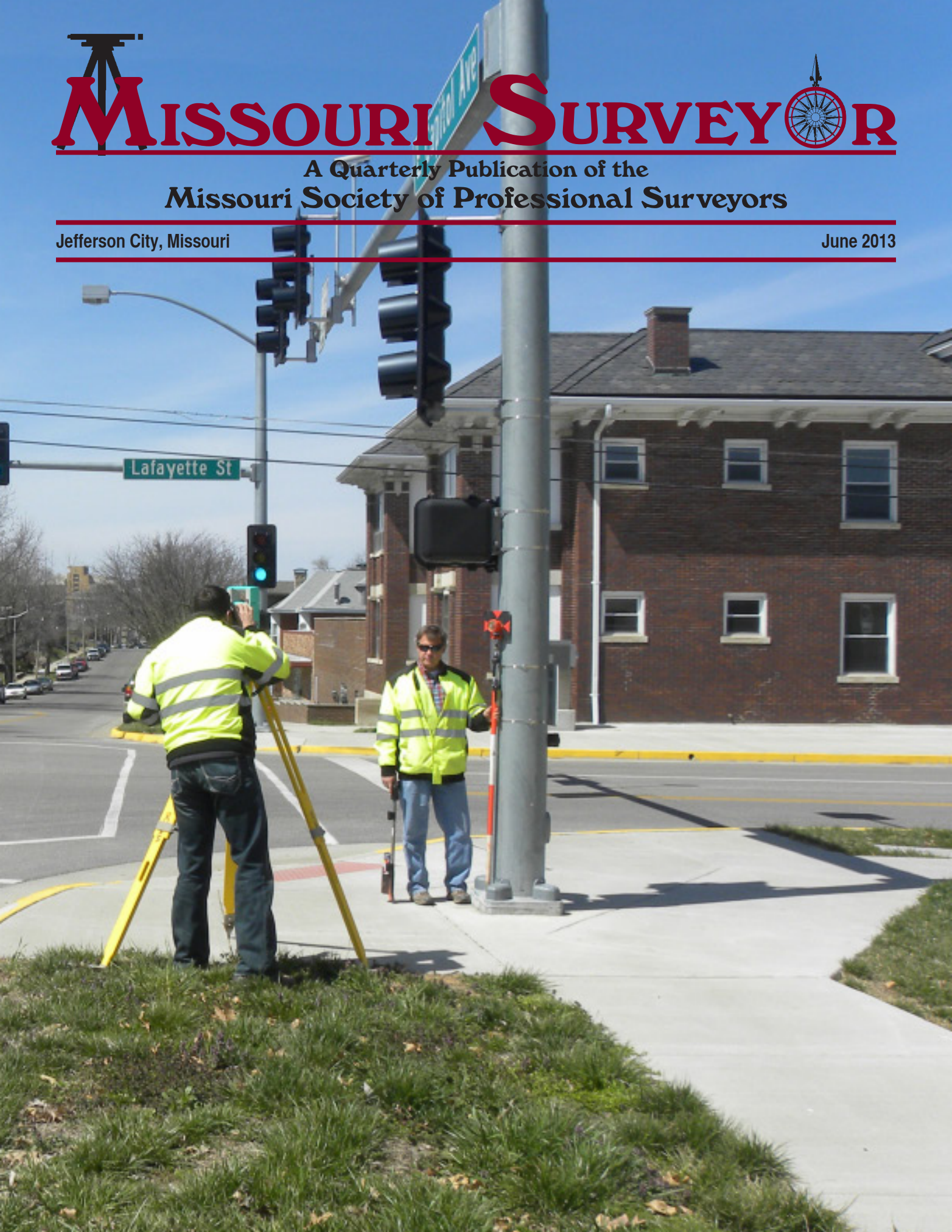
Missouri Surveyor

A Quarterly Publication of the
Missouri Society of Professional Surveyors

Jefferson City, Missouri June 2013



MISSOURI SURVEYOR

CALENDAR OF EVENTS

2013-2015

July 12-13, 2013
Board Meeting and
Pac Fundraiser Golf
Tournament
Minimum Standards Workshop
Capitol Plaza Hotel
Jefferson City, MO

August 28-30, 2013
Review Course
Best Western Capital Inn
Jefferson City

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

December 2013
Board Meeting
MSPS Office
Jefferson City, MO

May 8-10, 2014
Board Meeting and
Spring Workshop
Lodge of Four Seasons
Lake Ozark, MO

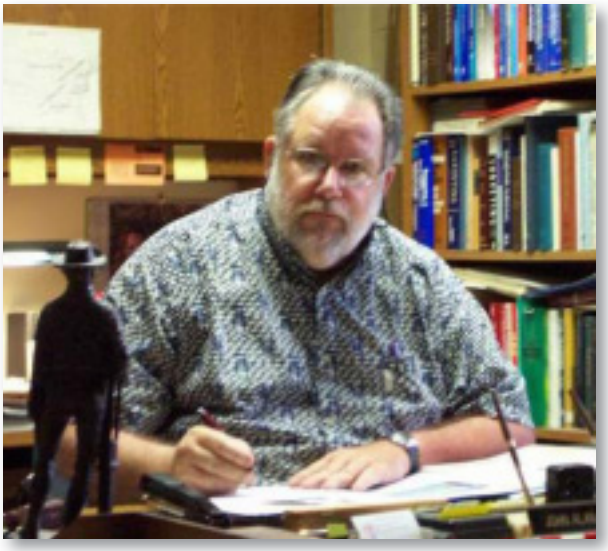
October 23-25, 2014
57th Annual Meeting and
Convention
Joint Meeting with the Kansas
Society of Land Surveyors
Sheraton Overland Park Hotel,
Overland Park, KS

May 7-9, 2015
Board Meeting and Spring
Workshop
Lodge of Four Seasons, Lake
Ozark, MO

John Alan Holleck, Editor

Notes from the Editor's Desk

John Alan Holleck



TGIS…(summer)!

School's out, and the weather is turning into summer, with some unfortunate outcomes. On behalf of MSPS, if you or yours have experienced some of the problems we've seen throughout the state with tornadoes, flooding, and other storm-related issues, we wish you the best and a speedy recovery.

This issue of the *Missouri Surveyor*, as always, starts with the President's Message. Ms. Herman is reporting another very successful session for surveyors and thanking all those that made it possible. Many thanks go to our Legislative Consultant (Mo McCullough) for his continuing fine work for the surveyors of Missouri.

Next up is a report from our NSPS Governor, Troy Hayes who has presented a detailed report of the last NSPS meeting in Gaithersburg. Troy continues his volunteer efforts on behalf of Missouri surveyors (I think I see a trend). Missouri is one of 22 states that are participating in the joint membership program with NSPS.

Next we are sad to report the loss of three surveyors, two who are past presidents of MSPS. Bill Shafer and Bill Kankolenski both passed away recently – one very suddenly. The third was a long time member of MSPS (Mike Manier). All will be missed.

We are thrilled to report that finally the new book "The US Public Land Survey System for Missouri" will be available at the MSPS annual meeting in October at the Tan-Tar-A Resort in Osage Beach. Dr. Richard Elgin will be reporting on the book and signing copies at the Friday evening reception. You don't want to miss this meeting to be one of the first to pick up your autographed copy.

Following in the *Missouri Surveyor* are several great reprinted articles from our neighboring newsletters… *"When Did Surveyors Stop Surveying?"*, *"A Question, An Answer and A Story…"*, *"Railroad R/W Centerline May Not Be the Center of the Tracks in a Curve"*, *"Subdividing Closing Sections"*, and *"A Classroom in the Snow"*.

Included with this newsletter is two opportunities to register for upcoming MSPS events – the Minimum Standards Workshops which will be held in Jefferson City this year and the Review Course taught by Dr. Elgin, Joe Paiva and Michael Flowers.

Have a great summer.

John

THE MISSOURI SURVEYOR

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Missouri Society of Professional Surveyors

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*The **Missouri Surveyor** is published quarterly by the Missouri Society of Professional Engineers, to inform land surveyors and related professions, government officials, educational institutions, contractors, suppliers and associated businesses and industries about land surveying affairs. Articles or opinions appearing in this publication do not necessarily reflect the viewpoints of MSPS but are published as a service to its members, the general public and for the betterment of the surveying profession. No responsibility is assumed for errors, misquotes or deletions as to its contents. Articles may be reprinted with due credit given.*

President's Message

Sharon Herman, PLS

Spring has been a busy time for our organization. The State Legislative session ended with MSPS having much success in the passage of some key legislation. Thanks to the dedication and hard work of our lobbyist, Mo McCullough, Representative Robert Ross, Representative Bart Korman, Representative Rocky Miller and Senator Brad Lager, the Land Survey Program will be moving out from under DNR into the Department of Agriculture. The same bill will rename the building that the Land Survey Program resides in to the Robert E. Myers Building. This is some well deserved recognition to our first State Land Surveyor who did so much in establishing the land survey program as we know it. We had less success with the legislative bill to increase the education requirements for licensure. MSPS will continue to work on this much needed change over the summer to be ready for another go around in the next session.

Our spring workshop was held the middle of May. The presentation on Laser Scanning technology really got me thinking. This is a new area that surveyors have an opportunity to get into at its infancy. It is a fast moving technology that will change the way construction projects are designed, delivered and constructed and a chance to expand our area of expertise that shouldn't be missed.

Warren Ward gave an excellent presentation on Pin Cushion Surveys. For those of us in the audience, he made some very good points relating to the benefits of mandatory recording of surveys and improving the surveyors' professional image with the general public. This was a timely subject as MSPS looks once again at expanding our recording requirements.

The Recording Steering Committee held their first meeting in May and had a good turnout of surveyors voicing a full spectrum of views on recording.

Next up for our society will be the Minimum Standards Workshop on July 13th. Hope to see all of you there.

Front Cover: While Abi (Padgett) was out walking in front of the MSPS office in Jefferson City she spied a couple of surveyors from the City of Jefferson City. Ric Hurst, PLS and Andy Koenigsfeld were doing a preliminary topographic survey of East Capitol Avenue. (Capitol improvement projects require collecting data on all contributing factors that might pose an interest to the scope of cost estimation). If you come across any photos like this, please send them our way and we'll use them either on the cover of the newsletter or with an article. Thanks!!

NSPS Governor's Report

by Troy Hayes, PLS, Missouri NSPS Governor/Director

I attended the spring business meeting of NSPS April 12-14 in Gaithersburg, MD. As of the date of the meeting 22 states, including Missouri, have signed the MOU with NSPS to become affiliate members. I had the privilege of representing Missouri on the NSPS Board of Directors at the first board meeting held after the re-organization of NSPS. MSPS was presented with a certificate of appreciation for being a leader in the campaign for affiliate membership and I will deliver the certificate to the MSPS board at the May meeting.

On Friday April 12 1 attended the NSPS Education, NSPS Membership, and NSPS Private Practice Committee meetings. I volunteered to serve with 5 others on the Education Committee for the upcoming year. The Mission Statement for that committee is "Helping the Surveying community to advance professionally, by promoting opportunities for surveying education and training". We will be developing the NSPS Educational Plan over the next several months. This plan will include developing model curriculums for surveying programs, looking at educational requirements for licensing, and also looking at continuing education for licensed professionals and how NSPS can assist affiliate members with providing quality programs for their members. I felt that this committee was dealing with many of the same issues we are currently dealing with here in Missouri and that I might gain information through the process that would benefit our planning here at home.

The membership committee reported that 22 states have officially executed agreements for affiliate membership and that the membership of 12 additional states have approved it and are waiting for the start of the next dues cycle to execute the agreement. There was much discussion regarding the new structure of NSPS and how we can capitalize on it to further promote the profession.

The Private Practice Committee has been inactive for a number of years and this meeting was just a brainstorming session on how the committee could be revived and what issues it should focus on to best benefit those of us in private practice.

The Governor's meeting was held on Saturday April 13. The morning session of the meeting consisted of presentations by the new NSPS Government Affairs consultant, John Palatiello of John Palatiello and Associates, and the new NSPS Media Consultant, Neil Sandler of Flat Dog Media Consultants. They facilitated a session to identify critical issues to NSPS and the surveying profession and how to best move forward to address those issues. This was a very productive session and I think the NSPS Board and staff did an excellent job in selecting these consultants.

The normal business of the Governors was conducted in the afternoon. The only new motion considered was a motion recommending that the NSPS ALTA/ACSM committee review "ExpressMAP" services offered by First American Title Insurance Company, to see if it violates professional practice and direct the committee to recommend an appropriate course of action. The motion was approved to be presented to the BOD, but the consensus was that whether or not if violated professional practice standards would have to be considered on a state by state basis.

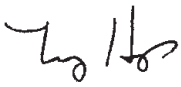
The BOD meeting was held on Sunday morning and included installation of the new President and officers. The new president is Lamar Evers of Florida. The meeting consisted of various officer and staff reports. NSPS Treasurer John Fenn reported that many of the affiliate states have still not made their first dues payment so the operating capital remains low, however significant savings have been realized by moving the office and restructuring to eliminate the cost to ACSM. The reserve capital in CDs remains intact and should remain so provided states begin submitting dues soon. The Governors motion on Express Map was approved by the BOD and the setting of a time and date for the next meeting was tabled pending additional information.

