# UTAH COUNCIL OF LAND SURVEYORS
# STANDARDS OF PRACTICE
# FOR BOUNDARY SURVEYS

By the Utah Council of Land Surveyors Committee on Boundary Survey Standards
Adopted by the Utah Council of Land Surveyors Executive Board August 14, 1999,
And as revised by the UCLS Standards and Ethics Committee and readopted on February 18, 2010
And as revised by Committee and readopted on September 10, 2010

*Abstract: These Standards are meant to remind the practitioner what their duty is to themselves, other practitioners, their clients, and the public. Standards not only provide threshold limits governing professional behavior and services but in the process reach for recognition through increased responsibility and foster appreciative public recognition of quality services. Further, these Standards may foster cooperation, trust, and credibility toward quality services and establish some minimum and reasonable threshold below which discipline or liability should be expected.*

*These Standards are suggested for adoption by municipalities, counties, state departments and local bodies of surveyors who practice Land Surveying within the State of Utah.*

## Section 1. INTRODUCTION

1. To provide for stability of position and security of title through proper location and delineation of real-property boundaries the Utah Council of Land Surveyors (UCLS) promulgates these "Standards of Practice" for performing property boundary surveys for use by surveyors licensed to practice Land Surveying in the State of Utah. These Standards recognize the continual change taking place in land-information systems and surveying technology, and accommodate various classical and modern surveying methods, whether ground-, aerial-, or satellite-based.

2. UCLS recommends these Standards for all surveys relating to creation, establishment, retracement, or resurvey of property boundaries (including easements), whether for public or private lands. These Standards provide for public needs such as:

    a) Surveying, platting, and recording or filing documents to meet requirements of multipurpose cadastres, land-information systems, and statutes.
    b) Properly describing newly created parcels, including easements.
    c) Discovering and documenting latent or patent ambiguities and encroachments for resolution.
    d) Setting new monuments to be readily located.
    e) Surveying to prescribed accuracy for digital data bases for multipurpose cadastres, and for ready recovery, restoration and replacement of existent, obliterated, or lost monuments.

3. These Standards provide surveyors and recipients of a survey with guidance for surveying performance. Wherever these Standards refer to a surveyor's duty, it is intended to include all persons who may actually perform tasks under the direction and supervision of the licensed professional.

4. It is recognized that those who are dependent upon the Professional Land Surveyor have specific needs, peculiar to the services offered in the establishment, retracement, resurvey, mapping, perpetuation and documentation of property boundaries (including easements) as to matters which would be discoverable from a survey, inspection and other evidence found in the readily available public records.

In the general interest of the public and the surveying profession the UCLS promulgate and set forth such details and criteria for Standards. It is recognized that the general public is entitled to rely on the survey furnished to them being of the appropriate professional quality, both as to completeness and as to accuracy.

5. The Professional Land Surveyor is licensed to protect the health, safety and welfare of the public. The practice of Land Surveying as defined in Utah Code 58-22-102 requires locating evidence of property boundaries and the perpetuation of that evidence in accordance with sound surveying practices. During the performance of their duties, surveyors must balance the necessity of their client to ascertain their boundary locations with the property rights of adjacent landowners. The surveyor's findings with regard to boundary locations play an important role in maintaining the public land cadastre and should be regarded as a benefit to the public welfare.

6. Federal, State and local regulations may exist which modify or enhance these Standards. The more stringent requirement, when conflicting, should prevail.

## Section 2. DEFINITIONS

1. Surveyors should refer to *Definitions of Surveying and Associated Terms* (2005) by the American Congress on Surveying and Mapping. This is an authoritative source of definitions for surveying and mapping terminology.

## Section 3. GENERAL PROCEDURES

### 1. Determine Purpose

1. Surveyors should inquire as to the intended purpose for which the survey will be utilized by the client. The purpose should incorporate the specific needs of the client for its intended purpose as dictated by unique circumstances and conditions.

### 2. Determine Scope

1. Surveyors should obtain sufficient information to understand the client's requirements and to define services. If more information is necessary, surveyors should advise clients that it must be obtained prior to determining the scope of services.

