mike said, this ought to last for the next 125 years. ❖



Robert J. Reese, PLS, is CLSA President and owner of Reese Water & Land Surveying Services, San Luis Obispo, CA

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CLSA Education Foundation Update

The CLSA Education Foundation was established in 1996 as a California non-profit corporation to “provide scholarship aid for students; to provide financial support to educational institutions or in the furtherance of educational purposes; to undertake educational studies and to publish the results thereof.”

The primary focus to date has been to build an enterprise to fund scholarships for students of Land Surveying. The program has evolved to the point where this year, 18 scholarships for a total of \$18,750 were awarded. 11 of those 18 scholarships are sponsored by various Chapters of CLSA who put considerable effort into raising money to defray deserving student’s educational costs. I really have to applaud the Chapters for their commitment to endowing scholarships. Please visit our scholarship page on CLSA’s web site to find out which Chapters are participating and to find out a little bit about the leaders in the Surveying profession these Scholarships are named after: <http://www.californiasurveyors.org/files/scholarsh.html>

Also on the CLSA web site is a list of those who donated to the Scholarship auction at the CLSA Conference in March: <http://www.californiasurveyors.org/files/educfound.html> This mostly annual event (the auction, not the conference) has been the main fundraiser for the Education Foundation and this past March we raised over \$24,000 for our efforts. One auction highlight that I cannot help but to mention was the donation of a beautiful CLSA quilt made by Barbara Herrick, wife of one of the Foundation’s Executive Directors. Barbara in the past has created a giant stuffed “Surveying Teddy Bear” that created a lot of excitement at the auction and this year she out did herself with this quilt. Dorothy Calegari, CLSA Executive Director also outdid herself in winning the bidding on the quilt. Dorothy always has some fun bidding at the auction and this year the quilt was a must have for Dorothy and she was very generous with her bid.



Thanks to all who donated and also to those who attended and participated in the Live and Silent auctions. Without your help we could not have made this year’s auction the success that it has become.

With the passing of noted Surveyor and author Francois “Bud” Uzes just weeks before he was scheduled to appear at the CLSA 40th Anniversary Conference, many were seeking a way to honor his

memory and the Education Foundation was able to establish a Bud Uzes Memorial Scholarship fund to which the family directed donations. We would hope to make this an on-going scholarship and your donation will help make this possible. Checks can be sent to: CLSA Education Foundation attn: Bud Uzes Memorial Scholarship, P.O. Box 9098, Santa Rosa, CA 95405

Speaking of donating, the Foundation has created a new vehicle to recognize those who would like to support the Foundation and it’s goals financially. Foundation “Associates” will be recognized on the CLSA website and the Gold, Platinum and Diamond level associates will be recognized in the California Surveyor. Congratulations to Bob Hart and the San Diego Chapter, CLSA for becoming the

first to donate at the Diamond level. See application on pg 31 for information on becoming an Education Foundation Associate.

Please keep the CLSA Education Foundation in mind for your year end charitable donating and tax planning. Also consider the Foundation as a beneficiary in your estate planning, if you are serious about supporting the Foundation and students of Land Surveying.

Additional efforts by the Foundation include establishing a “CLSA Auctions” web site as a place where Surveyors can go to look for bargains on equipment or to sell whatever they can. A percentage (15%) of the sales price will go towards supporting the Foundation. We hope to have the site up and running in the next few months.

The Foundation’s Board of Directors determines the direction the Foundation goes in it’s fund raising and endowment activities, but it is really the efforts of the Chapters and CLSA in funding some of our scholarships along with the participation of all of you in donating and bidding on auction items that keeps the Foundation alive and growing. To find out how you can help with fundraising, or to donate an item for the auction at the next conference, contact one of the Education Foundation Directors. The 2006 Directors are:

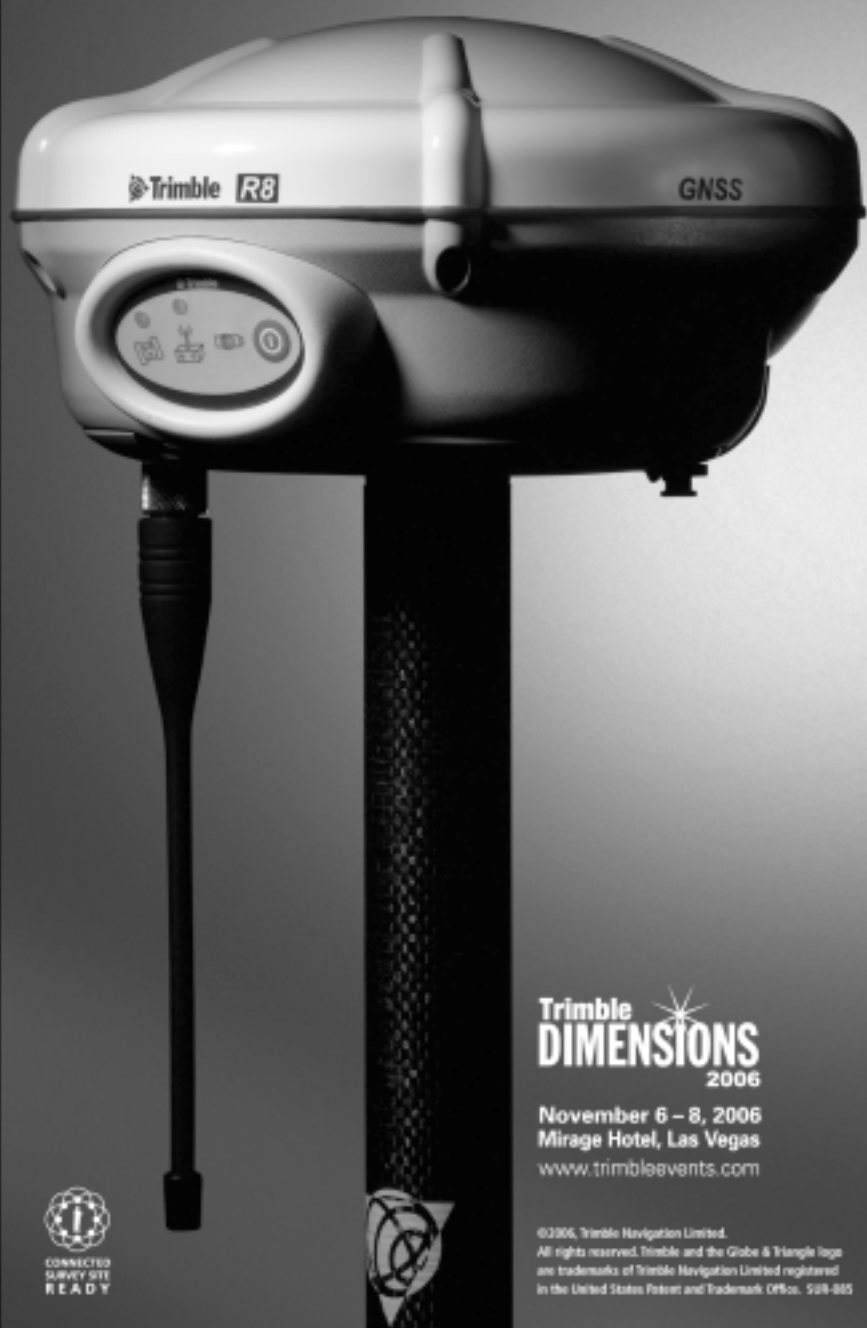
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Steven J. Martin
Senior Land Surveyor
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The author on a Height Modernization Survey in the Anza-Borrego Desert before the phrase “Height Modernization” was coined and before the advent of the California Spatial Reference Center. ❖

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The Santa Ana River Interceptor Emergency Design



10,000 CFS Flood Release, January 2005.

The COE increased flow rates again the day after the major effort on the cross sections but at far less volume than the maximum flow rate for the channel. This was done to keep the rate of erosion as low as possible. Fortunately, the water level had fallen to just below critical in the Prado basin and the huge flood releases were no longer needed.

The cross section field surveys were processed into CADD and formatted as profiles suitable for hydrographic analysis and engineering design. In a highly compressed schedule RBF had a complete Storm Damage Assessment survey Report prepared and in the hands of OCSD Engineers before the end of the month.

The Storm Damage Report indicated that large-scale changes had indeed taken place in the riverbed. Some cross sections showed that as much as thirteen feet of scour and up to seven feet of accretion had occurred compared to pre-storm conditions. Fortunately, the SARI Line had not been compromised, although the top of the pipe was exposed to river water in two places. By early February, OCSD had a working design for placing rock riprap stabilizers at several crucial sites. Working closely with District Engineers and contractors,

RBF surveyors controlled the layout of these stabilizer structures and a critical construction effort commenced. Besides constructing the stabilizers, OCSD placed riprap along several reaches of highly eroded riverbank to prevent further bank deterioration. Concurrently, OCSD requested that more areas of the river floodplain be compiled from the existing January aerial photography and RBF set about identifying and controlling ground photo control points by establishing field co-ordinates and elevations.

This multi-disciplined survey and design effort continued through mid-February when a five-week respite from the rain ended abruptly. Another Rex Block anchored itself along a longitudinal line just off the West Coast and another round of drenching rain began in Southern California. From February 17th to the 23rd enhanced shortwave energy rotating around the parent low-pressure area tapped into a sub-tropical jet stream and slammed significant moisture into California. Over that six-day period, rain-

fall at Prado Dam totaled nearly seven inches and over twenty inches was recorded in the San Gabriel and San Bernardino mountains. Nine people were killed in Southern California by this storm and property damage soared into the millions.