I would also like to report that MSPS has submitted our first payment to NSPS along with a list of all of our members who have paid their 2013 dues. Those who have

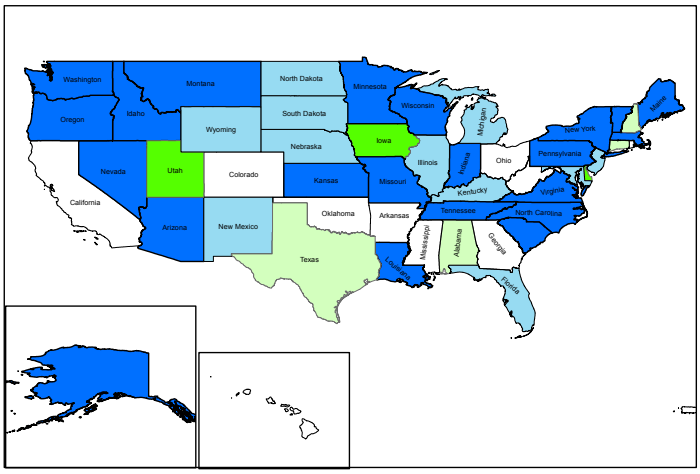
should receive their membership packages from NSPS in the near future. This meeting was the most productive and positive I have attended since becoming Governor. The reorganization and increased membership due to affiliate states has provided an opportunity for change and revitalization of NSPS. I am excited about the prospects for the future of the organization and our profession.

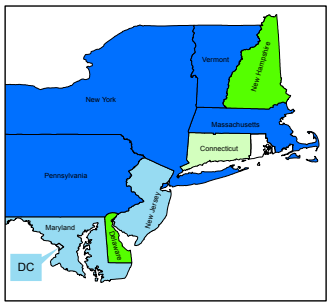
One additional thing that was discussed was the need for more interaction between our state executives and the NSPS staff. They are encouraging all states to consider sending their exec to the spring meeting next year and I would encourage MSPS to consider additional funds in next year's budget to allow Sandy to attend. I think it is important for her to have some input and would gladly reduce my travel budget if necessary in order to allow for her to go. There was also considerable discussion about moving the fall meetings around the country to some more central locations. It was suggested that NSPS "tag along" with the annual meeting of an affiliate state. There is not a more central location than Missouri and I would like for us to pursue being the first affiliate state to host the national meeting.

Respectfully submitted,



NSPS 100% Membership Participation





Legend

- Signed MOU
- Membership Approved
- Board Approved
- Positive Response
- Rejected
- Negative Response
- No Reponse

Date: 5/13/2013

Note: The process for a state society to approve the NSPS 100% Membership Participation Plan varies. Some states only need board approval, while other states need membership approval. The categories for this map reflect the current status of the state society as reported.

In Memory of William Irven Shafer

William Irven Shafer (Bill), born March 14, 1926 in Wamego, KS, passed away May 18, 2013. He served in the Pacific Theater of World War II as a private first class in the US Marine Corps. Upon return to the states, he met and married his beloved wife, Joyce in 1947 while attending Kansas State University. He graduated in 1950 with a Mechanical Engineering Degree. He subsequently pursued a life long career in land surveying and civil engineering. At Shafer, Kline, and Warren Engineering Company, a company originally founded by his father, he worked his way up from employee to become a principal and leading partner. Throughout his life he felt a strong sense of family and civic responsibility. He served as one of original volunteer firefighters for the city of Overland Park, where he also served as reserve police officer and firearms course instructor. In addition he served on boards and as president of Kansas Land Surveyors and Kansas Professional Engineering Society. He served as president of the Missouri Association of Registered Land Surveyors in 1972. He donated his time as a Boy Scout leader and other professional talents to churches and other civil organizations. He loved hiking, camping, hunting, four wheeling and woodworking. He is survived by his wife, Joyce of 65 years; his two sons, Steven (and his wife Tracy) and Kent (and his wife Linda); his two daughters, Karen (and husband Doulas Alvord) and Sandra (and husband Brian Miller). He also is survived by 12 grandchildren and by 9 great-grandchildren. A memorial service was held at 6 p.m. Wednesday June 5, 2013 at the Valley View United Methodist Church, 8412 W. 95th St., Overland Park, KS. 66212. You may make a donation to Hospice, Salvation Army, Wounded Warrior or your favorite charity in his name.

In Memory of William S. Kankolenski

William S. Kankolenski, of Little Valley, NY passed away on Monday, May 13, 2013. He was born in Niagara Falls, NY on October 17, 1957, a son of William P. and Mary S. [Gourlay] Kankolenski of Lewiston, NY.

Bill graduated from Trott Vocational High School and from Ferris State University in Big Rapids MI, with his Bachelor of Science degree in Land Surveying. He served with the US Air Force, from 1976 until 1980; and the MO National Guard in 1985.

Bill was a successful professional land surveyor for 32 years. He was currently working with the Cattaraugus County Department of Public Works. He was a licensed surveyor in Missouri, Illinois, Kansas and New York.

Bill was an Adjunct Professor in Land Surveying at Washington University, the University of Missouri - Rolla and at St. Louis Community College all in Missouri.

Bill taught courses which prepared surveyors to become licensed. He served as President of the Missouri Society of Professional Surveyors and served as Missouri's Governor to the American Congress on Surveying and Mapping with the National Society of Professional Surveyors; as well as a member of many other surveying organizations. He was a licensed Cessna pilot and real estate agent.

Bill loved spending time with his family and grandchildren at the family hunting camp "Sleepy Hollow" and on the family cattle ranch back in Missouri. He was a outdoors man who enjoyed hunting, fishing, skiing and golfing. Bill was an avid Buffalo Bills fan and attended the NFL Hall of Fame induction of Jim Kelly with his sons. He attended every football game that his sons had played during high school and college.

In addition to his parents he is survived by his wife of 10 years Belinda G. [Chapman] Kankolenski, his children Jeffrey S. Kankolenski of St. Charles, MO, Tyson J. Kankolenski of Overland Park, KS, Jonathan M. Kankolenski of St. Charles, MO, Kelly A. Kankolenski of St. Louis, MO, Matthew O. (Ashley) McCarter of Rolla, MO and Amanda L. Hensley of Salem, MO, Pap-pa of Mackenzie, Wyatt, Brenden, Daniel, Dylan and Lucas, two brothers John K. and James D. Kankolenski, one sister, Donna J. (Larry) Capatosto. He is also survived by many nieces and nephews.

Interment with Military Honors in Holy Trinity Cemetery, Lewiston, NY.
Visit www.rhoneyfuneralhome.com, for guest register

That Old Client Could Cost You Your License

by Ray Mathe, PLS, BPELSG Staff Land Surveyor, Reprinted from *California Surveyor*, Fall 2012

Beware, there is a trap that could affect your practice as a Land Surveyor! What I am talking about is Section § 8765(c) of the Professional Land Surveyors Act (PLS Act).

Do you remember that project you started three, four or maybe ten years ago, when you went out and did a preliminary survey for a land development project? I mean, let's face it, for those of us that were working in the arena where your client cared more about scope and schedule than the nice fee you were charging them ... it was an incredible season where engineering and surveying companies took in record profits. Seems like a hundred years ago, doesn't it?

There are hundreds of projects that just stopped one day. Topographic maps, approved tentative maps, construction staking files, improvement plans - all sitting on the shelf collecting dust. Many times our clients are no longer there. Bankrupt, restructured or sitting somewhere under another LLP waiting to get back into the land development game.

Those projects you never completed because your client wasn't going to throw away another dime because the economy was failing under the weight of inflated

home prices and predatory loans. At the time you performed those field surveys, you were not required to file a Record of Survey if your survey, disclosed any of the criteria detailed in Section § 8762(b)(1-5) of the PLS Act since Section § 8765(c) afforded an exemption as you were going to record your map in accordance with the Subdivision Map Act.

Well, not only are those documents collecting dust on your shelf, many of the tentative maps have long since expired, and there are no extensions available for them. Now it is pay day someday, your exemption under § 8765 expired with those tentative maps, and you are on the hook to file a Record of Survey or at the very least, a Corner Record for each of the defunct projects. Oh, and it doesn't matter that your client, contract, and maybe the old company you worked for, are expired too!

That's right, a contract or a client to pay the bill doesn't relieve you from the responsibility to comply with the law. However, depending on the contract in place at the time, your former employer could possibly have some shared responsibility as well. Although, your relief might come from the civil courts - don't get your hopes too high, administrative law regulates our practice. If you choose to stick your head in the sand and pretend there isn't a problem, your issues could become insurmountable for your license. You could face administrative fines in the amount of $5,000 per violation or worse.

In situations where you have not met the filing requirements, the Board's primary concern is compliance. But, if there is negligence and/or incompetence as a result of too many projects, or refusal to meet your obligations, you could find yourself in the middle of the formal disciplinary action process. Administrative fines or formal discipline, either way you will be required to file your Record of Survey.

The solution for you right now is to identify your old projects that require filing and submit an acceptable record to the county surveyor. Here is the silver lining: you don't need to bring the surveys up to date. You do, however, need to clearly represent the survey you performed at the time you were working on your project. Simply put, identify on the face of your map that the survey performed represents a survey in (insert date) and represents the conditions that existed at that time. Keep in mind the PLS Act filing requirements are there so that other professionals and the public know the basis for your work and a record of the evidence you found (and left) at the time of your survey.

Now is the time to look through those old dusty files and deal with those surveys you started a long, long, time ago. Don't get caught in the denial trap, the industry and the public need good surveyors - you might as well be one of those surveyors. While it may cost you some money to complete these projects, it is always a good time to do the right thing.

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 Valley Community College — St. Louis, Missouri
Contact: Richard Unger
Florissant Valley Community College
3400 Pershall Road
St. Louis, Missouri 63135
314-513-4319

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

Footprints of the past

by Gerald Fussell, PE, PLS, District 4 Chairman, Reprinted from *L' Arpenteur Louisiana*, February 2013

Recover and Preserve a Section Corner

On November 29, 2012, a mission was launched to recover the Section corner common to Sections 7 and 18, Township 18 North Range 14 West and Sections 12 and 13 Township 18 North Range 15 West, Northwest Land District, Caddo Parish, Louisiana. The survey team consisted of Gerald Fussell, PE, PLS; Don "Ricky" Wood, II, PLS; Jeremy Smith, Party Chief; Josh Scott, Instrument man; and David Lussier, Instrument man.

This corner was established by the Government Land Office in 1924 and was monumented with an iron post three feet long, two inches in diameter, thirty inches in the ground with a brass disk marked with the section numbers. Said corner was in conjunction with a resurvey of Cross Lake. Cross Lake lies North and West of the City of Shreveport. This corner is now in the middle of Roy Road which is a Caddo Parish and City of Shreveport maintained road.

R. N. Kelly and J. P. Terrell, Deputy Surveyors, surveyed the Township and Range boundaries, the section lines, and the traverse of Cross Lake in the year of 1837. A GLO report sets forth the fact that Cross Lake existed as a navigable body of water in the year of 1812 when Louisiana was admitted to the Union and also in the year of 1849 when the Swamp Land Grant was passed. The report further shows that Cross Lake was formed about the year of 1780, primarily due to the great log raft damming the Red River. In about 1850, the rotting away of the raft and/or cutting new channel allowed the water to begin to recede. In 1872 and 1873 the raft was finally removed, and the lake had practically lost its identity as a permanent body of water and was certainly no longer navigable.

The above-mentioned report further shows that Cross Lake was not correctly meandered in the 1837 and 1838 when the original surveys were made and much valuable upland or high ground was shown as lake by that survey.

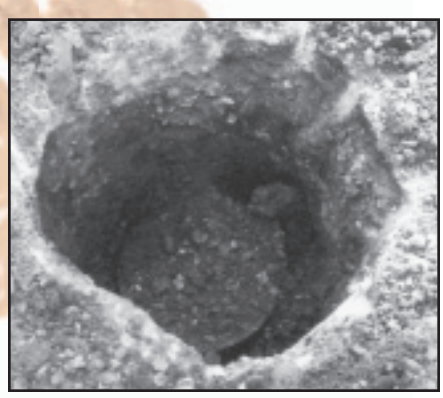
It was determined that 172.00 foot contour line represented the true mean high water line of Cross Lake in 1812 and 1849.

In December of 1923 the resurvey of Cross Lake began. Control for the proper determination of the 172 foot contour line was obtained by running a closed primary level loop around the lake starting at U.S. Engineer's permanent bench mark No. 46, in the NW corner of the public building in the City of Shreveport and closing back to the same point. Then, the Township, Range, and section lines were reestablished. Corners were proven where possible. Corners that could not be proven were established from supporting evidence or were established using double proportion methods for lost corners.

Before reestablishing the meander lines, the latitudes and departures of the original meander line of Cross Lake were calculated as returned in the field notes of the original survey, and the closing error was distributed in proportion to the length of the original courses. The adjusted meander line was then established.

