

Chapter 332-130 WAC

MINIMUM STANDARDS FOR LAND BOUNDARY SURVEYS AND GEODETIC CONTROL SURVEYS AND GUIDELINES FOR THE PREPARATION OF LAND DESCRIPTIONS

WAC

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WAC 332-130-010 Authority. The department of natural resources, in accordance with RCW 58.24.040, 58.09.050, and 58.17.160, prescribes the following regulations setting minimum standards for land boundary surveys and geodetic control surveys and providing guidelines for the preparation of land descriptions.

[Statutory Authority: RCW 58.09.050 and 58.24.040(1). WSR 92-03-007 (Order 597), § 332-130-010, filed 1/3/92, effective 2/3/92. Statutory Authority: RCW 58.24.040(1). WSR 89-11-028 (Order 561), § 332-130-010, filed 5/11/89; Order 275, § 332-130-010, filed 5/2/77.]

WAC 332-130-020 Definitions. The following definitions shall apply to this chapter:

(1) **Local geodetic control surveys:** Surveys for the specific purpose of establishing control points for extending the National Geodetic Survey horizontal and vertical control nets, also known as the National Spatial Reference System (NSRS), but not submitted to the National Geodetic Survey for inclusion in the NSRS.

(2) **GLO and BLM:** The General Land Office and its successor, the Bureau of Land Management.

(3) **Land boundary surveys:** All surveys, whether made by individuals, entities or public bodies of whatever nature, for the specific purpose of establishing, reestablishing, laying out, subdividing, defining, locating and/or monumenting the vertical or horizontal boundary of any easement, right of way, lot, tract, or parcel of real property or which reestablishes or restores General Land Office or Bureau of Land Management survey corners.

(4) **Land corner record:** The record of corner information form as prescribed by the department of natural resources in WAC 332-130-025.

(5) **Land description:** A description of real property or of rights associated with real property.

(6) **Land surveyor:** Any person authorized to practice the profession of land surveying under the provisions of chapter 18.43 RCW.

(7) **Redundant measurements:** Independent observations of a quantity that are collected under different conditions. Horizontal angles measured to a point from multiple backsights, observing reciprocal zenith angles and backsight distances, "closing the horizon," and GNSS positions for a point that are computed using different satellite constellations are examples of redundant measurements.

(8) **Parcel:** A part or portion of real property including but not limited to GLO and BLM segregations, easements, rights of way, aliquot parts of sections or tracts.

(9) **Survey Recording Act:** The law as established and designated in chapter 58.09 RCW.

(10) **Washington plane coordinate system:** The system of plane coordinates as established and designated by chapter 58.20 RCW.

(11) **Intelligent interpretation:** A land boundary survey capable of intelligent interpretation will provide, either on the face of the document or by reference to other pertinent surveys of record, information that is sufficient in kind and quality to explain the rationale for the boundary locations shown thereon and to allow for the accurate and unambiguous retracement or re-creation thereof without requiring oral testimony for clarification. Includes, but is not limited to, information required in RCW 58.09.060(1) and WAC 332-130-050.

(12) **Relative accuracy:** The theoretical uncertainty in the horizontal position of any subordinate point or corner with respect to other controlling points or corners, whether set, found, reestablished, or established. Relative accuracy is not related to uncertainties due to differences between measured values and record values or uncertainties in the geodetic position.

(13) **Relative precision:** An expression of linear misclosure, e.g., 1 part in 5000, in a closed traverse. Relative precision is computed after azimuths in a traverse have been adjusted. Relative precision is not a reliable predictor of relative accuracy.

(14) **Controlling point or corner:** Those points, whose horizontal positions are used to compute, establish or reestablish the horizontal positions of other subordinate points or corners. Subordinate points or corners are therefore dependent upon the positions of controlling points or corners.

(15) **GNSS:** Global navigation satellite system.

