

# A National Standard Record of Survey

by

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## Introduction

In 1991 I ran across a book entitled, *How to Lie with Maps* by Mark Monmonier<sup>1</sup>. I was immediately captivated by the name of this book, because, without even reading it or knowing its table of contents, it crystallized, in a single phrase, a long-standing impression of mine about our profession: the unfortunate number of practicing surveyors who are producing maps that lie to the public and betray our respected heritage.

Right after becoming licensed, it disappointed me to realize that certain surveyors are allowed to do get away with inferior boundary resolutions. How is it that some of the most important rules of boundary analysis could be openly broken on a map, then ignored by county or city surveyors who are charged with checking those maps?

This issue continued to bother me and eventually led to a series of articles<sup>2</sup> over the past few years that all had the same question: what can be done to prevent malpractice in our ranks that, while not widespread, is common enough to cast serious doubt about our professionalism and result in a serious disservice, if not injury, to the public?

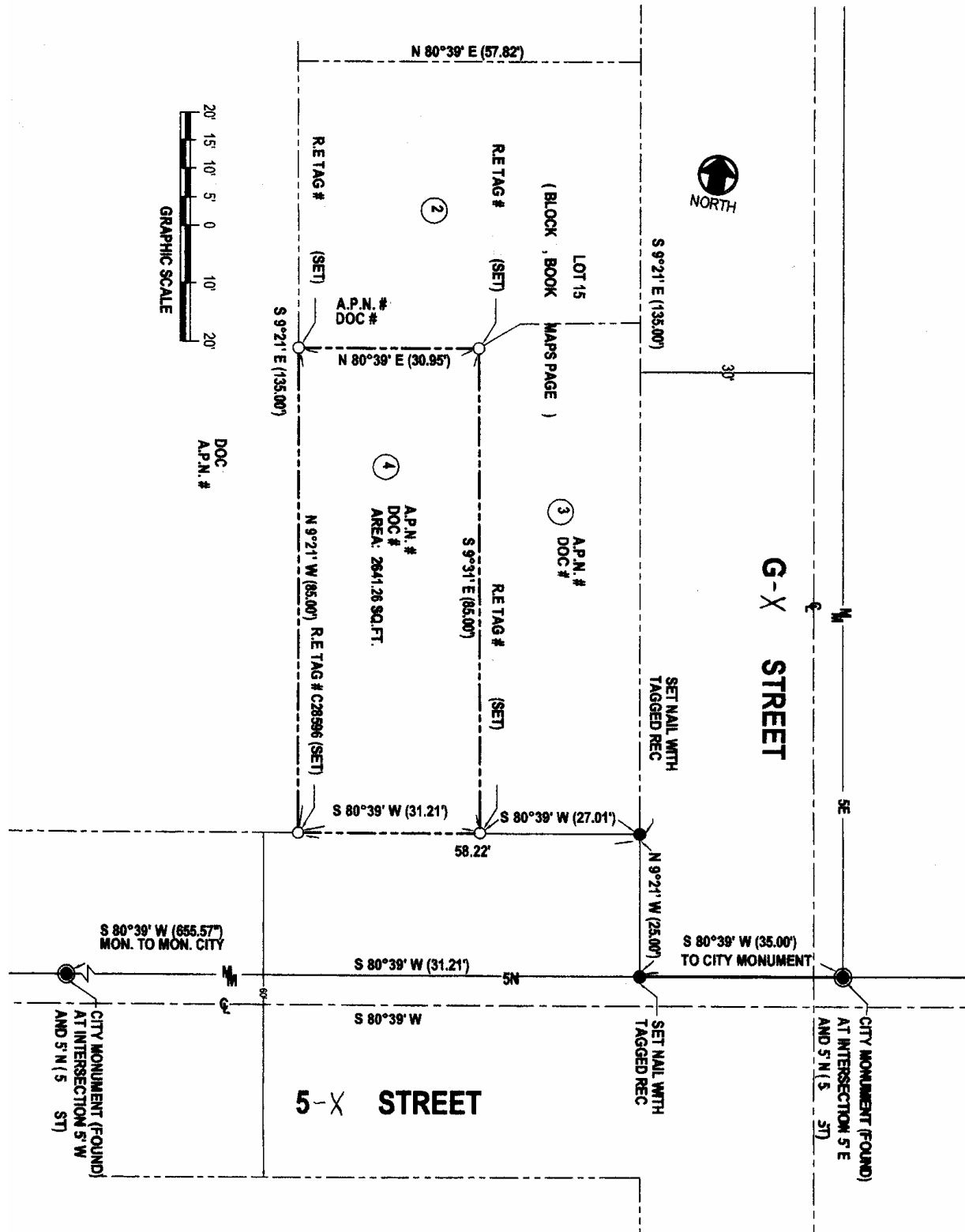
*How to Lie with Maps* deals with maps in the broadest sense and attempts to educate the public about how any map—due to the inherent need to selectively limit the data it presents—of necessity ends up telling many “little white lies” that we should be aware of as a consuming public. What I want to do is take that focus and apply it much more selectively to the maps that professional surveyors produce, and further still to the boundary resolutions that form the backbone of those maps. I will take an example map and critique it, and try to make the case that one of the best ways to try and discourage poor quality boundary surveys is to promote a national standard Record of Survey.

