

THE NEVADA TRAVERSE

Journal of the Professional Land Surveyors of Nevada

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A person is silhouetted against a bright, hazy sunset sky, standing on a rocky outcrop and using a surveying instrument. The scene is framed by the dark, leafy branches of trees in the foreground. The overall mood is one of exploration and precision in a natural setting.

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THE NEVADA TRAVERSE

This publication is issued quarterly by the Nevada Association of Land Surveyors (NALS) and is published as a service to the Land Surveying profession of the state of Nevada. *The Nevada Traverse* is an open forum for all Surveyors, with an editorial policy predicated on the objective of NALS and Bylaws, Article II, which reads:

‘The purpose of the association shall be to promote the common good and welfare of its members in their activities in the profession of Land Surveying; to promote the common good and welfare of the public in terms of professional land surveying activities; to promote and maintain the highest possible standards of professional ethics and practice; to promote public awareness and trust in Professional Land Surveyors and their work.

This organization, in its activities and in its membership, shall be non-partisan, non-sectarian, and non-discriminatory.”

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The Editor's Corner

by Trent J. Keenan, PLS



COVID-19, and our subsequent shelter in place orders quickly changed our lives and left us all in shock. As this new reality started to sink in, and everyone developed new routines and found new ways to meet our client's needs, we are also finding new ways to operate and stay connected with each other. The mantra of "we're all in this together" was embraced and we really found a sense of community, we brought our families back together, we brought them back to the dinner table, back to the outdoors, we found our neighbors are helping neighbors, everyone during these crazy times just seemed to roll with what came next and figure out what the new norm will be. Sure, there is the fear of the unknown, there is the long hair problems, there is the consistent snacking while working from home or the countless trips to ice cream store (Or was that only me?). But one thing is for sure, I am happy that this pandemic happened in a time where we are so digitally advanced that the changes really happened quick and seamlessly, at least for most of us, I hope.

It might be stormy now, but rain does not last forever!

Now let us talk about this edition of the Nevada Traverse.

With the sudden postponement of the conference, we wanted to bring the conference to you. You will find a lot of great articles as they relate to the final conference program.

NRS/NAC Rule of the month, with the current shelter in place orders it's a perfect time to highlight NAC 625.610 stamps, seals, and signatures on documents. There were some changes that were enacted by the State Board of Engineers and Land Surveyors and codified by the Legislative Counsel Bureau on January 30, 2019, that should be noted and addressed for your next electronic submittal.

We have another great article by Michael Kidd, PLS discussing the Government Peak & the Peculiar Copper Bolt. It is a great article talking about the first transcontinental triangulation survey and particular mountain peak.

We got Mr. C.de Baca to break his writers block with a couple contributions this month as well! We have a Double Proportion

Problem and how to approach the establishment of them, we also have a nice article about the struggling times we are all in with COVID-19. Thank you Carl, Welcome Back!

Jonathan Wooten tells us we should be preparing for the 2022 Datum updates, we will hear from our State and Chapter Presidents, YSN as well as our NSPS Director on the latest news coming out of their areas. Matt Gingerich talks about his view on continuing education. Gary Kent provides us with information on what a good leader is. We have a great business article by Mitch Duryea and so much more to list.

I hope you enjoy this recent edition of the Nevada Traverse and will continue to help me make this a successful publication. With some free time on your hands, I would love to see some great articles for the next edition. PLEASE send me your thoughts and ideas and we will find a way to write together! In times like this, it is important to be united as a community and support each other!

Remember, tough times never last, tough people do!



About the Cover...



A composite image of all the photos supporting the Government Peak Article.
Photo credit to Jeremy Long (Full Metal Worldwide) &
Kyle Lindsay (City of Henderson)

Do you have a cover shot you would like to submit?
Email: nals@NvLandSurveyors.org



The President's Message

by Greg Phillips, PLS

Greetings fellow Land Surveyors. I would like to send my heartfelt wishes to all of you during these challenging times as we are dealing with the COVID-19 global pandemic. I hope that, between the time I am writing this in late April and the time you are reading it, we have started to reopen the state and are gaining some normalcy. Our service of land surveying is essential to the infrastructure of our state. It has been a challenge to continue to provide our service while keeping everyone safe, but we are problem solvers and have been able to adapt to get our work done. I think most of us got into this profession due to the appeal of Social Distancing. I am very proud to see how our profession has rapidly evolved using our existing skills by adding some distancing tools for safety to continue to support our public infrastructure.

It is amazing to me what a change in reality can happen in less than a couple of months. January and February we were all charging ahead with a robust economy and what seemed to be endless opportunities. As an organization, NALS was moving full steam ahead, planning a three state conference with Arizona and California starting March 28 in our beloved Las Vegas. Based upon the preliminary information that was coming in about the disease, the conference committee made the tough decision to postpone the conference just a couple of weeks before it was to start. Little did we know at that point that we really had no decision to make. Governor Sisolak ordered non-essential businesses closed on March 17. This included our host, the Luxor and all other Las Vegas strip casinos and hotels. This was the first time the strip went dark since the mourning of John F. Kennedy in late November, 1963.

Fortunately, we are seeing some very positive signs and appear to be on the path to reopening. Based upon most models, we have passed the peak and flattened the curve. NALS has continued to work to support its members during these trying times. The Board of Directors has held meetings via Zoom. The conference committee has rescheduled our annual conference to August 21-25. We did have some initial registrations cancel due to uncertainty. At this point, we still have over 300 full registrations, most all speakers were able to reschedule, and nearly all exhibitors have committed to come. All indicators point to another great conference. Late August in Las Vegas will be a change from our typical time of year, so bring your swimsuits and sunscreen.

Many of you probably received the survey sent by the Nevada State Board of Professional Engineers and Land Surveyors (NSBPELS) in early February asking opinions on the 30 hours of Professional Development required biennially. The NSBPELS is reviewing this current requirement and considering if a reduced amount of hours, with a focus on ethics and law, would be more appropriate. Based upon the results of the survey, it appears as though the engineering and survey community is split down the middle on what side they fall on. In addition, reading some of the comments, and based upon my attendance at the Professional Association Liaison Committee Meeting on March 4 this year, the folks that have an opinion one way or the other have a very strong opinion for their side. I personally am supportive of the current requirement of 30 PDH's and believe a reduction in this requirement would be a detriment to our profession. Our NALS Board is in unanimous support of this position as well. We sent a letter of support of the status quo to the NSBPELS on February 28. I appreciate the work that the NSBPELS does to protect the public and am glad that we have two of our finest surveyors representing our profession on the Board, Michael Kidd, P.L.S., and Matt Gingerich, P.L.S. Thank you for your service and the great work you do.

This will be our second edition of the Traverse with both the new format and new Editor. I like the new look and am very thankful to Trent Keenan for taking on the role as editor. This is not an easy job, but Trent is the right person for it. In Trent's first editorially he asked himself "if not you, who"? I would like you all to reflect on that for a couple of minutes. Our profession is decreasing by proportion of the population growth of our state and country. I believe, as our ranks decrease, it is even more important that we stick together as a profession through our organization. This leaves quite a bit of work to be done by fewer and fewer people. Since we are on a role with quotes, "many hands make light work". Please consider supporting NALS, the Traverse, and Trent. Make a commitment to write an article, share an opinion, take a picture, and let us know what you are doing in your corner of the state. The Traverse provides opportunity for other members to help connect us all.

I am greatly looking forward to a return to normalcy. I feel very fortunate that through my profession of land surveying I am able to contribute to society while continuing to make a living. My heart goes out to those people and families in the service industry whose livelihoods and occupations were shut down overnight. Please support them however you can when you can. Send virtual high fives to our brothers and sisters behind the wheel and on the front line, in the hospitals, clinics, Costco's, and grocery stores. I am grateful for some recent good news and light at the end of this tunnel. I hope to see you all very soon, hopefully in Las Vegas at the conference.



Government Peak & the Peculiar Copper Bolt

by Michael Kidd, PLS



Whether you are a land surveyor, hunter, hiker, miner or just looking at maps for any reason, from time to time there may be something on a map that makes you think, "Why was someone here and what were they doing?" That is what I was thinking while looking at sources of information in preparation for a hunting trip a few years ago in eastern Nevada. One isolated National Geodetic Survey (NGS) control point caught my attention; NGS station "PIOCHE" with the Permanent Identifier (PID) designation HPO278. This NGS station is located about 22 miles east of Pioche, Nevada, on top of Government Peak, approximate elevation 8,783 feet, NAVD 88. My mind filled with questions. "What was happening in 1883 on a peak in the middle of the wilderness? Who set a copper bolt on an 8,783' peak near the Nevada-Utah border? How did they set a copper bolt leaded into bedrock and is the copper bolt still in place?"

There were not many metallic survey monuments being set in the western United States prior to 1900. Most survey monuments at that time in the west, were some type of stone or wood-based monument. This one little copper bolt was part of the first transcontinental triangulation survey, also known as the measurement of the arc of the 39th parallel. The transcontinental triangulation and the measure of the arc of the parallel extends from Cape May, New Jersey to Point Arena, California, covering 2,625 miles. The occupation of the "PIOCHE" station was typical of the main astronomic observation stations. This station on Government Peak had a horizontal measurement station, with the vertical observation station about 70 feet away.

The NGS data sheet lists this station as monumented in 1883 with the following description:

"Station is marked by a copper bolt leaded into a drill hole in bedrock. It is also marked a few inches above the bolt by a drill hole in the flat stone in the masonry foundation used for supporting the instrument. The station is nearly surrounded by a ring wall of rocks having an inner diameter of 11 feet." The 1883 date represents the year the observations were made, as the copper bolt was set in 1879.

*Direct quotes from the **Coast & Geodetic Survey Report Special Publication No. 4**, printed in 1900. Will be shown with italicized text.*

The following statement appears in the Special Publication No. 4, page 597.

Pioche, Lincoln County, Nevada; established in 1879 by W. Eimbeck. This station is located on the highest rock knoll of a peak in the mountains just east of Eagle Valley. The peak is about 1,000 feet west of the boundary line between the States of Nevada and Utah, and bears north 80° 25' east, distant 22.5 miles (about 33 miles by road), from the court-house in the town of Pioche. The geodetic point is marked by a half-inch copper bolt leaded into the solid rock in the center of a stone foundation pier for the theodolite, as a subsurface mark. The pier is covered by a stone slab, having a three-fourths-inch drill hole in its center, securely cemented to its top, as a surface mark. The copper bolt is 8 3/4 inches below the top of the drill hole. The vertical circle station bears north 26° 20.8' east, distant 69.23 feet, from the geodetic point, and both points were surrounded with circular stone walls, which were left standing.



The drill-hole for this copper bolt was most likely drilled by a process referred to as "down-hole double jacking".

From the Tonopah Daily Bonanza June 15, 1910
"While the Fourth of July committee is planning the attractions for the Fourth of July celebration here, they should not lose sight of the fact that this is a mining camp and that most of the visitors to the camp on that date will be people who directly, or indirectly derive their support from the mining industry. Therefore, the star number on the day's program – the piece de resistance, as it were – should be the drilling contest, both with the single and double jack, with

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generous prizes to the winners. Such a contest will arouse more interest and draw more people in attendance, than any other event that might be arranged."



In double jacking, two drillers hit a drilling steel with large sledgehammers, while a holder turned the steel slightly after each blow. As the hole deepened, the holder substituted longer steels in a way that did not interrupt the driller's disciplined rhythm. The above image and description is from the United States Forest Service Technical Publication for Hand Drilling and Breaking Rock for Wilderness Trail Maintenance.

The Civil War was still a very fresh memory. The railroad connecting the country was just completed and there was a desire to create a more connected country. A transcontinental survey was funded by Congress and began in 1871 with the bulk of the work completed by 1898. This survey was designed to connect the triangulation lines already executed on the Atlantic and Pacific coasts. The following statement appears in the **Special Publication No. 4**, page 18.

The cost per mile of progress was least in Maryland and Delaware, being \$103, and greatest in California, where it was \$463. The average expense of occupying one station was \$598 in the former case and \$9,031 in latter. The cost per square mile of territory, strangely enough, however, is greatest in a flat country, where short lines are necessary. The work in Indiana and Illinois cost \$11 per square mile, where the average cost per point was \$1,725, while that in Colorado cost about \$2, where the cost of occupying each station was \$6,131.

The photo shown next column is a typical horizontal observation station with a theodolite from the early years of the survey. The horizontal directions at all stations were observed with a 20-inch theodolite with observations from a minimum of 17 positions of the azimuth circle. The focal length of the instrument was 42-inches. The Coast and Geodetic Survey Report from the fiscal year ending June 1889 makes mention of new instruments to replace some of the aging theodolites. The following description appears on page 139 of the 1889 Report.

The theodolites are "repeaters" and it is believed they will prove to be superior instruments. The essential parts have been made by our best mechanics and special care has been taken to secure the

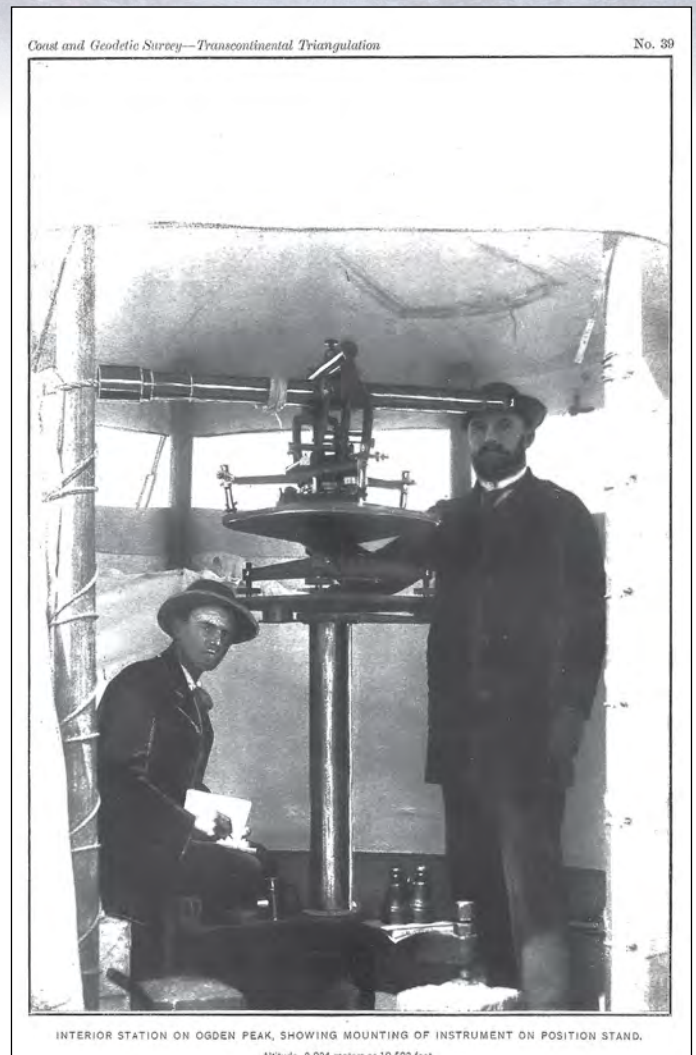


Photo 39 from Special Publication No. 4.

greatest possible degree of accuracy. The horizontal circles are eight inches in diameter, and will be graduated to five minutes, reading by three verniers to five seconds. The inner centers are made of bell-metal, and the others of "half-hard" brass, while the outer shells are made of ordinary "red metal." The use of steel for the centers was not permissible, as each instrument is furnished with an attachment for the approximate of magnetic declination. The telescope axis are perforated for axis illumination, thus adapting the instruments for azimuth determination and night observation of horizontal angles. ...

