

The Case for Accuracy Statements

Public Protection

Today everyone owns a GPS unit, whether it is a cell phone, a wristwatch, or the latest dual frequency survey grade unit. The technology allows most members of the public to measure, create reports, drawings, documents etc. practically anything that required a licensed professional twenty years ago. For example, while writing this article my watch will check my heart with a electrocardiogram (“ECG”) while I draft legal several documents, using Legal Zoom, performing each task without the benefit of a doctor or an attorney. Based on my training and experience I know the ECG and legal document production are little more than parlor games. I have a doctor check my heart regularly and the documents I produced will be sent to the attorney for review. However, when it comes to measurement, I regularly see well intentioned tradesman and laypeople measuring and documenting real property lines and critical infrastructure (i.e. structural steel, topography, underground utilities etc.). The marketing of the tools is often misleading as to the accuracy. Every instrument has a “least count” – the smallest value displayed. If the least count is 1/16th of an inch the presumption is the measurements are accurate to the least count. Of course, this is simply not true. In measuring latitude and longitude, the basis for state plane coordinates for construction, the displayed least count allows for calculations to the one hundredth (0.01’=1/8”) and may only be accurate to ten (10’) – therein lies the rub. This measurement discrepancy is not readily apparent and is the safety issue.

Imagine a critical gas line being reported with an accuracy of 1/8th inch and being 5’, 10’, 15’ out of position. This is a fatal accident waiting to happen. In a less fatalistic sense, the use of a UAV – commonly called a drone – to develop topography for a large construction project will not produce accurate quantities and will result in design mistakes, large cost variations in construction costs and legal disputes.

The California Professional Land Surveyor is professional licensed and trained in determining and reporting the accuracy of technical measurement equipment used to measure critical infrastructure, topography, and real property lines. The land surveying community has been using measurement technology, namely GPS, since the late 1980s. They have very specific training in reporting error analysis.

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To protect the public, contractors, architects, and engineers there is a need to quantify and certify to the accuracy of the measurement work. This has become much more urgent with the passage of California Senate Bill 865 – which mandates the mapping of underground utilities after January 1, 2023.

The Measurement Market Place

In the measurement world, what separates the Professional Land Surveyors (“PLS”) from the other participants (i.e. the construction contractors, GIS technicians, the drone operators, the terrestrial LiDAR operators)? Market share. The PLS has vastly less market share than any of the other participants – this will remain a fact until the end of time.

The measurement technology has allowed the unlicensed people to readily perform work that has traditionally been under the purview of the licensed land surveyor. The geospatial marketplace will continue to grow exponentially – certainly, there is an ongoing demand for three-dimension digital data. There is a need to quantify the quality of the digital measurement data. Therein rests the perpetuation of the profession and the opportunities for the California Professional Land Surveyor. The very real threat facing the land surveying profession is deregulation. Outside of the establishment of real property boundaries, writing legal descriptions and subdivision mapping the market is moving on without the land surveyors. Reread the first paragraph – the argument the PLS licensure process protects the public rings hollow and is simply no longer true in many instances. As stated, the numerical majority of digital measurement equipment is used by “others” and few PLSs can point to specific examples of public harm (i.e. structural failure, damages due to failure to meet measurement standards, the use of faulty work product etc.). The PLS is relatively insignificant to the measurement process and this is final unless the community can make the appeal a stated accuracy is important. Not convinced? Kiewit Corp. (“Kiewit”) self-performed a large percent of their “survey” work on the California 405 without a PLS. There were estimates of the unlicensed work completed exceeded \$10 million dollars. To give the readers a sense of the project scale, the Kiewit received a \$300 million dollar, above the original project budget, change order to resolve their lawsuit. In the end, a land surveying firm “verified” the completed surface structure [tongue firmly in cheek] using mobile mapping LiDAR and ultimately, Caltrans took delivery from LA Metro. The Board for Professional Engineers, Land

Surveyors and Geologist (“BPELSG”) issued two fines totaling \$10,000 – although the maximum fines, this amount equates to the cost of paying a land surveying firm for less than a week of fieldwork. Who thinks Kiewit will engage a team of licensed surveyors for their next \$500 million dollar project?

Many land surveying expert witnesses have been engaged in lawsuits that involved contractors staking their own structures. When a mistake happens, the parties posture, countersue, perform the legal gyrations, write the check, and continue on their way. The contractors save millions in land surveying costs and the mistakes are absorbed. The financial incentives to self-performing has permanently displaced the land surveying profession. Side note, the signatory contractors simply have a union “surveyor” dispatched to perform the work. Local 12’s position is it is not their job to enforce California licensure laws. In fact, it may still be true, Local 12 will dispatch their “surveyors” to the contractors for less cost than charged to professional service firms. The PLS has lost their footing in the precise measurement market and thereby, surrendered their relevancy in the marketplace.

How does the PLS Community Assert Their Relevancy?

It is in the best interest of the land surveying profession, their clients, the other measurement participants, and the public to determine the quality of the measurements and the resulting spatial data. In the simplest form, this is certifying, by signature and seal, the qualifying and quantifying the accuracy of the data. This determination necessarily demands the PLS community to develop their understandings of errors, mistakes, precision, accuracy (relative and absolute), and the selection of equipment and procedures to achieve the desired results. What makes this technical knowledge and resulting certification of value? Written accuracy specifications and ultimately, the liability of certifying to having met the specifications. The licensed professional community must embrace and manage the liability associated with certifying to the accuracy specifications. In short, no liability, no professional status. Therein rests the relevance and the value to those outside of the licensed professional community using the measurement technology.