The Santa Ana River and the Prado Basin experienced déjà vu of the January event, swelling with floodwaters that caused more erosion and accretion throughout the upper Santa Ana Canyon. Near the end of the month, the water subsided and the District discovered that the river had circumvented the recently installed riprap grade stabilizers. More emergency work commenced and an additional riprap grade stabilizer was constructed while the existing structures were repaired. Unstable embankments throughout the basin were again reinforced with riprap. Gravel was added near SARI Line manholes in an attempt to restore the historic surrounding grades. RBF remained busily engaged at multiple levels, establishing horizontal and vertical survey control for revetment construction, and capturing supplemental topographic data wherever and whenever it was needed.

At first it appeared that the situation had reverted to exactly where it had been after the January storms and RBF met with the District again to determine how to best proceed. A quick review of



Same area during one day low flow conditions, January 20, 2005.

the specifics indicated that the situation was actually not at all the same as after the January event. Because of the rapid response by all parties in January, the District had partially protected the SARI

Continued on page 24

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The Santa Ana River Interceptor Emergency Design

Line and its manhole structures by constructing the first set of rock stabilizers in record time.

The most critical element of the short-term effort, the integrity of the line itself, had been achieved, at least through the major storms of February. Moreover, because RBF had flown stereo aerial photographs in January there was an excellent record of river conditions prior to the February event. Using these photographs, RBF and the District discovered that there were four locations that had changed significantly from the January condition. RBF proceeded to perform traditional ground topography of these areas and layered the ground topography onto the January aerial, effectively updating the topo map. This allowed the long-term goal of design for the permanent emergency repairs to proceed without undue delay.

As the water receded further, RBF discovered that the dense riparian vegetation that had continually plagued ground survey operations had been vastly reduced by the January and February flooding. Many formerly inaccessible and obscured areas within the floodplain could be surveyed accurately for the first time. New channels had formed and former watercourses were filled in with silt. New field data was gathered throughout all of these areas and the shifting river cross sections over the SARI Line were again surveyed. A final RBF Consulting project report was compiled and published in April 2005. This report shows riverbed profiles dramatically different from those gathered over the previous four years.

The record rainy season, however, was not over yet. Rain events continued to occur until the second week of May but fortunately none of these resulted in significant river scouring. Although the site conditions had change significantly from the beginning of the Emergency Protection design effort, the District had continually been able to modify and update their proposed improvements because RBF Consulting continued to update the changing river environment.

The final design for protecting the

SARI Line permanently was completed in August of 2005 and put out to bid the following month. Construction of these protective elements was concluded in December of 2005.

The SARI Line Emergency Repair project is a case study in team oriented problem solving and adaptability under adverse circumstances. RBF Consulting and the Orange County Sanitation District collaborated to a degree that is not generally seen in a private and public sector partnering arrangement. The project succeeded because all of the players concentrated with intense focus on achieving a common goal despite a constantly changing playing field. The fundamental operating premise was that the SARI line could be protected and would be protected if everyone on the team functioned at their highest level.

RBF and OCSD complimented one another almost perfectly. RBF had the resources and mindset to obtain the constantly shifting base line information that the District needed. The District changed their designs on the fly, relentlessly pursuing their goals.

Because of this cooperative team effort, the SARI Line was protected during the record 2004/2005 winter and will be protected from 2005/2006 on, even during prolonged flood release conditions in the Santa Ana River basin. As a result the Orange County coastline and the millions of people who make their homes within the downstream floodplain will be more secure.

There was an interesting side note to this project. The Santa Ana River in upper Santa Ana Canyon is designated as a "Blue Line" stream by the Army Corps of Engineers and, as a result, is classified as being of significant ecological importance. The area is not channelized with concrete lining like the downstream reach of the river through Orange County. The river plain over the SARI Line in the upper canyon exists in an entirely natural state. Care had to be taken, even during emergency conditions, to perform surveys within the regulations for this type of resource. RBF Consulting succeeded by applying the

correct technology to the various microenvironments. Streambed disturbance by construction was minimal. Clearing for line of site was carefully performed to minimize even minor damage to riparian vegetation. Clearing for construction was confined to the specific areas where repair was a necessity by having the locations staked out prior to moving equipment on site. The construction footprint was minimized throughout the process, protecting a vital resource.

Certain government agencies have garnered recent criticism for being slow to respond in emergency situations. The SARI Emergency Design project indicates that this does not have to be the case. The potential of coping with adverse situations through the collaborative efforts of a Private Sector/ Public Sector team certainly had considerable merit in this specific situation. Although the District had previously retained RBF to perform a role in overall SARI Line maintenance, it could not have foreseen conditions that were beyond the intent or reach of a traditional on-call contractual agreement. When such conditions did occur; however, the District already had a highly capable private firm under signed contract and did not have to undertake any sort of selection process when time became absolutely critical. As a result, The District and RBF responded to a threatening circumstance with quick thinking and immediate action. Short-term measures were applied exactly where they were needed while concurrent efforts were set in motion to permanently solve the underlying problem. The successful achievement of both goals of the SARI Emergency Design project should serve as a model for how other agencies might consider responding to future disasters. ❖

Michael R. Miller, PLS is Vice President of surveying for RBF Consulting, Irvine, CA.