### 3. Evaluate Capabilities

1. Even though legally qualified by professional license, surveyors are still responsible for determining that their own abilities meet special needs of the project. Surveyors must possess proper knowledge, experience, equipment, and resources to undertake contemplated projects, and should determine that their capabilities are adequate.

### 4. Estimate Cost and Time

1. It is advisable to inform clients before work starts of estimated costs, date when work could begin, and estimated time required to complete the project.

### 5. Initiate Agreement

1. Before beginning professional services for which payment is expected the surveyor and client should reach agreement to fix the scope of the surveyor's duty, fee basis, and time period involved. For mutual protection, agreement should be documented (e.g. memorandum, services letter confirmation or work ordered, or contract). The agreement may also establish extent of limitations of responsibility.

2. If previously unknown factors are discovered during the survey process that will significantly affect the cost or completion schedule, the client should be informed in a timely manner. The discovery of unknown factors including latent or patent ambiguities may require additional scopes of work to be negotiated.

### 6. Accessing Survey Monuments

1. Survey monuments that control land boundaries are often located on properties owned by persons or parties other than the client. The recovery and perpetuation of these survey monuments are vital to the successful completion of the survey and provides benefit to the public welfare. Survey monuments must be recovered, observed, measured, restored or established by the surveyor as an essential part of his practice and duty. The surveyor must be sensitive to the concerns of land owners when accessing survey monuments and shall provide identification upon request.

## Section 4. TECHNICAL PROCEDURES

### 1. Record Research

Surveyors should:

1. search real-property records of public agencies to obtain title and survey history of subject and relevant adjoining properties. Under the legal doctrine of constructive notice, the surveyor is obligated to make reasonable searches for relevant records. Surveyors having actual notice of other private records should make a reasonable effort to obtain them for consideration in the survey.

2. search for relevant title records which may include, but are not limited to, abstracts, deeds, title reports and opinions, easements and descriptions of neighboring properties. Abbreviated documents such as tax statements are produced for assessment purposes only and are not legal record documents of land ownership. Surveyors are not required to identify errors or omissions caused by defective or fraudulent title records nor are they required to give title opinions.

3. search for relevant survey records which may include, but are not limited to, original government survey field notes and plats, subdivision plats and record of survey maps, deed exhibits, affidavits, corner recordation forms, and court and county surveyor's records.

### 2. Preliminary Research Analysis

Surveyors should:

1. examine documents to identify controlling corner monuments,

2. analyze the record data to determine contiguity between the subject and relevant properties and to identify patent ambiguities,

3. upon discovery of patent ambiguities, additional research is required, and

4. plan the procedure for performing the field survey.

## 3. Field Investigation and Survey

Surveyors should:

1. make a reasonable attempt to recover and identify monuments and other physical evidence controlling record boundary location,

2. consider extrinsic evidence (e.g. written, oral, or physical) which may determine the position of obliterated corners or may expose latent ambiguities in conflict with the title documents,

3. locate and describe (e.g. type, age, etc.) lines of occupation,

4. make necessary measurements, taking into account positional tolerance that must be achieved (refer to Section 5),

5. make sufficient check measurements to discover blunders and verify or validate other measurements, and

6. document all information and data collected in an appropriate, understandable form (e.g. field notes, sketches, affidavits, photographs, etc.).

## 4. Computations and Conclusions

Surveyors should:

1. determine geometric relationships between controlling corners and lines of occupation,

2. evaluate all data and evidence, compare field measurements with record information, determine sufficiency of evidence, resolve latent ambiguities, determine position of lost corners and supplement with additional data and evidence as necessary to derive proper conclusions (refer to Sections 3.5, 4.1 & 4.3),

3. make a determination of facts relative to the position of corners to be created or re-monumented,

4. apply proper principles of location for corners in accordance with law or precedent, derive conclusions, and determine the position of lost corners,

5. attempt to resolve disagreements between conclusions and record values,

6. in the event of disagreement with another surveyor's measurements or monument positions, attempt to resolve by consultation,

7. set sufficient monuments to comply with law and to enable retracement of the survey (refer to Section 6), and

8. document the results of the survey. (refer to Sections 7 & 8)

## Section 5. POSITION STANDARDS

### 1. Introduction

1. These Position Standards address positional tolerances for measurements that control land boundaries. In order to meet these standards, the surveyor must assure that the positional tolerances resulting from the measurements made on the survey do not exceed that which is allowable.