The section and meander corners were monumented with an iron post three feet long, two inches in diameter, thirty inches in the ground with a brass disk marked with the appropriate section numbers or meander corner.

Returning to the subject section corner, we were surveying a tract of land in Section 18, Township 18 North, Range 14 West. Our description called for the aliquot part of said section. We found an iron pipe marking the Northeast corner, reestablished the Southeast corner from old surveys, and found a 2 inch iron pipe with a bass cap, stamped Sections 18 and 19 T 18 N R 14 W and Section 13 and 24 T 18 N R15 W, marking the Southwest corner. The calculated location of the Northwest corner of Section fell in the middle of the asphalt of Roy Road. Our trusted metal locator gave us strong signal. We cut a hole about four inches square through the asphalt, and at about nine inches below the pavement surface, we discovered a metal object. We first thought that it was a water valve box. We covered the hole and regrouped.



We contacted the City of Shreveport and Caddo Parish to solicit their assistance in digging up the metal object. We were optimistic that we would find the GLO marker under the metal and that some Surveyor had enough forethought to preserve the monument before it was destroyed by the construction of Roy Road. In doing research of a survey about a mile north of this corner, we found that dedication for Roy Road was granted in 1926-1928 or only several years after the GLO had set the monument. A representative from the Parish

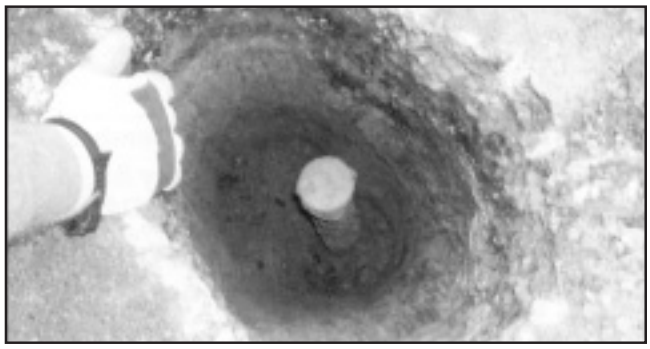
(continued on next page)

Footprints of the past *(continued)*

indicated that they would assist us in recovering the corner.

On November 29th we were surveying the project to the North and thought that the crew may have some time to devote to digging up the metal object. Another crew finished their task at lunch, and Ricky Wood and I met them at the site after lunch. We had two flaggers to control the traffic while the other members of the team began digging through the asphalt. We enlarged the original hole, using pick, punch, and rock bar, to about nine inches in diameter and discovered that the metal was an iron pipe six inches in diameter and a metal cap had been placed on it.

We enlarged the hole through the eight inches of asphalt,



with aid of the rock bar, to get a post-hole digger along one side of the pipe. After over two hours of digging, we were able to rock the pipe back and forth. With much effort, we were finally able to wrap a chain around the pipe and remove it from the hole. It was with great joy and a feeling of accomplishment when we discovered the original monument, still in perfect condition, that was set in 1924.

The brass disk was marked:

R15W R14W
S12 S7
S13 S18
1924

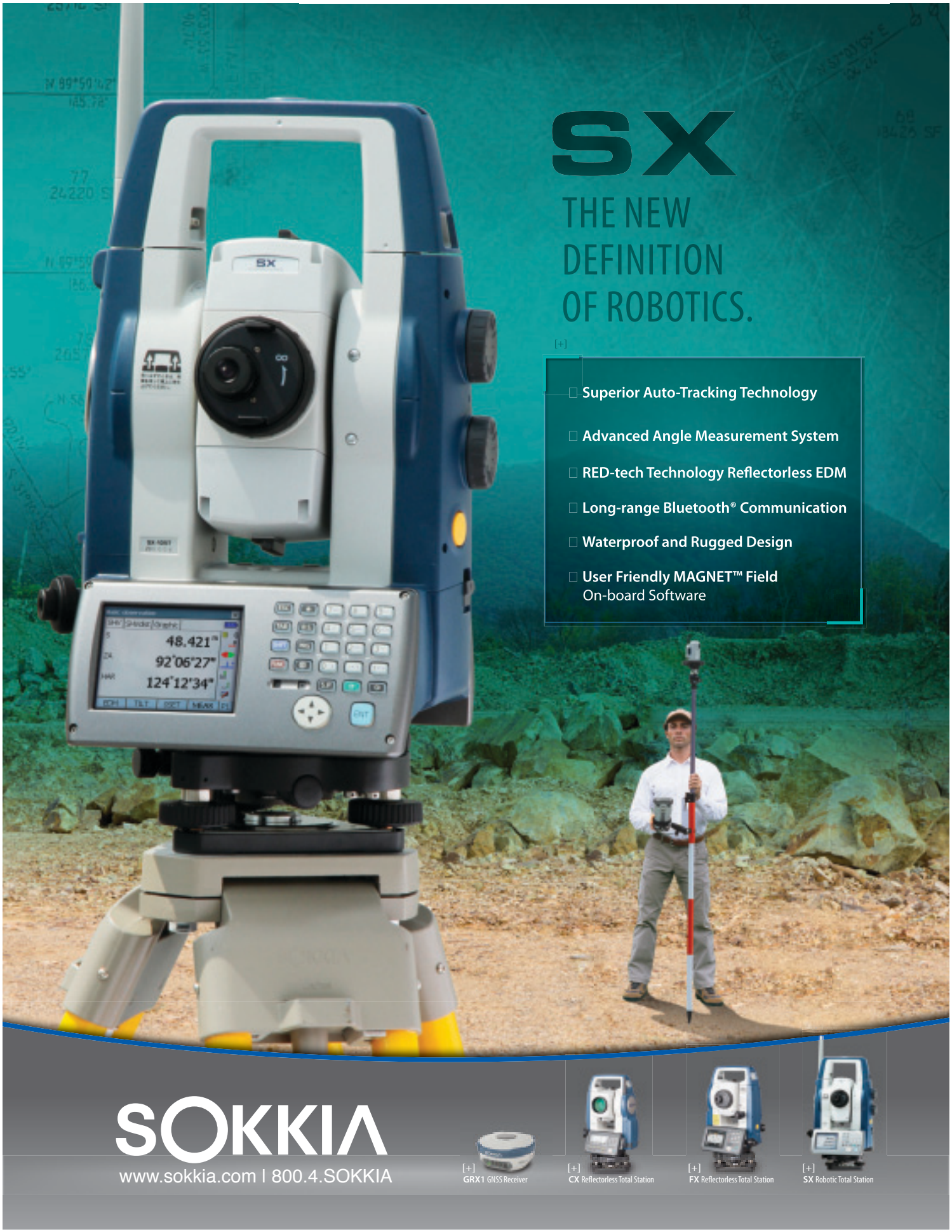
Based on the dates of dedication, we believe that this pipe protecting this corner had been under Roy Road for about eighty years.

We backfilled the hole sufficiently in order to place a water valve box, that we had scrounged, around the pipe and

disk with the top of the box being flush with the asphalt pavement. We finished placing fill and sackcrete to stabilize the box and placed the cover on the box. We had removed the word "water" by grinding and scribed the appropriate section numbers. We also determined the State Plane Coordinates of the monument using GPS. Now a Surveyor can remove the cover and have access to the brass disk that is about ten inches below the pavement.

We take pride in knowing that we have preserved a monument for the use of future Surveyors. In fact, I suppose that it can be said "we" left a footprint as well.

Pictured Left to Right: Josh Scott, Jeremy Smith, Gerald Fussell & Ricky Wood III


SX
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DEFINITION
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Dear Editor:

In reading a batch of Missouri court decisions, I ran across this edict of which Missouri Surveyors should be aware and heed:

"Judgment locating disputed boundary line with respect to defendant's privy would be modified by striking out such reference, since structures are not always permanent in position and do not make good monuments."

City of Marshfield v. Haggard
304 SW2d 672 (1957)

Dick Elgin, LS
Rolla, MO

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The New Book
"The U.S. Public Land Survey System for Missouri"

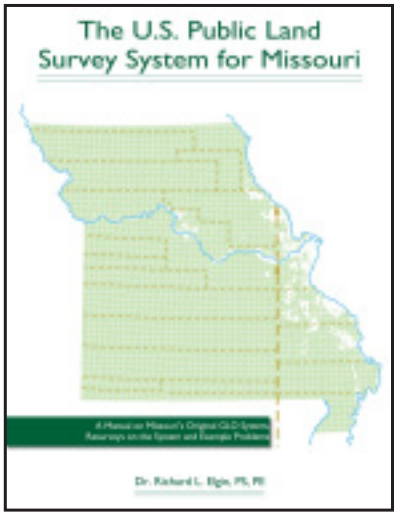
A New Book

Two years ago Dick Elgin approached MSPS about helping finance his book, "The U.S. Public Land Survey System for Missouri." MSPS agreed and the new book will be introduced and available for purchase at the Annual Meeting at Tan-Tar-A in October. Until its publication, a single book has never been available which discusses and explains all aspects of Missouri's version of the USPLSS. This book fills that void covering topics such as the early history of the USPLSS, the French and Spanish land grants, Missouri's boundaries, the original GLO instructions and methods as applied in Missouri, resurveys on our unique system, Missouri court decisions relative to the USPLSS, the reestablishment of lost corners, a historical review of Missouri's statute law relative to the USPLSS, current best practices for reestablishing lost corners, example section protraction and coordinate geometry problems involving proportioning, and, the presentation of about 110 GLO plats with comments. A summary of the book follows.

Chapter 1 "Early History of the U.S. Public Land Survey System; Pre-Missouri: The French and Spanish; and Missouri's Boundaries"

The book begins with the Land Ordinance of 1785 and reviews the early gestation period of the U.S. Public Land Survey System (USPLSS) up to the landmark (pun intended) year of 1815 when the surveys of the public lands began in Missouri Territory with the establishment of the Initial Point of the 5th Principal Meridian. However, long before the Louisiana Purchase both the French and Spanish had been making grants in what became Missouri, some of which ultimately would be confirmed by the United States. Generally, the later GLO surveys would close against these grants (about 3000 of them). The story of these French and Spanish grants in Missouri is summarized.

The section on Missouri's state boundaries begins with the earliest proposal to carve the State of Missouri from the Missouri Territory (1817, a shape which is a far cry from Missouri today) and traces the evolution of the shape of our state and the surveys of its boundaries, which ended with the north line of the Platte Purchase in 1852. It is an interesting story which includes the trodden-on rights of the Native Americans, political interests which shaped (literally) our state, the legal description of our state (written without benefit of prior survey of course), the gallant attempts by Deputy Surveyors to survey our boundaries, the ensuing resurveys of some of the state's boundaries, the Honey War with Iowa, Boundary Commissions for fix our boundaries, and, ultimately, U.S. Supreme Court decisions. Unfortunately some of the boundaries of Missouri which borders on more states than any other state (8) and which probably has brought more state boundary disputes to the U.S. Supreme Court than any other, in some locations, remain in flux.



Chapter 2 "Original Surveys on the USPLSS in Missouri"

Missouri was surveyed under Tiffin's Instructions and subsequent letters of instruction issued by the GLO. The instructions, methods, techniques and probable errors of the original surveys are discussed (and illustrated) in this chapter. The 5th Principal Meridian, the Standard Lines, the township exteriors and the subdivision of the townships are all covered. This explanation is important because today's resurveyor must "follow in the footsteps of the original surveyor." Without knowing the original surveyor's path and perhaps the error(s) of the Deputy Surveyor's ways, this is difficult to accomplish. The conundrum of GLO plat acreage is discussed, as are fraudulent surveys.

Chapter 3 "Resurveys on the U.S. Public Land Survey System"

Original surveys on the USPLSS ended with the GLO. Today the Professional Surveyor accomplishes resurveys

(continued on page 16)

The New Book *(continued)*

(which are more difficult than original surveys) in which we restore obliterated corners and we reestablish lost corners. "Proportioning in" a lost corner is a method of last resort and should only be undertaken after appropriate research, field investigation, and corner evaluation (and followed by reporting). This chapter discusses those phases of the resurvey as well as the Professional Surveyor's jurisdiction and authority.

Chapter 4 "Missouri Court Decisions Concerning Resurveys on the USPLSS"

In addition to statute law, all states have common law (or case law) in which the courts have established legal principles and interpreted statutes. Missouri has a long line of cases concerning the admissibility of surveys (particularly those other than the county surveyor) and also the misguided "Government Corner Rule." Although mostly moot thanks to statute changes in the 1990's, those lines of cases are discussed for historical perspective. There are not many Missouri cases which deal directly with "modern" resurveys on the USPLSS; however, those which do (even the early ones, now moot) are categorized and tabulated. Cases concerning riparian boundaries, prescriptive rights, access rights, unusual conditions on plats, and acquiescence, while of importance and interest to the professional surveyor, are not within the scope of this book.

