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# HOOSIER SURVEYOR

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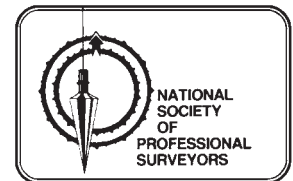


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## LUCAS OIL STADIUM

With the Lucas Oil Stadium under construction in the background are Benchmark Land Services personnel involved in the stadium's steel erection survey work: Donn Scotten, President, (standing in front); Rick Phillips, Sonny Sanchez, Meddie Demmings, Neil Hendrick and Mike True (kneeling, left to right); Rick May, Mike Phillips, Scott Paff, Brian Kelly and Norman Hiselman, Director of Surveying (standing in rear, left to right). See Page 14 for article.

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# HOOSIER SURVEYOR

VOLUME 34 NUMBER 1 SJMMER 2007

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## EDITORS NOTE

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Articles and columns appearing in this publication do not necessarily reflect the viewpoints of ISPLS or the Hoosier Surveyor staff, 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.

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## **ISPLS BOARD OF DIRECTORS (2007)**

First row, l to r: Frank Ballintyn,Sellersburg; Jim Tibbett, Linton; Richard Hudson, Valparaiso; Harold Hart, Charlestown; Don Bengel, Valparaiso; Ron Wharry, Frankfort; Second row, l to r: Dan Kovert, Fishers; Ed Sweetland, Greenfield; Mark Isaacs, Brownstown; Steve Murray, Battle Ground; Perry Cloyd, Columbus; not pictured Todd Bauer, Leo.



# PRESIDENT'S THOUGHTS

by Ed Sweetland, Greenfield, Indiana



It is July 22; Summer is almost over and I am writing my third president's message for the Hoosier Surveyor publication. Since in my last president's message, many notable events have happened in the land surveying community that I need to discuss with you. First I have recently changed jobs. I now work at USI Consultants, Inc. as a project manager within the Right-of-Way Services section. I want to thank my friends and colleagues at American

Structurepoint, Inc. for a long career and many fond memories. My updated contact information will be posted on the ISPLS web page and within this issue of the Hoosier Surveyor.

You may have heard through the grapevine or by a letter written by Dr. Kathy Banks, the Bowen Engineering Head and Professor of Civil Engineering at Purdue University that the BS Land Surveying Geomatics Engineering (BSLSGE) and combined BS Civil Engineering and Land Surveying (BSCE/BSLSGE) programs will be terminated in May 2010. Before Dr. Banks and Leah Jamieson, the Dean of the College of Engineering, made their final decision on the programs, a team of ISPLS members including Pat Cunningham, Bill Schmidt, Mike Falk, Tom Mahon, Ross Holloway, Steve Murray, Indiana Senator Ron Alting and myself met with Dr. Banks and Dean Jamieson on June 29 to discuss the future of the Purdue University BSLSGE and BSCE/BSLSGE programs. Our main goal was to convince Dr. Banks and Dean Jamieson to allow the programs to remain open for an additional ABET accreditation cycle (six years) so ISPLS and the Land Surveying Industry can aggressively market the programs to boost their enrollment and its research funding. Unfortunately Dr. Banks and Dean Jamieson have decided to terminate the existing BSLSGE and BSCE/BSLSGE programs and re-structure its programs within the multidisciplinary engineering (MDE) program with a land surveying tract (replacing the BSLSGE program) and a five year BSCE/BSLSGE program with an emphasis on land surveying (replacing the dual degree BSCE/BSLSGE program). I want to thank Pat, Bill, Mike, Tom, Ross, Steve and Senator Alting for their contributions during the June 29 meeting and ask for their support and input for the creation of the new Purdue Land Surveying programs. I also want to thank Dean Jamieson and Dr. Banks for the opportunity to discuss the future of the BSLSGE and BSCE/BSLSGE programs.

Currently Dean Jamieson and Dr. Banks are appointing a committee to develop a plan to implement the new Purdue Land Surveying programs. This committee will include administration and faculty the Colleges of Technology and Engineering, representatives from industry and government agencies and members of the Indiana Land Surveying Registration Board. I believe that this committee will be very beneficial to both Purdue and the Surveying Industry and will create Land Surveying programs that will enhance

the surveying profession for the twenty first century. I know that many of you are Purdue BSLSGE or BSCE/BSLSGE alumni and are not happy with Dr. Banks' discussion. I ask you to support the new programs and provide the Purdue committee with your positive input during the creation of the new Purdue Land Surveying programs for the State of Indiana. I pledge that the ISPLS Board of Directors will take a more active role in the creation of the new Purdue programs.

This crisis at Purdue has brought to light the current status of the Land Surveying programs at Vincennes University, Purdue Calumet and Indiana University Purdue University at Fort Wayne. Each program currently suffers from low enrollment, shortage of faculty, low research funding, low lab equipment funding, accreditation issues, and licensure requirement issues which all need to be addressed immediately. These issues are being addressed by the ISPLS Board of Directors and we are working with the program directors of all of the Land Surveying programs to find solutions to their problems. The ISPLS Board of Directors will begin marketing each of the programs to increase enrollment and program funding to ensure quality Land Surveying programs within the State of Indiana. I also ask for the Surveying Industry to aid in this marketing endeavor and ask for your funding and input so we can build together strong Land Surveying programs not only for the State of Indiana but for the Midwest region.

Our GPS-GIS monumentation committee is currently assisting INDOT with the creation of its CORS station network throughout Indiana. Construction and installation of the project's primary 18 monuments will begin in mid August and is scheduled for completion in the spring of 2008. The system will initially be closed to the general public and will only be used by INDOT staff for public sector surveying and mapping projects. Leica Geosystems will provide all base equipment and support for the CORS RTK network.

Our legislation committee is currently searching for a new lobbyist to replace Amber Vantil who worked for ISPLS the past fourteen months. Amber resigned from her lobbyist position to concentrate her activities with Indiana Bankers Association. Before her departure, Amber recommended The Corydon Group as her replacement. Rick Miller and I will be meeting with the Corydon Group to discuss the possibility of retaining them as the ISPLS lobbying firm.

Our chapters are currently very busy scheduling summer and fall seminars and golf outings for scholarship funding. I ask that you participate in both the chapter seminars and golf outings in your area. I plan to attend a few of the chapters golf outings to encourage non-golfers to improve their game for a good cause. I promise that if you golf with me, you will be entertained and will recall scenes of Rodney Dangerfield in the movie "Cattysack".

...continued Page 5

# ISPLS BOARD OF DIRECTORS MEETING HIGHLIGHTS

by Dianne Bennett, Executive Director

## March 24, 2007

The ISPLS Board of Directors held a meeting on Saturday, March 24, 2007 at ISPLS Headquarters. President Sweetland called the meeting to order at 9:07 a.m. The minutes and treasurer's reports were reviewed and approved.

Staff Activity Report - A written report was submitted for board review.

Adjustment to the Agenda - Doug Herendeen - Convention Contract for Marriott East. Doug is still in negotiations with the hotel.

Communication: Hoosier Surveyor - The committee met March 5th, a written report was submitted to the board for review.

Membership: Currently working on the 2007 Membership Roster.

Public Information and Marketing - The committee will hold a meeting on April 13th at ISPLS headquarters to review the committee charges and timelines.

Professional Development - Scholarships - Interviews for the Vincennes University are scheduled for April 13th.

There was discussion to move the Purdue University scholarship interviews to the Spring.

Trig-Star - Tony Gregory attended the ACSM Conference in St. Louis on March 9th - 12th. Tony serves on the National Trig Star committee.

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## President's Thoughts

...continued from Page 2

In closing I wish everyone a safe and event filled summer and fall. I look forward to meeting ISPLS members at chapter seminars, golf outings and chapter meetings. I also want to let you know that Sherry and I finished the Elkhart Triathlon on June 9, 2007. We thank you for your support during the past six months and encourage you to challenge yourself with a similar endeavor.



*Ed Sweetland crossing the finish line at the Elkhart Triathlon on June 9, 2007*

Government Affairs - NSPS Governor Report - Don Bengel reported on the Spring meeting held March 10-12, 2007 in St. Louis, Missouri. The next meeting will be September 28 - October 1, 2007 in Arlington, Virginia.

Legislative - A written report was submitted by Rick Miller.

Internal Affairs - Don Bengel gave a verbal report.

Old Business - The BOD reviewed the Strategic Goal Setting items and graded the BOD on its progress.

Announcements: The next BOD meeting will be May 19th at ISPLS headquarters.

