CHAPTER Lan 500 ETHICAL STANDARDS

PART Lan 501 CODE OF ETHICS

Readopt with amendment Lan 500 effective 11-1-2016 (Document #12031), to read as follows:

Lan 501.01 Purpose and Scope.

(a) To establish and maintain a high standard of integrity, skills, and practice in the profession of land surveying, the following rules of professional conduct are adopted in accordance with RSA 310-A, ***VI,*** and shall be binding upon every person holding a ***New Hampshire*** land surveyor~~'s~~ license.

Lan 501.02 Obligation to Obey.

(a) The ethical standards set forth in this part shall bind all licensees, and violation of any such standard shall ***be misconduct sufficient to support disciplinary sanctions.*** ~~result in disciplinary sanction.~~

(b) All persons licensed under RSA 310-A***:67*** shall be considered to have knowledge of the existence of these rules of professional conduct and to be familiar with their several provisions. ~~Such knowledge shall encompass the understanding that the practice of land surveying is a privilege, as opposed to a right, and the~~ ***A l***icensed land surveyor shall be ~~required to be~~ forthright and candid in ***their*** ~~his or her~~ statements or written response to the board ***and*** ~~or~~ ***the office of professional licensure and certification (OPLC)*** ~~its representatives o~~***in all*** matters ~~pertaining to professional conduct~~.

Lan 501.03 Standards of Conduct.

(a) The licensee shall:

(1) Undertake only work for which the licensee is qualified by education and experience; and

(2) When serving as an expert or technical witness on behalf of a party before any court, commission, or other tribunal, shall in direct testimony express an opinion only when it is founded upon adequate knowledge of the facts in issue, upon a background of technical competence in the subject matter, and upon honest conviction of the accuracy and propriety of the testimony.

(b) The licensee shall clearly identify ***themselves,*** ~~himself or herself, his or her~~ ***their*** employer, and in whose interest ***they*** ~~he or she is~~ ***are*** working and:

(1) Disclose fully to the client any financial or purchase interest the licensee or the licensee's employer has in the land on which ***they***~~he or she is~~ ***are*** working;

(2) ~~Conscientiously~~ ***A***~~a~~void conflicts of interest ***and***~~or even~~ the appearance ~~of such conflicts~~; and

(3) If~~, despite precaution,~~ a conflict of interest is discovered, ***the licensee*** ~~he or she~~ shall:

a. Promptly and fully disclose the conflict of interest to the client ***or*** ~~/~~employer; and

b. Act immediately to resolve the conflict.

(c) The licensee shall not knowingly issue a false statement or false information.

(d) The licensee shall advertise only in a truthful manner, stating the services the licensee is qualified and prepared to perform.

(e) The licensee shall not falsify or permit misrepresentation of the licensee's or the licensee's associates, academic or professional qualifications.

(f) With respect to misrepresentation, the licensee shall not:

(1) Misrepresent or exaggerate the licensee's degree of responsibility in, or for the subject matter of prior assignments; or

(2) Misrepresent pertinent facts in brochures or other presentations incident to the solicitation of employment concerning employers, employees, associates, joint ventures, or the licensee or ***their***~~his or her~~ past accomplishments with the intent and purpose of enhancing the licensee's qualifications and work.

(g) The licensee shall issue no statements, criticisms, or arguments on land surveying matters which are inspired or paid for by an interested party, or parties, unless such comments are prefaced by explicit identification of the licensee and by disclosing the identities of the party or parties on whose behalf the licensee is speaking.

(h) The licensee shall not attempt to injure***,*** by false statement or dishonest action, either directly or indirectly, the professional reputation, prospects, or business of another.

(i) The licensee shall be objective and truthful in all professional reports, statements,~~ or~~ ***and*** testimony. The licensee shall include only relevant and pertinent information in such reports, statements, ~~or~~ ***and*** testimony.

(j) With regard to written contracts and fees,~~ the~~ ***a*** licensee shall:

(1) Offer a written contract to the client;

(2) When utilizing a written contract specify the following:

a. The land upon which the work will be performed;

b. The nature and scope of the work to be performed;

c. The estimated time period within which the work is to be performed; and

d. A cost estimate or fee schedule;

(3) Not accept compensation or expenses from more than one employer or client for the same service, unless the parties involved are informed and consent;

(4) Not accept work on a contingent fee basis;

(5) Not solicit or accept gratuities, directly or indirectly, from contractors, their agents, or other parties dealing with the licensee's client in connection with the work for which the licensee is responsible.

