

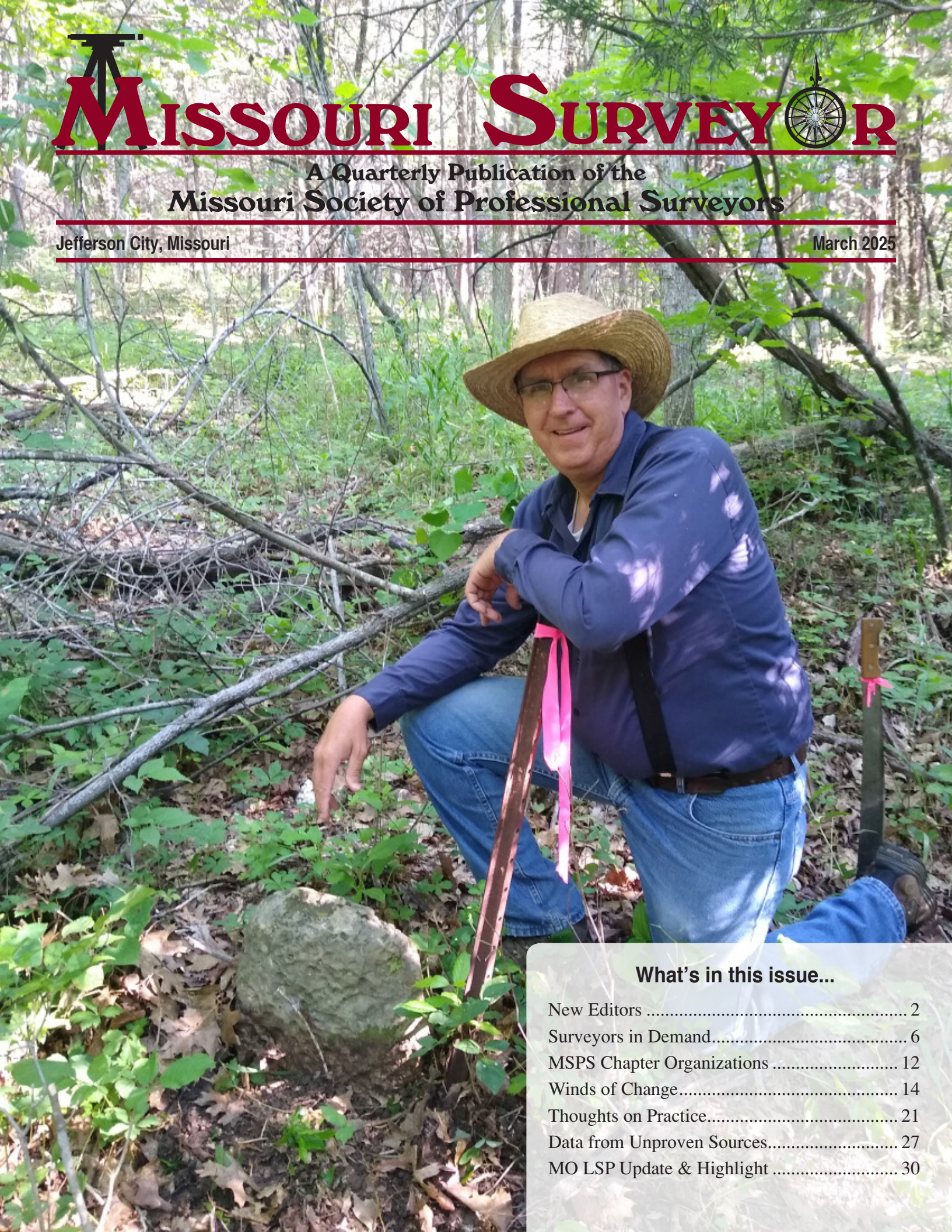


MISSOURI SURVEYOR

A Quarterly Publication of the
Missouri Society of Professional Surveyors

Jefferson City, Missouri

March 2025



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CALENDAR OF EVENTS

2025

March 12, 2025

USPLSS Webinar via zoom

April 30, 2025

Board Meeting
Lodge of Four Seasons, Lake Ozark, MO

May 1-2, 2025

47th Annual Spring Workshop
Lodge of Four Seasons, Lake Ozark, MO

July 11, 2025

Zoom Call, Board Meeting
MSPS Office, Jefferson City, MO

August 11-13, 2025

Review Course, Missouri S & T
Rolla, MO

October 2-4, 2025

68th Annual Meeting and Convention
Stoney Creek Conference Center,
Independence, MO

December 5, 2025

Zoom Call, Board Meeting
MSPS Office, Jefferson City, MO

Front Cover: Ray Riggs, Riggs Brothers Surveying kneels by recently rediscovered South Quarter Corner of Section 32, Township 34 North, Range 19 West in present day Dallas County, Missouri. The GLO corner was originally set in the summer of 1835.

Chris Ferguson, Editor
Austin DeSain, Editor



Notes from Editor Ferguson's Desk

Chris Ferguson, Vice-President, Editor

Words cannot do justice to the excitement I have being chosen as one of the two editors of this venerable publication!

Thanks go to Don Martin (now Editor Emeritus) for his tireless dedication for so long and raising such a high bar on a nationally recognized quarterly. Thanks also to Executive Director Sandy Boeckman who does so much behind the scenes for our society and this newsletter. Kudos also to the Board of Directors for the confidence in selecting me. And most of all, thanks to you – the Professional Land Surveyors of Missouri - for your loyal readership and contributions of relevant and interesting content. I truly hope you continue to make your voices heard, because this is your magazine!

I look forward to working with Editor Austin DeSain, and once we've reconned the site and become familiar with the blueprints, we will stake out our shared passion of surveying in the best light. Austin is immensely talented and incredibly organized and offers the perspective of a young surveyor with all the technical finesse the future demands. On the other hand, yours truly is a bridge to our past with all the trials, travels and reward a journeyman's career can offer. Hopefully, you will enjoy material from both of our diverse viewpoints.

Here's to many more editions of the *Missouri Surveyor* ahead! 🇺🇸

Chris



Notes from Editor DeSain's Desk

B. Austin DeSain, P.L.S., Director, Editor

I am pleased and full of gratitude as I write this, to be provided the opportunity to co-edit the *Missouri Surveyor* with Chris Ferguson.

Thanks to the directors of MSPS for the vote of confidence in this new role of mine, and to Chris for feedback, guidance and support as my fellow editor. I'm fortunate to share in this role with a seasoned professional, with public and private experience, of small and large scale whose experience is invaluable to our profession today. I appreciate the dynamic big-time and know the two of us will be able to converge on the points of interest with each publication.

Like when any surveyor questions a more experienced colleague about an opinion or for guidance on an issue, the answers come with stories. This is the way that I feel we surveyors communicate best, and the way that this publication has provided its impactful messages to you, the readers, for years.

Don Martin has indeed set the bar high for the two of us, his precise writing style and topics have occasionally been the subject of conversations between our now Editor Emeritus and myself as I've sent "letters to the editor" over the years (emails, they were all emails). I hope that together, we co-editors bring to our readers challenging topics, interesting material and comfort with the *Missouri Surveyor* like has long been the standard.

Thank you Don, MSPS, and to the Missouri Surveyors! 🇺🇸

Austin

THE MISSOURI SURVEYOR

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President's Message

Chuck Quinby, PLS



As I begin to write this Quarter's message, winter has finally settled in to stay. The weather is making it tough to get those outside projects completed. Snowfall has covered the streets, parking lots, and utilities, making it nearly impossible to accurately topo. Temperatures have plummeted and layering my clothing just bogs me down, making it difficult to move around. The gloomy, cloudy days contribute to my anxieties causing me to just want to stay inside and watch the world through my window. I need another cup of coffee...

However, there is good news! The shortest day of the year has come and gone. Each day's sunlight is lasting longer and longer. By the time you read this message spring will be on the doorstep. Daylight savings will start just a few more days afterwards. Construction season will be back in full swing and hopefully we will all be so busy we will not even remember the winter.

As winter winds down and spring gets rolling, be sure to take some time for yourself. Our mental health is very important and neglecting it has an impact on our ability to be productive. According to Wikipedia, depression, anxiety, over-or-under eating, oversleeping, insomnia and avoiding social situations are all symptoms of Seasonal Affective Disorder (SAD). During the winter months our levels of serotonin and norepinephrine (our "feel-good" hormones) are naturally depleted. Our levels of vitamin D - which also boost our mood - are limited due to the angle of the sun and the ultraviolet rays we need are being constricted through the low angle of the ozone layer.

Fortunately, we are Surveyors. A lot of our work is done outdoors. We can soak up those ultraviolet rays while we work, giving us the vitamin D we may be lacking. Being out in the sun lets that sunlight enter in through our eyes and causes that chemical reaction produces and replenishes our levels those feel-good hormones. Tending to your mental health could be as simple as taking some time off. A short vacation or even a staycation to take your mind off the pressures of work.

If your mental health is fine, good for you! Call a fellow surveyor and check on him or her. If you need a little help, reach out and even consider volunteering with one of our many diverse and interesting MSPS committees. Social activities can be invigorating and good for our mental health. We got this. Let us all have a healthy and prosperous year! 🇺🇸

Chuck Quinby

At Land's End; the End of the Road

Donald Martin, Editor Emeritus

About twenty years ago I attended a meeting with software engineers developing CAD packages for the design and development of civil works. I was part of a group there to provide feedback to developers on matters associated with topographic mapping, construction layout and other surveying related activities. It was a very interesting and engaging event. I felt welcomed, valued and helpful. I was glad I had been there.