## May 19, 2007

The ISPLS Board of Directors met on Saturday, May 19, 2007 at ISPLS Headquarters. Vice President Todd Bauer called the meeting to order at 9:10 a.m. President Sweetland assumed control of meeting at 9:45 a.m. The minutes and treasurer's report were reviewed and approved.

Communication - Membership - The BOD reviewed and approved the membership applications submitted by the membership committee.

The means of recognizing the "New LS's" was discussed. The Finance committee will report at the next BOD meeting.

Hoosier Surveyor - The Spring issue is now at the printer.

Public Information and Marketing - The committee met on Friday, May 18th at ISPLS headquarters. The committee discussed committee charges. The committee set 3 goals: 1) Organize events to promote land surveying to secondary school students 2) Promote land surveying to the general public 3) Promote ISPLS and the profession of land surveying to key legislators.

Museum of Surveying - The ISPLS "Pledge" to the Museum of Surveying building in Springfield, Illinois was discussed. The commitment made in 2004 when there was a space to expand the museum building located in Michigan. A motion was made and passed to pay the remaining Museum pledge.

Professional Development - Education - The committee requested that the "Science of Surveying" and "ALTA" seminars at

...continued Page 19

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## Board of Registration News

The Registration Board is continuing work on a rewrite of the continuing education rules to accommodate recent statutory changes made by the legislature.

At its July meeting, a number of hearings were held and actions taken against registrants who were short on their continuing education hours. Monetary penalties were levied and other requirements placed on surveyors who were either found guilty of violations or who agreed to settlements with the Board."

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# Ownership Line vs. Land Division Line: Are the Two Necessarily One and the Same?

By Terry W. McHenry, PLS, Nevada

## Introduction

For some time it has been my observation that there is a tendency to apply the various statutory provisions available in achieving land development objectives, but with limited regard to the integrity to our land tenure foundation, or the preservation thereof.

Obviously, there are a number of statutes designed to accommodate the division of land (e.g., NRS 278). However, statutes do not and cannot, anticipate all possible scenarios. This is particularly true when one throws into the mix local governmental administrative requirements which, in themselves, are enabled under statutory provision and thus should not usurp those provisions, but instead must work in concert with them. Inextricably tied to this is the need for due consideration of historical precedents and common law directives concerning real property lines, or ownership lines, in general.

Problems tend to arise when one goes on a search for which statutory provision will 'most closely' fit the circumstance at hand. The 'best fit' then can be, and sometimes is, either misapplied to extrapolated beyond its intended purpose, at times to the detriment of the very foundation of our land tenure system.

## Overriding Responsibility

As professional land surveyors; whether practicing on the private sector/development side, or on the governmental agency review/approval side of the spectrum, we each have an overriding responsibility to the custodianship of our land tenure schema. Retracement surveys, which are so much a part and parcel of our function, depend on both record and ground evidence being historically preserved from its parentage through to current status, and continuing onward. What discipline so well understands this, or is most apt to assume responsibility for it?

## Governing Directives

Admittedly, today's professional land surveyor finds him or her walking a difficult line, considering the myriad of directives which play into land division line and ownership line determination. For example, the following sources, to greater or lesser degree, have a bearing on the determination of both land division line and ownership line matters.

Federal Statutes & Regulations

State Statutes

Common Law

Case Law

State Administrative Code

Local Government Ordinances

Zoning

Planning & Land Use

Building Code

Fire Code

Engineering/Development Code

Design Manuals

Moreover, our system of jurisprudence, is structured around

an important hierarchy, which cannot be ignored when it comes to application of the above directions.

## Definitions

It is necessary to lay some groundwork concerning basic concepts and definitions surround the various types of landlines, and why they are often misunderstood. First, some definitions taken primarily from Definitions of Surveying and Associated Terms, prepared by a joint committee of the American Congress on Surveying and Mapping, and the American Society of Civil Engineers, 1978; reprinted 1981. Also incorporated are some concepts from case law guidance, absent citations.

**Boundary Lines** – a line along which two (designated) areas meet. The term is usually applied to boundaries between political territories, as a "state boundary line". A boundary line between privately owned parcels of land is termed a property line by preference, or if a line of the U.S. Public Land Survey System, is given the particular designation of that system, such as 'section line', 'township line', etc.

**Land Division Line** – a line resulting from the division of land by various means. A land division line is equivalent to a property line only when the latter is used in the context of a lone delineating separate, but contiguous, lots or parcels, and not necessarily separate, but contiguous ownerships.

**Property Line** – The line delimiting two contiguous parcels of land, or a street or roadway and one or more parcels of land (unfortunately, the term property line is frequently used interchangeably for both a land division line and an ownership line. These two types of lines can be different lines entirely – see discussion below).

**Ownership Line** – The division line between two or more separate, but contiguous or abutting ownership, proprietorships or lawful claims of title.

**Ownership** – In terms of real property, the state, relation, or fact of being an owner, having lawful claim to title; proprietorship; dominion, to the exclusion of others.

## Discussion

In the case of land division lines (by plat or patent), real property has been divided in anticipation of creating and conveying one or more separates parcels from the surrounding (parent) lands, by reference to the conveying instrument. Often these lines serve the dual function of ownership lines as well, at least upon initial conveyancing.

In the case where an ownership line has been created independent from a recorded plat, separate, abutting proprietorships or lawful claims of title have been, or are subject to be, determined by agreement, court decree, or by the various unwritten means recognized by law. The latter of these (and there are several) must of course be perfected to secure clear title. Here land division lines are either separate from ownership lines, or initially were not in the picture.

Essentially, one needs to remember that a land division line and an ownership line, while often being one and the same, do

...continued Page 11

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# GEOCHACHING

by Mike Davis, Indianapolis, IN

Geocaching - a high-tech version of treasure hunt or hide-and-seek for the GPS - using public - is an entertaining activity that could also benefit surveyors.

The National Society of Professional Surveyors sees it as a way to encourage careers in surveying, by sponsoring geocaches throughout the nation. The small "treasure chests" would provide information about local surveying-related attractions.

An associated activity - benchmark hunting - may be just as beneficial. Figures reported by [www.geocaching.com](http://www.geocaching.com), the Official GPS Cache Hunt Site, tell why:

\* In the seven-day period ending July 23, 802 benchmarks were logged by 373 geocachers.

\* Overall, 98,873 benchmarks had been recovered in 138,086 logs.

\* There were 736,425 total benchmarks in the database at [www.geocaching.com](http://www.geocaching.com).

That's a lot of data to help keep track of benchmarks, as noted by Greenfield's Craig Williams, LS, the president of ISPLS's Central Indiana Chapter, which planned a presentation on the topic for its August meeting.

Fishers resident Dan Kovert, LS, a member of the chapter, said he gave geocaching a try with his son, Kyle, after learning about it at a school function. Both enjoyed it - and Dan didn't miss the fact that it entertained a 16-year-old.

"A lot of the same qualities we see in surveyors you also see in geocachers," said Dan, who's also checking out the activity for the ISPLS board. "Keeping findings of benchmarks plays a key role, although their use of GPS and our use was different."

The Koverts got their start at [geocaching.com](http://www.geocaching.com), which traces the beginnings of the sport to May 2000, when the Global Positioning System's selective availability was turned off.

According to the Web site's history section, enthusiasts immediately began suggesting ways to use the enhanced technology, and a day later the first test of GPS accuracy was made by hiding a navigational target in the woods.

It developed from that to the current procedure of obtaining exact coordinates of a geocache from the Web site or other means and using a handheld GPS device to find it.

The name combines the prefix "geo," from geography, and "caching," from the French word "cache," a hiding place to temporarily store items. It's pronounced JEE-o-caching.

The target is usually a waterproof container - NSPS is suggesting a clear plastic jar - containing a logbook, writing utensil, and

miscellaneous trade items. The idea is to find a "cache," swap an item, and record the visit in the log book. Experienced geocachers log on to the Web site to post their findings for others to read.

Sites sponsored by surveyors could also include a bonus packet of "Did You Know" cards, offering bits of local trivia about surveying.

Benchmark-hunting only includes the finding and online reporting activities.

To help groups interested, NSPS has "A Guidebook for Setting Geocaches for a Surveying Organization" that can be read or downloaded from its Web site. The link is [www.nspsmo.org/news-events/geocachingshtml](http://www.nspsmo.org/news-events/geocachingshtml).

Indiana's Department of Natural Resources has an informational bulletin, "Geocaching on DNR Properties," on its Web site at [www.in.gov/dnr/parklake/publications/InfoBulletin46\\_Geocaching.pdf](http://www.in.gov/dnr/parklake/publications/InfoBulletin46_Geocaching.pdf).

