Missouri Standards FOR PROPERTY BOUNDARY SURVEYS

Presented By
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History of Standards

- 1964: Missouri Association of Registered Land Surveyors (MARLS) adopted survey standards, 1 and 1/2 pages long
- 1973: Missouri State Land Survey Authority - State Surveyors Office - developed and adopted Missouri's first set of modern survey standards
- 1975: Original "Minimum Standards" are filed with Missouri Secretary of State
- 1982-1989: Minimum Standards are revised and filed 5 times by DNR

History of Standards

- 1993: Missouri Board for Architects, Professional Engineers, and Land Surveyors (APELS) issued their set of Missouri Standards for Property Boundary Surveys and Real Property Reports
- 1994: Land Survey Program (LSP) and APELS jointly promulgate Missouri Minimum Standards for Property Boundary Surveys and all other Surveying CSR's

History of Standards

- 2003: Minimum Standards revised and reissued by LSP & APELSLA
- 2013: The Missouri Society of Professional Land Surveyors (MSPS) and LSP produced a new standard. The Missouri Board for Architects, Professional Engineers, Professional Land Surveyors, and Professional Landscape Architects (APEPLSPLA) agreed to the changes
- 2017: LSP and APEPLSPLA jointly promulgate Missouri Standards

2017

"Missouri Standards for Property Boundary Surveys"

- Reasons for revisions
  - Relevant to revolutionary changes in the surveying industry
  - Remove redundancy
- Principles used during the revision process
  - Simplicity
  - Clarity
  - Continuity

Summary of Revisions

"Missouri Standards for Property Boundary Surveys"

- Elimination of the word "Minimum" from the title
- Definitions - Revised terms and definitions to be more relevant
- General Land Surveying Requirements - This section received the greatest amount of revisions and is now the main core of the standards

Summary of Revisions

- General Land Surveying Requirements (cont.)
  - Refined to clarify requirements for **Records Research**
  - Reworked to identify the crucial parts of the **Field Investigation**
  - Moved the instructions regarding placement of monumentation and the evaluation of the reliability of found monumentation to this section

Summary of Revisions

- General Land Surveying Requirements (cont.)
  - Relocated monumentation portion of the Detail Requirements for Resurveys, Original Surveys, Subdivisions, and Condominium Surveys to this section
  - Detail Requirement sections were incorporated into the “Publication of results”
  - Inserted new a section called "Deliverables"

Summary of Revisions

- Accuracy Standards for Property Boundary Surveys
  - Urban Accuracy remained the same
  - Suburban renamed to Rural and redefined as everything not Urban
  - Rural Accuracy was removed
  - "relative position tolerance" has been replaced with “positional uncertainty”

Summary of Revisions

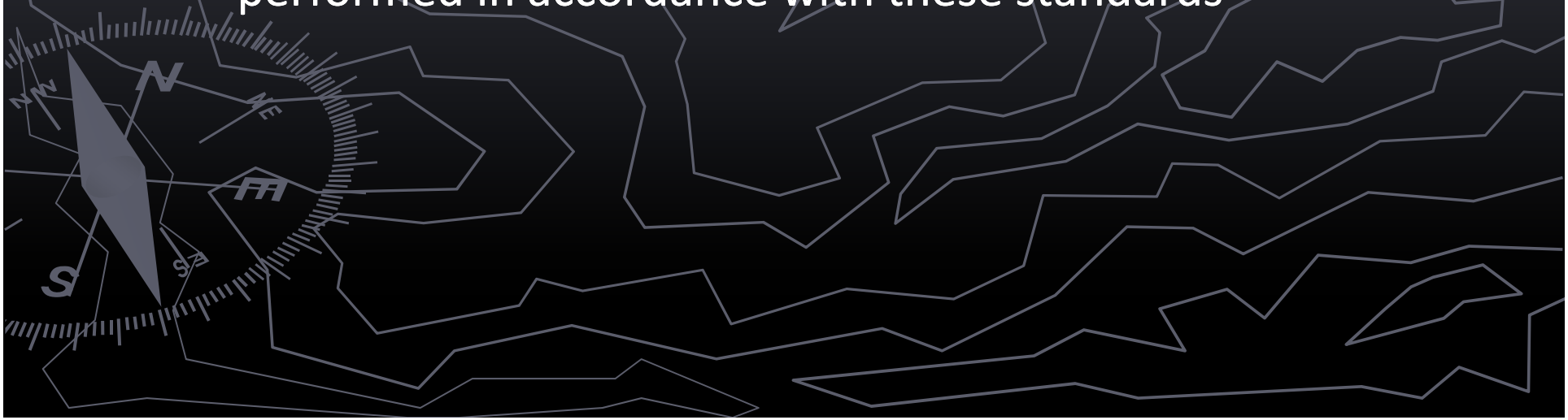
- Use of Missouri Coordinate System of 1983
  - Note the adjustment date on the North American Datum of 1983
  - Include a brief statement of the method used to obtain positions
  - Removed the statement regarding the recording of coordinates in deeds

Summary of Revisions

- Approved Monumentation
  - Standards concerning existing monumentation and witness monuments have been moved to General Land Survey Requirements
  - Revised definition of allowable semi-permanent monuments to be placed in asphalt pavement

Summary of Revisions

- Location of Improvements and Easements
  - Minimal changes
  - If requested to locate easements in the field, it shall be performed in accordance with these standards



Current Missouri Standards
Effective Date: July 1, 2017

Title 20—Department of Insurance, Financial Institutions and Professional Registration

Division 2030—Missouri Board for APEPLSPLA

Chapter 16—Missouri Standards for Property Boundary Surveys

PURPOSE: These standards provide the surveyor and recipient of boundary surveys with a realistic guideline for adequate survey performance.

Current Missouri Standards

20 CSR 2030-16.010 Application of Standards

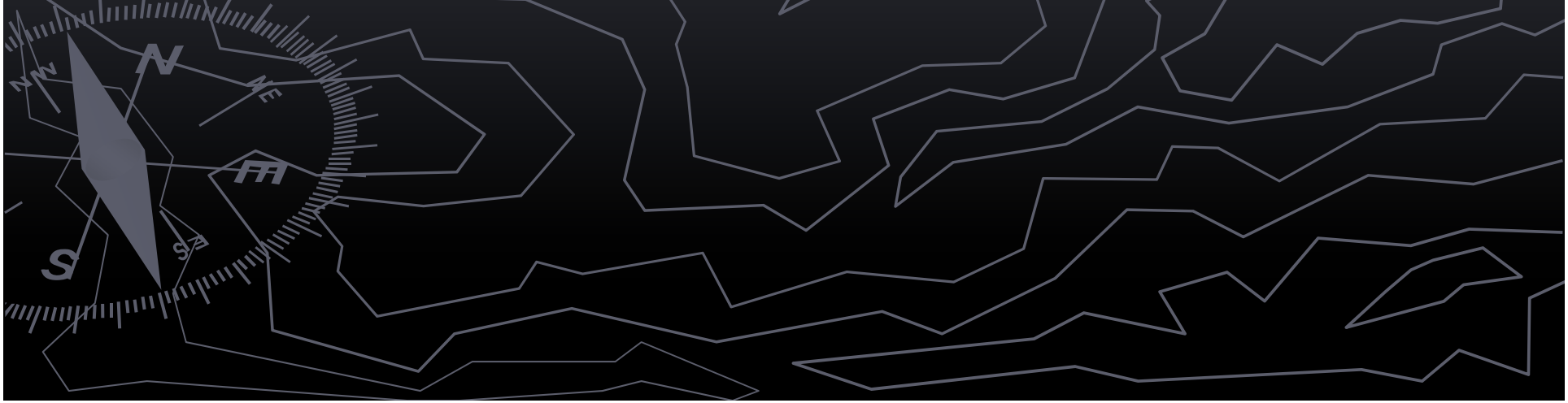
The standards in this chapter apply to all property boundary surveys made for determining the location of land boundaries and land boundary corners, but do not apply to preliminary plats or plans, plot plans, design surveys; geodetic surveys; or cartographic surveys . Any individual or corporation registered with the board to perform land surveying services in this state shall be familiar with and comply with these standards.