## Defective Boundary Maps

My recent articles spent more time building an argument for the prevalence of inferior maps—more time than I want to spend with this paper. I think the case has been made that there are too many examples of such maps; this paper will only examine one map for the sake of discussion.

Although I am licensed in six western states<sup>3</sup>, my work has been limited, primarily, to California, Nevada and Utah. Most of my work in California has been in the greater Sacramento Valley, but I have worked for five or six years in the San Francisco Bay Area, and it was in a Bay Area county that I recently came across the Record of Survey map that I want to discuss below. I obtained a full-sized copy of the map then had it scanned so that I could delete any references that would indicate who prepared it, or checked it, and where the subject parcel is situated. Only the mapping portion is reproduced for this discussion.

## Example Record of Survey



What first caught my attention with this map is that there were only two found monuments, one in the middle of the street intersection, and one in the street that runs to the west. While this doesn't automatically mean that there are problems with a map it does raise the possibility that it might have a weak boundary resolution.

The second thing I noticed is that the subject parcel (and its two neighbor parcels) was carved out of a lot from a block in an old subdivision, but the surveyor did not survey around the entire block. I knew that I had found my example map. How can you locate a modern lot inside an old subdivision block without locating the block first?

In my book this is impossible. First of all, in order to attempt to do that you have to make the assumption that the block still maintains its record shape and dimensions from the old map. Considering that the subdivision map was created in 1904, what are the odds that, if properly surveyed and broken down, the block would perfectly match the old map? Very slim, is my answer. The salient point here is that we don't even have the data to even begin to answer that question. This surveyor failed to survey the whole block.

This is a fatal shortcoming. It goes against accepted surveying practice that is hundreds of years old. This surveyor has used two street monuments to calculate his or her way over to the subject parcel and set new monuments at the calculated, record positions for the four corners of the client's property.

This flies in the face of court precedent and standard practice as explained in numerous, respected surveying texts. Standard practice would dictate the need, **first of all**, to locate the boundaries of the entire block, then, **second**, after determining whether or not there is an excess or insufficiency of distance going around the block (compared to the record distances shown on the subdivision map) to use proration as a way to determine the position of the old corner lot that the three modern parcels were created from? Then, **third**, once you have the old lot boundary determined, doesn't that finally put you in a position to use the principles of sequential conveyances to locate the boundaries of the subject parcel, and the two neighbor parcels that are inside the old lot?

Isn't it almost always the case that old subdivision blocks turn out to have dimensions that disagree with the original map? My experience has shown that, in 9 out of 10 cases, this is true. And, in general, the older the subdivision survey, the greater the chance that modern dimensions will disagree with it.

### The Parcel Matrix

I have previously put forward the idea of a "parcel matrix" that defines the unique characteristics of any particular lot and historical development of the parcels that surround it. The task in any boundary survey is to determine how many lots make up the matrix, then conduct enough research, and uncover enough field evidence to allow one to analyze the entire matrix. Only after that is done can the subject parcel be confidently located. Each situation is different. Each parcel is different. The concept of any given parcel being an integral part of a matrix of related parcels, provides a

framework for how to think about approaching a boundary survey. It is the rare exception that we get to survey a lot that is an island unto itself.