(k) The~~ licensee shall recognize that the~~ practice of land surveying by a person, firm, co-partnership, corporation, or joint stock association construed to practice or offer to practice land surveying shall be under the direct charge and supervision of a land surveyor licensed by the State of New Hampshire.

(l) The licensee shall advise the client of the level of precision most appropriate to the purposes of the survey.

(m) With regard to other laws, relations with other surveyors, and misrepresentations, the licensee shall:

(1) At all times in the performance of services, abide by applicable federal, state***,*** and municipal laws and regulations;

(2) Unless the circumstances are fully disclosed to all parties, not solicit or accept a land surveying contract from a government body on which a principal or officer of the licensee's organization serves as a member;

(3) Not contract for the completion of another licensee's contracted work unless reasonable effort has been made to consult with the prior licensee;

(4) Cooperate with other licensed land surveyors with an interchange of information, in particular, where discrepancies are discovered, where such interchange does not include confidential information; and

(5) Not perform any acts, allow omissions***,*** or make any assertions or representations which are fraudulent***,*** deceitful, or misleading, or which in any manner tend to create misleading impression.

(n) With regard to interacting with the board ***and the office of professional licensure and certification (OPLC)***, the licensee shall:

(1) Cooperate with investigations and requests for information from the ~~board~~ ***OPLC*** ~~and the board's representatives~~;

(2) ***File a complaint with the***~~Present information to the~~ ***OPLC***~~board of licensure for land surveyors for action~~, if the licensee has evidence of unprofessional conduct ~~of~~ ***by*** another land surveyor ~~provided that the licensee believes that such misconduct is occurring~~;

(3) Submit only truthful and correct information in any application or other document filed with or statement made to the ***OPLC or*** board;

~~(4) Inform the board of a principal business/home address to which all official board communications should be directed, and also of all addresses where he/she is practicing land surveying or has a branch office; and~~

(~~4~~***5***) ***As required by Plc 307.02,*** ~~Report to~~ ***notify*** the ***OPLC*** ~~board the establishment~~ of ***a change of*** business~~/~~ ***or*** home address***, or phone number*** ~~or the change or abandonment of a business/home address~~ within ***10 working***~~30~~ days.

(o) The licensee shall not engage in or participate in professional or business practices of a fraudulent or dishonest nature.

(p) With regard to signatures and seals, the licensee shall not:

(1) Sell ~~n~~or permit the use of ~~his or her~~ ***their*** seal to anyone~~, recognizing that the seal indicates the licensee's personal responsibility for the work bearing the licensee's seal~~;

(2) Affix a signature or seal to any map or document dealing with subject matter in which the licensee lacks competence by virtue of education or experience; and

(3) Affix the licensee's signature or seal to any plans or document not prepared by the licensee or by an employee, or a surveyor-in-training under the licensee's direct supervisory control, except historical documents pursuant to RSA 67***6***~~8~~:18, II.

(q) The licensee shall with respect to supervision of an employee or surveyor-in-training:

(1) Have direct involvement and thorough supervision of the entire survey process; and

(2) Supervise the work being performed during each phase of work performed from project conception through final project conclusion.

PART Lan 502 RESEARCH STANDARDS

Lan 502.01 Research Standards.

(a) A land surveyor assuming the responsibility of performing a land survey shall also assume responsibility for conducting and retaining research of adequate thoroughness to support the determination of the intended boundaries of the parcel surveyed.

(b) Minimum research standards for the surveying of real property shall be as follows:

(1) The subject tract shall be researched to ensure the correctness of the record evidence;

(2) All abutting tracts shall be researched to ensure the correctness of the record evidence;

(3) Record evidence of tracts other than the subject tract and abutting tracts shall be examined, or additional information sought, which might relate to the property lines and corners being surveyed whenever necessary;

(4) In the absence of sufficient record evidence substantiating the property lines and corners being surveyed, attempts shall be made to obtain evidence from unrecorded sources;

(5) When the property lines or corners being surveyed are defined by a specific elevation or coordinates, the description of monuments referencing the vertical or horizontal datums upon which the survey is based shall be obtained;

(6) Preliminary conclusions as to the completeness of data shall be formulated and any inconsistencies in the record information shall be reconciled;

(7) The consistency of the data shall be tested by plotting and compiling the appropriate record information; and

(8) A field investigation shall accompany the record research and evaluation, if appropriate.

