Missouri Surveyor

A Quarterly Publication of the
Missouri Society of Professional Surveyors

Jefferson City, Missouri June 2011

MISSOURI SURVEYOR

CALENDAR OF EVENTS

2011-2012

July 8-9, 2011
Board Meeting, Golf Tournament and Minimum Standards Workshop
Lodge of Four Seasons
Lake Ozark, MO

October 13-15, 2011
54th Annual Meeting and Convention
University Plaza Hotel
Springfield, MO

May 11-12, 2012
Spring Workshop
Lodge of Four Seasons
Lake Ozark, MO

July 14, 2012
Minimum Standards Workshop
Lodge of Four Seasons
Lake Ozark, MO

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

John Alan Holleck, Editor

Notes from the Editor's Desk

John Alan Holleck

Here we are on the cusp of another summer with a slight upturn in the economy. I hope everyone has weathered the situation and kept their heads above water. I myself have been somewhat lethargic during this period, which seems attached to the economy and my physical condition. I am not progressing in my fitness—regressing is more to the point—spurred on by depression about the quality of life. This is further exacerbated by my thinking that the *Missouri Surveyor* is not maintaining the high quality that Sandy and I strive to maintain. Let me know what you think as our readership.

Well, enough of me and my problems on to the June issue. As is the typical format, page two is the Editor's Notes followed on page 3 by the President's Message from Mark Nolte. This is followed by a longish article by an MSPS favorite Knud Hermansen, entitled "When is a Rod not 16.5 Feet? (More Times than Not)." The article includes many illustrations to go with the salient points of his argument. Chris Wickern follows with the first of a series of articles involving the "Grand Old Men" of Missouri surveying. He begins with "James S. Reed, Missouri LS 98." Chris is again on deck with "The Survey Mafia." Read the piece to determine who the mafia is. Next is Dr. Joseph Paiva commenting on a rather topical subject: the potential to "Keep GPS from Disappearing." It seems that the Federal Government, in an attempt to help the citizens, may actually be hurting them. The center section is devoted to an advertisement for the revamped "Professional Surveyor's Review Course." Long time sponsor Missouri S & T (formally the University of Missouri-Rolla) dropped out and MSPS has accepted the new sponsorship.

The second half of the June issue opens with "The Right-of-Way Acquisition Process" by lawyer Teri Kahlen from California. She uses her twenty-five years of experience to discuss an interesting subject. The Missouri Association of County Surveyors follow with information about their sponsorship of a workshop, entitled "Missouri's Recording History and French/Spanish Land Grants, Concessions and US Surveys." Gary John Bockman gives us his take on "What Do Principals of Land Surveying Really Mean?" Next is an "Open Letter" concerning the Surveyor's Museum in Springfield, Illinois. Its author—Marc Anderson—writes with passion about the neglected museum. Carol Clark and Liza Boswell, Georgia Trial Attorneys, offer the last major article entitled "What to Do When the Subpoena Comes." They advise not panicking and contacting an attorney among other things. Happy reading to one and all, see you in September.

THE MISSOURI SURVEYOR

Published quarterly by the
Missouri Society of Professional Surveyors

OFFICERS

Mark W. Nolte ..... President
Joe Carrow ..... President-Elect
Sharon Herman ..... Vice President
Robert L. Ubben ..... Secretary-Treasurer
Sandra C. Boeckman Executive Director
Ralph L. Riggs Immediate Past President

DIRECTORS

Ronald E. Kliethermes
Adam Teale
Paul G. Dopuch
Bryan Ferguson
Stan L. Emerick
Jim Matthis III

ADVERTISING RATES

	4 issues	1 issue
Full Page	650.00	200.00
Half Page (horizontal or vertical)	400.00	150.00
Quarter Page	250.00	100.00
Professional Card	50.00	N/A

COPY DEADLINE

March Issue — February 1
June Issue — May 1
September Issue — August 1
December Issue — November 1

EDITOR

John Alan Holleck
8510 E. 59th St.
Kansas City, MO 64129
Phone or FAX (816) 353-1782
E-mail: editor@missourisurveyor.org

PUBLISHER

Sandra Boeckman
P.O. Box 1342
Jefferson City, MO 65102
(573) 635-9446 FAX (573) 635-7823
E-mail: msps@missourisurveyor.org

President's Message

Mark Nolte, PLS

I write to you at the close of the Spring Legislative Session. As I am sure that you have read by now, many of our issues before the Legislature were passed and awaiting the signature of the Governor. Those include the lien rights and statute of limitations. The other important bill that we were pushing for was SB368 which would move the Land Survey Program from the Dept. of Natural Resources to the Dept. of Agriculture. This bill did not make it to committee, but by going through the motions, we now have a means of communicating and negotiating with the DNR over the summer of 2011 to resolve our differences. Senator Bill Stouffer (Napton, MO) has given us assurances that if the meetings between us and DNR are not fruitful, he will pre-file the same legislation and assure its passage in the next legislative session. Senator Stouffer has proven to be a good ally of Land Surveyors in the State of Missouri and I would appreciate that you send him a note of thanks. All in all, we were very successful. I want to thank all that took the time to communicate with your elected officials about all of these issues. It did make a difference.

One accomplishment that needs mention is that the DNR has given the go ahead to promulgate the cadastral mapping standards. We have been waiting for some time for this approval to start. Stakeholder meetings will be scheduled for this summer.

As I read over past President Ralph Riggs column from summer 2010, he pines for a good economic season to return to the mid-west. One year later, I pine for that same return. These economic times have caused us all to re-think how we do business and to reshape our business model. Sometimes good things can come out of bad times. I hope you all are able to hang on to see an economic recovery. The flooding in the southern parts of the State only adds insult to injury.

In closing, I want to thank all that have been a part of the success of MSPS in the year 2011. Many of you have contacted politicians and taken your time to serve on committees to move our issues forward. When asked, please agree to serve.

The Annual Meeting plans continue to take shape. Besides the off-site BBQ that is planned at the American Legion, I look forward to "Surveyors Got Talent". I am hopeful that the Soggy Bottom Boys from SE Missouri will provide an entry. As I understand, any "family friendly" talent entry is acceptable.

Cover: The 2011 Spring Workshop was attended by approximately 180 people with the main topic of discussion for the two-day conference of Interpreting the BLM Manual and sectional breakdown. Our speakers included Bob Shotts, Ralph Riggs and Robert Ross. Notably in the second row you will see our friend and past president Norman Brown with his wife Roberta. Norman added colorful commentary and insight for the entire meeting and we thank him for that. If you did not attend, you missed a good one! Thanks also to our speakers Shotts, Ross and especially Ralph Riggs who was drafted two weeks before the meeting to participate when another speaker had to drop out. We sincerely appreciate your efforts.

When Is a Rod Not 16.5 Feet?[1]

(More times than not)

Knud E. Hermansen, Ph.D., P.L.S., P.E., Esq.[2]

> The science of geometry and mathematics is exact. The infinite depths of stellar space are measured with such exact nicety that the position of stars and planets can be calculated to the fraction of a second of time. . . . How can it be that in the ascertainment of one line of so small an area, bounded by four lines only, a difference of from 8 to 24 feet arises? It is evident that the methods pursued, and not a defective science, have brought about the different results, different maps. *Warren v. Boggs,* 90 W.Va. 329, 332, 111 S.E. 331 (1922)

As experienced title attorneys and paralegals know, measurements along the same boundary vary between old and new surveys. At first impression there does not seem to be a logical reason for the sometimes large disparity between the measurements found in the deed and the modern surveyor's measurements. Consequently, litigators and the surveyor's client have the impression that the surveyor is at worst incompetent or at best negligent in surveying the historical boundaries -- adding or taking away land. The fact is that most times differences in the measurements do not reflect any change in boundary location or the addition or loss of land. Variations between old and new measurements are in fact common and should raise questions only if there were no differences.[3] Nevertheless, clients and litigation involving property boundaries frequently require a rational explanation to help explain the difference between the measurements cited in the records and more recent measurements.

> The science of mathematics is exact, but the different results reached in its application by different surveyors, is sometimes startling to the layman, when applied to what appears to be an ordinary survey." *Zirkle v. Three Forks Coal Company,* 103 W.Va. 614, 626, 138 S.E. 371 (1927) quoted from, *Warren v. Boggs,* 90 W.Va. 330 (1922)

> The original surveys of lands in the older States of the American Union, were exceedingly deficient in precision. This arose from two principal causes; the small value of land at the period of these surveys, and the want of skill in the surveyors. The effect at the present day is frequent dissatisfaction and litigation. Lots sometimes contain more acres than they were sold for, and sometimes less. Lines which are straight in the deed, and on the map, are found to be crooked on the ground. The recorded surveys of two adjoining farms often make one overlap the other, or leave a gore between them. The most difficult and delicate duty of the land-surveyor, is to run out the old boundary lines.... Gillespie LL.D., Civ. Eng., W.M. Treatise on Land-Surveying Comprising The Theory Developed from Five Elementary Principles; and The Practice with the Chain Alone, The Compass, The Transit, The Theodolite, The Plane Table, & c.: D. Appleton and Company, New York (1881)

To comprehend the basis for the difference, knowledge of the surveyor's duty and some historical information is required. The surveyor's duty in regard to surveying historical boundaries is often described as "following in the footsteps of the original surveyor."[4] Unfortunately, searching for footsteps involves searching for recollections, markings, monuments, and records that typically range in age from 50 to 300 years old. The intervening time has taken its toll on this evidence through decay, fire, flooding, construction, unintentional destruction, deceit, ignorance, and the unavailability or incompetency of reliable witnesses, to name a few.[5]

> [B]ut old surveys are not to be so tested. Most perfect in the beginning they are constantly undergoing change and decay, until by wind, fire, rottenness, and the acts and frauds of men, their evidences lie only in memory and hearsay." *Kennedy v. Lubold,* 88 Pa. 246 (1878)

> Monuments referred to in deeds are often perishable; as trees, wooden buildings, or fences; or slight and temporary; as a stake, or a stake and a few loose stones, intended to be supplied by something of a more permanent character. They serve to point out at the time, to the parties in interest, the bounds of the land conveyed. After these monuments are gone, and such a period of time has elapsed, that no one can be found who remembers to have seen them, or can testify as to their location; uniform continued occupancy, by buildings, fences or other equivalent indications of ownership is evidence that the land was located according to the original monuments. These monuments perish; and time sweeps away those who could point out where they stood...." *Cutts v. King,* 5 Me. 482, 487 (1829)

To further compound the problem, preventative or curative actions were prevented through ignorance, denial, or the seemingly prohibitive costs associated with surveying. As a result, the deed descriptions so often copied for one conveyance to the next are seldom as reliable or unpretentious as reliant parties would hope. The following is a brief explanation for some of the many errors and inaccuracies in older measurements.

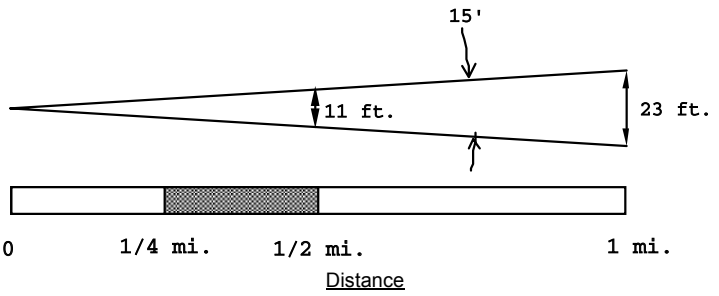
1 An edited version of this article appeared in ***Probate and Property*** (Vol. 6, No. 5, p. 8) Sep.-Oct. 92.

2 Knud Hermansen has a Ph.D. in civil engineering from the Pennsylvania State University and a J.D. from West Virginia University. Currently, he practices law, surveying, and engineering in Old Town, Maine and is an associate professor in civil engineering technology and surveying engineering at the University of Maine.

3 ***Western Mining & Manufacturing Company v. Peytona Cannel Coal Company,*** 8 W.Va. 406, 431 (1875)

4 ***Rivers v. Lozeau,*** 539 So.2d 1147 (Fla: 1989) While the concept has always been applied, the words that so aptly describe the surveyor's charge are said to have first appeared in a talk titled: "The Judicial Functions of Surveyors," by Chief Justice Cooley of the Michigan Supreme Court, read before the Michigan Association of Engineers and Surveyors.