Chapter 5 "Reestablishment of Lost Corners for Missouri"

The decision to declare a corner position lost and to reestablish it should be the most difficult one that a resurveyor makes. Is the corner truly lost or just obliterated? What were the instructions, methods and techniques of the original GLO surveyor and how might those influence a reestablishment? What case law might influence the reestablishment? What insight into lost corner reestablishments (generally) might be gained from reviewing the GLO's 1883 "Restoration" pamphlet? And finally, what does current Missouri statute law say about the reestablishment of the lost corner position? However…might there be some reasonable, alternative (perhaps "better") solution to reestablish the lost corner position? This chapter discusses all these subjects. It concludes by proposing best practices legal principles for the reestablishment of Missouri lost corners and then compares them to applicable RSMo Chapter 60 statutes.

Chapter 6 "Example Protraction and Resurvey Problems"

Chapter 6 contains example section protraction and single and double proportioning problems. Textbooks or reference manuals are lacking on the typical protraction methods employed in Missouri's version of the USPLSS. Actually, specific to Missouri, they don't exist in a textbook until now. The GLO system used in Missouri is unlike that used in any other state except Arkansas. Double corners on all township exteriors and the blank quarter corners methods combine to produce protraction techniques unique to our state (and Arkansas). This chapter explains the usual protraction scheme used in Missouri through example problems and illustrates the calculations to fully protract fractional sections. Using coordinate geometry, single and double proportion problems to compute the coordinates of lost corner positions are illustrated. There are about 30 example protraction, double and single proportioning example problems in the chapter.

Chapter 7 "Missouri GLO Plats"

Much can be learned about Missouri's USPLSS by studying its GLO plats. The Territory (and later, state) was relatively early in the public lands scheme, is highly fractional due to our many large streams, accommodates the earlier French and Spanish grants, and, due to the poor measurements on the 5th Principal Meridian south of the Missouri River, necessitated our odd placement of Standard Lines. Of the state's 2063 townships, these factors combine to create many, many very fractional and odd-shaped townships. Chapter 7 presents and describes the conditions of about 110 GLO plats which are illustrative of Missouri's "mixed bag" system. The plats used are made possible by DNR's recent high resolution scanning of the state's GLO plats. Reproduced in the chapter, they are in color and are beautiful. They show the artistry of the GLO draftsmen who prepared these first maps of our state.

The Price

The retail book price will be $110.00, but will be available at the MSPS Annual Meeting, and for orders received through 2013 at a discount. After that time the MSPS member price will be $110.00 and the nonmember price will be $135.00 (plus shipping). All book sales will be through MSPS.

The Author

This book, a textbook, reference manual, practice guide, statement of the statute and common law and history lesson of Missouri relative to its USPLSS is the only one of its type in the nation (except for Arkansas). Such a book can only be written by a highly experienced Professional Surveyor and one who is a researcher, practitioner, educator, writer and historian and one who has two years to devote to the project. (Plus the production staff and financial backing to get the book to press.) The author, Dr. Dick Elgin is such a person. Dick's entire professional career has been in boundary surveying. For 24 years, Dick owned and ran the family surveying business in which he was raised. He's taught surveying at Missouri S&T for years, as well as conducted literally hundreds of seminars and workshops on technical and professional surveying topics. From 1985 until the mid 2000's, along with Drs. Knowles and Senne, he developed celestial observation software and ephemerides and wrote on the subject. His interest in collecting and researching early American surveying equipment is reflected in the book as the techniques, methods and errors resulting from conducting compass surveys in the early 1800's is discussed. As he has coauthored three other books on technical surveying subjects and written scores of articles, Dick is accustomed to writing on a technical subject in a manner to teach it. His knowledge of the profession is broad, being a past member of the Missouri Board for Architects, Professional Engineers, Professional Land Surveyors and Landscape Architects and a past president of MSPS. He has the unusual and varied combination of surveying backgrounds to author this important book on Missouri USPLSS.

National Society of Professional Surveyors

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For Immediate Release

NSPS Spring Meetings April 12-14, 2013

NSPS Membership Grows; Communications & Legislative Affairs Programs Launched

The six-month-old national campaign by the National Society of Professional Surveyors (NSPS) to include every licensed surveyor in the United States among its membership is exceeding all expectations, with 22 state societies on board.

"This is truly exciting," exclaimed incoming NSPS President Lamar Evers, PSM. "We've already grown from under 3,000 members to well over 10,000 in this short amount of time, and I expect the other state societies to join in this effort to create a powerful national voice, with strong grassroots support, for professional surveyors."

In addition to the NSPS leadership, about 10 Executive Directors and representatives from 48 state societies and the District of Columbia were in attendance. The overwhelming consensus was that NSPS has begun to turn the corner on an era of activism and a positive new image for the organization and surveyors as a whole. "We are thrilled with the start to this program" remarked NSPS Executive Director Curt Sumner.

Presentations by principals of the newly contracted communications company (Flatdog Media) and legislative affairs consultant (John M. Palatiello & Associates) highlighted the meeting.

"I hope that five or ten years from now we will be able to say we were there at the spring meeting in 2013 that served as the turning point for this proud profession," said Flatdog Media President Neil Sandler. He outlined a communications effort that will embrace social media tools, a newly created blog, and print and e-editions of a monthly newsletter dubbed *Dual Frequency*, to open lines of communications between members of NSPS and leaders of the national organization, as well as providing a strong national voice for the profession.

John Palatiello outlined a legislative affairs program that will:

- serve as the voice, as well as the "eyes and ears of the surveying profession in Washington;"
- keep NSPS members informed of policy issues affecting the profession;
- create business opportunities for surveyors, and
- enhance the professional image of surveyors.

Palatiello also conducted a highly interactive open-forum strategic planning session designed to have everyone in attendance work towards a "common cause solution." Participants helped identify strengths and weaknesses of NSPS and the profession of surveying, as well as opportunities and threats to the organization and the profession. Following a compilation of the comments, a strategic plan will be created for review and approval by the board and NSPS membership.

More information on NSPS's Strategic Plan will be forthcoming.

FIG President CheeHai Teo addressed the NSPS spring meeting. He said that while these are exciting times for surveyors worldwide, surveyors in many other parts of the world are also being challenged to carve out their

(continued on page 20)

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roles. The continuing evolution of the role of the surveyor is being defined and redefined in every quarter of the planet. But professional surveyors can have a huge impact in the improved sustainability of the planet, and the definition of land rights as third world nations redefine their laws with regards to land ownership.

During the NSPS general membership meeting which preceded the strategic planning exercise, NSPS approved a variety of bylaws changes associated with the 100% joint membership program, and the 2013 NSPS officers and directors were installed.

The NSPS Board of Governors met immediately after the strategic planning session. A report on this meeting will be available soon.

The first day of the three-day Spring Business meetings featured a variety of Committee meetings and a well-attended State Society Executives Forum. More than 20 NSPS governors and officers engaged in discussions with the state executives about the excitement, opportunities, and anxieties associated with the new joint membership program.

On the last day of the meetings the NSPS Board of Directors met in its new configuration which included Directors representing each of the 22 state societies that have signed the Memorandum of Understanding for the joint membership program. Outgoing President Bob Dahn presented a certificate of appreciation to each of the 22 new directors. Photos of each of these presentations can be viewed on the NSPS Facebook.

For more information contact:
Trish Milburn, NSPS, at **trisha.milburn@nsps.us.com**;
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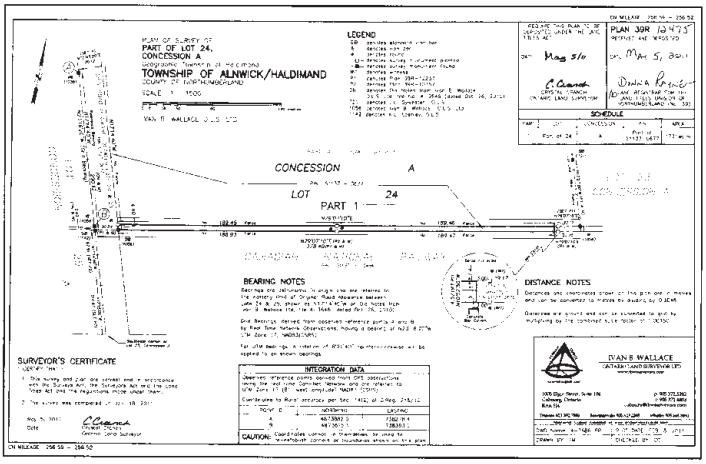
When Did Surveyors Stop Surveying?

by Crystal Cranch, OLS, OLIP, Reprinted from *Ontario Professional Surveyor*, Spring 2012

THIS NOT A SURVEY



This is a survey plan. And a mighty fine survey plan it is. Mighty fine.

So then, what is a survey? What does it mean to survey?

Surveyors survey.

Or at least they should! Read on.

Technology is a great thing. Who is going to argue with that? Technology has changed the way we survey. Who can argue with that? Technology has made us better surveyors. Hmmm, I am not convinced. Back before the days of robotic total stations, data collectors and GPS receivers, the completion of field work was very different. Before technology allowed us to make use of the rewards of the digital age, we used parallel offsets and cumbersome calculators. We instinctively used the SIN, COS and TAN buttons on these calculators, and we understood that angles were merely another form of measuring distances. (Think about the x and y-axis). Before we had access to instant global positioning, we used a much lower form of math to a much better outcome. Let me explain.

Today's trained staff understands the basic theory of the high level mathematical analysis that allows us to use satellites to determine precisely where we are on a global scale. We send our field crews out to sites with the latest and greatest in surveying equipment. They can punch buttons and save digital data at a rate that is mind-boggling. But does all this fancy and expensive equipment create better surveys? I am going to argue that the opposite is true.

Today's highly trained staff can use coordinate geometry to assess almost any mathematical solution in boundary retracement. I use math every day. I remember when I first learned how to use COGO, and how I played with the numbers until I could re-create the same mathematical solution that was created in the original survey. I remember the excitement I felt when I could show that if this one bar was 5cm west and 8cm north, then everything was plan and measure. I had great confidence in my solutions and was excited to be such a friggin' genius. Bring it on! I am the man! I mean, I am the woman! I quickly recognized the benefits of these amazing software packages that would enable us to blow our own minds out with mathematical analysis that would leave our Grade 12 math teachers in a state of awe. Eat your heart out Mr. Brown. This is an A++ solution.

For years I walked around with a mathematical claim of greatness that elevated my status as a surveyor. I was young(er) and more naive. Time and grace has led me to a position in life where I am more apt to admit my earlier flaws. I believed that this combination of technology in the field and software in the office made me a much better surveyor. I felt sorry for those surveyors who had to actually pull out their plumb bobs and run parallel offsets. I was so glad to see those dark ages fall behind us. I believed that technology allowed me the pleasure of living in an enlightened and advanced state. Now I have to admit that time has altered my perception - cleared my vision.

You see, in the dark ages when we ran parallel offsets, we actually did surveys when we were in the field. Today, we collect data. The problem with the blind collection of data is that it takes away the need to think. We are no longer completing surveys when we are in the field, we are just collecting data.

To make matters worse, as time went on, and data collection became more and more the norm; we gave up doing any assessment while in the field. Soon, we were gathering data that was not always the data we needed. Sometimes we gathered too much data. Often we gathered the wrong data. As time went on, there was less and less thought on the part of the field staff about what they were doing-which should have been to "survey". Questions like, "Since that bar looks to be disturbed, what other evidence do I need to pick up to ensure the corner can be properly retraced?" became obsolete. The new question is, "Do I have enough battery power to get through the day?" Heaven forbid if we run out of batteries.

In the dark ages, we could not easily assess high level mathematical solutions. Calculations were a part of the job description, but it meant lengthy and cumbersome

formulas and analysis. Back in the dark ages we did not take the time to "play" with the numbers to see if there was a better mathematical fit. **Rather than spending time assessing mathematical solutions, we spent our time assessing evidence**. I vividly recall when this epiphany hit me. I had spent a lot of time and effort with my COGO friend to find a perfect solution. It resulted in me calling three survey bars out by 3 or 4cm. I was proud of the fact that I had achieved mathematical perfection. But then it hit me. I had seen these bars in the field, and every one of them looked to be in their original position. The survey mantra "original bars in their original locations" came crashing into my world. For months I had nightmares that involved me sitting on a wooden stool while the "good" surveyors pranced around me chanting "Original bars - original location....". There were the voices of Lambden, de Rijcke and Stewart chanting an endless and off key chorus. Please, I begged, make it stop. I vowed to better myself. I would not become the laughing-stock of the profession. There are already enough people vying for this honour. (Here is where I am supposed to add 'lol' for those reading this without a sense of humour.)

And so I completed an internal audit of my own surveying practices. Not only was I "math'ing" these projects to death, I was looking at field notes that were not "surveys". The notes showed "stuff" and point numbers, but they did not show any evidence of evidence assessment. They did not indicate a survey was being done. They were just a page of numbers corresponding to a whack of data. Did I have the right data? Was I missing data? Did the field staff know that their role was to locate enough evidence to retrace the original boundary? Did I know that it was my role to retrace the original boundary?