PART Lan 503 TECHNICAL STANDARDS

Lan 503.01 Terminology. Terminology used in these standards shall be as defined ***in this chapter,*** ~~herein~~ or when not defined herein shall refer to the ~~1978~~***2005*** revised edition of "Definitions of Surveying and Associated Terms" as prepared by a joint committee of the ***National Society of Professional Surveyors (formerly known as the*** American Congress on Surveying and Mapping~~)~~ and the American Society of Civil Engineers as specified in Appendix B.

Lan 503.02 Definitions. The following definitions shall apply:

(a) "Aerial mapping" means the collection and processing of imagery, lidar, or other remotely sensed data from a crewed or unmanned aircraft for the purpose of producing geospatial information.

(***b***~~a~~) "As-built survey" means a survey performed to detail the horizontal and vertical positions of the physical improvements of all or part of a tract, parcel, or lot of land.

(c) "Checkpoint" means a point having independently established horizontal or vertical coordinates, or both, that is not used to control, calibrate, register, adjust, or otherwise process the dataset and that is used solely to evaluate the positional accuracy of the resulting product.

(***d***~~b~~) "Construction survey" means a survey to position on the ground physical structures and/or improvements that have been designed for a particular tract of land.

~~(c) "Dilution of precision value~~***"*** ~~(DOP)" means a measure of the accuracy of the readings based on the dispersion of the visible GPS satellites.~~

~~(d) "Elevation mask" means the cut-off angle for tracking satellites, set at 15 degrees above the GPS receiver's horizon.~~

(e) "~~Farmland and woodlot~~ ***Forest*** (F) surveys" means surveys of property of unimproved or improved lands used as farmland, woodlots, or wetlands, surveys of land which lie in remote, sparsely populated areas with difficult terrain, or both.

(f) "Field notes***"***, electronic or written, means the permanent detailed record made by a surveyor as he is in the process of establishing a boundary.

~~(g) "Geoid model" means the hypothetical surface if water reacted to gravity alone, over the entire surface, used as a base datum for determining heights.~~

(***g***~~h~~) "Global ***navigation satellite*** ~~positioning~~ system***"*** (G***NSS***~~PS) survey)"~~ means any survey in which the location of ~~property~~ features, for whatever purpose, are primarily measured using observations of radio signals transmitted from satellites ~~in a GPS~~. This survey includes all equipment and procedures from the planning stage to the reporting of final results.

(***h***~~i~~) "Land title survey" means a survey that conforms to the requirements of a particular land title insuring agency or "Minimum Standard Detail Requirements for ALTA/NSPS Land Title Surveys", adopted ***February 23,*** 20***26***~~16~~ by ***the American Land Title Association and*** the National Society of Professional ~~Land~~ Surveyors ~~and the American Land Title Association~~ as specified in Appendix B.

(***i***~~j~~) "Least squares" means a mathematical method of the adjustment of observation, based on the theory of probability.

(***j***~~k~~) "Line of possession" means a line defined by physical evidence of occupation.

(***k***~~l~~) "Linear misclosure" means the straight-line bearing and distance error by which a survey traverse loop fails to close.

(l) "Local accuracy" means the relative positional accuracy between survey points whose relationship is being evaluated and shall not mean the accuracy of a survey point relative to a continuously operating reference station, GNSS base station, or other reference point unless that reference point is itself a point being evaluated as part of the survey.

(m) "Loop closure" means the comparison to the elements of a polygon of the positional measurements of a survey traverse whose successive instrument set-ups form a loop.

(n) "Monument" means a physical object, natural or artificial in nature, which marks the location of a corner or other survey point.

~~(o) "Observation rate" means the stipulated short period of time between each of the downloads to storage from a GNSS receiver's microprocessor, also known as the sampling rate or data interval.~~

(***o***~~p~~) "Plat" means a plan drawn to scale showing all essential data pertaining to the boundaries and subdivisions of a tract of land, as determined by survey.