2. If the size or configuration of the property to be surveyed, or the relief, vegetation or improvements on the property will result in survey measurements for which the allowable positional tolerances will be exceeded, the surveyor must alternatively certify as to the positional tolerances that was otherwise achieved on the survey.

3. The lines and corners on any property survey have uncertainty in location which is the result of (1) availability and condition of reference monuments, (2) occupation or possession lines as they may differ from record lines, (3) clarity or ambiguity of the record descriptions or plats of the surveyed tracts and its adjoiners and (4) positional tolerance.

4. The first three sources of uncertainty must be weighed as evidence in the determination of where, in the professional surveyor's opinion, the boundary lines and corners should be placed. Positional tolerance is related to how precisely the surveyor is able to monument or report those positions.

5. Of these four sources of uncertainty, only positional tolerance is controllable, although due to the inherent error in any measurement, it cannot be eliminated. The first three can be estimated based on evidence; positional tolerance can be estimated using statistical means.

6. The surveyor should, to the extent necessary to achieve the standards contained herein, (1) compensate or correct for systematic errors, including those associated with instrument calibration, (2) select the appropriate equipment and methods, and use trained personnel, and (3) use appropriate error propagation and other measurement design theory to select the proper instruments, field procedures, geometric layouts and computational procedures to control random errors.

7. If radial survey methods, GPS or other acceptable technologies or procedures are used to locate or establish points on the survey, the surveyor shall apply appropriate procedures in order to assure that the allowable positional tolerance of such points is not exceeded.

### 2. Computation of Positional Tolerance

1. The positional tolerance may be tested by: (1) comparing the relative location of points in a survey as measured by an independent survey of equal or higher accuracy or, (2) the results of a minimally constrained, correctly weighted least squares adjustment of the points on the survey.

### 3. Allowable Positional Tolerance for Measurements Controlling Land Boundaries

1. The surveyor shall employ, in his or her judgment, proper field procedures, instrumentation and adequate survey personnel in order to achieve a precision of 0.07 feet (or 20 mm) + 50 ppm.

## Section 6. MONUMENTATION

1. Corners of the parcel or tract of land being surveyed should be monumented as required to meet the needs of the client for the intended purposes of the survey. Where monuments exist but are not of a durable material they should be rehabilitated and documented. In such cases where the placement of a required monument at its proper location is impractical, it is permissible to set a reference monument close by the point, and if such reference monument is set its location shall be properly shown on the plat of survey. When conditions warrant setting a monument on an offset, the location shall be selected so the monument lies on a line of the survey or on the prolongation of such line.

2. Artificial monuments should be constructed of durable material capable of being detected by commonly used magnetic locators. Where practical, monuments shall be solid and substantially free from movement. These monuments shall have affixed thereto a cap or other device bearing the registration number of the surveyor in responsible charge, or the regular business name or the governmental agency legibly stamped or imprinted thereon. Unless extenuating circumstances dictate, the minimum size monument should be not less than 5/8 inch in diameter, the minimum length should be 24 inches.

## Section 7. GRAPHIC REPRESENTATION OF LAND SURVEYS

### 1. Plats of Survey

Surveyors should:

1. complete and file plats, affidavits or certificates with proper local authority, in accordance with Utah Code 17-23-17 or other local regulations,

2. prepare survey records on stable and durable media capable of reproduction, recording, digitizing, and permanent storage,

3. clearly and understandably depict the final boundary or clearly disclose unresolved ambiguities and conflicts with adjoining properties and inform clients, of their existence,

4. show actual measured values on plats and certificates, to enable their future retracement. Values from the record should be shown in record units for comparison,

5. clearly indicate lines of occupation, and the extent of any encroachment relative to parcel boundaries, and

6. label adjoining properties with owner's name, include reference to relevant documents relied upon to reach conclusions.