5 ***Ulman v. Clark,*** 100 F. 180, 187 (W.V. 1900), ***Northumberland Coal Company v. Clement,*** 95 Pa. 126 (1880), ***Kennedy v. Lubold,*** 88 Pa. 246 (1878), ***Ralston v. Groff,*** 55 Pa. 276 (1867), and ***Cutts v. King,*** 5 Me. 482, 487 (1829)



Angular Uncertainty	16,500 ft. (1000 rods)	5,280 ft.	1,650 ft. (100 rods)	1,000 ft.	500 ft.	165 ft. (10 rods)
10∞	2887.1	923.9	288.7	175.0	87.5	28.9
1∞	288.0	92.2	28.8	**17.5****	8.7	2.9
30'	144.0	46.1	14.4	8.7	4.4	1.4
15'	72.0	**23.0***	7.2	4.4	2.2	0.7
1'	4.8	1.5	0.5	0.3	0.1	0.0
30"	2.4	0.8	0.2	0.1	0.1	0.0
15"	1.2	0.4	0.1	0.1	0.0	0.0
1"	0.1	0.0	0.0	0.0	0.0	0.0

Figure 1
The error caused by a 15 minute deviation in direction is shown by the figure. A 15 minute deviation in direction results in an error of 23 feet per mile.* Similarly, a 1 degree deviation in 1000 feet results in an error of 17.5 feet.**

Equipment Precision

The equipment used during the early surveys was not as refined or precise as modern survey equipment.[6] The typical equipment used in early land surveys consisted of a compass and chain. In some rural areas this equipment continued to be employed up into the 1960's.[7] The typical compass and chain[8] was seldom able to obtain measurements better than the nearest 1/4 degree (15 minutes) in direction and nearest link (7.92 inches) in distance.[9]

The typical compass did not have magnification and only a rudimentary method to measure the slope (if at all). The limitations of the compass were well known among the early surveyors and members of the Bar.[10] The magnetized needle frequently lost its magnetism or was subject to changes in the magnetic pole or variances caused by electric storms, the Aurora Borealis, and nearby magnetic attractions (local attractions).[11] In some cases, metal shavings or impurities were found to reside in the brass compass housing that drew the needle off along certain directions.[12]

The chain, the other piece of ancient survey equipment, was heavy and unwieldy. It was difficult to suspend without introducing considerable sag. Links soon stretched, became bent, clogged with debris, or kinked adding to the uncertainty of measurements.[13]

The adoption of the vernier transit and much lighter steel tape by many surveyors in the late 1800's and early 1900's allowed practitioners to measure directions to the nearest minute and distances to the nearest 1/100th of a foot, every 100 feet. (Compare this to modern equipment which can consistently measure angles to the nearest second and a distance [as far as visibility permits] to the nearest hundredth of a foot. Using the newest equipment, satellite receivers, visibility between stations is no longer a factor.)

(continued on page 6)

6 *Winding Gulf Colliery Co. v. Campbell,* 72 W.Va. 449, 467-468 (1913)
7 In fact, it would not be unusual to see this method employed at the present time for some large, rural woodland parcels.
8 "The ordinary surveyor's chain is sixty-six feet, or four poles long, composed of one hundred links, each connected to the other by two rings, and furnished with tally marks at the end of every ten links." W & L.E., A Manual of the Principal Instruments Used in American Engineering and Surveying, W & L.E. Gurley, Troy, N.Y. (1878) p. 141
9 A "finer cut" was impractical since traverse tables were generally limited to the nearest 15 minutes. *The Theodolite, The Plane Table, & c.*: D. Appleton and Company, New York (1881), Gurley, W & L.E., *A Manual of the Principal Instruments Used in American Engineering and Surveying,* W & L.E. Gurley, Troy, N.Y. (1878)
10 Lodge v. Barnett, 46 Pa. 477 (1864), Hagey v. Detweiler, 35 Pa. 409 (1860), Lodge v. Barnett, 46 Pa. 477 (1864), Ralston v. Groff, 55 Pa. 276 (1867), and Blasdell v. Bissell, 6 Pa. 258 (1847)
11 Variations of the Magnetic Needle, Report of the Commissioner on the Variations of the Magnetic Needle, State of Maine, 1866.
12 Cox v. Couch, 8 Pa. 147 (1848), Gurley, W & L.E., A Manual of the Principal Instruments Used in American Engineering and Surveying, W & L.E. Gurley, Troy, N.Y. (1878)
13 Lodge v. Barnett, 46 Pa. 477 (1864), Heaton v. Hodges, 14 Me. 66 (1836), W & L.E., A Manual of the Principal Instruments Used in American Engineering and Surveying, W & L.E. Gurley, Troy, N.Y. (1878), "If a chain's long links are held together by three rings, which was common enough, then there are eight wearing surfaces per link or 800 wearing surfaces per chain. If each surface wore 0.01 inch, the chain would be eight inches longer." Tascano, Patrick "Gunter's Chain" Surveying and Land Information Systems, Vol. 51, No. 3, p 155 (September 1991)

Practitioners

The training and skill of some past practitioners left much to be desired.[14] Rigorous training and formal education for surveyors were haphazard or nonexistent. One or more surveyors seemed to practice in every locale where their only attributes seem to have been a sense of direction, hemp rope or consistent pace, and a passable talent to draw lines. Their practice was questionable and would amount to fraud by today's standards.[15]

Licensing, which was intended to remove the charlatans, was not mandatory in many states until the later half of the 1900s.[16] Even after licensing of surveyors, many licensing requirements did not require a test or proof of skills before issuing a license to practice.

Assuming the surveyor had the minimum skill and knowledge, the help the surveyor employed seldom did.[17] The surveyor arriving at the site with a trained or semi-trained field crew was almost unheard of in the past. Help was more often then not the client and men hired from the local population. A survey crew in the early days was supervised by the surveyor or a trusted deputy who generally operated the compass or transit. The remainder of the survey crew (on a large survey) consisted of two chainmen hired from among the local population, two or more axemen to cut and mark line, a cook, and a cook's helper to clean utensils and help pack supplies. Training of the chainmen was rudimentary at best and left much to be desired in the resulting accuracy of the distances.[18]

> [I]t was not error for the court to call the attention of the jury to the fact that defendant's measurements were made by a 'baker attended by a tinsmith under the supervision of a lawyer.' This is not such departure from judicial gravity as to call for a reversal. *Omenstetter v. Kemper,* 6 Pa.Super. 309 (1898)

Terrain and Site Conditions

Present day practitioners and landowners sometimes fail to remember what the terrain and site conditions were like at the time of the early surveys. Virgin timber several feet in diameter, both standing and fallen, presented formidable obstacles to thwart the surveyor in measuring a straight line through the forest.[19] Hostile Indians,[20] foreign powers seeking control of the wilderness, squatters not interested in paper title, wild animals, disease, and lack of shelter and nutritious food took their toll. Under the circumstances, surveyors were more concerned with their surroundings and well being than their measurements.

> The difficulty of making an accurate survey by courses and distances, under the conditions obtaining in that country at the time this survey was made, were very great. It was a rough heavily timbered country, making it hard to see between stations, distant from each other, and slow and irksome to chain directly from station to station; but it was comparatively easy to select accessible points for corners, and practically guess at the courses and distances. To this we must add the circumstances that there was then a mad rush of speculators into this region for land at two cents an acre, and consequent pressure upon the surveyors, well calculated to induce resort to the easiest and quickest method of achieving results." State v. King, 64 W.Va. 546, 579-580 (1908)

> [I]n the wilderness in which those early surveys were made, it was practically impossible to avoid mistakes. Winding Gulf Colliery Co. v. Campbell, 72 W.Va. 449, 471 (1913)

Even after the virgin timber was removed and the land settled, the surveyor's ability to measure accurately was hampered by dense growth brought on by the now abundant sunlight and rich soil on what had once been shaded forest floor. Blazes once made to mark the boundaries were lost when the timber was removed or decayed. The present twenty minute drive to the courthouse took a day or more in the past on roads were mere muddy paths or covered with snow or debris. As a result, records were not always obtained and the previous measurements for the property and measurements for the adjoining property were not always compared before recording a new description or map.

Land Values

Many attorneys continue to use the same description written a hundred years ago. This practice not only fails to uncover latent problems but ignores the law of economics. The same parcel worth several hundred thousand dollars today was frequently purchased for pennies when the last survey was performed.[21] In the past, the cost of having the land surveyed may have been more then the price to purchase the land. Under these conditions, speed was more important than fastidious measurements.[22] The carelessness that caused the omission or overlap of a few acres at ten cents an acre was not worth the twenty five cents required

(continued on page 8)

14 Many practitioners will candidly admit that the early surveyors in George Washington's time were of the highest caliber. The skill and knowledge of the average surveyor subsequently went downhill. The trend appeared to reverse at some point midway in this century. See e.g. *Mahon v. Duncan,* 13 Pa. 459 (1850)
15 *Blain v. Woods,* 145 W.Va. 297, 306, 115 S.E.2d 88 (1960)
16 The first licensing act was attributed to Wyoming in 1907. Biship, L.C. *Surveying in Wyoming During Territorial Days and Now* (1957)
17 *Ralston v. Groff,* 55 Pa. 276 (1867), *Cox v. Couch,* 8 Pa. 147 (1848), and *Blasdell v. Bissell,* 6 Pa. 258 (1847)
18 *Reilly v. Mountain Coal Co.,* 204 Pa. 270, 54 A. 29 (1903), *Omenstetter v. Kemper,* 6 Pa.Super. 309 (1898), *Fisher v. Kaufman,* 170 Pa. St. 444, 33 A. 137 (1895)
19 *Gwynn v. Schwartz,* 32 W.Va. 487, 492-493 (1889)
20 *Ulman v. Clark,* 100 F. 180, 183 (W.V. 1900)
21 *State v. King,* 64 W.Va. 546, 579-580 (1908) and Simmons Creek Coal Company v. Doran, 142 U.S. 417, 432 (1891)
22 *State v. King,* 64 W.Va. 546, 579-580 (1908) and Ralston v. Groff, 55 Pa. 276 (1867)

to resurvey and correct the error. The landowner purchasing 400 acres was not concerned with overlaps or a deficiency of a few acres.[23] Needless to say, a deviation of a rod or two on a measurement would not have caused any concern whatsoever.

Procedures

The procedures employed by early surveyors leave much to be desired by today's standards. Old survey texts are filled with suggestions that were generally unknown or ignored by the early survey practitioner.[24] Surveyors were cautioned that frequent use of the chain would inevitably cause the links to stretch and eventually require the surveyor to remove a link or two. The surveyor willing to achieve measurements accurate to a few feet was advised to avoid measurements using the compass at certain times since the compass needle tended to vary by a few minutes during these periods of the day.[25] Deviations caused by the shift in magnetic north over time and location were ignored even though the error amounted to several degrees in some cases.[26] Instructions packaged with new compasses were quick to warn the surveyor to hold the chain away from the compass, periodically sharpen and adjust the spindle, and relieve the static electricity that built up in the glass.[27]

> When, however, the glass becomes electric, the fluid may be removed by breathing upon it, or touching different parts of its surface with the moistened finger. An ignorance of this apparently trifling matter has caused many errors and perplexities in the practice of the inexperienced surveyor. Gurley, W & L.E., *A Manual of the Principal Instruments Used in American Engineering and Surveying,* W & L.E. Gurley, Troy, N.Y. (1878)

Problems were so prevalent and generally ignored during surveys conducted in the early and mid-1800's that legislation was passed in many states requiring surveyors to periodically check their chain against a known line and note the deviation of their compass from a known meridian. Even the otherwise cautious surveyor was sometimes unaware of problems

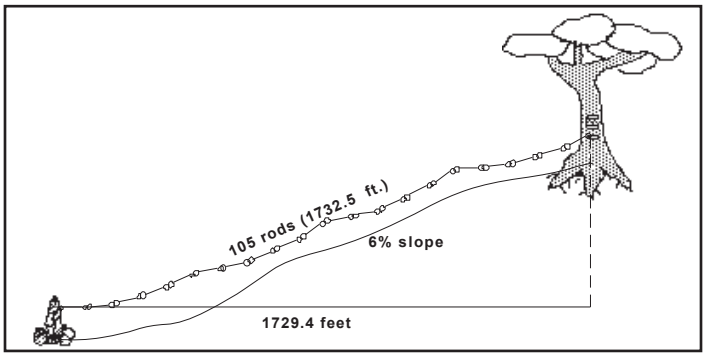


Figure 2
The error resulting from measuring on the slope rather than a horizontal distance is shown in the above figure. At a 6% slope and distance of 105 rods, a three foot error will occur. The steeper the slope or the longer the distance, the greater the error.

caused by iron ore deposits or other localized attractions sufficient to pull the needle off during a reading.