To get a quick view of what's nearby, log on to [geocaching.com](http://www.geocaching.com), set up a free account by selecting the My Account link, and then choose to search for caches or benchmarks once you're logged in. You can base the search on a ZIP code if you don't know the GPS coordinates. Selecting the Search for Caches with Google Maps link will produce a map showing sites in your area, along with information on the difficulty of finding the caches, terrain, date hidden, and size.

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## IGIC & ISPLS GPS-GIS Committee Needs Volunteers

The Indiana Geographic Information Council [www.igic.org](http://www.igic.org) and the ISPLS GPS-GIS Monumentation committee is in search of volunteers to serve on a committee to review and establish standards for handling of parcel boundaries, Cadastre and the US Public Land Survey System within the Indiana Map GIS system. Each volunteer should be registered or have a SIT status to qualify to serve on the committee. The Council and its committees meet bimonthly with their next meeting being scheduled at Paul Cripe Architects & Engineers on September 20 from 1 pm to 4 pm. If you are interested in becoming involved with the IGIC committee please call either Tom Mahon, LS (317-299-7500) or Ryan Swingley, LS (317-544-4996) for more details.



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# PERRY COUNTY SURVEYOR - HAROLD LYNCH

by Mike Davis, Indianapolis, IN

Two words - cornerstones and music - tell a lot about Perry County Surveyor Harold Lynch.

So do two others - friends and family.

Lynch, who is recovering at his home in St. Croix after having a stroke in October 2006, has had almost a lifelong passion for recovering cornerstones, especially in southern Indiana's Perry County, where he was born Sept. 28, 1933, and began the first of five terms as county surveyor in 1988.

His son David, a licensed surveyor and ISPLS member who also lives in St. Croix, estimates his father has found or identified and placed markers by about 2,700 cornerstones in his home county, plus some in seven other counties.

Harold described himself as a "cornerstone nut" in a 1991 article in the Perry County News, and he said he has been since he was a boy. The stone chunks fascinated him in his youth, as did the then-mysterious markings on their surface.

In his adult life - which also included work with the Job Corps and the U.S. Forest Service - he said finding cornerstones "kindled my faith in surveying."

It had other benefits, too. "All this walking keeps a man young," he said. "I feel like I've done the county some good."

He's also developed a deep appreciation for the work done by Daniel R. McKim, who he calls "the best surveyor our county ever had."

Lynch says McKim set most of the cornerstones in Perry County. He served 16 years, being elected in 1856, 1870, 1976 and 1880. "He did truly beautiful work," he told John Farless of the Perry County News in 2001.

"He was in every corner of the county and all over the county," Lynch said in an earlier interview. "In one period of three or four days, he set more than 25 cornerstones."

For years, Purdue students got a taste of Lynch's dedication when he represented the Forest Service at the university's four-week summer surveying camp at Branchville.

Music has been a big part of his life, as well. David remembers his dad singing and strumming his guitar as part of Harold Lynch and Friends, a group that played at festivals and nursing homes.

A family band with daughters Brenda (piano) and Sheila (vocals) and sons Charles and David (both on guitar) also has played at gatherings at the Ole Lynch Homeplace, about a mile and a half north of St. Croix, north of I-64, off Doolittle Mills Road. Though the farmhouse where Lynch was born is gone, there's a small cabin, several outbuildings, a working well, shelter house, and a lake that serves as a swimming hole for get-togethers. An upstairs loft in a fully restored barn provides an elevated bandstand.

In a 2003 interview with Perry County News editor Vince Luecke, Lynch pointed out a nearby lane that once served as the road from Alton, an Ohio River town southwest of St. Croix, to Eckerty, a railroad link about six miles north in Crawford County.

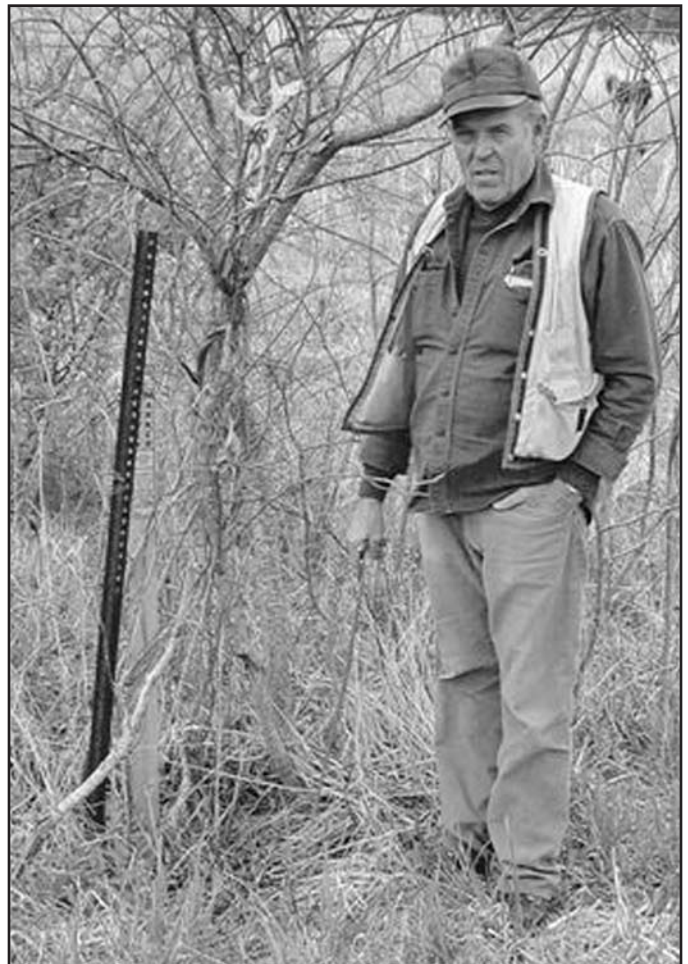
Now, he can point to I-64's exit 79, where work is under way on the southernmost segment of the O'Bannon Highway that will carry motorists north to the resorts and casino at French Lick and West Baden Springs.

David thinks that might bring development to the area - and more work for surveyors. He said his father, who was never licensed, encouraged him to strive for the certification. He and his wife, Michelle, a professional engineer and ISPLS associate member, started Lynch Surveying and Engineering in rural St. Croix in 2003.

He says his father, whose left side was affected most by the stroke, has made progress and is in fair condition. He uses a wheelchair to get around his home and has a 24-hour-a-day caregiver and several physical therapy sessions a week.

He recognizes visitors, and David says he remembers facts about past surveys . . . and finding cornerstones.

Harold Lynch's address is 12224 North St., St. Croix, IN 47576.



*Perry County Surveyor Harold Lynch visits a site along Ind. 37 where he found one of his first cornerstones while working for the U.S. Forest Service. He retired from the Forest Service in 1986 and was elected Perry County surveyor two years later. He's a self-admitted "cornerstone nut," and his son, David, estimates he's uncovered and perpetuated about 2,700 of them. (2001 Perry County News photo)*



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## Ownership Line

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not necessarily have to be the same. Both may co-exist without the necessity, or desirability, of eradicating the land division line. Ownership lines can and do move off of land division lines.

Perhaps the best illustration of the above principle is to use the Boundary Line Adjustment Record of Survey provision found in the Nevada Revised Statutes (NRS), Chapter 278.5692 and 278.5693, being referenced from 278.461, subsection 4c.

Picture with me a hypothetical illustration, using the concepts intended for the Boundary Line Adjustment (BLA) Record of Survey. Lots 1 and 2 of Lazy Acres Subdivision, created under statutory provision, lie in a tier of lots, with Lot 1 being oriented immediately west of, and abutting, Lot 2. The owner of Lot 1 builds and outbuilding garage in the rear of his property, and near his east line, without benefit of a survey. Subsequently, it is discovered the garage as positioned has encroached onto his neighbor, Lot 2, by approximately 1 foot. Surveyor Mr. Straightline is called into the picture to advise in resolving the problem. He recommends a boundary line adjustment, and the two owners agree and authorize Mr. Straightline to proceed with his survey and necessary mapping and document preparation. Fortunately, the two lots are of fair size and zoning in terms of minimum area is not a problem. It is decided to move the ownership line 6 feet eastward in order to satisfy the zoning requirement of a minimum side yard setback of 5 feet. The survey is conducted; mapping and document are produced and recorded, all according to statutory provisions. Problem resolved.

Let's analyze the results of this scenario in terms of its mapping, land division line, and ownership line principles.