### 2. Survey Certification

Surveyors should:

1. Reference the intended purpose of the survey (See Section 3.1) and these Standards of Practice or additional standards adhered to for the performance of the survey.

2. Include the record descriptions of the parcels being surveyed giving reference to the recordation information (i.e. Book, Page and Entry Number) of the document relied upon for the record description,

3. when depicting new boundaries not previously of record, include reference to the parent parcel description together with the description of the created parcel. Include a description of the remainder of the parent parcel if determined, and

4. when preparing a composite description of several surveyed parcels, include the record legal descriptions of the parcels (See paragraph 1 above) and include a statement of purpose for the composite in the narrative of the survey.

**3. Survey Narrative**

Surveyors should:

1. explain and identify the purpose of the survey and its intended use such as, construction of improvements, determination of encroachments, transfer of ownership, parcel division, etc.,

2. clearly indicate the physical description of two existing fixed monuments relied upon for the basis of bearings defining the orientation for the lines of the survey,

3. include reference to relevant title or survey records relied upon to reach conclusions,

4. include methods of construction of deed elements and physical evidence upon which conclusions were reached, and

5. indicate the theory of location for corners utilized to resolve ambiguities or conflicts and to derive conclusions in accordance with law or precedence (refer to Section 4.4).

**4. Legal Descriptions**

Surveyors should:

1. include a sufficient caption, body, and where applicable, augmenting and qualifying clauses when preparing a legal description,

2. state clearly the unique location of the property being described,

3. state clearly the basis of bearings or language which otherwise makes definite the method of direction and orientation for the lines of the subject property being described and the survey control related thereto when applicable,

4. make full and complete citation to relevant title or survey records which are intended to be incorporated into and made a part of the legal description by reference thereto,

5. call for detailed descriptions of physical monuments, both natural and artificial, to facilitate future recovery and to enable positive identification,

6. incorporate either directly or parenthetically, sufficient data to enable a check of mathematical closure for the subject property being described, and

7. when submitted on a separate document, affix their professional land surveyor's seal including the surveyor's signature and date.

## Section 8. CORNER RECORDATION

Surveyors should:

1. file a written record in accordance with Utah Code 17-23-17.5 for each government corner used as control unless the record currently reflects the existing conditions,

2. set a monument of durable quality witnessed by four reference monuments where practicable when rehabilitating a government corner,

3. set a witness monument wherever the nature of the ground will not allow the setting of a monument at the exact corner,

4. carefully describe the monument and all references including their bearings and distances,

5. include the geodetic or Cartesian coordinates, if known, of the corner relative to a private, local, county, state or federal coordinate system such as one pursuant to Utah Code 57-10, Utah Coordinate System, or other similar system with publically available transformation parameters sufficient to geographically position the corner, and

6. utilize a form which portrays information and data collected in a clear fashion (refer to Section 4.3).

## Section 9. ELECTRONIC DATA DISTRIBUTION

1. The client may request the Surveyor to provide the survey data in an electronic format. These formats may include such files as CADD drawing files, digital terrain model (DTM) files, or digital elevation model (DEM) files. When the surveyor provides these files, they are only for the benefit of the client for the intended purpose of the specific survey. The surveyor should also provide a signed and sealed hard copy drawing or similar representation of the survey. The hard copy drawing shall be the official plat or map and shall be deemed to be correct and superior to the electronic data. The electronic data file may also contain a statement that the file is not a certified document and that the official document was issued and sealed by (name and registration number of the surveyor) on (date).

2. The surveyor should retain for his or her records a duplicate copy of the files as submitted to the client with a record of the date the files were prepared. The duplicate copy retained by the surveyor is considered the original copy of the electronic files distributed to the client.

3. The surveyor may also need to address additional liability issues with appropriate contract language.