Current Missouri Standards Organizational Outline

- 16.010 Application of Standards
- 16.020 Definitions
- 16.030 General Land Surveying Requirements
- 16.040 Accuracy Standards for Property Boundary Surveys
- 16.050 Use of Missouri Coordinate System of 1983
- 16.070 Detail Requirements for Resurveys
- 16.080 Detail Requirements for Original Surveys
- 16.090 Detail Requirements for Subdivision Surveys

Current Missouri Standards Organizational Outline

16.100 Detail Requirements for Condominium Surveys
16.110 Location of Improvements and Easements



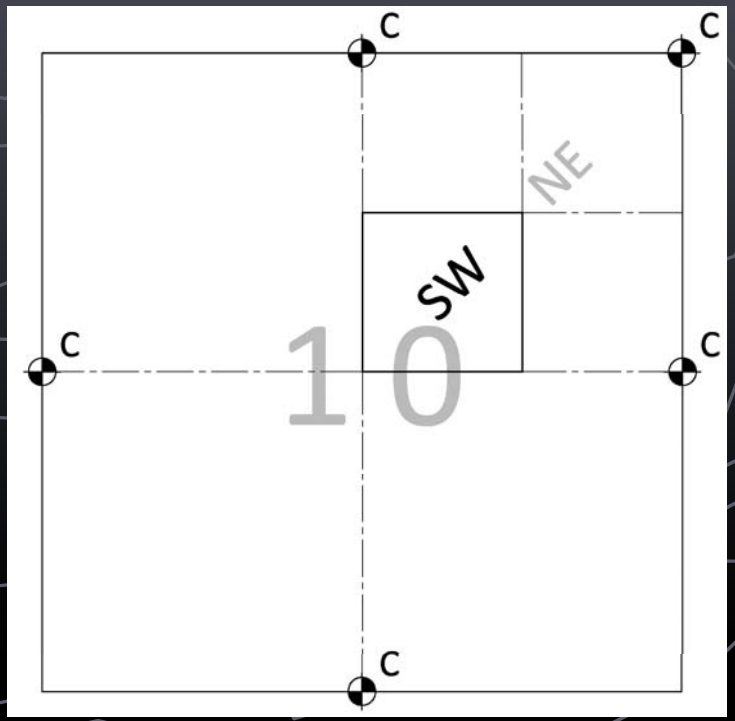
Current Missouri Standards

The Missouri Standards for Property Boundary Surveys are not intended to be used in place of professional land surveying judgment. There may be special circumstances and conditions that make it impractical to comply with some provisions of the standards. If the survey deviates from these standards, this deviation shall be noted, described, and justified on the plat of survey by the professional land surveyor. This provision cannot be used to intentionally circumvent the basic tenet of these standards.

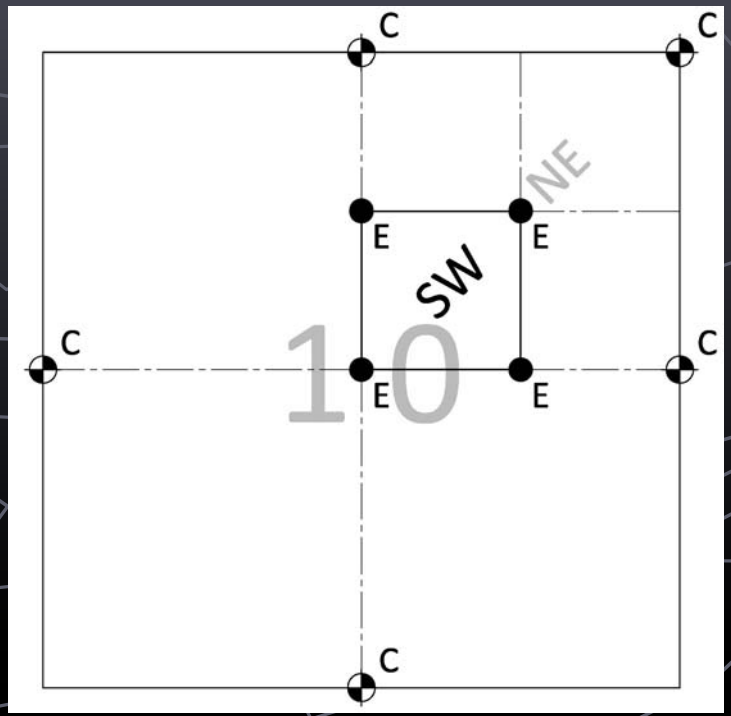
Missouri Standards Definitions

- **Condominium Survey:** a property boundary survey that creates and defines condominium property in accordance with Chapter 448, RSMo.
- **Controlling Corners:** those corners that determine the location of the exterior corners of the surveyed boundary.
- **Exterior Corners:** corners that define the shape and size of the parcel.

