Missouri Surveyor

A Quarterly Publication of the
Missouri Society of Professional Surveyors

Jefferson City, Missouri

September 2012

MISSOURI SURVEYOR

CALENDAR OF EVENTS

2011-2012

October 11-13, 2012
55th Annual Meeting
and Convention
Hilton Frontenac Hotel
St. Louis, MO

December 1, 2012
Board of Directors Meeting
MSPS Office
Jefferson City, MO

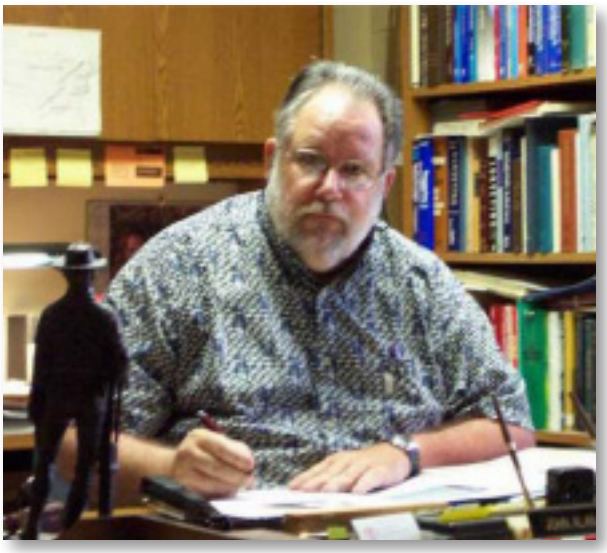
October 10-12, 2013
56th Annual Meeting
and Convention
Tan-Tar-A Resort
Golf Club, Marina
and Indoor Waterpark
Osage Beach, MO

October 2014
Joint Annual Meeting
with Kansas Society of
Land Surveyors

John Alan Holleck, Editor

Notes from the Editor's Desk

John Alan Holleck



Hope everyone was able to survive the hottest July in recorded history. August has brought a slight cooling and the aftermath of Hurricane Isaac dumped a few inches of much needed rain. However, it just might be too late to help anyone. Make sure to peruse the candidate biographies for the annual election. Now, without further ado on to the September issue of the *Missouri Surveyor.*

As usual, page two in my Editor's Notes followed on page three by Joe Carrow's President's Message. First up is "The Surveyor as an Expert witness" by Knud Hermansen. It is always a pleasure to print Mr. Hermansen's writings. Next, is "OUR SURVEYING FAMILY: The true value of State Conferences" by Bill Beardslee. Bill offers an interesting perspective on annual meetings. Please take note of "MSPS to Vote on Becoming Affiliation Member of the National Society of Professional Surveyors." Many thanks Troy for your explanation of NSPS's new offer, which concerns national membership. Enter a little humor with an explanation for the "Kilroy Was Here" gag of the 1940's. "Brokering Survey Services" follows. William E. McGrath describes the additional work produce being bundled together, and which may be encroaching on the surveyor's bailiwick. The Annual Meeting schedule of events followed by the aforementioned candidate biographies rounds out the front half of the newsletter.

Chris Wickern opens the back half to the *Missouri Surveyor* with "Old Testament Aspects of Boundary Surveying." Chris quotes fourteen chapters and offers his thoughts on the passages. Due to the acrimonies nature of the talks between MSPS and MoDOT, we publish the MoDOT Liaison Committee Report of July 2012 in its entirety. Kansas surveyor, Ernie Cantu, pens "Educational Opportunities You Didn't Know About—But Really should or, Where Do Future Surveyors Come From??" Dan Govero, in a Letter to the Editor, steps up on his soap and gets us thoughts on what it takes to be a Professional Surveyor. Good stuff, Dan.

Joseph V. R. Piava brings some new technology to bear on the profession, in "New Surveyor's Tool Puts Everything UP IN THE AIR." They are very small unmanned aircraft being utilized for surveying services. Curt Sumner, Executive Director of NSPS provides "The Light Squared Issue: A Brief Review." In the history corner is "Abraham Lincoln's Notes for a Law Lecture; written about July 1, 1850." Last but not least is "Surveying's Hidden Dangers" by California surveyor, Robert Fredricks. Robert discusses metal survey pole and overhead electrical wires.

John

THE MISSOURI SURVEYOR

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Missouri Society of Professional Surveyors

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President's Message

Joe Carrow, PLS

Here it is, the end of summer, hopefully the drought is nearing it's end also. We are quickly approaching the annual meeting. The year as president has gone by quickly, much faster than the grind of the legislative process of which we will soon be thrust into again. The past session I would consider to be a success, thanks to Mo McCullough and the legislative committee. Things on the legislative front for 2013 include new minimum standards, educational requirements for licensure, cadastral mapping standards, and maybe even our old friend mandatory recording.

I would like to thank everyone involved in the association for their involvement and time dedicated to the greater cause for our profession. The committee chairs and members have done a great job, and I am sure will do so in the future. The biggest kudos of course belong to Mrs. Sandra C. Boekman, the executive director, who is the reason our association is successful.

We have a great annual meeting planned, hope to see you in old St. Lou.

Thanks again!

Front Cover: "A transit of Venus across the Sun takes place when the planet Venus passes directly between the Sun and Earth (or another planet), becoming visible against (and hence obscuring a small portion of) the solar disk. During a transit, Venus can be seen from Earth as a small black disk moving across the face of the Sun...They occur in a pattern that generally repeats everay 243 years, with pairs of transits eight years apart separated by long gaps of 121.5 years and 105.5 years". (Wikipedia)

The cover photograph was taken on June 5, 2012 by Ray Riggs, a Professional Land Surveyor in West Plains, Missouri. The following method was utilized to capture the photograph. A Sokkia SET4B Total Station with a solar filter attached to the objective lens was focused on the Sun with the cross-hairs also in focus. A FUJI Finepix A500 digital camera was then pressed square against the eyepiece and the picture taken. After several attempts, a suitable frame was captured. Venus is the small "dot" in the upper right portion of the Sun. All of the photo attempts are visible at bigsurveyor.blogspot.com (search for Venus).

The Surveyor As An Expert Witness

by Knud E. Hermansen, P.L.S., P.E., Ph.D., Esq.

A surveyor is often involved in litigation in the capacity of an expert witness. In the capacity of an expert witness, the surveyor performs three functions. First, the surveyor identifies, introduces, and authenticates documents and other information relevant to the disputed boundary. Second, the surveyor explains the relevancy of certain information and how the information is used to fix the position of the boundary. Third, the surveyor gives a conclusion — an ultimate opinion on the location of boundaries and other related matters. If the surveyor performs the first two functions with competence, the surveyor will establish their credibility with the court. A surveyor that appears credible will have their opinion accepted and relied upon by the judge or jury without necessarily a clear understanding or comprehension of the underlying facts and basis for the surveyor's opinion.

The client is well served by the attorney that spends some time evaluating the surveyor in their role as an expert. There are several facets of a surveyor and the services performed by the surveyor that the attorney should examine.

There are numerous surveyors who are competent and respected practitioners, yet do not portray confidence and sagacity in stressful situations.

One facet to be examined is the surveyor's ability to handle stress. Some surveyors do not make good experts because of their inability to handle stress. There are numerous surveyors who are competent and respected practitioners, yet do not portray confidence and sagacity in stressful situations. The terror of sitting in the witness chair coupled with the seemingly hostile attention of the attorney and judge often leave these surveyors struggling for simple thoughts, stumbling over words, grasping for answers, spitting out nonsensical responses, shaking uncontrollably, and sweating profusely. Many are the attorneys who left a courthouse convinced not only that the surveyor had botched the survey and testimony but must have committed all the unsolved crimes in the area given their demeanor on the stand. Given the technical nature of surveying and the difficulty in explaining technical testimony, a good demeanor is an important factor to cultivate. In complex and technical testimony such as required for boundary litigation, it is not uncommon for an incompetent surveyor to be judged a more credible witness because of their superior and calm demeanor rather than the content of their testimony.

The root of many deficiencies in professional services can be traced to cost conscious clients coupled with surveyors willing to restrict their services based on a price the client is willing to pay.

An evaluation of the scope and depth of the surveyor's work should also be performed by the attorney. The root of many deficiencies in professional services can be traced to cost conscious clients coupled with surveyors willing to restrict their services based on a price the client is willing to pay. The purpose stated for the services also plays a role in the quality of the surveying service provided. The mortgage loan inspection used to obtain financing is a markedly different service than the boundary retracement survey used to prepare a description or erect improvements. In this regard surveyors are no different than attorneys. What attorney could honestly admit that they provide the same level of estate planning to the blue-collar worker with $5,000 life savings as compared to the billionaire? What attorney spends the same time on a deed for a $100,000 house as they spend on preparing a complaint starting a $1,000,000 lawsuit? The point is that a survey performed for a timber harvest may not be sufficient to base an opinion on regarding a $60,000 encroachment lawsuit that occurs many years later.

Also to be discovered by the attorney are surveyors who have arrived at an opinion without complete information or information that is not reliable, credible, or cannot be offered into evidence. An opinion formed without gathering or looking at all relevant information is usually determined to be untrustworthy and susceptible to impeachment. This situation is cause for the surprise of many experienced attorneys when they realize that the surveyor did not perform a complete search or limited the measurements to certain corner monuments that were convenient and failed to use others monuments more credible but less convenient.

For the surveyor to have had all the information but use it improperly is no less embarrassing for the attorney attempting to build a case on the testimony of the surveyor. There are

numerous cases where the surveyor has testified at some length to the care and accuracy of their research and measurements only to admit they began their services at an unverified point indicated to the surveyor by the client. Equally problematic are the situations where the surveyor has relied entirely upon private records that clearly contradict the valid deeds recorded in the public records. In a few cases, surveyors have relied on procedures or priorities that do not conform to the rules of construction or priority of control established by the courts.

These problems oftentimes arise by oversight or mistake made by otherwise competent surveyors. In a few cases, the surveyor is simply not competent. Few attorneys are aware that licensing surveyors is a relatively recent event in many states and certainly was not foolproof in insuring competence of the individual before licensure. There are numerous surveyors practicing that have never had to take a test or prove their competency in order to obtain their surveyor's license. When licensing of surveyors began, persons that applied and could show sufficient experience or education where given a license to survey without testing or further verification of qualifications.

Before continuing, it must be stressed that not all surveyors who were licensed without examination or other proof of competency are incompetent surveyors. On the contrary, some of the finest surveyors practicing were licensed in this manner.

While there are many examples to the contrary, the presumption will always be that the more education a person has, the more knowledgeable they will be.

There is also wide diversity in surveyor qualifications. These qualifications must also be examined and evaluated for the impact the qualifications may have upon the perceived credibility of the surveyor. While there are many examples to the contrary, the presumption will always be that the more education a person has, the more knowledgeable they will be. There are no mandated formal education standards for surveyors in many states. Experience prior to licensing also varies. Some surveyors have no college education while a few have a Ph.D. Between the two extremes are numerous surveyors with two, four-year, and various graduate degrees. Among surveyors with a college education there is a wide variety of degrees ranging from fine arts to engineering.

Compliance with mandatory standards should not be overlooked in analyzing the surveyor's services. In many states, surveyors have had to perform according to mandated standards or expressly except all or parts of those standards by agreement with the client. Some surveyors have ignored the standards. Other surveyors have misinterpreted the standards. A few have not understood the standards. Several surveyors were unaware standards existed for many years. Some surveyors have ignored or excepted certain parts of the standards that could prove critical in formulating a correct opinion or communicating a credible opinion.

In defense of the surveyors who have not studiously adhered to the standards or taken exception to certain parts, adherence to all parts of the standards is to substantially increase the cost of surveying services without necessarily affecting the accuracy of the surveyor's opinion. For example, the preparation of a complete report alone will often add hundreds of dollars to a typical retracement survey yet may have no effect on the location of the boundaries that were re-established.

The attorney must not only check that the surveyor is competent but must sometimes check those persons that the surveyor relied upon are also competent. Few surveyors do all the work required for a boundary retracement, instead relying on employees to do some or most of the mundane technical aspects of the work. In this regard, surveyors and lawyers share a common weakness as more and more work is delegated to non-professional employees within a firm. Untrained or minimally trained personnel often overlook important information or fail to catch and correct omissions. Compounding the problem is the large number of personnel and projects supervised by some surveyors. As the work-load increases for the licensed individual, review and checks becomes cursory or omitted on many projects. Proper supervision declines. Important pieces of information are undiscovered or the significance overlooked. The result is that in some cases the surveyor whose seal and signature appear on the plan had little to do with the services that the plan represent. As a consequence, the surveyor cannot always say why information was omitted or mistakes not detected.