The timing of this meeting coincided with a new opportunity, a new job. To take it would mean a lot of things which I believed I wanted. It would also mean leaving some work I truly enjoyed, some people I really respected and a mission I proudly served. Like those software engineers though, I had done all I could see and understand. I was becoming lost in my capacity to identify and resolve the challenges in my work. I was probably not serving my institution well, and it was in turn not serving me either. We were quickly reaching a state of misalignment, and resolution could only come with me adjusting or departing.

Unlike those developers, I did not assemble a group of experienced hands and seek their advice. I instead took some leave from work at the end of the meeting. I was going to travel solo a bit as I would reflect and reset. So, I left the small, mountain resort town in the Rockies where we met. I was off on a road trip down and along the western slope of Colorado and into the deserts of Utah. My travel itinerary was more a list of issues, thoughts and decisions than destinations on a map. I would let the roads lead me as I instead was setting my course for life. As I wondered what I would do, I wandered along meandering roads and trails. As I worried about work and career, I wove through woods and mountains. As I carefully pondered my future, I casually proceeded forward, merely following my hood ornament.

It had taken me atop the Grand Mesa, 10,500 feet of flat mountain plateau at the edge of the range. On a service road for high elevation summer grazing grounds, gravel and dirt led me to the very edge of the mesa. It was the end of the road...the end of mountain range...the end of the day. It was named Land's End. There stood a small, stone and log cabin, built during the Great Depression by veterans and CCC recruits. I seemingly followed a trail to it's terminus. It took me nowhere. Where there was no one. I was there, at Land's End; it was the end of the road.

Missouri Surveyor. It is the straight-forward, self-explanatory name of this newsletter. The quarterly publication of the Missouri Society of Professional Surveyors. Our association. It is a good, strong organization and the newsletter is a part of the MSPS 'brand.' We still publish it on paper and distribute it by the United State Postal Service. We still start each edition with a President's



Donald R Martin

Message. We still have the transit and compass in our cover logo. And we still do a pretty good job. Or at least I like to think so.

We get a lot of participation from our members. A lot of advertisements from our vendors. We even get a lot of praise, some awards, and occasional letters. Some of the most satisfying come from out-of-state and beyond the ranks of our membership. These are the notes from fellow surveyors in other states who have found us, read us, and chosen us to be their surveying publication of choice. Literally! That means a lot.

Most importantly, our members offer favorable regards. So do our Directors and Presidents. This is rewarding. Putting the newsletter together is also interesting and engaging. In editing I feel welcome, valued and helpful for and to our readers. I am glad I have been here. I became Editor in 2013, and it has been my pleasure to serve in that capacity for over ten years and forty-four issues. I first edited Missouri Surveyor in March of 2008 on an interim basis. This has been a wonderful opportunity for me, and I am grateful to our Society to have served in this way. Indeed, the brightest highlights of my career have come in association with MSPS! My time with the newsletter has been most special and I offer 'thanks' to my fellow members for allowing me this tenure.

But as I once was when standing at Land's End, I believe I have done all I can see and understand as Editor. I have become lost in my capacity to identify and resolve the challenges in my work. And I am afraid I am not serving this institution, nor its mission as well as it deserves. I am at the end of the road.

Unlike my tale of reaching Land's End, my feelings this time are not those of a quick thinking, eagerly engaged young man. No, I now stand on the precipice caught in the time paradox of an older man. The time paradox? Its when the hands on my watch move ever slower, while the pages on my calendar turn ever faster. Meaning: I have really slowed down in working, thinking and doing just as the years, months and days available to me become fewer. It's a matter of time...its 'that' time. Time to depart.

But you know, when I stood at Land's End, it was merely the end of the road I had just taken. Because before me was no end at all. There was a full horizon, spanning from corner to corner, unbound in its extent. And a few hundred feet to the west was the beginning of a gravel trail, a switch-back road twisting down the face of the mesa. Plunging through forests on the slopes, into vineyards and river valleys, and deserts across, with more mountains beyond. There were towns, a city, and more roads.

Can't just stand forever at Land's End, the end of the road. I best break-it-down and bunch-it-up for the last time. Austin DeSain and Chris Ferguson are getting ready for the next edition ...they'll get back with ya' then... 🇺🇸

Donald R. Martin, PLS #2698: Editor Emeritus

by *ESYRDHR*



Saturday December 7 is a day that will live in infamy. No, it wasn't a Sunday 83 years ago. That was also the day the MSPS Board of Directors got word that Donald R. Martin was resigning as the editor of the Missouri Surveyor, signaling the end of an era. Don has assured us that he will remain active in our Society and be available to aid us as needed in the future. However, his departure brings up the same feelings

that come to us when we have worked with someone for a long time and know their departure brings change.

Over the last eleven years Don had become that individual who was going to do what needed to be done to ensure the train ran on time and nobody was left at the station. It seems appropriate for us to stop for a few minutes and look at some of the things he has brought us over the last 44 issues of the Missouri Surveyor.

Don has been a member of MSPS since 1994 and a member of NSPS since 1997. As President in 2008 he was selected for the Surveyor of the Year Award in 2007 and the Robert E. Myers Service Award in 2011. In addition, the Missouri Surveyor was recognized for its March 2016 article honoring John Holleck and again in 2022 regarding the article he and Joe Clayton wrote on the Osage Treaty line.

You can't think about Don and his writings without bringing up his ol' pard Tripod the three-legged groundhog who has

been with Don from the beginning, commenting on the weather, politics, economy and let's not forget the pandemic when he burned his mask.

We do not know if Tripod was there as Don served the Missouri Department of Transportation for twenty-four years, and then continuing with the Missouri Department of Conservation for eleven years, but it was always with an eye to what he had done as a Professional Land Surveyor that he directed his writings.

He has authored numerous articles honoring surveyors who have gone over the hill for the last time, searching for their own lost corner.

As the owner of PLS Press he acted as the Editor of the Illinois Surveyor for five years from 2017 to 2022, Don has always been busy even in retirement. He has worked with State Technical College of Missouri, Association of Conservation Engineers, Missouri GIS Advisory Committee, Missouri Adaptive Enterprise Architecture, Association of State Highway & Transportation Officials and American Association of Photogrammetrist & Remote Sensors. It seems assured Don will stay busy moving into the future.

In conclusion, Don has been an active force in our profession acting honorably over the last thirty years in all of his endeavors. It seems fitting that we stop and recognize his contributions. A small token of which is to grant him the title of Editor Emeritus. Those who come after him have a large pair of shoes to fill. Thank You, Don for all you have given. 🇺🇸

Surveyors in Demand

Surveyor's Corner: An exercise in public relations

by Tim W. Burch, October 10, 2024, xyHt Magazine

We live in an age where everything is expected to be instantaneous and have our needs met within our short attention span of self-gratification. Because of technological advances borne from measuring and positioning systems surveyors use every day, the world around us has brought literally everything to our fingertips.

Groceries and household goods? Instacart. Takeout food? DoorDash. Need a ride? Uber. Handyman services? Angi. Everything else? Amazon. All these companies/apps share a common bond of location-based services, and they put the power of summoning them to your door within the confines of your cellphone.

The lack of flying cars aside, have we truly reached the age where civilization looks like “The Jetsons” cartoon from the early 1960s? (The show is supposed to take place in 2062, so flying cars could still happen.)

The advancement of technology has placed an expectation of nearly every service into one’s immediate availability and need, with an added twist of non-personal communication as the conduit for establishing your service request.

So, other than the location-based information, what does this have to do with professional surveying? Everything, so let’s dive a bit deeper into today’s business environment.

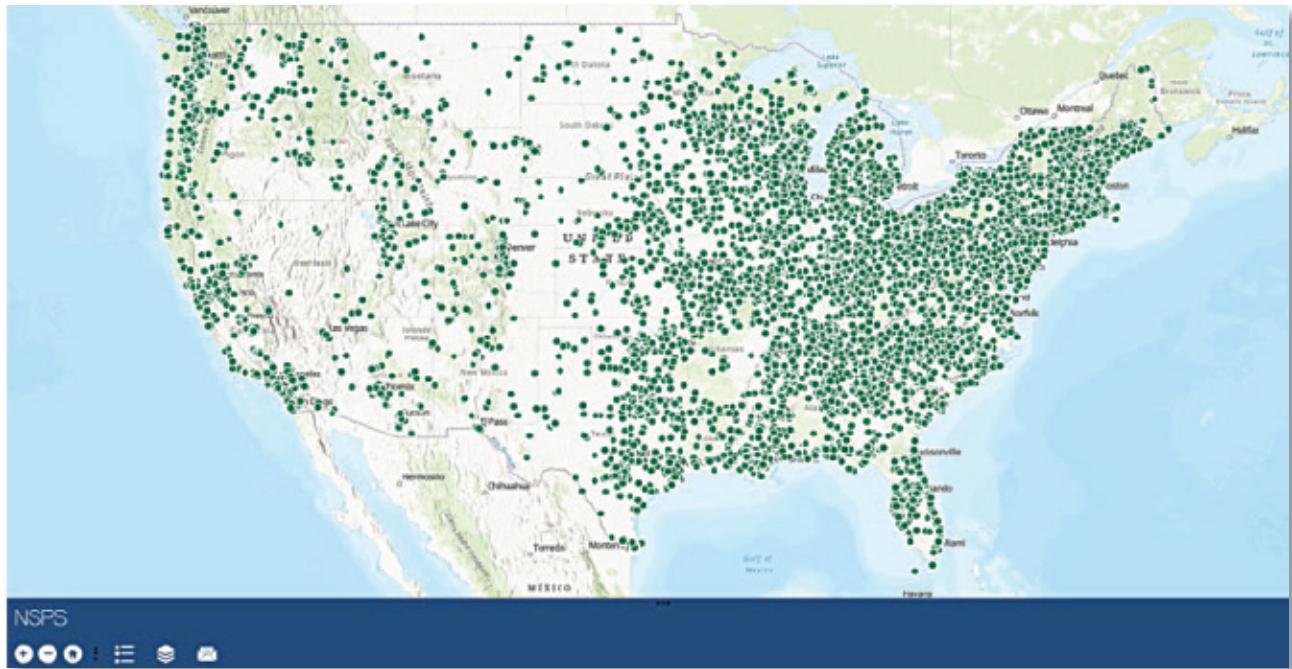
Problems we face

Here at the National Society of Professional Surveyors (NSPS), we constantly field calls, emails, and social media messages from potential surveying clients who think we are going to put them in touch with someone to serve their needs. The general context of the message goes like this:

- I only need a “simple” land survey.
- Why do I need the survey anyway?
- Most surveyors will not answer a phone call or return email,
- If they do, the time frames are “outrageous” (four weeks to six months).
- The fees are ridiculous and many times what my attorney/realtor says they should be.
- Is there any way I can do this myself?