First, we need to ask a couple of questions. Did the BLA create any new lots or parcels through the 'land division' process? No, it did not, and indeed it cannot in accordance with strict statutory provision. A Record of Survey (of any type in Nevada) cannot be employed as a vehicle to create additional parcels by any form of division of land. Second, what happened to the common land division line (and former ownership line) delimiting Lots 1 and 2 of Lazy Acres? Was it, by virtue of the BLA, expunged from the record? Absolutely not, the BLA had no effect whatever on the exiting record map of Lazy Acres. The BLA simply, and correctly, referred to it. What has actually happened is the ownership line has moved off of the land division line created via Lazy Acres, while the land division line remains fully in place and on record for all time, continuing to delimit Lot 1 from Lot 2. The new ownership limits can be described simply as: "All of Lot 1, and the westerly 6.00 feet of Lot 2, measured at right angles, of Lazy Acres. Lot 2, except the westerly 6.00 feet thereof, measured at right angles, of Lazy Acres.

Once the BLA Record of Survey record, reference can also be made to that record map, which in turn makes reference to Lazy Acres. My personal preference would be to retain direct reference to the original plat. Lazy Acres, for any subsequent descriptions written (as in the above), but to also refer to the BLA Record of Survey to continue the paper trail. Why? Here is where we need to put our retracement hats on. We must ask: how were Lots 1 and 2 created, and how was the new ownership line of the BLA created? The new ownership limits created by the BLA are based

on, and indeed depend on, the Lazy Acres plat. But because these and all other lots in Lazy Acres were created simultaneously, at the moment of recordation, any excess or deficiency later discovered in the respective blocks of Lazy Acres (absent any found, original, or record lineage to the original, and undisturbed monumentation) must be distributed proportionately throughout and within individual blocks in order to arrive at, in this case, the proper position of the common line delimiting Lots 1 and 2. From this position, then, the 6.00 feet would be measured to arrive at the proper position of the newly established ownership line resulting from the BLA. Not only does the original land division/ownership line common to Lots 1 and 2 not go away, it is necessary that the land division line be maintained in order to carry forward the 'map trail' for proper, future retracement and title purposes.

Just as it is important to distinguish between a real property corner position and the physical monument purporting to represent that corner's position; so it is equally important to distinguish between an ownership line and a land division line, when and where, as in the above case, a positional difference indeed exists.

Likewise, fences provide another example. Every astute land surveyor understands that not all fences (or walls, hedgerows, etc.) necessarily represent an ownership demarcation. Some fences are erected for convenience (so-called) purposes, such as livestock management. Others, of course, have been erected to follow a known (or believed) land division or ownership line, with the intended purpose of memorializing same. Obtaining an understanding of the origin, basis, age, and acceptance of a fence is part of the land surveyor's duty in assessing the weight of authority to place on a fence, relative to other forms of evidence recovered. In other words, how the fence was created will dictate its hierarchy among comparative evidentiary findings. And this leads us to another important principle.

Every parcel of land in existence was created under some lineage of authority, whether on par with its adjoiners (simultaneous conveyance) or junior to its parent parcel (sequential conveyance), and perhaps senior or junior to its adjoiners. This lineage of authority, the sources of which have been listed above under the subheading Governing Directives, plays a key role in guiding the professional land surveyor. This is particularly true when acting in the capacity of a retracement surveyor, but in the capacity of an original surveyor as well. In actuality, land surveyors involved today in new development land division must wear both the hat of the original and retracement surveyor. In the case of the latter, it is in terms of properly identifying and quantifying the base parcel or parcels to be further subdivided; in the former, it is in terms of effectuating further land division according to the hierarchy of current and applicable governing directives, and so as not to contravene underlying boundary law principles, including the body of common law and case law guidance.

Previously mentioned was the hierarchical structure of our system of jurisprudence. An understanding of how land division directives have historically evolved within this structure, coupled with the knowledge of how a specific parcel or parcels earmarked for further subdivision, and the adjoiners, were created, properly equips the land survey practitioner to work with the whole bundle of governing directives. However, to simply bypass the former

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# LUCAS OIL STADIUM: IT'S LIKE SURVEYING ON AN ANT HILL

By Norman H. Hiselman, P.L.S., Greenwood, IN

As told to David B. H. Best, P.L.S., Indianapolis, IN

The following interview with Norman H. Hiselman, P.L.S., Director of Surveying for Benchmark Land Services of Fishers, Indiana, is an account of the problems encountered and solutions arrived at while conducting surveying services in the Lucas Oil Stadium now under construction in Indianapolis, Indiana.

**QUESTION: When completed what will be the basic features of the stadium?**

Answer: The multi-purpose Lucas Oil Stadium located at the southwest corner of South Street and South Capitol Avenue in downtown Indianapolis will be the new home of the Indianapolis Colts. The seven-level stadium with a retractable roof will contain about 150 private suites and seat 63,000 for NFL football games. Reconfigured it will accommodate 70,000 or more for NCAA basketball and football games. The stadium will be the host site for the NCAA Final Four tournament and will be used for major conventions, trade shows, concerts and other events. HKS of Dallas, Texas designed the stadium in conjunction with the local design firms of A2S04, Browning Day Mullins Dierdorff and other Indiana design and engineering consultants. Cost of the stadium will be about \$675 million. Hunt Construction Group, Inc. is the construction manager. Assisting Hunt are the local firms of Smoot Construction and Mezzetta Construction. The stadium is scheduled to open for the Colts' 2008 season.

**Q: Is your company one of several surveying firms providing services at the stadium?**

A: Yes. There are at least six other surveying companies doing work in the stadium in addition to services provided by contractors' layout personnel. With many people possessing varying degrees of knowledge and expertise in control and layout work we have encountered some interesting situations.

**Q: How did Benchmark become involved in this project?**

A: It was an interesting set of circumstances. I believe that good employees make a good company. Of course, the company and its land surveyors must reinforce and enhance the level of knowledge and skills of its employees through training and encouragement. Our company received this surveying contract because one of our employees, Nick Crouch, had been involved in the construction of the Cincinnati Bengals stadium. So impressive was Crouch's work in the Bengals' stadium that when Derr Steel Erection Company of Euless, Texas formed a joint venture with Alberici Constructors of St. Louis, Mis-

souri to bid on the Lucas Oil Stadium contract Derr searched for Crouch in Indianapolis. A Derr employee had remembered Crouch from his work on the Bengals' Stadium. Derr tracked Crouch to Benchmark and we were awarded the contract.

**Q: What did the contract with Derr/Alberici call for Benchmark to do?**

A: In a meeting with William Shakelford of Derr we assessed their needs and expectations. Originally Benchmark was to check existing horizontal and vertical control and provide Derr/Alberici with certified as-built drawings of the anchor bolt layouts. The layout crew for Derr/Alberici consisted of Shakelford and Daniel Pearson. We were to coordinate our work with theirs. We were also instructed to provide indexing lines for the alignment of the bearing plates to be fabricated and placed over and onto the anchor bolts. Key to the erection of the support towers, super trusses and transverse trusses were these bearing plates and anchor bolts. We accomplished the indexing of the bolts by snapping chalk lines on the shear walls and on the deck surfaces on column lines in the vicinity of each anchor bolt cluster. We then applied a coat of clear shellac or lacquer over the lines to preserve them.

**Q: How did you set up horizontal and vertical control for the project?**

A: With the information gained from our initial meeting with Derr/Alberici we developed the procedures and guidelines needed to perform the required work. Our control work was run by conventional traverse or triangulation. As a rule of thumb we turned angles with one set for each one hundred feet of a line being measured. A set consisted of one direct and one reverse face of the instrument. Distances were measured at each face on both backsight and foresight with distances then averaged for a single line from both ends. Elevations via the horizontal control work were also to be carried. This method was not used for vertical control. However, it gave us another check. We used a Trimble S6 for this task. The applicable specifications were the standard deviation for a measured angle to be 3"; for distance (in the standard or continuous standard mode) +/- 3 mm + 2 ppm without a reflector, within 984 feet, and +/- 3 mm + 2 ppm with the reflector up to 5500 m. Often six sets of measurements for some of our traverse legs were required and may seem excessive. However, since this was a high profile project and, to the best of my knowledge, ours was the only surveying firm on the project required to provide certified as-built drawings and supporting information, we considered these standards to

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*Meddie Demmings of Benchmark Land Services (foreground) is assisted by Daniel Pearson of Derr Steel Erection Company of Euless, Texas in conducting the as-built measurement of the shear wall anchor bolts at the southeast corner of the Lucas Oil Stadium. There are 180 anchor bolts in this configuration. Precise locations of the anchor bolts are required for the fabrication of a steel plate to be placed over the anchor bolts.*

be appropriate. A useful feature of robotic instruments is their target locking capability. Six sets took as long as did two sets in the “old” days. The locking feature did have limitations based on distance, atmospheric conditions and other interruptions. The instrument and data collector can work together so that the whole process is completely automated. However, for our purposes we decided to control when the shots were to be recorded (i.e., when we were sure the instrument was locked on the correct target or when target locking had settled down). Another rule we adhered to was to set one point and always to check two. Atmospheric pressure and temperature readings were taken and applied every two hours.