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Rod Heights PART 1

If your circumstances are like mine, you probably acquired your field gear at different times, from different sources as the good deals came up or you needed a replacement, especially with survey rods. They get a lot of abuse.

If you have a mix and match situation, and you use your rods sometimes for GPS work, and also total station topo, and maybe for traverse work, then perhaps what I learned and did may help you. But if all your rods and prisms are the same model, by the same manufacturer, then read no further.

Since I take my prisms and GPS antennas off the rods when I put the rods back in the truck, my goal was to “standardize” all my rods and prisms so that I didn’t have to measure and adjust a rod every time I put a piece of glass or antenna on a different rod. What I did to standardize my rod assemblies was to first standardize the height of the rods and then standardize the height of the prism assemblies. Standardizing the rod height has two parts: making the rod points all the same height and also making the rods the same height from the rod point to the mounting surface of the threads on the rod. Standardizing the height of the prism assemblies is a little more straightforward.

Since I have a penchant for turning any simple process into something incredibly complex, I will cover the rod points in this Part 1. Part 2 will cover how I dealt with the different rod dimensions from different manufacturers and how I made the overall rod height the same. Part 3 will cover how I standardized my prism heights. Besides, if you’ve read this far, I’m not going to push my luck keeping your attention with ten pages talking about rods. One can take just so much.

ROD TYPES

The two types of rods are shown in Photo 1-1, the rod on the left is the non-adjustable type, and the rod on the right is adjustable.



1-1

Both rods are set at 5.00 feet, but you can see that the rod on the left has a mounting surface significantly higher than the one on the right, because the one on the right depends on a prism or other mounted equipment to make up the difference.

The situation for topo/traverse using EDMs is a little different than GPS RTK work, so I use two rods that are non-adjustable for GPS work.

They also have a nice feature of being able to pin the heights at 1.800m reading or 2.000m reading. They are not “fixed height” rods, but this helps eliminate rod slipping due to loose clamps. This way I have to add the offset for the antenna (written in big bold letters on the bottom of the antenna!) to the rod height set-

ting for GPS work. Both types of rods can be used for EDM (total station) work, of course.

ROD POINTS

There are two types of rod points, shown in Photo 1-2. The three on the left have tips that can be replaced. They may be steel, some are aluminum. They have replacement tips that you can buy separately (shown here slightly unscrewed) and are a little more expensive, but it is worth it since you can make the point a standard length and with a new tip it will stick to the center of a concrete nail set at an angle.



1-2

The four on the right are single piece steel. They are fine for bipods and tripods, but once they get rounded off, they are neither good for centering nor for accurate heights. (Gosh, I wonder why those check shots never come out the same?)

Notice in Photo 1-3 the difference between the two screw-in replacement tips. The one on the left has a sharp point and is what you usually get when you order replacement plumb bob tips. The one on the right has a steeper taper at the tip and may be included as part of a new rod. All things being equal, the difference in tip height alone is about 2.3mm, or about 0.008 feet.



1-3

Both machined aluminum points are hollow. It is a good idea to put a generous glob of grease on the 5/8x11 threads on the bottom of the rod, as well as on the threads for the replacement tips...helps removal after using the rod on that swamp topo job.

What I have found is that for a machined aluminum point with the longer replaceable tip, the overall height is approximately 86mm. With a point of this height, a non-adjustable rod will be pretty well calibrated. I say approximately because the measured heights of the six points I have range from about 85.8mm to 86.4mm, but I can live with that in most of the GPS, conventional control and topo work I do, as the errors from other sources are significantly greater. The adjustable rods themselves can be standardized to a common height by shimming, which I will discuss in Part 2. I hope you get the point I’m trying to make. ❖

Robert J. Reese, PLS, is CLSA President and owner of Reese Water & Land Surveying Services, San Luis Obispo, CA

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Preparing Easement Deeds - **Describing Boundaries versus Rights**

My client needed a waterline easement to irrigate a planned expansion of his commercial orchard. The grantor-to-be, his neighbor, was accommodating but thinking of soon selling the land. My client hoped to complete the transaction while conditions remained favorable.

I explained to my client that his grant of easement deed would ultimately consist of several components. One would be a legal description, which as a Land Surveyor, I would be

happy to provide. Another component would be the language by which the nature and extent of his rights would be defined. For that I suggested he consult with his attorney. I offered my own insights on the matter so as to emphasize just how important this language would be.

Years ago it was common to describe easements in the sparest of terms, "for waterline purposes", for example. However, such descriptions have proven to be problematic

because attendant rights, if any, are open to conflicting interpretation. The dominant tenement is certain that such rights are implied, while the servient tenement is equally certain they are not. Any rights not explicitly crafted into the granting language may someday be subject to dispute. This was especially significant for my client. His family intends to remain on the land and operate the orchard for generations to come. The decisions he was about to make would have long-lasting consequences for his heirs.