(***p***~~q~~) "Root collar" means that portion of a tree which is above ground and below the elevation at which the tree becomes merchantable or cylindrical.

(***q***~~r~~) "Rural (R) surveys" means surveys of property that lie outside urban and suburban areas.

(r) "Scanning" means the collection of dense spatial measurements using terrestrial, mobile, airborne, image-based, laser-based, or equivalent sensing technology.

(s) "Sideshot" means a reading or measurement from a survey station to locate a point which is not intended to be used as a base for the extension of the survey.

(t) "Standard property survey" means a survey of boundary, easements, rights of way and/or leases performed with research, field survey and analysis of all factors affecting and influencing the location of the boundaries, easements, rights-of-way, and leases of record, within or immediately surrounding the tract, parcel or lot.

(u) "Statistical accuracy data" means results of the comparison of differences between the observed positions and those derived as elements of a network of polygons, using statistical analysis.

(v) ~~"~~***"***Survey classification" means a specific survey type based upon the location and/or use of the site to be surveyed.

(w) "Topographic survey" means a survey to determine the configuration, relief or elevation of a portion of the earth's surface, including the location of natural and/or man-made features thereon.

(x) "Urban, suburban, industrial, commercial, condominium and multi-unit residential surveys (U)" means surveys of property lying within or adjoining a developed area of a city or town.

Lan 503.03 Survey Requirements.

(a) When the parcel is a condominium, the survey shall meet the requirements of RSA 356-B:20.

(b) Construction surveys shall include but shall not be limited to the layout of structures and physical improvements.

(c) Construction surveys shall adhere to the minimum technical standards as outlined in Lan 503.06, Specifications.

(d) For a survey to fall under the "~~farm~~***forest*** or woodlot survey" classification as outlined in Table 500.1, Survey Classification, Precision and Accuracy, the property shall be 10 acres or greater in area, shall be bounded by physical evidence, and shall have limited potential for development at the time of the survey.

(e) A standard property survey plat shall show all data required for a complete and accurate description of the land which it delineates.

(f) Standard property survey specifications, as outlined in Lan 503.06, Specifications shall apply to locate, monument, plat, determine the area or volumes, and prepare a land parcel description of a tract, parcel or lot of real property or easement. Standard property surveys shall include the location of lines of occupation and any possible encroachments.

(g) Standard property surveys shall include but are not limited to the following:

(1) Lot survey;

(2) Subdivision of land;

(3) Lot line ***adjustment***~~revision~~;

(4) Lot line elimination;

(5) Line survey;

(6) Boundary line agreement;

(7) Physical evidence survey;

(8) Easement survey;

(9) Monumentation survey;

(10) Establishment or re-establishment of political boundaries~~, or both~~; and

(11) Land title survey***;***

(12) As-built survey.

(h) Topographic survey specifications, as outlined in Lan 503.06, Specifications shall apply when gathering relevant information that will be represented on a topographic or existing conditions plan.

Lan 503.04 Class***i***fications of Real Property Surveys. Every survey of real property in this state shall fall under one of 3 classifications. These classifications and minimum requirements shall be as specified in Table 500.1, Survey Classification***,*** Precision and Accuracy:

Table 500.1 Survey Classification, Precision and Accuracy

SURVEY CLASSIFICATION	**U for** Urban Suburban Industrial Commercial Condominium Multi-unit residential	**R for** Rural	**F for** ***Forest*** ~~Farmland~~ Woodlots

PRECISION MEASUREMENTS	(conventional closed traverse)		
Unadjusted Linear Misclosure	1:1***5***~~0~~,000	1:5,000	1:300

Min. Scale Graduation of Instrument	20 sec.	30 sec.	1 deg.
Distance Measurement	EDM/Steel tape	EDM/Steel tape	Steel tape/ stadia
Elev. Used to Determine Property Lines	0.2' +/-	0.5' +/-	n/a

~~ACCURACY MEASUREMENTS (GPS survey or survey adjusted using least squares)~~

ACCURACY MEASUREMENTS (GNSS survey and survey adjusted using least squares)			
Minimum positional tolerances of land property corners computed least squares adjustment at the 95% confidence level			
(Cell intentionally left blank)	***U (urban)***	***R (rural)***	***F (forest)***
Local Accuracy of directly occupied corners	***0.07 ft (2.1cm) + 1:10,000***	***0.25 ft (8cm) +1:5,000***	***1.6 ft (50cm) +1:300***
Local Accuracy of control supporting the survey	***0.03 ft (1cm) + 1:10,000***	***0.13 ft (4cm) + 1:5,000***	***0.66 ft (20cm) + 1:300***