Ignorance of proper procedures or the speed necessary to survey large tracts in a short time resulted in paper surveys (i.e. protracted lines)[28] or surveyors pacing, using stadia,[29] or slope chaining rather than making time consuming horizontal measurements.[30]

In some cases distances were estimated and directions approximated.[31] In other cases haphazard corrections such as adding "one rod to each score" for slope measurements were applied in an attempt to compensate for crude practices.[32]

> [I]t appeared, that at the time this survey was made, an excess of ten or twelve per cent had been allowed by the surveyors in other parts of the lines of said township.... *Heaton v. Hodges,* 14 Me. 66, 67 (1836)

> But the experience of the Courts has shown, that excess of admeasurement is so uniformly indicated in surveys of that early period, the Court is not prepared to say, that the excess,

(continued on page 10)

23 *Collins v. Barclay,* 7 Pa. 67 (1847)
24 See e.g., Hosmer, George L, & Charles B. Breed, *The Principles and Practice of Surveying,* 1st Ed., John Wiley & Sons, New York (1906), Gillespie LL.D., Civ. Eng., W.M. *Treatise on Land-Surveying Comprising The Theory Developed from Five Elementary Principles; and The Practice with the Chain Alone, The Compass, The Transit, The Theodolite, The Plane Table, & c.*: D. Appleton and Company, New York (1881), Gurley, W & L.E., *A Manual of the Principal Instruments Used in American Engineering and Surveying,* W & L.E. Gurley, Troy, N.Y. (1878)
25 "[O]wing to the influence of the sun, which, in summer, will cause the need to vary from ten to fifteen minutes in a few hours, when exposed to its fullest influence." Gurley, W & L.E., *A Manual of the Principal Instruments Used in American Engineering and Surveying,* W & L.E. Gurley, Troy, N.Y. (1878) p. 57 The diurnal change for Eastport Maine was found to average around 15 minutes. *Variations of the Magnetic Needle, Report of the Commissioner on the Variations of the Magnetic Needle,* State of Maine, p. 17, 1866.
26 *Hagey v. Detweiler,* 35 Pa. 409 (1860)
27 Gurley, W & L.E., *A Manual of the Principal Instruments Used in American Engineering and Surveying,* W & L.E. Gurley, Troy, N.Y. (1878)
28 *West Virginia Pulp & Paper Company v. Dodrill,* 221 F. 780, 785 (N.D.W.Va. 1915), *Ruffner's Heirs v. Hill,* 31 W.Va. 428, 432 (1888), *Packer v. Schrader Mining & Manufacturing Co.,* 97 Pa. 379 (1881), and *Fisher v. Kaufman,* 170 Pa. St. 444, 33 A. 137 (1895)
29 *Keta Gas & Oil Co. v. Jents,* 380 Pa. 217, 110 A.2d 369 (1955)
30 "[A]ll of the measurements were made in slope feet rather than horizontal feet...." *Vandetta v. Yanero,* 157 W.Va. 220, 222, 200 S.E.2d 674 (1973), *Keta Gas & Oil Co. v. Jents,* 380 Pa. 217, 110 A.2d 369 (1955), *Cox v. Couch,* 8 Pa. 147 (1848) and *Blasdell v. Bissell,* 6 Pa. 258 (1847)
31 *State v. King,* 64 W.Va. 546, 579-580 (1908) and *Fisher v. Kaufman,* 170 Pa. St. 444, 33 A. 137 (1895)
32 Tascano, Patrick "Gunter's Chain" *Surveying and Land Information Systems,* Vol. 51, No. 3, p 158 (September 1991), *Dunn v. Hodges,* 21 me. 76 (1842), *Otis v. Moulton,* 20 Me. 205 (1841), *Machias v. Whitney,* 16 Me. 343 (1839), and *Heaton v. Hodges,* 14 Me. 66 (1836)

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

> which was proved in this case, was evidence, which would warrant the jury in drawing an inference of fraud. *Machias v. Whitney,* 16 Me. 343, 348 (1839)

The practice of actually running the boundary rather than traversing around the property forced many early surveyors to measure across obstacles or estimate the breadth of the obstacle rather than go around it. As a result, estimations were frequent. At other times chains were laid on top of obstacles or the chain curved around the obstacle rather than measuring the straight line distance between them.

Area which is a product of the direction and distances, can be no better than the worst measurement. As a result, the area which is frequently of most concern to the layman is subject to the widest variations and exaggeration.[33]

> The acre of that day, as is and was well known, in the locations made in this State, was larger than the exact acre. *Bussey v. Grant,* 20 Me. 281, 286 (1841)

Blunders

In the past, just as today, surveyors were prone to make mistakes. Early cases document many blunders that were discovered sometime after the survey.[34] It was not uncommon for the surveyor to lose their tally (the count of the number of chain lengths), transpose numbers, deviate from a straight line, misread the compass and chain, or make a miscalculation.[35]

> [O]ld surveys were often inaccurate; and mistakes often made, in copying their descriptions into the patents; leaving out lines and putting north for south, and east for west; and in copying those descriptions into subsequent conveyances.... *Winding Gulf Colliery Co. v. Campbell,* 72 W.Va. 449, 467-468 (1913)

In some ways, errors were more likely to occur in the past than today. The literacy of the population in the early days led to many errors traceable to poor grammar, lack of formal education, and spelling.[36]

> The descriptions in deeds are usually prepared by surveyors who compose the calls with reference to the lines as they exist on the ground. Surveyors are not informed of or concerned with the fastidious refinement in the use of language favored in some courts." MacCorkle v. City of Charleston, 105 W.Va. 395, 402, 142 S.E. 841 (1928)

> Remoteness, land values, habits and education of the people, and other things, did not tend to promote accuracy." *State v. Hicks,* 76 W.Va. 508, 510-511 (1915)

Other errors were a product of the time. Many of today's practitioners will no doubt attest to the fact that the invention of the typewriter was a welcome invention and prevented numerous errors previously caused by interpreting poor handwriting, smudges, and faded ink. The pencil and paper taken for granted by the modern practitioner and used to record information and jog the memory were rare and quite valuable in the past. The ink bottle and quill pen used by the early practitioners was not easily used in the field. The early surveyor was attuned to using knots on a thong, notches on wood, or sticks in a pouch to keep track of measurements. The slide rule and calculator which has eased the burden of tedious calculations and removed the cause of many math errors was beyond comprehension at the time most surveys were performed. All calculations were done long hand.

Errors were more likely to occur in the past than today. The literacy of the population in the early days led to many errors traceable to poor grammar, lack of formal education, and spelling.

This article is a brief summary of the many sources of errors in old measurements. A particular locale or name of an early surveyor may offer more particular reasons for differences. The attorney or paralegal, no less than the surveyor, should keep these facts in mind especially when interpreting descriptions where directions are stated to the nearest degree or fraction of a degree and distances to the nearest rod or fraction of a rod.

> In closing this report, it may not be improper to call attention to the fact that the various litigations and disputes about boundaries, which our courts of justice are constantly called upon to decide, are most of them either directly or indirectly the result of the present loose and imperfect method of conducting land surveys. This evil is not, however, it must be acknowledged, confined exclusively to the surveyors. Many of our lawyers, who are entrusted with the drafting of instruments of conveyance, are often deficient in the knowledge requisite to render their descriptions of land correct and to place them beyond the possibility of a misconstruction. *Variations of the Magnetic Needle, Report of the Commissioner on the Variations of the Magnetic Needle,* State of Maine, p. 74, 1866.

33 *Western Mining & Manufacturing Company v. Peytona Cannel Coal Company,* 8 W.Va. 406, 437 (1875)
34 *Day v. Wood Lumber Co.,* 78 W.Va. 19, 22 (1916), *Holston v. Vaughan,* 74 W.Va. 558, 560, 82 S.E. 390 (1914), *Harman v. Alt,* W.Va., 71 S.E. 709 (1911), *Stewart v. Doak Brothers,* 58 W.Va. 172, 175-176 (1905), *Ulman v. Clark,* 100 F. 180, 189 (W.V. 1900), *Gwynn v. Schwartz,* 32 W.Va. 487, 495 (1889), *Ruffner's Heirs v. Hill,* 31 W.Va. 428, 437 (1888), *Western Mining & Manufacturing Company v. Peytona Cannel Coal Company,* 8 W.Va. 406, 418 (1875), *Machias v. Whitney,* 16 Me. 343 (1839), and *Heaton v. Hodges,* 14 Me. 66 (1836)
35 *Winding Gulf Colliery Co. v. Campbell,* 72 W.Va. 449, 467-468 (1913), *Ralston v. Groff,* 55 Pa. 276 (1867), and *Lodge v. Barnett,* 46 Pa. 477 (1864)
36 *MacCorkle v. City of Charleston,* 105 W.Va. 395, 402, 142 S.E. 841 (1928), *State v. Hicks,* 76 W.Va. 508, 510-511 (1915), and *Wing v. Wood,* 13 Me. 111 (1836)

James S. Reed, Missouri LS 98

Chris Wickern, PLS

James S. Reed, Missouri LS 98: Married, father of four, Grandfather of nine, and one Great Grandchild. Jim graduated from the University of Missouri with a Bachelor of Science Degree in Agricultural Engineering in 1955. Jim's education was interrupted by the conflict in Korea where he served as a Captain in the US Army, Corps of Engineers.

Mr. Reed "got his start" surveying as a laborer for the University. Fate would place Jim's assignment as a "laborer" in a crew gathering cadastral and design data for the University. This eventually led to his becoming licensed as a Registered Land Surveyor in 1955, the same year he graduated with his B.S. At the same time Jim was starting a new company and doing his best to provide for his young family. Engineering Surveys & Services now has offices in Columbia, Jefferson City, and Sedalia, and employs 48 Professionals and Technicians.

Mr. Reed was licensed the same year the licensing requirement became law. The corners of the US Public Land Survey System had deteriorated drastically, and this new requirement was enacted to protect the public by making the perpetuation of boundaries and land corners a professional determination.

He spoke of a developer coming into his office with a preliminary drawing for a development. If he would just "sign off" on it, then the project would be his. Here he was, a recently licensed Engineer and Surveyor, a new business with little work, trying to feed a young family, and all he had to do was to "play ball." He spoke to a trusted friend and businessman about this quandary. This gentleman only had an eighth grade education, but was self made with many business interests. He told Jim that he was at a cross roads. One path would lead to an immediate but temporary easing of personal problems, but it would also lead to a lasting reputation of one who finds a way to side step a problem or put the problem off and maybe address it at a later date. The other path would lead to a different kind of lasting reputation. The reputation of a well respected professional who solved his clients' problems.

> ***Instead of waiting for clients and potential clients to call and ask him to do enough to just "get them by," Jim got involved starting with his community.***

Jim made his decision. Instead of waiting for clients and potential clients to call and ask him to do enough to just "get them by," Jim got involved starting with his community. Mr. Reed has served on or chaired the City of Columbia's Building Code Board of Appeals, the Building Code Revision Committee, the Fire Code Board of Appeals, and all but one committee concerning sewer or water and light since 1957.

Providing a professional service to the client and community naturally led to personal involvement in the newly formed professional society. Jim Reed is a life member of MSPS, and was the President of the Missouri Association of Registered Land Surveyors when the Land Survey Authority was passed in June 1969. The LSA was the first such authority enacted in the nation and was designed to "preserve the rapidly disappearing U.S. Government boundary markers and store vital documents of previous land surveys made in Missouri." (ACSM Surveying & Mapping, September 1969) Mr. Reed elaborated on this need in a presentation to the Colorado Surveyors Association: "The federal government turned over all public land survey monuments and records to the State of Missouri and said, 'Here Missouri, the land system is now yours to maintain.' What Missouri did with this very important heritage is something I am ashamed to say . . . Missouri did absolutely nothing! A long, steady, continuing process of deterioration and destruction of our land system and its markings then began and proceeded for over 100 years. Nobody thought much about it, nobody really cared!

James S. Reed (continued)

Land was worth $1.00 an acre and 5, 10, 50, or 100 feet simply was not important enough to worry about. There was plenty of land for everyone. . . . [time passed] Land prices soared and surveying along with its related corners and monuments became more and more critical. Professionals in Missouri became aware of this increasing problem and as a result, in 1955 a law was enacted licensing registered land surveyors in the State of Missouri. . . . It soon became apparent that preservation of land corners and care of land records was a must if our land system was not to disintegrate completely."

All of us who use today's Land Survey Program owe a great debt of gratitude to Mr. Reed and the many others who worked tirelessly to create and enact this essential program.

Some of Jim Reed's other accomplishments are: tasked to administer the Comity examinations from the time comity was enacted through 1975; member of the State Licensing Board, and he served on or was the Chairman of many committees including the rewriting of Chapter 60, and Chapter 445. Mr. Reed's many accomplishments and dedication moved the Society to honor him as one of seven Honorary/Life/Special Members.

Jim's advice to the newly licensed is to remember you are a licensed professional. You, as the professional, are charged to fully research and provide a professional opinion. There simply are no short cuts when you are called to make a professional determination. If we were to quantify Mr. Reed's many accomplishments the equation would be: A desire to provide the best professional services + Community involvement + Professional involvement = A very great measure of success!

"Remember you are a licensed professional. You, as the professional, are charged to fully research and provide a professional opinion. There simply are no short cuts."

The Survey Mafia

Chris Wickern, PLS

There is a long history of retracement surveys performed to perpetuate original surveys. Unfortunately, there is no long record of how these surveys have been perpetuated. There was a time when recording was expected to be a part of a boundary survey. The Territory of Missouri granted survey authority to County Surveyors in 1814. Our first mandated requirements stated, "No survey or re-survey hereafter made by any person except the county surveyor, or his deputy, shall be considered as legal evidence in any court of law or equity within this territory—except such surveys as are made by authority of the United States or by mutual consent of the parties." The requirements went on to state, "He shall number his surveys progressively, and shall also file and preserve a copy of the calculation or each survey, endorsing thereon its respective number. A copy of any survey shall be furnished by the surveyor to any person requiring the same, on payment of the fees herein after directed."

Think about this for a moment. The importance of Surveying was considered and passed the year before the initial point of the Fifth Principal Meridian was established; the year before Tiffin's Instructions were issued our Territorial Government enacted survey requirements! Boundary surveys were to be performed under the authority contemplated by law through the County and Deputy Surveyors. Their Surveys were to be documented and copies made available to the public on demand. This was true when the County Surveyors started subdividing sections, and it is still true in our statutes today. Chapter 60 today states, "60.185. The county surveyor of every county or city shall . . . Keep a fair and correct record of all surveys made by himself and his deputies . . . and every such surveyor shall record in such book a plat of all surveys executed by him or his deputies . . . such books shall be kept at the county seat. . . . Deliver a copy of any plat of survey to any person requiring such a copy." County Courthouses hold many of these irreplaceable documents. The County Surveyors and their Deputies were the only Surveyors the State granted legal authority to perform Land Surveys. No authority was exercised over the practical surveyor until 1955.