I now recognize that math can be one of the many tools that I can use to help me survey, but math must take its rightful place behind the assessment of evidence. Math can be used to help re-establish a boundary corner when no other evidence exists. But what happens when we calculate where the old fence corner was - then we tell our field staff to go set a bar there - then they set the bar two feet away from where the old fence post still stands without telling us about it - THAT IS NOT SURVEYING. Technology can be a cool tool used to allow us to survey in the digital age, but using technology without understanding what you are using it for is not helpful. What happens when we use a RTK receiver to locate that bar on the block corner, but not even think to locate that really old fence next door to the property we are surveying - THAT IS NOT SURVEYING. When did surveyors stop surveying?

Crystal Cranch is the surveyor of record of Ivan B. Wallace Ontario Land Surveyor Ltd. in Cobourg. She has created a blog on the Internet titled *Surveyor Says What???* It can be found at www.surveyorsayswhat.wordpress.com. She can also be reached by email at **crystal@ibwsurveyors.com**.

Southwest Chapter's 7th Annual Fall Workshop
Thursday, August 22, 2013.

Speaker: Dennis Mouland

Topics: "To Accept or Not to Accept" (4 hours) and "Thinking Beyond Technology" (4 hours).

Time: Doors open for registration at 7:30 am, classes begin at 8:00 am.

Location: Christ's Community United Methodist Church, 2700 East 44th Street, Joplin, Missouri.

Lunch: Catered Buffet at 12:00 noon from Red Hot & Blue and Charlie's Chicken.

Directions: From Exit 8 on I-44, head South along Range Line Road approximately 0.4 mile to the 44th Street Signal, head West along 44th Street approximately 0.25 mile to Church's driveway on South side of street.

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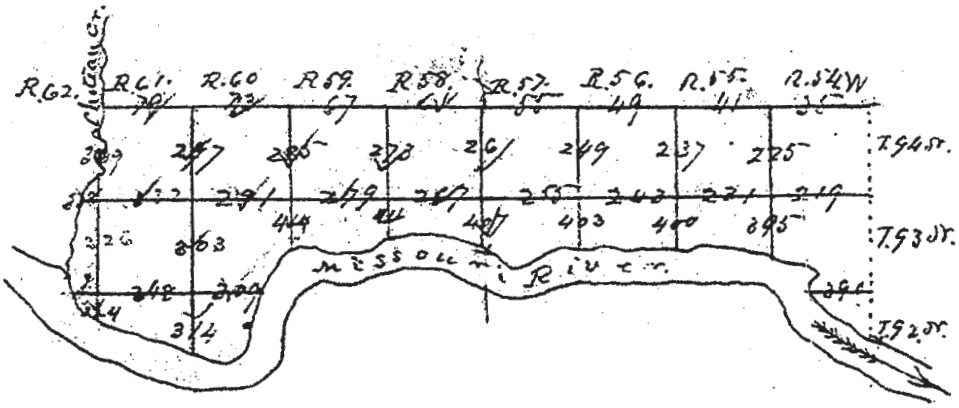
A Question, An Answer and A Story...

by Warren L. Fisk, PE, LS, Reprinted from *Backsights & Foresights*, February 2012

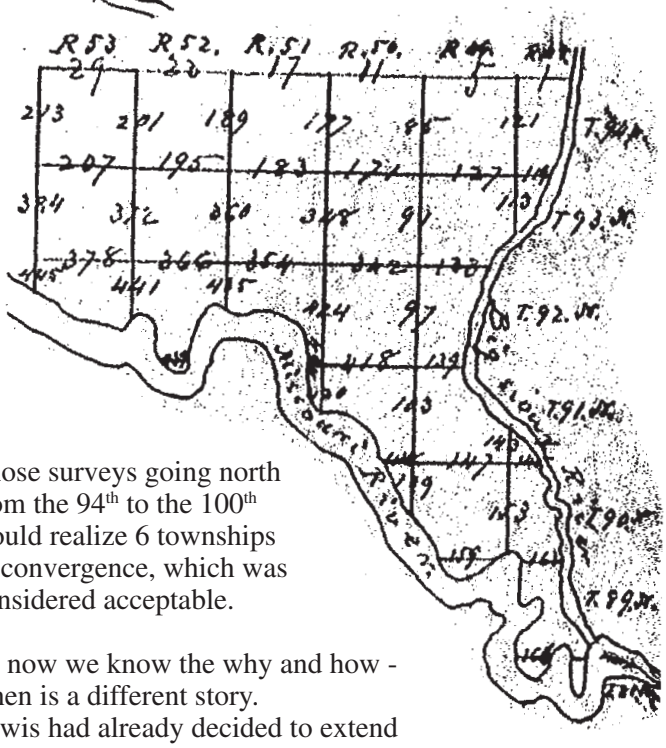
Why, in South Dakota, are there no Standard Parallels, no correction lines and no Guide Meridians in the 5th PM below Township 100 North? How can that even be done, when the Meridian distance from Sioux City to Sioux Falls is about 72 miles? The convergence in one four Township block is about 11 chains according to the example on page 56 of the 1973 Manual of Surveying Instructions. Three such blocks stacked upon each other would produce 33 chains of convergence, thus yielding fractional townships instead of regular townships. However, on the ground, the convergence at Township 100 North is about half of that. Why is that?

WILLIAM MINER



The answer lies in politics, clever planning by the Surveyor General, and economics. Even though the lands between the Missouri and Big Sioux River were still in what was considered "Indian Lands" in the late 1850's, by 1858 the Native Americans had ceded a very large part of this land and it was open for settlement as soon as surveys were completed. The land in question did not have Territorial status at that time, so the Surveyor General of Iowa, Warner Lewis, held jurisdictional authority and was in charge of the surveys.

Under normal circumstances, it would have been appropriate to extend the Standard Parallels in Iowa westward on the 88th, 92nd, 96th and 100th Parallels. The downside of this approach is that it would be time consuming and expensive. In order to avoid having too many squatters ahead of the surveys, particularly from Sioux City and north as far as the river town and port of Yankton, Lewis devised a plan where the excessive convergence could be avoided. By running one line east from the north-south halfway point, at the 94 North Township, the surveys could then be extended south to the Missouri. Instead of convergence, the townships would realize divergence.



Those surveys going north from the 94th to the 100th would realize 6 townships of convergence, which was considered acceptable.

So now we know the why and how - when is a different story. Lewis had already decided to extend the north line of Iowa westward into the Indian Lands, but only as far as

the Vermillion River. This line was called the north line of Township 100 North, even though the Township was only 5 miles north-south. It coincided with latitude 93 degrees 30 minutes North, which was the political boundary of Iowa. William Neeley was the chosen surveyor and his contract included an extended guide meridian north between Ranges 52 and 53 West, along with blocking out several Townships east of that guide. Neeley completed his contract in 1859 and that was the total of his work in the future Dakota Territory.

The next urgent need was in the Missouri and Big Sioux Valley and Lewis contracted with a favored Iowa firm of Ball & Darling. It was recorded that a William Miner of Yankton traveled to Dubuque seeking the contract, but he was not successful. However, John Ball's notes later reflect that Miner was a chainman on the crew. It was an interesting crew. Notably, the Surveyor General's son, Thomas Lewis was also a chainman. I wondered if his employment was a tacit condition of the contract award. Secondly, according to Miner's account, another member of the crew was a Bill Jones, son of a U.S. Senator from Iowa. However, Jones does not appear in Ball's listing of chainmen, axemen, flagmen and mound builders. He may have served as a teamster or cook, if not both. It is entirely possible that the Senator requested a favor that Lewis and Ball complied with which may not be much different than today's political favors. Rounding out the set of four chainmen were Thomas Powers, who became a U.S. Senator from Montana 22 years later, and Miner Lorrimer. The flag man was Horace J. Austin, later a Dakota Statesman and Deputy Surveyor. Ehud Darling is listed in Bell's notes as Assistant Deputy Surveyor.

Starting from Dubuque, Iowa, this crew traveled across Iowa to Sioux City. The journey of over 300 miles was walked by all except for the teamster of the heavily loaded wagon. Their work began 35 miles north of Sioux City along the Big Sioux River at the western terminus of the north line of Township 94 North in Range 48 West. They began work on September 21, 1860 and chained westward, presumably on latitudinal arc, until they met unceded Indian Land on the Choteau Creek at the western end of Range 61 West (about 4 miles west of Avon, SD).

According to the township layout provided by the Surveyor General (usually placed as a forward to the formal field notes as an aid to researchers to find which pages contain the information on a given survey line), Ball then returned to the Range Line between 49 and 50 West. He ran a quasi guide south to the Missouri River. He then filled in the townships east of the guide followed by those to the west.

In fact, Ball's notes indicate a different story that is quite helter-skelter and further complicated by the absence of placing the date at the end of each days work. I suspect that after the major lines that required two sets of chainmen, were completed, Ball and Darling each led separate crews doing the remainder of the work, which is fine except for the fact that in the certifications Ball is always listed as the Chief Deputy. This made it difficult for the Surveyor General to organize the notes and consequently required the re-numbering of the pages. Ball regularly set "Section Posts" at the corners with pits and a mound alongside. He did call for bearing trees, if available. Beyond that, I have not retraced any of Ball's work and cannot attest to its validity compared to what is found on the ground today.

This contract was Ball's only work in Dakota Territory, an entity formally established a few months later in March, 1861. Except for Miner and Austin, who both stayed in Yankton, Ball and crew returned to Iowa. William Miner's account of the survey is quoted in George Kingsbury's book South Dakota History and Its People. The account is well worth reading.

I was later able to determine that Ball was 46 years old and Austin, who had previously served on survey crews in Iowa in 1858 and 1859, was 23 years old. By luck, I found a letter from John Ball to Austin written 31 years later. Ball was a County Surveyor in Black Hawk County in Iowa. He indicates keeping in contact with both Austin and Powers. Tragically, this letter was penned about two weeks after Austin's death in February 1891. Of the parties involved in this project, I have found that much is recorded and known about Austin and I hope to share some of his story in a future article.

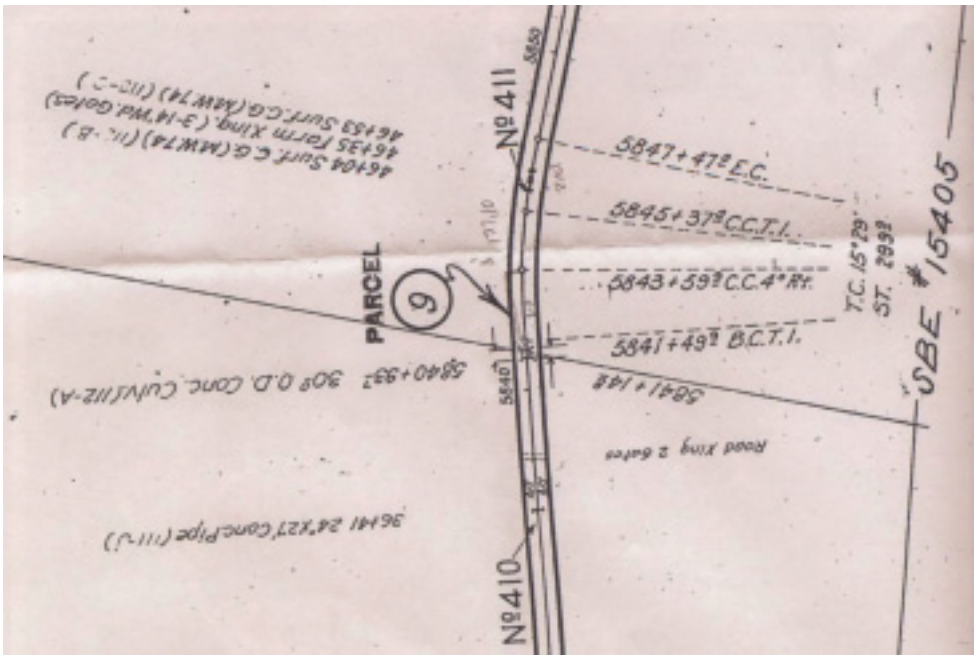
In conclusion, I would like to acknowledge and thank the staff of the I.D. Weeks Library at the University of South Dakota for helpful access to the Horace J. Austin Collection.

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

by Michael McGee, PLS, Reprinted from *California Surveyor*, Spring 2012

While working on a project for the Union Pacific Railroad in Santa Barbara County in 2000, 1 was requested to stake the railroad R/W. I was advised by the Omaha, Nebraska office of the Union Pacific Railroad that the center of the R/W in our location followed a circular curve as defined in the "Southern Pacific Taper Tables" and not the spiral curve that defines the center of the tracks as shown on the track map. I was supplied a copy of the Tables and an explanation of how they are used to establish the circular center of the R/W. At a CLSA Seminar in October 2009, titled "Railroad Surveying 101", speaker Charlie Tucker reiterated this concept numerous times during the day.