~~Minimum positional tolerances of land property corners computed least squares adjustment at the 95% confidence level.~~

	~~U (urban)~~	~~R (rural)~~	~~F (farmland)~~
~~Local Accuracy of directly occupied corners~~	~~0.05 ft (1.7cm) + 1:10000~~	~~0.25 ft (8cm) +1:5000~~	~~1.6 ft (50cm) +1.3:00~~
~~Local Accuracy of control supporting the survey~~	~~0.03 ft (1cm) + 1:10000~~	~~0.13 ft (4cm) + 1:5000~~	~~0.66 ft (20cm) + 1:300~~

Lan 503.05 ***GNSS Accuracy Requirements*** ~~Specifications~~. ~~The minimum specifications~~ ***in*** ~~per Lan 503.06 shall be adhered to for all surveys of property within this state.~~

(a) The distance from a GNSS base station to a directly occupied property corner or control shall not be used as the distance for the purpose of determining compliance with the local accuracy requirement.

(b) Compliance with the positional tolerance shall be demonstrated by statistical analysis of appropriately redundant observations through a least-squares adjustment at the 95 percent confidence level. Estimated precision, RMS values, or other accuracy indicators reported by GNSS field equipment may be used as quality-control information but shall not, by themselves, constitute verification that the positional tolerance has been achieved.

(c) 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, will result in survey measurements that exceed the minimum positional tolerances. In such cases, the reason shall be noted on the face of the plat explaining the site conditions and the actual positional tolerance achieved.

Lan 503.06 Applicable Specifications. ***All surveys of property within this state shall adhere to t***~~T~~he following minimum applicable specifications ~~shall apply to all survey classifications unless listed below~~:

(a) All survey field work shall be performed with methods of practice and equipment capable of attaining the tolerances as specified in Table 500.1, Survey Classification Precision and Accuracy providing for:

(1) Elimination and reduction of known systematic errors and mistakes;

(2) Sufficient redundancy to clearly state that the accuracy requirements have been achieved;

(3) Analysis of field procedures and data processing to achieve the accuracy and precisions; and

(4) Documentation verifying compliance with these standards.

(b) All survey instruments shall be kept in good repair, close adjustment, and operated according to manufacturers' specifications. A record of surveyor equipment maintenance shall be maintained by the surveyor.

(c) All pertinent information, measurements, and observations made in the field during the course of the survey shall be recorded as field notes in (d) below. Computer printouts of raw data downloaded from an electronic data collection device shall be considered a form of field notes.

(d) All field notes shall indicate:

(1) Location;

(2) Street names;

(3) Client;

(4) Instruments;

(5) Date;

(6) Field crew;

(7) Weather conditions; and

(8) Purpose of field work.

(e) Searches for evidence believed to be ferrous or magnetic in nature shall be conducted with a magnetic or metal detector when evidence is possibly buried or not visible.

(f) ~~Survey traverses shall be based on a bearing system determined from astronomic observations, GPS observations, or from geodetic monuments incorporated into the traverse. If neither method is practical the survey shall be based on a magnetic bearing observed with a compass having a scale permitting interpolations to one-half of a degree. An alternate method shall be orientation of the survey to an existing survey. Except for farmland surveys, angle measurements of the field traverse shall be repeated 2 or more times and each set of angular measurements shall be made with the telescope both in the direct and inverted by 180 degree position.~~ ***The bearing system and its origin shall be stated and shall be established by a method appropriate to the purpose and required accuracy of the survey. The method shall be reproducible from the survey records.***

(g) ~~Sideshots from the traverse to monumentation or other physical features controlling the position of a property line shall be minimized. Except for farmland surveys, angle measurements to those points shall be repeated 2 or more times. Precision of measurements from the traverse points to sideshot points~~