[Statutory Authority: RCW 58.24.040(1). WSR 19-01-045, § 332-130-020, filed 12/13/18, effective 1/13/19. Statutory Authority: RCW 58.24.030, 58.24.040, 58.09.050, and 58.17.160. WSR 09-03-084, § 332-130-020, filed 1/20/09, effective 7/1/09. Statutory Authority: Chapter 58.24 RCW. WSR 05-13-104, § 332-130-020, filed 6/17/05, effective 7/18/05. Statutory Authority: RCW 58.09.050 and 58.24.040(1). WSR 92-03-007 (Order 597), § 332-130-020, filed 1/3/92, effective 2/3/92. Statutory Authority: RCW 58.24.040(1). WSR 91-19-013 (Order 581), § 332-130-020, filed 9/9/91,

effective 10/10/91; WSR 89-11-028 (Order 561), § 332-130-020, filed 5/11/89; Order 275, § 332-130-020, filed 5/2/77.]

WAC 332-130-025 Corner restoration—Recording form. The record of corner information required to be filed with the county auditor by the Survey Recording Act shall be filed on a form provided by the department and following instructions provided by the department.

[Statutory Authority: RCW 58.24.030, 58.24.040, 58.09.050, and 58.17.160. WSR 10-09-011, § 332-130-025, filed 4/9/10, effective 5/10/10. Statutory Authority: RCW 58.24.040(1) and 58.09.050. WSR 97-02-071, § 332-130-025, filed 12/31/96, effective 1/31/97; WSR 92-03-007 (Order 597), § 332-130-025, filed 1/3/92, effective 2/3/92.]

WAC 332-130-030 Land subdivision and corner restoration standards—Recording. The following requirements apply when a land boundary survey is performed. If, in the professional judgment of the surveyor, the procedures of subsections (1) and (2) of this section are not necessary to perform the survey, departures from these requirements shall be explained and/or shown on the survey map produced.

(1) The reestablishment of lost GLO or BLM corners and the subdividing of sections shall be done according to applicable GLO or BLM plats and field notes and in compliance with the rules as set forth in the appropriate GLO or BLM *Manual of Surveying Instructions*, manual supplements and circulars. Federal or state court decisions that influence the interpretation of the rules should be considered. Methods used for such corner reestablishment or section subdivision shall be described on the survey map produced.

(2) All maps, plats, or plans showing a land boundary survey shall show all the corners found, established, reestablished and calculated, including corresponding directions and distances, which were used to survey and which will be necessary to resurvey the parcel shown. Additionally, all such maps, plats, or plans shall show sufficient section subdivision data, or other such controlling parcel data, necessary to support the position of any section subdivisional corner or controlling parcel corner used to reference the parcel surveyed. Where a portion or all of this information is already shown on a record filed or recorded in the county recording office of the county in which the parcel is located, reference may be made to that record in lieu of providing the required data.

(3) Documentation shall be provided for all GLO or BLM corner(s) or point(s) used to control the location of the parcel surveyed. This requirement shall be met by providing on the document produced:

(a) The information required by both the Survey Recording Act and the history and evidence found sections of the Land Corner Record Form; or

(b) The recording data of a document(s) that provides the required information and is filed or recorded in the county recording office of the county in which the parcel is located.

(4) Every corner originally monumented by the GLO or BLM that is physically reestablished shall be monumented in accordance with the Survey Recording Act. If the reestablished corner is not filed or recorded as part of a record of survey, plat or short plat, at least three references shall be established and filed or recorded on a Land Corner Record Form. If the reestablished corner is filed or recorded as part of a record of survey, plat or short plat, then ties to at least two other monuments shown on the record document may serve

in lieu of the required references. A valid set of coordinates on the Washington plane coordinate system may serve as one of the references. However, to best ensure an accurate relocation, references in close proximity to the corner are recommended. Monuments placed shall be magnetically locatable and include a cap stamped with the appropriate corner designation as defined in the current BLM *Manual of Surveying Instructions*.