The telescopes of three of the instruments have focal lengths of sixteen inches, and clear apertures of two inches... the other three instruments have telescopes fifteen inches in focal length and two inches of clear aperture.

The intention was to secure two full sets in each position and to balance the number of observations of the morning and evening. The observations were made from sunrise till about 8:00 in the morning and resumed about 4:30 in the afternoon until sunset.

The conditions of the weather on these high mountains could not be called unfavorable during the ordinary field season, which lasts from about the first of June to the first of November, excepting, however, the period of thunderstorms in midsummer. These thunderstorms, on account of their persistency among the high mountains, have frequently given rise to much suffering,

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Anyone Could Lead Perfect People

by Gary R. Kent, PLS

As I think about the new normal (not last week's new normal, but the one from 15 minutes ago), my mind dwells on what we need most in these uncertain times. And that is contemplative, compassionate leadership.



Yet leadership in our modern era is not an exercise in perfection. It is completely unrealistic to expect anyone to have all the right answers and do all the right things. In fact, in the complex world we live in, there are no unambiguously correct solutions; nothing can be done or said that will please everyone, that hurts no one or that helps everyone. And that is not because of so-called political correctness, victim-mentality or us vs. them mentalities. While those attitudes do exist, and they can make it more difficult to find acceptable solutions to the profound problems we face (not just today, but as we look to the future), accounting for them results in better, more comprehensive, more enduring answers.

Notice, I did not say those attitudes make it more difficult to *solve* our profound problems; I said it makes it more difficult to find *acceptable* solutions.

In the same way there are no unambiguously correct solutions to our problems, there are also no flawless leaders. And in the same way there are no flawless leaders, there are also no unblemished followers to be led.

Leaders who expect perfection in those they lead are, at best, unreasonable and at worst perverse: expecting more from others than we bring ourselves is a blatant act of arrogance. Those who expect perfection in those they lead are not only bound to be disappointed, they are not true leaders.

A major element of leadership is accepting imperfection in those being led. But there is so much more. A true leader is someone who engenders enough trust that people will follow him or her "into the fog." It is someone who has a vision and who can illuminate the path in a way that others can readily see it and that causes them to want to follow it also.

Among the things that leadership is *not*, is characterizing that one has all the answers. Not only is

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2022 DATUM Is It In Your SIGHTS?

by Jonathan L. Wooten PLS
Nevada Geodetic Coordinator



The idea of datum changes is in no way a foreign concept to Nevada Surveyors. We have successfully navigated, used, and worked through NAD83 (2011), NAD83, and although not in my lifetime, NAD27, along with numerous Vertical datums and Geoids. And guess what? We are gonna do it again. I hope you will agree that we have been hearing an abundance of news about the upcoming datum changes, including key topics presented by Carl C.de Baca in an article in the September 2019 issue of the Traverse. I also present information related to this subject, such as at a recent membership meeting for the Southern Chapter of NALS. Particulars related to this hot topic have also been presented at past NALS conferences.

As a surveying community, we are very fortunate to have Dana Caccamise as the National Geodetic Survey (NGS) Advisor for Nevada. He has spent countless hours communicating with our stakeholders, encouraging Nevada Surveyors to play an active role in shaping our future and being a champion for the geodetic needs of our state.

We have been hearing about this pending 2022 Datum update for some time and many of us have committed substantial time, resources, and efforts to prepare for it. Nevada surveyors and firms contributed their support through participation in the 2017-2018 NGS GPS on Benchmarks campaign. The data collected and shared for this campaign resulted in all our efforts being included in the latest Hybrid Geoid Model. Today, data continues to be collected and shared with NGS through OPUS-share for the use and calculations that will become the future transformation parameters between the Geometric & Geopotential datums, as well as the Geoid models for NGS products that we use every day.

So, 2022 Datum update, what is all this hoopla about? I like to think of it like this – the plan is that NGS will replace the datums we currently use, which are ground-based (linked to bench marks), with a new reference frame and geopotential datum that is not ground-based.

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Your Business is Like a Bus

by Mitch Duryea, PLS



The professional land surveyor is well trained, educated and experienced in the technical aspects of our profession. How to be a business owner is not included in his technical training or education. Running a business requires a different skill set that is usually learned through experience and typically not formal training or education. While most professional surveyors work in small organizations, the experience running a business is limited. Most learn through trial and error. This article reflects the on-going learning process of running a successful Land Surveying firm for over 25 years.

In his book *Good to Great*, Jim Collins used the analogy comparing a business to a bus. The focus of his analogy is having the right people on your bus and in the right seats (Collins, 2001). A business is more than just the staff. You need to know what type of bus you have, where the bus going, are the right people on the bus, are they in the right seats, and when is it time to get off of the bus.

What Type of Bus?

Self-employed or owning a business

When starting or building a business, a philosophical question must be first addressed. Are you going to be self-employed/working for yourself or are you going to build a business. The difference is that for the self-employed person, income is the primary focus. All of the business revenues are the "paycheck" for the self-employed person. For the business owner, revenues are the resources for building the business. In her 2013 article, Joanne Hession further defined the difference between being self-employed versus owning a business:

The self-employed are likely to be busy working to deliver products or services. The business owner, by contrast, is focused on building an enterprise that can run without the owner – a business with structure, systems and processes, a concern with clients and customers who don't relate only to the owner. In short, the business owner is building something which is independent and ultimately saleable. (Hession, 2013)

Business Organizations

After the self-employed / running a business question is answered, the type of business organization must be addressed.

There are a variety of business organizations, each with their own benefits, advantages and disadvantages, depending upon the goals of the owner. The options for business organizations include:

- Sole Proprietorship
- Partnership, limited (LP) or limited liability partnership (LLP)
- Limited Liability Company (LLC)
- C or S Corporations

Selecting the correct business organization is a personal choice and should be made with proper consultation with an attorney and accountant. The rules for these different types of organizations may differ between states.

Where is your bus going?

When you get ready for a trip, you collect information about the destination, you decide how you are going to get there and what you are going to do after you get there. The same is with a business. Where do you want to go, how are you going to get there and what are you going to do when you get there.

Mission Statement

A mission statement is a short statement that describes your business and identifies your core beliefs and values. To design your Mission Statement, look at samples from Fortune 500 companies along with others in your industry. Their Mission Statements should be easy to find on the company websites.

The following is the Mission Statement for Duryea & Associates:

Duryea & Associates strives to provide professional land surveying and mapping services throughout the western United States with the highest of professional and personal ethics.

In these few words, it is clear to see what, where and how Duryea & Associates operates. Your mission statement defines how you want to do your business and tells the public, and your potential customers about you. It is critical that the staff knows and agrees to adhere to the company Mission Statement. This Mission Statement needs to be reviewed on a regular basis and revised as deemed necessary by the leadership of the company.

The Business Plan

The Business Plan are the details of how you are going to execute your Mission Statement. The Business Plan should include the type of clients you want, the type of services you will provide, and the service area that you will provide these services.

Types of Customers: Identify the types of customers that your business will serve. For a survey company, this list could include: General Public, Contractors, Engineers & other design consultants, Developers, Public Agencies, etc. This list should also include a list of those clients that you do not want to work with.

Types of Projects: What services and products does your company provide, and maybe more importantly what types of services you do not provide.

Service Area: Where do you provide your services? Your service area might be your city or county. Your service area may be a larger area: your state, region, or nationally. Your service area may be different for different types of services or clients.

As with the Mission Statement, the Business Plan needs to be revisited on a regular basis, and modified as necessary.

The Marketing Plan

The Marketing Plan are the details for implementing your Business Plan. Your Business Plan has identified,

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Creating a Civil 3D Surface

Prepared by Rick Ellis

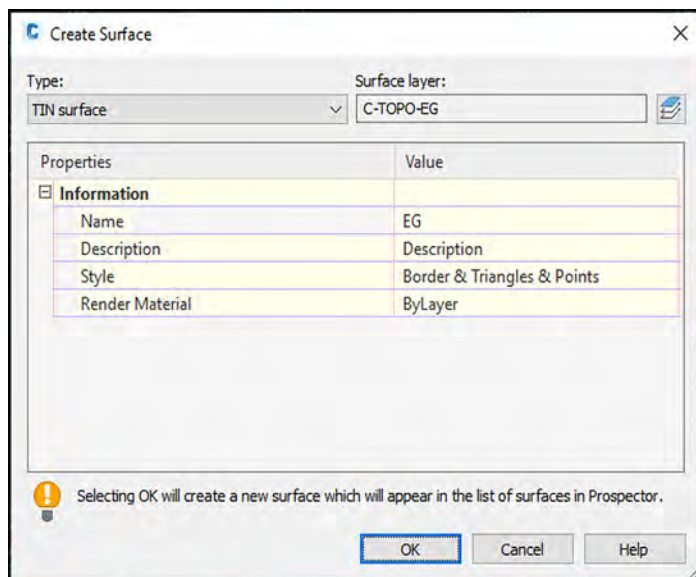
Creating a Civil 3D Surfaces from TIN Lines or 3D Faces

I'm sure many of you were looking forward to the APLS-CLSA-NALS Conference in March, I know I was. Well I guess a certain virus had other plans for us and instead of learning about different Survey topics in Las Vegas we got to stay home and learn about Social Distancing and flattening curves. All kidding aside, I hope that you and your loved ones are all healthy and safe. And we can all look forward to the conference on its new dates in August.

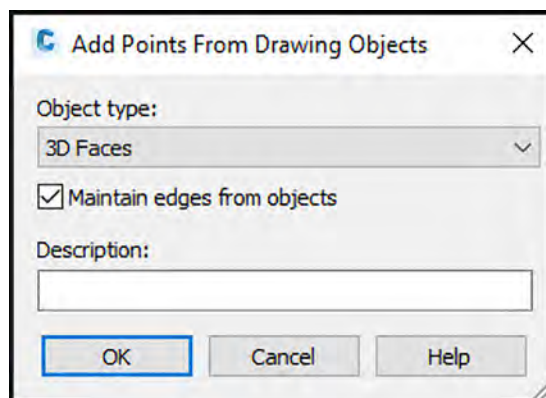
At the conference I will be teaching a full day of Civil 3D classes, broken into four sessions on different topics; Digging into Civil 3D Surfaces, Field to Finish in Civil 3D, A Practical Guide to GIS in Civil 3D, and Civil 3D Styles Tips and Tricks. I know August may feel like it's a long way off, so I thought I'd give you a small example of one of the topics that I'll be covering during one of my presentations. I hope that you find it helpful and I hope to see you at the conference in August.

We have all probably received a drawing at one time or another that contains 3D faces or 3D lines representing a surface. Now your job is to convert these AutoCAD objects into a Civil 3D surface that you can use for creating Profiles, Sections, Contours, and a variety of other things.

The best way to translate a surface from one software package to another is to use the LandXML import/export format. This will allow you to import an exact copy of the original surface without recreating it from 3D faces or 3D lines representing the TIN. This is the fastest way to get a surface that was created in another program into Civil 3D and it also eliminates the possibility of errors being introduced during the process of rebuilding the surface. However, the person supplying you with the drawing may be unable, or unwilling, to export the surface as a LandXML file for you. If this is the case Civil 3D has tools that make creating a surface from 3D faces or 3D lines representing a TIN both accurate and easy.



1. On the *Prospector* tab of the *Toolspace*, right-click on **Surfaces** and select **>> Create Surface**.
2. Confirm that **TIN surface** is selected as **Type**.
3. Select the desired **Surface layer** and **Style**.
4. Click **<<OK>>** to close the **Create Surface** dialog box.
5. On the *Prospector* tab of the *Toolspace*, expand the **Surfaces** node.
6. Expand the **Surface Name**.
7. Expand the **Definition** node under **Surface Name**.
8. Right-click on **Drawing Objects** under the *Definition* node and select **>> Add**.
9. Set the **Object** type to **3D Faces**.



If your drawing contains 3D Lines representing the TIN instead of 3D faces select Lines from the list.

10. Enable the option to **Maintain edges from objects**.

This option will create the new surface with triangles that match the exact geometry of the selected TIN lines, rather than just sampling the endpoints of the selected TIN lines and re-triangulating by proximity. This is a critical step to get the new Surface to match the TIN lines and the original Surface exactly. It is similar to treating all of the selected TIN lines as breaklines.

11. Click **<<OK>>**.
12. Select all the 3D Faces with a crossing window, then **[Enter]** to end the command.

The new surface will be built from the selected TIN lines and displayed according to the style that you assigned earlier.



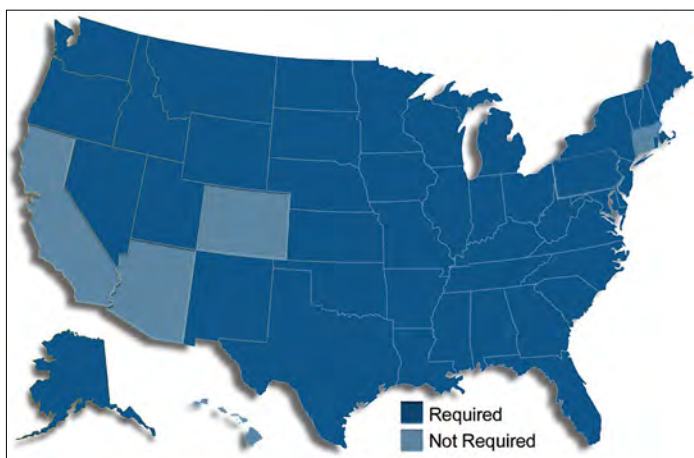
About the Author

Rick Ellis, Author and President, CADapult Software Solutions, has worked with and taught Civil/Survey CAD software since the mid-90s. He is the author of a series books on AutoCAD Map 3D, Civil 3D, and most recently, Carlson Survey, known as "Practical Guides". He continues to work on projects in a production environment, in addition to teaching classes to organizations both large and small around the country, helping them get the most out of their design software investment. <https://cadapult-software.com/shop/>



Continuing Education One Surveyor's View

Prepared by Matt Gingerich, PLS



Every two years licensed surveyors go through the same exercise of gathering up the evidence as to how many hours of continuing education accumulated since the last renewed cycle. One hopes they have enough to make the minimum. Can I count that class on CPR I took? Did I make it to all the sessions at the last conference, or was I sleeping off a rough night at the President's reception? Hopefully, you made the cut and got 30 hours or maybe even done well enough to accumulate excess units for your next renewal period.