As the land was settled the population grew and many corners were destroyed. We lost our way as a profession as untrained and untested people were commissioned to perform and were performing land surveys. These surveyors were not performing a function contemplated under the authority of law from 1814 to 1955. They were performing a service as an unregulated trade for nearly 150 years. Blacksmiths were a more closely regulated profession than practical surveyors were throughout most of this time. The records, maps, and practices of these practical surveyors grew and evolved. Practical surveyors were tradesmen. They were a result of public need and were not regulated. There were no requirements or standards imposed on their business. We are still using their evolved system *[the system given to us by the businessmen applying their trade],* and not that which was and is contemplated by law. Their surveys have always been considered proprietary, and were generally not made a part of the public record. This broke a public chain of evidence going back in time, and haunts the practicing Professional Surveyor today. It created the very conditions Justice Cooley spoke of in what we know as "Cooley's dictum," and greatly contributes to the "incalculable mischief" and "consternation" he spoke of. We are taught that our task is to "follow the footsteps" of the original surveyor. Those "footsteps" and the field evidence from the original survey have been and are fading with every passing day. Modern retracement must consider the original footsteps, but it must also consider how a corner has been relied on by the public over time. Subsequent surveys document how corners have been and are being perpetuated. Yet, these critical pieces of evidence Surveyors use to form a sound basis for their professional opinion are withheld from the public record.

Critical pieces of evidence Surveyors use to form a sound basis for their professional opinion are withheld from the public record.

We still suffer from those years when we lost our way, and in some ways, have yet to find our way back. Access to survey records is still "proprietary" and considered a "company asset." Vital survey records documenting changing evidence of a corners original location are not readily available. Today, Professional Land Surveyors are viewing record and field evidence and making a determination, and the records available are too often incomplete. Yes, we are to follow the footsteps of the original Surveyor, but we are also to restore the corner to its original position. Many corners are declared lost when in fact they are obliterated. One Surveyor evaluates the best *available* evidence, determines a corner is lost, applies appropriate rules, and reestablishes a monument at the "corner." Other surveyors have access to these *proprietary* documents. Armed with this additional documented evidence *not available* to others, they reach an entirely different conclusion.

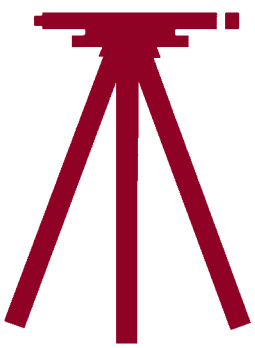
The result of this practice is not one of a profession dedicated to protecting the public, and seems to be contrary to

our stated core professional values. The Surveyor's Creed adopted by the Society in 1957 is something we administer to our new licensees at our annual convention, and it is good to remind ourselves of what it states from time to time. "I pledge: To engage only in honorable endeavor . . . To place service to others before personal profit, the honor of the land surveying profession before personal advantage and the public welfare above all other considerations." This fundamental and honorable pledge is echoed in our Code of State Regulations at 20 CSR 2030-2, "In the performance of professional services, licensees shall be cognizant that their primary responsibility is to the public welfare, and this shall not be compromised by any self-interest of the client or the licensee. . . . Licensees at all times shall recognize that their primary obligation is to protect the safety, health, property or welfare of the public." Our surveys are a part of and contribute to a stable land system. They must be available if we are to protect the public and fulfill our sole reason for licensure.

Many areas have companies with extensive records, and go to great lengths to keep this vital information private. It's considered their competitive edge. Yet, when discussing the need for this evidence for any subsequent Surveyor to form a professional opinion, they uniformly state it is made available to any Surveyor requesting the information. Well, which is it? Are the records their competitive edge, or are they always available to others? The practice has every potential to harm the public, violating our basic charge. [Consider the following words with the theme from the Godfather playing in your mind] Now we must pay homage to the private keeper of what had always been public knowledge. We must kiss the ring of the Survey Mafioso boss and ask for essential information to evaluate and form our professional opinion. The Don may or may not grant the request. Should the request be granted, you don't know if all the information was provided. Are we only looking at the records this "Family" decided was worthy of being kept? Was all the information made available, or was some withheld to lead you to "their approved" conclusion? After humbling yourself with hat in hand, you must travel and pay homage to the next syndicate.

OK, Mafia may be a bit extreme, and a more politically correct term would be more palatable. How about the term, Loyal Order of Secret Surveys? The public's LOSS is the surveyor's gain. If Surveyors are indeed licensed to "protect the public," then how can the public be protected if the evidence we document is not recorded and made a part of the public record? Why record deeds? Some state that recording would just add more government intrusion into the business of surveying. Isn't the government already in our business by requiring licensure on behalf of, and to protect, the public? If a surveyor is against recording, then shouldn't that surveyor be against licensing? Shouldn't surveying be made an unregulated (and unprofessional) practice? At best, this creates an unstable land system, and undermines the very reasons we exist as a profession. Recording has never been about an individual Surveyor's concern; it is about the profession and our charge to protect the public.

Ours is a time honored and ancient profession that dates from the surveyors of ancient Egypt; through the Geometer's of ancient Greece; the Agrimensors of the Roman Empire, and on to today's Professional Surveyor. All were regulated and granted authority. Our practice from the times of the ancients to today holds certain core principals in common. These principals teach us that which we do has and carries with it a legal and value impact on all those subject to the location of property boundary lines. No one parcel owner holds an interest that supersedes all others, just as no one surveyor holds information affecting others that belongs solely to them. To retain this critical documented evidence as private records which greatly impact the public is to not live by the very pledge we take upon affirming and receiving the privilege and title "Surveyor." If this profession accepts that public records may be retained as private and a form of professional property, we have lost our way as a profession. Moses led the Tribes of Israel through the desert for 40 years before returning home. The Biblical ancients were not left to wander forever; why is the contemporary surveyor left to do so? In our lands of plenty—plentiful in land evidence, monuments and records—Surveyors should no longer be left to wander. Instead of wandering, let's preserve, perpetuate and perform a truly professional service. Secrecy continues a legacy of professional disagreement which reflects poorly on all practitioners. *Open access* will reveal the foundation on which a stable land system is perpetuated. One in which surveyors may be seen as great stewards of our cadastre, not secret keepers. Over time, the simple act of recording will aide in restoring our professional credibility. In essence, it simply documents evidence, and changing evidence. It perpetuates the boundaries of real property and places it squarely in the public record for the publics' acceptance and reliance. It is an essential step in fulfilling our charge of protecting the public.



Take the Next Step Forward in High-Definition Surveying – or Risk Getting Left Behind

Surveyors are increasingly turning to the proven technology and software workflows that only Leica Geosystems can deliver. Why? Because more and more customers are demanding HDS™ measurement solutions in their project specifications.

As a result, many surveying companies equipped with HDS™ technology are – despite the recession – actually seeing their businesses grow. Thanks to HDS™, they are entering new markets... and handling precision measurement applications... they otherwise couldn't compete for.

Do you want your business to gain a competitive edge? With the latest HDS™ technology – the new Leica ScanStation C10 – you are investing not only in new technology, but also in the future of your company.

Don't risk being left behind!

By investing in the next generation of HDS™ technology now, you can save even more time and labor... maximize current staff activities... complete jobs better and faster... and submit more competitive bids for both your high-end jobs and daily routine surveys – while actually increasing your profit margins.

Doesn't it make sense to upgrade your technology to the next evolution from Leica Geosystems – the world leader in HDS™? Get your hands on the new Leica ScanStation C10 today, and you'll soon leave your competitors far behind.

FREE on-site demo and software

To arrange for a free on-site ScanStation C10 demo, go to **www.leica-geosystems.us/c10** or call **(925) 790-2374** today.

For more information, contact your local Leica Geosystems representative:
Josie Navarro ■ 925-790-2374 ■ josie.navarro@lgshds.com

www.leica-geosystems.us

- when it has to be **right**

Leica Geosystems

Keep GPS From Disappearing

Joseph Paiva, PLS, PE, PhD

The headline might sound sensationalistic, but the reality is that one of our federal regulatory agencies, in a fit of enthusiasm to extend broadband availability to more people, may be doing GPS in. Read on…

This is to inform you about the threat to GPS and to urge you to take action to prevent a possible reduction or disruption of GPS no matter what you use it for. LightSquared, a wholesale broadband provider to cell network companies has filed an application with the FCC that essentially repurposes a part of the radio spectrum. LightSquared is planning to build a network of transmitters, as much as 40,000, across this country to enable a much larger set of the population to have access to 4G class service. However those 40,000 towers don't cover all the rural areas of this country. So LightSquared is integrating these towers with an already authorized use that implements broadband in those areas using communications satellites. The satellite frequencies they will use will be right next to the block of the band in which GPS operates. So far, no problem as satellite communications frequencies are at power levels that are similar to those GPS uses.

The problem is when those ground based transmitters start working. Now, we will have the relatively weak signals from space for broadband access in rural areas in the same frequency band as the powerful transmitters on Earth for more densely populated areas. Some tests have shown that even though GPS and this broadband system will have distinctly different communications frequencies, that there is the likelihood of GPS signal reception on Earth being disrupted because of the ground-based towers. These tests show that on occasion, the ground based towers may have signal strengths that are *one billion* times the received strength of GPS signals.

This can create a signal-jamming problem similar to what we may experience when our radio picks up the much stronger signal of a different radio station than we are tuned to. This occurs because the intruding station's signal, though on a different frequency, is so strong that it "bleeds" over into our favorite stations frequency.

For some reason we don't understand, the Federal Communications Commission (FCC) has fast-tracked the LightSquared application and granted them a temporary waiver to begin implementing their plan. Due to protests from the private sector, notably the U.S. GPS Industry Council (USGIC), the FCC backtracked a bit and asked LightSquared to conduct a study to show that their use of the frequency band adjacent to GPS will not harm GPS users. This was like letting the fox guard the chicken house. More howls ensued. The USGIC (and perhaps others) are now part of the research study team with LightSquared.

Unfortunately, until recently, U.S. government agencies have been quiet about this application. Considering that the U.S. government designed, implemented and operates GPS, this is rather odd. However recently, assistant secretaries from the Departments of Transportation and Defense (the latter being the GPS operator) have filed statements of concern with the FCC (another federal agency). But private industry is not taking this lying down. They have formed a coalition to persuade the FCC that their conditional approval of LightSquared's application should not become permanent.

What can you do? Write the FCC and tell them how ridiculous their action is. Tell them that at least more unbiased research must be done. Tell them how and why GPS is important to you and your economic well-being. If you feel like it tell them how important GPS is to the economy. You can also sign up as an individual or as a corporation or association (or all three) as members of the coalition. To find out more about the coalition, sign up, get information on how to write the FCC, and to get the latest news on this issue, go to www.saveourgps.org. Please take action. The economic life you save may be your own!

Go to www.saveourgps.org and sign up your organization as a member of the coalition to persuade the FCC to not make the temporary waiver they have already granted permanent.

To write the FCC, send an email: fccinfo@fcc.gov

In the subject line, include:

Coalition to Save Our GPS, and

FCC File No. SAT-MOD-20101118-00239

For more information, check out articles on the subject at these links:

http://www.gpsworld.com/gnss-system/news/lightsquaredgps-interference-saga-wheels-grinding-11472?utm_source=GPS&utm_medium=email&utm_campaign=Survey-Scene_04_06_2011&utm_content=lightsquaredgps-interference-saga-wheels-grinding-11472

http://www.gpsworld.com/gnss-system/gps-modernization/news/coalition-save-gps-launched-wake-lightsquared-decision-11209?utm_source=GPS&utm_medium=email&utm_campaign=Survey-Scene_03_14_2011&utm_content=coalition-save-gps-launched-wake-lightsquared-decision-11209

http://www.gpsworld.com/gnss-system/news/gps-community-urged-contact-congress-regarding-fcc-proposal-10962?utm_source=GPS&utm_medium=email&utm_campaign=LBS-Insider_03_09_2011&utm_content=gps-community-urged-contact-congress-regarding-fcc-proposal-10962

http://view.bnpmedia-email.com/?j=fe5f16767567037a7214&m=fef41579726307&ls=fe261577766d077c701779&l=fed010707765027f&s=fdf71576746107747157372&jb=ffcf14&ju=fe1f16797c6c057b7d1071

Professional Surveyor's Review Course

August 10, 11, 12, 2011

Capitol Plaza Hotel, Jefferson City, Missouri

Sponsored by:

Missouri Society of Professional Surveyors

Proposed Schedule

Wednesday, August 10.....6.0 PDUs
1:00-5:00 pm and an evening session
Surveying Math

Calculator Use, Basic algebra, trigonometry and geometry,
Traverse calculations and coordinate geometry, Surveying math applications
(Bring your NCEES-approved calculator)

Thursday, August 11 .....9.5 PDUs
8:00 am-5:00 pm and an evening session
Surveying Fundamentals

Exam preparation, Legal principles and definitions,
Errors analysis, State plane coordinates
Route surveys, GPS & GIS

Friday, August 12.....6.5 PDUs
8:00 am-3:30 pm
Missouri Practice

Missouri riparian boundaries, Missouri Minimum Standards,
Missouri GLO system, Resurveys on Missouri's GLO system (RSMO Chapter 60)
Other Missouri rules and statutes

Fee Schedule:

Wednesday only	$250
Thursday only	$500
Friday only	$450

Multi Day Discounts:	MSPS Member	Non-MSPS Member
Wednesday and either Thursday or Friday	$600	$ 600
Thursday and Friday	$750	$ 800
All Three Days	$900	$1,000

Course Instructors are Dr. Joseph Paiva, PS, PE and Dr. Dick Elgin, PS, PE

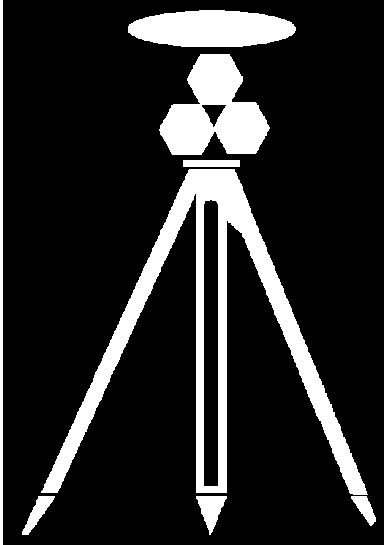
Dick Elgin and Joe Paiva are well known surveying professionals and educators. Joe helped found the original Missouri LS Review Course (over 30 years ago), and both have taught portions of the course ever since. Both have been university civil engineering faculty members (teaching surveying), both have written extensively and lectured widely on surveying subjects. Dick is the former (1984–2008) owner of Elgin Surveying & Engineering, Inc. (Rolla, MO). Joe is a geomatics and business development consultant to developers and manufacturers of surveying instrumentation and software. Both are currently writing books on technical surveying subjects.

