



THE Central Valley Chapter PRISM

Volume 4, Issue 6

November 2014

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2014 Chapter Programs

Boy Scout Merit Badge:
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Bill Koch (Coordinator)
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Up
Coming
Meetings!

Date: December 3, 2014

Time: 6:00 p.m.

Location: Perko's @ 901 North Carpenter Road, Modesto

Speaker: Landon Blake, PLS - Redefined Horizons

Topic: Construction Surveying Standards

Date: January 28, 2015

Time: 6:00 p.m.

Location: Perko's @ 901 North Carpenter Road, Modesto

Speaker: Roger Hanlin, PLS - CLSA 2015 President Elect

Topic: CLSA

Announcements

Fresno State University Announces

It's 54th Annual Geomatics Engineering Conference is February 20 & 21, 2015 in Clovis. Contact Marco Castaneda at neda209@mail.fresnostate.edu for more information.

CLSA/NALS Annual Conference

Is set for March 21-25, 2015, at the Silver Legacy Resort and Casino in Reno, Nevada

[Check State CLSA for more information](#)

Boy Scout Survey Merit Badge

Central Valley Chapter will be participating in the Boy Scout Midway, being held January 31, 2015. This will give local area scouts a chance to earn their Survey Merit Badge.

Central Valley Chapter joins Stanislaus County in Adopt-A-Road

The Central Valley Chapter of CLSA has agreed to a two year contract with Stanislaus County in the "Adopt-A-Road" program. The Chapter will be responsible for maintaining the mile long stretch of Claribel Road, between Roselle Avenue and Claus Road. There will be a clean-up event scheduled 2-4 times per year. Volunteers are needed for each event. If interested please contact Rich Brown.

2015 Membership is Approaching

You should be receiving your 2015 membership bill from State CLSA shortly. When you send in your dues, please don't forget to send in your Central Valley Chapter dues. You can also pay [online through the chapter website](#).

Classes, Training, and Continuing Education

Mark Your Calendars

CAD Masters - AutoCAD Level I (3-Day Course)

December 8-10, 2014, Sacramento
 December 22-24, 2014 Walnut Creek
 January 5-7, 2015, Sacramento
 January 13-15, 2015 Walnut Creek
 February 2-4, 2015, Sacramento
 February 10-12, 2015 Walnut Creek [Register here](#)

CAD Masters - AutoCAD Level II (2-Day Course)

December 3-4, 2014, Walnut Creek
 December 22-23, 2014, Sacramento
 January 20-21, 2015, Walnut Creek
 February 5-6, 2015, Sacramento
 February 22-23, 2015, Walnut Creek [Register here](#)

CAD Masters - AutoCAD Level III

December 11, 2014, Sacramento
 February 12, 2015, Walnut Creek [Register here](#)

CAD Masters - AutoCAD Civil 3D Intro (3-Day Course)

December 1-3, 2014 Sacramento
 December 15-17, 2014, Walnut Creek
 December 29-31, 2014, Sacramento
 January 12-14, 2015, Walnut Creek
 February 9-11, 2015, Walnut Creek [Register here](#)

ESRI - Introduction to GIS (2-Day Course)

Multiple Dates, Online [Register here](#)

Fresno State University

54th Annual Geomatics Engineering Conference

February 20-21, 2015, Clovis

For more information contact:

Marco Castaneda @ neda209@mail.fresnostate.edu

CLSA/NALS Annual Conference

March 21-25, 2015, Silver Legacy, Reno, Nevada

[Check State CLSA for more information](#)

Subdivision Map Act Seminar - Michael Durkee

April 22, 2015, Modesto

More information in the next edition of The Prism

If you have information about a training or class, please submit to: editor@californiacentralvalleysurveyors.org

Thoughts from the Editor



The saying goes that "10% of the people (members) do 90% of the work. This is true in just about everything that we do in our lives. Everything from associations we are involved with for work, school, or free time activities, to to groups associated with your profession, to church. If you really look at the numbers it may not seem so bad. Let's say that the same 50 people are involved with the same 5 things. So, 10% of the 50 people are doing most of the work for each group. That would be 5 people for each of the 5 associations, for a total of 25 people. That comes out to 50% of the 50 members doing work for one association.