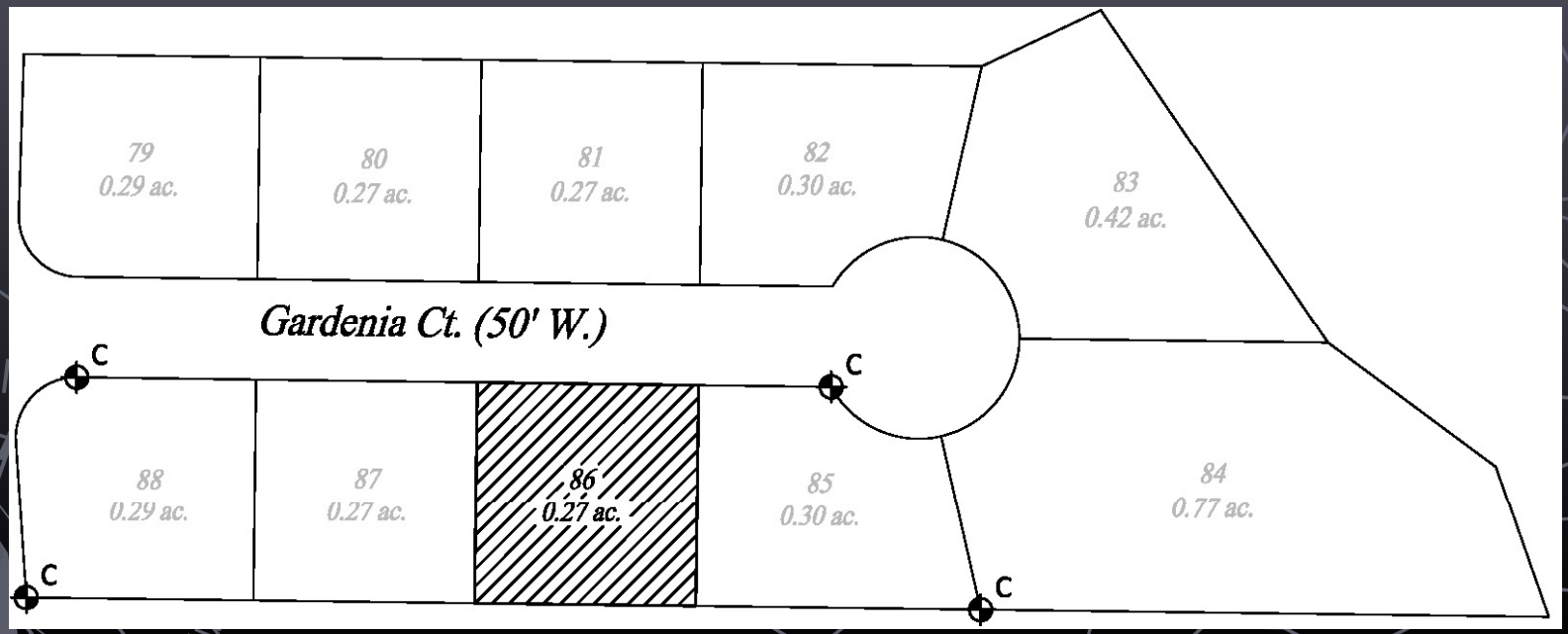
Controlling Corners



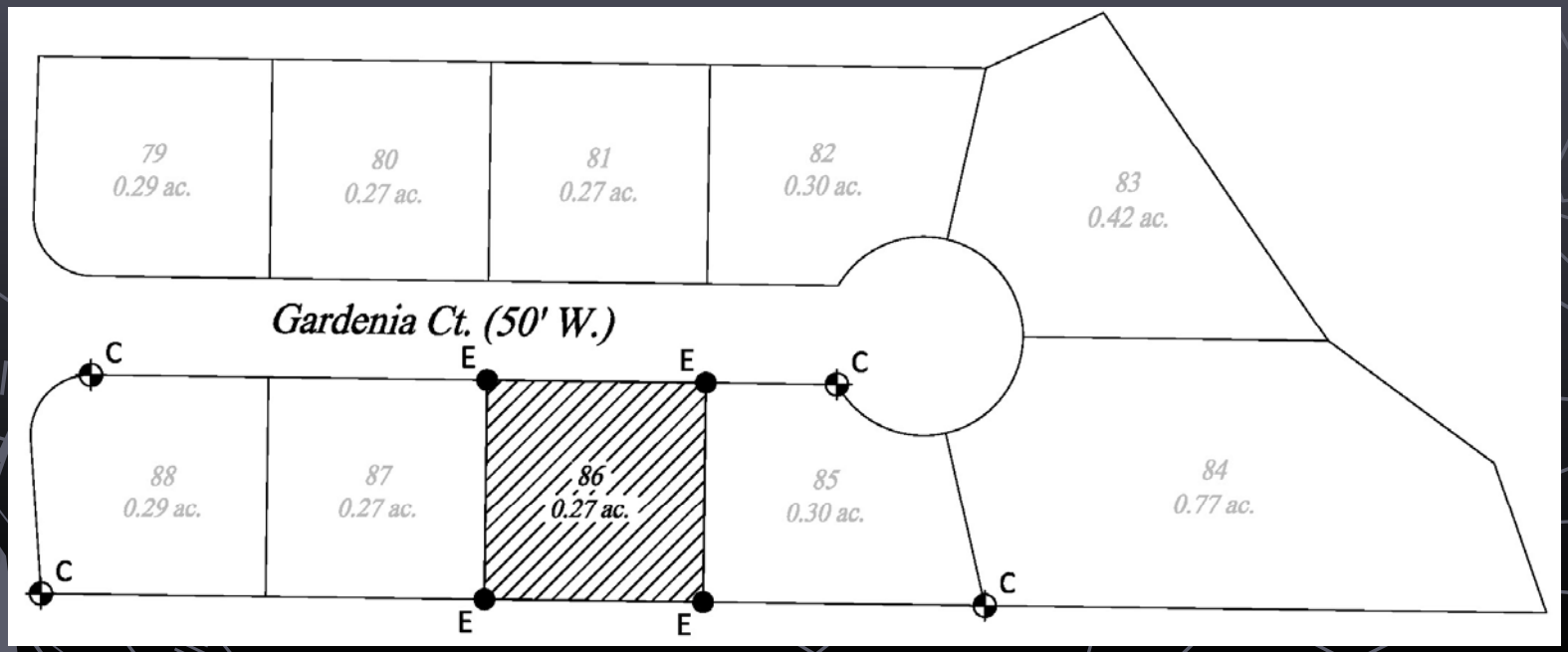
Controlling and Exterior Corners



Controlling Corners



Controlling and Exterior Corners



Missouri Standards Definitions

- **Material Variations:** the differences between surveyed lines and lines of possession or measurements called for in the record source of the property being surveyed that are, in the professional judgment of the professional land surveyor, significant enough to warrant particular notice.
- **Original Survey:** a survey which creates a new parcel, or parcels, out of a larger parent tract.
- **Physical Monument:** natural or artificial objects which are accepted and used to mark boundaries and corners.

Missouri Standards Definitions

- **Positional Uncertainty:** the positive and negative range of values expected for a computed horizontal position as a result of random (accidental) errors.

- **Property Boundary Survey:** any survey that creates, defines, marks, remarks, retraces, or reestablishes the boundaries of parcels of real property or the subdivision of lands.

Missouri Standards Definitions

- **Property Description:** a description of the limits of real property by metes and bounds or by an aliquot part of the United States Public Land Survey System or by lot or parcel designation referenced to a subdivision, survey or other document recorded in the public records.
- **Record Title Boundaries:** the limits of real property ownership as evidenced by one (1) or more written means of real property transfer and having provided constructive notification by being duly entered into the public records.

Missouri Standards Definitions

- **Random Errors:** unavoidable errors in measurement that are caused by the inability of the operator to make exact measurements.
  - Generally follow statistical principles and can be reduced with care in measurement, but can never be completely eliminated.
  - The algebraic sign of the error is unpredictable (usually expressed as ±)

Missouri Standards Definitions

- **Rural Property:** any property that is not urban property.
- **Subdivision:** a property boundary survey that partitions land into two (2) or more parcels by platting the divisions of land in accordance with Chapter 445.

Missouri Standards Definitions

- **Systematic Errors:** errors in measurement that conform to mathematical and physical laws and remain the same under set conditions. Systematic errors are detectible and can be minimized by:
  - Ensuring the proper adjustment of equipment
  - Applying appropriate corrections to observations
  - Using appropriate observation techniques to eliminate the effects of imperfection in equipment

Missouri Standards Definitions

- **United States Public Land Survey Corners:** those points that determine the boundaries of the various subdivisions of the United States Public Land Survey as set forth in section 60.301(1), RSMo.
- **Urban Property:** any property that is located wholly or partly within the corporate limits of any municipality or any commercial, industrial or multi-unit developmental property.

General Land Surveying Requirements

20 CSR 2030-16.030 General Land Surveying Requirements

(1) Records Research:

(A) Every survey executed shall be based on the property description of the parcel or parent tract taken from the public records; and,

(B) Prior to performing the fieldwork, the professional land surveyor shall acquire sufficient data to ascertain the record title boundary of the parcel(s) to be surveyed, (such as: adjoining deeds, maps, right of way plans, subdivision plats, original plats and notes, and subsequent surveys). This requirement does not obligate the professional land surveyor to search the entire chain of title.

General Land Surveying Requirements

(2) Field Investigation: The professional land surveyor or a person under his/her direct personal supervision shall:

(A) Search thoroughly for monuments and accessories at the necessary controlling corners and any other physical evidence that may be required to define the location of the exterior corners of the parcel surveyed, (such as: location of streets, roads, lines of occupation, parol information);

General Land Surveying Requirements

(B) Obtain appropriate and sufficiently redundant measurements to correlate all found evidence;

(C) Evaluate the reliability of the evidence and monuments found and apply the proper theory of location in accordance with surveying precedent; and,

(D) Reach a conclusion on the location of the boundary and set monuments as defined herein.

General Land Surveying Requirements

(3) Monumentation:

(A) The professional land surveyor shall establish semi-permanent or confirm existing monuments at every exterior corner of the tract being surveyed, except for lines running along streams or lakes where witness monuments must be set along the connected sidelines. When it is impractical to set a monument at a required corner, a witness monument shall be set along a line of the survey or the prolongation thereof;

General Land Surveying Requirements

(B) Existing monuments shall be evaluated for permanency by the professional land surveyor. Those needing restoration, preservation or replacement shall receive the due care necessary to insure that their permanency is secured in accordance with the requirements set forth herein;

General Land Surveying Requirements

(C) Additional Monumentation for Subdivision Surveys:

1. In addition to meeting the requirements set forth above, the professional land surveyor shall, prior to the recording of the subdivision plat, establish at least 2 permanent monuments for every 4 acres of land developed by the subdivision. This requirement is waived if the survey does not create more than 4 lots or parcels; and,

General Land Surveying Requirements

2. The permanent monuments required in subsection (3)(C)1. shall be set prior to the recording of the plat or if likely to be destroyed by construction, may be installed upon completion of the construction and must be set no later than twelve (12) months after the recording of the plat. The professional land surveyor shall also monument all lot corners in the subdivision with semi-permanent or witness monuments within the same twelve month period.