For more information, call MSPS at 573-635-9446

Missouri Society of Professional Surveyors

22nd Annual Minimum Standards Workshop

Saturday
July 9, 2011
Lodge of Four Seasons
Lake Ozark, Missouri



This course has been approved for continuing education credits from the Missouri Board for Architects, Professional Engineers, Professional Land Surveyors and Landscape Architects for 8 PDUs (8 hours of professional development units - four hours of Minimum Standards credits)

PROGRAM

7:00 a.m. ..... Registration & Continental Breakfast
8:00 am ..... **Panel Discussion: Missouri Statute Chapter 327, The Licensing Board, Common Complaints, and Board related topics**
Mike Freeman, Dan Govero, and Mike Flowers
9:00 a.m. ..... **Minimum Standards for Property Boundary Surveys**
Darrell Pratte PLS
11:00 a.m. ... **US Public Land Survey Corners-Registration Standards**
Robert Ross PLS
12:00 noon .. Lunch
1:00 p.m. ..... **New ALTA Standards**
Gary Kent, LS
5:00 p.m. ..... Review/Closing Remarks

PRESENTERS

MIKE FREEMAN, PLS, Chairman, Land Survey Division, Missouri Board for Architects, Professional Engineers, Land Surveyors and Landscape Architects and President of Freeman Land Survey, Hermitage, Missouri (417) 745-6957.

MIKE FLOWERS, PLS, Member, Land Survey Division, Missouri Board for Architects, Professional Engineers, Land Surveyors and Landscape Architects and retired State Land Surveyor

DAN GOVERO, PLS, Member, Land Survey Division, Missouri Board for Architects, Professional Engineers, Land Surveyors and Landscape Architects and President of Govero Land Services, Imperial, Missouri (636) 464-9380

GARY KENT, LS is in his 27th year with The Schneider Corporation, a surveying, GIS and consulting engineering firm based in Indianapolis and with offices in Charlotte, North Carolina and Des Moines, Iowa. Gary taught Boundary Law, Legal Descriptions, Property Surveying and Land Survey Systems as an adjunct instructor for Purdue University from 1999 to 2006 where he received Excellence in Teaching and Outstanding Associate Faculty awards. Gary is chair of the National Society of Professional Surveyors' committee on the ALTA/ACSM Standards and is liaison to NSPS for the American Land Title Association.

DARRELL PRATTE, PLS, State Land Surveyor, Land Survey Program, Division of Geology and Land Survey, Missouri Department of Natural Resources, Rolla, Missouri (573) 368-2300

ROBERT ROSS, PLS, Cadastral Section Chief, Land Survey Program, Division of Geology and Land Survey, Missouri Department of Natural Resources, Rolla, Missouri (573) 368-2300

To register, call MSPS at 573-635-9446

The Right-of-Way Acquisition Process

Teri Kahlen, PLS Reprinted from *California Surveyor,* Spring 2011, CLSA

At one time or another, many Land Surveyors contribute their services to highway projects—either before (field surveying to locate the boundaries of proposed property owners) or after (in the construction staking of the new highway, and filing a record of survey in the after condition). This article is intended to serve as a general overview of the right-of-way acquisition process for public agencies that seek the financial assistance of the Federal Highway Administration (FHWA).

Typically the FHWA provides funds to state governments that carry out highway projects. These funds are used to support activities related to building, improving, and maintaining public roads. Some states pass these funds to local governments or private entities. Many projects involve the acquisition of real property and the relocation of residents, businesses and others. Despite what some people might think, the government can't just take land away from owners. The 5th Amendment of the U.S. Constitution states that "No person shall . . . be deprived of life, liberty, or property, without due process of law; nor shall private property be taken for public use without just compensation."

All acquisition and relocation companies working on federally assisted projects are regulated by Public Law 91-646, the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, as amended, commonly called the Uniform Act. Public agencies and acquisition consultants work closely with state transportation departments (Caltrans, for example) during the acquisition process to ensure all federal and state requirements are met.

So what are the various phases required to build a federally assisted highway project? If you'd like to know, this general overview will be helpful and informative.

Planning and Project Development

The transportation planning process is an ongoing, ever evolving process and an integral part of project development. Once the need for a new highway or to widen an existing highway has been identified, a more detailed study is undertaken. From a property acquisition point of view, the key element of the study is the preparation of the right-of-way cost estimate; this is the first step in building a credible budget. This includes estimating costs to acquire the real property, including improvements, costs of relocating people and businesses, and demolition costs. The right-of-way cost estimate will also include costs associated with appraisals, environmental reports, title and escrow services, acquisition services, relocation services, and litigation.

Environmental Issues

After the project scope has been defined, the potential environmental impacts must be assessed. This assessment is done in accordance with the National Environmental Policy Act (NEPA) which was signed into law on January 1, 1970, establishing national environmental policy and goals for the protection of the environment in federally funded projects. Section 102 of NEPA requires a public agency, when using federal dollars, to incorporate environmental considerations and mitigation measures to minimize the environmental impact of a proposed project. In general, the NEPA process consists of an evaluation of a project's environmental effects, including its alternatives. There are three levels of analysis:

- Categorical exclusion determination;
- Preparation of an environmental assessment/finding of no significant impact (EA/FONSI); and
- Preparation of an Environmental Impact Statement (EIS).

Ultimately, the goal is to involve the public and private sectors in the process of identifying reasonable project alternatives to minimize or mitigate for the adverse effect to the environment. Obviously, the process is supposed to be completed before any right-of-way acquisition begins.

Project Design and Right-of-Way Engineering

Once the preferred project alternative is selected and fully addressed in the environmental documents, the engineering design can commence. In the project design phase, the construction plans, specifications, and estimates (PS&E) are developed for use in advertising and construction of the highway project. Utility relocation is a significant factor in the construction of a project, and early coordination is important in keeping the project on schedule. In addition to the utilities, railroads (for grade separation projects) also need early coordination. As part of the project design, right-of-way maps are prepared identifying the property required by the project. After the preliminary title reports are received, the right-of-way maps are prepared from the design plans to show the existing and proposed right-of-way lines, property lines (based on a field survey and boundary analysis), and owners' names for each property required. Other pertinent information to be shown includes the size of the parcels and type of estate, (i.e., fee, permanent easement, slope easement, temporary construction easement, storm drain easement, access easement, aerial easement, etc.) Depending on the agency involved, the right-of-way maps may also include the highway design centerline, design features, and other details of construction. These plans should be sufficient to prepare legal descriptions of the part take interests to be acquired for the project.

I enjoy right-of-way engineering because it is interesting and challenging to research property ownership and record information. I like to compile research data for the field crew and then evaluate what they actually find in the field. Boundary analysis is like solving a puzzle. It is exciting and educational to engage in surveying discussions with colleagues to help solve the puzzle. The map making is also exciting with the

(continued on page 24)

TRIMBLE TSC3

We've added a lot more capability.
Without taking anything away from its simplicity.

THE NEW AND IMPROVED TRIMBLE TSC3 CONTROLLER

The problem with new and improved is that too often it means unfamiliar and different. That's not the case with the new Trimble TSC3 controller.

Optimized for Trimble Access, this new field solution delivers more capable data collection, computing and connectivity than ever before, without sacrificing the familiar functions that have made our surveying systems famous.

COLLECT SHARE AND DELIVER:

A larger, full-color screen means more function from the map screen and more direct access to the features you need to complete the job. And keep the data flowing with integrated Bluetooth, WiFi and cellular modem.

Trimble Access field software allows you to bring data from the internal GPS, compass and camera into your workflow. In a single step you can automatically add images as attribute information to any point you are measuring.

Easier and more effective? Yes. More complicated? Not at all. The new Trimble TSC3 controller. It does amazingly complex things–all designed to make doing your job easier.

To learn more about the new Trimble TSC3, visit: trimble.com/TSC3

COLLECT | SHARE | DELIVER

SUCCESS FOUND HERE

Trimble

FOR MORE INFORMATION CALL YOUR TRIMBLE DEALER

Seiler Instruments
St. Louis, MO
314-968-2282

Seiler Instruments
Belton, MO
816-331-3383

opportunity to be creative. I have to say my most favorite part is writing legal descriptions—and I am grateful for having been taught well. The man that taught us used to work with Gurdon Wattles, the author of Writing Legal Descriptions, at Ticor in the 1960s. We had weekly in-house classes too. We were given all kinds of properties to describe and then we had discussions oil how we did it and why. Writing legal descriptions is rewarding because it allows me to be creative.

Appraisals

Property appraisals call begin once the right-of-way and construction needs of the project have been clearly defined. The appraisal practice is regulated by the Uniform Standards of Professional Appraisal Practice (USPAP). After the design is complete and the legal descriptions and plats are signed by the professional Land Surveyor for the acquisition parcels, we provide them to the appraiser. The appraiser will prepare their "value of opinion" based on the highest and best use, what improvements are on the property, any damages to the remaining property, etc. They walk the project, invite the property owner to accompany them on the appraisal inspection, and finally prepare a narrative report for submittal to the public agency. An appraisal review, prepared by another independent appraiser, is conducted to ensure that there is consistency among the property valuations on a project-wide basis.

Acquisition

Once the appraisals are completed and reviewed and the public agency has obtained their E-76 from the FHWA (E-76 gives the public agency authorization to proceed with the project), offers can be presented to the affected property owners. The right-of-way consultant (me, in this case) prepares the offer package. This includes the offer letter (based on just compensation), the purchase and sale agreement/contract, the grant deed/easement deed, and the statement of just compensation. Tile statement of just compensation is an abstract of the full narrative appraisal report for the benefit of the property owner.

We contact the property owners and make appointments to present the offer in person, discuss the project, and answer any questions they have about tile process. Then the fun begins: the negotiation. It would be nice to check our emotions in at the door; however, it is not always possible. We're affecting someone's home where families were raised and celebrations were enjoyed. The right-of-way consultant (also known as the negotiator) serves a unique and sensitive dual role which involves being an advocate for both the public agency and the property owner.

Some characteristics of the successful negotiator include knowledge of the project, experience in negotiations, credibility, courage, empathy, integrity/ethics and patience. The vast majority of property owners believe their property is worth more than the appraised value; that is where Code of Civil Procedure Section 1263.025 comes in. This code states the public agency will reimburse an owner up to the amount of $5,000 for the owner to secure an independent appraisal of the property if they choose. If the property owner chooses this option, we will review both appraisals and negotiate based on both appraisals and, ideally, have a win-win outcome.

Condemnation

When all attempts to negotiate an agreement fail it may be necessary for the agency to acquire the property by exercising its power of eminent domain. At this point, the acquisition should be turned over to legal counsel to begin condemnation proceedings. The right-of-way acquisition consultant continues to be involved in the process, as we are part of discovery. We can be diposed as our work provides the basis for the lawsuit. If the property owner challenges the proposed acquisition, the condemner may be required to prove necessity for the acquisition. Necessity is proved by offering engineering or design plans to substantiate the need to acquire.

When private land is needed for public use and is occupied, it may be necessary to displace the occupants if the new right-of-way line lies within their house/business or if it is a full take parcel. The Uniform Act requires an acquiring agency to provide advisory and financial assistance to those displaced from their homes or businesses.

Almost There: Right-of-Way Certification

The final step in the right-of-way process is memorialized by tile preparation of the right-of-way certification. Prior to advertising for construction bids for the project, the public agency must certify that the properties needed for construction have been acquired and are clear of any utilities and structures. The certification must state that the public agency has complied with the Uniform Act and the project is ready for construction.

Summary

So there you have it, in a nut shell. This is a very brief and simple explanation of the process. It can take anywhere from one to two years to complete and longer if condemnation is involved. What I enjoy about right-of-way acquisition is the challenge of coming to a mutually beneficial agreement. I'm always learning and stepping out of my comfort zone. As a professional Land Surveyor, what my skill set brings to the acquisition side of right-of-way is the ability to read and interpret engineering plans and legal descriptions in addition to a good understanding of land titles. That is particularly valuable in communicating with property owners with little experience in real estate.

Right-of-way engineering and land surveying have been Teri's forte for over 25 Years. She has been employed by both private firms and public agencies, and has been specializing in right-of-way acquisition for about four years. She holds a California real estate license and is a Notary Public. Currently she is a Project Manager for California Property Specialists, Inc., a Southern California firm whose primary business is assisting public agencies in acquiring rights-of-way for their projects.