[Statutory Authority: RCW 58.24.040(1). WSR 19-01-045, § 332-130-030, filed 12/13/18, effective 1/13/19; WSR 90-06-028 (Order 568), § 332-130-030, filed 3/1/90, effective 4/1/90; WSR 89-11-028 (Order 561), § 332-130-030, filed 5/11/89; Order 275, § 332-130-030, filed 5/2/77.]

WAC 332-130-040 Land description guidelines. An instrument used for the conveyance of real property should contain a description of the property sufficiently definite to allow location by a land surveyor without recourse to oral testimony.

The following guidelines consist of elements which are recommended for use in the preparation of land descriptions. They are not intended to be all inclusive and may not be applicable in all situations:

(1) In a description of a lot, tract, parcel or portion thereof in a recorded plat, short plat, or record of survey:

(a) Lot and block number or designation and addition or subdivision name;

(b) Official recording data and identification of recording office;

(c) Location by section, township, and range with respect to the Willamette Meridian, (if applicable);

(d) Property location by county and state.

(2) In a description of an easement, lot, tract, or parcel described by metes and bounds:

(a) Parcel location by the subdivision(s) of the section; or portion of any other official subdivisional tract from a GLO or BLM public land survey; or portion of a recorded plat, short plat, or record of survey;

(b) Section, township, and range with respect to the Willamette Meridian;

(c) Property location by county and state;

(d) Direction and distance to GLO or BLM corners or properly determined section subdivision corners with description of the physical corners, if applicable;

(e) A description of the boundary giving:

(i) Place of beginning and/or initial point;

(ii) Basis of bearings or azimuths;

(iii) Bearings, angles or azimuths in degrees, minutes and seconds;

(iv) Distances in feet and decimals of feet or record units, where applicable;

(v) Curve data showing the controlling elements;

(vi) Identification of senior adjoiners giving recording office and filing reference;

(vii) Calls to existing controlling monuments, both artificial and natural;

(viii) Calls which indicate if a course is a section line, subdivisional line, a line of record or parallel therewith;

(ix) A bearing and distance for each boundary line of the described parcel with a closing course returning to the point of beginning, except where the boundary can be described by a record, physical or natural feature.

(3) In a description based on a public land survey subdivision:

(a) Special segregations such as donation land claims, homestead entry surveys, townsites, tracts, and Indian or military reservations;

(b) Government lot number(s);

(c) Aliquot part designation;

(d) Section, township, and range with respect to the Willamette Meridian;

(e) Property location by county and state.

(4) Other elements of consideration for any land description:

(a) Avoid ambiguities when exceptions to a parcel are stated;

(b) Indicate width of strip description and its relationship to described centerline or survey line;

(c) Delineate the dividing line when designating a fractional portion of a parcel;

(d) When designating one-half or other fractional portion of an aliquot part by government subdivision procedures, follow with "according to U.S. Government subdivision procedures."

[Statutory Authority: RCW 58.24.040(1). WSR 89-11-028 (Order 561), § 332-130-040, filed 5/11/89; Order 275, § 332-130-040, filed 5/2/77.]

WAC 332-130-050 Survey map requirements. The following requirements apply to land boundary survey maps and plans, records of surveys, plats, short plats, boundary line adjustments, and binding site plans required by law to be filed or recorded with the county.

(1) All such documents filed or recorded shall conform to the following:

(a) They shall display a county recording official's information block which shall be located along the bottom or right edge of the document unless there is a local requirement specifying this information in a different format. The county recording official's information block shall contain:

(i) The title block, which shall be on all sheets of maps, plats or plans, and shall identify the business name of the firm and/or land surveyor that performed the survey. For documents not requiring a surveyor's certificate and seal, the title block shall show the name and business address of the preparer and the date prepared. Every sheet of multiple sheets shall have a sheet identification number, such as "sheet 1 of 5";

(ii) The auditor's certificate, where applicable, which shall be on the first sheet of multiple sheets; however, the county recording official shall enter the appropriate volume and page and/or the auditor's file number on each sheet of multiple sheets;