~~shall be a minimum of half the horizontal scale reading with distance measured to the hundredth of a foot. The exceptions to this shall be stone walls and fence posts which may be measured to the nearest tenth of a foot, and centerline and edges of water bodies which may be measured to the nearest foot.~~ ***Observations used to establish or retrace a boundary, locate controlling evidence, or extend survey control shall include sufficient independent or redundant measurements to detect blunders and demonstrate compliance with the applicable accuracy requirement. No particular instrument type, telescope-face sequence, or fixed number of repetitions shall be required when an alternate method provides equivalent or better reliability.***

(h) When feasible, vertical data shall be referenced to the ***official coordinate system in RSA 1-A.*** ~~North American Vertical Datum of 1988, or to the National Geodetic Vertical Datum of 1929.~~

(i) When vertical data is required, a minimum of 2 ***vertical reference points shall be established or recovered on or near the subject tract to permit the elevations to be reproduced and checked. A reference point shall be of a type and location appropriate to its intended duration and use.*** ~~benchmarks shall be established on the subject tract~~. Benchmarks set as nails in trees shall be placed at the root collar of the tree and not the usable portion of the tree. ***Benchmarks subject to frost activity shall be avoided.***

(j) The establishment of benchmarks shall be done with care and sufficient redundancy to ensure that the elevations are ***reproducible,*** accurate~~, and reproducible~~ ***and meet the intended accuracy required for the project***.

(k) Whenever possible and practical, a minimum of 2 known benchmarks shall be included in all level runs. All level runs shall either begin and close on separate known marks, or shall be a closed loop beginning and ending on the same known mark. ~~Benchmarks shall be established by differential leveling using an instrument equipped with an automatic compensator or spirit level vials.~~ The misclosure tolerance between benchmarks shall be 0.05' square root of M where M is the one-way distance in miles. The misclosure tolerance of a closed loop shall be 0.04' square root of M where M is the distance of the loop in miles.

(~~k~~***l***) If a benchmark set or maintained by a government agency is utilized, and if that government agency seeks input from the public sector regarding the status of such monument, then a report, following the agency's guidelines, on the condition of the mark shall be submitted to the agency.

(~~l~~***m***) Compass and tape methods may be used provided that the property lines shall be predominantly bounded by physical evidence, and shall possess a minimum number of angle points. Compass surveys shall be performed with compasses having a scale permitting interpolations to one-quarter of a degree. When compass surveys are employed, traverse lines shall be observed both as a foresight and a backsight. Taping shall be accomplished by use of a standard steel tape and corrected for slope.

(~~m~~***n***) ***Topographic, existing-conditions, photogrammetric, lidar, scanning, mobile-mapping, and aerial-mapping surveys shall be referenced to a horizontal control system and, when elevations are reported, a vertical control system appropriate to the purpose and required accuracy of the survey.*** ~~All topographic surveys shall be referenced to a vertical control system comprised of closed level loops.~~

(~~n~~***o***) ~~Grid lines for detailed cross-section work shall be closed and tied to the control system.~~***Project control shall:***

(1) Be established by methods capable of achieving the required accuracy;

(2) Include sufficient redundant observations to detect blunders and evaluate the reliability of the control;

(3) Be distributed horizontally and vertically throughout the project area in a manner appropriate to the size, configuration, terrain, vegetation, sensor geometry, and intended use of the survey;

(4) Minimize uncontrolled extrapolation beyond the limits of the control; and

(5) Be referenced to the coordinate system, horizontal datum, vertical datum, reference epoch, and geoid model, when applicable, identified in the survey documentation.

(~~o~~***p***) ***When remotely sensed or scanning data are used, independent checkpoints shall be used to evaluate the positional accuracy of the resulting mapping product.*** ~~Secondary traverses or level loops shall begin and end at points on the control system.~~

(q) A checkpoint shall not be used in the calibration, registration, adjustment, or other processing of the data being evaluated.

(~~p~~***s***) When aerial ***mapping*** ~~photogrammetry~~ is to be used to compile a topographic map the horizontal and vertical ~~photo~~ control points shall be incorporated into the horizontal and vertical control system.