TRIMBLE ROBOTIC Trade-In Specials

Special Trade-In Packages offered by Seiler Instrument Company that will fit your workflow processes and increase your productivity

Platinum Robotic Special

Up to a $4,000 trade-in allowance available

Trimble® S8 - 2" Robotic Total Station – with Vision

Includes: TSC3 w/Trimble Access & Roads with internal radio, Power Kit, Robotic Target Kit, Prism Pole, Accessory Kit for Data Collector, Trimax Tripod

- The Trimble® S8 Total Station is Trimble's most advanced Autolock and Robotic total station. It's designed to deliver unsurpassed performance and productivity in land surveying and specialized engineering applications, such as monitoring and tunneling.

Gold Robotic Special

Up to a $4,000 trade-in allowance available

Trimble® S6 - 3" Robotic Total Station

Includes: TSC3 w/Trimble Access & Roads with internal radio, Power Kit, Robotic Target Kit, Prism Pole, Accessory Kit for Data Collector, Trimax Tripod

- You can control all the functions of the Trimble S6 from the rod as you move through the job site making measurements. Now a single surveyor can perform high accuracy, Boundary, Stakeout, and Topographic surveys.

Silver Robotic Special

Up to a $2,500 trade-in allowance available

Trimble® S3 - 2" Robotic Total Station

Includes: TSC3, w/Trimble Access & Roads, Power Kit, 360 prism, Prism Pole, Accessory kit for Data Collector, Trimax Tripod

- The Trimble S3 is a robust, cable-free solution backed by world-class training, service and support through Trimble's extensive distribution network to keep surveyors up and running. The Trimble S3 System provides a great foundation for getting a survey crew into Robotic Surveying.

Give us a call for Special Package Pricing, trade-in offers and Financing Options!

Trimble
Authorized Dealer

Contact Us!

Seiler – St. Louis

Jeff Brinkman
Direct Dial: 314-218-6364
Cell: 314-422-7891

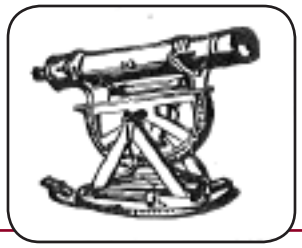
Pat Stack
Direct Dial: 314-218-6353
Cell: 314-614-5883

Seiler – Kansas City

Steve Tomps
816-331-3383
Cell: 816-520-7446

Email: solutions@seilerinst.com

SALES · RENTALS · SERVICE · TRAINING · SUPPORT · CONSULTING · FINANCING



Missouri Association of County Surveyors

4th Annual Summer Workshop, Saturday, July 23, 2011

"Missouri's Recording History and French /Spanish Land Grants, Concessions and US Surveys"

DORMAN STEELMAN LODGE ("Searcy Bldg.")
MONTAUK STATE PARK, SALEM, MO.

Saturday, July 23

8:30 a.m.	Missouri Association of County Surveyors Meeting — all workshop participants are welcome.
10:00 am–Noon	Missouri's Recording History (Chris Wickern, PLS, CFEDS) This presentation will cover the history of recording a survey, starting in 1814.
Noon–1:00 pm	Lunch — Dorman Steelman Lodge (on your own) (Courtesy of MACS for all County Surveyors attending)
1:00 p.m.–3:00 pm	French / Spanish Land Grants, Concessions and US Surveys **(Gerald Bader, PLS, Ste. Genevieve Co. Surveyor; City of Ste. Genevieve Surveyor)** This presentation will include a short history of concessions from the French and Spanish Governments. Review of several Township plats, some with one or two land grants, and others with 100 (+/-) land grants. Review of overlapping and oddly-shaped land grants with oddly-shaped fractional sections. We will compare the French/Spanish concessions with the US Survey of today.

This workshop will be approved for (4) PDUs (2 Minimum Standards) by the Missouri Board for Architects, Professional Engineers, Professional Land Surveyors, and Landscape Architects. All sessions will be held in the air-conditioned Searcy Building at Montauk State Park.

Pre-Workshop Activity
Friday, July 22nd, 10:00 a.m.
Float Trip (8 mi.) on the Current River

RegistrationFees:

Workshop, July 23rd	(MACS Member)	$50.00
	(Non-Member)	$75.00
Float Trip, July 22nd (due at time of registration)		$20.00/person

Other activities for families are available at Montauk State Park, including Tours of the Trout Hatcheries, 1800s Gristmill, and Hiking Trails. Campsites are available. Call 800-334-6946 for Campground reservations. Or go to http://www.mostateparks.com/montauk.htm

To register please make checks payable to MACS and send to Mary Frye, 101 E. Walton, Warrenton, MO 63383

Questions call Mary (573) 645-2722 (cell) or Jerry Bader (573) 883-6259 (cell)

What Do Principles of Land Surveying Really Mean?

Gary John Bockman, PE, PLS

Students of land surveying topics have read and attempted to memorize the various principles stated in their textbooks or in court cases.

As a former land surveying instructor, I have tried to present those principles and offer a few examples of their appropriate use. One of my clients called me recently with a request that revealed an interpretation of one legal principle that I had not previously considered.

A land surveyor must be careful not to develop "tunnel vision" in the interpretation and use of various legal principles.

In the opinion in the *Day v. Benesh* case, 104 Fla. 58, 139 So. 448, it was said: "The general rule is that a deed is not void for uncertainty (1) if the description is such as well enable a surveyor to ascertain and locate the land, (*Boley v. McMillan,* 66 Fla. 159, 63 So. 703), or (2) if it is possible to ascertain and identify the land intended to be conveyed. *Ansley v. Graham,* 73 Fla. 388, 74 So. 505."

I had always believed this principle to state that proper wording of boundary descriptions, including detailed descriptions of monuments found or set and their relation to boundaries of parcels or street rights of way would permit another surveyor to follow their work and reproduce it on the ground.

An employee of a client called and stated that I should drive to one of the firm's previously developed subdivisions to confirm that a certain street address was the same as the a specific lot within the subdivision. In addition, I was informed that such had to be completed prior to 1:30 PM the next day so that I could testify in a court case. The court case involved eviction of the tenant from the parcel and, apparently, the tenant was claiming insufficient notice of eviction because the deed description did not match the lease description.

The caller then e-mailed copies of a warranty deed for the parcel that listed the lot number then further described it by metes and bounds and a subsequent lease agreement for the parcel that described the parcel by street address. The client requested that I determine whether the parcel described in the deed as all of Lot ## in SSSSS subdivision and the parcel described in the lease as ### North AAAA Avenue were actually the same parcel and be prepared to testify as to my findings.

The client's attorney had adopted a strategy that if a land surveyor could review the recorded subdivision plat, the purchase deed and the lease agreement then confirm that all these documents referred to the same parcel of land, the concept of sufficiency of a description would be satisfied.

Although another firm had prepared the plat for the subdivision in which the subject lot was located, my firm had prepared the plat for the client's land that adjoined the north side of lot ## in subdivision SSSSS subdivision and the north end and east right of way of the dead end AAAA Avenue.

My approach was to review the recorded plat for the subject subdivision and definitely locate Lot ##, read the warranty deed and confirm that the cited lot number as well as the metes and bounds description matched the plat. I then drove to the address, photographed street signs at the intersection at the southeast corner of the subject parcel, then photographed the mailbox at the driveway to the parcel to confirm the street address. Our firm had surveyed around the subject lot previously during design of an adjoining phase in the subdivision and confirmation of the street address and lot number being the same parcel was done.

On the scheduled day of the hearing, the case was continued and has not been heard. The use of a land surveyor's testimony in this case to resolve conflicts between descriptions in a deed and a lease has not been ruled upon by the court. This case does illustrate that a land surveyor must be careful not to develop "tunnel vision" in the interpretation and use of various legal principles.

Open Letter

concerning the National Surveyors Museum in Springfield, IL

Dear Ms. Grahl:

I am writing today to remind all surveyors that they have a National Museum in Springfield, Illinois that is dedicated to their profession and its noble and illustrious history.

American surveyors, stung by the recent economic turndown, may have forgotten the existence of the Museum or they may have felt that they could not afford to support it under the current economic climate. I would urge them to re-consider becoming a member, and also strongly encourage them to actually visit the Museum.

The story of surveying is, in many ways, the story of America. From the laying out of the original colonial boundaries, roads, and railroads, to the western expansion that inspired the unique Public Land Survey System, land surveyors were at the forefront of a developing and pioneering nation. Surveying has a very rich historical heritage in America, and as we well know, many of our Presidents and statesmen were also surveyors at one point in their careers. It is a fitting tribute for this profession to have a National Museum that honors all surveyors, both past and present.

It is also fitting that this Museum be located in Springfield, Illinois, near the center of the nation and in the hometown of one of our famous surveyor-presidents, Abraham Lincoln. The Museum meshes well with the other Lincoln attractions and sites: The Lincoln Home National Historic Site, The Abraham Lincoln Presidential Museum and Library, New Salem State Historic Site (where Lincoln learned his surveying skills), and many others. The sites tell a critically important story in the history of the United States leading up to and beyond the Civil War and the abolition of slavery.

Springfield is also the Capitol of Illinois, and attractions related to that status also await the visiting public. In short, I encourage all surveyors to put a visit to Springfield on their travel “to do” list. I’m sure sure they will not be disappointed. I would also encourage all surveyors to support their National Museum as well in any way they can. It’s an undertaking that’s worthy of their support.

Thank You,

Marc Anderson - Past President,
Illinois Professional Land Surveyors Association

Angle and Direction

Warren Andrews, PE, PLS Reprinted from *Side Shots* newsletter, May 2011, PLSC

There are two things that are basic to surveying that in one way or another all surveyors are involved with, and those are distance and direction. Distance is probably simpler to solve whether you're pacing and counting your steps, laying out rods in a line for a baseline, stretching a rope or a chain, pulling a suspended band tape, or relying on the tiny time difference it takes a high frequency beam to go out and return from a reflector. (Incidentally, did you know the Latin word mille, for 1000, is where our English word mile comes from? One thousand paces, or double steps, of a Roman soldier—averaging 5.28 feet each—equals one English statute mile. The nautical mile is different and longer.)

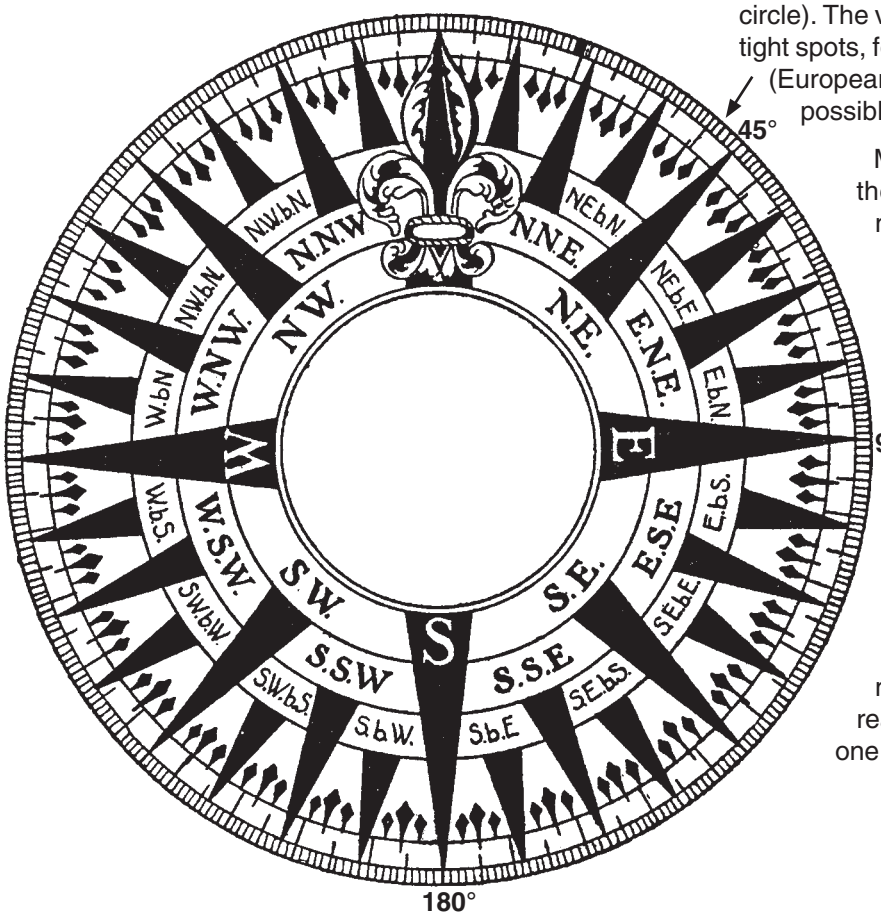
Direction is the second basic element of surveying and there are generally five systems used today. American surveyors use the sexagesimal system or 360 parts to the circle while most of the rest of the world uses the S.I. System of 400 parts or 100 to the quadrant. The third system is the artillery officer's in mils which is essentially 1 yard shift angularly at 1000 yards distance (6400 to a circle). The fourth system is unusable to a surveyor in the field and that is the mathematician's 2π radians to a circle, which is impossible to divide easily or rationally.

The fifth system is the old system used by navigators based on the directions of the compass. The compass card on the binnacle was divided into eight points to the quadrant and later into quarters of each point so 32 directions could be specified for each quadrant for a sailing direction. In other words, a command to the helmsman on the wheel of "northeast by a quarter north" is one diamond mark countercounterclockwise from the N.E. marker on the mariner's compass, which is equal to 42° 11' 15" azimuth from north. Bowditch's *"Practical Navigator"* gives this in great detail.