**Q: How did you get from one level to another in the stadium?**

A: After attending the obligatory safety and site management meetings Meddie Demmings, a Benchmark field person, and I donned our hard hats, safety glasses with side shields, and steel-toed boots and ran our control and tied into as many existing control points established by others as we could. During the early phase of construction access to different areas of the stadium was by wood ladders constructed by on-site carpenters and by standard aluminum ladders (my preference was the wooden ones). Depending on the height the carpenters made the ladders of 2 x 12s or 2 x 8s nailed together with 2 x 4 rungs. Some were eight feet wide to accommodate two rows of climbers. Heights varied from fifteen feet to twenty-four feet. Lad-

ders were located at various places within the stadium. Sometimes a person had to walk a maze to find a ladder to get to the next level. Much time was spent just navigating the stadium. It looked like the old ant farms we had as kids.

**Q: What problems did you encounter in establishing control for your survey work?**

A: We ran a traverse and then triangulated between a midpoint station and the two ends of our base line. Result of the 6,772-foot traverse was no angular error and a misclosure of 0.007’ north and 0.032’ east for a degree of precision of 1:206,000 (the result of compensating errors no doubt). We found that the existing internal control was 0.07’ north of the existing exterior control points. During our initial work we noted that other “layout” people were using a variety of instruments from levels with horizontal circles, common total stations, robotics, and GPS equipment. In no way do we degrade the work of others. Surveyors have their own ways of doing things.

During the summer of 2006 there were as many as 1600 persons on site. The stadium did resemble a disturbed anthill (O.K., I promise no more anthill metaphors). Each person seemed to feel his job to be the most important one on the project. It was common to have others move the backsights. Therefore, we checked our backsights often. At times other trades placed equipment and materials on control points to keep others from working in particular areas or from occupying their points the following day.



*William "Buckshort" Shackleford of Derr Steel Erection Company (left) and Meddie Demmings of Benchmark Land Services run check measurements of anchor bolts with Daniel Pearson, also of Derr, observing, before commencing with the anchor bolt final as-built measurements on the shear wall at the southeast corner of the Lucas Oil Stadium, Note the temporary beams supporting temporary scaffolding.*





*Meddie Demmings of Benchmark Land Services, wearing a protective harness attached to a safety cable, is setting out a column line in preparation for measuring as-builts of the anchor bolts at the southeast corner of the Lucas Oil Stadium. Note about 140 feet below the concrete beam the size in apparent miniature of materials and equipment on the playing field level of the stadium.*

The differences in control caused Derr/Alberici to have its construction manager decide what control to use. Hunt met with several layout personnel from the various trades and with Hunt's surveyor. Four concrete pads exist on the field level (some twenty feet below street level) with a cut "X" on each pad for the "radius points" of the four corners of the stadium. The northwest quadrant monument also is the project benchmark for vertical control. These monuments were designated as the base control for the project. During the meeting, I asked several people how they ran their control. One subcontractor replied that he set his control by resection. Reservedly, I asked him to explain resection. His answer indicated an understanding of the two-point resection concept. We did not use this method on the project. GPS in the RTK mode was in use on the floor of the stadium by several surveyors. As noted previously the playing field is twenty feet or more below street level. With the sides of the stadium rising up and with cranes and form tables nearby, I was surprised that GPS could operate successfully with all of the multi-path present. The precision for most rovers in RTK is 10 mm +/- 2 ppm. This was our position: Know your tools and their limitations, the required degrees of

precision and accuracy, and the techniques most appropriate for the task at hand.

**Q: How did you establish vertical control for the seven levels of the stadium?**

A: We ran our vertical control through two loops around our control at street level, once clockwise and then counter clockwise. We concluded that the vertical control was more of a concern than was the horizontal component. The height of the anchor bolts on the Terrace Roof level (114 feet above street level) when the bearing plates and nuts were in place required that the top of the nut could not extend above the top of the bolt. Since the bolts were cast in concrete we knew that we could work out horizontal discrepancies within reason. However, there was no acceptable solution for a bolt that fell below a certain elevation.

We developed a procedure to obtain good vertical control through all seven levels of the stadium. We ruled out differential leveling because of short backsights and foresights that required us to estimate to thousandths to compensate for readings between the divisions. Turns also involved reading from near the top of the rod on backsights to near the bottom of the rod on foresights on the way up and vice versa on the way down. The problem relates to the length of a telescoping level



*Above is a view of the northeast corner of the Lucas Oil Stadium under construction in Indianapolis highlighted by the initial placement of the north end of the east super truss. When completed the two super trusses that will support the moveable roof will measure 752 feet in length each with clear spans of 629 feet.*

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rod and its segments. With a level rod laid out on a flat surface and measuring its length with a tape from the bottom of the rod through each section usually minor differences will be found throughout the different sections of the rod. The differences are caused by wear on parts of the rod or in the manufacturing process. For most surveying needs these differences are insignificant. For projects requiring a high degree of precision and accuracy as for this stadium we felt differential leveling to be an inappropriate method.

Our solution was the special order purchase of a 200-foot standardized chrome highway tape since none were available locally. These tapes were in common use up to the 1980s, but not today. We established benchmarks at the openings of the elevator shafts at the street level by using a tape to measure distances between backsights, the instrument, and foresights to ensure equal turns. Then, using the 200-foot tape we measured vertically up the elevator shafts to each level while applying corrections for temperature and tension. The head and rear chainmen then switched places and measured the distances again. We still found differences in control values between the various trades. Derr/Alberici decided to use our method exclusively. Derr/Alberici's objective was to find a workable solution to every variance so that their steel work could rise up in one cohesive unit.

**Q: What method did you devise to provide as-built drawings of the shear wall anchor bolt clusters?**

A: Work on the as-builts began with each of the shear walls located in the stadium's four quadrants. A precise location of the sets of 180 anchor bolts clustered on each shear wall was required. We asked Shakelford of Derr/Alberici in what manner he wanted the as-built anchor bolts information. Shakelford explained the method they used to locate the anchor bolts. He said that he measured off of the closest of the six index lines with a 25-foot carpenter's tape and then eyeballed the centers of the 2 1/2" diameter bolts. With this information he prepared an AutoCAD file of his results. By our method we selected north-south and east-west axis lines and located the bolts by station and offset from these base lines. Since we were not comfortable with "eyeballing" the centers of the bolts, I created a "bolt-mic" from a wood lath 30 inches in length with a deck screw inserted in the edge at one end for adjustment to match the radius of the bolt. When we placed the edge of the lath so that it touched two bolt edges, the screw head was at the center of the end bolt where the measurement was to be made. From the measurements of all the bolts in the clusters located by station and offset the as-built drawings were created. From the as-built drawings the bearing plates were fabricated. When the bearing plates arrived on site and were placed over the anchor bolts, Derr/Alberici exclaimed that it was the first time they were able to set bearing plates in place without the need to be adjusted.

**QUESTION: How did the members of your survey party extricate themselves from the northwest quadrant shear wall?**

ANSWER: This was the only really distressing incident we've encountered so far in our stadium survey work. We were working on the anchor bolts as-builts in this quadrant. The shear walls on the north end of the stadium are located about five feet below the mezzanine level about twenty feet above the playing field level. The field party consisted of myself, Meddie Demmings of Benchmark and Daniel Pearson of Derr/Alberici. We scrambled over the edge and down to the shear wall using the 2 x 4s supporting the concrete forms. While we were locating the anchor bolts a Hunt safety officer asked us how we had gotten down to that level. Apparently the safety code required the use of a ladder for changes in working surfaces exceeding eighteen inches of difference in height. He told us that we could not leave that level without the use of a ladder. While we made our measurements we continued to implore passersby to find us a ladder or to have a carpenter build one for us. We finally got our "get out of jail free card" when a nearby concrete worker finished his work and loaned us his ladder.

**Q: What safety measures not normally associated with surveying work did you encounter in the stadium?**

A: Derr/Alberici assigned us additional tasks as their confidence in our work increased. We worked at higher elevations in the stadium. We acquired equipment and training not usually associated with the work of land surveyors. Benchmark purchased safety harnesses with double lanyards for use in the not so safe areas. This harness was required for use when working at heights six feet or more above the next level where safety railings were not in place. We also received training in the use of 165-foot boom lifts when we needed access to vertical weld plates near the top of the stadium.

