

Question #1

What is typically a common source of online research in a boundary survey?:

- a) NGS Datasheet Web-Site
- b) BLM Web-Site
- c) County Surveyor Online Map Index
- d) County Land Use GIS Online Map

Question #2

What boundary survey information may be shown on a tax assessor map for a parcel with a metes and bounds land description?:

- a) Location of property corner monuments.
- b) Gaps and overlaps in deed descriptions.
- c) Parcel chain-of-title.
- d) Bearings and distances around parcel boundaries.

Question #3

A boundary retracement survey map will typically show what two elements?:

- a) Tax assessor parcel numbers and found property corner monuments.
- b) Parcel areas and found property corner monuments.
- c) Owner names and title report exceptions.
- d) Tax assessor parcel number and title report exceptions.

Question #4

After a total station has been course leveled on a tripod, the next step in the typical set-up procedure is:

- a) Center the instrument over the control point monument.
- b) Set the backsight at zero.
- c) Fine level the instrument.
- d) Run the auto-compensator calibration.

Question #5

A GNSS baseline that forms a redundant tie in a closed loop of baselines is called a:

- a) A redundant baseline.



- b) An independent baseline.
- c) An independent closing tie.
- d) A double-difference baseline.

Question #6

A typical source of blunders in a GNSS control survey would be:

- a) A 1-foot bust recording and instrument height.
- b) Multipath from buildings or trees.
- c) Satellite clock error.
- d) Poor satellite configuration.

Question #7

What time of GNSS vectors are post-processed after a field survey:

- a) Real-time kinematic vectors.
- b) Real time network vectors.
- c) Fast static baseline vectors.
- d) Precise Point Positioning vectors.

Question #8

A slope stake is placed based on which combination?:

- a) A design elevation and station/offset from centerline.
- b) A horizontal offset from centerline and a design elevation.
- c) The elevations of existing topography and a design slope.
- d) The elevations of existing topography and a horizontal offset from centerline.

Question #9

Dimensions of building pads at the finished floor level are typically shown on:

- a) The civil engineering plans and architectural plans.
- b) The architectural plans and the underground utility plans.
- c) The landscaping plans and the underground utility plans.
- d) The structural engineering plans and the underground utility plans.

Question #10

What combination of information is typically recorded in field notes for a total station traverse for each instrument set-up:



Land Surveyor Training

Prepared By Landon Blake
Problem Set 100

- a) Instrument Height, Rod Height, Angle-of-Deflection, and Change-In-Elevation.
- b) Instrument Height, Rod Height, Prism Constant and Angle-of-Deflection.
- c) Angle-of-Deflection, Change-in-Elevation, Slope Distance and Vertical Angle.
- d) Instrument Height, Rod Height, Slope Distance, Horizontal Angle and Zenith Angle.

For Questions #10 to #16 refer to Exhibit #1.

Exhibit #1 shows existing topography using a cross-section taken from a surface model created with a UAV and surveyed aerial targets. It also shows a proposed building pad.

Question #11

If the proposed pad elevation is 29.4 feet, how far back is the left-side catch point of the pad from existing ground hinge point?:

- a) 0.2 Feet
- b) 1.0 Feet
- c) 3.0 Feet
- d) 3.8 Feet

Question #12

If the proposed pad elevation is 29.4 feet, what is the deepest fill that would need to be marked on a stake for the pad? (Assume a stake is placed at each major grade break on the existing topography):

- a) 1.4 Feet
- b) 2.8 Feet
- c) 5.4 Feet
- d) 10.2 Feet

Question #13

The steepness of which slope face controls the length of the pad slope on the right side of the pad?:

- a) GB1 to GB2
- b) GB2 to GB3
- c) GB4 to GB5
- d) GB5 to GB6

Question #14

The use of a UAV to determine elevations of existing topography could greatly expand the potential fill volume



of the building pad. Which grade break elevation is the most critical in determining the shape and volume of the building pad?:

- a) GB1
- b) GB2
- c) GB5
- d) GB6

Question #15

A swale with rip-rap armor would mostly likely be found at which location?