The accompanying document is an excerpt from a public agency grant of easement deed. It is a product of experience. Many of the terms were derived as a direct result of disputes brought about by poorly defined rights. Even though much of it did not apply to his situation, my client found it helpful because it alerted him to issues he had not previously considered. ❖

John P. Wilusz, PLS, PE is editor of the California Surveyor and is in private practice in Citrus Heights, CA

GRANT OF EASEMENT

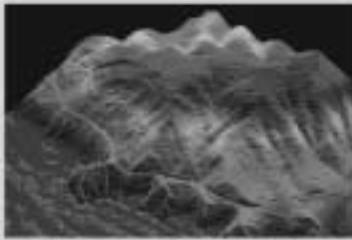
FOR VALUABLE CONSIDERATION, receipt of which is hereby acknowledged, **NAME OF INDIVIDUAL, CORP., ETC.** hereinafter called "GRANTOR") hereby grants to _____, a public body, (hereinafter called "AGENCY") a non exclusive permanent easement in, on, over, under, and across that certain real property in the County of _____, State of California, described in Exhibit "A" attached hereto and incorporated herein by reference, and depicted on Exhibit "B", the map attached hereto showing the boundaries of the easement.

The easement granted herein is a right-of-way to construct, reconstruct, enlarge, maintain, repair, replace (of the initial or any other size) and operate a pipeline (and additional pipelines if necessary), canals, open ditches and appurtenant facilities, including but not limited to metering devices, gates, electrical/electronic equipment including poles, antenna, solar panels and electrical cabinets and devices for controlling electrolysis, necessary to convey and/or meter water. GRANTOR further grants to the AGENCY:

- (a) the right of grading the easement area for the full width thereof.
- (b) the right to ingress to and egress from the easement area over and across GRANTOR'S remaining lands as described in that certain document, recorded on _____ in Book _____ at page _____ (or) document number _____, Official Records of _____ County, by means of roads and lanes thereon, if such there be, otherwise by such route or routes as shall cause the least practical damage and inconvenience to GRANTOR; provided further, that if any portion of such land is or shall be subdivided and dedicated roads or highways on such portion shall extend to the easement area, this right of ingress and egress on GRANTOR'S remaining land shall be confined to such dedicated roads and highways;
- (c) the right from time to time to trim and to cut down and clear away any and all trees, stumps, and brush now or hereafter in the easement area and to trim and cut down and clear away any trees on either side of the easement area which may interfere with the exercise of the AGENCY'S rights hereunder; provided, however, that all trees which the AGENCY is hereby authorized to cut and remove, if valuable for timber or wood, shall continue to be the property of GRANTOR, but all tops, logs, brush, stumps, and refuse wood shall be burned, chipped, or removed at the discretion of the AGENCY;
- (d) the right to install, maintain, and use gates in all fences which cross the easement area and the right to install Agency locks on existing or future gates installed within the easement area;
- (e) the right to mark the location of pipelines and other underground facilities in the easement area by suitable markers set in the ground; and
- (f) the right to line, seal, patch, or replace pipelines, canals, ditches, conduits and other facilities, installed in the easement area.

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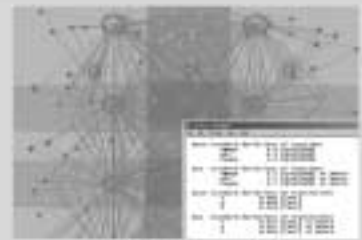
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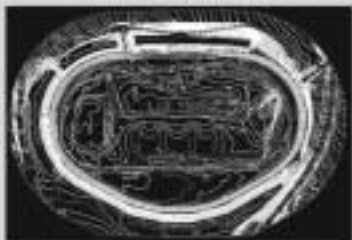
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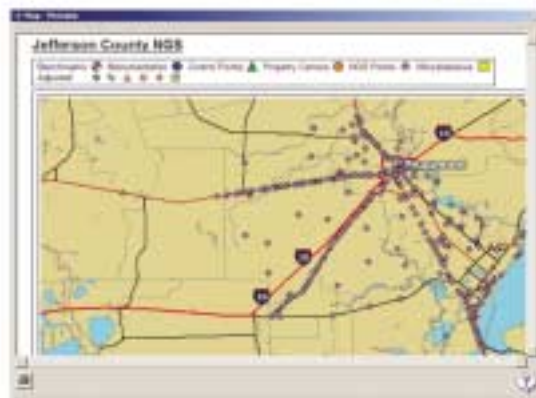
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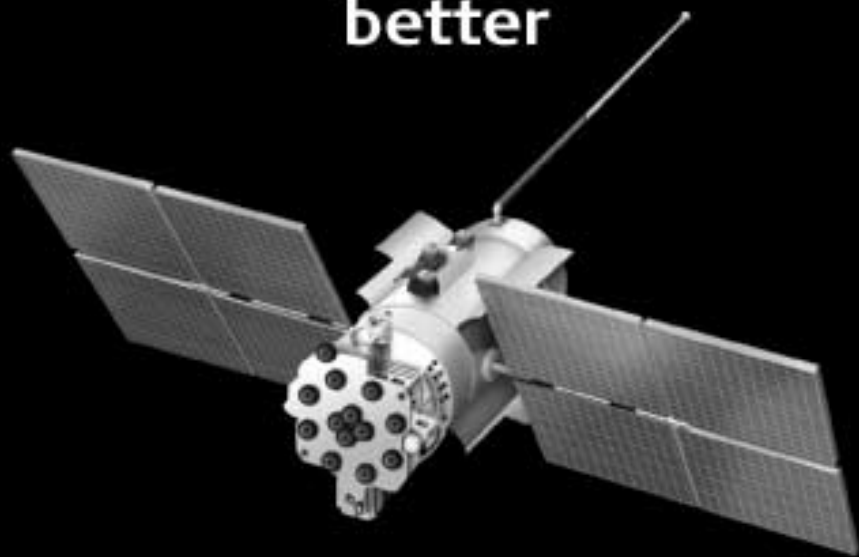
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Crossword Puzzle