Recently, the Nevada Board of Engineers and Professional Surveyors sent out a Survey Monkey gauging our opinion of the number of hours we should be required to renew our license. The survey got me to wondering how did we get here, and is this important to me?

Nevada Revised Statute 625.398 requires continuing education for both engineers and land surveyors. The law was proposed as Assembly Bill 26 to the 68th Legislative Session in 1995. Jack Holmes, PLS, Past President of the Nevada Association of Land Surveyors and Mike Turnipseed, PE, former Nevada State Engineer spoke in favor of passing of the bill. Jerry Higgins with the Nevada State Board of Engineers and Land Surveyors promoted the bill to "keep individuals in the engineering and land surveying profession up-to-date with the latest technology and development in the profession." There was no testimony in opposition to the proposed addition. The law was passed by a vote of 40-2.

In 1997 the requirement was further codified in Nevada Administrative Code (NAC) 625.430 – 625.490. This section of the NAC provides guidance on the types and value for reporting continuing education. It provides details on the credit one can receive for various types of activities, such as college courses, workshops, and even authoring a published paper. When these regulations were adopted, we did not have near the resources that are available today. Continuing education can be achieved

in a wide range of opportunities; chapter meetings, conferences, and more recently webinars have become easy to access and user friendly.

When Nevada adopted the requirement for continuing education only 10 states had similar legislation. Today, according to PDHengineer.com, nearly 45 states require some level of continuing education. Outside of our profession many other fields have similar requirements. Nevada educators are required to obtain six credits every six years to renew their teaching credential. Lawyers are required to obtain 13 hours per year, two of which must be related to ethics and professional conduct, and one for substance abuse and addictive disorders. Realtors are required to obtain 24 hours of continuing education every two years.

Having been actively involved with NALS the past 20 years, I have been fortunate to have attended many conferences, workshops and seminars. Looking back I think the value of attending these has been immeasurable. So much has changed with the tools we use. GPS, LiDAR, drones, and new datum changes to name a few. Our profession has been on the cutting edge of technology and while we learn much on the job, I strongly feel that the formal nature of workshops and seminars provide a different perspective. Interactive dialog in these settings enable the attendees to gain far more than reading out a topic or self-education. Often questions by the attendees spark a dialog that takes the learning experience far beyond what you can achieve with self-study.

One aspect the conferences and workshops have afforded me, the one that may be most beneficial, is difficult to quantify or count in my biannual renewal. Over the years of attending these classes, I have had the opportunity to get to know many of you. In my opinion, our relationships, which have been fostered by these classes, are a tremendous benefit. If we are following each other's footsteps and have a question on a boundary or control, it is likely we have met at an event in the past. This relationship makes it far easier to pick up the phone and resolve the question or problem. The relationships we have forged make it easier for us to do business, but I would argue our clients and the public are better served because of them.



About the Author

Matthew E. Gingerich, PLS. Matt's surveying career began with the Bureau of Land Management and he later worked in the private sector. Currently, Matt leads the Land Resources department for NV Energy's northern service territory. Over the last twenty years he has been involved with a wide range of responsibilities in surveying and land rights related to the construction and operation of the expanding gas and electric utility infrastructure in Northern Nevada. Matt graduated from the University of Nevada, Reno with a Bachelor of Arts in History and the Oregon Institute of Technology with a Bachelor of Science in Land Surveying. He has served as President of the Nevada Association of Land Surveyors and Chair of the Western Federation of Professional Surveyors. Matt and his wife Laura have two sons, Chad and Troy. Matt officiates high school football with the Northern Nevada Football Officials Association.



Nevada Young Surveyor's Network (NV YSN)



Prepared by Sarah Walker, NV YSN Chair



Nevada YSN is One Year Young!

The Young Surveyors Network has officially been around for over a year now! This year has been a huge growth period. What started with the 2 founders at the beginning has turned it a strong group of 39 members spread through various parts of the State. The group has enough membership now to break into chapters modeling the NALS framework. The newly formed Southern NV YSN Chapter is being put together headed by Kristin Kaminski from Henderson. A main group chat and full state membership is included for every member of the group; however, members are directed to their local YSN chapter to be involved in local meetings and events. It is a great time to be a Land Surveyor, and let's be honest it's nice to have like-minded friends along the journey! Feel free to join our network by emailing us at nvyoungsurveyors@gmail.com. Whether you are fresh out of high school, in the middle of college, been in the profession for a while and just wanting to support or get refreshed through exams, study groups, and seminars, then give us a shout. We are a fun, easy going and intellectual group and aim to have a good time as well as Educate, Connect, and Involve aspiring Land Surveyors.

Current Status

Due to the COVID-19 outbreak, the NV YSN is currently postponing all in-person activities until further notice. We have decided to make this decision for the health and safety of our members and the public. Calendar events that are currently postponed include: GBC College Survey Labs Mentorship Program and the June YSN Quarterly Meeting. Other events that were canceled involving our YSN members include the 2020 NSPS Student Competition at the NSPS Spring Meeting. All events are currently working on being rescheduled to a future time. YSN events are waiting to be rescheduled until "Stay at Home" orders have been lifted.

Now is a Great Time to Study!

Now is a great time to study for exams geared toward licensure!

The first step is to take the Fundamental of Surveying Exam (FS) through the NCEES. The exam is 110 questions, has a 6-hour testing window along with a break and is Computer Based Testing

(CBT). They exam is held on a computer at one of the NCEES Testing Centers. For more information visit ncees.org/surveying. After one passes the FS, they can then apply to the Nevada State Licensing board to obtain a Land Surveyor-In-Training (LSIT) Certificate. Following the FS Exam is the PS Exam. This Exam is through NCEES as well and contains 100 questions, has a 6-hour time window and is administered through CBT. Once one has passed both NCEES exams, the FS and the PS, the State Specific Exam is next. This exam is targeted towards Land Surveying and varies by state. It has been said by various PLS's that some state exams are easier to pass than others. For more information regarding the state specific exam or how to apply to apply for your LSIT or PLS in Nevada, please visit The Nevada Board of Engineers and Land Surveyors website at nvbpels.org.

Additionally, please reach out to the YSN if you are interested in joining our FS or PS NCEES Exam Study Groups! We currently have both groups in communication. It is very beneficial for peers to bounce questions off of each other when studying for exams like these. Study groups also receive a practice exam as well as other study material. These study groups, as well as our membership, is free so don't hesitate to contact us! We are stronger in numbers!



March Quarterly Meeting

The March quarterly meeting was a great success! There were about 20 people who attended the event held at Wild Island in Sparks. It started off with a social hour, transitioned into an epic group Laser Tag session, and ended in dinner and a discussion on the upcoming Datum Change. The Great Basin College Competition team was comprised of Nick Montoya as Team Captain and including Cole Hamlin, Bret Clarke and Sarah Walker. The team gave a small presentation on what they were learning about the New Datum change and it turned into many great questions and conversations amongst the group. New members were added, new friendships and connections were made, there was many laughs and great intellectual conversation! Thank you so much for everyone who attended we have such a great group of people and we couldn't be more thrilled to be able to bring everyone together. But most importantly thank you to NALS for helping fund the YSN's endeavors. We wouldn't be where we are today without all the great support we have received in the past year! Thank you to all the following sponsors:

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in a general sense, the types of clients or customers you want to attract. In the marketing plan you develop specific targets for potential customers and projects. The Marketing Plan provides clarity in your Go-No Go Process. The Go-No Go Process is an evaluation of potential projects and clients. Does this opportunity fit your Mission Statement? Does this opportunity fit your Business Plan? Do you have the resources to complete the project? Larry Burkett tells us in his book "Business by the Book" that we need to know the limitations of our businesses, and when in doubt say "No". (Burkett, 2006).

As with the Mission Statement and Business Plan, the Marketing Plan is to be reviewed and revised on a regular basis. Through these processes, you may determine you need to change the direction of your bus, and that is OK. You may find it in the best interest of your company to "fire" a client. A bad client can distract your staff from completing other projects for good clients.

Do you have the right people on the bus, and in the right seats?

You cannot run any type of business entirely alone. You need a team, even if you don't have any other employees. To run a successful business, you need to have 1) The Bus Driver, 2) Advisors, 3) Consultants and 4) Employees

The Bus Driver

Jim Collins defines the role of the bus driver as the leader, and it is the leader's job to get the bus going (Collins, 2001). In his book "EntreLeadership: 20 Years of Practical Business Wisdom From the Trenches," Dave Ramsey defines the characteristics of a Leader and those of an Entrepreneur (Ramsey 2011). Leader Character Qualities are

- To have Integrity
- To be Passionate
- To be Humble
- To be a Visionary
- To be Influential, and
- To be Disciplined.

Evaluate yourself and identify which of the traits you are good at and which you need to improve. Remember, "Your education, character, capacity, ability and vision are limiting your organization." (Ramsey, 2011).

Advisors

As stated earlier, we are not trained or educated in all of the areas of running a business. All of us need assistance to be successful. Any successful business has and follows the advice of their counselors to supplement your own skill set and provide necessary expertise to be successful. Two organizations that provide advisors through outside education and training for little cost are SCORE (Service Corps of Retired Executives) <https://www.score.org/> and the Small Business Administration www.sba.gov.

Consultants

The role of a consultant is to provide professional advice and services in areas outside your competency. Why does a client hire you? Because of your expertise as a Professional Land Surveyor. Why hire a consultant? Because they have their areas of expertise to make you successful. For a small to medium size firm, your consultants should include an Attorney familiar with your field, an Accountant / Payroll Service and Business Insurance Agents for Business Insurance and Employee Benefits.

Employees

When I first started Duryea & Associates, someone told me "There is nothing better than a good employee, and nothing worse than a bad one." It is the responsibility of the company leadership to recruit, train and retain good employees. This takes more effort to hire a good employee than getting a new client or customer. In her 2015

article, Wendy Maynard states, "Leaders must be rigorous in the selection process for getting new people on the bus. Invest substantial time in evaluating each candidate and make systematic use of at least three evaluation devices (e.g., interviews, references, background, testing, etc.)" (Maynard, 2015). If you do not find the right person, let the position go unfilled. As a business owner, you don't need bodies, you need the right people to do the right tasks. A business has options for different types of employees including contract, part-time, interns, sub-consultants and permanent/full-time to meet staffing needs.

What do you do if you have the "wrong" person on the bus? You cannot enable or allow bad or inappropriate behavior in the organization without negatively impacting the entire bus. There are numerous books and articles on the subject of how to separate from an employee. In addition, you may want to consult your attorney regarding the state laws that impact your business. When a change is necessary, make the change.

With the right people on the bus, are they in the right seats? You need to know your staff, their individual gifts, talents and skill sets and make sure they are working to their fullest potential. Having someone in the wrong seat (not a job or role that fits them) is frustrating to both the employee and the employer. This frustration can cause a good employee to leave the company, just because he is in the wrong seat.

When is it time to get off the bus?

When does it become apparent that the bus driver is not the right person any longer? When are you the square peg in the round hole? Are you the one holding back the organization? To quote Dave Ramsey, "Organizations are never limited by their opportunity; they are limited by their leader" (Ramsey, 2011).

It is never too soon to develop and implement your succession/exit strategy. Depending upon the type of organization you established, you have options when and how to get off the bus. Options can include 1) Simply close the doors, sell off the assets; 2) Fire everyone, go back to your home office, and do only what you want and can do yourself; 3) Sell the business to your employees; or 4) Sell the business to a third party.

To determine the best strategy for you, consult with a Tax Attorney, Investment Counselor and your Accountant. You will need to obtain an independent business valuation to help determine the best route to pursue.

In Summary:

Owning and operating a business can be a very fulfilling and profitable adventure. It is not for the faint of heart, but if you design your bus with the proper type of bus, knowing where your bus is going, and having the right people on the bus, it will be a great trip, and you will know when it is time to get off.



About the Author

Mitch Duryea, PLS earned a Bachelor of Science in Surveying and Photogrammetry from California State University, Fresno and a Master of Science in Higher Education from Kaplan University and is the President of Duryea & Associates. Mr. Duryea has been licensed since 1986 and is currently licensed in California, Oregon, Washington, Idaho, Nevada, New Mexico, Oklahoma, South Dakota and Hawaii.

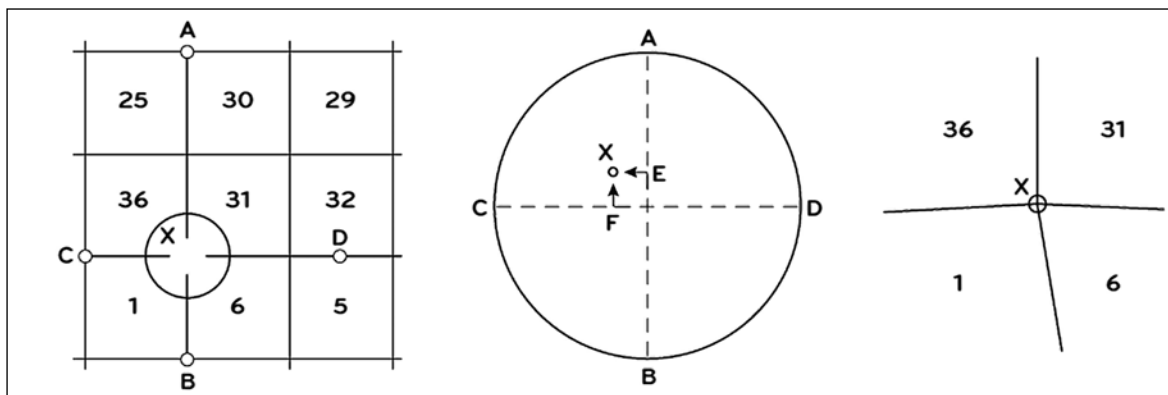


The Double Proportion Problem

Prepared by Carl C.deBaca, PLS
(with help from the 2009 BLM Manual of Surveying Instructions)

Cardinal Equivalent Distances

Hand-in-hand with the DP process goes the concept of Reduction to Cardinal equivalents (latitudes and departures). These are inseparable from the DP and any proportionate calculations that are not first reduced to latitudes and departures, are done incorrectly. This is a simple concept not so simply explained in the various editions of the Manual over the last 90 years. The latest version offers by far the most explicit reasoning of how and why but in my humble opinion, leaves something to be desired.