General Land Surveying Requirements

3. When the subdivision is a cemetery, the requirements of subsection (3)(C)1. for installation of permanent monuments shall be increased to include four (4) permanent monuments per block and the monumentation of all lot corners required in subsection (3)(C)2. shall not be required.

(D) Condominium surveys shall meet the requirements for subdivisions.

General Land Surveying Requirements

(4) Publication of Results: A plat shall be made showing the results of the survey or subdivision and shall conform to all of the following provisions:

(A) The plat shall include a drawing that shall be made to a convenient scale on a reasonably permanent and dimensionally stable material;

(B) The plat shall include the name of the person or entity for whom the survey was made and the date of the survey;

General Land Surveying Requirements

(C) Lettering shall be no less than eight-hundredths of an inch (0.08") in height. All characters shall be open, well-rounded, and of uniform width;

(D) The direction of boundary lines shall be shown by angles, azimuths or bearings with the directional reference system clearly described on the plat;

(E) A north arrow, a written scale and a graphic scale shall be shown on every sheet containing graphic survey data;

General Land Surveying Requirements

(F) Complete dimensions (distances, directions, and curve data) of all parcels surveyed or created. All linear measurements shall be shown as horizontal distances at the ground surface in feet or meters. Curved lines shall show at least two (2) elements. For non-tangential curves, a directional component shall be included to help define the direction of the curve (preferably the chord bearing);.

General Land Surveying Requirements

(G) All vertical measurements shall be shown as elevations above an established or assumed datum in feet or meters. When elevations are shown, a clearly defined elevation datum shall be shown, including the location and elevation of the benchmark used to establish the project datum;

(H) Measurements and calculated areas will be shown on the plat to a number of significant figures representative of the actual precision of the measurements;

General Land Surveying Requirements

(I) The plat shall display either a property description for the parcel(s) and or parent tract surveyed or a reference to the source document from which the property description was taken. Any new parcel created by survey shall have its property description shown on the plat and must be complete enough so that the parcel can be located and clearly identified. Subdivision plats shall identify all lots for sale by numbers, as set forth in Section 445.010, RSMo;

General Land Surveying Requirements

(J) The plat shall show sufficient data (distances and directions) to positively locate the parcel surveyed within the United States Public Land Survey System (USPLSS), or within the recorded subdivision. If the survey cannot be located by either of the previously mentioned provisions, it must be referenced to other lines and points sufficiently established by record;

(K) All controlling corner monuments that were found and exterior corners that were found or set shall be identified on the plat;

General Land Surveying Requirements

(L) Any material variation between record and measured dimensions; and any material variation and the extent of such variation between surveyed lines and lines of possession at all exterior corners shall be shown on the plat. Material variation will include, but is not limited to, survey monuments, fences, obvious occupation i.e. mowed lines, walls or other structures whether on the property surveyed or on adjacent property;

General Land Surveying Requirements

(M) The plat shall reference the source document(s) for any pertinent data obtained during the records research provision set forth above. The plat shall also reference the property type (Urban or Rural);

(N) The identity of the record title documents for adjoining properties, consistent with the records research provision set forth above, shall be shown on the plat, including their record source;

General Land Surveying Requirements

(O) In addition to the above, all condominium surveys shall show the pertinent information required in section 448.2-109, RSMo, and the legally sufficient descriptions of easements serving or burdening the condominium; and,

(P) The plat shall include a statement that the survey and or subdivision were executed in accordance with the Missouri Standards for Property Boundary Surveys as set forth herein. The statement on a condominium plat shall also include a declaration that the plat contains all information required by section 448.2-109, RSMo.

General Land Surveying Requirements

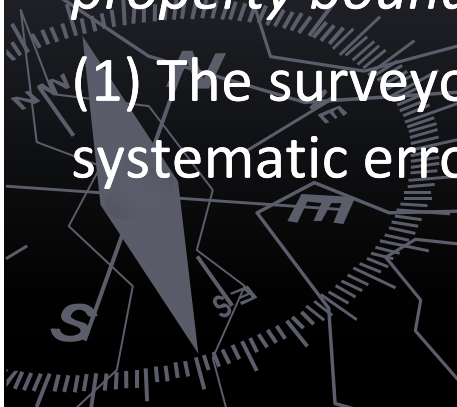
(5) Deliverables: The professional land surveyor shall furnish to the client a plat containing the drawing and other pertinent information identified above. Each sheet of the plat shall bear the signature and seal of the professional land surveyor in responsible charge. This signed and sealed plat shall be the official plat and shall take precedence over any other formatted data that may be delivered to the client or his representatives, successors or assigns.

Accuracy Standards for Property Boundary Surveys

20 CSR 2030-16.040 Accuracy Standards for Property Boundary Surveys

PURPOSE: This rule sets forth the accuracy standards for all property boundary surveys.

(1) The surveyor shall make an effort to detect and remove systematic errors.



Accuracy Standards for Property Boundary Surveys

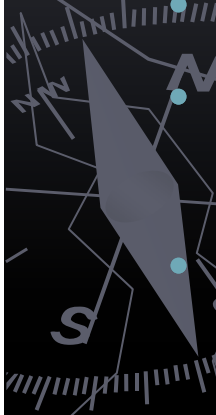
Examples of Systematic Errors:

- Applying the incorrect temperature and/or pressure corrections
- Using incorrect instrument heights and/or target heights
- Incorrect prism offset
- Imperfectly adjusted surveying equipment

Accuracy Standards for Property Boundary Surveys

The effects of systematic errors can be minimized by:

- Properly leveling the surveying instrument and targets
- Balancing foresight and backsight observations
- Entering the appropriate environmental correction factors
- Entering the correct instrument heights, target heights, and prism offset
- Regularly calibrating the surveying equipment



Accuracy Standards for Property Boundary Surveys

Reliability of Measurements:

Precision - the degree of closeness or consistency of repeated measurements of the same quantity to each other.

Accuracy - the agreement of the measurement to the true value.

Uncertainty – the range within which it is expected the error of the measurement will fall.

Accuracy Standards for Property Boundary Surveys

Positional Uncertainty is the remaining error after Surveyor has:

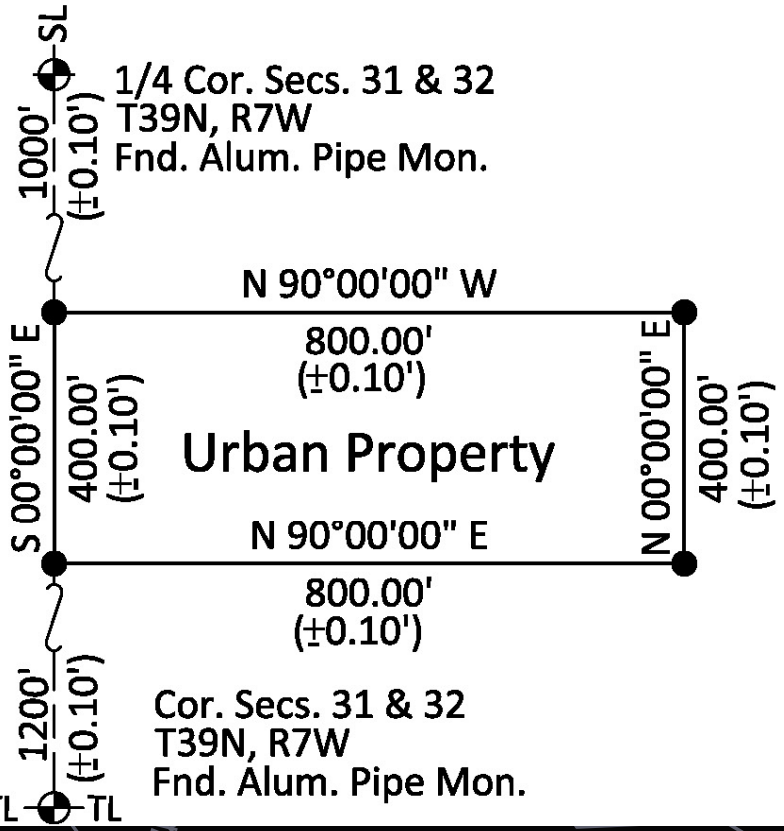
- Confirmed all surveying equipment is in proper adjustment
- Selected the appropriate surveying equipment
- All personnel has been properly trained
- Utilized proper field and computation procedures