Finally, the mindset of the surveyor should be explored. The attitude or mindset of a surveyor often has a major impact on the quality of the surveying services and the credibility of the surveyor as an expert. The attitude or mindset refers to what the surveyor understands a surveyor's responsibility to the client should be and the ethical limitations of professional practice. For example, there are a few surveyors that look upon themselves as technicians. (E.g., "You tell me where to put the corner and I'll make the measurements between the corner locations you selected.") At the other end are a few surveyors who believe they have the power and right to determine all matters pertaining to boundaries including title issues. These surveyors feel qualified and authorized to determine boundaries based on acquiescence,

(continued on next page)

The Surveyor As An Expert Witness *(continued)*

estoppel, adverse possession, and other equitable doctrines. (E.g., "The stone wall has been there for 20 years so your boundary is now the wall despite what your records say.")

> It is not unusual for the extent of the dispute to exceed the ability of evidence to support the claim.

In discussing the surveyor and survey services, it would not be fair for the surveyor's competency as an expert to ride entirely upon the surveyor's ability, background, and care. More times than good conscience should allow, attorneys have encouraged litigation to begin or continue where the costs of litigation far exceed the value of the area disputed. Similarly, attorneys will attempt to build "castles on sand." For example, it is not unusual for the extent of the dispute to exceed the ability of evidence to support the claim. Such would be the case where two neighbors are arguing over half a foot (the location of the old oak tree) when the nearest monuments that can be used are the center of a road and a four foot wide rock wall several hundred feet away. In other cases, the technical complexity or reliability of the evidence exceeds any reasonable ability for the typical jurist or jury to understand. The fact is that a vast majority of boundary disputes should and could be handled through mediation by a knowledgeable mediator or presented before a real estate attorney or surveyor acting in the capacity as an arbitrator.

In some boundary disputes that go to litigation, adequate preparation and investigation by the attorney is often lacking. Many surveyors share the experience where they receive a call from an attorney seeking services as an expert a short time before trial. There are also numerous times when the client's attorney has never attempted to speak to the surveyor until shortly before trial or, in some cases, the day of trial. Also of some frequency are situations where a boundary dispute goes to trial where each side is equally burdened by incompetence be it the surveyor or attorney. Many decisions by courts are based on the lesser of two evils rather than a clear presentation and analysis of the evidence by the so-called experts and attorneys employed by each side.

> The attorney should make a great effort to prepare an expert on how to communicate their opinion.

A common problem that frequently arises for the surveyor who is sought as an expert is the attorney who seeks a "hired gun" or advocate for the client's position. Ethically, a surveyor is obligated to perform an unbiased analysis to arrive at an opinion on the location of the boundary by a fair and reasonable interpretation of the operative conveyances guided if need be by a proper application of the rules of construction as established by appellate court decisions. Consequently, the surveyor's responsibility in retracing a boundary should be independent of the client's needs, wishes, or best interests. The attorney should not influence an expert witness in formulating an opinion (i.e., what to say). The attorney may and should, however, make a great effort to prepare an expert on how to communicate their opinion. This is an important distinction lost among some attorneys. If the surveyor has been allowed to arrive at an unbiased opinion on the location of a boundary, the surveyor is cautioned that a diligent effort is expected from the surveyor to defend that position — to become an advocate for their opinion.

> A court appointed surveyor should be considered in all boundary litigation cases.

In closing a discussion about employing surveyors in litigation, one option that is often ignored by attorneys is to seek the appointment of a surveyor through the court to locate disputed boundaries – a court appointed surveyor. This option will be discussed in a future article.

In closing, it is my experience that most surveyors would rather earn a fee in some other manner than as an expert witness. While successfully educating the judge or jury can be a rewarding experience, the process is often fraught with stress and difficulties. Explaining a complex and technical analysis within a limited time frame is difficult enough. However, within the confines of a courtroom, the explanation must be done with frequent interruptions brought about by objections, trick questions, poorly worded questions, and under the ministrations of at least one hostile attorney who is trying very hard to make the surveyor or the surveyor's testimony appear faulty, biased, incomplete, and irrelevant.

Nevertheless, the role of a surveyor as an expert is an important one that must be approached with a motivation to educate, a willingness to communicate effectively, and an acceptance of the difficulty that attenuates the process of giving testimony in litigation.

Robert S. Shotts Confirmed

Robert S. Shotts, LS # 1941, was recently confirmed by the Missouri Senate to an appointment by Governor Jay Nixon to the Landscape Architect's division of the Missouri Board for Architects, Professional Engineers, Professional Land Surveyors and Landscape Architects. Pictured with Bob is his Senator, Chuck Purgason and Bob's wife Delilah.

MO Colleges/Universities Where Land Surveying Coursework is Available

The following list will be updated quarterly as new information becomes available.

Longview Community College — Lee's Summit, Missouri
Contact: David Gann, PLS, Program Coordinator/Instructor — Land Surveying MCC — Longview, MEP Division
Longview Community College
Science and Technology Bldg.
500 SW Longview Road
Lee's Summit, Missouri 64081-2105
816-672-2336; Fax 816-672-2034; Cell 816-803-9179

Florissant Community College — St. Louis, Missouri
Contact: Ashok Agrawal
Florissant Community College
3400 Pershall Road
St. Louis, Missouri 63135
314-595-4535

Missouri State University — Springfield, Missouri
Contact: Thomas G. Plymate
Southwest Missouri State University
901 So. National
Springfield, Missouri 65804-0089
417-836-5800

Mineral Area College — Flat River, Missouri
Contact: Jim Hrouda
Mineral Area College
P.O. Box 1000
Park Hills, Missouri 63601
573-431-4593, ext. 309

Missouri Western State University — St. Joseph, Missouri
Contact: Department of Engineering Technology
Missouri Western State University
Wilson Hall 193
4525 Downs Drive
St. Joseph, MO 64507
816-271-5820
www.missouriwestern.edu/EngTech/

St. Louis Community College at Florissant Valley
Contact: Norman R. Brown
St. Louis Community College at Florissant Valley
3400 Pershall Road
St. Louis, Missouri 63135-1499
314-595-4306

Three Rivers Communitiy College — Poplar Bluff, Missouri
Contact: Larry Kimbrow, Associate Dean
Ron Rains, Faculty
Three Rivers Community College
2080 Three Rivers Blvd.
Poplar Bluff, Missouri 63901
573-840-9689 or -9683
877-TRY-TRCC (toll free)

Missouri University of Science and Technology — Rolla, Missouri
Contact: Dr. Richard L. Elgin, PLS, PE
Adjunct Professor
Department of Civil Engineering
1401 North Pine Street
211 Butler-Carlton Hall
Rolla, Missouri 65409-0030
573-364-6362
elgin@mst.edu

University of Missouri-Columbia, Missouri
Contact: Lois Tolson
University of Missouri-Columbia
W1025 Engineering Bldg. East
Columbia, Missouri 65211
573-882-4377

Missouri Southern State College — Joplin, Missouri
Contact: Dr. Tia Strait
School of Technology
3950 E. Newman Rd.
Joplin, MO 64801-1595
1-800-606-MSSC or 1-417-782-MSSC

MSPS at the Fair

Joe Clayton working the booth.

Robert Ubben discussing surveying with a fair-goer.

Our Surveying Family: The True Value of State Conferences

by Bill Beardslee, PLS, PE, PP, Reprinted from *Empire State Surveyor*, Vol. 48-No. 2, March-April 2012

During January and February there were approximately twenty-five state conferences throughout the country. From coast to coast, surveyors are migrating to the chosen site in their state to meet. Some go cheerfully and some with great disdain. Some will stay for the entire conference or turn it into a mini-vacation by adding a few extra days. Others will come for one day or the minimum amount necessary.

The "necessary" portion of the conference has evolved from the creation of continued competency requirements in many of the states. I will save the lengthy discussion on the merits of continued competency for a future article.

Many of the states offer speakers from all over the nation to expound on a great variety of topics. Be it surveying procedures, mathematics, the application of law to surveying, business practices, or project planning, you are likely to find a course of your liking at the conference. This provides an opportunity to experience "outside the box" topics which normally aren't discussed in the everyday work environment, but are important to the expansion of our knowledge.

The information you collect from the instructors may help you work more efficiently, collect more effectively, expand into a new service area, or obtain a critical data source. But to me, it is, and will always be, about the people – the great surveyors of your state.

It is a great pleasure to sit and converse with a surveyor from the other end of the state whom I get to spend time with only once a year and, was it not for the state society, most likely would never have met. We have so much in common, the conversation flows easily.

You find out about families and tragedies, interests and hobbies. You are fascinated by what some surveyors are involved in. I personally enjoy hearing about their hobbies, some of which are mentioned in each edition of this column.

At some time during each seminar or class, and whenever a few surveyors are just sitting around talking, the most valuable part of the conference arises – the "war stories." They are as much a part of survey lore as Lewis and Clark. At every conference I attend, at least one time during the telling of these stories, I say, "Wow! I never thought of that!" It may be a place to get information, a person to contact, a way to solve a field problem, a method of handling a personnel issue, a way to increase collections, or an item to include in proposals – each one coming from a surveyor's personal experiences. There will always be that one gold nugget from your contemporaries that makes the trip worthwhile.

At the conference, you have an opportunity to talk in a much more relaxed and productive atmosphere – no one yelling, no phones ringing, no crisis to deflate. It's just a conversation between friends.

I am fortunate to have attended more conferences than I could ever remember in numerous states. The overall value of those events is the number of great ideas I have discovered and the friends I have been blessed to have all over the country.

During the awards ceremony at a recent conference, the recipient noted that after all the years he has been in this wonderful profession, other surveyors were no longer just his friends, they were his surveying family! This really prompted me to think and I couldn't agree more. All those friends I meet at conferences are really my surveying family!

Attending the conference is like going to a wedding. You see more family members you only have an opportunity to see at weddings. You promise many you will be in touch. You hear, "Let's get together for dinner," or golf, or other activities, just as much at the conference. And, just as importantly, you would be ready at a moments notice to help anyone in either of these families.

The 1979 Pittsburgh Pirates won a world series with the fans and team united by the sounds of "We Are Family" by Sister Sledge. Why don't we keep that in mind when we attend the next conference and when we interact with our surveying family throughout the year? Maybe it will help us work together to reach greater heights.

Our peers – Our people – Our family

Bill Breadslee is director of engineering for Breadslee Engineering in Sparta, New Jersey a subsidiary of Greenman-Pedersen, Inc. Reprinted with permission, *Professional Surveyor Magazine*. www.profsurv.com

MSPS to Vote on Becoming Affiliation Member of National Society of Professional Surveyors

At the Board meeting held this past May the MSPS Board of Directors approved a motion that would allow MSPS to become an "Affiliation Member" of the National Society of Professional Surveyors (NSPS). Doing so would give full membership in NSPS to all voting members of MSPS. Since there is a cost of $40.00 per member to cover the NSPS dues final approval of this motion is contingent on the results of a vote of the MSPS membership.

Since the opportunity to vote on the issue must be provided to all MSPS members the ballot will be mailed to each member in October after the annual meeting. You will be given a reasonable amount of time to vote and return the ballot to the MSPS office in Jefferson City. The issue will require a simple majority for passage. A draft copy of the ballot is currently being considered by the Board for approval and will be posted on the MSPS website when approved.

As a long time member of NSPS and its predecessor ACSM and as the current Missouri Governor to NSPS I have experienced firsthand the benefits of NSPS membership to myself and have witnessed the work the organization has done to expand and protect the surveying profession. Due primarily to the current membership fee of $212/year only 8-10% of the Professional Surveyors in the U.S. are NSPS members. Approval of this issue will grant all MSPS members those identical benefits for only $40/year. I strongly encourage your support for this issue and will attempt to outline the goals NSPS has established for this program and some the benefits you can expect to enjoy if the measure is approved.

The number one goal of NSPS is 100% participation. In order to be the national voice for surveyors, NSPS needs to increase its influence by increasing membership to include as many of the 30,000-50,000 U.S. surveyors as possible as opposed to the current levels. Other goals include: Unification of the state survey associations throughout the country, expand the state associations current advisory representation through the Board of Governors to a voting role on the NSPS Board of Directors, and to allow all surveyors who benefit from NSPS's work to be counted as members at a modest cost.