This example map does absolutely nothing to investigate any evidence that would bear on the locations of the other three streets that form the boundaries of the block. In fact, from this Record of Survey alone, we do not even know if it is a typical, rectangular block bounded by four streets. (It is, by the way). Are there any other centerline monuments that fix any of the other three streets? If not, are there any right of way monuments that could be used to establish the centerlines? What about street monuments in the next blocks going out in each direction? Couldn't they be used to establish the three missing intersections, which would then allow for the block in question to be established?

And, if there were absolutely no other monuments of any kind around the block, or around neighboring blocks in the same subdivision—a highly unlikely scenario—wouldn't the final option be to locate and split the improvements as a means for fixing the block boundaries?

Not on this map. Only one street was established by any of the above methods.

And how was the only other street shown established? The surveyor doesn't say so, but, since the bearings shown are exactly ninety degrees apart, one is left to assume that he or she used the record angle shown on the old tract map as the justification for fixing the bearing of the other street.

If only that were true.

As it turns out the old tract map clearly shows that the block is all squared up at ninety degrees at the far, opposite end, and that all the lots are squared up to each other, all the way east, **except for the final two lots**—the two lots that border on G-X Street. Why? Because G-X Street is **not** at ninety degrees to 5-X Street! It falls 10 minutes short of being ninety degrees to 5-X Street. All the north-south lot lines for the entire block are shown with the bearing, N 9°21' W. But the bearing for G-X Street is N 9°31' W. This is clearly shown on the map. It is also clearly acknowledged by the three modern deeds in question. Even the Assessor's Map shows the 10 minute difference. All the basic documents easily available to the surveyor were in agreement on this point, and yet somehow the surveyor either failed to grasp this key feature of the block, or inexplicably chose to ignore it and calculate the position of the modern lots as if the entire block was square and at ninety degrees all the way around.

How could this surveyor miss all the record evidence to the contrary? I can't help but think that there is a clue in the surveyor's use of parentheses to embrace record information. Only distances are embraced with parentheses—not bearings. One is left to wonder, or assume, what the record bearings would be in the three deeds or on the original map. Is it possible that this surveyor thinks that distances are always paramount to bearings? That distances need to be held at all costs? That distances in the modern deeds even take precedence to the fact that the block was not square to begin with?

Another mistake is that, using the bearings and distances shown on the Record of Survey, the adjoining Parcel 3 does not close by 0.25 of a foot. However, using the courses from the deed for Parcel 3, it does close. Is this the reason why the surveyor chose not to annotate three of the courses for Parcel 3? An example of lying by selectively failing to disclose conflicting information?

To add insult to injury, the document quoted for the subject parcel is incorrect. It is not the right document, rather it is a trust deed for another parcel on the other side of town. This surveyor fails to even correctly reference his own client's deed!

And there is yet another serious weakness with this map: what light would have been shed on the situation if evidence of occupation had been located and shown on the map in relation to the lot lines? It's hard to believe, in a tract that was created 101 years ago, in a large urban city, that there is no evidence of occupation along any of the eleven parcel lines shown on the map. It's always been my opinion that the importance of evaluating occupational evidence increases directly in relation to the lack of monumentation. Here we have no fences, or shrubbery, or building lines of any kind to ad evidence either way on the legitimacy of the resolved parcel lines.

Here, then, is a list of the major failings of this map:

1. The wrong deed was shown for the subject parcel.
2. The entire block was not surveyed.
3. The streets were held at ninety degrees, in conflict with the record map.
4. The block corner was erroneously located.
5. The neighbor parcel to the west does not close.
6. Evidence of occupation was not considered.
7. Junior-senior rights were not addressed.

Apparently, in this surveyor's mind, it was a whole lot easier, and quicker, and more profitable, to avoid all those pesky issues by simply forcing the block to be square and assuming that it still had record dimensions. After all, if the County Surveyor is unlikely to take you to task over any of the above issues—large or small—what have you got to loose?

The inescapable conclusion is that this map is a terrible disservice to the client who paid for it, the public in general and future surveyors that will now have to deal with all the ramifications of an incompetent survey. No one should be able to pass any state licensing test without having learned about the importance of junior-senior rights. And no one should be allowed to rise to the level of a county or city surveyor with a philosophy of map checking that would not include these principles as basic requirements for allowing a map to be recorded.