- a) At GB6.
- b) At GB5.
- c) At the left side catch point of the building pad.
- d) At the right side catch point of the building pad.

Question #16

The design for the building pad calls for 1.0' feet of crushed gravel as a base below a minimum cap of 1.0' of native earth fill. Between which two points will the building pad as design be unable to fit this requirement?

- a) Between GB2 and GB3.
- b) Between GB3 and GB4.
- c) Between GB4 and GB5.
- d) Between GB5 and GB6.

For Questions #17 to #20 refer to Exhibit #2.

Exhibit #2 shows the proposed route of an access easement to benefit the Lands of Blake and the Lands of Arceo. The easement will run from Red Oak Road and will end at the north property line of the Lands of Arceo. The easement will be 30 feet wide. It is not to encumber the Lands of Cazares or the Lands of Dixson. You need to write a strip land description for the access easement so easement deeds can be prepared from Cano, Lee, and Palacio to Blake and Arceo.

Question #17

Which of the following is the best description of the control line and width of the access easement strip?

- a) "Being a strip lying 15' on each side of the following described line:"
- b) "Being a strip of land lying 30' on each side of the following described line:"
- c) "Being a strip of land lying 15' on either side of the following described line:"
- d) "Being a strip of land lying 30' on the left side of the following described line:"



Question #18

What is the best description of the point-of-beginning for the control line of the strip description?

- a) "Beginning at a point on the southwest corner of the lands of Dixon..."
- b) "Beginning at a point that bears South 01-10-00 West of the northeast corner of Parcel B of Parcel Map 10-125..."
- c) "Beginning at the north line of Red Oak Road..."
- d) "Beginning at the southeast corner of Parcel B of Parcel Map 10-125..."

Question #19

What is the best course for the leg of the strip that runs along the east line of the Lands of Blake?

- a) "Then due south along the Lands of Blake 200' to the Lands of Arceo..."
- b) "Then South 01-15-15 West 200' along the east line of the Lands Of Blake to the Lands of Arceo..."
- c) "Then South 00-00-00 East 200' along the east line of the Lands Of Blake to the Lands of Arceo..."
- d) "Then North 01-15-15 West 200' to the point of termination."

Question #20

What is the best description for the courses of the access easement strip that run along the dividing line between the Lands of Cano and the Lands of Cazares?

- a) "Then due north from the Lands of Lee to the north line of the Lands of Cano..."
- b) "Then along the centerline of Red Oak Creek in a generally northern direction to the north line of the Lands of Cano..."
- c) "Then in a generally northern direction to the north line of the Lands of Cano..."
- d) "Then meandering a creek to a point that bears North 89-55-00 West 320' from the northwest corner of the Lands of Cano..."



Land Surveyor Training

Prepared By Landon Blake
Problem Set 100

Question #1

C

Question #2

D

Question #3

B

Question #4

A

Question #5

B

Question #6

A

Question #7

C

Question #8

C

Question #9

A

Question #10

D

Question #11

B

Question #12

C

Question #13

C

Question #14

D

Question #15

C



Land Surveyor Training

Prepared By Landon Blake
Problem Set 100

Question #16

A

Question #17

D

Question #18

D

Question #19

B

Question #20

B



Land Surveyor Training

Prepared By Landon Blake
Problem Set 100

Question #1

Subject areas tested by this question:

- Boundary surveying.
- Land records research.

Comments on the correct answer:

- In the United States most survey land records are maintained at the county level by the county surveyor.
- Most county surveyors have an online map index that shows the footprint of field survey maps on a basemap layer.

Comments on the wrong answers:

- NGS datasheets are used for geodetic control surveys, not boundary surveys (as a general rule).
- The BLM web-site can be used to obtain land records related to surveys in the Public Land Survey System, but that is not needed for boundary surveys in areas outside of the Public Land Survey System.
- Land use is not directly related to boundary surveying, but to land use planning.

Question #2

Subject areas tested by this question:

- Boundary surveying.
- Land records research.

Comments on the correct answer:

- In many places in the United States the tax assessor will use bearings and distances in a metes and bounds land description to create parcel geometry for the tax assessor map. They will then (sometimes) show these bearings and distances on the tax assessor maps.