Example Railroad Map



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

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

The radius "R" of the track circular curve (NOT the same curve as the center of the right of way) is given in the Taper Curve Tables on Page 13 and 19 as 1432.467' (=25/sine (degree of curve/4). The radius "D" of the center of the R/W (NOT the same curve as the center of the track circular curve) is given in the Taper Curve Tables on Page 19 for a No. 1 Taper with 7 chords as 1434.116'. The offset between the two curves is given as "d" in the same Taper Curve Tables as 1.649'. The Begin and End of the circular curve for the center of the R/W (again, NOT the same curve as the center of the track circular curve) is located 104.969' towards the PI on the semi-tangent from the Begin Curve and from the End Curve, respectively, listed as "t" in the Taper Curve Tables on Page 18 for a No. 1 Taper with 7 chords. The total semi-tangent shown on the map is 299.9' which agrees with the sum of 104.969 plus the semi-tangent of 194.96 (=D*tan(15029'/2)).

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

The following link was offered up by Steve Martin in March 2010 as part of a CLSA Forum Thread, and by

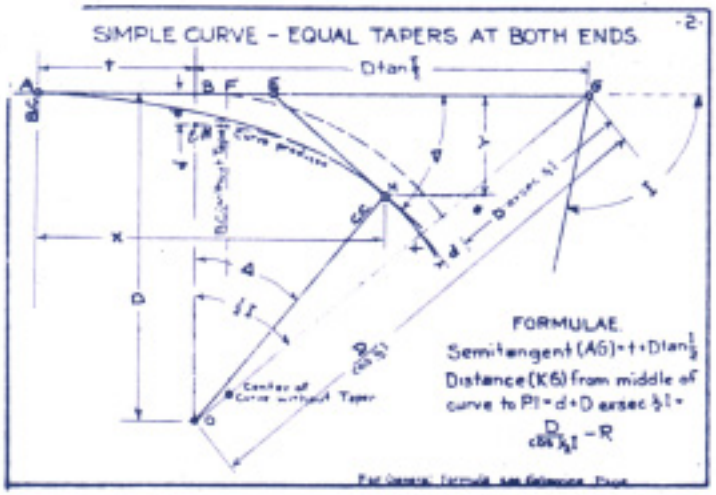
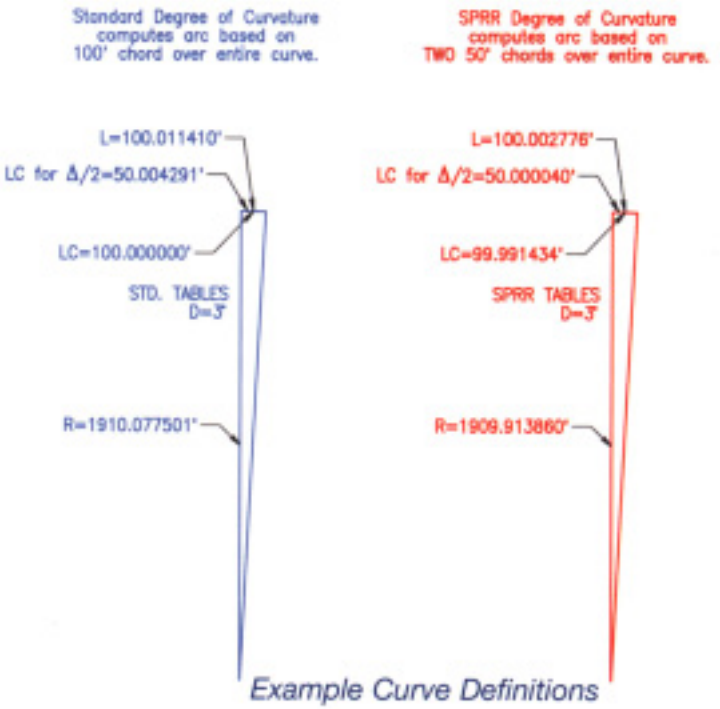


Diagram from Page 2 of SP Taper Curve Tables



Example Curve Definitions

Evan Page, PLS in a 2008 Thread titled Spirals who stated "The definitive reference on these curves was written by Lee Perkins, a SPRR field engineer, in 1915. A PDF version of this book can be found here: http://www.archive.org/details/railroadtaperthe00perkrich". A cursory inspection found the Tables in this publication to be in agreement with the Southern Pacific Taper Tables referred to above.

Midland Surveying, Inc. Announces HUBZone Certification; New Website

Midland Surveying, Inc. of Maryville and St. Joseph, Missouri is pleased to announce that on April 12, 2013, the company received HUBZone (Historically Underutilized Business Zone) certification from the U.S. Small Business Administration (SBA). The HUBZone program was created to help small businesses in underserved communities have access to federal contracting opportunities. The goal of the program is to ultimately stimulate economic growth and provide employment opportunities in HUBZone designated communities.

Troy Hayes, President of Midland Surveying said, "With this designation, Midland Surveying looks forward to increasing our ability to provide professional services to federal and state agencies, while better serving the communities in which we live and work in." The company is now eligible to receive HUBZone contracting opportunities and can perform work under any North American Industry Classification System (NAICS) code to provide land surveying services for projects in which they are qualified.

For more information on Midland's HUBZone Certification and the latest on Midland's professional surveying services and recent projects, be sure to visit their newly redesigned **website at www.midlandsurvey.com**.

Awards Nomination Form

to be awarded at the Annual Conference
October 11, 2013 at Tan-Tar-A Resort

Person Nominated:_____

Name of Award:_____

On a separate page highlight the reason(s) for your recommendations/nomination.

Mail or fax completed form to the **Missouri Society of Professional Surveyors, PO Box 1324, Jefferson City, MO 65102, Fax: 573-635-7823, no later than September 15, 2013**. If you have questions contact Curtis McAdams, Awards Committee Chair.

AWARDS

Surveyor of the Year Award has been given since 1987. This award is given to a MSPS member who has given freely of his/her time and efforts to the organization and toward the betterment of the surveying profession.

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Robert E. Myers Service Award –
Rich Howard, Stan Emerick, Don Martin, Robert Myers, John Teale, Jim Mathis, Robert S. Shotts, Stan French, Dan Lashley, Gaylon Smith, Gerard Harms, John A. Holleck, J. Michael Flowers, Erwin Gard, Rich Norvell, David Krehbiel, Richard Elgin, Dan Govero, Jim Anderson, Rich Barr, Norman Brown, and Harold Schulte

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Subdividing Closing Sections

by Norman Bowers, LS, PE, and Steven S. Brosemer, LS, Reprinted from *"Section Lines",* Kansas, May 2012

Our article in the February 2012 issue of *Section Lines* discussed the history of laws relating to establishing center corners of sections. This article deals only with sections that close on a standard parallel or base line. The base line in Kansas is the Nebraska border, and the standard parallels occur at 30 mile spacing south from the base line. Since townships were surveyed by the GLO from north to south the closing sections are those sections lying immediately south of the base line and standard parallels. These fractional closing sections have the additional complication of the GLO surveyors not physically locating the north quarter corner.

As stated, the legislative history on establishing the center corners of closing sections was listed in our previous article, and is restated here. Kansas became a territory in 1854 but there were no territorial laws prior to 1860 relating to subdivision of sections. In 1860 the territorial legislature at Ch. 85 Sec. 1 specified that the center of the section should be set at the intersection of two straight lines between opposite quarter section corners. This territorial law was not helpful on closing sections as there was no north quarter corner. Kansas became a state in 1861 and then in 1862, the state legislature established state law which had three methods of subdividing a section depending on the location of the section in the township. Ch. 196 Sec. 11 applied to sections closing on the base line or standard parallel. The 1862 method for closing sections is basically identical to the current state law KSA 19-1411, which calls for running a north south line parallel to the east line of the section and set the center corner 40 chains north of south quarter corner. So the legislative history is fairly simple for closing sections:

Prior to 1860: No law
1860 to 1862: Intersection of lines between quarter corners
1862 to present: Current method.

It is realistic to presume there was a good reason that the legislature considered subdivision of sections in 1862. While we have lost the details over the years, it is apparent that like any legislative action there was a perceived need and an agreed solution. While almost all surveyors would agree that the wording of KSA 19-1411 is confusing and ambiguous, it does generally match the method the GLO protracted closing sections prior to the civil war. If we look at GLO township plats prepared prior to the civil war, we find the north-south half section line was made parallel with the east line of the section. Figure 1 illustrates how, in 1856, the GLO protracted Section 2 T6S, R19E; this is the only township plat we found in Kansas that actually shows distances to the north quarter corner. If you divide in half the distance along the south line of Section 2, 79.26 chains, it equals the distance shown between the northeast corner and the protracted north quarter corner. This corresponds to how our state law since 1862 would require the section to be subdivided. See Figure 1.

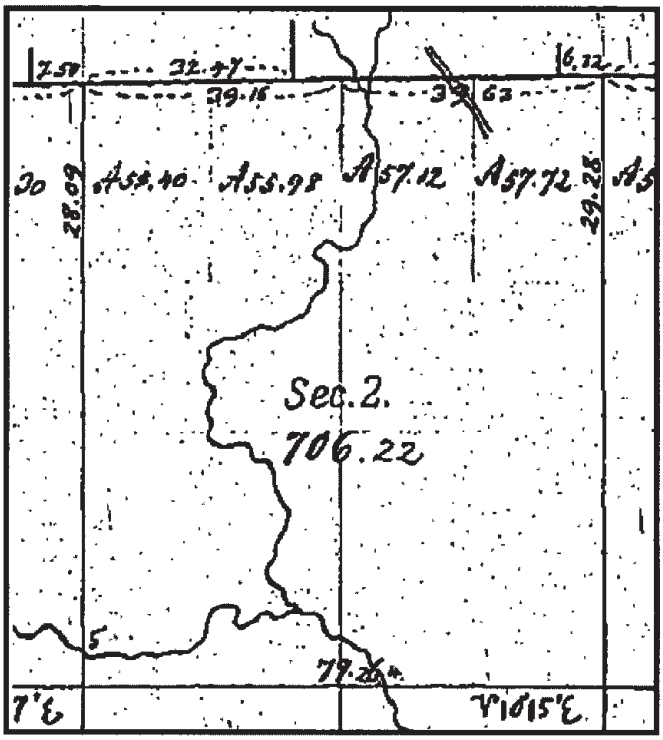

Figure 1: Section 2 T6S R19E

In states surveyed prior to Kansas it was a common practice of the GLO to protract the sections closing on a standard parallel so that the north-south half section line was parallel to the east line of the section. Figure 2 is a portion of an 1856 GLO plat in T21S, R12E. The acreage of the lots is not proportional so it is obvious the GLO did not intend the north quarter corner to be at the midpoint between section corners nor did it intend it to be at "just 40 chains" from the Northeast corner for that matter. If you do the calculations you will find the GLO intended the protracted north quarter corner to be 40.35 chains west of

(continued on page 32)

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Subdividing Closing Sections *(continued)*

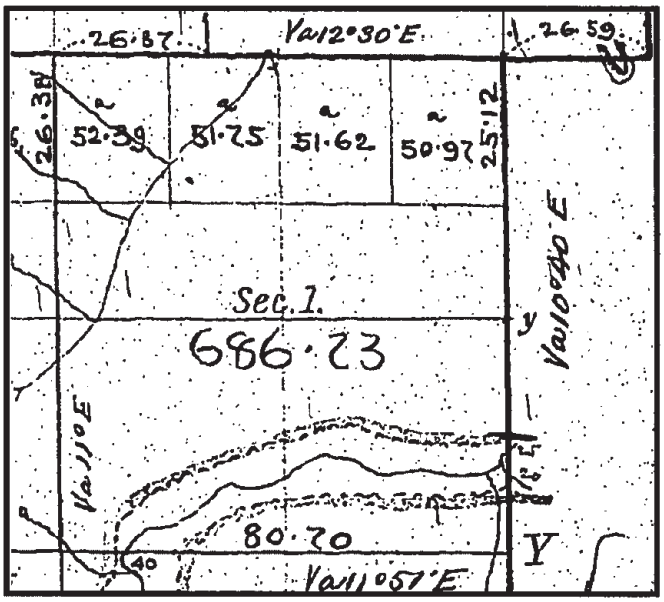


Figure 2 Section 1 T21 R12E

the northeast quarter which is parallel with the east line of the section. This is essentially how the state law requires the section to be subdivided. This means that state law and the GLO plats prior to the Civil War are in fundamental agreement on how to subdivide the section.

Even though there are ambiguities in KSA 19-1411 and the GLO protractions, they can still offer guidance on how to interpret this statute. It is likely that when the statute was adopted in 1862 surveyors were not subdividing closing sections as intended by the GLO plat, and a written description in state law was needed. The current statute reads as follows: "**19-1411. Establishment of center corners and quarter-section corners of sections closing on a parallel or base line.** In establishing the center corner of all sections closing on a parallel or base line, the land surveyor shall commence at the quarter-section corner on the south boundary of the section, and run a line north, parallel to the east boundary of such section; and at 40 chains from the quarter-section corner on the south boundary, such land surveyor shall permanently establish the center corner of the section; and at the point where the said north line produced intersects the parallel or base line, which must be just 40 chains west of northeast corner of the section, such land surveyor must permanently establish the quarter-section corner on the north boundary of the section."