Some of the current NSPS Member Benefits/Programs are: Promulgation of ALTA Standards, Involvement in rules and regulations in the states, student competition programs, National Surveyors Week, Boy Scouts of America Surveying Merit Badge, Speakers Kits, Trig-Star, NCEES-Exam Prep. Other personal benefits include: Insurance programs (E&O Insurance Discounts), Scholarships, Certification programs for Hydrographic Surveyors, Surveying Technicians (CST) and CFEDS.

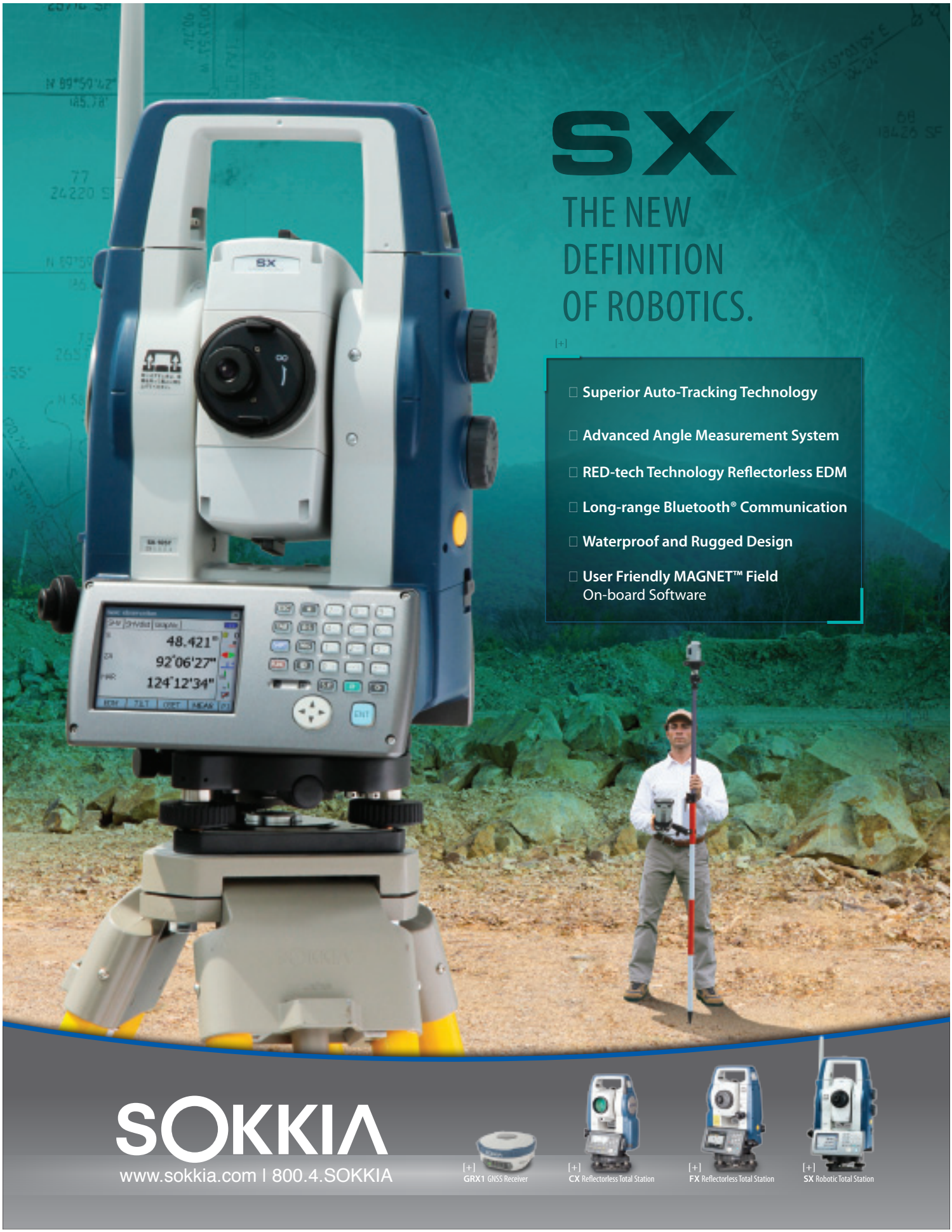
I encourage you to attend the annual meeting in St. Louis. I plan to speak briefly on this topic during the annual business meeting and Curt Sumner the NSPS Executive Director will also be there to answer questions. In the mean time if you have questions on the matter feel free to contact me be email at tryhayes@midlandsurvey.com or by phone at 660-582-8633.

Draft Ballot

Shall the Missouri Society of Professional Surveyors (MSPS) become an "Affiliation Member" of the National Society of Professional Surveyors (NSPS). In so doing MSPS annual membership dues will increase from $82.00 to $125.00. $40.00 of the increased dues will be paid to NSPS and will result in full membership privileges in NSPS to all MSPS members in good standing. Becoming an "Affiliation Member" will also give MSPS the right to appoint the Missouri NSPS Governor, or another member of MSPS should they so choose to serve on the NSPS Board of Directors, which will insure that the interest of Missouri Surveyor's are considered on national issues affecting the surveying profession.

Yes_____

No _____


SX
THE NEW
DEFINITION
OF ROBOTICS.
[+]
Superior Auto-Tracking Technology
Advanced Angle Measurement System
RED-tech Technology Reflectorless EDM
Long-range Bluetooth® Communication
Waterproof and Rugged Design
User Friendly MAGNET™ Field
On-board Software
SOKKIA
www.sokkia.com | 800.4.SOKKIA
[+] GRX1 GNSS Receiver
[+] CX Reflectorless Total Station
[+] FX Reflectorless Total Station
[+] SX Robotic Total Station

Kilroy Was Here

Reprinted from *Section Lines*, (Kansas), Feb. 2012

This is interesting ... I have often wondered about Kilroy ... now I know. Great piece of history. Anyone born in the mid thirties (or earlier) knew Kilroy. We didn't know why but we had lapel pins with his nose hanging over the label and the top of his face above his nose with his hands hanging over the label too. I believe it was orange colored. No one knew why he was so well known but we all joined in. Kind of a war story, now we know.

KILROY WAS HERE. WHO THE HECK WAS KILROY? In 1946 the American Transit Association, through its radio program, "Speak to America," sponsored a nationwide contest to find the REAL Kilroy, offering a prize of a real trolley car to the person who could prove himself to be the genuine article. Almost 40 men stepped forward to make that claim, but only James Kilroy from Halifax,Massachusetts, had evidence of his identity.

Kilroy was a 46-year old shipyard worker during the war who worked as a checker at the Fore River Shipyard in Quincy. His job was to go around and check on the number of rivets completed. Riveters were on piecework and got paid by the rivet. Kilroy would count a block of rivets and put a check mark in semi-waxed lumber chalk, so the rivets wouldn't be counted twice. When Kilroy went off duty, the riveters would erase the mark. Later on, an offshift inspector would come through and count the rivets a second time, resulting in double pay for the riveters.

One day Kilroy's boss called him into his office. The foreman was upset about all the wages being paid to riveters, and asked him to investigate. It was then he realized what had been going on. The tight spaces he had to crawl in to check the rivets didn't lend themselves to lugging around a paint can and brush, so Kilroy decided to stick with the waxy chalk. He continued to put his checkmark on each job he inspected, but added KILROY WAS HERE in king-sized letters next to the check, and eventually added the sketch of the chap with the long nose peering over the fence and that became part of the Kilroy message. Once he did that, the riveters stopped trying to wipe away his marks.

Ordinarily the rivets and chalk marks would have been covered up with paint. With war on, however, ships were leaving the Quincy Yard so fast that there wasn't time to paint them. As a result, Kilroy's inspection "trademark" was seen by thousands of servicemen who boarded the troopships the yard produced. His message apparently rang a bell with the servicemen, because they picked it up and spread it all over Europe and the South Pacific. Before war's end, "Kilroy" had been here, there, and everywhere on the long hauls to Berlin and Tokyo.

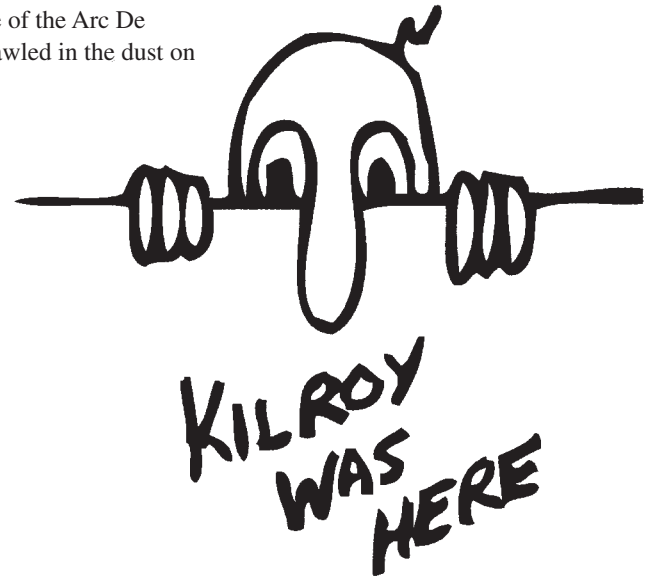
To the troops outbound in those ships, however, he was a complete mystery; all they knew for sure was that some jerk named Kilroy had "been there first." As a joke, U.S. servicemen began placing the graffiti wherever they landed, claiming it was already there when they arrived. Kilroy became the U.S. super-GI who had always "already been" wherever GIs went. It became a challenge to place the logo in the most unlikely places imaginable (it is said to be atop Mt. Everest, the Statue of Liberty, the underside of the Arc De Triumphe, and even scrawled in the dust on the moon).

As the war went on, the legend grew. Underwater demolition teams routinely sneaked ashore Japanese-held islands in the Pacific to map the terrain for coming invasions by U.S. troops (and thus, presumably, were the first GI's there). On one occasion, however, they reported seeing enemy troops painting over the Kilroy logo. In 1945, an outhouse was built for the exclusive use of Roosevelt, Stalin, and Churchill at the Potsdam conference. Its first occupant was Stalin, who emerged and asked his aide (in Russian), "Who is Kilroy?"

To help prove his authenticity in 1946, James Kilroy brought along officials from the shipyard and some of the riveters. He won the trolley car, which he gave to his nine children as a Christmas gift and set it up as a playhouse in the Kilroy front yard in Halifax, Massachusetts.

If you check the WWII memorial in Washington DC, you will see Kilroy peeking over a wall.

So, now you know!



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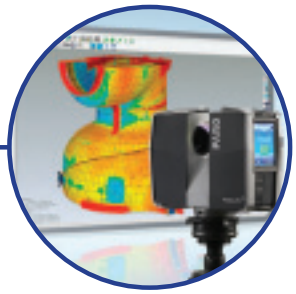

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Brokering of Survey Services

by William E. McGrath, PLS

As the surveying profession is undergoing an evolution of changing technologies and methods to achieve various deliverables and even deliverables themselves, so too is the title insurance industry. After the refinancing boom of the early 2000's, major title companies have been gobbling up smaller companies to consolidate a multi-billion dollar industry in an effort to increase profits. Because of the present day downturn in the real estate market major title companies are seeking ways to maximize profits in a number of different ways. One of the ways is by lowering their overhead costs. Because of the electronic age more and more searches are done "on-line" rather than at the county clerk's office. Many of the larger title companies are outsourcing their searching tasks overseas. The other day I needed a deed prior to 1972 in order to complete a survey. Since that particular county clerk's "on-line" records only go back to 1972, I have to go get it myself.

Another way major title companies are seeking to increase their revenue source is by bundling more and more products and services to offer their customers in previously untapped markets. Everything from employee background checks to environmental due diligence services. The title insurance industry is learning from their big brother, the Health Maintenance Organization (HMO) industry. The HMO industry has become the gatekeeper to your medical care which relegates your doctor to a mere employee of your HMO. To your health care detriment, it is your HMO who decides what medical test or procedure you can have, not your doctor.

The title insurance industry, in following in their big brother's footsteps (HMO's), are now offering "Land Surveys" from their "list of providers". Does that sound familiar? In order to remove the survey exception off their title policy it is THEY and they alone, who will determine if you need an ALTA survey, a boundary survey that meets the minimum standards of your state board, or something less like an Express Aerial Map. An Express Aerial Map is basically an aerial photograph overlaid by a local tax map or deed plotting. The Express Aerial Map is provided by the title company not a licensed professional land surveyor.