This crossword is designed to honor the past presidents of CLSA. For more than 40 years, CLSA has played an active role in promoting land surveying in California. These people have all had a hand in shaping our association.

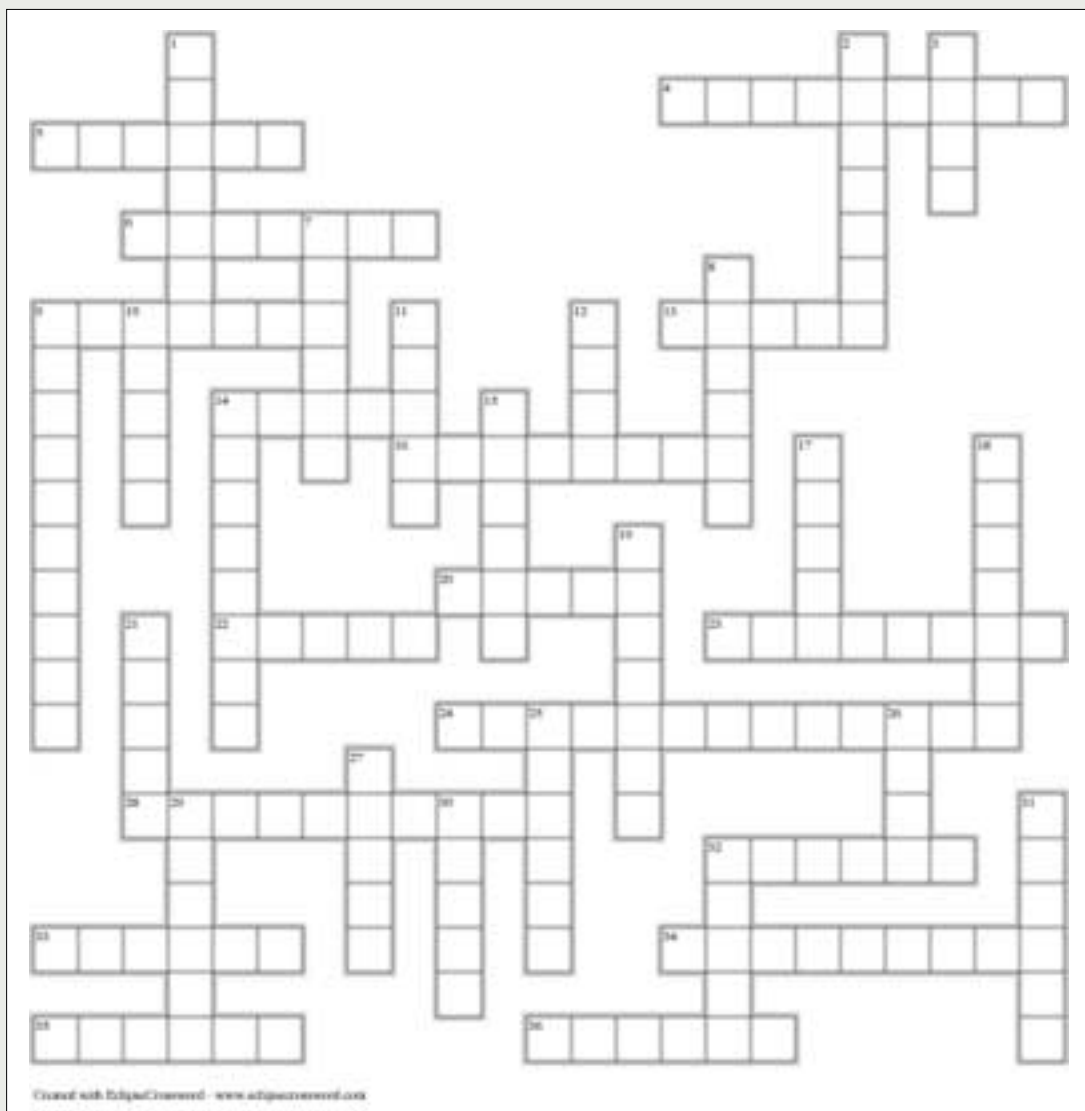
Determine who was president of CLSA for each year. See how many you can remember. For those of us with less than stellar memories, we can “cheat” by going to the CLSA website main page and clicking on “History”. The link is: <http://www.californiasurveyors.org/files/history.html>