(~~q~~***t***) Measurements ~~to~~***of*** physical features~~, or~~ improvements***, terrain, and elevations*** shall be ***made and reported at a precision consistent with the intended use of the survey. Reported coordinate or elevation precision shall not imply an accuracy greater than that supported by the observations, processing, control, and feature-indentification method. The surveyor shall account for uncertainty in the interpretation or definition of the feature being located.*** ~~taken with a precision compatible with the detail being located as follows:~~

~~(1) Linear measurements shall be taken to the nearest foot when locating feature such as:~~

~~a. Streams;~~

~~b. Ditches;~~

~~c. Wetlands;~~

~~d. Poles;~~

~~e. Pavement;~~

~~f. Curbing;~~

~~g. Ledge outcrops;~~

~~h. Boulders;~~

~~i. Manholes;~~

~~j. Catch basins;~~

~~k. Culverts; and~~

~~l. Signs;~~

~~(2) Horizontal and vertical angles to the features shall be taken to the nearest minute;~~

~~(3) Elevations shall be ***reported*** taken to the nearest hundredth of a foot on building floors, manhole rims, curbing, pipe inverts, pavement; and~~

~~(4) Natural ground elevations and water levels shall be taken to the nearest tenth of a foot.~~

(~~r~~***u***) Measurements ***for construction surveys*** shall be ***made*** ~~taken~~ to a precision compatible with the construction tolerances ***and intended use of*** ~~for~~ the project.

(~~s~~***v***) Construction layout monuments shall be of a type and character and set in a manner so as to provide a degree of permanency consistent with the terrain, physical features and intended use. Sufficient monuments and offset information shall be provided to enable the user to check the accuracy of any points or lines established there from. Any stakes that show offsets and/or cut and fill data shall also show sufficient information to identify the horizontal position of the points to which they refer.

(~~t~~***w***) All buildings, structures, or foundation layouts shall have the perimeter closed, or in the case of a rectangle, the diagonals measured.

(~~u~~***x***) ~~Accuracies and classification of~~ G***NSS***~~P~~S surveys ***and geospatial data collection*** shall ***comply with the applicable accuracy, control, verification, and documentation requirements of*** ~~be as specified in~~ Lan 503~~.04 Table 500.1, Survey Classification Precision and Accuracy~~.

Lan 503.07 Metric System. The metric system of measurement may be used to measure or report any dimension, area***,*** or volume required by a survey. When the metric system is used, the technical standards established herein shall be translated to metric equivalents.

Lan 503.08 Monumentation Of Boundary and Subdivision Surveys.

(a) Monuments shall be set so that upon completion of the boundary and subdivision survey, each corner of the property will be physically monumented.

(b) When it is impossible or impractical to set a boundary monument on a corner, a reference monument shall be set, similar in character to a boundary monument, on the line of the survey or a prolongation of such. When an offset monument is set, it shall be clearly identified as such on the plat.

(c) Every boundary or reference monument set shall be composed of a durable material and set in a fashion to assure permanence. A permanent monument shall be any mark or marker which, if left undisturbed, will remain recoverable and identifiable, in place for a period of at least 25 years.

(d) Monuments shall include but not be limited to the following:

(1) Iron rod or iron pipe, 1/2" diameter minimum, marked with the license number or name of the surveyor;

(2) Bound made of concrete or stone, minimum 4" x 4";

(3) Drill holes or other identifiable marks in stone or concrete; or

(4) Brass or aluminum disc, 2" diameter, at a minimum.

(e) Adequate monuments shall not be disturbed. Inadequate monuments may be replaced with a well set and substantial monument. Double monuments shall be avoided whenever possible. The monument being replaced shall be noted in the field notes and on the plat, if one is prepared. When an inadequate monument is remonumented, the adjacent land owner(s) shall be notified.

Lan 503.09 Plats.

(a) For results of a survey where a plat is prepared, the plat shall identify the tract or parcel and contain enough information so that the boundaries of the parcel of interest can be located with certainty in the future by a competent land surveyor.

(b) As appropriate to the purpose of the survey, a survey plat shall contain, but not be limited to, containing the following:

(1) The municipality, date, scale, bar scale, and description or purpose of the plan;

(2) The name and address of the company or individual which prepared the plat, or both, and the name and seal of the licensed land surveyor;

(3) Owner of record with mailing address, assessor's parcel number, and title reference;

(4) Meridian arrow and origin with the date of observation or reference plat;

(5) Vicinity map;

(6) Bearing and horizontal distances on all pertinent property lines;

(7) Curved boundary lines showing radius, delta, and length;

(8) On non-tangent curves, a course and distance of the long chord shall be shown;