Now, that looks great on paper and all. But, as we all know, that is not what happens in real life. If using the scenario from above, there would probably be 10-15 people doing most of the work, with maybe another 5-10 helping out when they could. When I ask people why they don't help out, the response I commonly get is that it takes so much time. What people don't realize is that it takes so much time because so few help. If everyone pitches in, then it wouldn't be so time consuming for most. So, as the new year approaches and you start to think about your New Years resolution, maybe you could make giving a helping hand the top of your list. Have a safe and happy Holiday Season!!!

If you would like to comment on this topic or suggest another, please submit it to:

editor@californiacentralvalleysurveyors.org

Technology

Are Your Surveys Accurate?

By J. Anthony Cavell, PS, CFedS

This may not be an easy question to answer, off the cuff. For starters, what does it mean for something to be accurate? Experience shows several different meanings are attached to this word. Which one(s) should apply to surveys?

ac cu rate adjective \a-ky-rt, a-k(-)rt\¹

1. free from error, especially as the result of care
2. conforming exactly to truth or to a standard: exact

Hmm, something very interesting in the definition--"free from error." Is that possible? If so, how? I remember hearing an engineering definition that speaks of accuracy in degrees. How can that jive with the absolute definition, "conforming exactly to truth?" The engineering/mathematical definition usually calls accuracy "closeness to truth" and precision as "degree of care" or "fineness of repeatability."

Anyone being prepared for legal deposition has been advised not to say more than he knows; do not expand; answer only the question put to him. Why? Of course, it is so a slight misstatement or contradiction will not have to be defended or explained under cross-examination. Those who practice examination and cross-examination know a witness who is sworn to tell the truth loses credibility if ANY of his testimony is not accurate; that is, not truthful! Perhaps, to be sure, a look at the competing word, precise, is in order.

pre cise adjective \pri-ss\²

1. exactly or sharply defined or stated
2. minutely exact
3. strictly conforming to a pattern, standard, or convention

Figure 1 illustrates the engineer's/mathematician's textbook understanding of accuracy and precision.

Accuracy, the noun, is commonly defined by proximity or by degrees instead of by truth or lack of error. It would seem a surveyor must decide whether he functions as a designer (engineer/technician) or a surveyor ("weigher" of evidence). Perhaps even more importantly, he must know to which definition his client audience subscribes. Those who subscribe to the latter definition tend to consider the work of surveying as essentially little more than using a ruler or similar tool to measure a value or apply a technology.

Here's another example. Observe Figure 2. Notice the Center of Population for Louisiana is near New Roads. Assume there is an sample of people who when asked where they live answered "Louisiana" and one was from Lake Charles, one from New Orleans, one from Shreveport and one from Woodville, Mississippi lied. The statistical center of Louisiana is marked by the COP at New Roads. Of the three respondents the one from Woodville (the liar) gave the most accurate textbook answer. His home is closest to truth. Shreveport, Lake Charles and New Orleans (all truthful answers) would be considered less accurate by the engineering text book definition.

As a land surveyor, conveying useful, correct information is of the utmost importance. After all, actions taken or avoided due to a lack of understanding can be extremely costly and painstaking to correct. The professional owes accuracy (the truth), above all, to his client and, to the degree the client needs and can understand, precision. Sometimes accuracy demands a lessening of precision because even a little bit of wrong contaminates the whole and changes it from true to false. "I am from Louisiana" would be true if from Monroe or Lafayette but "I am from Shreveport" would be false if from Bossier City despite that they share a common boundary. Likewise stating the area of a parcel to fewer significant figures might change a false report to a true one.

How do you know your survey reports and maps are accurate? Do you always check measurements? Do you always verify records? What about field evidence? Do you simply trust them as is?

How do you know the precision of your surveys and maps? Do you always check measurements? Do you always verify field notes? What about instrument calibration and employee procedures? Do you simply trust them as is?

History of Precision

Precision can be an important part of surveys. It has always been important for the surveyor to be aware of the limits of precision inherent in measurements. Throughout history surveyors have been aware of the importance of consistency and discipline in measurement techniques. Geometry and trigonometry were used as a means of checking consistency in linear measures. Likewise linear measures could be used to check angular measures. By today's common experience, the uniformity of standards, especially standards of linear measure look inconsistent. The inhabit-

Continued on page 10

State News

The Basics About Deeds in California

By Mike Durkee, Esq. and Jennifer Chavez, Esq.

Surveyors review and inspect deeds in the course of performing their professional duties and are often instrumental in preparing the technical components of a deed, in particular the legal description. This article provides a general overview of the types of legal instruments that can be used to convey real property in California.