Accuracy Standards for Property Boundary Surveys

(2) Precision requirements for Urban Property:

(A) The uncertainty due to random errors of any dimension of direction or distance shown on the plat shall not exceed fifty parts per million (50ppm) or one tenth of a foot (0.10') for distances less than two thousand feet (2,000') at the sixty-eight percent (68%) confidence level (one sigma); and,

(B) The positional uncertainty of any coordinates shown on the plat relative to the control that is held fixed, shall not exceed fifty parts per million (50ppm) or one tenth of a foot (0.10') for distances less than two thousand feet (2,000') at the sixty-eight percent (68%) confidence level (one sigma).



Uncertainty due to random errors
50 PPM = 50/1,000,000 = .00005
At 68% confidence level (one sigma)

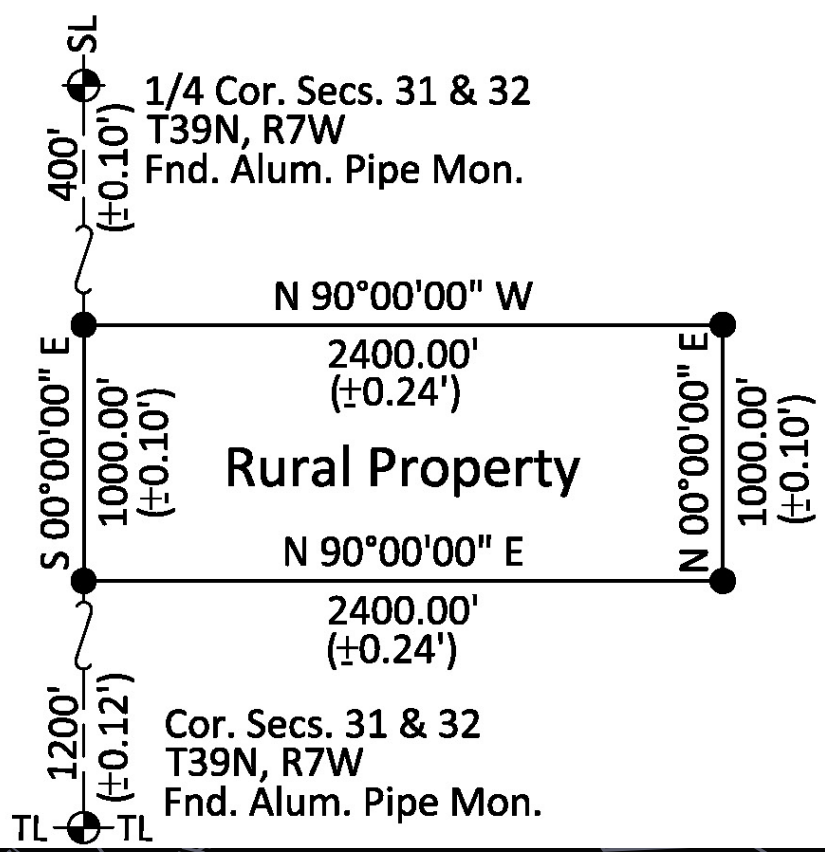
Direction or distance:
800' x .00005 = 0.04' = Minimum 0.1'
400' x .00005 = 0.02' = Minimum 0.1'
2,400' x .00005 = 0.12'
1000' x .00005 = 0.05' = Minimum 0.1'
1200' x .00005 = 0.06' = Minimum 0.1'

Accuracy Standards for Property Boundary Surveys

(3) Precision requirements for Rural Property:

(A) The uncertainty due to random errors of any dimension of direction or distance shown on the plat shall not exceed one hundred parts per million (100ppm) or one tenth of a foot (0.10') for distances less than one thousand feet (1,000') at the sixty-eight percent (68%) confidence level (one sigma); and,

(B) The positional uncertainty of any coordinates shown on the plat relative to the control that is held fixed, shall not exceed one hundred parts per million (100ppm) or one tenth of a foot (0.10') for distances less than one thousand feet (1,000') at the sixty-eight percent (68%) confidence level (one sigma).



Uncertainty due to random errors
100 PPM = 100/1,000,000 = .0001
At 68% confidence level (one sigma)

Direction or distance:
2400' x .0001 = 0.24'
1000' x .0001 = 0.1'
6,800' x .0001 = 0.68'
400' x .0001 = 0.04' = Minimum 0.1'
1200' x .0001 = 0.12'

Accuracy Standards for Property Boundary Surveys

20 CSR 2030-18.030 (3) Second Order Horizontal Control.

- (A) The relative accuracy of the distance between directly connected adjacent stations shall be equal to or less than twenty-five millimeters (25 mm) for distances equal to or less than one kilometer (1 km), and twenty parts per million (20 ppm) for distances greater than one kilometer (1 km).
- (B) The positional accuracy of a station shall be sixty millimeters (60 mm) in urban areas and one hundred (100) mm in rural areas.

Use of Missouri Coordinate System of 1983

20 CSR 2030-16.050 Use of Missouri Coordinate System of 1983

(1) When the professional land surveyor is specifically requested or required to reference land boundary corners to the Missouri Coordinate System of 1983, the professional land surveyor shall comply with the following requirements:

(A) The position of the corner shall be based upon a geodetic control station having a horizontal accuracy of second order *(*as defined in 20 CSR 2030-18*)* or higher order;

Use of Missouri Coordinate System of 1983

(B) The survey connecting the corner to the geodetic control station shall meet the accuracy standards for property boundary surveys set forth in this chapter; and