On my shelf are 4 BLM Manuals: 1930, 1947, 1973 and 2009. There are of course older editions yet, but my financial ability to collect copies of these is somewhat restricted. I know there are digital versions on the internet but for the purposes of this discussion, the past

Introduction

Many of us in the profession of Land Surveying will never have cause to break out the BLM Manual of Survey Instructions and refresh our memories on the proper procedure for the proportionate re-establishment of a Section Corner. Still the NCEES and the licensing boards in the 'Public Land States' will usually sneak some aspect of a DP in to their licensing examinations. So, everyone has had to deal with this issue at least once, even if it's only on a test.

Once all the land in a township has passed into private ownership and other means of gathering and evaluating evidence for the reestablishment of a missing corner are available to the surveyor, the question arises - is DP even the proper way to re-set a corner? The question of whether a corner is truly 'Lost' or merely 'Obliterated' is different in public and private lands, and for good reason - respecting the Bona Fide rights of landowners being one obvious one. A thousand rules governing the interpretation of evidence also begin to rear their heads. The question of when to do a DP is a topic that could generate pages of copy and endless debate. Let's set that whole discussion aside for a different day.

A lost corner is one whose original position can-not be determined by substantial evidence, either from traces of the original marks or from acceptable evidence or reliable testimony that bears upon the original position, and whose location can be restored only by refer-ence to one or more interdependent corners.

A lost corner is one whose original position cannot be determined by substantial evidence, either from traces of the original marks or from acceptable evidence or reliable testimony that bears upon the original position, and whose location can be restored only by reference to one or more interdependent corners.

Before proceeding with your Proportionate Reestablishment, make sure you have met this threshold.

four editions should be sufficient, (I'm not only cheap, I'm lazy). So, let's take a look at the evolution of the DP and the reductions to cardinal equivalents over those four editions. After we look at how we got to where we are now, we'll examine the procedure itself and go to the nuts and bolts of doing a DP properly. Relax, it won't be that bad.

In the 1930 Manual, Chapter 5, Sections 367-369 (page 270) the process is delineated as a field exercise. One sets out temporary stakes at the proportionate latitude and departure points from the recovered corners and then intersects in the cardinal directions from those temporary stakes to reestablish the lost corner. The simplest of diagrams is shown on the facing page. No discussion of how to arrive at the proportionate latitudes and departures is provided. *It probably seemed so simple to the authors that they didn't see any need to spend time on the topic.*

In the 1947 Manual, Chapter 5, Sections 367-370 (page 292) the explanation is a bit better but substantially the same as 1930 and is still treated as a field exercise with temporary stakes. The diagram is unchanged. How to properly proportion latitudes and departures remains unexplored.

In the 1973 Manual, Chapter 5, Section 5-25 thru 5-29 (pages 134) we finally see the authors addressing the issue of cardinal equivalents with some specificity. The phrase "Lengths of proportioned lines are comparable only when reduced to their cardinal equivalents" appears (italics are original). However, they don't spend any time explaining the method for arriving at these 'cardinal equivalents'. The diagram is now three separate diagrams that lays out the process pretty well graphically. The discussion is not so definitively laid out as a field exercise, (which is a definite change in the feeling of the manual).

So here we are at the 2009 Manual, the latest and possibly last version of the manual. In Chapter 7 (note that the three previous versions all covered Restoration of Lost Corners in Chapter 5), in Sections 7-8 thru 7-12 (pages

CONTINUED ON PAGE 30 ►

danger, and delay in the progress of work. They would envelop or hover around the mountains for days in succession, accompanied by the most violent electrical discharges and thunderbolts imaginable. During such times, the whole mountain top fairly hummed or hissed by virtue of escaping electricity and sparks a couple of inches in length could easily be drawn from any exposed insulated object. These storms would usually set in about 11 o'clock in the morning and last until long after sunset. Though no fatality is fortunately recorded, they proved, nevertheless, the main cause of discomfort and danger to the party exposed to their fury. ...

The experience of the heliotropers would seem to have been more perilous, for three of them were knocked down and rendered partly unconscious, while a tent, several signals, and a theodolite were demolished by lightning. ...

A few words about the Indians may not be deemed out of place. Though numerically well represented, particularly in Colorado and Nevada, and frequent visitors at the surveyor's camp, their demeanor was uniformly unobtrusive and considerate.

GEODETIC SURVEY.

The Corps Encounter Difficulties with Mormons and Indians.

The Pioche Record of last Saturday has the following: Mr. Eimbeck of the geodetic survey now engaged in running a line from the Pacific to the Atlantic, was in town the early part of the week. He has sent one of his men over on the high mountain in the range over in Utah, about forty miles east of here, who will be stationed there about a month, employing his time taking heliographic observations. Mr. Eimbeck says his corps of surveyors may reach this vicinity next Spring, then again not until October. He complains that the settlers through a portion of the country which he has been working in do not treat his men properly—looking upon them as horse-thieves, etc. At one place, we believe Snake Mountain, on which a station had been established, the Indians set the wood and brush around the base of the mountain afire, for the purpose of driving the men stationed there away. The Indians do not know what to make of the heliographic signals. Mr. Eimbeck started on his return to Troy District, Nye County, his headquarters, on Tuesday.

From the Eureka Daily Sentinel, November 2, 1881



Photo 41 from Special Publication No. 4.

The instruments were mounted on masonry or rock, the observer stood upon a raised floor, and the whole walled in and surmounted by a stout canvas tent in order to break the force of the wind. The theodolite stood upon its iron position stand and was effectively protected against direct sunlight and radiant heat by the double-

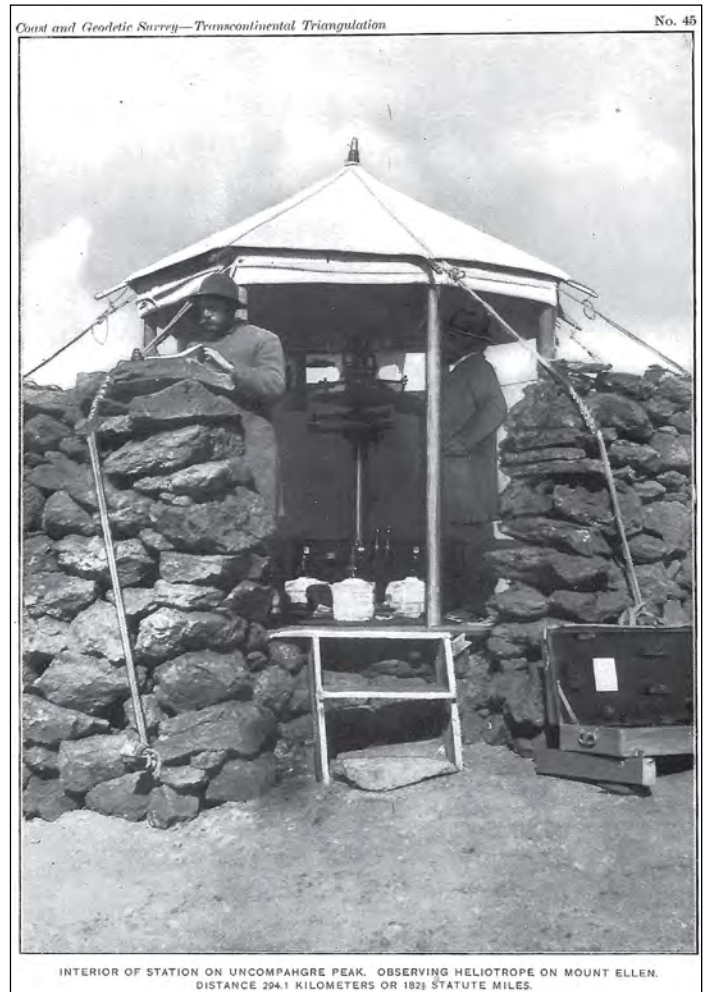


Photo 45 from Special Publication No. 4.

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Applications

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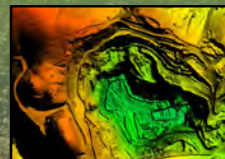
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Monitoring & Inspection

- Geological surface monitoring
- Infrastructure and facility inspection
- Change detection over time
- Removing personnel from dangerous situations

GIS

- Imagery and elevation layers for databases
- Imagery classification and analysis



Contacts:

Kevin Almeter, PLS – Survey & Mapping Manager

Phone: (775) 828-5687

Email: kalmeter@woodrogers.com

Michael Detwiler, LSI – Photogrammetrist

Phone: (775) 828-5688

Email: mdetwiler@woodrogers.com



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NALS Launches Job Board

Visit the NALS Website at: NvLandSurveyors.org

NALS Job Board

Search...

Quick links • FAQ • ACP • MCP • Notifications • Private messages • [nalsboardadmin](#)

NALS Home Page • Board Home Page • NALS Jobs • NALS Job Board

NALS Job Board

New Topic • Search this forum... • Mark topics read • 4 topics • Page 1 of 1

| TOPICS | REPLIES | VIEWS | LAST POST |
|--|---------|-------|---|
| Western NV College - Instructor Needed by nalsboardadmin • Thu May 17, 2018 9:19 pm | 0 | 1 | by nalsboardadmin • Thu May 17, 2018 9:19 pm |
| Senior CAD Technician by sgrimmitt • Thu May 17, 2018 3:36 pm | 0 | 1 | by sgrimmitt • Thu May 17, 2018 3:36 pm |
| Welcome to the NALS Job Board by nalsboardadmin • Wed May 16, 2018 11:57 pm | 0 | 8 | by nalsboardadmin • Wed May 16, 2018 11:57 pm |
| Welcome to phpBB3 by nalsboardadmin • Sun Apr 15, 2018 12:10 am | 0 | 3 | by nalsboardadmin • Sun Apr 15, 2018 12:10 am |

New Topic • Mark topics read • 4 topics • Page 1 of 1

Return to Board Index • Jump to

NALS has launched a new job board to help employers fill vacancies and members search for new opportunities. The job board is a separate system from our members' portal, to post you will need to register and follow the onscreen prompts. Registration is free. You do not have to register to view postings.

VISION 2020

FOCUS ON THE FUTURE

APLS-CLSA-NALS Tri-State Conference



August 21-25, 2020
Luxor Hotel
Las Vegas, NV

FEATURED SPEAKERS:

Gary Kent, PLS
John Stahl, PLS
Michael Dennis, PLS
Steve Parrish, PLS

SILENT & LIVE AUCTIONS
EXHIBIT & VENDOR DEMOS

**23 Continuing
Education Hours**

Registration Information: PLSeducation.org
conference@PLSeducation.org | 888.944.3510 | 707.548.4406 Fax

APLS-CLSA-NALS 2020 CONFERENCE REGISTRATION

NAME (First/Last) _____ NICKNAME or NAME (as you wish it to appear on your badge) _____

COMPANY _____

ADDRESS _____

CITY _____ STATE _____ ZIP _____

PHONE _____ FAX _____

E-MAIL _____

MEMBER # _____ PLS # _____

SPOUSE/GUEST (if attending – see Spouse/Guest Registration below) _____

MEMBER REGISTRATION

| | BY MAR 6 | AFTER MAR 6 | AMOUNT |
|--|--------------|--------------|-----------------|
| Conference (Saturday - Tuesday) | \$525 | \$575 | \$ _____ |
| Includes: Saturday through Tuesday Conference workshops and sessions. Includes Saturday, Sunday, and Monday Luncheons, Sunday IceBreaker Reception and Monday Scholarship Auction. | | | |
| Conference (Sunday - Tuesday) | \$425 | \$475 | \$ _____ |
| Includes: Sunday through Tuesday Conference workshops and sessions. Includes Sunday, and Monday Luncheons, Sunday IceBreaker Reception and Monday Scholarship Auction. Does not include Saturday workshops or sessions | | | |
| Conference One Day | \$225 | \$275 | \$ _____ |
| Select Day: <input type="checkbox"/> Saturday <input type="checkbox"/> Sunday <input type="checkbox"/> Monday <input type="checkbox"/> Tuesday | | | |

NON-MEMBER REGISTRATION

| | BY MAR 6 | AFTER MAR 6 | AMOUNT |
|--|--------------|--------------|-----------------|
| Conference (Saturday - Tuesday) | \$625 | \$675 | \$ _____ |
| Includes: Saturday through Tuesday Conference workshops and sessions. Includes Saturday, Sunday, and Monday Luncheons, Sunday IceBreaker Reception and Monday Scholarship Auction. | | | |
| Conference (Sunday - Tuesday) | \$525 | \$575 | \$ _____ |
| Includes: Sunday through Tuesday Conference workshops and sessions. Includes Sunday, and Monday Luncheons, Sunday IceBreaker Reception and Monday Scholarship Auction. Does not include Saturday workshops or sessions | | | |
| Conference One Day | \$325 | \$375 | \$ _____ |
| Select Day: <input type="checkbox"/> Saturday <input type="checkbox"/> Sunday <input type="checkbox"/> Monday <input type="checkbox"/> Tuesday | | | |

OTHER REGISTRATION

| | | |
|---|--------------|-----------------|
| Spouse/Guest Registration | \$225 | \$ _____ |
| Includes entrance to Exhibit Hall, Sunday Icebreaker Reception, Sunday, Monday, and Tuesday Lunch and Monday Scholarship Auction. | | |

| | | |
|---|--------------|-----------------|
| Full-time Student Registration | \$225 | \$ _____ |
| Must attach current student ID. Includes Conference Registration (Sunday through Tuesday), Sunday, and Monday Luncheons, Sunday IceBreaker Reception and Monday Scholarship Auction. Does not include Saturday (all day). | | |

PHOTO/VIDEO DISCLAIMER: By registering for and attending this conference, you agree that your image may be taken during the conference and used at any time, without further notification, for printed materials, websites, social media and other marketing purposes.

PHOTOGRAPHY, RECORDING, LIVE STREAMING, & VIDEO TAPING: Attendees/Participants may not record or broadcast audio or video of conferences sessions, workshops, seminars, etc.