One major title company made the decision to forego the approximately $30,000 per ALTA survey of commercial sites and opted to pocket $3,000 to $7,000 per commercial transaction for their own Express Aerial Map product, which is nothing more than an "on-line" aerial with a tax map or deed plotting (which may not mathematically close) super-imposed on the photo.

An ALTA Land Survey is performed by a Professional Land Surveyor licensed in the particular state that the survey is performed, it is prepared and certified to meet the requirements for an ALTA/ACSM Land Title Survey as detailed by the American Land Title Association, National Society of Professional Surveyors and the American Congress on Surveying and Mapping. A Boundary Survey is a Land Survey that is performed by a Professional Land Surveyor licensed in the particular state that the survey is performed. It is prepared and certified to meet the minimum standards of the rules and regulations promulgated by that particular state where the survey is performed.

Both the ALTA Survey and the Boundary Survey are prepared so the title insurer can make specific underwriting decisions regarding the deletion of the standard survey exceptions within a title policy. When a title insurance company issues a title policy, the holder of the policy wants these standard exceptions removed. Both types of surveys (ALTA & Boundary) will report on the ground matters of concern in relation to these exceptions. Both types of surveys are certified by the surveyor to the title insurer and other parties to the transaction. This extends the liability to the surveyor for any error or matter not reported or shown. Without the added protection having the survey certified to the consumer (insured), the consumer (insured) would normally not be able to recoup any damages from the surveyor because of privity of contract laws.

Consider the standard title exception pertaining to ***"….rights, interests or claims of parties in possession not disclosed by the public records."*** Even with high-resolution photos, it is virtually impossible to locate property corners and any existing survey ground monuments on an Express Aerial map product. Without an exacting location of property corners, it is impossible to super-impose the property boundary onto the aerial map with any degree of acceptable accuracy. If the boundary cannot be accurately depicted, then the easements locations, which are most likely tied into the boundary cannot be accurately shown. In most instances, there would be questionable situations regarding the possibility of encroachments across property lines or into easements. This would be a detriment to the end user relying on this product in much the same way as an HMO not allowing you to have that biopsy. This particular product could be deemed illegal in some states by offering surveying services without being duly licensed.

In cases where the title company is relying solely on their Express Aerial map product they are taking the risk that no claim will arise

(continued on page 16)

Brokering of Survey Services *(continued)*

regarding the issues raised within the standard survey exceptions. There should be questions asked of the title insurer who may be preparing the map product to suit their best interest rather than those of the ultimate property owner or lender. In order to properly protect the consumer (insured) an ALTA Survey or Boundary Survey should be prepared by a Professional Land Surveyor duly licensed in that particular state, most preferably one with adequate errors and omission insurance. The Surveyor would be acting as an independent outside party, that has no interest in any underwriting decision and can accurately report the facts to be reviewed not only the title insurer, but by all parties within the transaction.

The main purpose of the ALTA Survey or the Boundary Survey is to allow the title insurer to delete the standard survey exceptions. But, many other parties within a real estate transaction rely upon the survey and the matters reported thereon during the due-diligence process. The buyer and more importantly their legal counsel who are looking out for their client's best interests are very concerned about the information revealed on the survey. Not only regarding the matters relating to the deletion of the standard exceptions, but the exacting configuration of the land, matters on the property relating to zoning compliance, restrictions, easements not revealed by public record but observed on the ground by the surveyor.

When the title company uses its Express Aerial map product there is no guarantee to the accuracy of the legal description of record and more importantly, there is no verification of any discrepancy between the recorded legal description and the facts on the ground. On many occasions a legal description is recorded with a typographical error or mathematical error of closure. Without an on the ground survey to check for these discrepancies; gaps, gores or overlaps may inadvertently be created causing a potential claim against the property. On a properly performed ALTA Survey or Boundary Survey, the legal description is revealed and the surveyor must note and show any discrepancy between the record and measured dimensions. Furthermore, the surveyor must report any gap, gore or overlap with adjacent deeds. This will not be disclosed on Express Aerial map product.

Besides title companies offering property surveys from their "list of approved surveyors", there are a number of survey brokering companies that only offer that service. In reviewing some of the service provider contracts, they don't allow the professional land surveyor to contact or communicate with the end user client at all. This is not only unethical, it is illegal in many states.

Some of the advertised services these re-invented "Real Estate Due Diligence" companies offer include: Land Title surveys, Elevation Certificates, Flood Zone Determination Certificates, Express Aerial Maps (that have the tax map and/or deed plotting super-imposed), Zoning Reports, Geotechnical Reports, Phase I & II Environmental Reports, As-Built Surveys and the list goes on and on. Many of these services are offered in violation of state licensing laws.

In reviewing some of the disciplinary actions of a number of state licensing boards thru out the country, I have noticed that several have sent out "cease and desist" orders to these companies. One large title insurance company that does over a billion dollars a year in revenue had their attorneys send a letter back to one licensing board stipulating that they were not "offering survey services", they were merely "coordinators of survey services". I suspect these companies view these "cease and desist" orders as nothing more than mosquito bites. Some of these "coordinators of survey services" companies could very well be in violation of federal RESPA laws. Some states are using "back door" regulations by disciplining licensees for doing any work for these companies.

What has your state done to curb or regulate this assault on the consumer? What has your state professional organization or the National Society of Professional Surveyors done to lobby for badly needed legislation to protect the consumer?

ABOUT THE AUTHOR:
William E. McGrath, PLS, is a Riparian Consultant that specializes in New Jersey Tidelands issues relating to grants, licenses, tidelands claims and waterfront land use. He is a N.J. Licensed Professional Land Surveyor and is currently Vice President of the New Jersey Society of Professional Land Surveyors. He was chosen as "Surveyor of the Year" by that organization in 2010. He has authored many articles in national professional publications (e.g. Professional Surveyor Magazine 11/10 http://www.profsurv.com/magazine/article.aspx?i=70829)

Annual Conference Schedule of Events

Thursday, October 11, 2012

7:00 am — Registration
Continental Breakfast

8:00 am-5:00 pm — Hospitality Room open

8:00-10:00 am — **The Role of the First Surveyor**
Part 1: Who's Monuments Control and Why
Speaker: John Stahl
We all think we understand the distinction between the original surveyor and the retracing surveyor, but do we really? When there is no "original " surveyor, where does the "first" surveyor fit into the pictures? Is their monument the "original" monument, or are they simply putting forth their "best effort" to establish the monument? What if their "best effort" isn't good enough? What if they failed to follow the instructions properly? What if the blundered? When are these good reasons to reject their monuments and when are they not reason enough? How is the surveyor to evaluate the evidence necessary to resolve these important questions? Is there a set process we can use? What do the courts say about the process and how do we surveyors apply it?
There are many answers to these questions.

10:00-10:30 am — Break

10:30-12 noon — **The Role of the First Surveyor - Part 1** continued

12:00-1:00 pm — Lunch

12:30 pm — Golf at Forest Park Golf Course
4-person scramble benefitting MSPS Scholarship Fund

1:30-3:00 pm — **The Role of the First Surveyor**
Part 2: Uncalled for Monuments - Do We Accept or Reject?
Speaker: John Stahl
All surveyors are faced with decisions on a daily basis. Do we accept or reject that uncalled-for monument? How do we arrive at our decision? What factors enter into our decision? What practical measures should we undertake in reaching our decision? What liabilities do we face for making the proper or improper decision? How can we best protect ourselves from liability when we make that difficult decision. This workshop will explore many of those questions. We will discuss recent court developments clarifying the principles surveyors can apply when making their decisions. Through this workshop, you will have an opportunity to examine your methods and compare them with the methods used by others. Is there more than one way to handle them? Are there better ways? We call all learn alternative methods to approach age-old decisions.

(continued on next page)

3:00-3:30 pm Break

3:30-5:00 pm **The Role of the First Surveyor - Part 2** continued

5:00-9:00 pm Exhibitor Set-Up and Reception

Friday, October 12, 2012

7:00 am Registration and Exhibits Open
Continental Breakfast with Exhibitors

8:00 am-5:00 pm Hospitality Room open

8:00-12:00 noon Business Meeting and Introduction of Vendors

12:00-1:30 pm Awards Luncheon and Exhibit Viewing

1:30-3:00 **Proposed Minimum Standards**
Speakers: Stan Emerick and Chris Wickern
For several years now the MSPS Standards Committee has been engaged in a dialogue over the best way to incorporate the advancementsin technology into a rejuvenated setof the Missouri Minimum Standards. The results of that discourse will be the foundation for this workshop.Some of the proposed modifications are result of new technologies, others are augmentationsof old procedures, and still others are simplyan attempt to clarify terminology. We will show you some sections that we propose to eliminate and other sections that we plan to fortify. And we will explain how we came to these conclusions and why we view this as a benefit to the professional land surveyor. Dwindling are the days of simple traverse closures, being consumed by a mixed use of robotic instruments and VRS networks and OPUS solutions. Regardless of the constraints that you'd like to hold in your own practice, if you wish to survive in an ever changing professional environment,you will need at some point to learn new terminology,modifyyour procedures and adapt to a new set of rules. Why not start that journey today with a survey of the new standards?

3:00-3:30 pm Break and View Exhibits

3:30-5:00 pm **The New Minimum Standards** continued

5:15 pm Load Bus

6:00 pm Dinner and Tour at Anheuser-Busch Brewery
Transportation, food and drinks included

Saturday, October 13, 2012

7:00 am Registration and Exhibits Open
Continental Breakfast and Past Presidents Breakfast

8:00 am-5:00 pm Hospitality Room open

8:00-10:00 am **Ethics**
Speaker: Curt Sumner
This session will explore the concept of Ethics in general, and discuss its applications to business practice. What are the factors that influence the development of one's ethics? How, or should, personal ethics affect how one conducts business? How, or if, should ethical standards be set by law, professional conduct standards, etc?

10:00-10:30 am Break

10:30-12:00 noon **Transferring Real Property**
Speaker: Eric Harris
The "Deed" - The Wagon that hauls the fruit of your labor! Learn how to "Give" advice and not be guilty of the "unauthorized Practice of Law"! How to render a diagnosis and prognosis on a seriously ill "Conveyancing" Instrument. How a surveyor can cure legal description defect in title transfers. Preliminary Matters: Governing Law and Statute v. Common Law; Essential Elements of a Valid Deed; Parties of Deeds; Words of Grants; Legal Description; Execution of Deeds; Delivery and Acceptance; Exceptions and Reservations; Conditions, Restrictions and Covenants; Co-Tenancies; Life Estates and Future Interests; Transfers; Sheriff's and Commissioner's Deeds; Forms and Practice Helps - Checklist; The Most Common Mistakes Made by the Scrivener.

10:30-12:00 noon **Remedies to Resolve Property Line Problems**
Speaker: John Stahl
Surveyors are often the first to discover a boundary problem. When the surveyor discloses the problem and walks away, what other remedies are available to the surveyor? What knowledge, skills and expertise can the surveyor bring to the resolution table? We will discuss the various remedies which can be used to deal with property line problems, whether caused by a failure in the title documentation or a failure in the location of the boundary. We will discuss the surveyor's role in applying the laws designed to assist in the resolution process from mediation to litigation.

12:00-12:30 pm Lunch (Exhibitor Breakdown)

12:30-2:00 pm **Transferring Real Property** continued

12:30-2:00 pm **Remedies to Resolve Property Line Problems** continued

2:00-2:15 pm Break

2:15-4:30 pm **Adverse Possession, Prescription Easements, Way of Necessity (How, When, Rules), Implied Easements**
Speaker Eric Harris
How the doctrine of adverse possession and the Land Surveyor can "legally" assist the client in "stealing" land from his neighbor. How the doctrine of prescriptive easement and the Land Surveyor can assist the client in getting "ingress and egress" over the land of an adjoiner without having to pay for it! What does "way of necessity" mean to the Judge? What evidence does it take to establish a "way of necessity'? When is a land owner legally landlocked? Can the Bully force his way over your land without having to pay you any significant damages for the inconvenience. What is the benefit of establishing an "implied easement"? How can the Land Surveyor assist his client in preparing for depositions, creating trial exhibits and serving as an "expert witness" in the trial of the lawsuit?