If you have an idea for a puzzle theme or a clue you would like to include in an upcoming puzzle, email to crossword@californiasurveyors.org

Ian Wilson

CLSA CROSSWORD PUZZLE #1

Past Presidents



Across

- 4. 1979
- 5. 1988
- 6. 2000
- 9. 1973
- 13. 1966
- 14. 2006
- 16. 1982
- 20. 1993
- 22. 1967
- 23. 1986
- 24. Who posted the government withholding tax survey on the CLSA Forum?
- 28. 1969
- 32. 1995
- 33. 1980 & 1981
- 34. 1972
- 35. 1998
- 36. 1984

Down

- 1. 2002
- 2. 1976
- 3. 2004
- 7. 1992
- 8. 1968
- 9. 1997
- 10. 1989
- 11. 1978
- 12. 1996
- 14. 1987
- 15. 1991
- 17. 1985
- 18. 1990
- 19. 1999
- 21. 1977
- 25. 2005
- 26. 2001
- 27. 2003
- 29. 1970 & 1971
- 30. 1994
- 31. 1974 & 1975
- 32. 1982

Ian Wilson, PLS is the president of Ian Wilson Land Surveying, Inc., in Temecula, CA. His practice specializes exclusively in boundary and topo surveys. He has worked in both private and public sectors for small firms in California and Caltrans, respectively. As well as being a licensed land surveyor, he and his wife, Laura, are newly certified SCUBA divers. They are looking forward to “getting wet” on future trips along coastal California and around the world.

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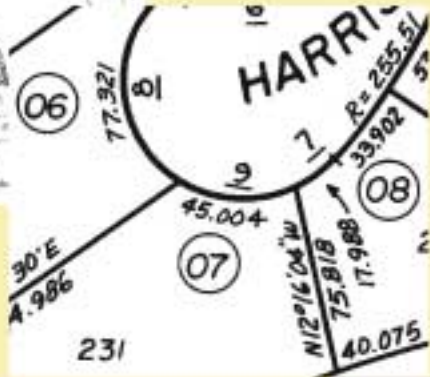
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The goal of the California Land Surveyors Association is to promote and enhance the profession of surveying, to promote the common good and welfare of its members, to promote and maintain the highest possible standards of professional ethics and practice, and to elevate the public's understanding of our profession. CLSA represents all Land Surveyors, whether they are employees or proprietors, whether in the public or private sector.

Representation

LOCAL: Your local chapter represents you in local issues. Through your chapter representative to the State Board of Directors, the individual member can direct the course CLSA will take. **STATE:** The Surveyor is represented at the state level through an active legislative program, legislative advocate, and liaison with the State Board of Registration. **REGIONAL:** CLSA is an active member of the Western Federation of Professional Surveyors. This Federation is composed of associations throughout the western United States and addresses regional issues. **NATIONAL:** Through institutional affiliation with the National Society of Professional Surveyors and the American Congress on Surveying and Mapping, CLSA is represented at the national level.

Educational Opportunities

CLSA presents annual conferences which provide technical and business programs, as well as exhibits of the latest in surveying and computing technology. Seminars and workshops are presented to assist in continuing education. CLSA publishes the California Surveyor magazine and the CLSA NEWS to keep the membership abreast of changing legislation, legal opinions, and other items which affect our profession.

Business and Professional Services

CLSA provides a fully staffed central office which is available to answer questions or to provide up-to-date referrals concerning legislation, educational opportunities, job opportunities, or other issues concerning our membership. Professional liability insurance programs are available to members.