The PLS community cannot legislate the use or prohibition of the measurement tools. It has been said “you do not make rules for tools”. To discuss the regulations or enforcement as to who can do what with which equipment is a nonstarter and a waste of

time. It is common place to have contractors use a RTN GPS system to locate the land surveyor's construction stakes and use the saved stake locations to avoid re-staking costs. A violation of the Professional Land Surveyors' Act? Good luck with that argument.

The PLS has a unique legal authority already in the law that is not being utilized to protect the public from measurement harm. The California Business and Professions Code section 8726 defines the practice of land surveying. Specifically, section 8726, in pertinent part, states:

A person, including any person employed by the state or by a city, county, or city and county within the state, practices land surveying within the meaning of this chapter who, either in a public or private capacity, does or offers to do any one or more of the following:

(a) Locates, relocates, establishes, reestablishes, or retraces the alignment or elevation for any of the fixed works embraced within the practice of civil engineering, as described in Section 6731.

...

(f) Geodetic or cadastral surveying. As used in this chapter, geodetic surveying means performing surveys, in which account is taken of the figure and size of the earth to determine or predetermine the horizontal or vertical positions of fixed objects thereon or related thereto, geodetic control points, monuments, or stations for use in the practice of land surveying or for stating the position of fixed objects, geodetic control points, monuments, or stations by California Coordinate System coordinates.

(g) Determines the information shown or to be shown on any map or document prepared or furnished in connection with any one or more of the functions described in subdivisions (a), (b), (c), (d), (e), and (f).

(h) Indicates, in any capacity or in any manner, by the use of the title "land surveyor" or by any other title or by any other representation that he or she practices or offers to practice land surveying in any of its branches.

...

(k) Coordinates the work of professional, technical, or special consultants in connection with the activities authorized by this chapter.

...

(m) Creates, prepares, or modifies electronic or computerized data in the performance of the activities described in subdivisions (a), (b), (c), (d), (e), (f), (k), and (l).

(n) Renders a statement regarding the accuracy of maps or measured survey data.

[emphasis added]

The Professional Engineers have a similar authority to provide accuracy statements.

The California professional community is technically ready to capture the market for accuracy statements – with training and the adaptations of accuracy statements in the existing work product (exclusive to field measurements) the community could position themselves between the end users, the clients, and the other measurement equipment users. Recent legislation requiring the mapping of underground utility locations demands accuracy to protect the public from harm.

Based on several CLSA Chapters voiced objections to accuracy statements, please be clear, these proposed accuracy statements only pertain to field measurements. This means legal descriptions, lot line adjustments, or any work product based on record data will not require accuracy statements.

As a progressive state with high value real estate it is curious that California is in the stone-age of technical surveying standards. Many states, namely Washington and Nevada come to mind, have had established accuracy standards for more than twenty-five years. The National Society of Professional Surveyors has adopted a nationally accepted accuracy standard and accompanying certification for the American Land Title Association's ("ALTA") minimum standard details dating back to 1997. Land surveyors performing ALTA surveys have been certifying to accuracy standards for over twenty (20) years.

The strategy is to implement the accuracy statements for current work product, effectively sharpening our skills, and begin to assist the public agencies to write accuracy

statements into their specifications. The alternative is to become further irrelevant and continue to lose market share. The California Professional Land Surveyor has to let their past project roles go, it is over, and move into a new role, the role of a professional that guides and manages unlicensed technical staff using measurement tools. The law recognizes and supports this professional role and the public using the geospatial data demands it. The only remaining question is whether it will be the licensed land surveyor providing the services.

The Opportunities

There are sizable opportunities on the horizon. Senate Bill 865 is currently on the Governor's desk and he is expected to sign it. This Senate Bill carves out, indirectly, a role for the PLS to determine the accuracy of the legally mandated requirements to locate underground utilities. History has shown us the market will move forward around the land surveyors – as was the case with GIS, stock ortho-photography/topography, drone topography, and construction grading and staking.

To prepare for these opportunities the professional firms have to understand the outdated business model of unlicensed field crews, especially those that function exclusively with designated field staff, needs to be phased out. In their stead, the trained and licensed (including the semi-professional LSIT) will work with the trades (i.e. carpenters, ironworkers, grade checkers) to supervise and train their staff to achieve the required project accuracies. The land surveyor's role will be professional certifications, not providing the daily labor. The efficient business model will necessarily include licensed staff that moves effortlessly between the office and the field. Conceivably, the business model will more closely follow a hybrid of project management and inspection. Anything less is to accept becoming more irrelevant and frankly, obsolete. The future fortunes of the profession will reside in the technical expertise and not labor hours. Traditionally, a firm was measured by the number of crews fielded – the presumption was the more field crews the more successful the firm. This has changed in recent years and will continue to change to the success of the firms will be measured by the number of licensees and more so, the number of licensees that can transition from the office to the field and back to the office on a regular basis.

Examples [added under separate cover]