2:15-4:30 pm **Electronic Seals and Signatures - Are You In Danger?**
Speaker: John Stahl
This course will examine the purpose of the surveyor's seal and signature. What do they truly mean? We will review recent court ruling s which have direct impact upon the use and misuse of electronic seals and signatures. The course will look at current and pending legislation regarding e-signatures, their use, and their application to the surveying profession. We will also discuss the differences between imaging and electronic certifications.

Call MSPS at 573-635-9446 to register or print entire program agenda at www.missourisurveyor.org.

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Nominations for 2012 Officers & Board of Directors

President
Sharon C. Herman

Sharon is the Office Manager of Govero Land Services, Inc. overseeing the survey department. She has worked in the surveying profession for 20 years and obtained her Professional Land Surveyors License in 2004. Sharon graduated Magna Cum Laude from Jefferson College with an Associate of Applied Science Degree in Architectural Drafting and Construction Technology.

Sharon has been an active member of MSPS for many years, serving on various committees and as a member of the Board of Directors. In the past she has served as a mentor to young women at the local community college pursuing a career in the surveying / engineering fields.

Sharon enjoys traveling, hiking and playing tennis with Joe, her husband of 30 years and spending time with her 2 grown daughters and their families.

President-Elect
Robert L. Ubben, PLS

Robert is a Principal at Affinis Corp., located in Overland Park, Kansas. He joined Affinis in 1988 and has been in charge of all survey department services for nearly a decade. Licensed in Missouri in 1995 and in Kansas in 1997, Robert works primarily in the Kansas City Metropolitan area and surrounding counties. He has an Associate of Science in Land Surveying from Longview Community College, located in Lee's Summit, Missouri.

Robert is a member of the Kansas Society of Land Surveyors and the Missouri Society of Professional Land Surveyors. Robert has worked as a part time instructor teaching Legal Aspects of Surveying at Longview Community College during fall semesters. Robert and his wife Amanda have two children, one grand child, and live in Raytown, Missouri. Robert and Amanda enjoy spending time with their son at high school band and sporting events, and babysitting their granddaughter.

Vice President
Adam Teale

Adam Teale is a principal owner of Midland Surveying, Inc., located in Maryville and St. Joseph, MO. He is responsible for static GPS control surveys, mission planning, and post-processing of geodetic control. He is also responsible for project scheduling, research compilation and cataloging, analysis and review of field surveys, platting, and government corner registration. Adam is currently chairman of the Membership Committee. Adam has a B.S. in Geography and Surveying from East Tennessee State University. He is a licensed professional surveyor in Missouri and Iowa and obtained certification as a Certified Federal Surveyor in 2009.

Away from work, Adam officiates high school football, coaches youth soccer, and enjoys time with his wife Anna and two young children.

Secretary-Treasurer
Jim Mathis

Jim Mathis is owner and operator of a surveying/engineering business in Southeast Missouri and has practiced land surveying for over 40 years. He has extensive experience in contract cadastral surveying for state and federal agencies and is responsible for the perpetuation or establishment and registration of over 3,300 corners of the U.S. Public Land Survey System. He is a past member of the Land Surveying Division of the Missouri Board for Architects, Engineers, and Land Surveyors, and currently serves on the MSPS board of directors.

Nominations for 2012 Board of Directors

Joe Clayton

Joe began his surveying career over 30 years ago with the United States Army performing high-order geodetic surveys for targeting tactical nuclear missiles throughout Europe. After his military service he returned to Missouri and joined MoDOT as a chainman. At MoDOT he quickly rose in position achieving the job of Party Chief in the Joplin area. His talent of adapting new technologies for surveying applications led Joe to the DOT's headquarters where he served as the Department's leader for surveying policy and training. Joe implemented the use of GPS for transportation topographic and boundary surveys while serving as a land surveyor during a return assignment in southwest Missouri. Today he is a Land Surveyor with the Missouri Department of Conservation where he manages the Wildlife Land Boundary Program with a practice focused on surveying services for wetlands and waterfowl habitat. Joe is a graduate of the US Army Field Artillery Survey School; he has under graduate course studies from three Missouri Universities and is a certificate candidate of the Land Survey Program of the University of Wyoming. A founding member of the Southwest Chapter of MSPS he is now a member of the Central Chapter. Joe is the current MSPS Liaison to the Missouri GIS Advisory Council where he chairs their Policy and Legislation committees. He is the chair of the MSPS GIS/Vision 21 Committee and is an active member of the Legislative, Nominations

and Standards committees. Joe takes the responsibilities granted to the surveyor by the public very serious. Joe says, "Paramount among these responsibilities is to perform my professional duties, while protecting the public's interest." Residing in Jefferson City, Joe and his wife Michelle are the proud parents of an adult son and three teenagers! Joe appreciates the opportunity to serve in a leadership role!

Curtis McAdams

Curtis is a principal owner of Midland Surveying Inc., located in Maryville and St. Joseph, MO. He currently serves as Vice President of Operations in the St. Joseph office. Curtis is responsible for project management and scheduling, research compilation, analysis and review of field surveys, platting, and government corner registration. He is also responsible for completing Airfield Obstruction Surveys. Curtis began his surveying career in 1992 with Midland Engineering, Inc., now Midland Surveying. He has been a member of MSPS since 1998 and currently serves as Co-Chairman of the Awards Committee. He is also a member of the National Society of Professional Surveyors. He is a licensed professional surveyor in Missouri and Nebraska. Prior to becoming licensed, he completed surveying related courses from Northwest Missouri State University, Missouri Western State College, Longview Community College, and the University of Wyoming.

Curtis resides in Maryville with his wife Megan and their daughter, Sloane (8) and son, Sutton (5). He appreciates the nomination and looks forward to serving MSPS and the surveying society.

Jerrod Hogan

Jerrod started his surveying career in Indianapolis where he worked as a instrument operator, CAD technician and Crew Chief. He moved his family to Joplin in the summer of 2000. Jerrod finished his Missouri required coursework at Missouri State University in Springfield. He obtained his Missouri license in 2004 and is also licensed in Kansas, Arkansas and Oklahoma. He is a Vice President and Project Surveyor at Anderson Engineering and manages the survey department for Anderson's Joplin Office Jerrod has been a member of MSPS since 2002. He was a charter member and founding president of the Southwest Chapter. Jerrod is active in his local Chamber, local politics, community and local chapter of MSPS. He resides in Joplin with his wife Melissa and three children, Shae (13), Miles (6) and Ava (3). Jerrod appreciates the nomination for director of MSPS and is excited at the opportunity to serve the Society.

Christopher M. Wickern, PLS

Chris is a surveyor for Engineering Surveys & Services in the Sedalia office. He served for many years as a Combat Engineer at Ft. Leonard Wood, MO and Europe. He discovered surveying at Ft. Sill, OK, and was an instructor at the Field Artillery Surveyors Course. He also served as an Instrument Man, Party Chief, Battalion Chief Surveyor, and Brigade Chief Surveyor at Ft. Sill and Korea. Civilian life brought the opportunity to learn "Boundary Surveying", or surveying beyond measurements and calculations. He was a "registered" land surveyor in Arizona, where he taught surveying at Cochise County Community College. He has also been a "certified" federal surveyor, but here in Missouri, Chris is what we surveyors have always been, a "professional" land surveyor. He has worked in southeast, central, the Kansas City area, south central Missouri, and served as the Chief Surveyor for the Kansas City District, US Army Corps of Engineers. Chris has written articles appearing in national and regional survey publications, the Missouri Surveyor, and Title News published by ALTA. He is currently a member of the Legislative Committee, Newsletter Staff, Public Relations Committee (Chair State Fair Sub- Committee), and the Co- Chair of the Standards Committee.

Rich Howard

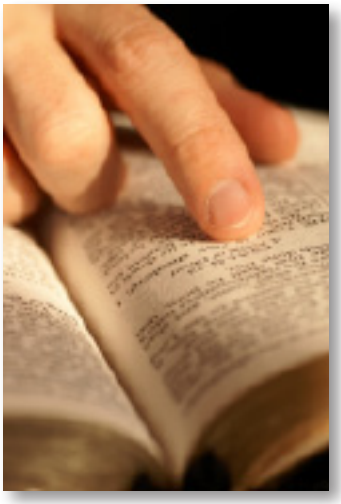
Rich of Vienna is a Land Surveyor for the Department of Conservation where he leads the Land Boundary Program for Fisheries & Forestry. Aside from his service to the State Rich has private-sector experience in rural boundary surveys and engineering surveys for residential and farm development. The current MSPS Sales/Public Relation Committee chair, he is a graduate of the Land Surveying Certificate Program of the University of Wyoming. Devoted to community service and civic involvement Rich is member of the Lions Club, the Eagles and the Vienna United Methodist Church. An avid hunter and fisherman Rich enjoys family time at his cabin on the Gasconade River with his wife Gail, daughters Malinda and Sarah, son-in-law Matt and grandson Tyler. Rich is honored by this nomination to the MSPS Board of Directors and appreciates all opportunities to serve the Society and the surveying profession.

Old Testament Aspects of Boundary Surveying

by Chris Wickern, PLS

The Book of Genesis tells us, *"In the beginning God created the heavens and the earth. … Then God said, Let the waters below the heavens be gathered into one place, and let the dry land appear; and it was so. God called the dry land earth… and God saw that it was good… Then God said, Let Us make man … and let them rule over … all the earth… God blessed them; and God said to them, Be fruitful and multiply, and fill the earth, and subdue it; God saw all that He had made, and behold, it was very good."* Here it is, the source, and our deed is back to when dirt was created. The original survey by the Creator, land quit-claimed to man, male and female and it was very good. Surveyors have been marking, remarking, dividing, consolidating, and subdividing land since then. There are many Biblical references affecting our ancient and time honored profession. Some of these can be seen in our modern standards of practice. Others illustrate how many problems we see today, go back a very *l o n g* way.

Genesis: *"So the field and the cave that is in it were deeded over to Abraham for a burial site by the sons of Heth."* OK, was this ambiguous description written by the seller, Title Company, or attorney?



Exodus: *"I will fix your boundary from the Red Sea to the sea of the Philistines, and from the wilderness to the River Euphrates; for I will deliver the inhabitants of the land into your hand, and you will drive them out before you." "For I will cast out the nations before you and enlarge your borders; neither will any man covet your land when you go up to appear before the Lord your God…"* Establishing and fixing a boundary from title by conquest.

Leviticus: *"You shall do no injustice in judgment, in measurement of length… or volume."* This is much like the typical response by the Surveyors Generals to many questions from county surveyors. One illustration is from the 1856 GLO Instructions: "… it is impossible to frame instructions … so … as to …enable a … Surveyor to do… justice to all parties concerned. After all that might or could be said, much will depend upon the judgment… of the surveyor on the ground."

Numbers: *"And you shall measure outside the city on the east side two thousand cubits, on the south side two thousand cubits, on the west side two thousand cubits, and on the north side two thousand cubits."* Go figure, a metes description found in the book of Numbers.

Deuteronomy: *"You shall not move your neighbor's boundary mark, which the ancestors have set…"* Or else what? *"You shall not have in your house differing measures, a large and a small. You shall have a perfect and just weight, a perfect and just measure…"* "Perfect" is a pretty steep standard. *"Cursed is the one who moves his neighbor's landmark. And all the people shall say, "Amen!"* Oh! There's the "or what." To be cursed by the original, Original Surveyor has eternal consequences.

Joshua: *"Pick out from among you three men for each tribe, and I will send them; they shall rise and go through the land, survey it according to their inheritance, and come back to me You shall therefore survey the land in seven parts and bring the survey here to me, that I may cast lots for you here before the Lord our God. ... and Joshua charged those who went to survey the land, saying, Go, walk through the land, survey it… So the men went, passed through the land, and wrote the survey in a book in seven parts by cities…"* Here we have Survey parties performing surveys under authority, with instructions, bringing back their returns, and documenting their work; sound familiar?

1 Kings: *"So they divided the land between them to survey it; Ahab went one way by himself and Obadiah went another way by himself."* Prospect Robbins and Joseph Brown may have had this in mind when they met and went different ways establishing the 5th Principal Meridian and Base Line.

Job: *"Where were you when I laid the foundations of the earth? Tell Me, if you have understanding. Who determined its measurements? Surely, you know! Or who stretched the line upon it? To what were its foundations fastened? Or who laid its cornerstone…"* In Adams v. Hoover the court quoted Cooley's dictum echoing this ancient writing, "To disturb such boundaries … would cause, as Justice Cooley stated in Diehl, supra, "incalculable mischief and consternation"." It is also closely related to today's Revised Statutes of Missouri Chapter 60, Section 60.305; "In the resurvey of the… lands …the surveyor shall observe… The boundaries… are unchangeable… The original… corners established by the original… must stand as the true corners..."