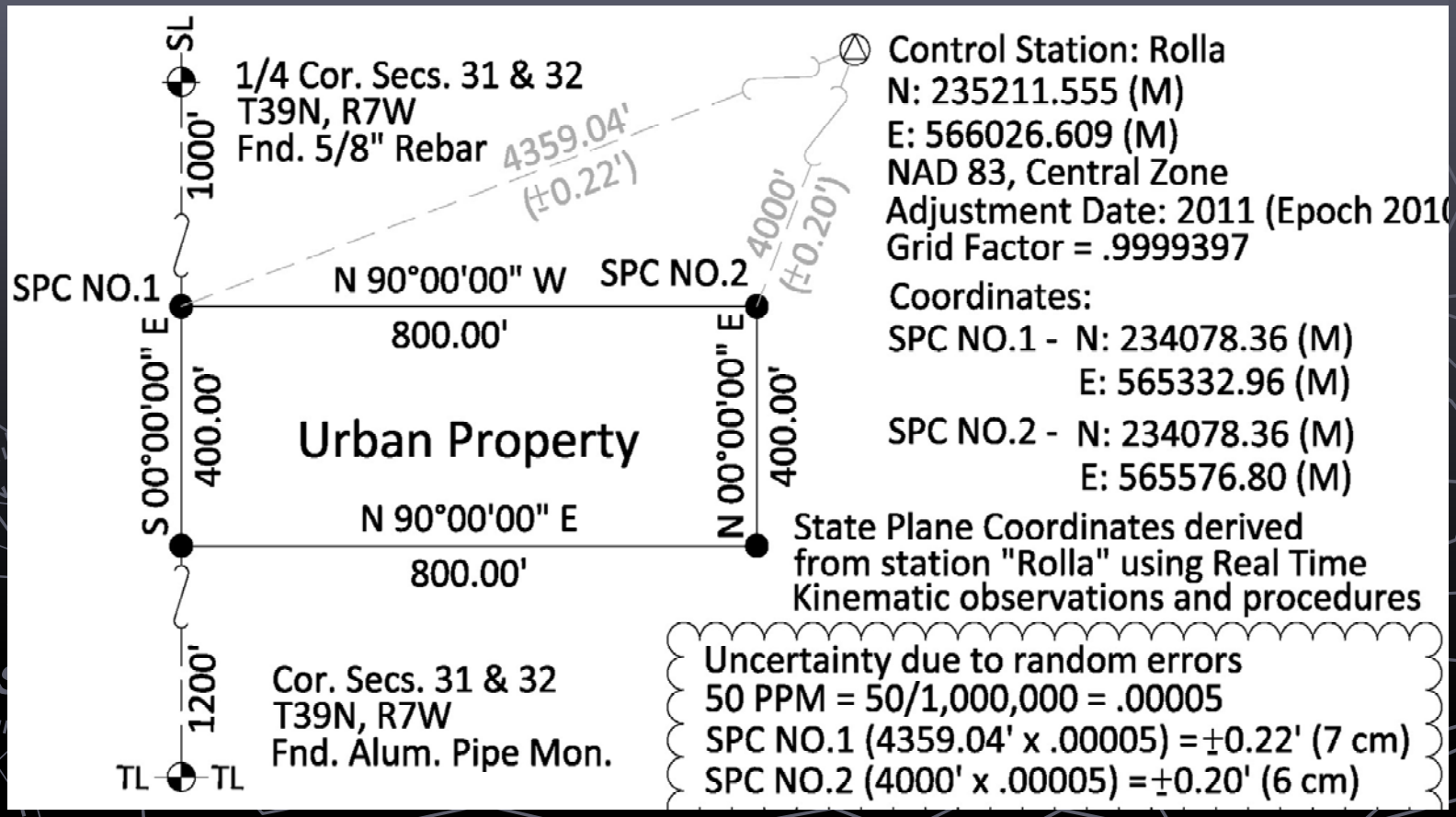
(C) The plat or other publication of results shall:

- identify the geodetic control station(s) that were used to determine the position of the corner(s)
- along with a list of the coordinates of those control stations(s)

Use of Missouri Coordinate System of 1983

(C) The plat or other publication of results shall identify: (cont.)

- the appropriate adjustment date or realization designation on the North American Datum of 1983
- along with the epoch date when applicable
- a brief statement of the method used to obtain those positions
- and the grid factor used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1/4 Cor. Secs. 31 & 32
T39N, R7W
Fnd. 5/8" Rebar
1000'
4359.04'
(±0.22')
4000'
(±0.20')
Control Station: Rolla
N: 235211.555 (M)
E: 566026.609 (M)
NAD 83, Central Zone
Adjustment Date: 2011 (Epoch 201
Grid Factor = .9999397
SPC NO.1
N 90°00'00" W
SPC NO.2
800.00'
S 00°00'00" E
400.00'
Urban Property
N 00°00'00" E
400.00'
N 90°00'00" E
800.00'
Coordinates:
SPC NO.1 - N: 234078.36 (M)
E: 565332.96 (M)
SPC NO.2 - N: 234078.36 (M)
E: 565576.80 (M)
State Plane Coordinates derived
from station "Rolla" using Real Time
Kinematic observations and procedures
1200'
Cor. Secs. 31 & 32
T39N, R7W
Fnd. Alum. Pipe Mon.
TL
TL
Uncertainty due to random errors
50 PPM = 50/1,000,000 = .00005
SPC NO.1 (4359.04' x .00005) = ±0.22' (7 cm)
SPC NO.2 (4000' x .00005) = ±0.20' (6 cm)

Approved Monumentation

- 20 CSR 2030-16.060 Approved Monumentation

(1) The professional land surveyor shall select a type of monument providing a degree of permanency consistent with that of the adjacent terrain and physical features and as required by these standards. All monuments shall be solid and free from movement. They shall be set in the ground at least to the depth of the length given unless they are encased in concrete. With the exception of drill holes and cut crosses, the precise position of the corner shall be marked by a point on a cap and the cap shall be inscribed with the licensure number of the professional land surveyor in responsible charge, or the corporate licensure number or name of the company.

Approved Monumentation

(2) Permanent monuments shall be selected from the following:

(A) Concrete monuments consisting of reinforced concrete at least four inches (4") square or in diameter and no less than twenty-four inches (24") in length with its precise position marked by a point on a brass or aluminum cap not less than one and one-half inch (1 ½") in diameter;

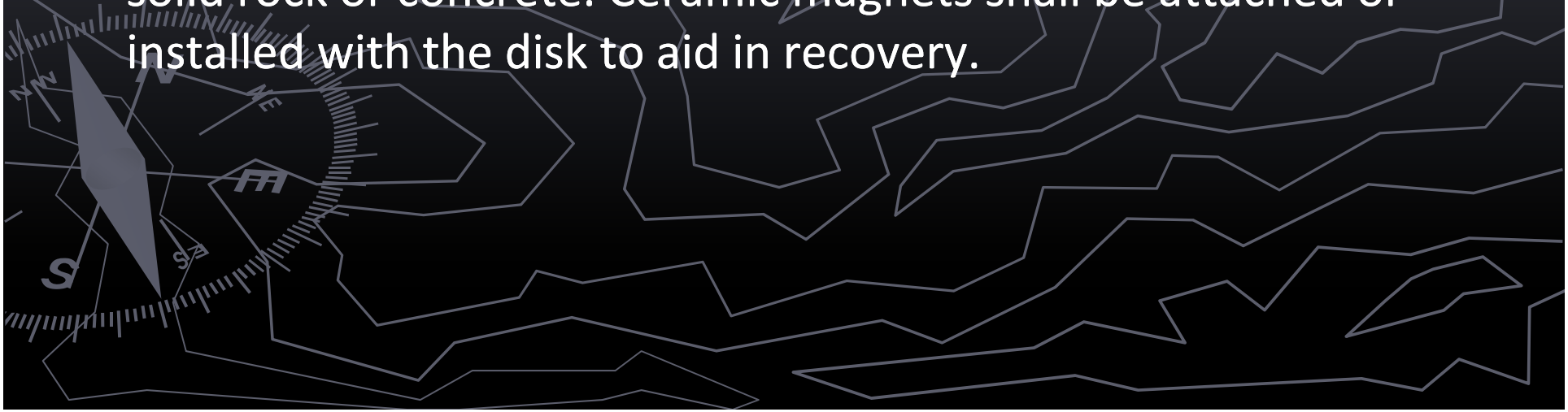
(B) Commercial cast iron or aluminum survey markers no less than twenty-four inches (24") in length. Nonferrous markers shall have ceramic magnets attached to aid in recovery;