Generally, California law requires that the conveyance of real property occur in a written instrument that names a grantor, a grantee and identifies the property being transferred. (Cal. Civ. Code, § 1091.) The deed must be signed by the grantor and it must be delivered to and accepted by the grantee. (Cal. Civ. Code, § 1054; *Reina v. Erassarrent* (1949) 90 Cal.App.2d 418, 426.) In California, most such conveyances occur by grant deed or quitclaim deed. California Civil Code section 1092 sets forth a form of grant deed that may be used to transfer title to real property, but it is not the form typically used in practice. There is no requirement that a deed be recorded (*Williston v. Yuba City* (1934) 1 Cal.App.2d 166, 170-171), but recording is obviously a best practice. To be recordable, the grantor's signature on the deed must be acknowledged. (Cal. Civ. Code, § 1195(b); Cal. Gov. Code, § 27287.)

1. Grant Deeds. A "grant deed" is the most common instrument used to convey real property and should always be used when a conveyance is for consideration (i.e., money) because it includes certain implied warranties that are absent in a quitclaim deed. The operative term in a grant deed is the word "grant" (Cal. Civ. Code, § 1092) and is typically used as follows: "Grantor hereby grants to Grantee that certain real property located. . . ." A grant deed conveys the grantor's entire interest in the property, including any interest that the grantor might acquire after the date of the grant deed, unless it is clear that the grant is for a lesser estate, such as an easement. (Cal. Civ. Code, §§ 1105, 1106.)

Conveyance by grant deed includes two implied covenants. The first implied covenant is that prior to execution of the deed, the grantor did not convey the property, or any right, title of interest therein, to any other person. (Cal. Civ. Code, §§ 1113.) This is not a covenant that the grantor actually owns the property he or she is purporting to convey to the grantee (though that covenant will be implied in any purchase agreement), but only a covenant that the grantor has not previously conveyed the interest covered by the grant deed to a third party. As noted above, the grant deed conveys any interest acquired by the grantor after the date of the grant deed. (Cal. Civ. Code, §§ 1105, 1106.) Therefore, if the grantor does not actually hold title to the property at the time of the grant deed, but acquires title later, that title is deemed to have been conveyed to the grantee by the grant deed. (Id.)

The second covenant implied in a grant deed is that the property is free from encumbrances made by the grantor or any person claiming under him or her. (Cal. Civ. Code, § 1113.) This is not a covenant that the property is free and clear of all liens and encumbrances, but only free of encumbrances made by the grantor.

These two implied covenants are very limited in scope and owners of real property in California typically obtain title insurance to cover the gaps. Title insurance, among other things, insures that fee title is vested in the grantee and that the title is encumbered only by specified matters excepted in the title policy. With title insurance, a grantee could pursue claims against the title company, rather than the grantor, for any defects in title.

2. Warranty Deed. The rarely used "warranty deed" is the second type of deed that can be used to convey property in California. In addition to the implied warranties in a grant deed, a warranty deed expressly warrants the title to property and the quiet possession of the property to the grantee. (Cal. Civ. Code, § 3304.) If a third party claims a right to the title or to possess the property (such as pursuant to a lease), a grantor that conveys by warranty deed would be required to defend that claim. (Id.) These express warranties run with the land and are not personal to the grantor and grantee. (Cal. Civ. Code, §§ 1462, 1463.) Consequently, the warranty deed grantor remains liable to subsequent owners of the property that assert claims relating to title or quiet possession that arose from the grantor's ownership of the property. (Id.) Most grantors are unwilling to make these broad and long lasting express warranties, and grantees do not need them because of the availability of title insurance, though it is common in California for a seller of real property to purchase a basic policy of title insurance for a buyer as part of a purchase and sale transaction.

Continued on page 5

The Basics About Deeds..., *cont. from page 4*

3. Quitclaim Deed. Another common way to convey property in California is by quitclaim deed. A quitclaim deed, unlike a warranty deed, does not include any implied covenants at all. (*Platner v. Vincent* (1924) 194 Cal. 436, 444.) It is a conveyance only of whatever right, title and interest the grantor had at the time the quitclaim deed was executed and delivered. (*Leggio v. Haggerty* (1965) 231 Cal.App.2d 698, 712-713.) This form of deed is frequently used where no money is passing hands, such as in a deed between family members or where deeds are provided to clear a cloud on title. The operative term in a quitclaim deed is "quitclaim" and is typically used as follows: "Grantor hereby remises, releases and forever quitclaims to Grantee certain real property..." As with a grant deed, grantees who acquire title by quitclaim deed frequently obtain title insurance to insure the validity of their conveyance.