On a personal note in the 1970s I worked on the high iron of Market Square Arena that was being built in downtown Indianapolis. The arena was the first home of the Indiana Pacers and has since been razed. The arena contractor experienced a serious problem concerning the placement of the domed roof. The roof did not line up with the columns supporting it. I was working for a local surveying and engineering firm known for its progressive outlook and the use of the latest technology. The firm was using a Model 76 Geodimeter EDMi. This was the right instrument at the right time to obtain the measurements needed. Recently discharged from the Marine Corps I walked the prism around the I-beams at the top. With Market Square Arena long in the past I had developed a serious fear of heights. Just to clean the second-story gutters on my house or to check the roof for hail damage proved a real challenge for me. Out of necessity I now tolerate working at higher levels.

I climb ladders perched on the edge of shear dropoffs. However, I am not ready to hang on the trusses at 242 feet above the playing field.

**Q: What was Benchmark's involvement in the erection of the super trusses?**

A: The sliding roof will be supported by two super trusses running north to south over the east and west edges of the playing field. Each of these super trusses is 752 feet from end to end with a 629-foot clear span between support towers. I commend the design engineers for their ingenuity in designing these trusses and towers! We prepared reports of the super trusses' location to real time positioning of each segment. The super frame for the trusses is constructed in a box-type format with parallel beams about seven feet apart. The beams are joined at gussets that are shaped steel plates. The segments are triangular like the old steel truss bridges. Each leg of the triangle averages about 75 feet in length. The super frame is erected by assembling three segments on the ground and then "flying" the assembled segments up to their position in the super truss. Before the pre-assembled segments were joined to the super frame we measured the lengths of the legs for accuracy. Since the segments were assembled flat on the ground, we took measurements by walking along the top of the assembly (about twelve feet off of the ground) and then measuring the reverse side. To measure the reverse side we crawled underneath the structure. We took the measurements while lying on our backs with arms extended upwards and straining to maintain the proper tension on the tape.

**Q: What method did you devise to verify the coordinates for the intersecting points on the gussets?**

A: The prismless technology of our total station became a real asset in monitoring and positioning the super frame. Previously a rodman was "flown up" in a box suspended at the end of a crane cable to the structure to take readings at various points. To obtain measurements a dedicated expensive crane was required. Another method required a rodman to walk along the super structure under construction. The rodman would scurry all over the super structure trying to get measurements while 242 feet above the playing field. Not only were these methods time consuming. They were also fraught with safety concerns. We suggested the use of reflective targets manufactured by Trimble, Leica and Topcon. These targets varying in size cost about \$100 for a letter-size page containing from 16 to 48 targets. The project would require some 320 targets. We proposed placing the targets on the gussets at the intersections of the centerlines of the trusses extended. The manufactured targets are silver and highly reflective. The stadium authority rejected anything left on the framework detracting from its finished look. Derr/Alberici's Shakelford had luck using a Trimble 5806 and the use of targets cut from a roll of green

reflective tape. The color of green matched the beams. Lines were drawn on the tape for targets. This eliminated the need for someone to go back and paint over the targets once the super frame was in place. We are using the rolled tape. The structural engineer gives us the coordinates for the intersecting points on the gussets. The coordinates were given in inches and decimal parts thereof that were measured north or south of the base line, east or west of the meridian, and as a distance above the playing field. All were converted into feet and decimal parts thereof and adjusted to the project datum. Three sets of coordinates were required for each survey point of the gussets. The super frame initially was not assembled in its final position. It was erected with a camber and rake so that when the other structural elements and loads were added it would settle into place. There are coordinate values for the structure when shored with guy cables taut, guy cables slack, and in the final position. It was very important to know at what stage of assembly was the super frame.

**Q: What problems did you encounter regarding the effect of temperature on the super trusses?**

A: In the morning we would take measurements to the survey points on the gussets on the field side of the structure. Then we moved to the other side of the stadium to take measurements on the non-field side. This procedure was time-consuming.

Sometimes, and very sporadically, the arrived-at coordinate values did not support each other from one side of the structure to the other. Common sense dictates that they should have. After all, this was a pre-measured, bolted up structure. We first thought that perhaps the diameter of the laser beam was becoming wide enough at longer distances to catch a structure edge or a cable made invisible by parallax. So we switched to a Topcon GPT9000A with a longer reflectorless range (2000 m advertised), ergo a smaller laser beam diameter. Still we had the same results.

Much of this type work was done during the winter of 2006 and the spring of 2007. In Indiana it is common to have extreme temperature swings from day to day and even from morning to afternoon during the winter, especially during the winter of 2006. Consistently we made temperature corrections to our instruments. For calculation purposes the long or "y" axis (meridian) of the stadium is north-south. However, it is actually oriented about twenty-six degrees east from north. Between the winter solstice and vernal equinox the sun comes up out of the southeast. This means that the entire length of the east side of the super structure received a "broadside" from the sun every morning whereas the west side of the "box" remained in the shade. The effect resulted in the east side of the structure expanding faster than the west side. There was some difference of opinion as to whether this could cause an

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## Minutes

...continued from Page 2

the 2007 convention for 6 mandatory hours each. A motion was made and passed to approve the seminars for 6 CEH Mandatory.

Doug Herendeen reported on the 10 - year contract with the Marriott East. A motion was made and passed to sign the contract with the Marriott East on behalf of the BOD. Doug also presented the 2008 ISPLS "Preliminary" Convention program.

Scholarship - A written report was submitted. The committee met on Friday, April 13th and conducted interviews of students from Vincennes University for the Peggy Archer Memorial Scholarship. The 2007 scholarship was awarded to Joshua L. Graham.

Trig-Star - The winner of the NSPS Trig Star contest in Indiana is Eric Jiang of Kokomo High School in Kokomo, Indiana. Eric's score was 82 points out of 100 in 56 minutes. The test was sponsored by Jon Pyke of the Wabash Valley Chapter. The overall participation in the state included 27 schools. A total of 540 students took the test.

Government Affairs - Board of Registration - The board met May 11th. Most of the meeting was taken up with disciplinary hearings. The remainder of the meeting was standard business, no major actions on rules or procedures.

GPS-GIS Monumentation - The committee is working on "Height Modernization and the INDOT CORS Station.

Legislation - A report was submitted regarding the "proposed civil penalty Legislation" HB 1651.

Bylaws - The committee held meetings on March 1, April 5, and May 17.

Finance and Planning - The 2007/2008 budget was submitted and reviewed. A motion was made to approve the 2007/2008 as presented.

Chapter Reports - Reports on chapter activities were reported for the Northwest Chapter, Northeast Chapter, Tecumseh Chapter, Central Indiana Chapter, Southwest Chapter and Greenville Chapter. There were no reports from the Wabash Valley Chapter, Hoosier Hills Chapter, Initial Point Chapter, Southeast Chapter and the St. Joe Chapter.

Chapter Participation Convention - There was board discussion on "Chapter" participation/sponsorship of the Annual Convention regarding the percent of profit. A motion was made and approved to change the percent of the profit received by the Chapters from 20% to 10 % starting 2010.

There was discussion regarding Chapter Annual Financial Reporting. The Bylaws committee is to review the current by-laws regarding Chapter Financial Reporting and report back to the BOD.

The Tecumseh Chapter and Northwest Chapter submitted a requested to Co-Sponsor the ISPLS Convention. A motion was made and passed to accept the Tecumseh Chapter as 2010 co-sponsor and the Northwest Chapter as 2011 co-sponsor.

Old Business - The BOD reviewed the progress on the Strategic Goal Setting items.

New Business - An update from Roger Woodfield was presented on the Indiana/Illinois State Line Project. The project is scheduled for June 5, 6, and 7, 2008 in Marshall, Illinois. Also discussed was the "Boys Life Scout Poster".

## Lucas Oil Stadium

...continued from Page 17

intermittent 0.08-foot difference between sides, but as spring came and the temperature variances lessened the results became much closer. Ideally we could take measurements on cloudy days only with the temperature a steady 68 degrees. But then, of course, traffic would always slow down for surveyors and attorneys would never comment on ALTA surveys. Our solution was to work either early in the day or as late as possible with the use of two field parties collecting data on both sides simultaneously.