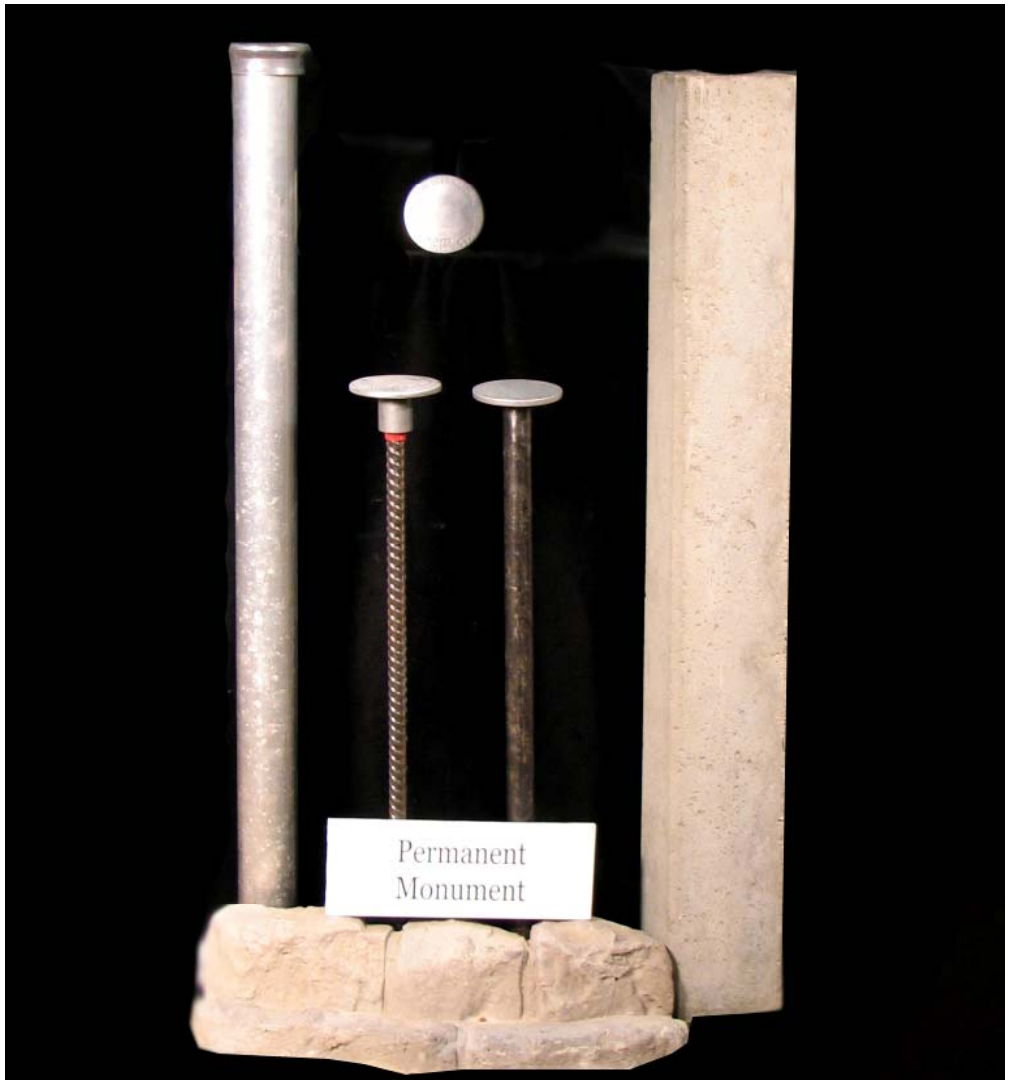
Approved Monumentation

(C) Steel, coated steel, or aluminum rod markers not less than five-eighths inch (5/8") in diameter, iron pipe markers not less than three-quarter inch (3/4") inside diameter and not less than twenty-four inches (24") in length. These monuments shall have a permanently attached cap of the same metal or of a dissimilar metal if the metals are insulated with a plastic insert to reduce corrosion. Nonferrous rod markers shall have ceramic magnets attached to aid in recovery; and

Approved Monumentation

(D) Brass or aluminum disks not less than two inches (2") in diameter, countersunk and well-cemented in a drill hole in either solid rock or concrete. Ceramic magnets shall be attached or installed with the disk to aid in recovery.




Permanent
Monument

Approved Monumentation

(3) Semi-permanent monuments shall be selected from the following:

(A) Iron pipe markers not less than three-fourths inch (3/4”) outside one half inch (½”) inside diameter at least eighteen inches (18") in length and having a plastic or metal cap;

(B) Steel or aluminum rod markers not less than one-half inch (1/2") in diameter and not less than eighteen inches (18") in length and having a plastic or aluminum cap;

Approved Monumentation

(C) A cross-cut or drill hole in concrete, brick, stone paving, or bedrock at the precise position of the corner or on a prolongation of a boundary line; and

(D) In asphalt paving, cotton picker spindles, railroad spikes (center punched or chiseled cross), semi-permanent ½" rebar, and magnetic spikes (minimum of 8" in length) that are solid and not easily removed or destroyed.

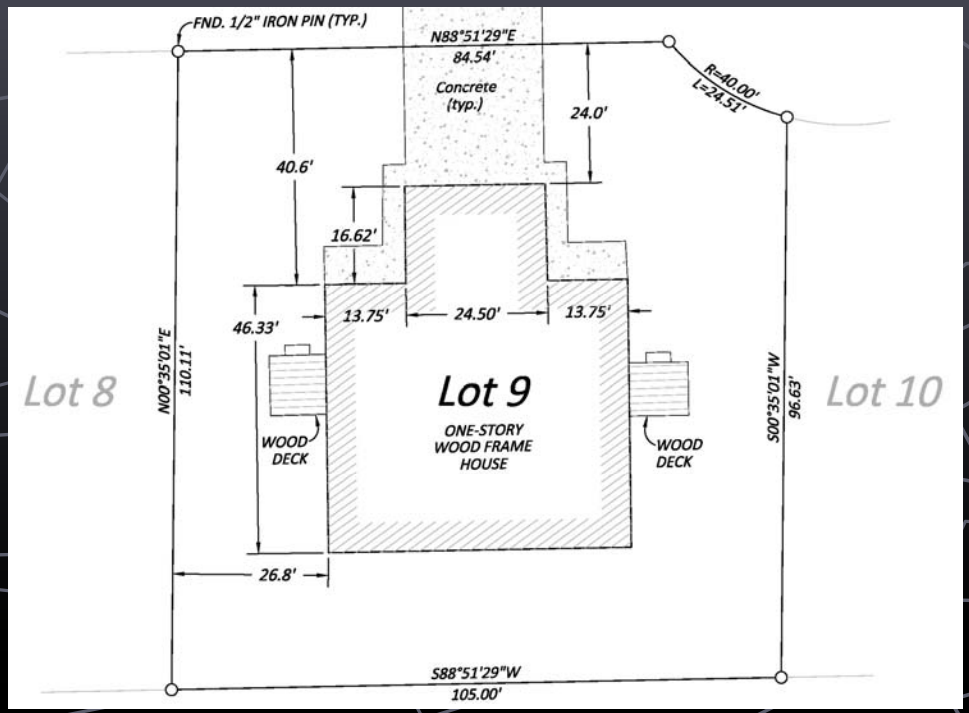

Semi-Permanent
Monument

Location of Improvements and Easements

- 2 0 CSR 2030-16.110 Location of Improvements and Easements

(1) When the professional land surveyor is specifically requested by the client to locate the improvements on the property surveyed, the professional land surveyor shall locate by measurement all permanent structures having fixed foundation, slabs or footings and shall reference them to the property boundary on the plat with a minimum of three (3) dimensions. Dimensions shall be parallel, perpendicular or radial to the property lines.