EXHIBITOR DISCLAIMER: By registering for and attending this conference, you agree that your contact information may be provided to exhibitors for a one-time use in providing you information regarding their products/services.

OPTIONAL ACTIVITIES

| | | AMOUNT |
|--|--------------|----------|
| Extra Sunday Lunch Ticket | _____ @ \$55 | \$ _____ |
| Extra Monday Lunch Ticket | _____ @ \$55 | \$ _____ |
| Extra Sunday Icebreaker Ticket | _____ @ \$55 | \$ _____ |
| Extra Monday Auction/Dinner Ticket | _____ @ \$55 | \$ _____ |
| Continuing Education Certificate | \$25 | \$ _____ |
| Student Assistance Donation (<i>Suggested Donation \$20</i>) | | \$ _____ |

PAYMENT INFORMATION

Total Enclosed \$ _____

☐ Check Enclosed (Checks payable to A-C-N Conference)

Charge to: ☐ Visa ☐ MasterCard

CARDHOLDER NAME _____

CARD # _____

EXP. DATE _____ CVV# _____

BILLING ZIP CODE _____

AUTHORIZED SIGNATURE _____

MAIL TO:
A-C-N Conference Office
526 South E Street
Santa Rosa, CA 95404

FAX TO: (707) 578-4406
QUESTIONS?
(888) 994-3510
conference@plseducation.org

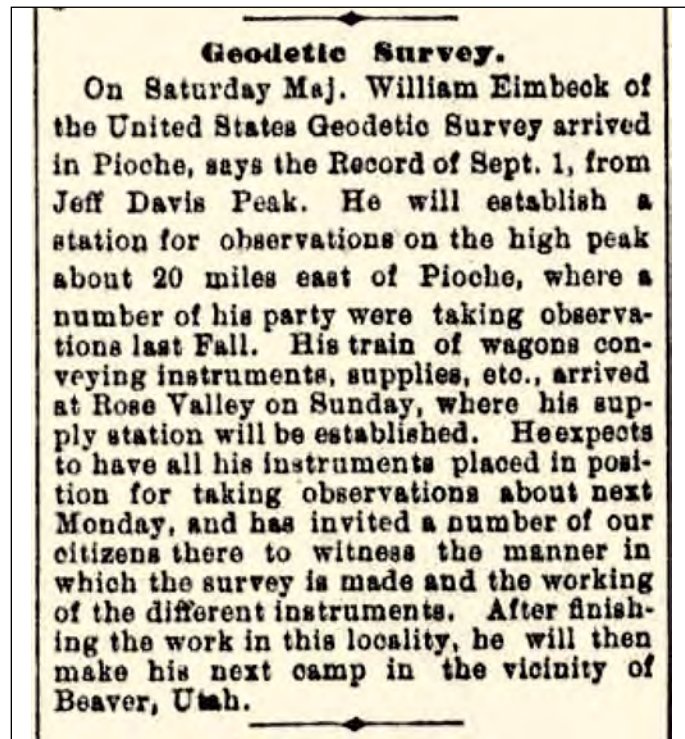
CANCELLATIONS: - Cancel by April 15th to receive a FULL REFUND. Cancel after April 15th but before July 20th, to receive a refund, LESS \$50 CANCELLATION FEE. Cancel after July 20th, no refund will be available but substitutions can be made. NOTE: Should you cancel your registration and decide to re-register, the early bird registration price will not be available and the "walk-in" rate will apply. See PLSeducation.org for list of registration prices. Substitutions welcome – additional fees may apply, contact the conference office at: (888) 994-3510 for more information.

Register Online at: www.PLSeducation.org

walled and double-roofed observing tent. As the occupation of a station covered about a month, only two principal stations a year could be disposed of, since the favorable season lasted but four months. ...

The party of occupation was composed of three officers and a recorder, with the necessary complement of men acting as packers, drivers, and cooks, the whole party consisting of 12 to 13 persons. The heliotropers stationed in pairs at the distant stations numbered from 10- to 20, according to the requirements of the figure of the triangulation. In consequence of their long connection with their duties; they lived in tents or stone cabins or "dugouts," close to their stations, and considering the exposure and isolation of their positions it must be conceded that they acquitted themselves well of their trying and responsible duty. With but few exceptions the horizontal directions and zenith distances were observed upon heliotrope light. As a rule the reflectors were of square shape, varying in dimensions from 1 to 6 inches, and as a matter of experience it was found that a 3-inch mirror sufficed for lines of from 80 to 100 miles, but 4-inch mirrors were needed for lines of 100 to 150 miles; the longest line demanded a square mirror of 6-inches. The signaling or call lights used at the observing station consisted of reflectors from 8 to 12 inches in size; these powerful lights were easily discernible with the unaided eye by the heliotropers, even up to distances of 150 statute miles, and served them for directing their mirrors at the beginning of an occupation of a station; they were also used for communication.

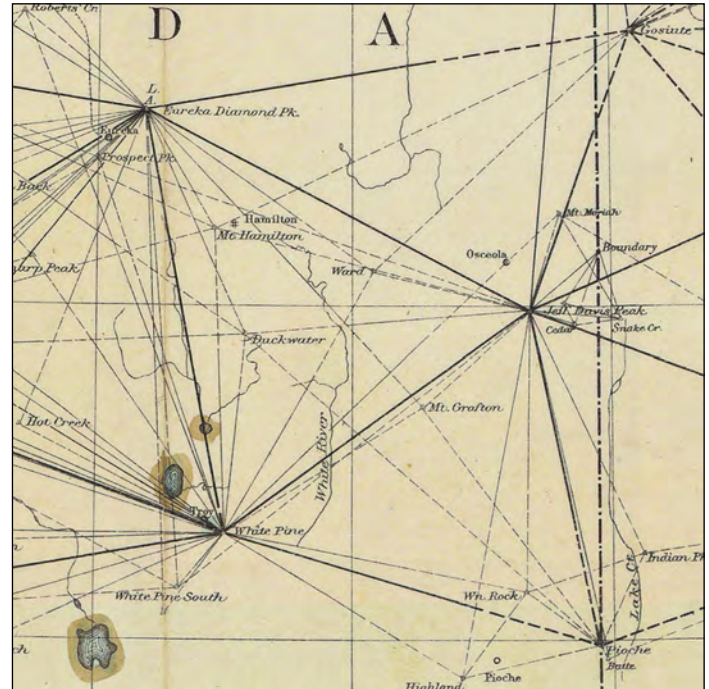
The "PIOCHE" station was occupied for the purpose of primary observations in September of 1883. The newspaper clip below is from the Eureka Daily Sentinel, September 6, 1883.



The principal drawback to the prosecution of the work was the almost total absence of modern ways of transportation, ordinary freight wagons and pack animals being the only means available. ...

The wagon roads had frequently to be made passable by building bridges across gulleys. Lower camps were established at the end of

transportation by wagon, and a pack trail was located and opened to the upper camp, usually distant 5 to 10 miles, and involving much cutting of fallen timber, grading, and blasting or quarrying of rocks; the ascent was usually between 3,000 to 7,000 feet. Ordinarily about 10,000 pounds of outfit, instruments, and provisions had to be transported to the upper camp – usually two weeks labor – for which purpose from 5 to 7 pack mules were employed, each carrying as a load about 150 pounds – rarely and exceptionally as much as 200 pounds – according to the length of trail, steepness, and height of ascent. The transportation of the great theodolite, weighing with packing box about 200 pounds, required from one to two days. Sometimes it was carried by hand; at other times it was drawn by a horse and guided by men. This was accomplished by men carrying it and guiding it while a horse was pulling it by means of a rope. ...



The map shown above is a portion of the original map from the Coast & Geodetic Survey Report showing the progress on the transcontinental triangulation at the end of the fiscal year ending June 1884. The lines represent the primary, secondary and tertiary control and observations completed for the triangulation network.



The photo above is what the "PIOCHE" station looked like on May 17, 2013.

CONTINUED ON PAGE 24 ►

Simply stated, the current datums we use are based on passive control (monuments), and the 2022 reference frame and datum will be based on GPS measurements on NGS CORS.

This is how NGS states this redefinition: <https://www.ngs.noaa.gov/datums/newdatums/index.shtml>

"To improve the National Spatial Reference System (NSRS), NGS will replace the North American Datum of 1983 (NAD 83) and the North American Vertical Datum of 1988 (NAVD 88) with a new geometric reference frame and geopotential datum in 2022.

The new reference frames will rely primarily on Global Navigation Satellite Systems (GNSS), such as the Global Positioning System (GPS), as well as on a gravimetric geoid model resulting from our Gravity for the Redefinition of the American Vertical Datum (GRAV-D) Project.

These new reference frames will be easier to access and to maintain than NAD 83 and NAVD 88, which rely on physical survey marks that deteriorate over time."

The upcoming 2022 redefinition brings with it notable changes to the horizontal and vertical. Some of the changes include the rollout of NATRF 2022 (North American Terrestrial Reference Frame of 2022), NAPGD 2022 (North American-Pacific Geopotential Datum of 2022), new State Plane Coordinates (2022 SPCS), and the deprecation of the US Survey Foot and nationwide implementation of the International foot as a standard. That's a mouthful and a lot of differences to learn about and be prepared for.

Practically speaking, the relative positional (or coordinate) conceptual location of any project using the NSRS will change, but the physical location of any project will not change. For example, the physical location of your house will not change but the relative coordinate position of your house will be offset as it has with any of the past datum changes e.g., NAD27, NAD83, NAD83 (2011) and now moving forward to NATRF 2022. The long and short of the difference between previous datums and the 2022 datum is that previous datums were adjusted to the passive control (monuments), wherein 2022, the passive control will be accessed through GNSS and tied to the datum, but will not be a definition of the datum. The CORS relative to the ITRF will be the basis for tying to the datum via GNSS. As far as a relative coordinate position, in Nevada, we can expect to see a horizontal shift of approximately 4.5 feet in a Northwesterly direction.

The vertical component will be a Geopotential Datum based on the gravity measurements applied to the earth's surface as it relates to the geometric reference frame. Thus, it is important to use the appropriate Geoid models for the geometric datum being used. In Nevada, we can expect elevation shifts between -1.5 and -2.5 feet.

So, what does all this mean to us Surveyors? In short, we need to be careful to identify and report the horizontal and vertical datums that are used for every survey and measurement. Will our measurements change on January 1st, 2022? I'd say it doesn't really matter, but being aware and learning about these pending changes will better prepare us for working with the 2022 datum once it does become available.

NGS is also updating the State Plane Coordinate Systems (SPCS) as part of the 2022 updates. Be on the lookout for news and upcoming definitions to the Nevada SPCS and simply be aware of which datum you are using to ensure consistency between datum and SPCS. Practice makes perfect!

As your Geodetic Coordinator, I am proud to inform you that all the applications related to the Nevada SPCS have been filed with and accepted by the NGS. These forms were part of a formal request on behalf of Nevada to have the option of SPCS Low Distortion Projections (LDP) and to allow State input into the size and shape of the Multi-Layer SPCS for the state. Today, we have 3 zones, but it is yet to be determined if we will need more than this to meet the NGS requirements for SPCS zones. Being innovative, NGS has set up the SPCS in a 3 layered approach. The first layer will be for the entire state (much like a UTM zone to cover a large area). The second is a multi-layer, which will be the SPCS zones (much like we currently have with East, Central, and West). The third layer will be the LDP zones requested and produced by the state.

At this time, the application has been submitted, but it is our responsibility to determine the size and areas that need to be covered by the LDP zones that we are requesting for the state.

If you would like to have input, please contact your State NALS President to submit ideas, requests, or concerns. The Legislative Committee is also working on the language to update NRS to reflect the necessary changes as relates to the SPCS.

One more thing we need to be cognizant with the upcoming datum change is the devaluation of the US Survey foot and the nation-wide implementation of "the Foot" (or some other name). What is clear is that the definition of the so-called "foot" will be a 0.3048 m/ft conversion factor, which is also the same as the conversion factor for the International Foot. This will be very important to include as part of the metadata for each survey, especially since we are one of the states that currently use the US Survey foot and will have to pay attention to what we are using as we move forward, especially when working with older surveys.

I am honored to be part of this prestigious group of men and women that make the profession of surveying boundless. I am confident that as we move forward together, we will meet these upcoming changes with professionalism, confidence and careful preparations that we demonstrate in our work every day.

For more information on the 2022 Datum, visit www.ngs.noaa.gov



About the Author

Jonathan L. Wooten is a Professional Land Surveyor registered in Nevada and Arizona, with over twenty-four years of experience in Land Surveying, including mapping, topographic, construction, and control surveys. He has served as a board member of the Southern Chapter of the Nevada Association of Land Surveyors and assists NALS and the NGS in community educational outreach programs and training opportunities for local surveyors. Mr. Wooten is responsible for the management and operation of the Las Vegas Valley Water District's GPS base station network and serves as the Nevada Geodetic Coordinator for the NGS.



Sustaining Members

Following is a listing of sustaining members of the Nevada Association of Land Surveyors. Please remember that these firms and businesses, through their NALS membership, are supporting the aims and objectives of our association.

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F. (702) 228-6753
leotorres@atmlv.com

Atkins Global

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T. (323) 425-5680
chevyhdz23@gmail.com

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awiegand@berntsen.com
www.berntsen.com

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T. (805) 459-4047
fred@bizwatt.com

Carlson Software

T. (859) 568-8429
lrojas@carlsonsw.com

Dirtworks Positioning, LLC

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Tommy@DirtWorksPositioning.com

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hunter@lidarusa.com

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F. (778) 359-6693
marty@monsenengineering.com

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PO Box 33434
Las Vegas, NV 89133-3434
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twolf@ArtisanSurveying.com
www.ArtisanSurveying.com

US Survey Supply

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Bandon, OR 97411
T. (541) 404-6825
rod@ussurveysupply.com

Vertical Mapping Resources, Inc.

Andrew Babian

1610 Montclair Avenue, Suite D
Reno, NV 89509
T. (775) 737-4343
info@verticalmapping.com

NALS Board of Directors Meeting

Friday, May 1st, 2020 • Odyssey Engineering • via virtual meeting

MINUTES

CALL TO ORDER

President Greg Phillips called the meeting to order at 9:00 AM.

ROLL CALL

Greg Phillips, President
Justin Moore, Vice President
Robert Carrington, Secretary/Treasurer
Todd Enke, Director
Bill Ray, Director
Frank Wittie, Director
Crissy Willson, Executive Director

Guests: Nancy Almanzan and Trent Keenan

PRESIDENT'S REPORT

Report included in agenda.