Before diving into what the typical NSPS staff rebuttal is to these requests, let’s examine a few other professional services and businesses for reference to our situation. When is the last time you have cold called a personal service provider (doctor/dentist/optometrist/attorney) to inquire about an appointment? Do they return calls and/or emails about your inquiry?

If you are fortunate enough to have them pick up the call, what are their timeframes? Do you get a range of fees? How do you know if the fees are competitive? Same goes for an architect or engineer; how do you evaluate their cost estimates and lead times?



How about a contractor for a non-emergency service or project? If they give you a reasonable timeframe, how do evaluate their cost estimates for your project? They might not have professional licenses or certifications, but they do perform a service that involves significant cost and coordinated timeframes.

The simple answer is the public does not place the professional surveyor in the same high standing as these services. Each of these professions are seen through the eyes of the public as professionals, whereas the professional surveyor is still seen as a tradesman who performs a menial service typically required by necessity.

The common ground

What do all these professional and construction services have in common? They all lack the necessary number of workers to meet the demands of the public, who have become accustomed to instantaneous response and satisfaction, all at reasonable pricing. In many places throughout the U.S., the scarcity of a professional surveyor is obvious (see map).

The surveying profession has also been afflicted with several factors that has set it back for decades:

- Surveying practitioners who have provided their services with low profit margins, keeping the normal standard of price expectancy below the actual value of the service rendered.
- Opinions of survey pricing provided by attorneys and real estate agents to prospective clients that establish an artificially low value of our services.
- Lack of professionalism by the surveyor in conducting their services.

(continued on next page)

Surveyors in Demand *(continued)*



Surveyors should participate in career fairs and events to connect with potential students and employees.

Another factor that has influenced (and lowered) the importance of the professional surveyor is the decreased cost for purchasing equipment and software for performing survey-related tasks. This situation has led to expanded usage of GNSS through handheld devices and cellphone technology by non-surveyors. The public's perception is that anyone can find property markers with a low-cost metal detector in conjunction with publicly available GIS information to perform their "survey," so why pay a professional to do it?

Educating the public

Rather than continuing with the status quo of blindly turning our clients away with unexpected timeframes and costs, we need to build upon a forward-thinking strategy of educating them on the value of surveying by a professional. Here are several key strategies to consider when corresponding with our clients:

- Create a compelling narrative: Develop a story that highlights the value and impact of the profession.
- Understand their needs:
- Why do they need a survey?
- What information are they seeking?

- What are their pain points?
- Interact with your audience: Respond to comments and messages promptly.
- Address misconceptions: Correct inaccurate information about the field.
- Consistent messaging: Ensure all communication aligns with the brand identity.
- Identify key demographics: Who needs to know about your profession? Students, job seekers, potential clients, or the public?
- Tailor your message: Create content and messaging that resonates with your target audience.
- Highlight success stories: Showcase the positive impact of the profession.
- Open houses: Invite the public to learn about the profession firsthand.
- Webinars and workshops: Offer online and in-person events to share knowledge about our profession.
- Collaborate with other professionals: Build partnerships within the industry.
- Offer mentorship opportunities: Connect experienced professionals with aspiring ones.
- Leverage employee advocacy: Encourage employees to share their experiences.

By increasing our communication with the public and helping them to understand the impact of surveying on the world around us, we can raise the professional profile of the surveyor. The goal of our practitioners should be to elevate the value and respect of the profession, but we must do our part to earn those characteristics from the public we serve. While the surveyor might not be seen as a potential lifesaver like a medical professional, the services we provide do directly affect how our clients interact and function in their daily lives. We simply need to become better storytellers of who we are and be greater advocates for our professional services.

There is an adage that states: “The best time to plant a tree was 20 years ago. The second best is now.” If we start planting those survey “trees” now, the sooner we can become the trusted profession the public needs us to be.

Tim W. Burch is executive director of the National Society of Professional Surveyors. 🇺🇸



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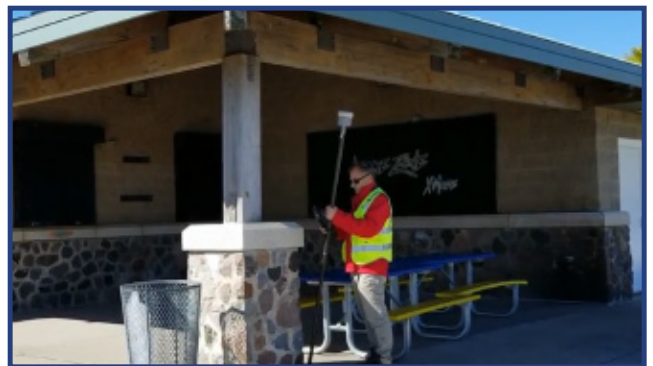
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MSPS Chapter Organizations

by B. Austin deSain, PLS

While the Missouri Society of Professional Surveyors has long been the senior survey organizations in Missouri, there are also regional and “local chapters” that many not be aware.

The smaller chapters are great for both younger surveyors who have recently been introduced to the surveying profession & older surveyors who can provide the experience and lessons learned to attentive attendees in those smaller group settings. Often there is a continuing education incentive for professionals with a comfortable casual environment for the student and associate members. Many small survey groups have met through the years to convene for education, business discussions and efforts to work with other civic organizations or governments in their regions.

The local chapters in our state help to support the Missouri Society of Professional Surveyors by way of promotion and often those are the members who step up to provide courses and volunteers when MSPS hosts a Spring Workshop or Annual Meeting in their vicinity.

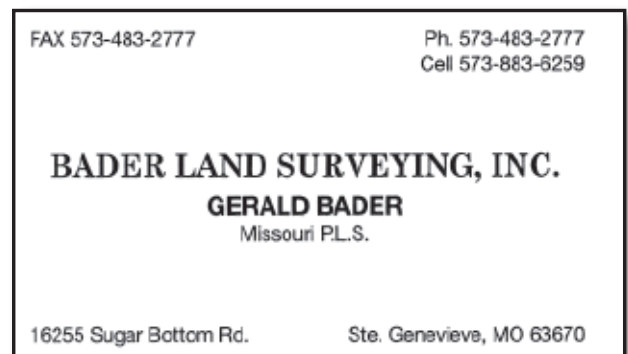
The Chapter report has long been a part of the MSPS Board meetings and provides a time for directors and members statewide to hear about the happenings in the local chapters. These issues often seen first by the local chapters may well affect surveyors state-wide shortly thereafter. Should the reader choose to become involved with the local chapter in your region, here is a current list:

Kansas City/Metro Website: <https://sites.google.com/view/kcmetrosurveyors/home>

Ozark: <https://www.facebook.com/Ozarkchaptermmps/>

Southwest: <https://www.facebook.com/people/SW-Chapter-MSPS/>

St. Louis: <https://stlsurveyor.org/>



MSPS-St. Louis Chapter Awards Its First Scholarship

[St. Louis, Mo. December 11th, 2024] – The St. Louis Chapter of the Missouri Society of Professional Surveyors is proud to announce the awarding of its first scholarship.

This scholarship was awarded to Leah Guss of Truxton, Missouri. Leah has been working with Lewis-Bade, Inc., in Warrenton, Missouri, as part of a field-to-finish survey crew while completing Warrenton high school with honors. Leah has just completed her first semester at Southern Illinois University-Edwardsville as a part of the Geomatics program. She has been volunteering at fundraising events such as the recent MSPS/IPLSA golf tournament. Leah has been involved with 4H and the FFA competitions as a national finalist, band, and she enjoys bow-hunting, and deer hunting.

The MSPS-STL Chapter reviewed applications for the new scholarship before deciding she would be the first recipient. “She has set the bar pretty high”, said Josh Saunders who is the Chairman of the Scholarship Committee.

The MSPS-STL Chapter intends to award future scholarships for those taking academic courses and working towards professional licensure and is accepting scholarship applications for 2025 through their website at www.stlsurveyor.org. 🇺🇸



From left to right: Leah Guss, Josh Saunders-Chair of the Scholarship Committee, and Bob Boyer and Kevin DeSain, members of the Scholarship Committee.

Winds of Change on Winnibigoshish

by Chris Ferguson with Liz Schlieff and Ted Sommer

Under a slate gray sky buffeted by wind-driven rain, Forest Surveyors from across the country toiled feverishly with a spirit of purpose...