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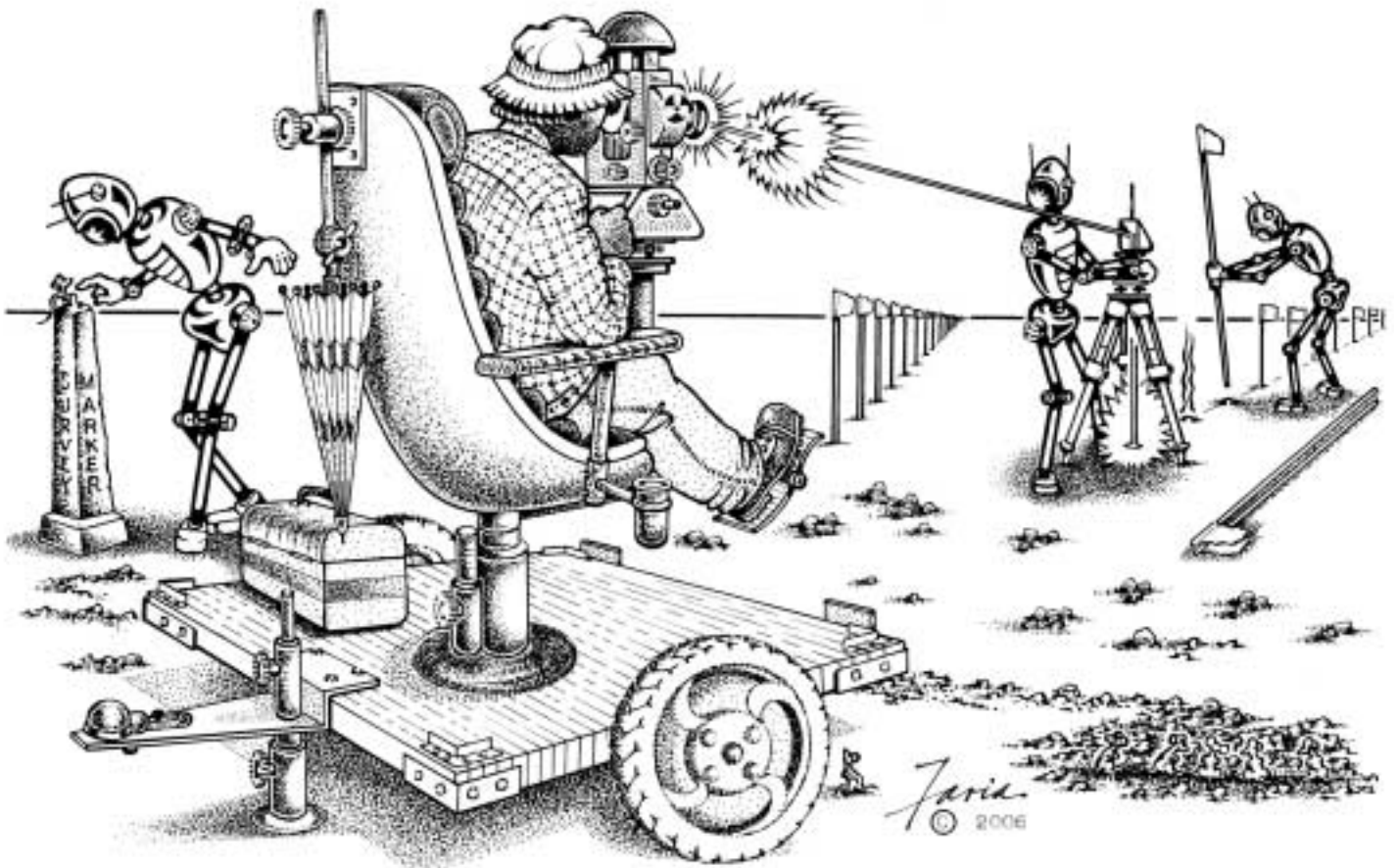
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CRC Remembrance of my Beloved 41C

By: Carl C. deBaca, PLS

My calculator failed the other day. I'm still in shock. It was the world-conquering Hewlett Packard 41 CX. I bought it when I was a party chief in 1985 and it was my daily calculator through all my subsequent years in the field, the office and now a little of both. Sure, lately I was just using it to add numbers and maybe compute a circular curve, but it's the only calculator I've used since Reagan was president. The day I turned it on and it just wouldn't access the memory registers, like an Alzheimers patient nearing the end, was a sad day indeed.



I took my LSIT exam with that calculator and my Nevada and California LS exams as well. I computed acreage, traverse adjustments, resections, horizontal curves, vertical curves, astronomic azimuths, not to mention gas mileage, hours worked each week and my kids math problems with my old friend, and now it's gone.

The 41CX, as its predecessors, the 41C and 41CV had continuous memory, a huge step forward from previous, (and very useful) models such as the HP 67 and HP97 which could compute just about anything but retained nothing once turned off. The 41 series was programmable and had ports where eeprom (erasable programmable read only memory) chips could be plugged. Some very good surveying programs were written for these calculators and burned onto eeproms. The 41 series also had the ability to attach a card reader and read/write programs and data on cards, which was extremely useful. In 1985, a CX with a survey chip, card reader and an optional printer was just about as powerful as a desktop computer running Wildsoft or Holguin and it put a lot of computing power in the hands of field personnel.

Ironic it seems to me, is the fact that this 20 year calculator, the 57 Chevy of hand-held computing, is now unwelcome at NCEES examinations. The 41CX is just too powerful, I guess. The beef, they say, is the alpha capability. Though far-fetched, the fear is that a dishonest examinee could type the questions in and thus un-secure the test. Well, he or she could just as easily write the questions down on scratch paper or their arm, etc. Calculators don't steal test questions, people do.

Anyway, my 41CX is dead. I could go out and buy the next big thing, but I haven't been able to identify what that might be. I always heard good things about the 48 series but of course, HP discontinued them. Since I have two more 41CXs, like new and still in their boxes, I guess I'm not too worried. I can probably play out the string, so to speak, without buying anything more expensive than batteries. If I'm lucky ❖

Carl C. deBaca, PLS, is past editor of the *California Surveyor* and owner of *Alidade, Inc., Elko NV*

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