(9) Irregular boundaries without curves, such as rivers or streams, or with curves which have no definable geometry, shall have sufficient information to mathematically close the plat;

(10) Tie lines, when used, shall be noted that they are not property lines;

(11) All monuments set or found, including monuments with tie lines on which establishment of the corners of the surveyed premises are dependent;

(12) Monuments shall be described as to material, and the relation of the monument to the surveyed lines and/or corner;

(13) Lines of possession where they affect the surveyed boundaries;

(14) Abutters with title reference and assessor's parcel number;

(15) Easement and right-of-way limits, references to easements and encumbrances of record, whether private or public, and evidence of any unwritten interests observed, to the extent that they have a physical effect on the land;

(16) Revision dates and purposes;

(17) Legend, unless symbols are clearly identified within the plat;

(18) Man-made structures pertinent to the purpose of the surveyed project;

(19) Plats and data relevant to the survey;

(20) Any record evidence of a cemetery or burial ground shall be duly noted on the plat unless such cemetery or burial ground is located on the plat;

(21) The area of the subject tract or parcel, expressed in acres, unless the area is less than 2 acres, in which case the area may be expressed in square feet;

(22) If a boundary, easement, or right-of-way shown on the tract is an elevation, the referenced datum shall be noted on the plat along with at least one permanent benchmark with reference elevation;

(23) All benchmarks shall be adequately described on topographic surveys or boundary surveys when property lines are defined by an elevation to enable it to be recovered at a later date;

(24) A certification by the land surveyor stating the method and classification of the survey or the precision and accuracy attained; and

(25) ~~If coordinates of positions are shown the following shall also be included:~~

~~a.~~ The unit ***of measurement used***~~s of reported coordinates~~;

(26)~~b.~~ The horizontal datum and coordinate system of the horizontal coordinates;

(27)~~c.~~ Vertical datum of the vertical coordinates ***and any transformations used***; and

(28)~~d.~~ Basis of bearings.

Lan 503.10 ~~GPS~~ Documentation. ***The following information shall be retained in the survey records, as applicable:*** ~~The following information shall be retained in the plat, plan, report, or documentation~~:

(a) ***The s***~~S~~cope***, purpose, location, and date or period of data collection*** of the survey;

(b) ***The data-collection method, equipment, sensor configuration, and relevant software and version information***~~Location of the survey~~;

(c) ***Identification and description of control points, checkpoints, benchmarks, and existing monuments used***~~Sketch of GPS positioned points~~;

(d) ***Field collection parameters necessary to evaluate the observations, including antenna or sensor heights and correction sources when applicable***~~Indication of whether type of GPS field procedure is static or kinematic~~;

(e) ***Calibration, registration, strip-alignment, transformation, adjustment, or other processing results***~~Data collection parameters, including:~~

~~(1) Date;~~

~~(2) Beginning and end times of occupation of the traverse station;~~

~~(3) Elevation mask;~~

~~(4) Observation rate; ***and***~~

~~(5) The number of or identification of simultaneous satellites observed; and~~

~~(6***5***) Antenna height measurements;~~

(f) ***Coordinate-system, horizontal datum, vertical datum, units, and geoid-model information*** ~~Processing results including:~~

~~(1) Record of rejected data;~~

~~(2) Loop closures;~~

~~(3) Statistical analyses of vectors; and~~

~~(4) Coordinates of points with statistical accuracy data;~~

(g) ***Records of rejected, excluded, or edited observations and the reason for rejection, exclusion, or editing***~~Identification of Geoid model and horizontal and vertical datums~~;

(h) ***Redundancy, loop closure, residual, statistical, and quality-control results appropriate to the method***~~Accounting of any difficulties encountered during field observations and office procedures with resolution~~;

(i) ***Independent-checkpoint results and the horizontal and vertical accuracy reported for the final product***~~Identification of receiver hardware and observation processing software used including version numbers~~;

(j) ***Any difficulties, limitations, obstructions, environmental conditions, or areas not verified, together with their resolution or disclosure***~~Raw observational data, including dilution of precision values~~; and

(k) ***Raw observational data and other records necessary to support the survey conclusions and permit evaluation by a competent land surveyor***~~Name, description and order of existing monuments used as control~~.

APPENDIX

RULE	STATUTE
Lan 501 - 503	RSA 310-A:58, VI