If the sexagesimal system is used there are several different ways to scribe or mark a circle. For example, my Ainsworth mining transit is marked with two sets of numbers on the horizontal circle, the outer ring from 0 to 360 in a clockwise direction while inside that the numbers go from 0 to 90 to 0 and continuing from that 0 to 90 and back to 0 (same as the 360 on the outer scale) for the four quadrants. This makes it easier to read, or set, azimuths or angles right or to read or set bearings directly. (The 30 minute vernier is on the inside circle). The vertical circle is end reading, not side reading for tight spots, for the four quadrants with zero being horizontal. (European instruments use zero as vertical to reduce the possible error in recording plus or minus angles).

My C. L. Berger & Sons mining transit marks the horizontal circle differently. Clockwise it is numbered from 0 to 360 and from the same 0 counterclockwise to 360. This 900 combination will give an angle right or an angle left—but don't mix up the two.

Before the dividing engine, such as that of Jesse Ramsden in England in the 1770's, the horizontal and vertical circle plates had to be scribed by hand with ensuing slight inaccuracies. Ramsden's theodolite, scribed from his dividing engine, had a 36-inch diameter horizontal plate that was readable to one second of arc and was first used in July, 1787, to connect with the French triangulation across the Channel. (See Control Points No. 10). The modern Wilde T-4 and the Kern DKM3 could be read ten times more accurately than Ramsden's one second.



Mariner's Compass clip art courtesy FCIT

Affinis Names New Ownership

Overland Park, Kan. - Aligning with a strategy for growth and continued client-facing service delivery, Affinis Corp is restructuring its ownership by welcoming nine company co-workers.

"At a time when many in the industry are facing tough economic challenges, we are gratified to be able to offer our key performers an ownership package," said Rick Worrel, who will continue to serve as the President of the company he started more than 10 years ago.

Executive Principal level owners are Worrel, Mike McKenna and Robert Ubben. In addition to being part of the leadership of Affinis, McKenna has extensive experience in traffic engineering, ITS and transportation planning. Ubben has been a longtime Affinis team member as the survey manager.

"Though we are in growth mode, we are fully committed to maintaining our intense focus on our client's need," said Worrel, "We were founded on the vision of understanding wants and fulfilling expectations. By strengthening our ownership and leadership teams we have increased our ability to creatively and efficiently meet the needs of our clients."

Executive Principals: Mike McKenna, Rick Worrel, and Robert Ubben

Additional Principal owners include Jason Davis, Ryan Fleming, Les Hamilton, Brent Johnson, Tim McEldowney, Linda Rottinghaus and Cliff Speegle.

In a world in which customer service means less more often than it means more, Affinis Corp is staking its future on relationships with clients. In fact, Affinis means "relationship" in Latin. Today the firm has more than 30 co-workers in our two offices, one in Overland Park, Kansas and one in Lee's Summit, Missouri. For more information on Affinis, go to www.affinis.us.








Many thanks to our exhibitors during our annual Spring Workshop

Laser Specialists
Surdex
Klein Survey Systems
Carlson Software
Rotolite of St. Louis
Surveyors Materials
Land Survey Program
Griner & Schmitz
Seiler Instruments
National Society of Professional Surveyors

What to Do when the Subpoena Comes

Elizabeth W. Boswell, Carol Clark Law Reprinted from *Backsights & Foresights,* August 2011, SDSPLS

You are minding your own business, platting away, when the sheriff, marshal, or another designated individual comes to your office to serve a subpoena. Panic! Why me? Am I being arrested? No, you are being served with a subpoena for your testimony or professional records. Do I have to respond? Can I be paid for the interruption of my business? Do I have to give a deposition if I don't want to? Do I need counsel? All of these are legitimate questions with straightforward answers.

At the outset, act, don't react. First look at the subpoena itself. What is being sought? Who is seeking it?

What is a subpoena? Is the subpoena valid?

In Latin, the words "sub poena" mean "under penalty." A subpoena is an order issued by a court requiring you to appear in person at a certain place, date, and time to testify as a witness about a particular case. It may require you to appear in court to testify, or it may require you to appear at a certain place and time to be deposed. More likely than not, you have received a subpoena requesting that you provide certain documents or business records. Read the subpoena carefully. It will tell you the names of the parties to the case and their attorneys, the court issuing the subpoena, and what you are being required to do.

There are several kinds of subpoenas. A trial subpoena may be used to secure your attendance to give testimony at trial. A deposition subpoena may be used to require you to appear for a deposition and to produce your records, files, papers, documents, surveys, plats, photographs, field notes, or other tangible things. Or you may only have been served with a subpoena for the production of your files, without a requirement that you appear to give testimony.

To be valid, a subpoena must be signed or issued by the clerk of the court where the lawsuit is pending and must bear the official seal of the court. It may be served by a deputy sheriff, other process server, or any person over 18 years of age, or it may be served upon you by registered or certified mail, or overnight delivery (e.g., UPS or Federal Express). It must be served within a reasonable time, but in any event, no less than twenty-four hours before you must appear to testify. The conventional practice, however, is to give a witness a minimum of ten days to respond to a subpoena. A subpoena must be accompanied by a witness fee of $25.00 per day. An additional requirement is reimbursement of 20 cents per mile if you are being subpoenaed to testify outside of the county where you reside. Witness fees and mileage are required to be tendered when the subpoena is served. The payment of these fees may not, however, be demanded as a condition precedent to your compliance with the subpoena, but if you reside outside of the county where your testimony is to be given, the subpoena will not be valid unless it is accompanied by payment of the $25.00 witness fee plus mileage for a minimum of twenty miles. If the party issuing the subpoena is the State or a political subdivision of the State, or if the issuing party is a criminal defendant, fees and mileage need not be tendered.

A witness may be required to attend an examination by deposition and to produce the requested documents in the following places: (1) the county of his residence; (2) the county of his employment; (3) in the county where he transacts his business in person; (4) in any county in which he is served with a subpoena while therein; and (5) at any place which is not more than 30 miles from the county seat of the county of his residence, his employment, or where he transacts his business in person. A subpoena requiring your attendance at a hearing or trial may be served at any place in the State.

Do I need counsel?

You do need counsel under any of the following circumstances.

If you have any doubt as to the validity of the subpoena, you should consult your attorney to determine whether it is in fact valid and enforceable. Even if the subpoena does not appear to be valid from your cursory review, do not ignore it. Seek counsel to determine whether a motion to quash the subpoena is in order.

If you have reason to believe that the subject matter of the case in which you have been subpoenaed may expose you to liability or call into question the quality of work you have performed relating to the properties at issue in the litigation, you will certainly want to consult your attorney to give him or her a "heads up" regarding the issues that concern you, so that you can best be counseled to make sure that you do not do anything to increase your exposure or inadvertently make any admissions against your interest that could come to harm you later. In other words, if you think you might ultimately be brought into the lawsuit as a defendant, you absolutely need legal counsel immediately. This course of action is particularly important if you have been subpoenaed to give a deposition, in which you will be testifying under oath, with your testimony transcribed by a court reporter. Such testimony becomes "written in stone." It is absolutely essential that if you are to be deposed, you are prepared by your attorney well in advance and, if at all possible, represented by him at the deposition so that he may interpose appropriate legal objections and make sure that the other attorneys "follow the rules." Remember that you will have to live with whatever you say in deposition. There are no second chances to change your story. If you

do, your testimony will be impeached and your credibility shot.

If the subpoena appears in any way to be unduly burdensome or oppressive, or if you wish to object to it on those grounds or on the grounds that it causes you undue annoyance or embarrassment, there are certain procedural protections that an attorney can invoke on your behalf. Time is of the essence, however. You have ten days after service of the subpoena for your attorney to object to it. Upon such written objection filed with the court, the party serving the subpoena will not be entitled to inspect and copy the materials subpoenaed unless and until the court orders the production. This procedural protection is extremely beneficial; such written objection, if timely filed, acts as a kind of a self-effecting "protective order." Then you do not have to comply with the subpoena unless and until the party who served it makes a motion to the court and obtains a court order requiring your compliance. Once such an objection is filed, your attorney will have the opportunity to negotiate with the party issuing the subpoena to narrow the scope of the information that is being requested, or to negotiate with him regarding your costs of compliance with the subpoena. If, for example, the subpoena would require you to search for and retrieve old files that have been archived, your attorney may be able to negotiate with the subpoenaing party to ask that he share in your cost of obtaining the requested files. If the subpoena is unduly broad in scope, your attorney could negotiate with the party issuing the subpoena to narrow the scope of what is being requested. Your attorney could negotiate with the issuing attorney to obtain an agreement that you will be paid for your employees' time in assembling the requested files, or for copying costs. If your attorney is not able to negotiate an acceptable arrangement with opposing counsel, even if that party files a motion with the court to require your compliance, the court can and may condition your compliance upon the issuing party's advancement to you of the reasonable costs of producing the documents that are sought. The court has the authority to modify the subpoena, or quash it altogether, if it is unreasonable or oppressive.

A document subpoena does not require you to copy the requested materials. It requires you to produce them and permit their inspection and copying by the party issuing the subpoena. There are practical reasons, however, why you may not want to produce your original files and records. An attorney can assist you in making these strategic decisions, and in helping you reduce your costs while making sure that you do not run afoul of the law.

Consequences of Non Compliance

Failure to comply with a valid subpoena can result in a fine of up to $300.00, or imprisonment up to twenty days if you are found in contempt of court. Obviously a subpoena cannot be ignored and must be taken quite seriously, and the safe course of action is always to consult with an attorney the moment you receive a subpoena.

If it is impossible or extremely difficult for you to appear at the time required by the subpoena, you or your attorney can call the attorney who issued it. He or she might be able to postpone the date by which you must respond to the subpoena. Be aware, however, that if a court date is already established, the lawyer may not be able to change the date and time of your requested appearance. If it is absolutely impossible for you to appear, for example for medical or serious business reasons, you should obtain the advise of counsel as to whether there may be legal grounds for you to be excused.

What Do I Produce?

A subpoena for the production of documents must spell out precisely what files or documents are being called for. You are only required to produce those documents that are in your "possession, custody, or control." If you have relevant files in other places that are in your custody or control, but not in your direct possession, these files will be subject to the subpoena. An example of such documents would be files that you maintain in a separate storage facility, or files that are in the possession of your attorneys, accountants, or other such professional.

Electronic files create a nightmare for a party trying to comply with a subpoena. The definition of "documents" under the Civil Practice act includes all "data compilations from which information can be obtained [and] translated, if necessary, by the respondent through detection devices into reasonably usable form." Subpoenas for the production of documents, therefore, include emails and electronic data of all forms, if those "documents" meet the description of the categories of files sought by the language of the subpoena. It is easy to forget the existence of emails and other electronic data that do not exist in hard copy. If you are responding to a subpoena, the scope of which would include your computer files, you cannot afford to omit their production.

Failure to comply with a valid subpoena can result in a fine of up to $300.00, or imprisonment up to twenty days.

A subpoena for the production of documents may, at first glance, appear to be a subpoena requiring you to appear at

(continued on page 34)

What to Do when the Subpoena Comes (continued)

deposition and produce the requested documents. If what is really being sought is the documents and not your deposition, you should receive a cover letter from the attorney issuing the subpoena giving you the option to appear at a place and time certain, or just to produce the requested documents with a certification by your or your company's records custodian that a diligent search for the requested documents has been made, and they are being produced therewith.

Conclusion

Subpoenas are serious matters. Ignoring them, or failing to comply, can result in serious consequences, including arrest and jail. Recipients of subpoenas are not without legal protections, however. The best way to protect yourself, the moment you receive a subpoena, whether for trial, deposition, or the production of documents, is to contact your attorney. Remember that time is of the essence: You have only ten days for your lawyer to file the necessary written objections. The expense of consulting your attorney will usually be less than the expense that you may incur if your do not avail yourself of the available statutory protections. This will always be the safest course of action, and especially so if your sworn testimony is being sought.

Carol Clark and Liza Boswell are trial attorneys, experienced in all aspects of Georgia law relating to real property disputes. They have enjoyed a longstanding friendship with SAMSOG, having worked with SAMSOG on legislative matters affecting Registered Land Surveyors, and having spoken at SAMSOG's Technical Seminars and Annual Summer Meeting. They can be contacted at: Carol Clark Law, 6075 Lake Forrest Drive, Suite 200, Atlanta, Georgia 30328, Tel. 404.250.3300, Fax 404.250.3306, carol@carolclarklaw.com, and lizaboswell@carolclarklaw.com

In Memory of Gene Buzzard, PLS #1463

Gene Buzzard, 75, St. Joseph, died Thursday, May 18, 2011 at Heartland Regional Medical Center after a lengthy illness.

Gene was born to Lee and Mabel (Marcum) Buzzard on October 6, 1935 in Ridgeway, Mo.

He grew up in Northwest Missouri and worked on the family farm. He graduated from Mt. Moriah High School. He had high moral standards and believed a person was a Christian by the way they lived their lives and treated others. Gene was a member of the Mt. Moriah Baptist Church.

He married his high school sweetheart, Marjorie Ruth (Jincks) on October 18, 1953. Gene and Marjorie were a devoted couple for over 57 years. They worked side by side in the family business, Gene Buzzard and Associates Land Surveyors and Engineers, for over 25 years.