Comments on the wrong answers:

- County assessors don't track gaps and overlaps in land descriptions of deeds.
- County assessors don't track chain-of-title. Chain-of-title requires searching the grantor/grantee index at a clerk and recorder or the use of a land title plant.
- County assessors don't typically track and show the placement of survey monuments. In rare cases, a tax assessor map may show major property corners, like PLSS section corners and quarter corners.

Question #3

Subject areas tested by this question:

- Boundary surveying.
- Survey work products.

Comments on the correct answer:

- A boundary retracement map will almost always show parcel areas and found property corner monuments. In special situations of uncertainty, a surveyor might exclude parcel areas. Found property corner monuments should be shown on any boundary retracement map.

Comments on the wrong answers:

- Tax assessor parcel numbers are helpful information on a boundary retracement map, but aren't usually



Land Surveyor Training

Prepared By Landon Blake
Problem Set 100

required or shown.

- Owner names may be shown on a boundary retracement map, but land title report exceptions are usually shown on a land title survey. (Many boundary retracement surveys don't map easements at all, unless requested by the client.)

Question #4

Subject areas tested by this question:

- Surveying equipment.
- Field surveying procedures.

Comments on the correct answer:

- After course leveling the tripod, the total station needs to be centered over the point before it is fine leveled.

Comments on the wrong answers:

- You shouldn't set the backsight until the instrument has been fine leveled.
- As a general rule shouldn't run any type of instrument calibration until the instrument is centered over the point and fine leveled.

Question #5

Subject areas tested by this question:

- Surveying equipment.
- Field surveying procedures.

Comments on the correct answer:

- An independent GNSS static baseline is one that duplicates an existing baseline in a 3-leg loop. The existing 3 baselines are called *dependent baselines*. An independent baseline is "independent" because it is not need to calculate point coordinates and can serve as a check on those coordinates as a redundant measurement.

Comments on the wrong answers:

- Double differencing is a technique used in the actual processing of static GNSS baselines.

Question #6

Subject areas tested by this question:

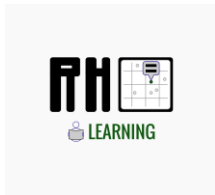
- Error analysis and adjustment.
- Geodetic control surveys.

Comments on the correct answer:

- A 1-foot bust is not a small error. It is a mistake, or blunder.

Comments on the wrong answers:

- Multipath from trees or buildings typically creates small errors and can't always be eliminated from a survey.
- Satellite clock error is typically small and accounted for in processing of GNSS data.
- A poor satellite configuration would typically result in a small error and can't always be eliminated from a



survey.

Land Surveyor Training

Prepared By Landon Blake
Problem Set 100

Question #7

Subject areas tested by this question:

- Surveying equipment.
- Field surveying procedures.

Comments on the correct answer:

- Fast static baselines must be post-processed using software before they provide accurate location data.

Comments on the wrong answers:

- Real time kinematic vectors and real time network vectors provide accurate location data at the time of the field survey.
- Precise point positioning doesn't use vectors to calculate locations.

Question #8

Subject areas tested by this question:

- Construction surveying.
- Field surveying procedures.

Comments on the correct answer:

- The location of a slope stake is controlled by a slope and the elevation of the existing topography where the slope is staked. This is why it is called "slope staking".

Comments on the wrong answers:

- A position staked from a horizontal offset and a design elevation would be a form of point staking not slope staking.

Question #9

Subject areas tested by this question:

- Construction surveying.
- Construction plan reading and interpretation.

Comments on the correct answer:

- Building pad elevations are typically where the work of the civil engineer and architect interface. As a result, building pad elevations and footprints are typically shown on both sets of plans.

Comments on the wrong answers:

- Building pad elevations are not typically shown on underground utility plans and landscaping plans.

Question #10

Subject areas tested by this question:

- Surveying equipment.
- Field surveying procedures.



Comments on the correct answer:

- To calculate the geometry of a traverse you need to know the instrument height, rod height, slope distance, horizontal angle and zenith angle.