From bottom left: Shelby Worel (Chippewa), Steve Grimaldi (GM-Finger Lakes), Brent Johnston (Coconino), Dwayne Ketzler (Mark Twain), Liz Schlieff (Eastern Region), Sean Crouch (Hiawatha), Nathan Price (Washington Office), Val Pulido (Ottawa)

Second Row (L-R): Todd Armbruster (Chippewa), Tony Dynek (Chequamegon-Nicolet), Brock Frierhood (BLM), Todd Maki (Ottawa), Paige Wiechman (Cheq-Nic), Chris Ferguson (Mark Twain), John Taivalkoski (Hiawatha), Ken Roy (BILS), and Ted Sommer (Cheq-Nic)

This story begins with loss of tribal lands in Northern Minnesota taking place from before statehood until the 1950's. Although treaties with the United States created tribal reservations in exchange for land outside the reservations, tribal lands were lost at an alarming rate due to various U.S. policies and administrative actions. In Minnesota specifically, the Bureau of Indian Affairs (BIA) transferred land to the Forest Service to grow the Chippewa National Forest, but without consent of Native American owners. While eventually declared illegal by both the Department of Interior and the US Supreme Court, no judicial remedy was possible since the statute of limitations had long passed to quiet title against the United States. Through efforts of multiple advocates taking many years, the Leech Land Band of the Ojibwe Reservation Restoration Act (LLBORRA) became law in 2020, directing the return of 11,760 acres of National Forest System (NFS) land in Cass County. That marked the symbolic beginning of correcting injustices from decades before.

The land restoration became reality on June 28, 2024. Only surveys necessary for transfer were performed prior to restoration. A key obstacle that impeded progress of the post-transfer implementation surveys was the vacant Professional Land Surveyor position on the Chippewa National Forest; therefore, the Chippewa was hamstrung in their efforts to mark any transfer boundaries. Some lands that were surveyed prior to transfer by the Bureau of Land Management (BLM) to create new legal descriptions were also not marked to Forest Service standards for clear identification.

This is where the Forest Service Inter-Regional Survey Initiative 2025 was designed to help. The Initiative was created to encourage learning by survey staff while accomplishing a priority Forest Service project in a short period of time. Through the efforts of USFS Chief Surveyor Nathan Price and Eastern Regional Surveyor Liz Schleif (who also supported the LLBORRA implementation efforts beginning in 2020), a team of Professional Surveyors and technicians from multiple Forests assembled for the task at hand. Crew members came from Vermont, Michigan, Wisconsin, Missouri, Arizona, and Washington DC. The Chippewa National Forest prioritized surveys in areas where recreational use was high, public recognition was critical, and where definite boundary locations were needed to manage natural resources and infrastructure.

The first full workday for most of the group, Monday, October 21st was held suspiciously on an unseasonably warm and sunny day. The order of the day was to assemble at the Chippewa National Forest Supervisor's Office. Introductions, project orientation, and safety briefs were held in the morning, with a surprise visit from Regional Forester Tony Dixon. Forest Supervisor Michael Stansberry, Deputy Forest Supervisor Millie Baird, and acting Blackduck District Ranger and Lands Program Manager Ashley May-Klick all expressed their gratitude and offered support to ensure success for the Initiative.

None of the assembled survey teams were familiar with Minnesota's various coordinate systems and Hiawatha Forest Surveyor John Taivalkoski's expertise helped everyone achieve "the common grid" before measuring in earnest the following day. Cass County Surveyors Dan McAninch and Levi Bergstrom along with Itasca County Surveyor Guy Carlson shared local information with the group, understanding better than the visitors the parameters of the impending field work.



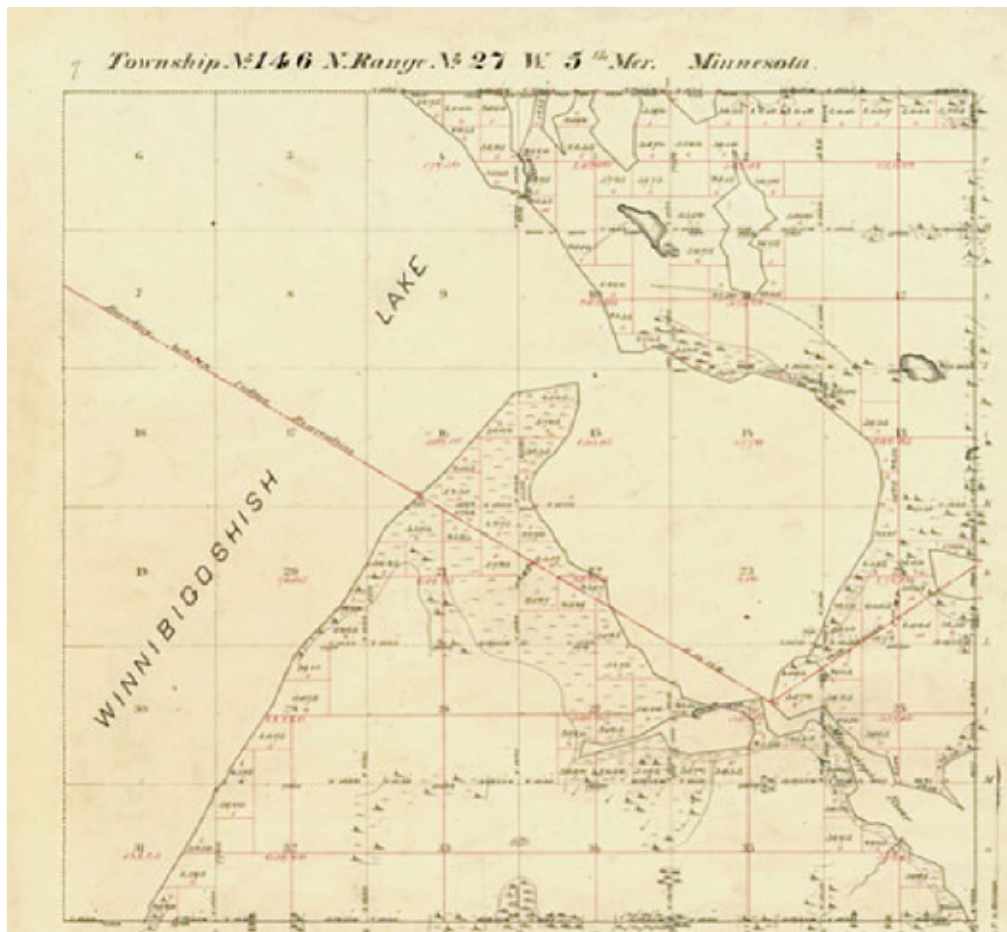
Orientation at the Chippewa Supervisor's Office (SO) was critical to gain an understanding of the project

(continued on next page)

Winds of Change on Winnibigoshish (*continued*)

For lack of a better term, Chequamegon-Nicolet Surveyor Ted Sommer was the Project Manager, deftly assigning teams and setting the fieldwork schedule. He and a few others arrived days before as an advance party to recon some of the sites. Ted was also to roam between crews prioritizing as necessary and announcing any changes of plans. Day 1 concluded with presentations by BLM Indian Land Surveyor (BILS) for the BIA Midwest Region, Ken Roy, and BLM Surveyor Brock Friermood who discussed Indian land tenure, the colorful survey history of Lake Winnibigoshish (“Lake Winnie”) and some of the unique challenges they faced recovering and setting corners for the transfer parcels.

The project is in the uppermost reaches of the Fifth Principal Meridian, part of one of the United States’ largest Public Land Survey System Meridians. These Townships, numbered 141 through 147 North and between Ranges 27 through 31 West are largely fractional and riparian, bounded by large glacial lakes. They were initially surveyed in the 1850’s, later intermittently partitioned into Indian Allotments of 160 acres or less, then largely resurveyed by the GLO in the 1910’s through 1930’s by order of the US Army Corps of Engineers as Lake Winnie (also having the distinction as the widest point of the Mississippi River) was dammed as a reservoir and to protect the downstream metropolis of Minneapolis/St. Paul from annual flooding.



Original GLO Plat (circa 1857)

Much of the 19th century original evidence was long-obiterated - the result of extensive logging of white pine in the area - with many early corners considered lost by the GLO resurveys. Fortunately, most of the subsequent surveys were recoverable.



An original GLO brass cap from 1919 Resurvey found disturbed. Note the markings for the many Meander Corners encountered.



An original GLO scribe in a pine stump

Unlike Monday, the first full field day greeted us with blustery winds and threatening skies. Crews focused on the Chippewa's top priority near the Birches recreation site on Lake Winnie. Ken and Brock assisted the author's crew finding new BLM pipes countersunk in roadways under sandy glacial till. Rain soon followed, turning into a deluge, and forcing an early break for lunch under the shelter of a pavilion. It was a good time to update progress, confirm calculations and tend to GPS base stations and radios.

Cool autumn winds finally blew the storm eastward and we finished posting the boundary between points located that morning. Other crews were facing the same difficulties but also enjoying similar production in the Norway Beach and East Pike Bay areas. Ted tirelessly worked to reassign crews and maintain the pace of work as work expanded throughout the area.

On Wednesday and again on Thursday Chequamegon-Nicolet Survey Tech, Paige Wiechman (who performed a significant portion of research for all projects) led her team including Liz and energetic Realty Specialist Shelby Worel out to Star Island by circuitous boat rides to recover corners and post new lines between the Chippewa NF and the Leech Lake Band of Ojibwe ("LLBO.") They found several long-forlorn GLO corners and pressed hard to post thousands of feet of new lines near a popular recreation area and summer homes. John's crew and Ottawa NF Surveyor Todd Maki's team toiled mightily in some tough country around Steamboat Bay of Leech Lake and Pike Bay of Cass Lake.



Nathan and Todd checking calculations while sheltering from the rain at the Birches Pavilion

(continued on next page)

Winds of Change on Winnibigoshish *(continued)*

We had all heard how difficult it was going through the dense Hazel undergrowth but experiencing it firsthand was to discover it was nearly impenetrable. It elicited several unsavory epithets from the author, who was far from alone. Our team had a hardy Realty Specialist as well. Todd Armbruster “earned his stripes” hauling and pounding heavy steel signposts and blazing line. Nathan and Mark Twain Surveyor Dwayne Ketzler gamely cleared line and hung signs along the routes.