Isaiah: *"Who has measured the waters in the hollow of His hand, measured heaven with a span and calculated the dust of the earth in a measure? Weighed the mountains in scales and the hills in a balance?"* Just a reminder in case you forgot about by whom and by what authority the Original Surveyor performed His work.

Jeremiah: *"And I signed the deed and sealed it, took witnesses, and weighed the money in the balances. So I took the purchase deed, both that which was sealed according to the law and custom, and*

that which was open; and I gave the purchase deed to Baruch. 'Thus says the Lord of hosts, the God of Israel: Take these deeds, both this purchase deed which is sealed and this deed which is open, … Men will buy fields for money, sign deeds and seal them, and take witnesses…" The transfer of property, purchased, signed, sealed, and witnessed, some things have never and should not change.

Ezekiel: *"He took me there, and behold, there was a man whose appearance was like the appearance of bronze. He had a line of flax and a measuring rod in his hand, and he stood in the gateway. …"* No pressure here, we have gone from a standard of perfection to an Angelic standard.
"Appoint three men from each tribe. I will send them out to make a survey of the land and to write a description of it… Then they will return to me. You are to divide the land into seven parts… After you have written descriptions of the seven parts of the land, bring them here to me… So the men left and went through the land. They wrote its description on a scroll, town by town, in seven parts, and returned to Joshua … and there he distributed the land to the Israelites according to their tribal divisions." Another example of surveys performed under authority, with instructions, returns made, and surveys documented. Just as with title, some things should not change.

Hosea: *"The princes of Judah are like those who remove a landmark; I will pour out My wrath on them like water."* Fair warning; don't mess with the Original Surveyor.

Zechariah: *"… My house will be built in it," declares the LORD of hosts, "and a measuring line will be stretched over Jerusalem… Then I raised my eyes and looked, and behold, a man with a measuring line in his hand. So I said, "Where are you going?" And he said to me, "To measure Jerusalem, to see what is its width and what is its length."* The Original Surveyor is retracing His previous work before He builds His house. What a concept!

There are many references to surveying in the Bible. These few from the Old Testament demonstrate that many aspects of boundary surveying have been around for thousands of years. Surveys were performed under authority with instructions, returns were made, and they were documented. Standards direct the surveyor to do justice with perfect measure, and to fulfill an Angelic standard of care. Substandard work may incur being eternally cursed with the Almighty's wrath being poured out like water. It's enough to send chills down a modern surveyors' spine.

On the bright side, if we exercise due diligence and do no injustice, our reward may be found in the Book of **Psalms:** *The boundary lines have fallen for me in pleasant places; surely I have a delightful inheritance.*

Announcing Changes to the Missouri State-Specific Surveyor Exam

The Missouri Board for Architects, Professional Engineers, Professional Land Surveyors and Landscape Architects (Board) has determined that, beginning with the April 2013 exam, the state-specific surveyor exam will be split into two parts. Passing this exam is required of each applicant for an initial surveying license and those applying for a Missouri surveying license by comity.

Part I (General) will include items on the Missouri Minimum Standards for Property Boundary Surveys, Missouri Statutes and Rules, Missouri Plane Coordinates, and Missouri Riparian Boundaries.

Part II (Public Land Survey System) will include items on Original GLO procedures and methods, the GLO system applied to Missouri, GLO section protraction, numerical calculation problems applied to USPLSS for Missouri, and resurveys on the USPLSS for Missouri.

Part I and Part II of the exam will each be a separate one-hour exam. Both parts of the exam will remain open-book.

Each examinee will be required to achieve an acceptable score on each part before receiving a pass for the Missouri State-Specific Exam. Applicants will be allowed to retake the part or parts that they fail.

Questions concerning this new exam format should be directed to the Board office at 573-751-0047.

Kansas Icon Announces Plan for Retirement

Reprinted from *Section Lines*, Kansas, February 2012

Mr. Murray Rhodes, L.S., Vice President of Surveying Services announced he plans to retire from BHC Rhodes over the course of the next several months. As an industry veteran, his retirement marks a historic time for the Kansas City area and the state of Kansas. In 1991, the Governor appointed Rhodes to the Kansas State Board of Technical Professions as the Land Surveyor Representative, where he is still active as the Board's representative to the National Council of Examiners for Engineers & Surveyors (NCEES). Rhodes was also the former Wyandotte County Surveyor, and held this office from 1968 through 1998.

During his terms as county surveyor Rhodes pioneered the integration of surveying and local governments, and also led the implementation of the first parcel level GIS in the nation in Wyandotte County. Mayor Joe Reardon, Unified Government of Wyandotte County and Kansas City, Kansas, said, *"Murray Rhodes has been a part of our community for many years. His contribution to our citizens goes beyond his technical expertise as an award winning land surveyor, and our elected County Surveyor. He has a reputation for integrity and fairness and is a true pillar of our County. Currently Murray and his firm have contributed to some significant local projects such as the Hollywood Casino, Livestrong Sporting Park and the Schlitterbahn Water Park. I would like to wish him well on his retirement. He will be missed. "'*

Over the course of his nearly fifty-year career, Rhodes has been a member of numerous professional associations and boards, held several leadership positions and won numerous awards. He has also served as guest speaker nationally and internationally and acted as legal expert witness for local trials.

NOW THEN:

That is the official announcement. But what we know is much different than that. Those of us who are fortunate enough to know Murray know that he is, and has always been, a consummate surveyor and simply a good man. He is kind and generous with his time, expertise and knowledge. He is always willing to help those who need it. He has mentored any number of young surveyor wannabes into good competent surveyors. Murray is one of those people who sees what needs to be done, whether on a survey, in an organization, or in a governmental setting, and quietly and patiently perseveres until the goal is

met. Murray has a full, but dry (and some say slightly twisted) sense of humor. He is always ready to lend an ear and a helping hand to anyone who needs a sounding board, advice, technical expertise or a bit of wisdom born from experience. In short, Murray Rhodes is both a valuable resource and a good friend. Murray, you will be missed. God bless you in all your future endeavors.

Now back to the official announcement:

In 2005 his company, Rhodes Surveyors, Inc, merged with BHC, forming BHC Rhodes Civil Engineering and Surveying. This merger, along with an additional acquisition, created the most extensive land survey records library in the metro. The records date back to the 1800's and are regularly accessed by those in the industry for historical data. Rhodes' long term plan in 2005 was to mentor new leadership for surveying services and transition into retirement. With this achieved, BHC Rhodes' surveying operations will continue to offer the same variety of professional services from their Kansas City, Kansas office.

BHC Rhodes Civil Engineering and Surveying was founded in 1992 and is based in Overland Park, KS. They have three office locations in Kansas and perform work nationally and internationally. Their progressive work environment and "no problem" service led to their recognition as one of the Kansas City area's leading firms, ranking in Ingram's Magazine Corporate Report honor roll for consistent, long-term revenue growth for ten years. BHC Rhodes has been recognized by local and national magazines and placed on the Top 25 Engineers list with The Kansas City Business journal. BHC Rhodes has been awarded Best Place to Work both locally and nationally as announced in CE NEWS magazine. For more information visit their web site at http://www.ibhc.com.

MoDOT Liaison Committee Report July 2012

At the May board meeting, the Board of Directors accepted our committee's recommendation to send MoDOT a request for information about the reorganization and its possible effect upon land surveying procedures.

The text of the proposed letter is included below. We believe that we have covered our members' significant issues.

PROPOSED TEXT OF LETTER

Mr. Bradley McCloud, PLS
Missouri Department of Transportation

Dear Mr. McCloud;

As a member of the Missouri Society of Professional Surveyors, Missouri Department of Transportation (MoDOT) Liaison Committee, you are aware the committee met with MoDOT staff on October 22, 2009 to discuss issues raised by MSPS members regarding MoDOT procedures for right-of-way definition, monumentation, and acquisition.

MSPS appreciates the cooperation of MoDOT, allowing staff to meet with our committee and provide insights into the procedures used to develop this modern transportation system for Missouri citizens, and those visiting, or traveling through, Missouri.

The MSPS committee met on several occasions to discuss the information received from MoDOT staff. The purpose of the MSPS Committee is to protect the Professional Land Surveyors (PLS), working under contract or employed by MoDOT, from any procedures that do not strictly follow the Missouri Minimum Standards for Property Boundary Surveys (Standard). The goal of this committee is to make everyone employed by MoDOT, involved in real property rights (as defined in Section 327.272 RSMo), aware ofthe Standard, when adherence to the Standard is applicable, and why adherence is important when buying and selling real property. Meetings included discussion of recent changes in the Engineer,ing Policy Guide and whether the changes fulfilled adherence to the Standard.

During the time of those discussions, MoDOT accomplished extensive reorganization resulting in numerous changes including district boundaries, personnel assignments and budget reductions. With the reorganization process complete and MoDOT staff members in their new assignments, the MSPS committee would like to resume the consideration of MoDOT surveying procedures.

On behalf of MSPS, the committee would like post reorganization information about the MoDOT structure, staff, and procedures that relate to land surveying and right-of-way acquisition.

MSPS requests a description of current steps in the right-of-way acquisition procedure, particularly any changes made during the reorganization. Recognizing that MoDOT projects involve teams of individuals with different areas of expertise, and within different departments, it would be beneficial to know which department supervises the various steps in the process.

Specific areas in which committee members have expressed a desire for additional information are:

1. What department initially conceives a project?

2. What areas of expertise are assigned to a project team, who is the team leader, in what department does the team leader work?

3. At what point do land surveyors begin and end their portion of the work, who determines their scope of work?

4. As work tasks are undertaken, how is the coordination of various departments conducted and how are final decisions made when conflicts arise?

5. Once right-of-way acquisition begins, how do different departments participate, particularly with respect to definition of the taking?

6. After acquisition, what procedures are used to document and perpetuate the identity of the right-of-way, and its relationship to the United States Public Land Survey System?

7. Is there any difference in land surveying work tasks used in projects completed by MoDOT staff, and by outside consultants?

8. Is there a central repository for executed right-of-way documents and construction plans, or are they maintained within district or area offices?

The MSPS objective in sending this letter is to ensure understanding of recent changes in MoDOT structure, and to gain knowledge about changes in policy that have resulted from reorganization. Once our committee understands current MoDOT procedures, and compares those procedures to the Standard, we look forward to further dialogue.

A related topic of discussion our committee has considered is the current status of the Virtual Reference Network and any plans for its future. This is, of course, a long range goal for us.

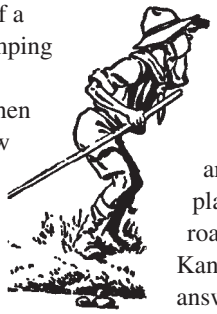
Educational Opportunities
You Didn't Know About—But Really Should
or, Where Do Future Surveyors Come From??

by Ernie Cantu, LS, Reprinted from *Section Lines*, (Kansas), Feb. 2012

Children First: CEO Kansas

On October 25, 2011, a group of middle-school-aged girls got the opportunity to see what the career of land surveying is about. They visited Professional Engineering Consultants (P.E.C.) and got to hear about the uses of a thermal camera, how much pressure it takes to make a block of concrete explode, AND they got hands-on experience with a total station. They were fascinated with intricate survey CAD drawings of Wichita State University and the high-accuracy measuring device and how it could measure between two points even if there were walls between the points (a prism in one office and another prism across the office space on top of a file cabinet in another office).

Although the technology buttons and beeps made their eyes wider and their faces smile like playing with the latest version of a vibrantly-colored Smartphone, what really set them to jumping around with chatterbox excitement (apparently typical for middle school girls when they get that WOW factor) is when they saw the stack of blue KSLS "What You Should Know About Land Surveying" brochures, because right on the front panel of the brochure is a young woman depicting land surveying as a viable career choice, as she is in the field with a GPS receiver in her hands. (Who is that woman? If you see her, congratulate Sarah Boeh-Cerra for volunteering.) The girls each took a brochure and the elderly women who accompanied them asked if they could have the rest of the stack to put with their library of motivational career reference material. Congratulations to KSLS for such a powerful tool!