Comments on the wrong answers:

- Deflection angles aren't typically collected in a total station traverse.
- Total stations typically collect zenith angles not vertical angles.
- Surveyors typically record instrument heights, rod heights, and vertical angles which are used to calculate control point elevations in a traverse.
- The change in elevation is not typically recorded directly from the instrument. The change in elevation reported on the instrument is between the measuring center of the instrument and the center of the prism and isn't directly referenced to the control points on the ground.

Question #11

Subject areas tested by this question:

- Construction surveying.
- Slope staking.

Comments on the correct answer:

- The proposed building pad elevation is 1.4 feet above the elevation of the existing hinge point on the left side of the pad. The slope is a 3 to 1. The horizontal distance of the slope is this 4.2 feet. The left-side existing ground hinge point is 5.2 feet from the proposed left-side building pad hinge point. The catch point of the proposed building pad on the left side at this cross-section is thus 1.0 feet from the left-side existing ground hinge point.

Question #12

Subject areas tested by this question:

- Construction surveying.

Comments on the correct answer:

- The pad will be deepest over the lowest existing ground elevation.

Question #13

Subject areas tested by this question:

- Construction surveying.

Comments on the correct answer:

- As the slope from GB1 to GB2 gets steeper, the length of the right-side building pad slope gets shorter. As the slope from GB1 to GB2 gets shallower, the length of the right-side building pad slope gets longer.

Question #14

Subject areas tested by this question:

- Construction surveying.

Comments on the correct answer:

- If the elevation of GB5 is lower or the horizontal location moves to the right on the cross-section, the left-



side slope won't catch where intended and will run much farther to the left. This will greatly increase the shape and volume of the building pad.

Question #15

Subject areas tested by this question:

- Construction surveying.
- Site drainage.

Comments on the correct answer:

- Water will pond or pool at the right-side catch point of the proposed building pad. It will need to be drained or flowed away and erosion from the flow of water will need to be prevented.

Question #15

Subject areas tested by this question:

- Construction surveying.
- Earthwork.

Comments on the correct answer:

- The pad as designed is too shallow between GB4 and GB5 to meet the required fill spec.

Question #16

Subject areas tested by this question:

- Construction surveying.
- Site drainage.

Comments on the correct answer:

- Water will pond or pool at the right-side catch point of the proposed building pad. It will need to be drained or flowed away and erosion from the flow of water will need to be prevented.

Question #17

Subject areas tested by this question:

- Boundary surveying.
- Boundary design.
- Land descriptions (strip descriptions)

Comments on the correct answer:

- We want to create a 30' wide strip lying on the left side of the control line, which is the boundary lines common to Dixon, Cazares, Palacio, Lee and Cano.

Comments on the wrong answers:

- Answer A would encumber the lands of Dixon and Cazares.
- Answer B would create a 60 foot-wide strip.
- Answer C would create a 15-foot wide strip, not a 30' wide strip.

Question #18

Subject areas tested by this question:



Land Surveyor Training

Prepared By Landon Blake
Problem Set 100

- Boundary surveying.
- Boundary design.
- Land descriptions (strip descriptions)

Comments on the correct answer:

- We want a point of beginning that is easily identified and preferably on the lands we encumber with the easement. Answer D meets these requirements.

Comments on the wrong answers:

- Answer A is referenced to lands we don't encumber with the easement.
- Answer B uses only measurements (metes) and not an appropriate controlling call for the south line of Parcel B or the north line of Red Oak Road.
- Answer C defines only a line and not a point.

Question #19

Subject areas tested by this question:

- Boundary surveying.
- Boundary design.
- Land descriptions (strip descriptions).
- Basis-of-Bearings.

Comments on the correct answer:

- We want a course that holds the measured bearing and distance from our survey with the correct "along" call and the correct "to" call. Answer B meets these requirements.

Comments on the wrong answers:

- Answer A is uses a bearing on the wrong basis-of-bearing.
- Answer C uses a bearing on the wrong basis-of-bearing.
- Answer D has no "along" controlling call or "to" controlling call.