In 19-1411, the two calls for 40 chains are somewhat in disagreement with the GLO plat. To set the center corner 40 chains north of the south quarter corner would result in the center corner most likely not being on a true line between the east and west quarter corners. However, theoretically the south half miles in a closing section are exactly 40 chains, and the south quarter corner was to be set on true line between section corners, so 40 chains would be on a true line between quarter corners. The GLO plat always is drawn with a straight line between quarter corners. Our interpretation of the 40 chains is that is GLO measure and the center corner should be on line between the east and west quarter corners- it is the only interpretation that harmonizes the law with the GLO plat.

The statement in 19-1411 for the north quarter corner to be "just 40 chains west of the northeast corner of the section" is at variance with both the GLO plat and the statement to run the half section line parallel with the east line of the section. Our opinion is that this 40 chain call is descriptive in nature and does not override the GLO plat and the previous requirement in 19-1411 to run the line parallel with the east line.

To run the north-south half section line parallel with the east line of the section, we should take into account any offset in the location of the east quarter corner. Then the center of the section should be set on true line between the east and west quarter corners and the distance west from the east quarter corner as is currently measured between the south quarter corner and the southeast corner of the section. What about that closing North quarter corner? We believe in harmonizing the GLO plat, i.e., the same as the south line of the $SE^1/_4$ or half way between opposite section corners, depending on the GLO plat and the resulting patents.

Sections surveyed after the Civil War

Our limited research of closing sections in Kansas leads us to believe that the GLO changed methods of protracting closing sections during the Civil War. What we found was that after the Civil War, the north protracted north quarter corner was intended to be at the midpoint between the closing section corners. Figure 3 is a portion of an 1870 GLO plat in T16S, R25W, shown here as typical. The government lots on the north side of section 3 are all proportional, and so it is obvious that the north quarter

corner was protracted at the midpoint between section corners. The only way to know for sure what the GLO protraction intended is to check the GLO township plat for the section you are subdividing. Most GLO township plats do not show the distance between the section corners and the protracted north quarter corner like Figure 1, they just show the acreage of the government lots as shown in Figure 2. However, it is fairly simple matter to look at the acreage listed for the government lots to see if the north quarter corner was to be the same distance west of the northeast corner as the southeast corner is from the south quarter corner or at a midpoint between the section corners as these are the only two methods we have found. This would point to what we like to think of today as the "normal" method of the subdivision of sections, i.e., at the intersection of opposite quarter corners.

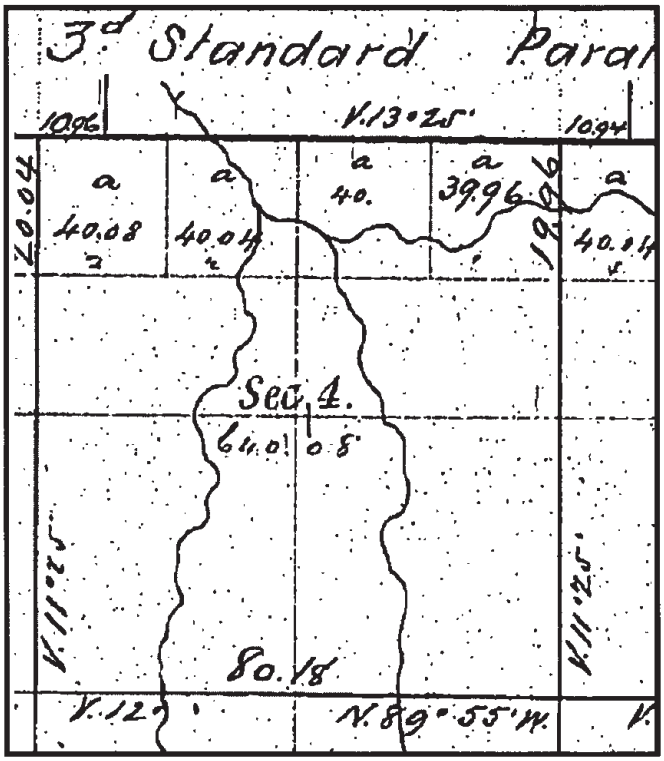


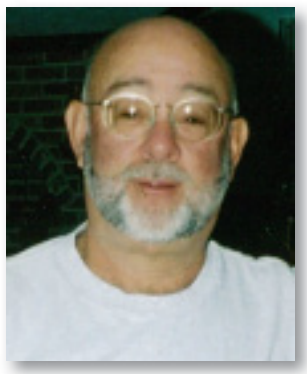
Figure 3 Section 4 T16S R25W

The issue for surveyors in Kansas is that the state law was not changed to match the method of protraction used by the GLO after the Civil War. If we follow the letter of state law then we do not follow the intent of the GLO plat. So what is a surveyor to do? First, we need to keep in mind that the statutes related to center corners are for the original surveyor of the section. If the section has been surveyed and the survey has been accepted by the land owners, we become retracement surveyors. The statutes do not say we have to reject monuments that are not in a theoretically correct position. The statutes do not say we have to split the section every time we survey, and then correct all previous surveys. In fact, the courts make it very clear that "reinventing the wheel" is very much frowned upon. There are many cases, old and recent, that accept the results of "improperly" done subdivisions.

But if we are the original surveyor to subdivide a closing section where the state law and the GLO plat do not coincide, we face a dilemma. We were unable to locate any Kansas court cases that deal directly with this issue. However, the wording on every federal land patent gives the acreage according to the GLO plat and includes the following statement: "according to the official plat of the survey of the said Lands, returned to the General Land Office by the Surveyor General". It is our opinion that the specific wording in the land patent makes the state law inapplicable if not in harmony with the plat. A surveyor would be well advised to follow the intent of the GLO plat and make a note on the plat calling attention to the fact that the surveyor divided the section in accordance with the GLO plat as stated in the land patent rather than the exact letter of KSA 19-1411, ambiguities and all. However, if the reader accepts our opinion that prior to the Civil War there wasn't significant conflict between Kansas law and the GLO plat, then the note may not be necessary. But remember, Kansas Minimum Standards requires that the surveyor provide "Sufficient data to clearly indicate the theory of location applied in finalizing the locations of the corners," so this would be an ideal time for a narrative as part of your plat or report of survey.

Editor's Note: This article was taken from KSLS' "*Section Lines*" publication. The Statutes mentioned and methods proposed are for Kansas. This is great background and information for the Missouri surveyor, but should not be applied in Missouri.

In Memory of Michael "Mike" S. Manier PLS 1385



Michael "Mike" Stephan Manier, 65, of Houston, whose life was rooted in Texas County where he operated businesses, enjoyed its people and served to better the community, died Thursday, May 2, 2013, following a bout with cancer.

Mike was born May 13, 1947, in Waynesville, Missouri. A 1965 graduate of Houston High School he later attended the University of Missouri-Rolla and graduated in May of 1969 with a degree in civil engineering. While attending UMR he worked summers for the Missouri Department of Transportation on a survey / construction crew. During this time at UMR he also became close friends with one of his instructors, Norman L. Brown PLS while taking survey courses.

In 1970 he became a registered Land Surveyor and joined his grandfather, Kaga Ross, in the family business, Ross Lumber Co., in downtown Houston. That same year he and Norman Brown started a land surveying and engineering company called "Big Piney Surveying and Engineering".

During the 1980's he continued to expand his business interests when he acquired a Redi-Mix concrete and gravel company in Houston and Licking. Although he had several business interests, land surveying always seemed to be his highest priority and passion.

Mike was elected the Texas County Surveyor in 1989 and held the office until 1992. He took an interest in the restoration of the corners of the USPLSS in Texas County and contracted with the DNR to restore as many of the original GLO corners he was able to locate. He also worked on the dependent resurveys of the boundaries of the Ozark National Scenic River ways in southern Missouri. He became an avid collector of antique surveying instruments that he displayed in his office and home. He was a member of MARLS/MSPS and participated in the "Surveyors Rendezvous" for many years.

Mike also worked to better the community. He was a former member of the Board of Regents for Linn State Technical College. His son Chuck Manier is also a licensed PLS and has worked in Mike's surveying business.

Mike is survived by his mother Helen Manier and wife Sandra, sons Kirk, Chuck and wife, Natalie; Scott and wife, Callie; three grandchildren, Millie, Nola and Waylon; brother, Mark and wife, Debbie; and sisters, Nancy Adey and her husband, Willie; Linda Manier and Jean Gabel.

Submitted by J. Michael Flowers PLS

Our Surveying Family: The True Value of State Conferences

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

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

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

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

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

It is a great pleasure to sit and converse with a surveyor from the other end of the state whom I get to spend time with only

once a year and, was it not for the state society, most likely would never have met. We have so much in common, the conversation flows easily.

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

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

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

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

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

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

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

Our peers - Our people - Our family

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

A Classroom in the Snow

by Tony Jones, RLS, Reprinted from *"Wisconsin Professional Surveyor"*, December 2011

On a balmy day in mid-October, I received a call from Roger Hatlen, math instructor at Rhinelander High School (RHS), asking me if I would be interested in organizing a demonstration of land surveying techniques, equipment, processes and careers for his freshman-level math students at RHS. I agreed and we prepared a short curriculum for a day at the Cedric A. Vig Outdoor Classroom (CAVOC) in Rhinelander. Prior to our day, I worked with Mike Oestriech (Oestriech Surveying and Mapping) to stake four 50' by 50' squares to be subdivided by the students, and four sets of hubs to establish grades for a septic line.

I was able to enlist the help of a number of my fellow surveyors, as well as some of the Land Surveying Students at the Nicolet Area Technical College program. We quickly got enough volunteers, equipment and suggestions over the course of the next three (still balmy) weeks to meet on Wednesday, November 9th for the day-long demonstrations.

On Tuesday night, the local weather forecaster predicted a "dusting" of snow possible on Wednesday, so I figured we'd have a nice day, if a bit cool and blustery. On Wednesday morning, the snow was starting, but Roger Hatlen told me that if school is on, we will have our field trip. By 8:30 a.m. the students were divided into three person "crews" that would rotate through four "stations" throughout the course of the group with stations as follows:

1 . A simple lot and block proration included Mike Oestriech (Oestriech Surveying and Mapping) using a theodolite and 100' tape, Dave Tlusty (Langlade County) with his robotic total station and prism rod and Jacob Stephenson and Brandon Hubin-Barrows (NATC Students) had conventional total stations
2. GPS demonstrations were given by Charlie Brinkmeier (City of Antigo) and Dave Kircher (WiDOT) using survey grade and resource grade GPS receivers to collect topographic data and create metadata files from tree data (type, size, board feet, etc) they previously collected.
3. Conventional leveling demonstrations with Devon VandenHeuvel (NATC instructor) and Justin Meyer (NATC student) using an auto level and grade rod to establish hub elevations for a septic system. Hubs were courtesy of MSA Professionals, Rhinelander office.
4. Using pre-cut 8 foot long by 1 foot wide plywood, students used a plumb bob and a wooden folding tape to transfer elevations from a known benchmark to an unknown location. We then checked the results with an auto level and grade rod.

From left to right: Tony Jones, Mike Oestriech, Devon Vanden-Heuvel, Justin Meyer, Dave Kircher, Tyler Ruppert, Jacob Stephenson, Molly Towne, Dave Tlusty, Brandon Hubin-Barrows, Charlie Brinkmeier, and Roger Hatlen

Mike Oestriech (far left) and Devon VandenHeuvel (second from left) look on with RHS students as Dave Tlusty demonstrates his robotic total station under the cover of the deck.

As you can see from the pictures, we ended up being blanketed by nine inches of snow in a blizzard condition. By the end of the day, the students were soaking wet, the field note paper was illegible and the equipment was so caked with snow we could hardly see. Fortunately, the CAVOC caretaker, Arnie Plamann, had started a fire in the fire place to thaw out the students. After eight hours, the students came away with an understanding of a day in the life of a Northern Wisconsin land surveyor and an appreciation for mathematics in the workplace. Roger and I plan on continuing this program in the spring with some of his more advanced classes and refine this so that we can do it in October next fall.

I would like to personally thank everyone that came out with their equipment and knowledge to brave the weather and make this day a soaking-wet success. I would also like to thank Harold Charlier and Allen Schneider for their ideas and direction. And someday, someone needs to explain to me why high school students venture forth into a blizzard with nothing but tennis shoes and hoodies to keep warm.

Jacob Stephenson (NATC student) demonstrates a conventional total station as Tyler Ruppert (RHS) far right, and his students huddle together in a surveyor's version of "March of the Penguins".

Roger Hatlen (RHS), middle, helps students transfer elevations using 8' lengths of plywood, a plumb bob and wooden folding ruler.