In conclusion, there are three types of deeds that can be used to convey property in California: (1) the grant deed, which is used in most arms-length transactions, (2) the quitclaim deed, which is used in transactions where it does not make sense to make implied warranties of any kind, such as between family members, and (3) the warranty deed which is almost never used because of the express warranties that are incorporated into it and unnecessary in light of the availability of title insurance.

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National News

The Hayden Example

By Warren D. Ward

AT THE END OF THIS well built, tall, plank fence, about three lots from the corner, was an iron pipe. They both immediately felt relief knowing that there was monumentation in the ground they could use for their survey.

Then, at the same instant, they both saw a much newer plastic cap, approximately one foot away from the pipe, offline from the fence and nearly hidden by the sand. The two suddenly realized that their survey would be more complicated than they had thought about a second ago.

“At least we have a recent, precise point to proportion from, better than nothing,” reasoned The Kid to himself.

“Oh, great. Now we have a perfect GPS point, done by a guy in the office who can’t find it in his heart to accept an old monument, ruining the whole block. There goes all the profit for this job,” whined The Old Man to the Great Surveyor in the Sky.

It was summer tourist season in this mountain town. The local shops on Main Street enjoyed an endless line of browsers, here to play in the huge parks and to boost the local economy, purchasing relics passed down straight from the wilderness pioneers who explored these parts not so long ago.

The survey crew stood out as locals—dressed nothing like the many visitors here to explore the mountain grandeur, but appropriately for exactly that: boots, hats, long pants, long-sleeve shirts, etc.

Glutton motioned with his chin to follow, and Eager (the Kid) did, curiously, around the corner and into an antique bookstore about three doors down. They squeezed their way through a crowd of book lovers and sat down on chairs in one of the back corners. The Kid assumed this was some sort of rest stop or micro nap. “It’s about time you took a look at one of Hayden’s surveys,” The Old Man lectured.

“Are you talking about Edward Abby and Hayduke who destroyed survey stakes?” Eager retorted, hinting that he had already read *The Monkey Wrench Gang*.

“No, sir. You likely have not read any of Hayden’s atlases,” chortled The Old Man. He motioned for a store clerk



and pointed to the corner of a locked glass case, then asked for the Hayden Atlas, buried way in the back.

Out came a large, old book, about 20” x 30”, and 2” thick, placed on the glass, in front of this survey crew, who did not look like antique book collectors.

“This is one of Hayden’s Atlases!” stated the senior surveyor to an astonished audience. “It was presented to Congress probably around 1877. It was drafted in pen by Ferdinand Hayden, surveyor, who made several of these books to cover all the Rocky Mountains, for Congress, who needed geological maps of the West. You can buy this copy for \$5,000: a steal!”

Glutton carefully opened the book and let his audience (gawking like a group of flatlanders at an Elk on the side of the road) marvel at the sheer splendor of the maps made by Hayden. There were contour maps as beautiful as the mountains they replicated, covering many square miles of the Rockies, in this very volume.

The old surveyor flipped through a few pages and found the contours of the area where they now stood. There were old gold mines noted, accurately shown, now gone. There were no highways or air-

Continued on Page 9

Classifieds

The California Department of Transportation is Recruiting for Transportation Surveyor

- Work on world class projects
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Minimum Qualifications

Graduation from a four-year curriculum in surveying, surveying engineering, or surveying geomatics accredited by the Accreditation Board for Engineering Technology. (Registration as a "Senior" in such a curriculum will admit an applicant to the competition, but applicants must produce evidence of graduation before being considered eligible for appointment.)

(Possession of a valid certificate as a Land Surveyor in Training issued or accepted by the California Board of Registration for Professional Engineers and Land Surveyors or possession of a valid certificate as an Engineer in Training accepted by the California Board of Registration for Professional Engineers and Land Surveyors in lieu of a certificate as a Land Surveyor in Training may be substituted for the required education.)

For more information regarding how to take this online exam to be eligible for this exciting career opportunity, please refer to the link at: <https://jobs.ca.gov/Bulletin/Bulletin/Index?examCD=3PB60>



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Picture of the Issue



Central Valley Chapter is working with Stanislaus County Public Works to Adopt-A-Road. The 1 mile strip of Claribel Rd., between Roselle Ave. & Claus Rd. will be under the cleanup care of Surveyors.