Paige, Shelby, and Chippewa Boat Captain Mike McDaniel ashore at Star Island

Green Mountain Finger Lakes Surveyor Steve Grimaldi focused his efforts on the Strawberry Point near a summer homes group and posting line solo till late in the day when Brent Johnston – Surveyor from the Coconino stepped in to help wrap up that portion of boundary.

The final field day was much the same with crews focusing on the Southeast Pike Bay area near Takagami Summer Home Group. Joining us for a portion of the day were Dave Bismarck, LLBO survey technician, and Matt Frazer, LLBO GIS Manager, who had both performed extensive GLO corner search during the time NFS lands were being considered for the project. Our team now included Survey Technicians Tony Dynek (Cheq-Nic Forest) and Val Pulido (Ottawa NF) who helped immensely as we discovered the best way to traverse the Hazel was to “push” the line forward lining up from the rear and furiously attacking the brush with chainsaws. We soon heard the sweet music of line cutting and post driving from Todd’s team who was pushing from the opposite end of the line. Ted then “drafted” Val to swamp for him through the tangle toward Steve and Hiawatha Survey Technician Sean Crouch to close out the line.

All planned work complete, we returned to the SO to turn in notes and excess material. More importantly, it was time to recognize the outstanding contributions of the many stellar performers! Several awards were issued to this hardworking group of ad hoc survey crews. Mentorship was particularly valued and celebrated. It was a joy to learn from each other throughout the week.



Crews check the GPS Base & Radio in an open area before attacking the Hazel undergrowth

A hearty meal was enjoyed by all in downtown Bemidji (fabled birthplace of Paul Bunyan, a fitting role model) before farewells and launching on the following frosty dawn to our respective home duty stations. As we departed, we were blown along by the winds of change; a beginning of acknowledging and correcting reservation loss by the Leech Lake Band of the Ojibwe. 🇺🇸



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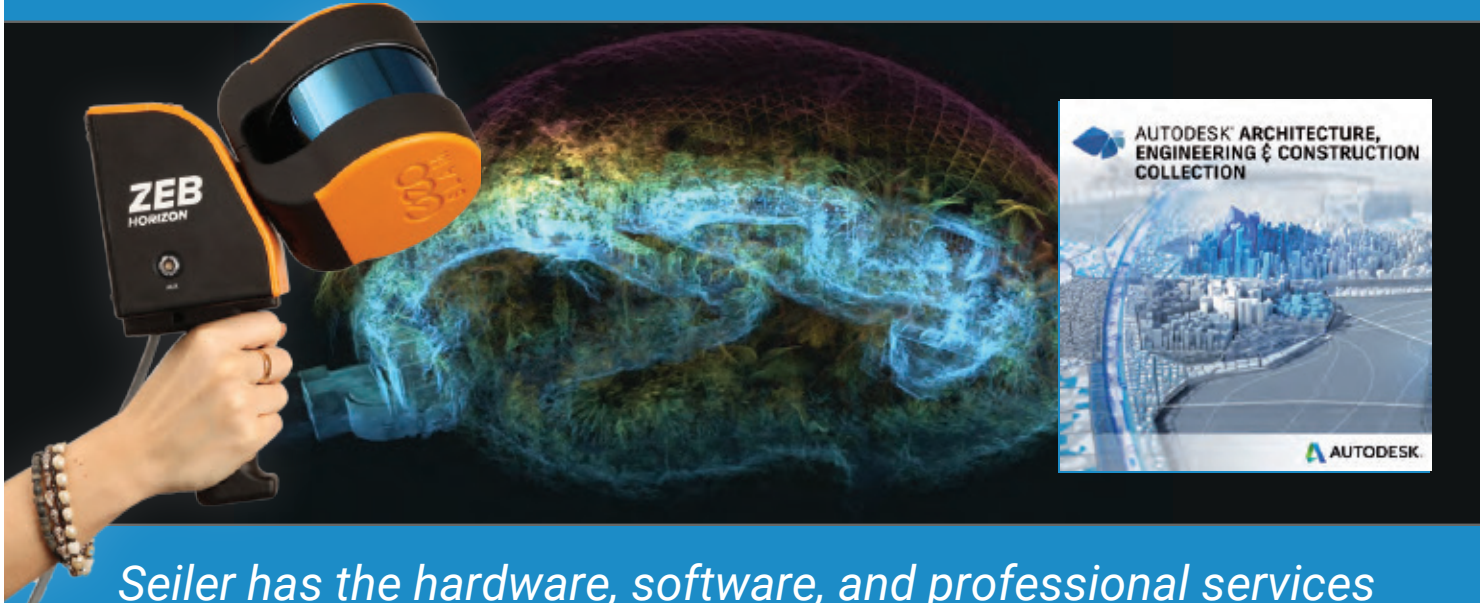
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Thoughts on Professional Practice and Education

Article 13: Pursuit of Graduate Education

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

This is the thirteenth article I have prepared in the series offering thoughts on professional practice and education. In this article I am going to give my thoughts on obtaining graduate education. I will define graduate education as any education earned beyond the undergraduate bachelor degree.

I will start with the premise that graduate education is not necessary for a rewarding and successful surveying career. I would even go so far to state that for many surveyors, obtaining graduate education will not gain an economical return on the investment. Finally, I will readily admit that there are numerous surveyors without a graduate education or even an undergraduate degree that are far more intelligent than many people with graduate education including more intelligent than me. In other words, three graduate degrees does not make me more intelligent than many surveyors without a degree. If you are content with your position in the profession, your future, and your prospects, you do not need to consider graduate education.

There are three reasons to embark on graduate education. The first is to expand the depth of your knowledge. This would be accomplished by obtaining advanced education in surveying. The second reason is to expand the scope of knowledge. Expanding the scope of knowledge would occur by obtaining advanced education in a discipline other than surveying such as business administration, law, public administration, civil engineering, or forestry, as examples. The third reason is to qualify for other employment or licenses. For example, a graduate degree is generally required for a tenured college faculty position.

As a consequence, a person with an undergraduate degree in philosophy that decides to pursue surveying, may wish to consider getting a graduate degree in surveying rather than an undergraduate degree in surveying. A person with a surveying degree may wish to obtain a graduate degree in business administration.

The first graduate degree is generally a master's degree (e.g., Master of Science, Master of Arts, Master of Business Administration). The master's degree tends to focus on a specific discipline. There is little, if any, requirements when obtaining a master's degree for earning non-discipline specific

courses to provide for a 'rounded' education. Thirty credits are generally required for a master's degree. Some of the credits may be awarded for research and thesis. The thirty credits may be composed entirely of surveying or surveying related coursework.

For the person interested in graduate study, there are two decisions that must be made. The first decision is to decide the focus of graduate study. The person must decide if studies will be in surveying or another field such as civil engineering, business, law, etc. The next decision is to decide the intensity of study. What I mean by intensity of study is the goal of graduate education. The easiest route for graduate education is to obtain a graduate certificate in a certain field. A graduate certificate at the University of Maine requires 12-15 credits of study, depending on the field of study. The next level of intensity is a master's degree that generally requires around 30 credits of study. Finally, a doctorate requires 42 to 90 credits of study beyond the bachelor's degree. In some cases, a person can achieve the ultimate goal of obtaining a graduate degree by taking smaller steps. For example, the credits used to obtain a graduate certificate can later be used to obtain a master's degree. The credits obtained in a master's degree can often be used toward a doctorate. There are exceptions such as a law degree where there are no intermediate goals toward obtaining a juris doctorate (law degree).

A student that seeks to embark on graduate education should be aware that many graduate programs will not accept or only accept a limited number of credits from another university. For example, a university that requires 30 credits of graduate study to obtain a master's degree may only accept six credits from another university. The program would require 24 credits be obtained at the university awarding the graduate degree.

† Other books and articles by Knud can be found at <https://umaine.edu/svt/faculty/hermansen-articles/>

Thoughts on Professional Practice and Education

Article 14: Philosophy of Educating Students Beyond Course Contest

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

This is the fourteenth article I have prepared. In this article I will offer thoughts regarding my approach to teaching students beyond the course topic and perhaps reveal one of many character flaws I possess – at least according to some students. I might point out for the sake of the reader, that I share these flaws with many employers in these modern times.

As a faculty member, I stand in the cross roads where many individuals leave pampered or sheltered home lives and must soon work in a profession where the employer expects to make a profit from the graduate's endeavors and the client expects to receive quality service for a reasonable fee. I have been challenged many times attempting to adjust student attitudes. I am often disliked by students for my efforts. I believe my efforts are appreciated by employers. The reader may judge for themselves after reading this article.

I will begin by crediting three sources for my belief that attitude adjustment is part of any learning process. First, I will credit my father who had a strong belief that his three boys must earn their keep on his dairy farm. Second, two weeks after graduation from high school, I left the farm to become a U.S. Marine. The Marines are well known for attitude adjustment. The third source is the court system. I challenge anyone to appear before a judge with an attitude contrary to what the judge expects.

For the thirty plus years I have taught at college, I have attempted to introduce students not only to surveying knowledge but also to expose the student to the realities they will face when employed in surveying practice. Better the students understand life's foibles and harsh realities sooner rather than later. I would prefer they frustrate me rather than frustrate employers and dismay clients. My attempts at attitude adjustment have not always been well received by students nor have I always been successful in restructuring attitude.

The following are my goals for attitude adjustment among students.

Education or employment is not to be treated as an inconvenience in personal priorities. Mark Twain said,

“To change your life, you need to change your priorities.”