President Greg Phillips discussed the challenges that the profession is facing due to COVID-19 outbreak. It is nice to see how Surveyors have adapted to continue to work while still protecting the health and safety of the community.

SECRETARY/TREASURER'S REPORT

Financials included in the agenda.

Secretary/Treasurer Robert Carrington reviewed the financial statements as included in the agenda.

MOVED by Todd Enke and **SECONDED** to accept the financial statements as included in the agenda. **MOTION CARRIED.**

EXECUTIVE DIRECTOR

Executive Director Crissy Willson discussed the need for member engagement. As Chapters are unable to meet in person, Crissy will assist in setting up virtual meetings so that members can still network.

2022 DATUM

Legislative Chair Robert Carrington has provided draft language to address the 2022 Datum. It was reported that Washington has recently passed legislation. Crissy to send the final Washington language to Robert. We will need to develop a list of stakeholders to reach out to prior to introducing the legislating.

Jon Wooten has provided an article for the next issue of the Nevada Traverse.

ADVANCED EDUCATION

Report included in agenda.

Advanced Education Chair Trent Keenan reported that the review of Great Basin College (GBC) has been completed. The NALS Education Foundation dedicated funds to help offset the cost of the GBC review. Trent Keenan, Justin Moore, and Carl C.deBaca participated on the review committee. GBC is moving forward with the hiring of a second professor. Trent participated on the hiring committee. There were two candidates interviewed. A candidate has been selected and an offer has been written. Once a hire is official an announcement will be made.

ADVANCED TECHNOLOGY COMMITTEE

Advanced Technology Committee Chair Todd Enke to follow information regarding Ligado (formerly LightSquared) network and its affect on GPS.

BOARD OF PROFESSIONAL ENGINEERS & LAND SURVEYORS

Report included in agenda.

The Nevada Board of Professional Engineers & Land Surveyors (BPELS) is considering changing the continuing education requirement. NALS

has sent a letter urging BPELS to maintain the current requirement in order to protect the public. A second surveymonkey has been sent to the profession.

Crissy suggested that NALS request a letter of support from WestFed and NSPS.

NEVADA TRAVERSE

President Greg Phillips thanked Trent Keenan for volunteering to serve as Editor. The Nevada Traverse has been revamped with all new graphics and the Board of Directors all expressed their happiness at the new look and their gratitude to Trent.

Trent reported the next deadline for the Traverse is April 25th.

CONFERENCE

Report included in agenda.

Unfortunately, due to the COVID-19 outbreak the conference was postponed to August 21-25. Attendees were provided an opportunity to cancel their registration if they were unable to attend the rescheduled dates. The deadline to cancel was April 15th. Almost 70% of the attendees chose to maintain their registration. Registration is still open and members are encouraged to register (or re-register if they cancelled).

Information for the conference can be found at PLSeducation.org

MEMBERSHIP

Report included in agenda.

Chapter Officers to contact members on the unpaid dues list and encourage them to renew their membership.

NDOT AD HOC COMMITTEE

Report included in agenda.

Due to the COVID-19 outbreak, the launch of the NDOT software has been postponed.

NOMINATING COMMITTEE

Immediate Past President Jason Higgins is chairing the Nominating Committee and will provide a proposed slate of candidates to the NALS Board of Directors in July.

NSPS DIRECTOR

Report included in agenda.

Nancy Almanzan and Greg Phillips attended the NSPS Spring Meeting which was also held virtually due to COVID-19 outbreak. As the annual lobby day was cancelled, NSPS is reviewing options of setting up virtual meetings with representatives. NSPS is also planning to offer assistance to associations states without a lobbyist.

OUTREACH

NALS hosted a booth at the Nevada Counselor's conference. Trent Keenan and Jason Higgins also provided a presentation to high school students.

Unfortunately, due to the COVID-19 outbreak the TrigStar program was cancelled this year.

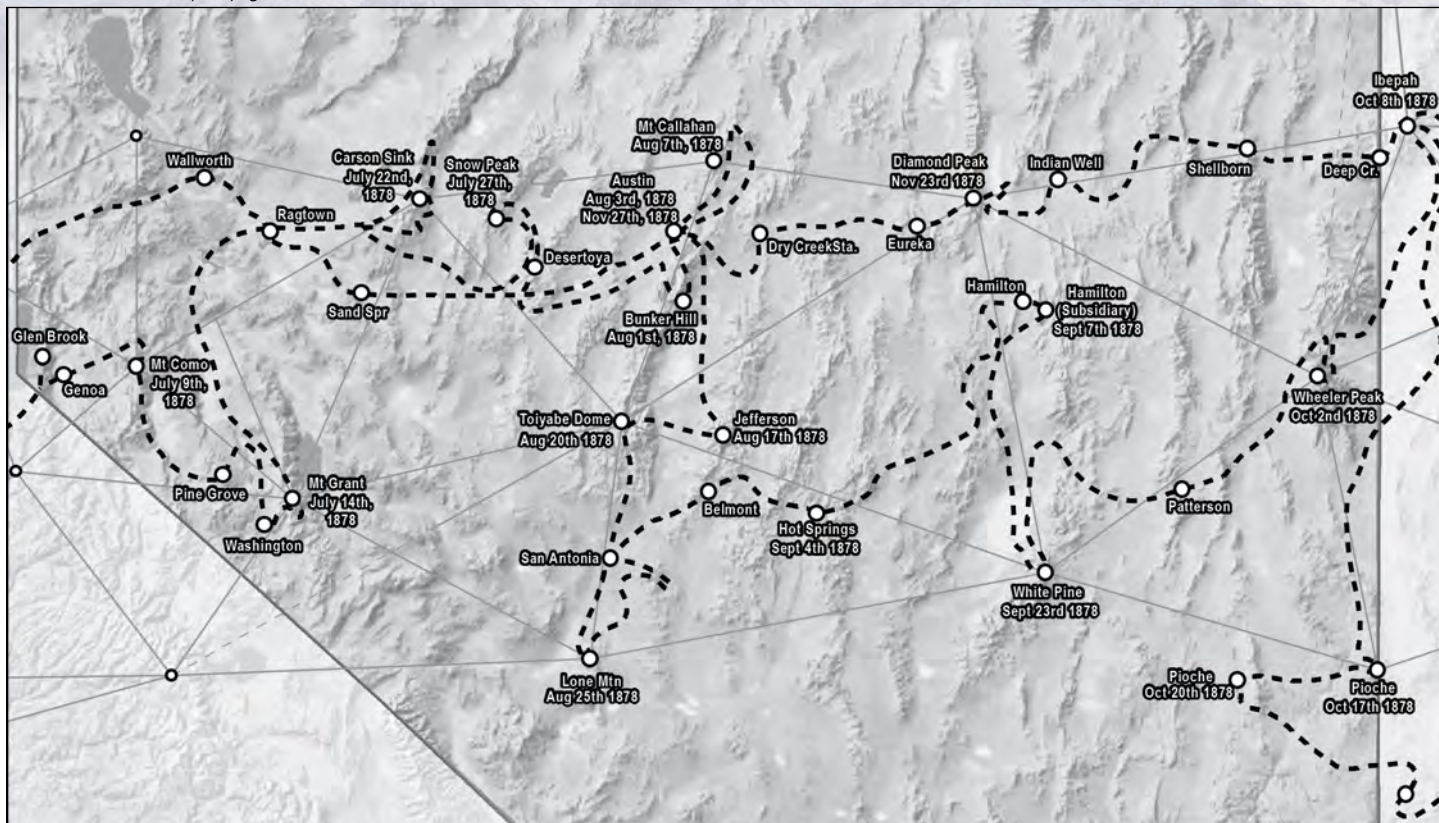
MEETING SCHEDULE

July 31st – Reno
August 21-25th – Conference
October 16th – Las Vegas

ADJOURNMENT

The meeting was adjourned at 11:00 AM





Above is a map showing the 1878 expedition route, with camp locations and dates. **Map created by Kyle Lindsay**

The Coast and Geodetic Survey work in Nevada was put in the charge of A. F. Rodgers and W. Eimbeck, both Coast & Geodetic Survey Assistants. Both Rodgers and Eimbeck were part of the 1878 reconnaissance survey of Nevada. This was a lightly outfitted group on horseback that covered Nevada in the Summer and Fall of 1878. Prior to leaving from California in June of 1878, Rodgers had invited John Muir to join them on the expedition across Nevada and he accepted.



Augustus F. Rodgers
Coast & Geodetic
Survey Photo Archives

William Eimbeck
Coast & Geodetic
Survey Photo Archives

If I have given the impression that I hiked this peak and provided the recent photos, that would be incorrect as I am not the source of these photos. There are people out there that thoroughly enjoy hiking these high peaks and checking one more peak off their list of hiking accomplishments. I worked with two of these adventurous types, Tracy Foutz and Daniel Fazekas, who hiked this peak on May 17, 2013.



Tracy and Daniel. Photos from the day of the hike.

I offloaded Tracy and Daniel in the morning, as I was on my way for some research at the Lincoln County Courthouse in Pioche, Nevada. About 6 hours later I retrieved them. They returned from their hike with photos, cuts, scratches, and ripped clothing from cutting through the thick brush on their climb and descent. But possibly the most interesting encounter greeted them as they were getting back in my truck. I was kind enough to park next to a rattle snake that gave a sharp distinct rattle as they walked beside the truck. Thankfully, the snake was tucked into a rock and just wanted to be left alone. They happily obliged him.

There are many topics related to this article that were only lightly touched on, or not at all. The background on Augustus F. Rodgers, William Eimbeck or John Muir. Also, the measurements of the baselines associated with this survey and the use of heliotropes. The list below will provide additional reading on these topics:

Eimbeck's Duplex Bars by Jerry Penry,

CONTINUED ON PAGE 32 ►

Surveying in the Time of Cholera*

**Hi-falutin literary reference – author really means Covid-19*

Prepared by Carl C.de Baca, PLS



Well here we are in the spring of 2020. No flying cars, no portable jet-packs, no moon bases. In my 59th year, I feel somewhat cheated. Not many of the great predications of my childhood in the late Sixties have come true, but many of the sad realities are still around, like war and disease. We conquered Polio in the Fifties, came up with a vaccine that pretty much eliminated Measles in the Sixties, and eradicated Smallpox by 1980. Those achievements may have been our medical high-water mark, (especially when considering the anti-vaxxers' idiotic campaign against childhood vaccination). Since 1980, our planet has been repeatedly threatened by a never-ending lineup of nasty viruses, of which Covid-19 is just the latest. It's unbelievable how quickly and how profoundly this virus has impacted every aspect of the world we live in. I've never seen anything like it, and I've been clear to Tonapah... twice.

In some parts of the country, Surveyors and Surveying are deemed 'essential' with respect to building and maintaining critical infrastructure, but not everywhere. In those places of reason, we are still free to do our jobs, though with a variety of crazy restrictions. Others in other places are not so lucky. You know, and I know, that what we do is definitely essential to critical infrastructure, to health and safety of the public and to an ordered society. However, we don't have an ordered society at present. Will some of the changes our society is going through right now end up being permanent? Could they lead to further erosion of our illustrious profession? Who can say? Will unlicensed providers fall under the essential services umbrella and continue making inroads into our profession? All I can say is that it doesn't look promising. Policies generated in emergency circumstances have a way of sticking around long after the emergency is over.

By this time this goes to press and ends up in your mailbox, things could be better, the sun could be coming out. Or equally likely they could be worse with the full effects of a pandemic bearing down on us. More likely yet is that things will be pretty much the same as they are at the time of this writing: a lot of confusion, random shortages, random work stoppages, no clear view of the post-virus future. And, high unemployment, a twitchy stock market, a huge uptick in failing businesses and corporations. It is indeed hard to see anything good in all that. Less work and less job security equates to less financial security for individuals, families, companies and corporations, and that in turn could translate to less demand for our core services in the coming months.

CONTINUED ON PAGE 32 ►

Southern Nevada Chapter Update

Prepared by Nick Ariotti, PLS

President - SNALS Chapter

As we are all aware 2020 was off to a great start..., then the world hit a historic brick wall like we have never seen in modern times. COVID-19 has affected each and every one of us. Working from home has now become the new norm for many and for those who cannot, has resulted in total loss of income. Luckily for most surveyors, our work was deemed essential and we are able to continue working. It says a lot about the importance of what we do. This may give the profession more recognition and could have positive effects on the low numbers of new Surveyors, but only time will tell. As for the NALS Southern Chapter (SNALS), losing the ability to hold in-person meetings may affect our anticipated income for the year. However, our leadership has planned for the unknown and we have savings to rely upon to get us through this time.

SNALS has been able to hold our regular board meetings via online and the challenges have been real. We have canceled all monthly meetings through May and more cancellations may be coming. The annual picnic was cancelled and has not been rescheduled at this time. As information changes, we will keep the membership updated. Please stay safe and we will get through this together.



Lahontan Chapter Update

Prepared by Bill Ray, PLS

President - Lahontan Chapter

As everyone is aware by now, the COVID-19 Virus has affected pretty much everything. It has changed the way we do business and the way we interact with our co-workers, friends, and family. The Lahontan Chapter of NALS is no exception, we have cancelled the Lahontan Chapter membership meetings for April and May.

This is a troubling time and we are working on ways to adapt and overcome the challenges we are facing. We are currently looking into holding a virtual meeting so that we can continue to connect and inform the membership on our upcoming plans for the remainder of the year. By the time you read this we may have already held the first ever virtual meeting.

Moving forward we will still be scheduling a Golf Tournament when it is safe to do so because we feel that having a brief distraction and getting out for some fresh air would be beneficial for everyone. We would also like to hold our annual summer BBQ but the dates of both events will depend on how soon we come out of the Virus Shutdown and whether or not it is safe to do so.

So, for now, please stay safe and hopefully we will have some positive news shortly.



WFPS - Nevada Director Report



The Western Federation of Professional Surveyors (WFPS) held a Board of Directors meeting on February 28, 2020 in conjunction with the Land Surveyors of Washington (LSAW) Conference at the Tulalip Resort in Tulalip, Washington.

HIGHLIGHTS FROM THE 13 WESTERN STATES

ALASKA (ASPLS) Steve Buchanan – Current membership is 185. The University of Alaska Anchorage Geomatics program is stable with 3 full-time faculty members and several adjunct instructors. The program was in jeopardy of being cut due to the Governor's veto of \$130 million from the university's operating budget. The Geomatics Advisory Board (GAB) mobilized and started a fundraising campaign to save the program and has raised over \$150,000. The GAB is an independent group of geospatial professionals from private and government entities formed to help guide the UAA Geomatics program. A list of donors is on the University of Alaska website at <https://uaa.alaska.edu/academics/college-of-engineering/departments/geomatics/support-geo.cshhtml>.