**Q: What final thoughts do you have about Benchmark's surveying work in the Lucas Oil Stadium?**

A: I am back in our Greenwood, Indiana office. Benchmark's project management at the stadium is now in the capable hands of Rick May. I am now doing the things a land surveyor normally does including the supervision of the layout of an internal track system within the new Boral Brick factory under construction in Terre Haute, Indiana. The stadium project was an excellent learning opportunity for some of Benchmark's field personnel as well as for myself. We worked alongside layout crews from different trades using different ideologies and techniques. We worked with equipment not normally used by surveyors. We implemented practices that took us back to the basics of land surveying to provide the necessary degrees of precision and accuracy. I know that I speak for others in Benchmark when I convey a sense of pride of having been involved in a high profile project like this, as well as doing something that supports the Indianapolis Colts, our hometown team.

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# MEET A MEMBER

by David Best, PLS, Indianapolis

Our featured ISPLS member this issue is George S. Ridgway, A.I.A., P.L.S., who was the recipient this year of an Honorary Doctorate degree from his Alma Mater Vincennes University. His dual registrations as an architect and a land surveyor are unique for ISPLS. In our interview this is what I found out about George:

**QUESTION: What led you in these seemingly divergent directions as an architect and as a land surveyor?**

**ANSWER:** In 1966 I received an A.S. degree in architectural drafting from Vincennes University. During my early days as an architectural draftsman I was introduced to the local Knox County Surveyor. He was looking for someone to draw his plats. It meant extra money for me. That was in 1968. I always needed extra money! I was hired. After several months of drawing plats with no knowledge of how the data for the plats was collected, the county surveyor said, "You need to go out into the field with us." That began my apprenticeship as a surveyor.

**Q: In addition to your degree from Vincennes University in what years did you receive your B.S. and M.S. degrees from Indiana State University and in what years did you become registered as an architect and land surveyor?**

**A:** I received my B.S. degree in 1968 and my M.S. in 1975. Both degrees were in vocational education. I became a licensed land surveyor in 1983 and a registered architect in 1979.

**Q: As president of G. S. Ridgway and Associates, Inc. is your company's emphasis more in the field of architecture or in land surveying?**

**A:** Ours is a firm of eight persons. More than two-thirds of our commissions are for architectural services. However, I still work as a member of our survey crew. I enjoy being on the "front of the chain." I believe that it's important to be on the site before you certify a property survey. Half of solving a problem is simply to show up.

**Q: As a member of ISPLS what do you consider to be the greatest benefits of our society?**

**A:** Membership in ISPLS is very important to me. It's a means of maintaining life-long friendships. The society provides great opportunities to keep up to date on the many aspects of surveying.

**Q: What advice can you offer to young people who are interested in becoming architects or land surveyors?**

**A:** My advice is not much different from what young people have heard many times: "Lots of math and science." In addition, if they plan to own their own businesses, take all of the courses in economics they can.

**Q: What is your relationship with William A. Cook, the principal person involved in the restoration of the French Lick Springs Hotel and Resort and the West Baden Springs Hotel?**

**A:** William A. Cook and I have been good friends and have worked together on many projects since June 6, 1987. We have completed architectural projects for the Cook Group in seven states

and on three continents. The work overseas includes manufacturing buildings in Ireland and England, office and manufacturing buildings in Australia, and distribution buildings in Asia. I believe that so far Mr. Cook and I would say that our best efforts have been the West Baden Springs Hotel and the French Lick Springs Hotel and Resort.

**Q: Did you encounter any particular problems in conducting surveys of the two hotel properties?**

**A:** The major surveying problems with the French Lick and West Baden properties were title-oriented. The properties comprised over 3000 acres contained in about 100 parcels. It required many hours of deed interpretations, record research, field reconnaissance, and just plain hard work. Bell Surveying, Woolpert Engineering, Morley & Associates and my company spent many untold hours to afford the solutions.

**Q: In conducting tours of the West Baden and French Lick hotels what do you find impresses people the most?**

**A:** The tours I conduct are tailored to fit the group. The tours for ISPLS members and for members of the Indiana Surveyors Historical Society of West Baden included a view from atop its roof. Most people want to hear about the myths, facts, surprises and secrets of these two buildings. One myth is that the center disk of the West Baden Springs Hotel was a bandstand that raised and lowered. The disk never ever moved. Another myth was that there was always gambling at both hotels. This was not so. Gambling took place in casinos in both towns.

**Q: In the restoration of the West Baden Springs Hotel by the Cook Group what, if any, deficiencies did you discover in the original construction of the building?**

**A:** It was built by Caldwell and Drake in 1902 at a cost of \$414,500 and took 277 days to complete. During the winter months of 1902 the contractor added hot charcoal to the fresh concrete, cutting its strength in half. As a result in 1991 a 104-foot section of the hotel collapsed.

**Q: How do you spend your leisure time?**

**A:** Some of my best leisure hours are spent on the porch with my wife Jan and our two dogs Anna and Bear. I also enjoy flying my airplane from my own grass runway.

**Q: What can you tell us about your airplane and any untoward incident relating to it?**

**A:** The plane is a 1982 Piper Dakota. I once flew into Big Rapids, Michigan during a winter storm. I was collecting a very large load of ice on the wings. I made two instrument approaches to Big Rapids. On the final approach I saw the runway. Normally, I would fly the approach at 70 knots. That night, after being on instruments for three hours, I flew the approach at 120 knots! When I crossed the end of the runway I reduced the throttle by no more than an eighth of an inch and we landed hard. I got out of that fine bird and saw an inch of ice on every surface. Needless to say it was a good airplane, a good approach, and a Good Lord watching out for me!





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Nikon 9 pin download cable	\$100.00	\$1.89
Nikon Connex Software for download & data manipulation	199.00	\$4.51
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Heavy-Duty Wood/Fibgls tripod	\$109.00	\$1.98
Mini Prism package	\$159.00	\$2.56
8ft Prism Pole	\$155.00	\$1.70
<b>Total:</b>	<b>\$7,517.00</b>	<b>\$158.25</b>



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and go directly to the governing directives typically consulted beginning at the state statute and local governing body levels can, and does, result in serious mistakes that jeopardize the integrity and preservation of our land tenure fabric.

A principle example of this surfaces in the misunderstanding of a relatively recent addition to the Nevada Revised Statutes (NRS) at Chapter 278.4925, the Merger and Resubdivision (without reversion to acreage). Envisioned to circumvent the necessity of preparing and causing to be recorded two separate maps (viz., a Reversion to Acreage, under NRS 278.490, followed by a final map), the Merger and Resubdivision (M&R) now accommodates both objectives of: 1) ‘clearing the slate’ internally, in whole or in part, or a former subdivision configuration; and 2) reconfiguring all or a portion into another scheme of lots or parcels suitable to the present owner’s objectives, all in one map. When the M&R is used, particularly in large acreage circumstance, where two or more aliquot parts of the U.S. Public Land Survey System (USPLSS) under one ownership are involved, and perhaps encompassing a partial subdivision under state statute authority, it is here where a misapplication of the M&R has most often occurred.

First of all, we must remember that aliquot parts of the USPLSS and the lines delimiting same were created under Federal Statute authority. Secondly, a Final Map falling within an aliquot part of the USPLSS has been created under state statute authority. Here is a case where that hierarchy previously mentioned must not be ignored. Thirdly, the USPLSS is the parent land division framework of our land tenure system; in effect, the parent and underlying source of virtually all parcels of land created under state statute authority. And it is this foundation that must be recognized for its value, and preserved for public benefit and for use by land survey practitioners on into the future.

In case you are wondering, yes, I am aware and recognize that once Federal Lands are patented into private ownership, state statutory authority governs from that point forwards. However, this does not negate the fact that the USPLSS schema is the foundation of virtually all subsequent land division activity right to the present time, including that developed under state statute authority. Nor does it discount the fact that in most Public Domain states, the USPLSS schema is very closely followed as to concept in retracement work. For Nevada, this equates to approximately 140 years of land development activity launched from the foundation of the USPLSS. To conduct a retracement survey, or to resolve a problem between contiguous ownership locations, may or may not entail working back to the USPLSS schema, but the necessity does occur, and not infrequently. More importantly, the ability to do so when called for must be preserved.

So, just what is the problem I’ve been leading up to? The problem is that there are some who apparently believe that in applying the Merger & Resubdivision Statute, all lines are fair game for eradication, including the USPLSS aliquot lines. This, in my

opinion, is misguided thinking on several points, as follows:

1. It fails to make the power distinction between a land division line and an ownership line (remembering that the two may be, but are not always, one and the same).
2. It disregards the hierarchy of Federal Statute authority over State Statute authority. Nowhere that I am aware of is a state statute afforded the legal ability to approve the removal of land division lines created under Federal Statute authority, particularly when the state was never given the authority to approve their creation in the first place.
3. It has the potential of setting up a methodical disassembly of the entire foundation upon which our system of land tenure is based. If you begin removing the foundation, the whole system will eventually collapse, thus removing the land surveyor’s ability to conduct retracement surveys and resolve discrepancies found both on the ground and in the record.
4. It is totally unnecessary to satisfy the intent of the Merger & Resubdivision statute, and to properly accommodate the further subdivision of lands for development purposes.
5. Lastly, and regrettably, it is in part sourced in the one discipline that should know better.