Question #20

Subject areas tested by this question:

- Boundary surveying.
- Boundary design.
- Land descriptions (strip descriptions)

Comments on the correct answer:

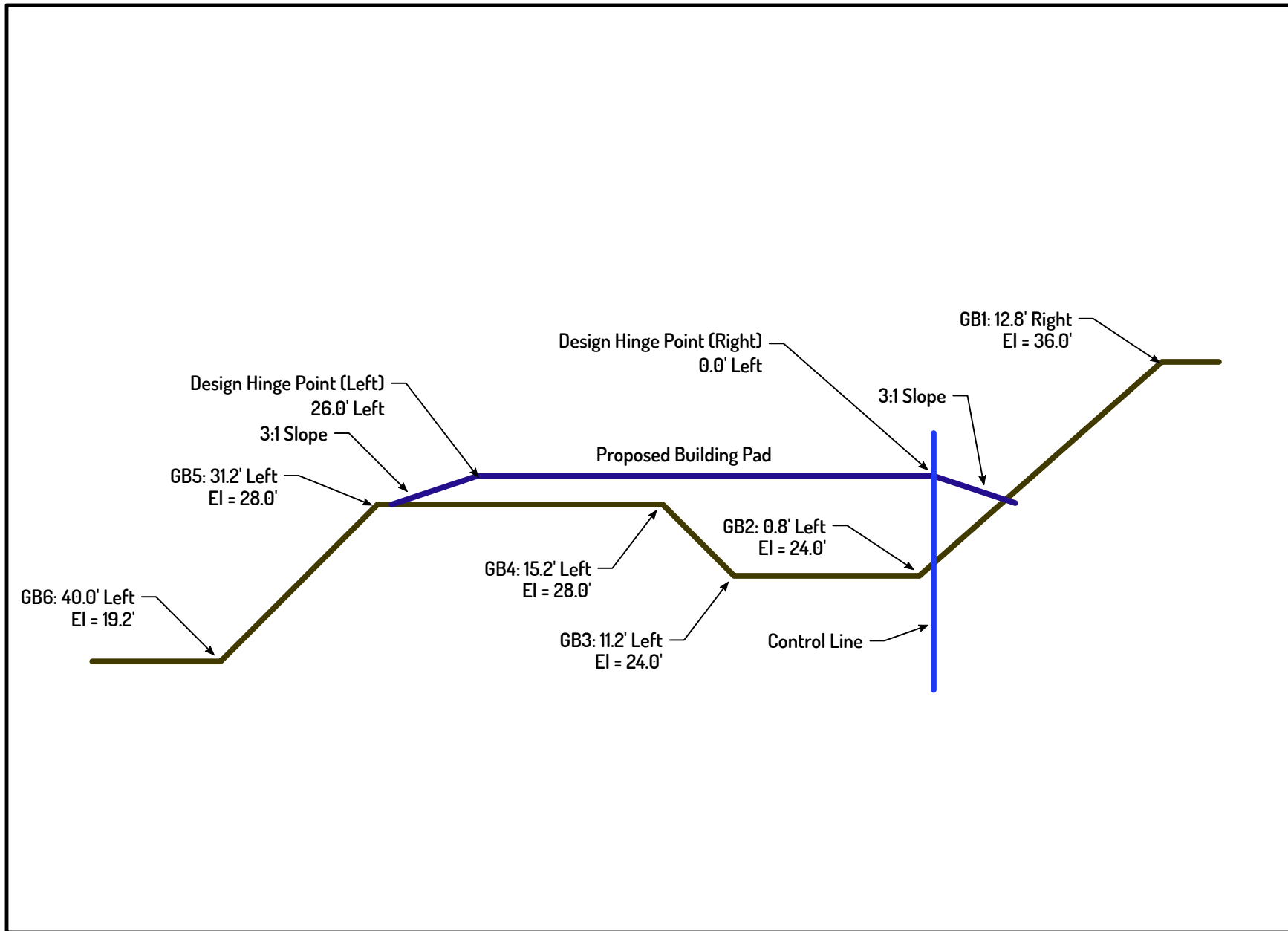
- We want a course that has a correct along call and a correct to call. Answer B meets these requirements.