SURVEY MARKING PRODUCTS

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The Hayden Example..., *cont. from page 6*

ports, but even without many of the modern-day towns these observers could recognize their own region just by looking at the contour lines and a few named peaks and rivers as existed in 1875.

“Hayden didn’t have Autocad in the 1870s, or GPS, or anything electronic for that matter,” The Old Man said. “He climbed every mountaintop in the Rocky Mountains and triangulated with a transit to each peak he could see from that point. He handsketched the panorama he beheld from each of his transit stations. No button-pushing!”

“A few years before this, he surveyed and mapped what is now Yellowstone, inspiring Congress to designate our first national park. Hayden is a great unknown in history. This surveyor’s work is at the foundation of the very story of America. America did not need or want these maps to be perfect. Hayden made great, useful, and accurate maps with the tools that he had. I have yet to see a better, more accurate, or more beautiful map ever drawn by man!”

After thanking the clerk, still speechless at the discovery of this book in his own store, The Kid stepped among the tourists outside, impressed with what he just learned. He and The Old Man had just decided that they would use that old pipe as their controlling monument. It might not be exact according to some office manager, but they were proud to be surveyors, like Hayden, and proud to be among the likes of one unknown surveyor who set that pipe long ago.

*Reprinted with the permission of
XYHT Magazine — November 2014*

YOU ARE INVITED!



The Geomatics Engineering Program at Fresno State University cordially invites you, your colleagues, friends and family to the **54th Annual Geomatics Engineering Conference**

February 20th and 21st 2015

Clovis Veteran Memorial, Clovis, California.

The conference will have a variety of activities for you to enjoy including:

Zombie auction, Live auction, Bulldog Race, Banquet, Scholarship Commemoration, Panel Discussion

Presentations by great speakers such as Gary Kent and Michael Pallamary.

This is a student-run conference and with your presence you will be supporting the Geomatics Engineering Program and its students. The student are working hard to make this event enjoyable and fun, please come support us.

Price and more information about this event will be announced soon. Stay tuned.

If you have any questions, comments or if you would like to be added to our mailing list please feel free to email us:

Marco Castaneda – Conference Chair
neda209@mail.fresnostate.edu
Luz Garcia- Conference Co-Chair
luz931@mail.fresnostate.edu

The Geomatics Engineering Program at Fresno State is a non-profit organization. Donations, scholarships, auction items, or any other help are welcomed and appreciated.

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Accuracy..., cont. from [page 3](#)

ants of the period were well aware of that and what was primarily sought was consistency within a local area or a single project.

A good example might be found in the Bible. Genesis 6:15 in the Bible describes the Ark's dimensions were 300 cubits long, 50 cubits wide, and 30 cubits high. Many think that's about 450 feet long, 75 feet wide and 45 feet high! It could have been different, because cubits were used and the length of the cubit depended most likely on the stature of the construction supervisor, in this case Noah.

A cubit was the length of a man's arm from fingertips to elbow. A quick look with Google gives one a perfectly clear example of how those who can count, but don't understand mensuration almost always find ways to make measures definite and WRONG. It proudly displays on the top of the search: "1 cubit = 45.72 centimeters." They somehow KNOW this ancient and variable measure to a tenth of a millimeter! That's more precision than I can muster and I wonder about how many men it would prove accurate? Very, very few I am sure.

Surveyors knew the difficulty of manufacturing and sharing perfect copies of any standard length, so common items with tolerably small variations were employed. Often, if one drops the least significant figure in any measure, they would agree on the unit length. Some of the earliest known land surveys were completed by the Ancient Egyptians in 3000 BC. They used relatively rudimentary tools and simple geometry, resulting in incredible maps. Over time, technology has been refined and with it, precision. Has accuracy? It depends (the standard survey answer).

While many of the advancements in tools available today seem almost miraculous, the fundamental basics of land surveying remain the same. The wisdom of the ancients still serves us well when we honor accuracy over precision. The ancients knew the supervisor's arm was a good standard for a single project. They knew, on the ground, permanent monuments would survive and correct following surveyors whose standard length was different AND serve as obvious, notorious markers for all to witness.

We are now able to take measurements down to tiny fractions of an inch and use highly technical means to reduce or point out error. But, despite all this, errors still remain. This is where the disconnect happens between those who have learned arithmetic and counting, and those who have learned to measure. Today it extends between those who put their faith in digital displays and those who know from where the displayed numbers come.