(iii) The surveyor's certificate, where applicable, which shall be on the first sheet of multiple sheets and shall show the name, license number, original signature and seal of the land surveyor who had responsible charge of the survey portrayed, and the date the land surveyor approved the map or plat. Every sheet of multiple sheets shall have the seal and signature of the land surveyor and the date signed;

(iv) The following indexing information on the first sheet of multiple sheets:

(A) The section-township-range and quarter-quarter(s) of the section in which the surveyed parcel lies, except that if

the parcel lies in a portion of the section officially identified by terminology other than aliquot parts, such as government lot, donation land claim, homestead entry survey, townsite, tract, and Indian or military reservation, then also identify that official subdivisional tract and call out the corresponding approximate quarter-quarter(s) based on projections of the aliquot parts. Where the section is incapable of being described by projected aliquot parts, such as the Port Angeles townsite, or elongated sections with excess tiers of government lots, then it is acceptable to provide only the official GLO designation. A graphic representation of the section divided into quarter-quarters may be used with the quarter-quarter(s) in which the surveyed parcel lies clearly marked;

(B) Additionally, if appropriate, the lot(s) and block(s) and the name and/or number of the filed or recorded subdivision plat or short plat with the related recording data;

(b) They shall contain:

(i) A north arrow;

(ii) The vertical datum when topography or elevations are shown;

(iii) The basis for bearings, angle relationships or azimuths shown. The description of the directional reference system, along with the method and location of obtaining it, shall be clearly given (such as "North by Polaris observation at the SE corner of section 6"; "Grid north from azimuth mark at station Kellogg"; "North by compass using twenty-one degrees variation"; "None"; or "Assumed bearing based on ..."). If the basis of direction differs from record title, that difference should be noted;

(iv) Bearings, angles, or azimuths in degrees, minutes and seconds;

(v) Distances in feet and decimals of feet;

(vi) Curve data showing the controlling elements.

(c) They shall show the scale for all portions of the map, plat, or plan provided that detail not drawn to scale shall be so identified. A graphic scale for the main body of the drawing, shown in feet, shall be included. The scale of the main body of the drawing and any enlargement detail shall be large enough to clearly portray all of the drafting detail, both on the original and reproductions;

(d) The document filed or recorded and all copies required to be submitted with the filed or recorded document shall, for legibility purposes:

(i) Have a uniform contrast suitable for scanning or microfilming;

(ii) Be without any form of cross-hatching, shading, or any other highlighting technique that to any degree diminishes the legibility of the drafting detail or text;

(iii) Contain dimensioning and lettering no smaller than 0.08 inches, vertically, and line widths not less than 0.008 inches (equivalent to pen tip 000). This provision does not apply to vicinity maps, land surveyors' seals and certificates.

(e) They shall not have any adhesive material affixed to the surface;

(f) For the intelligent interpretation of the various items shown, including the location of points, lines and areas, they shall:

(i) Reference record survey documents that identify different corner positions;

(ii) Show deed calls that are at variance with the measured distances and directions of the surveyed parcel;

(iii) Identify all corners used to control the survey whether they were calculated from a previous survey of record or found, established, or reestablished;

(iv) Give the physical description of any monuments shown, found, established or reestablished, including type, size, and date visited;

(v) Show the record land description of the parcel or boundary surveyed or a reference to an instrument of record;

(vi) Identify any ambiguities, hiatuses, and/or overlapping boundaries;

(vii) Give the location and identification of any visible physical appurtenances such as fences or structures which may indicate encroachment, lines of possession, or conflict of title.

(2) All signatures and writing shall be made with permanent black ink.