Comments on the wrong answers:

- Answer A doesn't contain an "along" call.
- Answer C doesn't contain an "along" call.
- Answer D doesn't contain a correct "to" call.

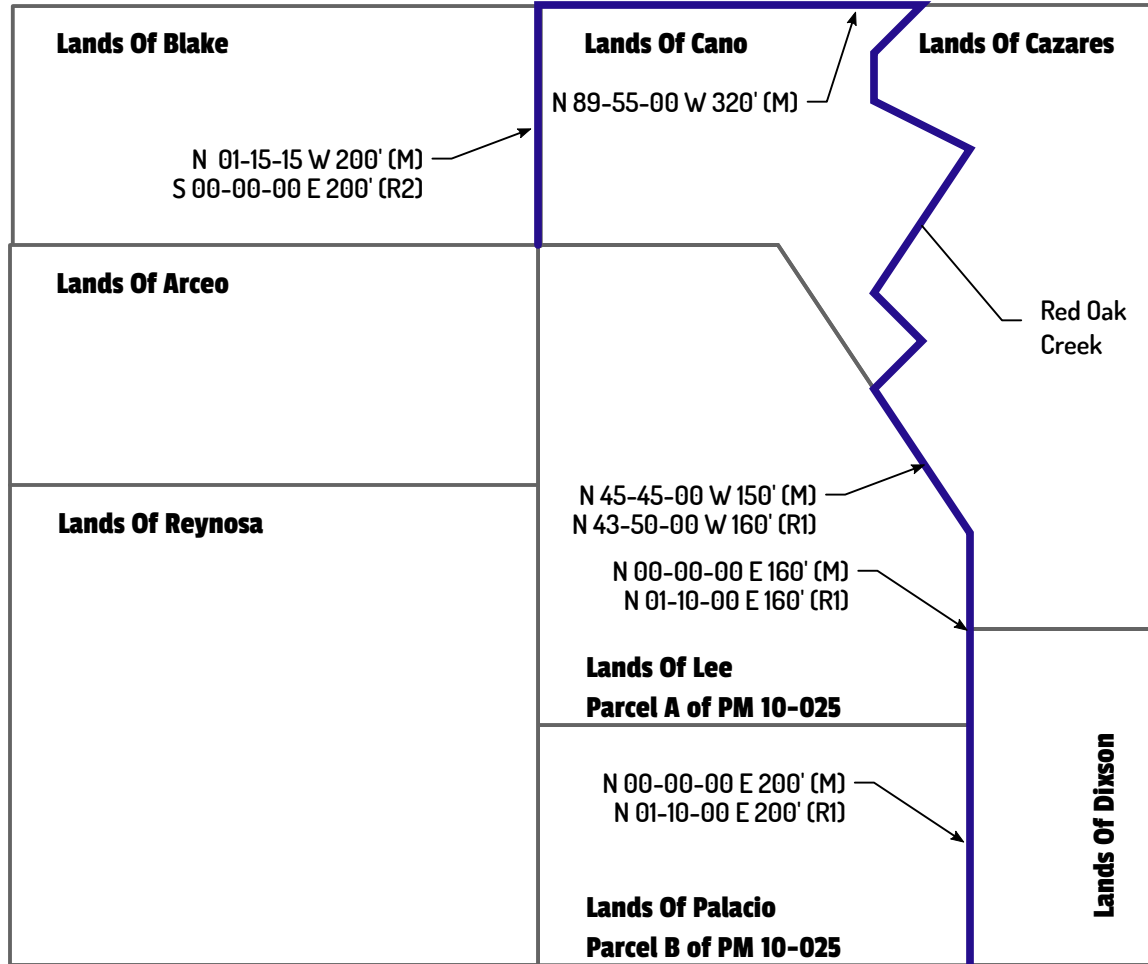


Problem Set 100 - Exhibit 1





Problem Set 100 - Exhibit 2



R1: Parcel Map 10-025
R2: Vesting Deed For Lands Of Blake
M: Measured Values From Your Field Survey

