

BUREAU OF LAND MANAGEMENT

Controlling Intermediate Monuments

With Jim Clafin

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CADASTRAL SURVEY

Controlling Intermediate Monuments

Jim Claflin is going to talk about Controlling Intermediate Monuments with a special emphasis on how witness corners and line trees are covered in this edition of the Manual.

In this session, we are going to talk about controlling intermediate monuments and how we evaluate them and how we use them to restore quarter and section corners. So we can see in this slide what are they? They are line trees, witness points, they are witness corners, which we are going to talk about in depth. They can be meander corners, which are set at the high water mark or the meander line of a body of water, a river or lake.

They can be special meander corners, which are established, on some division of section lines where they intersect adjusted meander lines. They can also be auxiliary meander corners. I think we can also look and see that continuing that they can be closing corners, crossing closing corners, angle points which we find in parcels and tracts and other areas that are non rectangular within the PLSS system.

Intermediate monuments could also be lot corners or even 1/16th corners which we are going to show an example and lastly they can be mileposts which are established on boundaries of reservations and states and even international boundaries. The thing to remember with controlling intermediate monuments is that if they are evaluated and used to reestablish quarter corners and section corners, they can control alignment, restoration and the establishment of a corner.

Let us talk a little about line trees. There has been policy developed over the years to deal with line trees and this slide talks about a Washington Office memo which talks about line trees. Under the law, a definitely identified line tree with distinguishable marks is a monument of the original survey so we are giving this line tree if it can be conclusively identified the same weight as we would a section corner or quarter corner of the original survey. A point to be made here is that the line tree is used for section alignment as a control point in the reestablishment of a lost corner and an establishment of minor subdivision corners.

Another controlling intermediate monument which we want to explore is the witness corner. The witness corner has been the subject of much policy and has been one of the more confusing corners which we as surveyors have to deal with when reestablishing a true point for a PLSS corner. What are they? A witness corners is not the corner point but a witness to the true point for the corner. The point that we want to make here is that the corner point being witnessed is

recovered when the witness corner is recovered.

So without the witness corner, you certainly do not have the corner point. When are they used? Witness corners are used when you physically cannot establish the true point for a section or a quarter corner or sixteenth corner. It has been our policy in the past 20 years to try to move away from witness corners and use reference monuments as often as possible.

We can use a reference monument when we can place something physical at the true point and we strongly encourage our surveyors to try to get some physical monumentation at the true point and then use reference monuments. Witness corners are not witness points. Witness points are normally used on a surveyed line when we exceed 40 chains without some type of monumentation, so try not to confuse witness corners with witness points.

What are the basic rules for reestablishing a corner when we encountered a witness point or witness corner? Corners that are normally reestablished by double proportionate measurement will be determined by extending the line through the witness corner at record distance. I have an example here of a couple of witness corners which were set during a resurvey.

As you can see, the corner of section 1, 2, 11 and 12 the true point could not be established, so a witness corner was set South 0 degrees 36 minutes West on the section line between 11 and 12, 2.46 chains from the true point. If you study our resurvey plats, the bearing and distance is always from the true point to the witness corner.

In this case, if you were doing a survey in this area and you needed to establish that position, you would project the line from your control to the south. In this case happens to be a witness corner to the one-quarter section corner of 11 and 12, up the section line, through the witness corner to the section corner and project that line, the 2.46 chains to reestablish that point. This is a corner, which would normally be double proportioned so our policy is to project line through to reestablish this point.

In our next situation, we have a corner which is normally reestablished by single proportionate measurement; it is going to be determined by a proportionate between the witness corner and the opposite controlling corner. So let us go back to those example and look at the quarter corner between sections 11 and 12. As you can see the witness corner is set on the section line North 0 degrees 36 minutes east, 1 chain from the true point for the corner of 11 and 12. So that means we would have to proportion that position to the nearest controlling corner to the south.

In this case, we have established a south 16th during the course of the resurvey. So this actually provides us with a good example of a controlling intermediate monument where you would use a 16th corner as a controlling intermediate monument to reestablish this quarter corner position and that would be proportioned based on your retracement distance and the record which is 20.57

chains distance to the true point and an additional chain to the witness corner. The last situation that we have with the witness corners is a witness corner that is set off line.

In this slide you can see that witness corners that are determined from an off line witness corner will normally be reestablished by record bearing and distance. Off line witness corners are normally treated like a reference monument, a bearing tree, or a bearing object. In this last example, we show the West 1/16th between section 30 and 31, which for some reason we were not able to monument the true position, so there was a witness corner placed East 1 chain.

In this situation, you would use the witness corner and go due East 1 chain to reestablish or to determine the position for the 16th corner. Just a caution, make sure that when you are doing these types of restorations and determining these positions that you are on our bearings, you are not working on an assumed bearing. That you are actually working in an astronomic or geodetic bearing and on our basis of bearing.

As a recap to our section on controlling intermediate monuments, we have seen that there are quite a few points along the line that can be used and evaluated to restore quarter corners and section corners. We take a pretty detailed look at witness corners and our policies, our current policies on how we deal with witness corners and also line trees and how they are dealt with.

The next edition of the Manual does a good job of discussing controlling intermediate monuments and offering you the guidance on what to do when you encounter this situation. I would encourage you to review Chapter 6 of the Manual for Controlling Intermediate Monuments.



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