(3) The following criteria shall be adhered to when altering, amending, changing, or correcting survey information on previously filed or recorded maps, plats, or plans:

(a) Such maps, plats, or plans filed or recorded shall comply with the applicable local requirements and/or the recording statute under which the original map, plat, or plan was filed or recorded;

(b) Alterations, amendments, changes, or corrections to a previously filed or recorded map, plat, or plan shall only be made by filing or recording a new map, plat, or plan;

(c) All such maps, plats, or plans filed or recorded shall contain the following information:

(i) A title or heading identifying the map, plat, or plan as an alteration, amendment, change, or correction to a previously filed or recorded map, plat, or plan along with, when applicable, a cross-reference to the volume and page and auditor's file number of the altered map, plat, or plan;

(ii) Indexing data as required by subsection (1)(a)(iv) of this section;

(iii) A prominent note itemizing the change(s) to the original map, plat, or plan. Each item shall explicitly state what the change is and where the change is located on the original;

(d) The county recording official shall file, index, and cross-reference all such maps, plats, or plans received in a manner sufficient to provide adequate notice of the existence of the new map, plat, or plan to anyone researching the county records for survey information;

(e) The county recording official shall send to the department of natural resources, as per RCW 58.09.050(3), a legible copy of any map, plat, or plan filed or recorded which alters, amends, changes, or corrects survey information on any map, plat, or plan that has been previously filed or recorded pursuant to the Survey Recording Act.

(4) Survey maps, plats and plans filed with the county shall be an original that is legibly drawn in black ink on mylar and is suitable for producing legible prints through scanning, microfilming or other standard copying procedures. The following are allowable formats for the original that may be used in lieu of the format stipulated above:

(a) Photo mylar with original signatures;

(b) Any standard material as long as the format is compatible with the auditor's recording process and records storage system. Provided, that records of survey filed pursuant to

chapter 58.09 RCW are subject to the restrictions stipulated in RCW 58.09.110(5);

(c) An electronic version of the original if the county has the capability to accept a digital signature issued by a licensed certification authority under chapter 19.34 RCW or a certification authority under the rules adopted by the Washington state board of registration for professional engineers and land surveyors, and can import electronic files into an imaging system. The electronic version shall be a standard raster file format acceptable to the county.

(5) The following checklist is the only checklist that may be used to determine the recordability of records of survey filed pursuant to chapter 58.09 RCW. There are other requirements to meet legal standards. This checklist also applies to maps filed pursuant to the other survey map recording statutes, but for these maps there may be additional sources for determining recordability.

CHECKLIST FOR SURVEY MAPS BEING RECORDED

(Adopted in WAC 332-130)

The following checklist applies to land boundary survey maps and plans, records of surveys, plats, short plats, boundary line adjustments, and binding site plans required by law to be filed or recorded with the county. There are other requirements to meet legal standards. Records of survey filed pursuant to chapter 58.09 RCW, that comply with this checklist, shall be recorded; no other checklist is authorized for determining their recordability.

ACCEPTABLE MEDIA:

- For counties required to permanently store the document filed, the only acceptable media are:
 - ☐ Black ink on mylar or photo mylar
- For counties exempted from permanently storing the document filed, acceptable media are:
 - ☐ Any standards material compatible with county processes; or, an electronic version of the original.
- ☐ All signatures must be original and, on hardcopy, made with permanent black ink.
- ☐ The media submitted for filing must not have any material on it that is affixed by adhesive.

LEGIBILITY:

- ☐ The documents submitted, including paper copies, must have a uniform contrast throughout the document.
- ☐ No information, on either the original or the copies, should be obscured or illegible due to cross-hatching, shading, or as a result of poor drafting technique such as lines drawn through text or improper pen size selection (letters or number filled in such that 3's, 6's or 8's are indistinguishable).
- ☐ Signatures, date, and seals must be legible on the prints or the party placing the seal must be otherwise identified.
- ☐ Text must be 0.08 inches or larger; line widths shall not be less than 0.008 inches (vicinity maps, land surveyor's seals and certificates are excluded).