### Alternatives: How to Discourage or Prevent Bad Maps

The above map is not an isolated case. A cursory, 20-minute examination of other Record of Survey maps in this county, over only the past two years, turned up 7 other maps that were equally deficient. Haven't we all run across maps like these? The frequency will vary from region to region, but my research has shown that this is not an isolated problem. But the frequency is not as important as the fact that it is allowed to happen in the first place.

One of the results of my studies into this problem is that there are a lot of surveyors out there who are against taking any steps to enact new laws as a response.

A frequent cry was made that we already have enough laws, and we should not be campaigning for yet more laws to regulate surveyors.

Other surveyors suggested that, instead of new legislation, the best ways to attack the problem would be to:

- toughen the rules and guidelines of the various state boards of registration
- change the codes of ethics of the state boards and private survey organizations
- change licensing exams
- encourage surveyors to turn in other surveyors who do inferior work
- let the market place weed out bad practitioners

Anything besides changing the law.

My position is that we should attack the problem from every available avenue. I also believe that the law is the foundation for all of the above attempts to guide our profession and that it would be self-defeating to make other changes without bringing our state laws into conformance with the principles of good boundary resolution.

Good, defensible boundaries form the basis of almost every map that we produce. Even a topographic map is meaningless without a solid boundary to relate everything to. Boundaries are the historical *raison d'être* for surveying. How on earth can it be that the laws that we work under give such short shrift to the ingredients of a good boundary resolution?

In California, in the only two laws that govern boundary surveying in this state, surveyors are instructed to "...show the definite location of the subdivision, and particularly its relation to surrounding surveys..." and that a record of survey shall show "...the relationship to those portions of adjacent tracts, streets, or senior conveyances which have common lines with the survey." That is the sum total of laws regulating boundary resolutions in California—two sentences! There is no attempt to spell out the ingredients of a good boundary resolution.

This astounding brevity is an open door for some surveyors to find ways to minimize, or ignore altogether, what we have all learned must go into a competent boundary resolution. The fact is that certain surveyors have chosen to hide under this brevity, and that certain county and city surveyors use this same brevity to dodge the issue entirely and claim that it is not in their purview to challenge the resolutions shown on the maps they are entrusted to check. Checking a map, in many cases, boils down to simply looking for north arrows, reading the closure calculations and making sure that certificates are worded correctly.

I know this because I have talked to many surveyors who feel this way. I have also been told, repeatedly, by county and city surveyors, that their only obligation is to make sure that the adjoiner deeds and/or maps are referenced, and that it is not their problem to check to see if the surveyor has applied obvious, correct principles of boundary analysis.

This is inexcusable. Our laws should be changed to reflect good practice in this area. And it is no excuse to argue that boundary work "is more art than science" and that it is incapable of being spelled out into specific duties.

## Suggested Model Law

Last year I prepared an outline of the basic steps that should be taken in any boundary survey, from research to field work to the analysis and resolution. It was the first attempt that I am aware of to describe the boundary resolution process, and to frame it in a way that it could be placed into state law. Being a first attempt it is bound to be incomplete and would hope that others could find ways to improve upon it. But it is out there for all to think about and I encourage all surveyors to read it and consider its implications. (See Addendum 1.)

I firmly believe that it is time for the surveying community to stand up and take the steps necessary to remove the grey areas that lazy and incompetent surveyors use to their advantage, and to the public's detriment. Proper boundary surveying can, and should be, dealt with at all levels of our profession, by enacting tough laws which spell out what is expected of the private practitioner and which obligate county and city surveyors to check for proper analytical procedure as much as they do for spelling and the inclusion of north arrows.

I have researched all of the 50 states and believe me, California is typical in its brevity when it comes to what the laws dictate. Very few states are attempting to spell out what goes into a boundary survey. Texas is exceptional in this regard. They have recently strengthened their board rules (see Addendum 2), and they should be commended for it. One can only hope that other states will follow their lead. If they do, perhaps the day won't be too far off when we will see such language elevated from the level of board rules to state law.

## Boundary Statements: Added to all our maps?

I also believe that we do not have to wait for the tedious wheels of state legislatures to change the law in order to make a difference. We can take action ourselves, right now, to put the pressure on inadequate boundary surveyors by adopting a "Record of Survey Standard" that could be added to the 1999 ALTA/ACSM Standards.