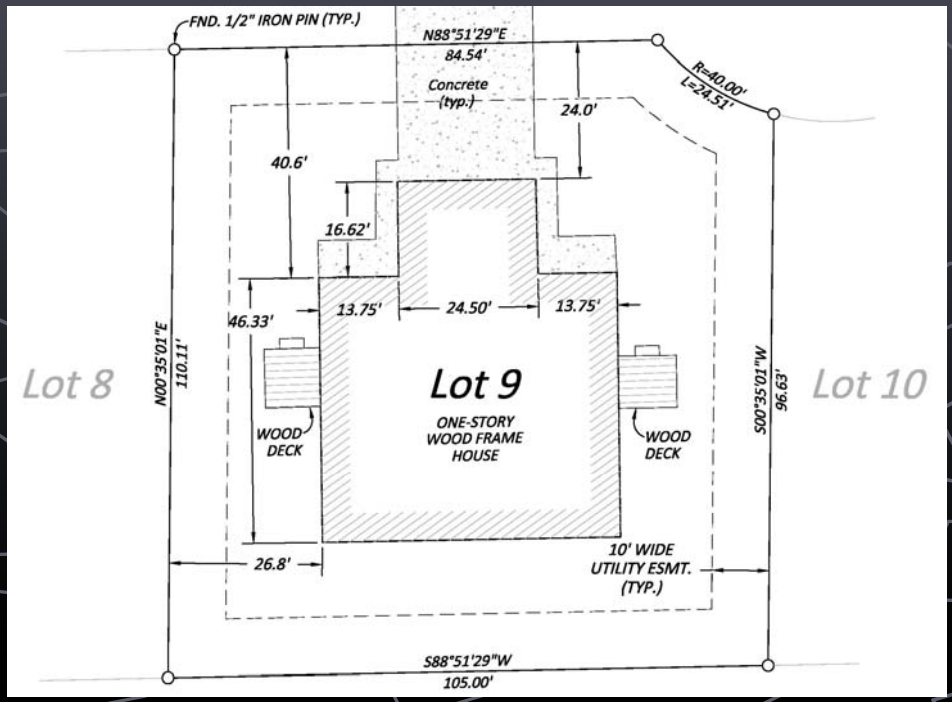
Location of Improvements and Easements



Location of Improvements and Easements

(2) When the professional land surveyor is specifically requested by the client to show easements on a property boundary survey, he/she shall show by graphic representation all easements appearing on the recorded subdivision plat and all easements provided to the surveyor by the client. If the professional land surveyor is specifically requested by the client to locate any easements on the ground, he/she will do so in accordance with the standards defined herein.

Location of Improvements and Easements



CHECK LIST FOR REVIEW OF SURVEY PLATS FOR COMPLIANCE WITH MISSOURI STANDARDS FOR PROPERTY BOUNDARY SURVEYS

CHECK LIST FOR REVIEW OF SURVEY PLATS
FOR COMPLIANCE WITH
MISSOURI STANDARDS FOR PROPERTY BOUNDARY SURVEYS

NAME OF SURVEYOR: _____ **DATE OF SURVEY:** _____

REVIEWED BY: _____ **DATE:** _____

DESCRIPTION OF SURVEY: _____

_____

_____

CHECK LIST FOR REVIEW OF SURVEY PLATS FOR COMPLIANCE WITH MISSOURI STANDARDS FOR PROPERTY BOUNDARY SURVEYS

GENERAL LAND SURVEY REQUIREMENTS

ALL SURVEY PLATS SHALL SHOW THE FOLLOWING	YES	NO	NA
1) Name of person or entity for whom the survey was made	____	____	____
2) Date of the survey	____	____	____
3) Lettering 0.08" or larger in height	____	____	____
4) Direction of all lines surveyed with directional reference	____	____	____
5) North arrow, written scale and graphic scale on each sheet containing graphics	____	____	____
6) Horizontal (ground) distances of all lines surveyed in feet or meters	____	____	____

CHECK LIST FOR REVIEW OF SURVEY PLATS FOR COMPLIANCE WITH MISSOURI STANDARDS FOR PROPERTY BOUNDARY SURVEYS

ALL SURVEY PLATS SHALL SHOW THE FOLLOWING (cont)	YES	NO	NA
7) All curved lines defined with minimum of two (2) elements Additional directional component for non-tangential curves	____	____	____
8) Definition of elevation datum	____	____	____
9) Location and elevation of bench mark used	____	____	____
10) Distance and area dimensions representative of actual precision	____	____	____
11) Show or reference source of boundary description	____	____	____
12 Show property description of parcel created	____	____	____
13) Subdivision plats identify all lots for sale by numbers	____	____	____

CHECK LIST FOR REVIEW OF SURVEY PLATS FOR COMPLIANCE WITH MISSOURI STANDARDS FOR PROPERTY BOUNDARY SURVEYS

ALL SURVEY PLATS SHALL SHOW THE FOLLOWING (cont)	YES	NO	NA
14) Sufficient data to locate the property (distance and direction)	____	____	____
15) All controlling corners found and exterior corners found or set identified on plat	____	____	____
16) Any material variation between measured and record dimensions and or between measured and lines of possession	____	____	____
17) Reference source document(s) for pertinent data obtained in records research	____	____	____
18) Accuracy from type of property being surveyed	____	____	____
19) Plat shall identify title documents for adjoiners as they appear of record	____	____	____
20) Statement that survey is in compliance with Missouri Minimum Standards for Property Boundary Surveys	____	____	____

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TITLE BLOCK CHECKLIST – 20 CSR 2030 – 2.050 The title block must, at a minimum, contain the following information	YES	NO	NA
21) The name of the licensee either as a sole proprietor, partnership, Corporation, limited liability company, or other appropriate entity	____	____	____
22) The licensee's address and phone number	____	____	____
23) Name or identification of project	____	____	____
24) Address/location of project (city/county and state)	____	____	____
25) Date prepared	____	____	____
26) Space for the licensee's signature, date and seal	____	____	____
27) The printed name, discipline, and license number of the person sealing the document	____	____	____
28) The printed name, discipline, and certificate of authority, number of the corporation as defined in Section 327.011, RSMo.	____	____	____

CHECK LIST FOR REVIEW OF SURVEY PLATS FOR COMPLIANCE WITH MISSOURI STANDARDS FOR PROPERTY BOUNDARY SURVEYS

WHEN THE MISSOURI COORDINATE SYSTEM 1983 IS USED	YES	NO	NA
29) Name of first or second order control station used	____	____	____
30) Coordinates of control station (in meters)	____	____	____
31) Grid factor used	____	____	____
32) Adjustment date and or epoch date	____	____	____

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ADDITIONAL REQUIREMENTS FOR SUBDIVISION SURVEYS	YES	NO	NA
The recorded plat shall show			
33) Semi-permanent monuments at all exterior corners	____	____	____
34) Two permanent monuments for every four acres developed	____	____	____
35) Semi-permanent monuments at all lot corners. All monuments shall be set within twelve (12) months from date recorded.	____	____	____

CHECK LIST FOR REVIEW OF SURVEY PLATS FOR COMPLIANCE WITH MISSOURI STANDARDS FOR PROPERTY BOUNDARY SURVEYS

REQUIREMENTS FOR CONDOMINIUM SURVEYS	YES	NO	NA
36) Name of condo	____	____	____
37) Survey or general schematic map of entire condo	____	____	____
38) Location and dimension of property not being developed and location of existing improvements	____	____	____
39) Legal description of property being developed	____	____	____
40) Extent of any encroachments	____	____	____
41) Location of all easements	____	____	____

CHECK LIST FOR REVIEW OF SURVEY PLATS FOR COMPLIANCE WITH MISSOURI STANDARDS FOR PROPERTY BOUNDARY SURVEYS

REQUIREMENTS FOR CONDOMINIUM SURVEYS (cont)	YES	NO	NA
42) Unless shown on plans, the following:			
a) Location and dimension of vertical unit boundaries	____	____	____
b) Location and dimension of horizontal unit boundaries	____	____	____
c) Unit identifying number	____	____	____
43) Location and dimension of limited common elements	____	____	____
44) Statement that plat contains information required by Section 448.2-109	____	____	____

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LOCATION OF IMPROVEMENTS - (WHEN REQUESTED)	YES	NO	NA
45) Permanent structures located by:			
a) Minimum of three dimensions	____	____	____
b) Dimensions parallel or perpendicular to straight lines	____	____	____
c) Dimensions radial to curved lines	____	____	____
LOCATION OF EASEMENTS - (WHEN REQUESTED)	____	____	____
46) Easements shown on subdivision plat	____	____	____
47) Easements shown on other recorded documents and provided to Surveyor by Client	____	____	____

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GLO CORNER PRESERVATION AND REQUIRED FILING OF CORNER FORMS	YES	NO	NA
48) Permanent monuments at GLO corners	____	____	____
49) The following GLO corners were restored or reestablished and registered with MDA / Land Survey Program	____	____	____
Township, Range, Corner Index Number			
_____	____	____	____
_____	____	____	____
_____	____	____	____
_____	____	____	____