INDEXING:

- ☐ The recording officer's information block must be on the bottom or right edge of the map.
- ☐ A title block (shows the name of the preparer and is on each sheet of multiple sheets).
- ☐ An auditor's certificate (on the first sheet of multiple sheets, although Vol./Pg. and/or AF# must be entered by the recording officer on each sheet).
- ☐ A surveyor's certificate (on the first sheet of multiple sheets; seal, date, and signature on multiple sheets).
- The map filed must provide the following indexing data:
 - ☐ S-T-R and the quarter-quarter(s) or approximate quarter-quarter(s) of the section in which the surveyed parcel lies,
 - ☐ Optional: A graphic representation of the section divided into quarter-quarters may be used with the quarter-quarter(s) in which the surveyed parcel lies clearly marked;

MISCELLANEOUS

- If the function of the document submitted is to change a previously filed record, it must also have:
 - ☐ A title identifying it as a correction, amendment, alteration or change to a previously filed record,
 - ☐ A note itemizing the changes.
- For records of survey:
 - ☐ The sheet size must be 18" x 24"
 - ☐ The margins must be 2" on the left and 1/2" for the others, when viewed in landscape orientation.
 - ☐ In addition to the map being filed there must be two prints included in the submittal; except that, in counties using imaging systems fewer prints, as determined by the Auditor, may be allowed.

[Statutory Authority: RCW 58.24.040(1). WSR 19-01-045, § 332-130-050, filed 12/13/18, effective 1/13/19. Statutory Authority: RCW 58.24.040(1) and 58.09.110. WSR 00-17-063 (Order 704), § 332-130-050, filed 8/9/00, effective 9/9/00. Statutory Authority: RCW 58.24.040(1). WSR 89-11-028 (Order 561), § 332-130-050, filed 5/11/89; Order 275, § 332-130-050, filed 5/2/77.]

Reviser's note: The brackets and enclosed material in the text of the above section occurred in the copy filed by the agency.

WAC 332-130-060 Local geodetic control survey standards. The following standards shall apply to local geodetic control surveys:

The datum for the horizontal control network in Washington shall be as officially adjusted and published by the National Geodetic Survey of the United States Department of Commerce as established in accordance with chapter 58.20 RCW. The datum tag and coordinate epoch date shall be reported on all documents prepared, which show local geodetic control.

[Statutory Authority: RCW 58.24.040(1). WSR 19-01-045, § 332-130-060, filed 12/13/18, effective 1/13/19. Statutory Authority: Chapter 58.24 RCW. WSR 05-13-104, § 332-130-060, filed 6/17/05, effective 7/18/05. Statutory Authority: RCW 58.24.040(1). WSR 91-19-013 (Order 581), § 332-130-060, filed 9/9/91, effective 10/10/91; WSR 89-11-028 (Order 561), § 332-130-060, filed 5/11/89; Order 275, § 332-130-060, filed 5/2/77.]

(12/13/18)

WAC 332-130-070 Land boundary survey standards. The following standards shall apply to land boundary surveys:

(1) The accuracy or precision of field work may be determined and reported using either relative accuracy standards or field traverse standards, provided that field work not capable of analysis with field traverse standards must be evaluated using relative accuracy standards and procedures. Final results must meet or exceed the appropriate standards as contained in WAC 332-130-085 or 332-130-090.

(2) The datum when using the Washington Plane Coordinate System shall be as officially adjusted and published by the National Geodetic Survey of the United States Department of Commerce as established in accordance with chapter 58.20 RCW. The datum tag and the coordinate epoch date shall be reported on all documents prepared which reference the Washington Plane Coordinate System.

[Statutory Authority: RCW 58.24.040(1). WSR 19-01-045, § 332-130-070, filed 12/13/18, effective 1/13/19. Statutory Authority: Chapter 58.24 RCW. WSR 05-13-104, § 332-130-070, filed 6/17/05, effective 7/18/05. Statutory Authority: RCW 58.24.040(1). WSR 90-06-028 (Order 568), § 332-130-070, filed 3/1/90, effective 4/1/90; WSR 89-11-028 (Order 561), § 332-130-070, filed 5/11/89; Order 275, § 332-130-070, filed 5/2/77.]