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Bax Engineering Co., Inc.	221 Point West Blvd.	St. Charles	MO	63301	636-928-5552	dbax@baxengineering.com
Bowen Engineering & Surveying, Inc.	2121 Megan Drive	Cape Girardeau	MO	63701	573-339-5900	info@bowenengsurv.com
Buescher Frankenberg Associates, Inc.	103 Elm St.	Washington	MO	63090	636-239-4751	mail@bfaeng.com
Burdine & Associates, Inc.	1638 Jeffco Blvd.	Arnold	MO	63010	636-282-1600	
Cardinal Surveying & Mapping, Inc.	PO Box 278	Cottleville	MO	63338	636-922-1001	shelly@cardinalsurveying.com
Central MO Professional Services, Inc	2500 E. McCarty	Jefferson City	MO	65101	573-634-3455	kbrickey@cmps-inc.com
Cochran	530 A E. Independence Dr.	Union	MO	63084	636-584-0540	mail@cochraneng.com
Cochran	737 Rudder Road	Fenton	MO	63026	314-842-4033	tvanleer@cochraneng.com
Cole & Associates, Inc.	10777 Sunset Office Dr. Ste. 10	St. Louis	MO	63127	314-984-9887	twesterman@colestl.com
Doering Engineering, Inc.	5030 Griffin Road	St. Louis	MO	63128	314-487-6913	mdoering@doeringeng.com
Frontenac Engineering Group, Inc.	2725 Sutton Blvd. B	St. Louis	MO	63143	314-644-2200	billb@frontenacengineering.com
George Butler Associates, Inc.	9801 Renner Blvd.	Lenexa	KS	66219-9745	913-492-0400	
Govero Land Services, Inc.	5929 Old State Rd.	Imperial	MO	63052	636-464-9380	glsland@goverolandservices.net
Grimes Consulting Inc.	12300 Old Tesson Road, Ste. 300 D	St. Louis	MO	63128	314-849-6100	
Harms, Inc.	PO Box 52	Eldon	MO	65026	573-392-3312	jharms@harmsinc.com
Hood-Rich, Inc.	801 S. Glenstone	Springfield	MO	65802	417-862-4483	ddrumm@hoodrich.com
Integrity Engineering, Inc.	PO Box 700, 1714 E 10th Street	Rolla	MO	65402	573-341-2100	terris@integrityeng.com
John R.M. Nelson, Inc.	PO Box 482	Bolivar	MO	65613	417-326-2777	jnjnkn@yahoo.com
Koehler Engineering & Land Surveying, Inc.	194 Coker Lane	Cape Girardeau	MO	63701	573-335-3026	wkoehler@koehlerengineering.com
Midland Surveying, Inc.	501 N. Market	Maryville	MO	64468	660-582-8633	tryhayes@midlandsurvey.com
Migar Enterprises, Inc.	PO Box 528	Grandview	MO	64030	816-966-0839	
Minnick Surveying	7905 Big Bend Blvd., Ste. 101	Webster Groves	MO	63119	314-721-9500	info@minnicksurveying.com
Musler Engineering Co.	32 Portwest Court	St. Charles	MO	63303	636-916-0444	rich@muslereng.com
Olsson Associates	7301 W. 133rd St., Ste. 200	Overland Park	KS	66213	913-381-1170	pward@oaconsulting.com
Pellin Surveying LLC	208 South Church Street	Union	MO	63084	314-985-5263	pellinsurveying@gmail.com
Phoenix Engineering & Surveying, LLC	3855 S. Northern Blvd	Independence	MO	64052	816-743-9000	wes@phoenix-llc.com
Pickett, Ray & Silver, Inc	3320 Rue Royale	St. Charles	MO	63301	636-397-1211	dskornia@prs3.com
Pitzman's Co. of Surveyors & Engineers	2725 Sutton Blvd.	St. Louis	MO	63143	314-781-5665	bill@pitzmans.com
Poepping, Stone, Bach & Associates, Inc.	801 Broadway, Ste. 224, PO Box 190	Hannibal	MO	63401	573-406-0541	psba@psba.com
Riggs & Associates, Inc.	102 W. Trish Knight St., PO Box 71	West Plains	MO	65775	417-256-8125	ralphr@riggslandsurveying.com
Schlagel & Associates, PA	14920 W. 107th St.	Lenexa	KS	66215	913-492-5158	
Schmitz, King & Associates, Inc.	18900 West 158th St., Ste. G	Olathe	KS	66062	913-397-6080	dave@schmitzking.com
Schultz Surveying and Engineering	4800 West Blvd.	Poplar Bluff	MO	63901	573-686-0806	sjschultz@sseeng.com
Shafer, Kline & Warren, Inc.	1700 Swift Ave., Ste. 100	N. Kansas City	MO	64116-3821	816-756-0444	graham@skw-inc.com
Shaffer & Hines, Inc.	PO Box 493	Nixa	MO	65714	417-725-4663	chines@shafferhines.com
Sprenkle & Associates Inc.	PO Box 286	Monett	MO	65708	417-236-0112	
St. Charles Engineering & Surveying, Inc.	801 S. Fifth St., Ste. 202	St. Charles	MO	63301	636-947-0607	
Surdex Corporation	520 Spirit of St. Louis Blvd.	Chesterfield	MO	63005	636-368-4400	brianh@surdex.com
The Sterling Company	5055 New Baumgartner Road	St. Louis	MO	63129	314-487-0440	ggower@sterling-eng-sur.com
Thouvenot, Wade & Moerchen, Inc.	720 Olive Street, Ste. 200A	St. Louis	MO	63101	314-241-6300	jlandeck@twm-inc.com
Tri-State Engineering, Inc.	702 S. Main St.	Joplin	MO	64802	417-781-0643	slett@tristate-engineering.com
West Wildwood Surveying, LLC	8023 Waddell Avenue	St. Louis	MO	63125	636-394-6090	wwsurv@att.net
Whitehead Consultants Inc.	114 N. Main St.	Clinton	MO	64735	660-885-8311	mtaylor@wcieng.com
Zahner & Associates, Inc.	26 N. Jackson St.	Perryville	MO	63775	573-547-1771	zahner@zahnerinc.com

SCHEDULE OF EVENTS

Annual Meeting • Building a Foundation for Success
Tan-Tar-A Resort • Osage Beach, MO • Oct 10-12, 2013

Thursday, October 10, 2013

7:00 am — Registration and Continental Breakfast

8:00 - 5:00 pm — Hospitality Room Open

8:00 - 12 noon — **Measurements, Monuments and Maps**
This intermediate–to–advanced level seminar covers the interrelationship and weighting of evidence (measurements, monuments, and maps) in the analysis of boundary determination. It also covers the use of such evidence in creating boundaries as distinguished from reestablishing them. The course discusses accuracy versus precision, error theory and adjustment techniques as well as real property corners and the monuments used to mark them, all from an evidentiary, i.e. non–mathematical, point of view. Examples and illustrations are used in the process.
Speaker: Chuck Karayan, LS, President, GeoLex

12:00 - 1:00 pm — Lunch

12:30 pm — Golf Tournament

1:00 - 5:00 pm — **Measurements, Monuments and Maps continued**
Speaker: Chuck Karayan, LS, President, GeoLex

5:00 - 7:00 pm — Exhibitor Set-Up

Friday, October 11, 2013

7:00 am — Registration and Continental Breakfast with Exhibitors

8:00 - 5:00 pm — Hospitality Room Open

8:00 - 11:30 am — Business Meeting
Discussion on the proposed legislative changes to education for surveyor licenses.

11:30 - 1:00 pm — Awards Luncheon and Exhibit Viewing

1:00 - 3:00 pm — **Introducing and Summarizing the New Manual**
With funding assistance from MSPS, Dick Elgin has written "The U.S. Public Land Survey System for Missouri," a new manual which discusses all aspects of the System, as applied in Missouri. Topics covered include the early history of the USPLSS, the French and Spanish land grants in Missouri, the original GLO system and resurveys on Missouri's system, Missouri court decisions relative to the USPLSS and example problems applying Chapter 60, RSMo. Dick will summarize this new manual which will be available for purchase at the convention.
Speaker: Dick Elgin

3:00 - 3:30 pm — Break to View Exhibits

3:30 - 5:30 pm — **Improving Your Firm's Office Procedures**
A presentation for all those in a surveying/engineering firm who are involved with a survey project, from the firm owner to the surveying technician. The talk offers effective, tested, practical, successful ideas for "progressing" the project from initial client contact to getting paid. Taught by an old-school surveyor and business owner, Dick gives the attendee the benefit of his 26 years of frustration in getting the project successfully out the door. The talk includes in-house forms, example estimate letters, example surveyor's notes for plats and aphorisms for the surveyor.
Speaker: Dick Elgin

5:30 pm — Wine, Cheese & Book Signing with Dick Elgin
During Friday evening exhibitor's reception, MSPS will have available to purchase the new manual, "The U.S. Public Land Survey System for Missouri." Author Dick Elgin will be signing this new landmark manual.

Saturday, October 12, 2013

7:00 am — Registration, Continental Breakfast and Past President's Breakfast

8:00 - 5:00 pm — Hospitality Room Open

8:00 - 10:00 am — **Statistical Analysis**
Speaker: Stan Emerick

10:00 - 10:30 am — Break to View Exhibits

10:30 - 12 Noon — **Statistical Analysis continued and Accuracy versus Precision**
Speaker: Stan Emerick

12:00 - 1:00 pm — Lunch and Exhibitor Breakdown

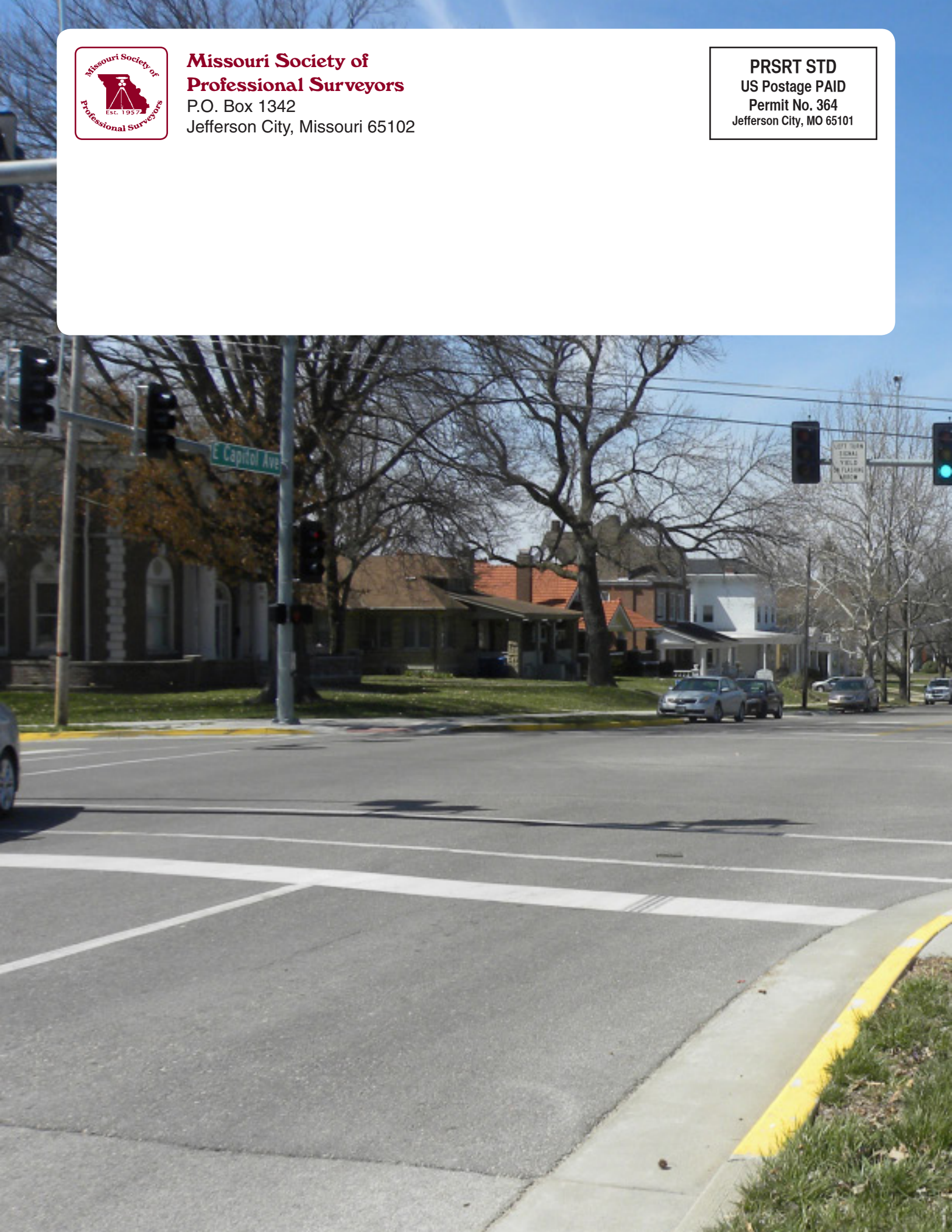
1:00 - 2:30 pm — **CONCURRENT SESSIONS**
Photogrammetry, LIDAR
Speaker: Steve Kastent

Minimum Standards
Speaker: TBD

2:30 - 3:00 pm — Break

3:00 - 5:00 pm — **CONCURRENT SESSIONS**
UAV's and Mobile Mapping Air and Water
Speaker: Jim Peterson

Minimum Standards
Speaker: TBD



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