Many students find it difficult to change their priorities from themselves to clients and employers. Some students want to socialize, party, do on-line gaming, and so on. Some students consider this a sacred right. A full-time employee owes the employer and client 40 plus hours of satisfactory work a week without personal distractions affecting their efforts. This means that social sites should remain unused during working hours. I expect students to put in the necessary hours of class, study, and effort without distraction with personal pursuits.

When planning board meetings and property closings are routinely rescheduled to accommodate a survey employee's personal life, I will reconsider this policy.

Examples: *“I'm in intramural volleyball. We have a game during the test time. Can I take the exam next week? ... Can I take the exam early so I can start my break earlier? I already have my tickets to fly home. ... I was given a one-week cruise in the Caribbean for my birthday. Can I hand in my homework when I return?”*

Standards are established by the instructor or employer, not the individual. I suppose it is to be expected when growing up in a society where everyone gets a trophy that students expect to be accommodated when they believe they have made a good faith attempt even though they failed to achieve anything notable with the attempt. I often have to remind students that in practice, there may be twenty proposals submitted to a prospective client but only one proposal is accepted. All other proposals fail. No matter how hard a surveyor tries, unless services are delivered fully to the client per the contract, the surveyor is not paid in full.

When employers are compensated for unsuccessful proposals or fully compensated for unfinished services, I will reconsider this policy.

Examples of Conflict: *“I spent a lot of time on this assignment, I should get more points ... I really studied hard. How can you fail me? I was only an hour late with my homework submission, you should grade it! ... This is my last semester. You can't fail me now.”*

Bad events for a student (employee) will be confined to the individual and not affect the class (business). Many

students think that a problem they believe they are not responsible for is sufficient justification for special accommodations for the class. I acknowledge that bad things happen to good people; yet, real life cannot stop or even allow for adjustments for the student at the expense of the class. Therefore, in my class, if a student has an emergency, class tests are not rescheduled, homework dates are not adjusted, and expectations not relaxed. Life must go on.

I will change my policy when an employee can have additional vacation days because bad things happen after they have used all their vacation time for that year already.

Examples of Conflict: *“Evenings for me are not a good time for testing, can you move tests to another night. I don’t think I should have to look at examples to determine what I did wrong. You should provide individual feedback.”*

Lack of planning on the student’s (employee’s) part will not become an emergency on my (the employer’s) part. Some students believe that their lack of planning requires me to compensate as a result. Some individuals seem unable to plan and are very offended that I will not alleviate the situation caused by their poor planning.

My policy will change when employers allow employees to set their own work schedule and production outputs.

Examples of Conflict: *“My ex just dropped off my children for me to watch. I will have to take the test tomorrow. ... I forgot to set my alarm so I missed the exam. I will need to take a makeup.”*

An instructor (the employer is) not your mother. Students often come to college ill prepared to handle stress and crisis. The student expects faculty and employers to show the same empathy, support, and consolation for any and all stress and personal crises that they once received from their mother. I am not the student’s mother. Some students have taken great umbrage with me because I don’t react in the same empathetic manner their mother did by immediately changing my life and course requirements to best suit their emotional needs.

When survey firms hire emotional support counselors, I’ll rethink this policy.

Examples of Conflict: *“I just broke up with a girl I’ve been dating for four years, since I was in 9th grade. I can’t study or handle an exam right now. ... I can’t believe that Trump won the election. I need some time off from class to deal with my distress.”*

Murphy’s Law can strike more than once or bad luck often accompanies habitual faulters. I am not surprised that some students encounter more than their fair share of unfortunate happenstances. These students are often the marginally motivated or the habitually ill-prepared students.

Employers don’t usually keep these individuals as long-term employees. The employees I am referring to tend to get sick only on Fridays or Mondays and have alarm clocks that never seem to work or ring loud enough.

When employers promote underachieving employees, I will change my policy.

Example of Conflict: *“My internet went down with the storm. I couldn’t take the test. I know you said in the syllabus that you will drop the lowest test score. However, I had to miss a test already because my car had a flat tire on my way home from work. My spare was flat as well.”*

A student should not fertilize and water problems they have at the instructor’s (the employer’s) expense. Individuals often exasperate their problems by demanding more accommodations than practical or required by law. We can all admire someone that achieves great success with disabilities. Increasingly, there are people experiencing difficulties that they believe should be treated as protected disabilities. They demand accommodations without demonstrating an effort to overcome their ‘disability’.

I will relax this policy when employers allow employees to stay in the survey vehicle rather than leave the vehicle and go into the field because the bugs are particularly bad or they saw a snake while unloading the survey equipment.

Example of Conflict: *“I can’t handle cold temperatures. I won’t be able to do lab this week unless we move inside where the temperature is warmer.”*

When your bucket is full, you can’t fill the instructor’s (employer’s). Individuals often exasperate their problems by taking on more than they should handle. Rather than step back, regroup, and try again, they demand accommodations and blame me for pointing out a solution that doesn’t require I bend over backwards and provide accommodations.

I will change my policy when employers routinely loan their employees money because the employee runs short of funds between paychecks.

(continued on next page)

Article 14: Philosophy of Educating Students Beyond Course Contest (continued)

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

Example of Conflict: *"I'm taking care of my mother and trying to complete my coursework from last semester. I need to delay taking the first exam. ... What do you mean I can't? You are not being considerate in helping me deal with this problem. ... No, I won't drop the course until my personal crisis is resolved. I don't want to wait until next year to take this class."*

I should point out these remonstrations I have presented should not be a surprise to students. I make these rules known to students before the course begins using a document available to them. The document is titled: 'Rules for the Course.' It is available for viewing on my publication web site. This document is given to every student at the start of the course and cause some students to immediately complain about rigid rules and heavy-handed ways. Apparently, similar rules were not applied in high school or other college courses.

I am encouraged in my attitude adjustment attempts by feedback from employers. I had one employer explain to me about interviews he has with seniors that apply for employment with his firm. The employer will ask the senior what the senior thought of me as their instructor. If the senior complained I was unfair or had similar negative sentiments toward me, the firm did not hire that person. The firm believed if the senior found it difficult to work within my rules, they would not work well within the constraints of the employment rules set by the surveying firm.

I suppose fairness allows that disgruntled students have a say about me. I am far from perfect. Perhaps the reader of this article may wish to give me some nasty criticism that arose from reading this article. Maybe the reader is a former student and has kept their angst bottled up since the time they were a student in my class. Fortunately, some enterprising fellows set up a web site called RateMyProfessors.com where strangers, students, and a great many short-time-students can voice their opinions about faculty anywhere, at any time, including criticizing me (or complimenting me).

This is an unofficial web site. Official university evaluations can only be completed by real students that have actually taken a college course and finished the course. The unofficial web site I just mentioned will allow anyone to comment about an instructor regardless if the individual was in the course, dropped the course, or even took the instructor's course. (I have never taught some of the courses cited on this website that students claim I taught.) Consider adding your own opinion. Having taught over 5000 students and close to that many licensed surveyors in seminars during my career, this web site is a chance to vent or make your thoughts known.

† Other books and articles by Knud can be found at <https://umaine.edu/svt/faculty/hermansen-articles/>

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Continued from the Front Cover

Continued from the front cover... In the summer of 1835, U.S. Deputy Surveyor Richard T. Holliday set a limestone corner monument to mark the South Quarter Corner of Section 32, Township 34 North, Range 19 West in present day Dallas County, Missouri. DS Holliday also took two post oak trees as witness to the corner. In March of 1948, County Surveyor James McConnell "Found old Govt spot and restored 1/4 Sec. corner." CS McConnell described the corner as a Limestone 20" x14" x4" and took two new witness trees.

On June 2nd, 2023, 188 years later, Ray Riggs and Parker French of Riggs Brothers Surveying spotted the stone with an old channel post driven beside it. A stump hole for the northeast GLO post oak was found but nothing positive at the northwest GLO tree position. Evidence was found of both McConnell trees. The stone had a "X" chiseled on the top and was leaning slightly. 🇺🇸



Howell County Officials being sworn in - From left to right in the picture is: Circuit Judge, Coroner, County Surveyor Ray Riggs, Public Administrator, Southern Commissioner, Northern Commissioner.

Jane's Surveying Marion County Surveyor

In a historic moment for Marion County, Marla Meyers, Marion County Clerk, swears in Jason Janes, PLS #2004017826, as the newly elected County Surveyor, succeeding his father, John Janes, PLS #2354, who served with distinction for 24 years. This ceremony marks the continuation of a proud family legacy in the surveying industry, spanning three generations since 1972, with Jackson Janes, a land surveying student, poised to carry the torch forward.



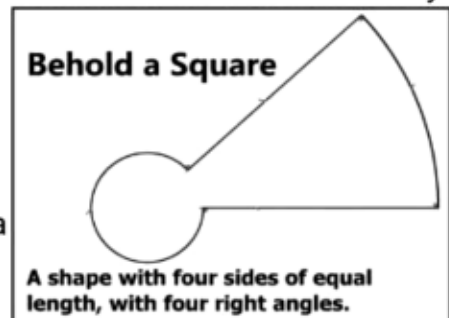
Data from Unproven Sources – A Frivolous Example

by Donald Clinkenbeard, P.L.S.

On Saturday October 5, 2024 at the Annual Meeting, Austin DeSain and Stan Emerick gave an excellent presentation about the emerging significance of Artificial Intelligence (AI) and the inevitable impact on Surveying. There are currently more things unknown than known about AI, but it is certain every practicing Land Surveyor will need to sharpen their critical thinking. Some things asserted by AI software will “not necessarily be so”, and it will fall on each of us to discern the truth.

This article is not a full treatment of AI considerations.

A fellow surveyor texted me the cartoon shown here. It is frivolous and mildly funny in its own right. Perhaps it is also a chance to talk about ways to test the truth of any modestly believable assertion, or of data discovered from an unproven source. This example is frivolous. But testing for truth can be demonstrated.