WAC 332-130-080 Relative accuracy—Principles.

The following principles of relative accuracy are provided to guide those who may be analyzing their work by these procedures.

(1) Relative accuracy means the theoretical uncertainty in the location of any point or corner relative to other points or corners set, found, reestablished, or established. A standard of relative accuracy can be achieved by using appropriate equipment and implementing field and office procedures that will result in a ninety-five percent probability of achieving the accuracy required.

(2) Relative accuracy is not related to uncertainties due to differences between measured values and record values or uncertainties in the geodetic position.

(3) In the application of a relative accuracy standard, the surveyor must consider the established land use patterns, land values of and in the vicinity of the surveyed parcel, and the client's intended use of the property. Higher levels of precision are expected to be used in situations necessitating higher accuracy.

(4) Each land boundary survey should contain a statement identifying the method of mathematical analysis used in achieving a stated relative accuracy.

[Statutory Authority: RCW 58.24.040(1). WSR 90-06-028 (Order 568), § 332-130-080, filed 3/1/90, effective 4/1/90; WSR 89-11-028 (Order 561), § 332-130-080, filed 5/11/89; Order 275, § 332-130-080, filed 5/2/77.]

WAC 332-130-085 Relative accuracy standards for land boundary surveys. The following standards may be applied to boundary surveys utilizing field traverses and shall be applied when positioning techniques used in a land boundary survey are not amenable to analysis with standards in WAC 332-130-090. Such standards should be considered minimum standards only. Higher levels of accuracy are expected to be utilized in areas with higher property values or in other situations necessitating higher accuracy.

The maximum allowable relative accuracy for positions shown on a boundary survey under this standard is 0.07 feet

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plus 200 parts per million at the ninety-five percent confidence level, based on the distance shown on the map between the two positions being tested. It is recognized that in certain circumstances, the size or configuration of the surveyed property, or the relief, vegetation, or improvements on the surveyed property, can result in survey measurements that may cause the maximum allowable relative accuracy in the survey to be exceeded. If the maximum allowable relative accuracy in the survey is exceeded, the surveyor shall report the reasons for exceeding the standard, shall identify those monuments whose positions exceed the standard and the amount by which said monuments exceed the standard.

[Statutory Authority: RCW 58.24.040(1). WSR 19-01-045, § 332-130-085, filed 12/13/18, effective 1/13/19.]

WAC 332-130-090 Field traverse standards for land boundary surveys. The following standards shall apply to field traverses used in land boundary surveys. Such standards should be considered minimum standards only. Higher levels of precision are expected to be utilized in areas with higher property values or in other situations necessitating higher accuracy.

- (1) Linear closures after azimuth adjustment.
 - (a) City - central and local business and industrial areas 1:10,000
 - (b) City - residential and subdivision lots 1:5,000
 - (c) Section subdivision, new subdivision boundaries for residential lots and interior monument control 1:5,000
 - (d) Suburban - residential and subdivision lots 1:5,000
 - (e) Rural - forest land and cultivated areas 1:5,000
 - (f) Lambert grid traverses 1:10,000
- (2) Angular closure.
 - (a) Where 1:10,000 minimum linear closure is required, the maximum angular error in seconds shall be determined by the formula of $10 \sqrt{n}$, where "n" equals the number of angles in the closed traverse.
 - (b) Where 1:5,000 minimum linear closure is required, the maximum angular error in seconds shall be determined by the formula of $30 \sqrt{n}$ where "n" equals the number of angles in the closed traverse.

[Statutory Authority: RCW 58.24.040(1). WSR 90-06-028 (Order 568), § 332-130-090, filed 3/1/90, effective 4/1/90; WSR 89-11-028 (Order 561), § 332-130-090, filed 5/11/89.]