The ALTA Standards, like state laws and regulations, fall far short of an adequate description of what constitutes a good boundary analysis. The suggested model law in Addendum 1 could be added to the ALTA Standards, and surveyors across the country could voluntarily chose to place a note on their Records of Survey indicating that their boundary work was performed in compliance with those principles. The title block of the map could read: "ALTA/ACSM Record of Survey." Then, along with a Basis of Bearings and a Statement of Purpose we could a new type of statement:

### *Boundary Statement*

The boundary analysis and resolution shown on this map conforms to the principles and standards of an ALTA/ACSM Record of Survey as outlined in the 1999 ALTA/ACSM Standards.

A formal statement like this would go a long way toward adding credence to the most important aspect of the maps that we produce—the boundary. And it raise the bar for our mapping products and put pressure on surveyors to get serious about following accepted industry standards in their work.

This is an approach that could be implemented sooner, rather than later. If we have any respect for the most important function that we perform we should begin taking steps toward insuring that those people that we allow to become licensed are made cognizant, at every level of our profession, that good boundary work is not just encouraged, but fully expected...and yes, even legislated. How can we do otherwise?

### Notes and Citations

1. Mark Monmonier, *How to Lie with Maps* (The University of Chicago Press, 1996.)
2. Hixson, R. Lee, *When Good Intentions Fail*, Professional Surveyor, August, 2002.  
Hixson, R. Lee, *Creating a National Standard Record of Survey*, Surveying and Land Information Science, Vol. 63, No. 2, 2003, pp. 123-128.  
Hixson, R. Lee, *Proposed: an ALTA/ACSM Record of Survey*, P.O.B., December, 2003.
3. R. Lee Hixson, PLS is licensed in California, Nevada, Oregon, Utah, Idaho and Wyoming.

### Addendum 1

(What follows is a proposed outline and description of the basic procedures and principles that should be followed when performing a boundary resolution. Something like this could be included in the ALTA/ACSM Standards, in statements of professional ethics, as part of the Board Rules of a state, in the NSPS model law and even in state statutes. It is time we put a stop to the notion that boundary resolution is incapable of being explicated, much less codified into state law. I encourage others to improve upon this attempt)

#### A. Determination of the Type and Extent of the Boundary Survey

Boundary Resolution. The term “boundary resolution” shall refer to the entire process of analyzing all available, pertinent information relating to: a) the location of the boundary of a given subject parcel, b) the relationship of that boundary to the matrix of parcels (and/or rights-of-way) that surround it, and c) a determination of whether or not there exists any inconsistencies or incompatibilities in any of the boundaries so located.

Parcel Matrix. A “parcel matrix” varies in nature from state to state and region to region and is unique for each neighborhood of parcels. It is defined as that cluster of parcels surrounding the

subject parcel being surveyed, which extends far enough in all directions to take into account the history of parcel divisions in that area, the type(s) of divisions that lead to the creation of the subject parcel (simultaneous, sequential, or a combination of both), and, once understood, allows for a proper and complete plan for field work and office analysis that will allow for a resolution of the subject parcel boundary. This may require extending the survey and analysis to include only one additional parcel in each direction, if for example, the subject parcel and all the immediate surrounding parcels were created simultaneously. But in all cases, at minimum, the subject parcel and all adjacent parcels (or rights of way, etc.) must be included if the surveyor is to determine the presence of any gaps or overlaps in record information.

For a successful and cost effective field survey, it is critical to conduct a preliminary deed investigation to determine what basic type of deed situation exists within the parcel matrix being surveyed: is it GLO public lands/cadastral, lot & block subdivision, sequential metes & bounds or a combination of these? The surveyor shall assess how many parcels need to be included in the boundary resolution process in order to make sense of the parcel matrix in question. At minimum this will include the subject parcel and every bounding parcel that adjoins it. However, circumstances may require that the research, the field survey and the analysis be extended to additional parcels, beyond those that are immediately adjacent to the subject parcel.

Additionally, circumstances may also require that a chain of title search be performed on one or more of the parcels in the matrix, in order to settle any junior/senior rights issues.