ARIZONA (APLS) Mike Fondren – Current membership is 370. The 2020 conference with California and Nevada has been rescheduled to August 21-25 in Las Vegas. APLS has developed Right of Entry door hangers and a best practice guide which is available to members. APLS is actively engaged in the effort to prepare for the new national datums planned for release in 2022 and is accepting contributions to purchase an annual lease of Low Distortion projects (LDP) Design Software. The software will allow APLS to design SPCS zones that are optimized for Arizona Communities.

CALIFORNIA (CLSA) Ray Mathe & Warren Smith – Current membership is 1592. The 2020 Conference with Arizona and California has been rescheduled to August 21-25 in Las Vegas. CLSA Education Foundation provides over \$40,000 in scholarships each year. CLSA is monitoring AB 5 which deals with the definition of an employee vs. independent contractor for purposes of collection unemployment and disability insurance. There are exclusions for certain professions, but not land surveyors. CLSA is seeking legislative clarity on the bill.

COLORADO (PLSC) Roger Nelson & Todd Beers – Current membership is 329. The 11th annual Rocky Mountain Surveyors Summit was held February 26-28 in Golden, Colorado. The conference included CFedS training and testing for NSPS CST Levels 1-3. The state licensing board has proposed for the review of initial applications be performed by NCEES instead of the Colorado Licensing Board. PLSC has raised concerns that are being reviewed by the board. PLSC is reviewing draft legislation for the compensation to municipalities when roads are vacated and also reviewing legislation related to a fixed fee for submitting documents to county clerks and recorders offices state-wide.

HAWAII (HLSA) Cliff Yim – Current membership is 88. Cliff Yim was recently appointed as the WFPS Director from Hawaii. HLSA is working with its members on a bill, SB 898, to amend the current Land Curt Deregistration Legislation and require land owners seeking deregistration to submit a File Plan and Regular System

description of the deregistered parcels as part of the deregistration process.

IDAHO (ISPLS) - Jeremy Fielding was recently appointed as the new WFPS Director from Idaho. ISPLS recently launched a new website at www.idahopls.org.

MONTANA (MARLS) Dick Smith & Russ Kluesner – MARLS conference was held February 19-21, 2020 in Great Falls, MT. MARLS Board of Directors is currently reviewing an updated Standards of Practice Manual and is in the process of updating their laws and regulations reference guide. Corryn Greenwalt is the new survey instructor at Flathead Valley Community College.

NEVADA (NALS) Nancy Almanzan & Trent Keenan – Current membership is 262. NALS membership has increased 40% over the last four years. The APLS-CLSA-NALS Conference has been rescheduled to August 21-25 at the Luxor Hotel in Las Vegas. The second professor at Great Basin College (GBC) has been authorized and the search has started. The 81st Session of the Nevada Legislature will begin in February 2021 and the NALS Legislative Committee is looking into new language to support the upcoming 2022 datum. WFPS Director from Nevada, Trent Keenan, is the new editor of the *Nevada Traverse*. The latest edition is available online and it has been completely revamped with new graphics.

NEW MEXICO (NMPS) Allen Grace – NMPS is reviewing potential legislation efforts in preparation for the 2021 Legislative Sessions. NMPS has been reviewing and discussing 2022 Datum recommendations as well as the international foot initiative. The conference will not be held May 1-2 as planned. NMPS is currently considering alternatives. NMPS is still focusing its efforts on the four-year degree program at New Mexico State University.

UTAH (UCLS) Mike Nadeau – Current membership is 399. The UCLS conference was held February 21-19 in St. George. The Surveyors Historical Society Rendezvous was recently held in Salt Lake City and many of the historical topics were related to Utah and the western United States. September 18-21, 2019. UCLS Conference will be held February 19-21, 2020 in St. George, UT. Legislative Committee is working on legislation to address the 2022 datum. Utah is looking at an administrative rule change rather than statute, so it will be easier to update in the future. UCLS continues to participate in the TrigStar and Boy Scout merit badge programs.

WASHINGTON (LSAW) Ben Petersen & Chris Jepson – Current membership is 806. A Boundary line adjustment model ordinance has been proposed and has received extensive feedback. Washington's Call-Before-You-Dig law has been revised eliminating the pre-survey option. It was replaced with a "Design Locate Request" which offers no guarantee of markings. Washington requires 2 separate signatures on maps – on the certification and across your stamp. The issue of electronic signatures is still being debated and is currently not allowed

WYOMING (PLSW) Mark Corbridge – Current membership is 132. PLSW is currently working towards revising the State Plan Statute. PLSW is working with the Board of Registration and the University of Wyoming on an outreach program to elementary through high school students. PLSW is also working with GeoInquiry in conjunction with the GIS community to reach high school students. A beta version of this program has been presented to teachers and was well received.

CONTINUED ON NEXT PAGE ►

NSPS - Nevada Director Report



Prepared by Nancy Almanzan, PLS

The Spring 2020 NSPS Business Meetings were held via GoTo Meetings & Webinars between April 1 and April 17th. The Spring Meetings were originally scheduled to be held in Washington, DC, along with Lobby Day, but given the current circumstances, the meetings were changed to the on-line format and overall, they were well-attended and successful.

The Western States Director's Council meeting was postponed until the Fall meetings in Tulsa, Oklahoma.

The Workforce Development Committee was held on April 1. Discussions included the Bureau of Labor Statistics Operational Outlook handbook and rates for professional surveyors; what states are doing in terms of recruitment of new surveyors and the role of NSPS in recruitment efforts; and developing a database for states to share their resources and activities involving outreach and recruiting. The short and long-term impacts of COVID-19 on the surveying industry and future efforts on outreach were also discussed.

The NSPS Foundation Board of Trustees meeting was held on April 3. The foundation is currently managing 15 funds which include scholarships and grants to surveyors experiencing hardships. The Foundations recently had many of their legal documents, including the bylaws, incorporation papers and some MOU's reviewed by a law firm in Washington DC. The firm recommended several revisions to the bylaws to make them clearer and in line with current charitable business practices. The proposed revisions were reviewed and approved by the Foundation Board. The Foundation received 37 applications for scholarships this year and awarded scholarships to 15 deserving students, including NALS YSN Co-Chair Sarah Walker. Congratulations Sarah on receiving the Bernsten International Scholarship!

The NSPS General Membership Meeting was held on Friday, April 17th followed by the Board of Directors Meeting. Outgoing NSPS President awarded several Presidential Citations. Awardees included the Leadership of YSN, Trish Milburn with the NSPS office and Rich Vannozzi, the outgoing Chair of the NSPS Student Competition. Following the awards, Curt Sumner installed the 2020 NSPS Officers:

Mark Sargent – President
Tim Burch – Preside-Elect
Amanda Allred – Vice President
Craig Amey – Secretary
Robert Miller – Treasurer
Lisa VanHorn – Immediate Past President

As Executive Director, Curt Sumner reported on a variety of issues: NSPS, along with other organizations, will continue to lobby the FCC in regards to Ligado (formerly LightSquared); NSPS Plat Map Competition has extended the deadline for map submittals to June 30; NSPS has created a repository for COVID-19 information related to surveying; the "Surveyor Says" podcast is looking for new guests & speakers; Bob Jupin,

longtime accountant for NSPS is retiring this year and NSPS is looking for a replacement; the Government Affairs committee is looking to create a group to assist states who don't have lobbyists on their legislative actions.

There were 8 motions voted on under new business at the Spring Business Meeting. Details of the motions will be included in the next report.

The next NSPS meetings will be held September 25-27, 2020 in Tulsa, Oklahoma. Please feel free to contact me with any concerns, suggestions, or questions you may have about NSPS.



WFPS Report...continued from previous page

WFPS OFFICERS 2019-2021

Mike Nadeau (Utah) – Chair
Ben Peterson (Washington) – Chair-Elect
Mark Corbridge (Wyoming) – Secretary/Treasurer
Executive Director: Crissy Willson

WFPS FOUNDATION

The WFPS Disaster Relief and Scholarship fund has been established through the NSPS Education Foundation. Donations are now being accepted. The criteria and application information has been sent to all State Associations and can be found on the WFPS website.

**Donations can be made mailed to WFPS: 526 South E Street,
Santa Rosa, CA 95404.**

<https://www.nsp.us.com/donations/donate.asp?id=18191>

WESTERN STATES ROUNDTABLE DISCUSSION

On February 27, 2020, "A Roundtable of Surveyors from the 13 Western States", moderated by Mike Nadeau, WFPS Chair, was held in conjunction with the LSAW Conference. Topics for discussion included recruitment, mentoring, outreach, and marketing the profession. Surveyors from several of the western states also collaborated on new technology, prevailing wages, modular licensing, and commonalities in state regulations and surveying laws.

About WFPS

The Western Federation of Professional Surveyors (WFPS) was formed in 1979. The Board of Directors includes two delegates from each of the 13 western states. WFPS serves as a regional voice for Land Surveyors and meets quarterly to discuss practice issues affecting western state surveyors. For more information about WFPS and the state associations, visit WFPS.org

WFPS Executive Office

T. (707) 578-1130 F. (707) 578-4406 E. admin@wfps.org



NRS / NAC Rule of the Month:

Prepared by Trent J. Keenan, PLS

NAC 625.610 Stamps, seals and signatures on documents; revision of original plans. (NRS 625.140, 625.565)

During this time of shelter in place and all the governmental entities closed to the public, the focus on submittals and trying to keep up with the current development demand has moved to electronic/digital platforms. With the current situation and new requirements, I thought it would be a good time to look back at recent changes that were to stamping/signing regulations adopted by the State Board.

***The following changes were adopted as temporary regulations December 10, 2018, by the State Board of Professional Engineers and Land Surveyors and codified by the Legislative Counsel Bureau on January 30, 2019.** LCB File No. R085-18

We will jump ahead in the document to Section 10 of the regulation.

10. A licensee with responsible charge of the work contained in a document described in subsection 8 may have an electronically prepared seal and *digital* signature applied to such a document which is electronically submitted, released or issued only if:

(a) The files containing the document are locked electronically to prevent any changes to the document;

(b) Secure encryption methods are in place to prevent the copying, transferring or removing of the seal and *digital* signature and to prevent changes to any

electronic drawings after the document is submitted, released or issued; and

(c) The licensee believes adequate protections are in place to prevent fraud or misuse of the *digital* signature.

To see the full document, please visit: https://nvbpels.org/pdfs/R_085-18_V3.pdf

Editorial note:

Like many of you likely had to do recently, I just had to create my first Adobe Digital ID (Encrypted Certificate). Honestly, it was not as bad as I thought it would be to setup and there is a full tutorial on the Adobe website that walks you through step by step. It is too long to provide in this edition of the Traverse, but if you have any questions or need help getting yours setup, please do not hesitate to contact myself or Adobe support. After the creation of my digital ID, I feel my document is secure and cannot be edited without first unlocking the certificate. I would suggest you get yours setup today and be ready for your next electronic submittal.

For a more in depth look into the State Board of Engineers & Land Surveyors stance on digital signatures, please see the links below to published newsletters

<https://nvbpels.org/newsletter/the-nevada-connection-february-2019-1>

<https://nvbpels.org/newsletter/the-nevada-connection-october-2019>

References:

<https://helpx.adobe.com/acrobat/using/securing-pdfs-certificates.html>

https://nvbpels.org/pdfs/R_085-18_V3.pdf



SURVEYOR'S CERTIFICATE

I, TRENT J. KEENAN, A PROFESSIONAL LAND SURVEYOR LICENSED IN THE STATE OF NEVADA, CERTIFY THAT:

1. THIS PLAT REPRESENTS THE RESULTS OF A SURVEY CONDUCTED UNDER MY DIRECT SUPERVISION AT THE INSTANCE OF CENTENNIAL 275 PLAZA LLC.
2. THE LANDS SURVEYED LIE WITHIN THE THE NORTH HALF (N1/2) OF SECTION 28, TOWNSHIP 19 SOUTH, RANGE 60 EAST, M.D.M., CITY OF LAS VEGAS, CLARK COUNTY, NEVADA AND THE SURVEY WAS COMPLETED ON MARCH 30, 2020.
3. THIS PLAT COMPLIES WITH THE APPLICABLE STATUTES OF THIS STATE AND ANY LOCAL ORDINANCES IN EFFECT ON THE DATE THAT THE GOVERNING BODY GAVE ITS FINAL APPROVAL.
4. THE MONUMENTS DEPICTED ON THE PLAT ARE OF THE CHARACTER SHOWN AND OCCUPY THE THE POSITIONS INDICATED AND ARE OF SUFFICIENT NUMBER AND DURABILITY.

TRENT J. KEENAN, PLS
NEVADA CERTIFICATE NO. 16802



Trent
Keenan,
PLS, WRS,
CFedS

Digitally signed
by Trent
Keenan, PLS,
WRS, CFedS
Date:
2020.05.06
13:34:52 -07'00'

Great Basin College Advisory Committee



Prepared by Carl C.de Baca, PLS

Summary - Round table discussion of LSG Dept and LSG Advisory Committee

March 13, 2020

Attending:

Byron Calkins GBC Professor Land Surveying and Geomatics Program

Brett Murphy GBC Dean of Applied Science

Kathy Schwandt GBC head of Comp Tech Dept

Laurie – GBC Assistant

Madison Arbilla – Comp Sciences Instructor

Ken Wong Program Reviewer from Professor of Northern Alberta Institute of Technology (via video feed)

Norm Rockwell – NALS Great Basin Chapter – longest serving member of Advisory Committee

Carl C.de Baca – NALS LSG Advisory Committee Member

Trent Keenan – NALS Chair of Advanced Technology (via telephone)

Justin Moore – NALS Vice President

The program review started off on Friday morning, March 13, with a gathering, via video feed, of six current GBC LSG students having an hour-long discussion with Professor Wong regarding their thoughts on the state of the program. In the interest of keeping that discussion open and spontaneous, Professor Calkins and the LSC Advisory Committee members were asked to forego attending. At this time, we have no feedback on what the students might have said to Professor Wong, but given the written responses to Calkin's poll (provided to us as background information), the students rate the program very highly.