The program is called "Future Women in STEM Careers" for low-income girls to choose a STEM career. "Future Women in STEM Careers" is a program of Children First: CEO (Children Educational Opportunities) of Kansas Inc., a non-profit organization in Wichita, Kansas focused on assisting in equalizing educational opportunities for low-income families with children and youths. The program encourages girls to select a career path in Science, Technology, Engineering and Math (STEM) through company tours to build a bridge between low-income girls in middle and high school and professional women in STEM careers. Their website is http://childrenfirstceo.org.

Boy Scouts of America and Quadrangles

On November 29, 2011, Steve Ukena received training on how to use a USGS 7.5-Minute Quadrangle Topographic Map to track down Universal Transverse Mercator coordinates (UTMs). With an interest in motivating the Youth, Steve Ukena volunteered for the monumental task of being a merit badge counselor for the Boy Scouts of America Geocaching Merit Badge. Being an experienced geocacher himself, the endeavor at first sounded like a breeze, until he discovered that within the requirements for the Geocaching Merit Badge is learning how to track down UTM coordinates using a USGS Quadrangle. To teach Boy Scouts about using UTM coordinates would first require knowing about the UTM coordinates himself. So Steve sought this knowledge from a reliable source. He contacted the Kansas Society of Land Surveyors and found what he was seeking.

Little did he expect, that he would not only learn how to expertly use a USGS 7.5-Minute Quadrangle Topographic Map to track down Universal Transverse Mercator coordinates and how to explain that concept to the Scouts, but he also learned, through his inquisitiveness, some surveying history. He was introduced to a timeline, traveling from today's GPS satellite signals back to the days of using a Gunter's Chain to measure 80 chains and 80 chains and 80 chains across a land without roads, across a land hiding the threat of flying arrowheads, 80 chains and 80 chains and 80 chains, marking places on the ground that would one day form the zillions of roadway intersections forming the "grid of squares" across the Kansas landscape. Seek and you shall find. Steve sought the answer to the ominous UTM and left as an enlightened person, now aware of so much more, and with more questions about surveying.

When the time comes for Steve to test the Scouts for this Badge, he will be open to receiving help from geocachers and land surveyors. Anyone willing to help Steve with his endeavor, or also wanting to pursue becoming a BSA Merit Badge counselor is encouraged to contact KSLS.

Steve Ukena is with Sales for the company Direct Mail Printers in Wichita, Kansas. Steve knows how to go geocaching and he now knows a lot more about survey history. After he feels comfortable with presenting the BSA Merit Badge in Geocaching, perhaps we'll ask him to look into the BSA Merit Badge in Surveying as well.

Butler Community College Free Class Day

This year Butler Community College is offering another Free Class Day and the KSLS South Central Chapter will be in Andover on March 31, 2012, presenting a number of classes to educate the public that land surveying is a viable career choice. Class listings are still in the works but may include topics like Geocaching-101, Survey-Grade GPS and Survey History. For geocaching that day, check out the website http://coord.info/GC3962M.

Letter to the Editor

PROFESSIONAL SURVEYOR

So you want to be a Professional Surveyor. What does that mean, how do we achieve this status? Blacks Law Dictionary describes professional as follows: "A person who belongs to a learned profession or whose occupation requires a high level of training and proficiency."

So will more education make you a professional surveyor? My belief is no. Education is only part of the equation. To be recognized as a Professional you must get involved whether locally or nationally. Getting involved with not only surveying, but local Chambers of Commerce, Church Organizations, Economic Development, School Boards, Parent Teacher Organizations, Lions Club, and Kiwanis, etc., and becoming a leader in the community helps us achieve the professional status.

It requires people within the organization to get involved to make the organization a professional organization. Education is important, but training in the field is also important. If you have the knowledge but can't apply it – what good is it?

I do believe we should work toward a four year degree for surveyors, but that is not the total answer. It takes individuals to become professionals and those individuals will bring professional status to the profession and the organization that support us.

Thank you.

Daniel L. Govero, PLS

President, Govero Land Services, Inc.

Chairman, Education Committee for MSPS

Member, MO Board for Architects, Professional Engineers, Professional Land Surveyors & Landscape Architects

Chairman, Jefferson County Growth Association (JCGA)

Chairman, Jefferson County Port Authority

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New Surveyors' Tool Puts Everything UP IN THE AIR

by Joseph V.R. Paiva, PhD, PS, PE, Reprinted from *Empire State Surveyor*, Vol. 48, No. 1, January/February 2012

Just when you thought the only thing you needed to decide was whether to buy your laser scanner—and if so, when—here comes another technology on the horizon. It can help you get more done faster, it can also expand your reach ... Yes, yes, you've heard it all before. What have they cooked up now?

The answer is sUAS.

Small Unmanned Airborne Systems. Some people hear about them and say "drones." Drones are UAS, but usually not sUAS. Some of the military's drones have 60-foot wingspans, and even the smaller ones can weigh in at several hundred to a couple of thousand pounds. But sUAS aren't anything like the Predators and Desert Hawks being used by the military. Or the ones used for surveillance by the Border Patrol or various police agencies. Or the ones that loiter overhead for a variety of reasons—atmospheric sampling, providing temporary communications links or doing some type of electronic monitoring.

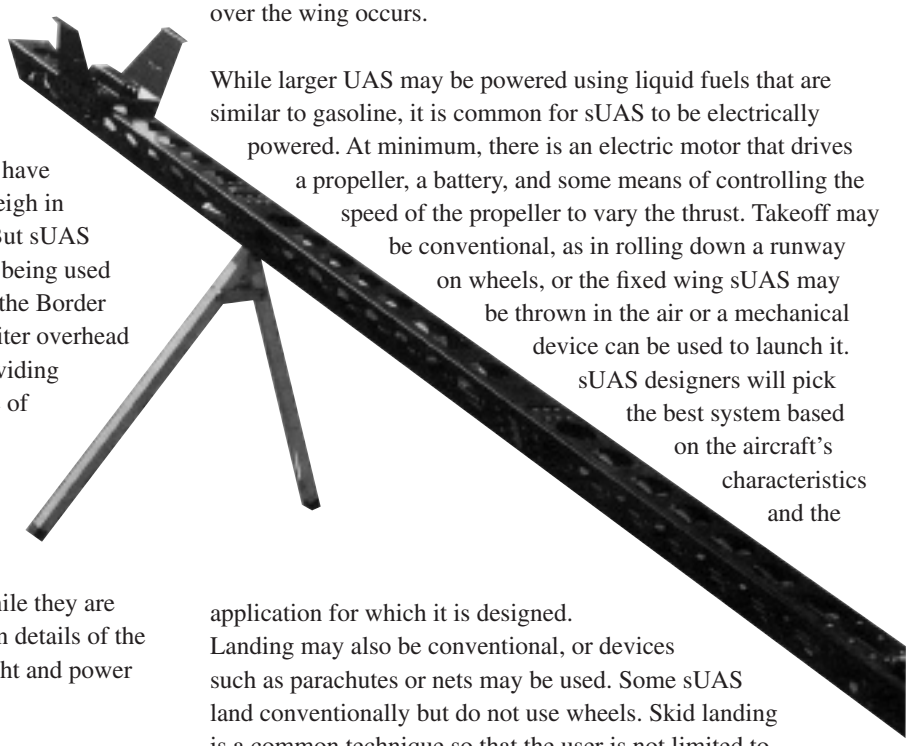
A purpose-built sUAS for geomatics (or, if you prefer, surveying and mapping) is a mini-version of the systems you might be familiar with in conventional manned aerial photogrammetry. Yet while they are similar, they're definitely not the same. They differ in details of the benefits, drawbacks, costs, skills required, size, weight and power consumption, and so forth.

What are the characteristics of sUAS?

It is impossible to generalize too much about sUAS technology, but the greater majority of them can be described, as long as you realize that a particular sUAS you are discussing may not have all of these general characteristics.

We begin by first breaking them down into two classes: rotor wing and fixed wing. A rotor wing is often in the configuration of a helicopter, as most of us know. Many others designed for sUAS applications have multiple rotors, four, six or eight being relatively common. While rotor wing sUAS are extremely useful devices for certain applications-such as inspection of inaccessible parts of structures or the small sections of ground surface—they are generally not that great for photogrammetric mapping of larger areas. This is because their stability is questionable when the weather is not calm; flying them in a straight line is difficult; and most have extremely short flight range because of their extraordinary power consumption.

Fixed wing sUAS can be configured similar to most commercial aircraft we see, with a wing near the front and a vertical stabilizer and horizontal stabilizer in the back. However other designs may be seen, with the "flying wing" concept used quite a lot. Regardless of the details, fixed wing sUAS use the concept of an airfoil (the wing) to generate lift, which is only possible when the movement of air over the wing occurs.



While larger UAS may be powered using liquid fuels that are similar to gasoline, it is common for sUAS to be electrically powered. At minimum, there is an electric motor that drives a propeller, a battery, and some means of controlling the speed of the propeller to vary the thrust. Takeoff may be conventional, as in rolling down a runway on wheels, or the fixed wing sUAS may be thrown in the air or a mechanical device can be used to launch it. sUAS designers will pick the best system based on the aircraft's characteristics and the application for which it is designed. Landing may also be conventional, or devices such as parachutes or nets may be used. Some sUAS land conventionally but do not use wheels. Skid landing is a common technique so that the user is not limited to smooth paved surfaces required for wheeled landings.

The aircraft may be "pilot-in-the-loop," which means that the plane is under remote control of a pilot from the moment it starts its engine until it lands. Or it may be semi-autonomous, where takeoff and landing are manual, but part of the mission is automated. The aircraft may also be fully autonomous. This means that once the "takeoff' button is pressed, it executes a pre-programmed flight plan automatically and lands at a designated spot. Autonomous vehicles should have preprogrammed "fail safes" that handle abnormal or out-of-the-ordinary situations that may require mission suspension or termination. Autonomous vehicles are generally required by the civil aviation authorities (in the United States, the FAA) to have a radio link that allows the pilot to observe that conditions are abnormal (such as an imminent collision with a flock of birds) and either suspend or terminate the mission.

Almost all sUAS that are autonomous will have a speed sensor to determine airspeed, an altimeter, and GPS. Autonomous sUAS must also have some kind of attitude sensor to detect the three principal rotations of pitch (nose up or down), roll (right or left wing up), and yaw (orientation of nose or longitudinal axis of the aircraft in relation to the direction of travel).

What is a mapping sUAS?

A mapping system that is sUAS-based carries a camera payload, automatically flies a predetermined flight plan with correct forward and side overlap, takes pictures automatically, and has avionics that keep the plane flying as straight and level as possible. The avionics includes a three-axis gyro (usually a micro-device) and a three-axis accelerometer. Usually, like all well-designed craft that are created to be autonomous, it will have GPS on board so that it can navigate to the points designated on the flight plan that was uploaded into the aircraft before takeoff. The system will include software that allows the flight plan to be created before takeoff. This usually includes designation of landing and takeoff points, boundaries of the area to be flown, and usually, designation of the altitude above ground level at which the mission will be carried out.

The system will also include software for downloading the imagery once the craft is on the ground, viewing it, geocoding it (if it hasn't been geocoded in the air), and preparing for the process of converting the imagery into data products (usually orthomosaics, digital surface models—DSMs—and X, Y, Z point clouds).

Why are mapping sUAS being developed?

The sUAS has several operational benefits for surveying and mapping that cannot be ignored. Generally, they can fly in a wider array of weather conditions than is optimum for manned aerial photogrammetry. In fact, because flying height is usually 150 m or so, cloudy weather is usually not a problem. It is lightweight and can be brought to a site without worry about the logistics of getting a large airplane near the site. Very often the system can be taken along as luggage on a commercial airplane flight. While acquisition costs can vary between the cost of a total station and a low-end lidar scanner, the costs of operation are miniscule. While the sUAS cannot carry a large payload (a few hundred grams is the norm-usually far less than a pound), the cameras used, which are usually semiprofessional off-the-shelf systems, can capture images of exceptional clarity and resolution. At the 150 m flying height, pixel resolution of 5 cm is normal. This opens up a style of data capture and mapping that has not been feasible before.

Generally, conventional photogrammetry serves extremely well when the areas to be mapped are large (tens to hundreds to thousands of square miles). On the other hand, surveyors with on-the-ground systems such as total stations and RTK GPS become expensive time-wise and cost-wise as areas to be mapped get larger than about 10 acres. With sUAS technology, a user can bridge the gap between these two well-developed and relied-upon systems. In addition to making mapping of areas larger than about 10 acres to about 10 square miles economically feasible, without the limitations of weather delays, sUAS mapping is sometimes the only solution when it is dangerous to fly over the area to be mapped with manned aircraft or even to approach the area on the ground. Examples of sUAS saving the day are already numerous, including levee surveying during floods, forest fires, and the recent Fukushima nuclear power plant accident in Japan.