The first test that I propose is to review the known definition of a “Square”. It is true that squares have four equal sides and four right angles. But all “Squares” are also “Rectangles” and the four sides are all “lines”. The cartoon states two similarities between the figure illustrated and a square. But it errs in declaring “Behold a Square”.

First Principle: Definitions matter. As a note to those individuals still needing to take professional licensing exams, take time to study and memorize definitions. An old test writer’s trick is to utilize very specific defined terms when asking questions. Without a precise knowledge of defined terms, you may not realize what is being asked. You also may not recognize that data you need, though not directly stated in the question, can be assumed from precise definitions. Consider the entire definition of words and concepts.

Like words have definitions, mathematical processes require specific input data and need to generate specific output data. Both Words and Math require Rigor. Incomplete elements in either the input data or output results strongly suggest a lack of mathematical rigor. As one example, solving a specific triangle requires three elements consisting of sides or angles. A triangle result based on two side lengths and no angles would be unreliable. It remains possible that an AI process (or human) made certain unstated assumptions. **I strongly recommend doubting any result based upon incomplete input data, unstated assumptions, or resulting in incomplete results.**

Second Principle: It is vital to know basic math. The example cartoon is a picture and a brief description, but offers no verification that it is rigorously possible. One thing that AI will increasingly do is manipulate images, sometimes in deceptive ways. Call me a “nerd” (and you would be correct) but I found myself wondering whether the figure depicted was mathematically possible. And I was curious what parameters might define any mathematically valid figure of the described type. **If the concept presented by the cartoon is “possible”, it may not be “universal”.** Despite the specific cartoon being clearly frivolous, I decided to do the math. IT IS AN INTERESTING MATH PROBLEM. Try doing the math for yourself.

(continued on next page)

Data from Unproven Sources – A Frivolous Example (continued)

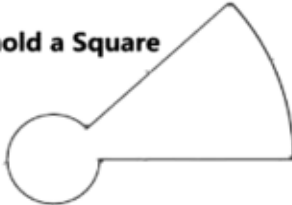
A MATHEMATICAL SOLUTION

Donald Clinkenbeard, PLS

Hopefully, you did the math yourself to verify whether the cartoon below is mathematically possible. Here is my solution. There may be other solution methods. First thing to do is make a sketch and define variables.

My variable definitions are to the right. →

Behold a Square



A shape with four sides of equal length, with four right angles.

The image at Left may be deceptive. Is it Mathematically Possible? What Limitations Apply, if any?

NOT A SQUARE
Squares are Rectangles.
Having 4 Equal Sides and 4 Right Angles NOT FULL DEFINITION of Square.

Δ in Radians
Unitless Ratio
(Δ=L/R) & (L=RΔ)
(360° = 2π Rad)

Δ=X
Radius=R
L=RX

Δ=(2π-X)
L=RX (RADIAL)

Radius= (R+RX)
L=(2π-X) * (R+RX)
(and) L=RX

**IS GEOMETRY POSSIBLE?
PROVE IT WITH MATH.**

The first thing I decided was to express angles in Radians during calculations. Radians are both a valid angular unit of measure, and a "unitless ratio". That often simplifies mathematical expressions. I decided not to define units of length, again for simplicity.

Since the arc length of the smaller and larger radius arcs are equal by definition, set them equal to each other. (Each is based on Length=Radius x Delta in Radians)

$$(2\pi - X)(R + RX) = RX$$

$$2\pi R + 2\pi RX - RX - R(X^2) = RX$$

(Divide both sides by R. "R" drops out.)

$$2\pi + 2\pi X - X - X^2 = X$$

(Formatted as Quadratic Equation)

$$0 = X^2 + (2 - 2\pi)X - 2\pi \quad >\text{where}>$$

(General Quadratic Format)

$$0 = aX^2 + bX + c \quad X = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

a = 1, b = (2 - 2π), c = -2π

$$X = \frac{(2\pi - 2) \pm \sqrt{(2 - 2\pi)^2 - (4(1)(-2\pi))}}{2}$$

$$X = \frac{(4.283185307) \pm (6.593816619)}{2}$$

(Negative Value Does NOT Give 4 Sides Equal.)
(Tests of both Positive and Negative Solutions later.)

X = 5.438500963 Radians (Positive Solution)
(After finding X in Radians convert to Degrees)
X = 311.603152058 Decimal Degrees

X = 311°36'11.34741" Small Radius Δ

Large Radius Δ = (360° - 311°36'11.34741")

It turns out that the figure as sketched in the cartoon is mathematically possible.

The figure will scale at any size based on distance "D" or R.

Only one angle as Delta (Δ) will result in the four equal lengths.

Δ=48.23.48.65259
L="D" (RADIAL)

L="D" (RADIAL)

L="D" (RADIAL)

L="D" (RADIAL)

L = (Any Distance) "D"
Δ=311°36'11.34741"

NOT A SQUARE

The following two tests at a specific value R=3.200 document that the two Quadratic Solutions for Delta (one Positive and one Negative) are **NOT BOTH VALID**. The Negative Quadratic Solution Fails. Always **MAKE A CHECK!**

Now look at the implications of the Negative Quadratic Option:

(Continuing from the prior equation seen below.)

$$X = \frac{(4.283185307) \pm (6.593816619)}{2}$$

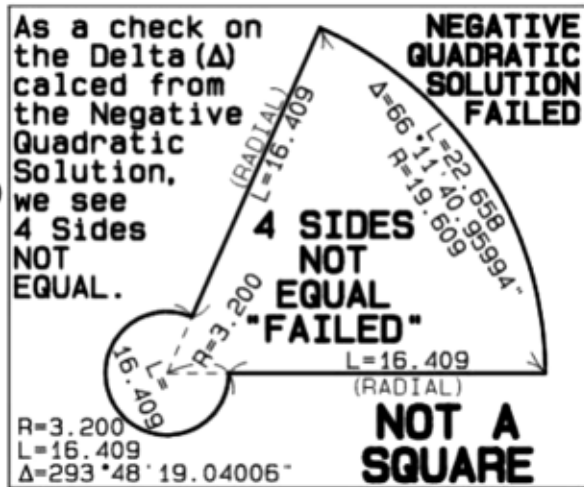
$X = -1.155315656$ Radians
 (Being Negative we might Add Full Circle in Radians)
 (This angle in Radians doesn't work in our problem.)

$$X = 2\pi - 1.155315656 \text{ Radians}$$

$X = 5.127869651$ Radians
 (After finding X in Radians convert to Degrees)

$$X = 293.805288906 \text{ Decimal Degrees}$$

**$X = 293^{\circ}48'19.04006''$ Small Radius Δ
 BUT this FAILS as shown to the Right.
 Large Radius $\Delta = (360^{\circ} - 293^{\circ}48'19.04006'')$**



The aggravating reality is -1.155315656 SOLVES the original quadratic equation.
 $0 = X^2 + (2 - 2\pi)X - 2\pi$ Where: $X = -1.155315656$
 A valid algebraic solution is not always a practical solution in the real world.
Check each algebraic solution against your real world constraints.

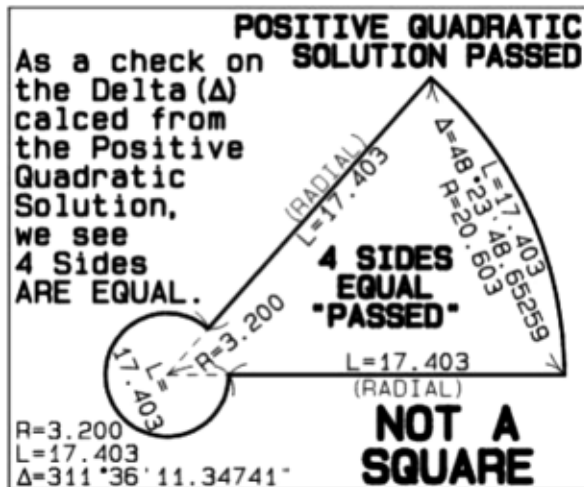
Check of Positive Quadratic Solution for Delta at a Specific Value of R:

(Small Radius Delta as Calced Previously.)
 Using the same value $R=3.200$ as above.

**$X = 311^{\circ}36'11.34741''$ Small Radius Δ
 Large Radius $\Delta = (360^{\circ} - 311^{\circ}36'11.34741'')$**

I am persuaded that the Delta Value shown here is the ONLY Delta Value regardless of values of R or D that will result in Four Equal Sides and Four Right Angles as conceptually defined.

The defined geometric parameters will scale to any size, but not work at any other Delta Angle.



Both Licensed and Aspiring Surveyors need knowledge of Geometric Rules of Construction, Trigonometry, and Basic Algebra. This task was frivolous, but the needed skills are vital. If this math was beyond you, consider upgrading your basic math skills. Your math knowledge may prevent believing fake AI results, and allow you to model the likely performance of new methods or concepts. Artificial Intelligence (AI) may deceptively alter images, grab data, or adopt procedures from any source. Your math skills may provide one form of check.

Not everything found on the Internet is true. But you already know that.

2024 State Land Survey Program Update and Project Highlight

In December of 2024, Scott Faenger, State Land Surveyor, reported to the Missouri Society of Professional Surveyors that the LSP had 27 County and Private Surveyor Co-op Corner Restoration Contracts for FY24, restoring a total 207 corners at a total cost of \$86,190.00.

The program also oversees the Land Survey Repository, which between July 1, 2023 to June 30, 2024, received 17,701 documents (of those, 1,959 were corner docs) to be added to the Land Survey Index (LSI) and the Corner Master Index (CMI) databases, an average of 1,475 documents per month, or 70.67 per day. This work is very important because in turn, a total of 39,374 orders were received through online orders, at an average of 3,281 per month.