He started working for the Missouri Highway Department in 1953, also working for the police department in Bethany, Mo., before moving to St. Joseph. He then was employed by the Missouri Department of Transportation for over 15 years. He was employed by Robert Kimball Engineers, before starting his own business, Gene Buzzard and Associates Land Surveyors and Engineers in 1975. At one point, all of Gene and Marjorie's children worked with them in the business. He was the last elected Buchanan County Surveyor. He retired in 1997, selling his successful business to Bartlett and West Engineers. He then worked for Bestgen, Inc. Gene was one of the original founders of the Missouri Land Surveyors Association. He taught class in land surveying at Missouri Western State University.

Over the years, Gene and Marjorie traveled to all the states in the Union, including Alaska and Hawaii. They also covered all the Provinces of Canada and the Yukon Territory, except they forgot Rhode Island.

Gene loved to camp, travel, and hunt and loved spending time with his family. Gene had a clever sense of humor. He was a storyteller. Gene was a person who never met a stranger.

He learned through trial and error and had multiple talents from car mechanics to carpentry and plumbing; he was intrigued with taking things apart and putting them back together, many times taking transmissions apart on the kitchen table. He loved animals and would take his dog with him to work.

He was preceded in death by son, Rickie Buzzard and his parents.

He was a devoted father and grandfather. He leaves behind his wife, Marjorie; cherished daughter, Deborah Buzzard and Keith Sawyer; devoted son, Don Buzzard; grandchildren, Michael Brock (Janice), Victoria Petitt (Brock); Tonya, Nicole, Alisha, and Tiffany Buzzard; and several great-grandchildren, all of St. Joseph; one brother, Charles Buzzard (Ellen), Texas; one sister, Virginia (Buzzard) Straub of Kansas City; numerous nieces and nephews and a multitude of friends.

In Memory of Gary Keith Shearholdt, PLS #2252

Gary Keith Shearholdt, 56, of Springfield, passed away Friday March 4, 2011 after a long, courageous battle with cancer.

Gary was born on June 13, 1954, the son of Robert L. and Dora Murlene (Minson) Shearholdt. He graduated from Central High School in 1972, and began a long career in land surveying, having attained the title, Missouri Registered Land Surveyor on August 31, 1988. For the last 16 years he was employed by City Utilities, spending most of that time in Electric Operations as a Senior Engineering Tech.

Gary was preceded in death by his father, Robert, and his brother-in-law, John Dameron.

He is survived by his wife of 25 years, Mary, of the home; his mother, Murlene of Springfield; his brother, Larry of Kansas City; his aunts, Gladene Hoit of Tulsa, Mary Caffey of Lebanon, Mo., and Sammie Anderson, California; his nieces, Christine Hanvey and husband, Joe of Alpharetta, Georgia, Jennifer Chase of Wentzville, and Cassandra Shearholdt of Kansas City; great nieces, Aiyana Chase, Georgia Hanvey and great nephew, Nick Hanvey; several cousins and many friends.

Mary would like to thank City Utilities Electric Operations and the Greene County Public Administrators office for their love and support. Also the compassionate professionals on Cox South 5 West, and William Cunningham, M.D., the staff of Oncology Hematology Associates and the Wheeler Ambulatory Infusion Center for not only giving Gary more days in his life, but more life in his days.

Because of Gary's love for cats and his desire to rescue as many as possible, the family suggest memorial contributions to the C.A.R.E. Animal Rescue P.O. Box 215 Aurora, MO 65605.

Steve McLaughlin and Rick Reese Retire

At the end of March Steve McLaughlin, Project Surveyor with the Missouri Land Survey Program, retired from the Land Survey wrapping up a lifelong career with ten years of service to the State of Missouri. Steve worked in the Program's Cadastral Section.

Rick Reese's tenure with the Land Survey Program came to an end on the first day of June. Rick is a lifelong surveyor. The last twenty years of his career was spent with the Program. Rick began as the State Parks Surveyor, but spent the vast majority of his time in the Geodetic Section. Both men are dedicated, highly capable and respected Land Surveyors and we wish them well in future pursuits. Even if those pursuits are catchin' fish.

Steve instructs a Boy Scout on the use of a total station during Merit Badge University.

Rick stands at a proposed site for the 2010 United States Center of Population in Plato Missouri.

Missouri Society of Professional Surveyors
54th Annual Meeting

University Plaza Hotel, Springfield, Missouri

October 13–15, 2011

Wednesday, October 12, 2011

7:00–9:00 pm	Exhibitor Set Up and Welcome Reception with Exhibitors

Thursday, October 13, 2011

7:00 am	Registration, Continental Breakfast and Exhibitor Set Up
8:00 am–5:00 pm	Spouses Hospitality Room Open
8:00–12 noon	The Public Land Survey System for Missouri and Arkansas Speaker: **Dick Elgin** This session covers all aspects of the U.S. Public Land Survey System for Missouri and Arkansas (where the rectangular system is different from all other states): The early history of the system (1785–1815), Tiffin's Instructions (1815), the establishment of our Initial Point, the 5th Principal Meridian and Base Line, establishment of our Correction (Standard) Lines, the original surveys of the township exteriors and subdividing townships into sections. GLO plats, lotting schemes and protraction of fractional sections. Resurveys: Comments on statutes, rules and court decisions. Resurvey principles. Standard corners versus closing corners. The 1883 "Restoration of Lost and Obliterated Corners" manual and its application to Missouri and Arkansas. Applicable state statutes and court decisions for both states. Example problems relative to section protraction, proportioning and using coordinate geometry to calculate lost corner positions on our version of the Public Land Survey System.
12:00–1:00 pm	Lunch provided
1:00–5:00 pm	The Public Land Survey System for Missouri and Arkansas (continued) Speaker: **Dick Elgin**
5:00 pm	Reception with Exhibitors

Friday, October 14, 2011

7:00 am	Registration, Continental Breakfast with Exhibitors
8:00 am–5:00 pm	Spouses Hospitality Room Open
8:00–12 noon	Business Meeting
12:00–1:30 pm	Awards Luncheon and View Exhibits

CONCURRENT SESSIONS

1:30–5:00 pm	Surveying Business Session – The Great Game of Business Speaker: **Steve Baker**
1:30–5:00 pm	Understanding Deeds and Description Speaker: **Walt Robillard** The surveyor performs a very important function in preparing land or property descriptions. First, the professional must understand the distinction between the two, yet one is legal and the second is professional. A distinction must be made between preparing a description and then placing that distinction on the ground. In the event ambiguities occur, what can the surveyor expect the courts will rule and what are the controlling elements?

3:00 pm	Final Break with Exhibitors
5:30 pm	BBQ Dinner with "Surveyors Got Talent", American Legion Post 639 The American Legion Post will cater the BBQ at this "family-oriented" event. Bus transportation will be provide between the hotel and the American Legion. There will be three different kinds of BBQ meats with all the accompaniments. Your $20 ticket includes dinner, transportation, drink tickets and entertainment. Other activities also available are horseshoe contest for adults, softball and volleyball for the children. You won't want to miss this event.

Saturday, October 15, 2011

7:00 am	Registration and Continental Breakfast
7:00 am	Past President's Breakfast
8:00 am–5:00 pm	Spouses Hospitality Room Open

CONCURRENT SESSIONS

8:00–12 noon	Ethics and the Professional Speaker: **Walt Robillard** This seminar/workshop will examine the role of ethics in today's professional relationships. The historical foundations and modern approach to business and personal relationships will be explained followed by the presentation of actual, practical ethical questions will help the individual to help differentiate between possible "rights" and "wrongs."
8:00–12 noon	Practical GPS...Back to the Basics Speaker: **Tom Bryant** This session will be very light on GPS theory and heavy on practical usage of GPS in the surveying environment. We will cover how, when and where of using GPS. The session will cover methods of quality control and verification of your data. The history and use of the MoDOT VRS system will be covered. We will also discuss other tools to use to enhance your GPS experience.
12:00–1:00 pm	Lunch Buffet
1:00–5:00 pm	Contracts and Contract Law for the Professional Speaker: **Walt Robillard** This seminar/workshop will examine the importance of working in a business environment from strength; having a valid contract in place before undertaking any project. In today's business world a surveyor simply must assure what is to be produce is understood by the surveyor and the client and that payment will be made in a timely manner for the final product.
1:00–5:00 pm	Minimum Standards for Property Boundary Surveys Speaker: **J. Michael Flowers** Missouri Land Surveyors have been required to meet these standards for all boundary surveys since they were promulgated by the State Land Surveyor's office in the early 1970's. These same standards are dually issued by the State Board of Registration and utilized as the guideline for practice in our state. This presentation will assist the newly licensed surveyor and refresh the old guys like myself with discussion and review of the requirements. It will also fulfill the PLS's continuing educational requirement for four PDUs for license renewal. Please bring a current boundary survey you have completed or were responsible for to use during this presentation.

2011 MSPS Corporate Members As of 6/2/11

ABNA Engineering, Inc., St. Louis, MO
Affinis Corp., Overland Park, KS
Allenbrand-Drews & Assoc., Inc., Olathe, KS
Amsinger Surveying, Inc., Marshfield, MO
Anderson Engineering, Inc., Springfield, MO
Anderson Survey Co., Lee's Summit, MO
Aylett Survey & Engineering, Co., Gladstone, MO
Bader Land Surveying, Inc., Ste. Genevieve, MO
Bartlett & West, Inc., St. Joseph, MO
Barton Engineering Co., Inc., Lebanon, MO
Bax Engineering Co., Inc., St. Charles, MO
Buescher Frankenberg Associates, Inc., Washington, MO
Cardinal Surveying & Mapping, Inc., Cottleville, MO
Central MO Professional Services, Inc, Jefferson City, MO
Cochran, Union, MO
Cochran, Wentzville, MO
Cole & Associates, Inc., St. Louis, MO
Doering Engineering, Inc., St. Louis, MO
Frontenac Engineering Group, Inc., St. Louis, MO
George Butler Associates, Inc., Lenexa, KS
Govero Land Services, Inc., Imperial, MO
Grimes Consulting Inc., St. Louis, MO
Harms, Inc., Eldon, MO
Hood-Rich, Inc., Springfield, MO
Integrity Engineering, Inc., Rolla, MO
John R.M. Nelson, Inc., Bolivar, MO
Koehler Engineering & Land Surveying, Inc., Cape Girardeau, MO
Marler Surveying Co., Inc., St. Louis, MO
Mathews & Associates, Inc., Springfield, MO
Midland Surveying, Inc., Maryville, MO
Migar Enterprises, Inc., Grandview, MO
Olsson Associates, Overland Park, KS
Pellin Surveying LLC, Washington, MO
Phoenix Engineering & Surveying, LLC, Independence, MO
Pickett, Ray & Silver, Inc, St. Charles, MO
Pitzman's Co. of Surveyors & Engineers, St. Louis, MO
Poepping, Stone, Bach & Associates, Inc., Hannibal, MO
Riggs & Associates, Inc., West Plains, MO
Robert S. Shotts, Inc., Lebanon, MO
Schmitz, King & Associates, Inc., Olathe, KS
Shafer, Kline & Warren, Inc., N. Kansas City, MO
Shaffer & Hines, Inc., Nixa, MO
Sprenkle & Associates Inc., Monett, MO
St. Charles Engineering & Surveying, Inc., St. Charles, MO
Taliaferro & Browne, Inc., Kansas City, MO
The Sterling Company, St. Louis, MO
Thouvenot, Wade & Moerchen, Inc., St. Charles, MO
Tri-State Engineering, Inc., Joplin, MO
West Wildwood Surveying, St. Louis, MO
Whitehead Consultants Inc., Clinton, MO
Zahner & Associates, Inc., Perryville, MO

The Patron Saint of Land Surveyors

Land boundaries and stable land systems are at the very foundation of society. The art and science of proving existing boundaries and creating new ones date from the time of the ancients, and it is the land surveyor who maintains the ancient and fundamental foundation land systems are built on.

The ancient practice of the art and science of land surveyors is clearly demonstrated in the Bible. Ezekiel 40:3 says, "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." Our tools have changed. We don't measure with a line of flax and measuring rods, but it is still the professional land surveyor who stands in the gateway. Today, we stand in that gateway where the ancients placed us with our charge to protect the public. We protect the public in much the same way as we always have. We gather and evaluate the written record evidence that describes the land. We gather and evaluate the record telling us how the land has been divided. We gather and evaluate the record evidence of previous surveys that may have an effect on the land. We gather evidence of landmarks and features on the ground. We use these to reason and form a learned professional opinion represented by our plats and our reports. We seek proof and truth to restore and reestablish what has been done before, and to establish what is intended by new divisions today.

The New Testament tells us that the Apostle Thomas was incredulous and filled with doubt when the other Apostles announced that Christ had risen. Thomas alone said, "Except I shall see in his hands the print of the nails, and put my finger into the place of the nails, and put my hand into his side, I will not believe" (John 20:25). He has since been known as "Doubting Thomas." Little is known about St. Thomas before he was called to be an Apostle of Christ. We do know St. Thomas the Apostle doubted and sought evidence and proof, just as land surveyors seek evidence and proof. Perhaps he did stand in the gateway with lines of flax and a measuring rod in hand, but there is no doubt that St. Thomas the Apostle's selection as the patron Saint of land surveyors is especially fitting and appropriate.

Please Patronize Our Supporters

Missouri Society of Professional Surveyors
P.O. Box 1342
Jefferson City, Missouri 65102