Accuracy varies depending on how the imagery is used. Conventional photogrammetric processing techniques cannot be used together with sUAS technology. The principles of close range photogrammetry and vision software must be used instead. This requires, among other things, high overlap photography-usually a minimum of 75 percent forward and side overlap. When properly controlled with surveyed ground targets, accuracies at the 5 cm level horizontally and 10-15 cm vertically are feasible. Potential users see sUAS as the ideal data collection source for many applications, including volume mapping for construction projects, construction progress mapping, change detection in a variety of applications, forest and agricultural crop monitoring and management, and open cut mine management.

Caveats and full disclosure

Currently FAA regulations (the regulator of the use of our national airspace) do not allow the use of any unmanned system without a permit. Permits for most of the applications mentioned here are only available to government agencies and publicly owned universities. Commercial flights with sUAS are banned except for research or training purposes or for market surveys, when a special airworthiness certificate may be issued to a commercial company.

It is anticipated that the FAA will issue new regulations that open up the skies for sUAS ... but even the proposed regulations have yet to be released. The current guess is that they will be disclosed in March 2012. 'Men there will be a comment period, and then a period for the FAA to modify the regulations based on legitimate comments they received. So, commercial flights may still be a year or two in the future for most of us. But there's no harm in dreaming ... and many public agencies have already started using sUAS for mapping for GIS, volume determinations, environmental assessment, resource mapping, etc.

The author of this article works for an sUAS manufacturer, Gatewing NV, of Ghent, Belgium. He may be reached at jvrpaiva@swbell.net

The LightSquared Issue: A Brief Review

by Curt Sumner, LS, Executive Director National Society of Professional Surveyors (NSPS),
Reprinted from *Empire State Surveyor*, Vol. 48, No. 1, January/February 2012

For more than a year now, the surveying community has been riveted by the specter of a devastating blow to the technology that has revolutionized not only our profession, but also the entire world of positioning, especially high-precision positioning.

We "users" have found ourselves perplexed by the concept that anyone could rationally accept the premise that a portion of the communication spectrum, heretofore specifically set aside for satellite-based operations, could be what appears to us carelessly and suddenly now on the threshold of being designated for terrestrial-based operations that would virtually eliminate our ability to utilize the GPS equipment we as a country have come to depend upon.

To be clear about the source from which this article is coming, full disclosure dictates that I inform you that I am not a technical expert in the development, production, nor even use of GPS equipment. Like many other surveyors, I am familiar with how GPS equipment operates and the multitude of benefits it provides to our profession and so many of our fellow citizens. The article is being presented from my perspective, based on a fairly heavy diet of information and propaganda having been thrust upon me and others during the past year.

Some have implied that we, the user community, share some of the responsibility related to the current dilemma for not having envisioned that such a circumstance was inevitable. From my point of view, not even the manufacturers of GPS equipment could have been completely prepared for the issuance of the conditional approval granted by the FCC to LightSquared in January 2011. Operating in accordance with the concept that only "satellite-based" operations were to be allowed near the band in which GPS signals are received, why would one pursue the development of the so-called "fix or solution", filters that might lessen or eliminate the interference from signals that were not to be allowed in "the neighborhood"?

Still, even from staff in some congressional offices we (NSPS) have visited, we, the users, have been accused of "stealing" signals from adjacent bandwidth as if we are thieves in the night, lurking in the shadows to fill our GPS receiver purses with ill-gotten signal. A good friend, one much more intelligent than am I about this issue, recently said to me, "the issue of poaching is a disingenuous spin that has been played by many companies jockeying for spectrum over many decades. The FCC does not, cannot, and has never put restrictions on where GPS receivers can look for signals. They regulate transmission, not reception. One can look into any band for signal. There are no prohibitions and never have been. Eavesdropping is a different legal matter altogether, and is more about what someone does with signals. No spectrum licensee has ever been ruled to have any claim to prohibiting anyone from looking into a spectrum".

The current FCC ruling that is being sought by LightSquared that would disallow protection for GPS users from interference is unprecedented and unwarranted, as is the notion to enforce receiver standards. It is critically important that the FCC hear from our professional community not only on this specific item, but also the entire issue.

Just this week, our Government Affairs Consultant Laurence Socci issued an Action Alert to the surveying community to submit comments to the FCC about the ruling LightSquared has requested. The link for submitting comments is http://fjallfoss.fcc.gov/ecfs/upload/display?z=sjbci. A copy of the full Action Alert can be found at http://nysapls.org/associations/7142/files/NSPS-Action-Alert.pdf

Just today, we learned that the FCC has released documents in compliance with a Freedom of Information Act (FIOA) request. You can view the information using the link, http://www.fcc.gov/encyclopedia/lightsquared-foia.

A few days ago, the Aircraft Owners and Pilots Association (AOPA) asked the FCC to revoke LightSquared's license. A link to an article on this is:

http://www.aopa.org/advocacyarticles/2012/120131lightsquared-tests-offer-no-practical-solution.html?WT.mc_id=ebrief

There are many articles being written supporting both sides of this issue. Some say LightSquared is doomed, while others decry the audacity of the FCC to allow complaints from the user community to stand in the way of "progress". It is important to say here that neither I nor NSPS is opposed to higher quality broadband service. We just don't think it should come at the unnecessary expense of GPS reception.

To remotely imagine that this issue is drawing to a close is misguided, and we must remain diligent.

We at NSPS are working hard to provide relevant and timely information to the surveying community, and to other related GPS users to keep you informed about it. Please reciprocate with your continued involvement, and your support of your national organization.

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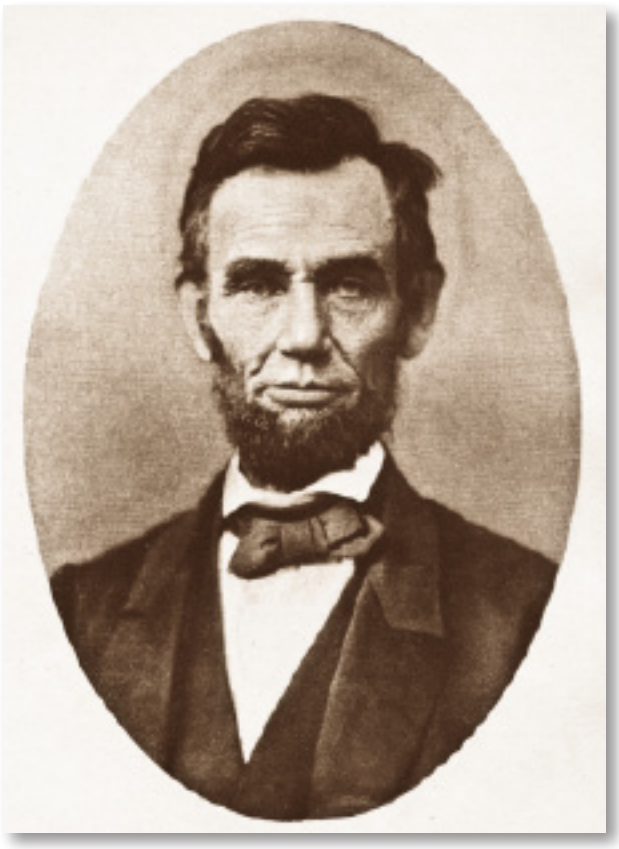
Abraham Lincoln's Notes for a Law Lecture; written about July 1, 1850

by David Mann, LS, Reprinted from *The Cornerpost*, Vermont, March 2012

I am not an accomplished lawyer. I find quite as much material for a lecture in those points wherein I have failed, as in those wherein I have been moderately successful. The leading rule for the lawyer, as for the man of every other calling, is diligence. Leave nothing for to-morrow which can be done to-day. Never let your correspondence fall behind. Whatever piece of business you have in hand, before stopping, do all the labor pertaining to it which can then be done. When you bring a common-law suit, if you have the facts for doing so, write the declaration at once. If a law point be involved, examine the books, and note the authority you rely on upon the declaration itself, where you are sure to find it when wanted. The same of defenses and pleas. In business not likely to be litigated, -- ordinary collection cases, foreclosures, partitions, and the like, -- make all examinations of titles, and note them, and even draft orders and decrees in advance. This course has a triple advantage; it avoids omissions and neglect, saves your labor when once done, performs the labor out of court when you have leisure, rather than in court when you have not. Extemporaneous speaking should be practised and cultivated. It is the lawyer's avenue to the public. However able and faithful he may be in other respects, people are slow to bring him business if he cannot make a speech. And yet there is not a more fatal error to young lawyers than relying too much on speech-making. If any one, upon his rare powers of speaking, shall claim an exemption from the drudgery of the law, his case is a failure in advance.



Discourage litigation. Persuade your neighbors to compromise whenever you can. Point out to them how the nominal winner is often a real loser -- in fees, expenses, and waste of time. As a peacemaker the lawyer has a superior opportunity of being a good man. There will still be business enough.

Never stir up litigation. A worse man can scarcely be found than one who does this. Who can be more nearly a fiend than he who habitually overhauls the register of deeds in search of defects in titles, whereon to stir up strife, and put money in his pocket? A moral tone ought to be infused into the profession which should drive such men out of it.

The matter of fees is important, far beyond the mere question of bread and butter involved. Properly attended to, fuller justice is done to both lawyer and client. An exorbitant fee should never be claimed. As a general rule never take your whole fee in advance, nor any more than a small retainer. When fully paid beforehand, you are more than a common mortal if you can feel the same interest in the case, as if something was still in prospect for you, as well as for your client. And when you lack interest in the case the job will very likely lack skill and diligence in the performance. Settle the amount of fee and take a note in advance. Then you will feel that you are working for something, and you are sure to do your work faithfully and well. Never sell a fee note -- at least not before the consideration service is performed. It leads to negligence and dishonesty -- negligence by losing interest in the case, and dishonesty in refusing to refund when you have allowed the consideration to fail.

There is a vague popular belief that lawyers are necessarily dishonest. I say vague, because when we consider to what extent confidence and honors are reposed in and conferred upon lawyers by the people, it appears improbable that their impression of dishonesty is very distinct and vivid. Yet the impression is common, almost universal. Let no young man choosing the law for a calling for a moment yield to the popular belief -resolve to be honest at all events; and if in your own judgment you cannot be an honest lawyer, resolve to be honest without being a lawyer. Choose some other occupation, rather than one in the choosing of which you do, in advance, consent to be a knave.

Comment: Although this is an address that Lincoln prepared for attorneys, / believe much of the sentiment is relevant to all technical consultants, / like to believe that Lincoln's experiences as a surveyor must have had some influence on the content of this essay Ed Rogers

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Surveying's Hidden Dangers

by Robert Fredricks, PLS, Reprinted from *California Surveyors*, Spring 2012

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

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

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

Chris and the instrument person, Tim Hughes, were on the opposite side of the highway when they heard screaming. From their instrument set-up point they could not see the heavy oak-covered area Neal was working in. They keyed the microphones on their hand held radios and called to Neal. They weren't even sure who was screaming. The voice that came back on the radio could not be understood. Neal had been able to key his mic while lying on the ground.

It was clear he needed help. Tim was the first to get to Neal and immediately saw he was in bad shape. Tim took off his coat and vest and covered Neal and began to look for signs of shock. He checked for injuries and saw burns on Neal's arm. Chris called 911. Later Neal would tell us that Tim's confident, assuring voice had a strong calming effect. Neal had been electrocuted and then thrown down a hill. The paramedics arrived within minutes of Chris' call.

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

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

Because of his early release, I changed direction and went to Watsonville to sit down with the crew and see how they were doing. The whole way while driving to Watsonville I looked at the power lines, they were everywhere. Hidden and standing out, a mixture of so many lines, something you just stop noticing. They camouflage in life's scenery to where they almost don't exist. We called for a "stand down" that day. I looked at all the pictures again and we talked about what we could have done differently. It was clear what had happened. Neal had raised the rod through the heavy brush so it could be seen from the instrument. Something a lot of us have done hundreds of times. This time the rod came in contract with a 12KV power line. The rod stayed in contact and RG. & E. had to cut power to get the rod off the line. Neal was lucky to be alive.

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

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

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