New corner forms are on the horizon! The MSPS Standards Committee met twice with the LSP to discuss modifications to the Code of State Regulations, Chapters 2 CSR 90-60, 61 and 65 necessary for the implementation of the new coordinate system. Language referring to the Missouri Coordinate System of 1983 in the regulations will be amended to better focus on modern times. The corner document form will likely reflect similar language. Jess Moss continued work on Distortion maps and a User's Manual for the new coordinate system. 60 EDM baseline reports were run for the new system, with 6 requested to be certified. The EDM program encountered a cyber-attack during work, that was resolved through a modification of the online form allowing for entry, certification and submittal with results delivered after.

The mission of the Land Survey Program (LSP) is to develop and provide information required for the accurate and economic location of property boundaries in Missouri. To fulfill this mission the program has followed its mandate based on the statutory responsibilities set by the legislature in 1969, when the State Land Survey Authority was created.

The program's duties are defined in Missouri Revised Statutes, Chapter 60.510 – 60.620:

1. Restoration and reestablishment of the original United States Public Land Survey Corners in Missouri;
2. Establishment and maintenance of a state-wide Land Records Repository;
3. Extension and densification of the horizontal and vertical control network in the state; and
4. Provide for the development of uniform standards for land surveying, geodetic surveying, mapping, and the maintenance of the U.S. Public Land Survey System (PLSS).

Since one of the functions of the land survey program is the preservation of U.S. PLSS corners, the Cadastral Section provides an organized effort to restore, reestablish and perpetuate these corners. This is accomplished by way of in-house projects, contracting with county commissions, county surveyors, and private surveyors. The work is archived and provides for a statewide database used by land surveyors, engineers, tax assessors, mappers and the public. Developers of parcel level Geographic Information Systems (GIS) utilize this data as the primary framework for mapping projects. Survey investigations and technical assistance are provided to the public by the Cadastral Survey Section.

One such project that the State Land Surveyor was requested to investigate had to do with an adjacent landowner who accused a neighbor of encroaching, and the quarter corner J-07 had been obliterated, in Township 38 North, Range 5 East. Corners for J-05, J-07 & J-09 are shown in the following images, taken during the survey.

J-05 Corner to Sections 7, 8, 17 & 18
Original Survey

1817: Volume 203 at Page 168, William H. Ashley, D.S.

Set a Post and Marks: 17" White Oak S.15°E., 40 links



20" White Oak N.78°E., 100 links

Subsequent Surveys

1911: Missouri Land Survey Document 750-22973 Thomas H. Holman, C.S.

Finds stumps of both witness trees and Sets a Stone and marks new trees:

6" White Oak S.35°W, 8 links, 7" White Oak S.56 ½°E., 43 links

(continued on next page)

2024 State Land Survey Program Update and Project Highlight *(continued)*



1986: Certified Land Corner Document 600-38557, Orvis D. Lashley, PLS 1538

Finds an 8" by 8" by 9" above ground milled limestone with cross on top and 7, 8, 17 & 18 chiseled on the sides. He finds a stump hole S.35°W, 8 links (1911), a forked White Oak S.56 ½°E., 43 links (1911) and a stump hole S.15°E., 40 links (GLO)

he leaves the stone in place and marks new trees:

12" Red Oak S.45°W., 12.2 ft., 14" Red Oak N.49°W., 7.5 ft., 9" Red Oak N.58°E., 32.2 ft.

16" White Oak S.14°E., 26.9 ft.

2024: Certified Land Corner Document 600-109889, Scott Faenger, PLS 2015000227

Finds limestone 8" by 8" by 9" above ground. 7, 8, 17 & 18 chiseled on the sides.

Stump hole N.78°E., 100 links (GLO), Stump hole S.35°W., 5.3 feet (1911), Snag S.56 ½°E., 28.4 feet (1911), 19" Red Oak S.45°W., 12.2 feet (1986), Red Oak Stump N.49°W., 7.5 feet (1986), 16" Red Oak N.58°E., 32.2 feet (1986), 21" White Oak S.14°E., 26.9 feet (1986)



We left the stone in place freshened up the witness trees taken in 1986 and marked new a 13" Hickory S.22°W., 23.5 feet.

J-07 ¼ Corner to Sections 8 & 17

Original Survey

1817: Volume 203 at Page 168, William H. Ashley, D.S.

@ 37.50 chains set ¼ Section Post from which:

16" White Oak S.44°E., 20 links

12" Red Oak N.44°E., 36 links

Subsequent Surveys

1911: Missouri Land Survey Document 750-22973
Thomas H. Holman, C.S.

Plat indicates Stone at midpoint and takes new trees:

8" White Oak, N.27°E, 36 links,

12" Black Oak, N.56°W., 44 links



(continued on next page)

Mark Your Calendar

47th Annual Spring Workshop

May 1-2, 2025

Lodge of Four Seasons, Lake Ozark, MO

2024 State Land Survey Program Update and Project Highlight *(continued)*

2024: Certified Land Corner Document 600-109891, Scott Faenger, PLS 2015000227

At the computed midpoint we found no evidence of C.S. Holman position. Approximately 40 feet north of the computed position we found a 10 inch square by 3 feet long milled limestone with $\frac{1}{4}$ scribed on one side and 17 scribed on another side, the area had been bulldozed out some time ago. The corner was reestablished at the midpoint position placing the recovered stone on its side to the North and go on the mark: 20" Hickory N.68°W., 47.5 feet, 25" White Oak N.37°W., 23.8 feet, 27" Red Oak N.31°E., 39.4 feet.



J-09 Corner to Sections 8, 9, 16 & 17

Original Survey

1817:

Volume 203 at Page 168, William H. Ashley, D.S.

@ 80 chains set Post from which:

14" White Oak N.75°E., 66 links

16" White Oak S.24°W., 90 links



1911: Missouri Land Survey Document 750-22973 Thomas H. Holman, C.S.

CS Holman finds evidence of the original survey and sets a Stone and takes new trees:

7" White Oak West, 31 links, 7" White Oak N.69°E., 13 links, 4" Hickory N.17°E., 18 links

(continued on next page)

2024 State Land Survey Program Update and Project Highlight *(continued)*

1981: Missouri Land Survey Document 600-29271 Harold L. Koen PLS 280

Found Limestone 8" by 8" by 48", with GLO depressions, grouted cap on stone.

He goes on to mark 4 new witness trees. Since 1981 this corner has been mentioned on 9 different surveys.



The reason for the our office involvement was the location of the the $\frac{1}{4}$ corner between Sections 8 & 17. The 2003 survey finds the East 16th corner between 8 and 17 and measures west 1320' and sets a 5/8" rebar for the $\frac{1}{4}$ corner. This section line on the GLO plat and notes is 75 chains wide.



Unfortunately we had to reestablish the quarter corner but our midpoint location is a much better representation of the GLO location than found rebar 80+ feet to the west.





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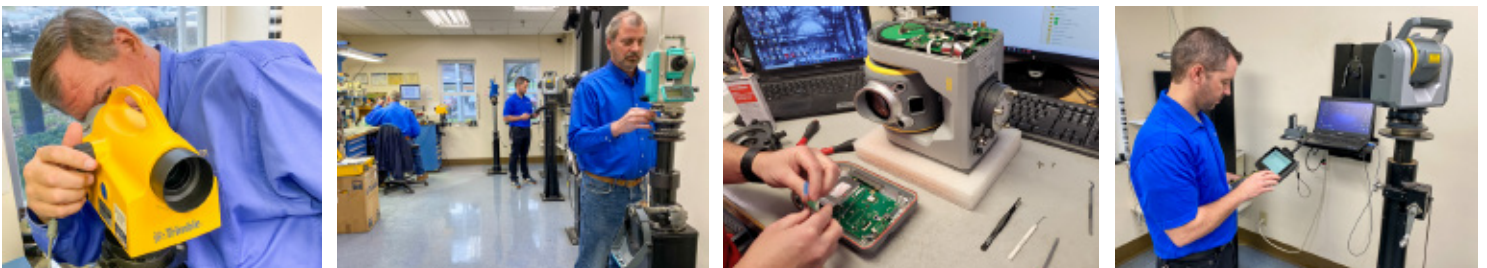
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- Determine the boundary.
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Forward your resume or inquiries to Mark Young, PLS & PE: Mark.Young@WilSurveyInc.com

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LEGAL PRINCIPLES 101: THE LEADING BOUNDARY CONTROL LEGAL PRINCIPLES IN 4 HOURS

by Dr. Richard Elgin, PLS, PE
Rolla, Missouri

MARCH 2025
8:30 - 12:30 (CST)
(webinar login begins at 8:15 am)

WEBINAR ABSTRACT

In surveying education and mentorship the legal principles of boundary location seems to not have the priority that it once did. But this aspect of the boundary survey is just as important as it ever was...if not more important. The webinar examines the leading boundary control legal principles: sequence and simultaneous conveyances, construing and writing boundary descriptions, prescriptions, acquaintance, dedication, easements, reversions, the USPLSS and riparian boundaries. This webinar is meant for the surveying student or one on the path to licensure and also the PLS seeking an interesting, informative continuing education topic.

DR. RICHARD L. ELGIN, PLS, PE

Dick Elgin is a rare surveyor: A practitioner, having owned and operated a surveying and mapping firm for 24 years. An author, having written "Legal Principles of Boundary Location for Arkansas," "The U.S. Public Land Survey System for Missouri" and "Riparian Boundaries for Missouri." An educator, being Adjunct Professor Emeritus of Surveying at Missouri University of Science & Technology (Rolla). Semi-retired, he works for Archer-Elgin Engineering & Surveying (Rolla, MO).

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