In the case of a Record of Survey it is recognized that, depending on the wishes of the clients and the judgment of the surveyor, not all of the boundary lines of the subject parcel need be surveyed. The extent of the matrix may be adjusted accordingly. However, in all cases, the analysis needs to be sufficient to insure that no other parcel is being adversely affected by the location of a particular line.

## B. Information Gathering

All of the following types of record and non-record information should be considered, obtained and analyzed in the process of resolving the boundary of any parcel:

### 1. Record Information

All record information relating to the boundary survey should be obtained. This should include, at minimum, the current vesting deeds for the subject parcel and all surrounding parcels. However,

depending on the situation, it may also be necessary to obtain the vesting deeds for additional parcels in order to understand the proper relationships of all the parcels in the area in question. In addition all record maps that have any bearing on the location of the subject parcel—or the parcels adjoining the subject parcel—should be obtained and analyzed.

## 2. Non-record Information

All non-record information for the subject parcel and surrounding parcels shall be obtained. This may include, but not be limited to, such information as: railway maps or deeds, highway maps or deeds, GLO maps and field notes, county and/or city maps and improvement plans, easement deeds, the testimony and opinion of the owners of property in the area (or any other person with pertinent knowledge about boundaries or monuments), utility company maps and documents, and any unrecorded maps or other information on file at private survey or engineering offices. Such information will vary from one region to another and all reasonable efforts should be made to obtain as much useful information as possible.

## 3. Field Survey Information

All types of monuments, those of record and those not of record, shall be tied in the field, along with any lines of occupation such as fences, hedges, structures or roads. Such information shall be collected for the subject parcel and all contiguous, surrounding parcels and, depending on the circumstances, other nearby parcels as well. The distance that the survey shall extend beyond the subject parcel (and the adjoining parcels) will vary depending on the number and quality of the monumentation found in the field, and also upon the nature of the legal descriptions in question (lot & block vs. metes and bounds for example).

## C. Analysis and Resolution

A boundary resolution is the analysis of all of the above information such that the surveyor can determine the location of each property line defining the subject parcel in its proper location relative to the parcels surrounding it. The surveyor shall determine what survey principals and what legal principals are pertinent to the survey in question and then perform all calculations and analysis necessary to properly apply those principals to the survey at hand.

The resolution process must necessarily take into account the boundaries of all abutting parcels, such that a determination can be

made that there either are, or are not, any discrepancies along any of the boundary lines in question. All sources of errors and inconsistencies should be considered, between deeds, maps, monuments or lines of occupation. Any discrepancies that are found shall be clearly and plainly described on the map being recorded, along with documentation and references that explain the reasons for the discrepancies, and, whenever possible, the surveyor's solution to the problem. To this end, efforts shall be made to reconcile such discrepancies by whatever means are legally available to the surveyor. This may include correction deeds, Lot Line Adjustments, Quit Claims, Quiet Title and cooperation with other surveyors who have worked in the area to resolve any differences between their surveys.

To make it clear to those who will examine the map in the future, the surveyor shall either 1) place a written statement on the plat which explains the resolution; or 2) show sufficient notes and comments, together with angles, bearings and distances (record vs. measured) on the map portion of the plat, or 3) a combination of both. The intent shall be to remove any doubt about how the surveyor arrived at the resolution shown on the map.

## Addendum 2

(From the Texas General Rules of Procedures and Practices for surveyors.)

### **§663.16. Boundary Construction.**

(a) When delineating a property or boundary line as an integral portion of a survey, the surveyor shall respect junior/senior property rights, footsteps of the original surveyor, intent of the parties involved, the proper application of the rules of dignity or the priority of calls, and applicable statutory and case law of Texas.

(b) Appropriate deeds and/or other documents including those for adjoining parcels shall be relied upon for the location of the boundaries of the subject parcel(s).

(c) A land surveyor assuming the responsibility of performing a land survey also assumes the responsibility for such research of adequate thoroughness to support the determination of the location of intended boundaries of the land parcel surveyed. The surveyor may rely on record data related to the determination of boundaries furnished for the registrants' use by a qualified provider, provided the registrant

reasonably believes such data to be sufficient and notes, references, or credits the documentation by which it is furnished.

(d) All boundaries shall be connected to identifiable physical monuments related to corners of record dignity. In the absence of such monumentation the surveyor's opinion of the boundary location shall be supported by other appropriate physical evidence which shall be explained in a surveyor's report.