WAC 332-130-100 Equipment and procedures. (1) All land boundary surveys filed or recorded shall contain a statement identifying the type of equipment used, such as 3-second theodolite and electronic distance measuring unit, total station or GNSS receiver, and procedures used, such as field traverse, scanning, photogrammetric survey, GNSS based relative static or real time kinematic survey, or a combination thereof to accomplish the survey shown;

(2) All measuring instruments and equipment shall be maintained in adjustment according to manufacturer's specifications.

[Statutory Authority: RCW 58.24.040(1). WSR 19-01-045, § 332-130-100, filed 12/13/18, effective 1/13/19. Statutory Authority: RCW 58.24.020. WSR 04-11-019 (Order 711), § 332-130-100, filed 5/10/04, effective 6/10/04. Statutory Authority: RCW 58.24.040(1). WSR 89-11-028 (Order 561), § 332-130-100, filed 5/11/89.]

WAC 332-130-110 Closure and redundancy. The following standards shall apply to geodetic surveys and land boundary surveys.

All land surveys shall contain procedures, measurement redundancy, and closure checks sufficient to detect errors and blunders and to ensure that the survey standards, chapter 332-130 WAC have been met.

[Statutory Authority: RCW 58.24.030, 58.24.040, 58.09.050, and 58.17.160. WSR 09-03-084, § 332-130-110, filed 1/20/09, effective 7/1/09.]

WAC 332-130-145 Topographic elements on maps—Requirements. For the purposes of this section, topographic elements consist of information shown on a map which depicts the horizontal and vertical positions of natural and/or fabricated features and existing terrain surfaces. Usually, contour lines and spot elevations are used to depict surface relief, but a variety of methods can be used to show changes in terrain.

The following requirements shall apply to maps that include topographic elements, prepared by professionals registered under chapters 18.43 and 18.210 RCW. Such requirements should be considered minimum only. The professional conducting the work will determine what precision and accuracy are expected to be utilized for topographic mapping services necessitating various levels of accuracy.

- (1) The following elements must be included on every map that includes topographic elements:
 - (a) Vertical datum used (such as "assumed," "NAVD 88," "NSRS," "unknown");
 - (b) North arrow;
 - (c) Map scale and graphic scale bar;
 - (d) Legend of symbols used;
 - (e) Licensee name and contact information;
 - (f) Seal and signature of licensee.
- (2) Statements of clarification for elements shown:
 - (a) Basis of elevations citing benchmark(s) used with elevation(s) (such as "city bench mark 20-01, elevation 456.32 feet, GPS observation including metadata");
 - (b) Purpose or intended use of the topographic elements shown on the map (such as "preliminary plat," "on-site septic design," "civil engineering design");
 - (c) A description of the source of the contours (such as "contours derived from direct field observations," or "contours shown are from county GIS");
 - (d) Labeling to determine contour interval(s);
 - (e) Description of project benchmarks established (such as "railroad spike in power pole," "chiseled 'X' in concrete curb");
 - (f) Statement of elevations and contour accuracy (such as "national mapping standards, one-half the contour interval");
 - (g) Statement on limitation of use (such as "preliminary-not for design," "this is not a boundary survey");
 - (h) Source of boundary information (such as "record of survey including auditor indexing information," "county GIS") and method(s) used to relate area mapped to said boundaries.
- (3) Statements of clarification of utility information shown:
 - (a) Source of utility location (such as "surface markings," "as-built," "potholing," or "field measurement");

(b) Statement of accuracy of utility depiction (such as "locations of underground utilities shown hereon are based upon field measurement" or "locations of underground utilities shown hereon are based upon as-built maps");

(c) A statement of the scope of work between the project owner and the licensee regarding the comprehensiveness, exclusions, and limits of the utility investigations leading to these utility depictions.

[Statutory Authority: RCW 58.24.040(1). WSR 18-17-080, § 332-130-145, filed 8/13/18, effective 9/13/18.]