**Conclusion**

Should the terms “Ownership Line” and “Land Division Line” simply be regarded as different names for the same entity, or should they properly be conceptualized as two distinct entities which may occupy the same position, but not necessarily in all cases? If this

*We must conduct ourselves in a fashion that not only protects and preserves this foundation for those who follow in our footsteps, but also by creating the physical and paper trail necessary to enable a facile search back through historical events.*

commentary has served its purpose, the reader will understand that we must conceive the two terms as separate entities that, depending on the circumstances, may or may not occupy the same physical, or record, position.

The land survey practitioner must work within a number of governing directives, the entire bundle of which is structured to operate in accord with a well-established hierarchy. To disregard that hierarchy can result in grave consequences.

A proper understanding and respect for the importance of our land tenure foundation is the burden of every professional land surveyor. We must conduct ourselves in a fashion that not only protects and preserves this foundation for those who follow in our footsteps, but also by creating the physical and paper trail necessary to enable a facile search back through historical events. The land surveyor is part historian and chronicler. As such, we should be about the business of continuing and preserving, not eradicating, the chain of material and recorded evidence. And we should be sensitive to, and prepared to speak out concerning, ante directives or practices that would result in the degradation of our land tenure fabric.

*Reprinted from the “Missouri Surveyor” September 2006*



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# How safe are Your Crew Vehicles?

By Ronald E. Koons, RoSaKo Safety

When we complete a Written Safety program for Surveying/Engineering firms one of the key elements is the safety audit. As a part of the safety audit I always check out the field crew vehicles to make certain they are in good working condition. By good condition I don't just mean mechanically, but are they *user friendly*? Your crews spend a large portion of their time each year in their vehicle. It is important to make certain the vehicle is adequately outfitted for the jobs they will be performing and the conditions they will encounter. Let's cover the basics and see how your vehicles stack up in the user friendly department.

One of the first items that may seem basic, but I see problems for many firms, is how many employees will be riding in the vehicle. I see today's field crews anywhere from one to three workers on a regular basis. A regular pickup truck with two bucket seats may be fine for one or two workers, but is a real problem for three. A situation that I see many times is a two seat van with three workers traveling to a jobsite. The golden rule is that there should be no more employees in a vehicle than there are DOT Certified seats in which they can sit and use a seatbelt. Drywall mud buckets, instrument cases, bags of concrete mix, and folding lawn chairs don't count as appropriate seats.

Smoking in field vehicles is an issue that flares up tempers in many companies. There are both health and safety issues involved with smoking in a vehicle. The health issues have been well covered by the media for over 40 years. While an individual may have the right to smoke as he or she wishes, your company has the right to determine if you will allow smoking in a company vehicle. While a one person crew may not bring up second hand smoking issues, the two - and three - person crews most certainly can breed problems. Many crew members will not say anything to a fellow crew member about smoking while they really hate to be exposed to the smoke. They don't want to offend the other workers or start an argument. Aside from the health issues come two other points. The first is purely safety. A loose cigarette in a vehicle can start fires and if you have any flammable or combustible liquids in the passenger compartment it can be downright dangerous. Vans are particularly dangerous since there is no good place to carry your flammable liquids without exposing workers to a hazard. While not a safety issue, in the long run you also need to look at the trade-in or resale value of your field vehicle. Many dealers now tell me that they give less trade-in value for a vehicle that has obviously been exposed to a lot of smoking. Getting the odor out costs time and money and is not always totally possible. Many drivers will not purchase a vehicle that smells of smoke.

CDL - required vehicles such as semi trucks and many delivery vehicles are required to do daily pre-operational vehicle checks. We can learn from the professionals and perform a pre-operational check on field crew vehicles each day. Many times in our self serve gasoline society we neglect to check even the basic fluid levels. How long has it been since the parking brakes were checked on your vehicles? A simple list with boxes for checking off the items can be an invaluable tool to keep vehicles in top operating condition. Items as simple as a brake squeal can be noted and may prevent braking problems for the next person who drives a vehicle. Checking the battery terminals for corrosion may save a jump start down the road which can sometimes led to dangerous sparking of a battery. A vehicle in top operating condition is a safe vehicle.

Indiana just changed their laws to require the wearing of seatbelts in pickup trucks. There is just too much data to prove that seatbelts save some serious injuries and many times may even save a life. It should be a company policy that all employees wear seatbelts whenever their vehicle is in motion or on a public highway. Just two weeks ago I was on a rental car shuttle bus from the Raleigh airport when I overheard a conversation between two people from Indianapolis. One of the people said that he had been in an accident a couple of years before in a relative's van. He was in the passenger seat and when he went to fasten the seatbelt it was caught behind the seat. The driver asked if he should stop and he said he would just ride without the seatbelt. A few minutes later a young lady pulled in front of their van on I-69 and they hit her vehicle doing over 60 mph. The driver had very minor injuries and the passenger had serious injuries. He told everyone that taught him a lesson and now he never rides or drives without fastening his seatbelt. Emphasize the importance of seatbelts to all of your employees.

We can't forget the basic safety items of a fire extinguisher and first aid kit. You must have both in every vehicle. A 5 - pound abc extinguisher is always my recommendation for the minimum size. A gasketed first aid kit helps keep dust and moisture away from the included first aid items. Remember that gloves need to be changed out at least once per year. Latex gloves can deteriorate at temperature extremes and may not properly protect a worker when needed. I also recommend that you include some of the other basic items that can help in the event of an emergency. Jumper cables, a cheap emergency blanket, three triangles or other safety devices, a role of duct tape and a few basic tools may be invaluable when problems occur. Checking your vehicle for the tools to change a flat tire should be part of that daily pre-operational check as should be occasionally checking the pressure of the spare tire.

The last major item is how your tools, equipment, and other materials are stowed in a vehicle. Always make sure that any tool chests or carriers are secured to the frame of the vehicle or are some how arranged so they can't come loose during an accident or sudden stop. A rebar flying through the air at 70 mph can be a deadly projectile. The tops of all tool cabinets need to have a lid or some way to prevent materials from becoming dislodged during sudden braking events. Everything should have a place in your storage system and everything should be in its place. Even spray paint should have an appropriate location so other materials can't puncture or otherwise damage the cans. There are many ready-made inserts for vans and pickup trucks manufactured and some are made specifically for surveying applications. If you make your own box consult with your employees and let everyone have input on what is needed. Your field crew workers know what they need and may have better input than the owner of a firm. The storage needs may have changed since you were in the field full time. All vans should have some type of protection shield between the storage compartment and the passenger compartment. Even pickup trucks may need a screen over the window of a cap to prevent projectiles from penetrating the window.

I hope this has given you an idea of some basic vehicular safety items. Remember, the #1 cause of death in the workplace is motor vehicle accidents. With the amount of driving your employees undertake in a year it is critical they are properly protected.

## CALENDAR

### August 31, 2007

ISPLS Seminar, Spring Mill State Park, Mitchell, Indiana,  
Topic to be announced.

### September 14, 2007

Indiana Land Surveying Board of Registration Meeting,  
Government Center South, Rm. W064, Indianapolis

### September 15, 2007

ISPLS Board of Directors Meeting, ISPLS headquarters

### September 13-15, 2007

The Surveyors Historical Society's 2007 Rendezvous will  
be held at George Washington Birthplace, Virginia, as a  
joint venture with the National Park Service.

Contact: Roger Woodfill, SHS Administrator,  
e-mail: shs9@earthlink.net

### September 21, 2007

Central Indiana Golf Outing, Maple Creek Country Club  
(Near 21st Street & Mitthoeffer) Start: 9:00 a.m.

### October 12, 2007

Southwest Chapter Seminar, "From Error Analysis to  
Relative Positional Accuracy", Speaker: Tony Gregory,  
Location: Spring Mill State Park

### October 20, 2007

ISPLS Board of Directors Meeting, ISPLS headquarters

### January 16-18, 2008

56th ISPLS Annual Convention, Adam's Mark Hotel (Airport) ,  
Indianapolis, Indiana, Hosted by Initial Point Chapter and  
Wabash Valley Chapter.

## WELCOME NEW ISPLS MEMBERS

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Charles Marshall - Associate

Gregory Williams - Prof. Member

Jeffrey Yeary - Associate

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