After that segment wrapped up, Norm, Justin and I gathered in Room 203 of the Hi-Tech Center and joined the GBC staff plus Professor Wong who called in via video. Norm started off with a discourse on the evolution of the program from the initial math and surveying classes he taught in the late 1960's when the school was still the Northern Nevada Community College. His talk encompassed the change from NNCC to Great Basin College and took us through Dr. Elithorp's arrival and the start of the program that we know today. I spoke about Elithorp's decision to take the majority of classes on line as a way to counter act the difficulty of getting students to come to Elko to matriculate. I also spoke about how we dealt with Elithorp's decision to leave, which caused the suspension of the program, which in turn caused the school to search for a replacement professor. This new professor's job would be to ride out the two year period when students already enrolled in the program could finish and then the program would likely be put to sleep for good. I discussed being part of the committee that selected Calkins and that his hiring triggered a recruiting boom and that the school eventually lifted the suspension which led to the growth from less than 20 to over 120 students a semester that we see today.

With Byron leading the discussion and Wong asking various questions, Trent, Justin and I all took turns speaking about our commitment and support of the program, the establishment of specific scholarships directed at GBC students, our commitment to helping the student team each year so that they can compete in the national competition, and our expectations of the program. During the discussion, Murphy stated that the school has indeed set aside money to hire a second full-time professor. At long last the school has recognized that the program's steady increase in numbers and graduations is here to stay. Both Calkins and Wong indicated that this second professor would get us over the hurdle toward ABET accreditation. That accreditation is needed more than ever now that the online education field is no longer GBC's alone to exploit. Maine, New Mexico and Idaho now have competing on-line programs and all three of those are accredited. Murphy also noted that while the program does not carry a 'low enrollment' tag any longer, it does still have a 'low graduation' tag and that causes additional scrutiny to be put on the program from a school that has limited resources in a state that also has limited resources to spend on education.

Ms Schwandt spoke about how the program integrated into the overall college program and expressed that Calkin's commitment and enthusiasm have been an inspiration to the rest of the faculty and are the real reason for the current success of the program.

Pending Professor Wong's formal report, I would suggest that the program review was a strong success and that NALS representation was critical in helping Wong shape his understanding of the program. We demonstrated that the professional surveyors of Nevada back the program explicitly, that we have great rapport with Calkins and that he listens to our concerns as much as we listen to his requests for assistance. Wong recognized this and lauded the program for having this kind of support from the local surveying community.

Conclusion

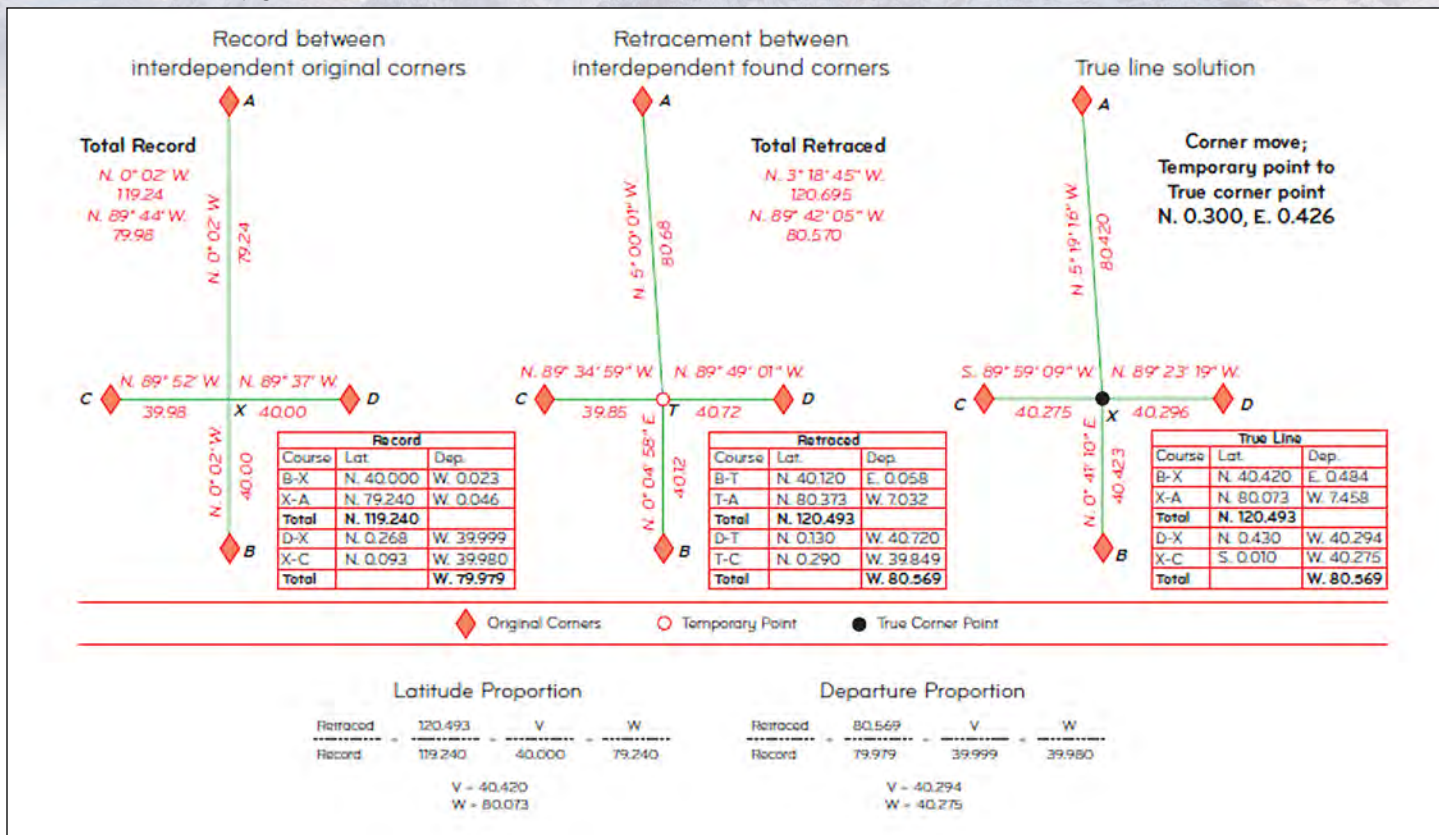
First and foremost, NALS needs to find out what it can do to help GBC alleviate the dangers in carrying the 'low graduation' tag. The importance of this cannot be overstated.

The program is stable and is generating a number of graduates in both the Associate's and Bachelor's degree programs. The graduates that we are seeing join the workforce in Nevada are skilled and articulate. When the second professor is hired, NALS will need to work with the school to ramp up recruitment to Nevada high schools. TrigStar can certainly be part of that effort, but it can't be the only thing we do. The testing period is long over, TrigStar is a failure as a recruiting tool.

NALS should focus on helping Calkins repopulate the Advisory Committee and making that committee a strong and direct liaison of the Advanced Education Committee with formal lines of communication and reporting. This has not been the case in the past, and I would say that over the past two or three years, communication between NALS and GBC/Calkins has not been as formal, direct or effective as in the years immediately preceding. This must change for both our sake and the LSG program's.

As the recruitment for a second professor takes shape, it would behoove NALS to secure a seat at the table for evaluating candidates for the position. This will

CONTINUED ON PAGE 32 ►



166-168) we see more precise language on how to accomplish a DP and reduction to cardinal equivalents is even broken out into a separate section (7-9). This explanation is good and taken together with the 3 old diagrams and 3 new diagrams with tables on the facing page, finally gives some clarity to the method for reducing the distances of both measured and record data to their cardinal equivalents, and then proportioning the results to establish the temporary points.

Still a little fuzzy? Read on...

How to Approach the Double Proportion

First of all, this procedure can only be correctly computed with your data expressed in the true meridian (Astronomic Azimuth). Forget coordinate systems and northings/eastings. Public Land Surveys are based on astronomically determined True North and proportionate reestablishments are correctly expressed in Latitudes and Departures, based on the local meridian. After getting your field data to this point, there are two steps: A) Reduction of data to cardinal equivalents and B) Proportioning. Once your survey data is in the same reference frame as the original surveyors, i.e. Astronomic North, you can break your data into the north (Latitude) and east (Departure) components and prorate against similar calculations done for the Record (GLO or BLM Plat) data. Once those steps are completed, the restored corner position can be computed very simply. Following are step-by-step instructions that might clear up some grey areas that are still apparent in the 2009 BLM Manual of Survey Instructions.

This recipe assumes you have made your field measurements and recovered the necessary monuments to be used for putting the missing corner back. It also assumes that you were either working in Astronomic North or have converted your data

beforehand. *Note: there is an attached series of diagrams that will hopefully make sense of the various terms and variables used in these instructions.*

Reduction to Cardinal Equivalent Distances

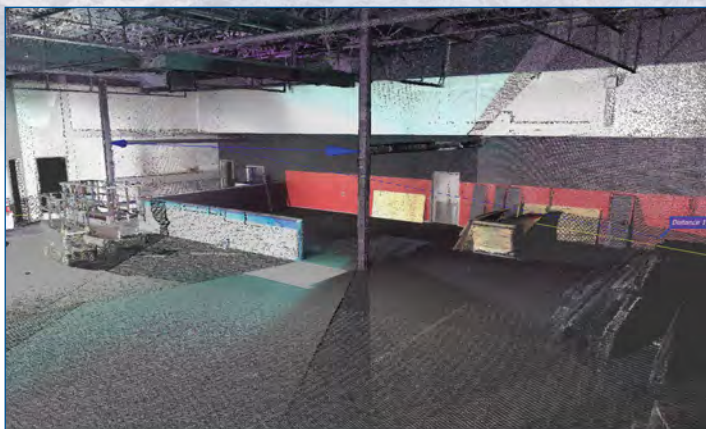
1. Record Data - Compute the lat/dep for A to X. Ignore the dep.
2. Record Data - Compute the lat/dep for X to B. Ignore the dep.
3. Record Data - Compute the lat/dep for C to X. Ignore the lat.
4. Record Data - Compute the lat/dep for X to D. Ignore the lat.
5. Sum the lats from steps 1 and 2. Let's call it AB
6. Sum the deps from steps 3 and 4. Let's call this one CD
7. Measured Data - Compute the lat/dep for A2 to X. Ignore the dep.
8. Measured Data - Compute the lat/dep for X to B2. Ignore the dep.
9. Measured Data - Compute the lat/dep for C2 to X. Ignore the lat.
10. Measured Data - Compute the lat/dep for X to D2. Ignore the lat.
11. Sum the lats from steps 7 and 8. Let's call this one AB1
12. Sum the deps from steps 9 and 10. Let's call this one CD1

Now for the Proportioning part (we're almost done)

13. AB/AB1 This is the proportionate factor for the latitude. Multiply this factor by the record lat for A to X. that's your proportionate latitude from A. Multiply the factor by the record lat for X to B. that's your proportionate latitude from B. If you compute these two points, they will be on an east-west line at the proportionate latitude distance of the missing corner.

14. CD/CD1 This is the proportionate factor for the departure. Multiply this factor by the record dep for C to X. that's your proportionate departure from C. Multiply the factor by the record

CONTINUED ON PAGE 32 ►



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PS from The American Surveyor 2019

The Longest Line by Albert "Skip" Theberge from The American Surveyor, 2012

Archaeology at the Top of Nevada: Geodetic Surveys of 1878-1895 by Gregory R. Seymour

Trails Past, Inc. Nevada Archaeological Association Ely, Nevada April 2007

The Life and Letters of John Muir by William Frederic Badè, Chapter XIII, Nevada, Alaska, and a Home, 1878-1880

The Transcontinental Triangulation Special Publication No. 4 by the United States Coast and Geodetic Survey, can be found at the web link below.

ftp://ftp.library.noaa.gov/docs.lib/htdocs/rescue/cgs_specpubs/QB275U35no41900.pdf

All comments, feedback and other opinions are welcome.
Michael Kidd, P.L.S.
Michael.Kidd@cityofhenderson.com

About the Author

Michael Kidd, PLS is currently the City Surveyor for the City of Henderson, Nevada. Michael's entry into the land surveying profession began with the U. S. Air Force in 1985. He is currently the Vice Chair on the Nevada Board of Engineers and Land Surveyors, he also served as a member of the NCEES Professional Surveyor Exam Committee.



Anyone Could Lead...continued from page 7

that dishonest, it is the work of a demagogue.

True leaders do not seek to be leaders, they are sought as leaders. They are highly self-aware. They know their strengths and, especially, their weaknesses. And they accept the fact that those they seek to lead have their own flaws and weaknesses. Anyone could lead perfect people ... if there were any.



About the Author

Gary Kent is in his 38th year with Schneider Geomatics in Indianapolis, having transitioned to part-time status earlier this year. He also provides training, consulting and expert witness services as manager of Meridian Land Consulting, LLC. He has served on the Indiana State Board of Registration for Professional Surveyors since 2004 and is a past-president of both ACSM and the Indiana Society of Professional Land Surveyors. Gary has presented programs on boundary law, easements and rights of way, surveying standards and practice, and leadership in all 50 states.



dep for X to D. that's your proportionate departure from D. If you compute these two points, they will be on north-south line at the proportionate departure distance of the missing corner. 15. Now for the final step – the cardinal-direction shift to the restored corner. The two lines described above in steps 13 & 14 intersect in one unique place. That place is the new corner. Now set it and move out, you're burning daylight.



About the Author

Carl C. de Baca, PLS is a longtime practicing land surveyor in both Nevada and California and a thirty-plus year member of NALS. He has a passing familiarity with the Nevada Traverse and a great enthusiasm for provoking thought in his fellow surveyors



Surveying in the Time of Cholera...continued from page 25

All we can do is keep ourselves and our families as safe as possible, don't give in to panics and try to keep an eye on the prize. Even in discouraging times you have to find a way to continue to promote your profession, recruit for the future and support your professional organization. Social distancing is a physical thing only and does not mean that we can't all keep in touch and hang together through this. Hopefully we can all get together at our rescheduled conference this fall and share beer and an uncomfortable laugh at the first half of 2020.




Great Basin Advisory Committee...continued from page 29

foster an even closer relationship to the program. I'm confident Murphy would be amenable to having one of us sit on the hiring committee.

During the ABET evaluation process that will start as soon as a second professor is in place, the function of that formalized committee can and should take on the additional duty of curriculum review and advisement. Wong indicated that this is something the ABET reviewers will expect to see. This will be an easy transition for such a committee, as long as leadership, the committee chair and the members of the committee have sufficient commitment.



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Members have spoken and we are listening! To fill the void left by the ending this past July of the NSPS Radio Hour, the weekly radio show hosted by Executive Director Curt Sumner, we are proud to announce our new podcast, **"SURVEYOR SAYS!"** featuring all things surveying.

SURVEYOR SAYS!



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