The Value of Accuracy in Maps

Accuracy is the single most important factor of maps and land surveys. Precision is often in the eye of the beholder. Since the purpose of a land survey is to locate and describe boundaries on which ownership rights may depend, assuming imprecision equals inaccuracy often leads to legal entanglements. While all surveys must be accurate, certain types require more precision than others. When things like hydrological features and roadways are involved, high levels of precision may be required.

The Imprecision of Maps

Maps are usually not all that precise. Many, if not most, think they are precise, because it is all they know, but maps are merely close approximations. As abstractions of reality, some maps may require thousands of measurements to be sufficiently precise. While modern day professionals often have access to incredible numbers of measurements, there is always a point of diminishing return. Most laymen (and too many in the geospatial fields) think it never hurts to have a little more. Frequently, less data that is precise and highly qualified will yield superior results than excessive data of poorer quality. One exception is with truly random data that one is able to "cherry-pick" for quality; more data may imply more data worth cherry-picking.

[Click for complete article](#)

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CLSA EDUCATION FOUNDATION

Land Surveying Photo Gallery



California Land Surveyors Association Education Foundation would like to thank Bryant Sturgess for generously donating his collection of historic images.

The proceeds from the photos sold on this website will be used to fund scholarships for land surveying students.

It's In There

8771.

(a) Monuments set shall be sufficient in number and durability and efficiently placed so as not to be readily disturbed, to ~~assure, ensure~~, together with monuments already existing, the perpetuation or facile reestablishment of any point or line of the survey.

(b) When monuments exist that control the location of subdivisions, tracts, boundaries, roads, streets, or highways, or provide horizontal or vertical survey control, the monuments shall be located and referenced by or under the direction of a licensed land surveyor or licensed civil engineer legally authorized to practice land surveying, prior to the time when any streets, highways, other rights-of-way, or easements are improved, constructed, reconstructed, maintained, resurfaced, or relocated, and a corner record or record of survey of the references shall be filed with the county surveyor.

~~(b) (c) When monuments exist that control the location of subdivisions, tracts, boundaries, roads, streets, or highways, or provide horizontal or vertical survey control, the monuments shall be located and referenced by or under the direction of a licensed land surveyor or registered civil engineer prior to the time when any streets, highways, other rights of way, or easements are improved, constructed, reconstructed, maintained, resurfaced, or relocated, and a corner record or record of survey of the references shall be filed with the county surveyor. They shall be~~ *A permanent monument shall be* reset in the surface of the new ~~construction, construction~~ or a ~~suitable monument box placed thereon, or permanent witness~~ *witness monument* or monuments set to perpetuate ~~their~~ *the* location if any monument could be destroyed, damaged, covered, *disturbed*, or otherwise obliterated, and a corner record or record of survey *shall be* filed with the county surveyor prior to the recording of a certificate of completion for the project. Sufficient controlling monuments shall be retained or replaced in their original positions to enable property, right-of-way and easement lines, property corners, and subdivision and tract boundaries to be reestablished without devious surveys necessarily originating on monuments differing from those that currently control the area. ~~It shall be the responsibility of the governmental agency or others performing construction work to provide for the monumentation required by this section. It shall be the duty of every land surveyor or civil engineer to cooperate with the governmental agency in matters of maps, field notes, and other pertinent records. Monuments set to mark the limiting lines of highways, roads, streets or right of way or easement lines shall not be deemed adequate for this purpose unless specifically noted on the corner record or record of survey of the improvement works with direct ties in bearing or azimuth and distance between these and other monuments of record.~~

(d) The governmental agency performing or permitting construction or maintenance work is responsible for ensuring that either the governmental agency or landowner performing the construction or maintenance work provides for monument perpetuation required by this section. (e) It shall be the duty of every licensed land surveyor or licensed civil engineer legally authorized to practice land surveying to assist the governmental agency in matters of maps, field notes, and other pertinent records. Monuments set to mark the limiting lines of highways, roads, streets or right-of-way or easement lines shall not be deemed adequate for this purpose, unless specifically noted on the corner record or record of survey of the improvement works with direct ties in bearing or azimuth and distance between these and other monuments of record.

~~(e) (f) The decision to file either the required~~ *a* corner record or a record of survey ~~pursuant to~~ *as required by* subdivision (b) ~~or (c)~~ shall be at the election of the licensed land surveyor or ~~registered civil engineer~~ *the licensed civil engineer legally authorized to practice land surveying* submitting the document.



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