

Land Surveying Services

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Virtually every site development, building, or infrastructure improvement project requires the services and expertise of a land surveyor. Land surveys provide spatial information necessary for the competent design and construction of a building project.

Surveying is an integral part of the A/E/C industry. Surveyors create accurate, detailed topographic and utility location maps that serve as the basis for critical design decisions. An aesthetically pleasing site plan, a drainage system that handles storm water efficiently, and the logical placement of site utilities and other improvements depend on the topographic information recorded by a surveyor. Accurate boundary information is also necessary so design professionals can locate buildings and other site amenities where they meet regulatory and jurisdictional requirements.

Close collaboration with a surveyor can help a building project run more smoothly. When made aware of critical design or construction considerations, surveyors can direct their work to yield information that will add significant value to a project during design, construction, and operation. Architects, other building design professionals, and allied engineers need reliable, accurate, and timely information from the surveyor to conceptualize site improvements with confidence and design an appropriate building. Contractors need guidance from the surveyor before and during construction to ensure they excavate and build in the proper horizontal and vertical locations. The return on investment from high-quality survey information cannot be overemphasized. The availability of precise, accurate, complete, and timely data can help prevent a project from experiencing complications as well as unnecessary time extensions and costs, which can easily lead to other problems.

CLIENT NEEDS

Survey services required for architecture projects—whether a brownfield redevelopment, a new school or church, a building addition, a highway or utility corridor, or a residential subdivision—can vary widely. However, boundary, utility, and topographic information is typically required for planning and design, and stakes must be placed to

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Summary

LAND SURVEYING SERVICES

Why a Client May Need These Services

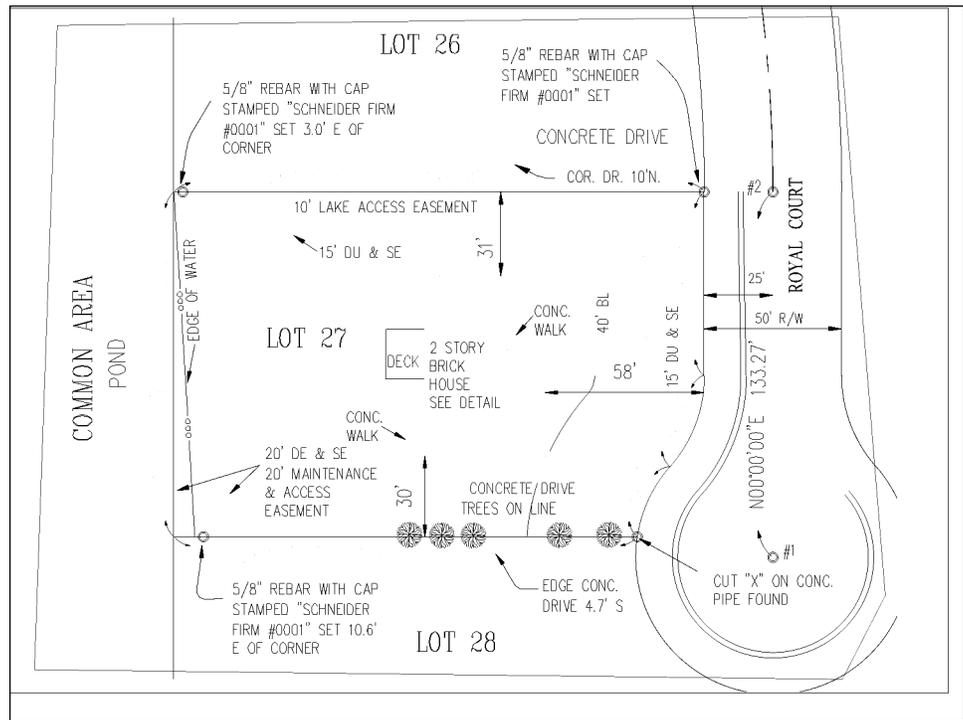
- To establish or verify property boundary lines
- To locate above- and belowground utilities
- To determine land contours and elevations
- To record locations of natural and man-made site features
- To set construction staking
- To verify as-built conditions

Knowledge and Skills Required

- Knowledge of mathematics, science, and the law
- Skill in use of geodetic methods to locate geographic points
- Ability to use surveying tools and technologies
- Ability to match appropriate survey methods to project needs

Representative Process Tasks

- Project definition and planning
- Data gathering from existing sources
- Data gathering in the field, including observation, measurement, and recording
- Documentation of survey data and information
- Staking before and during construction



This boundary survey of a residential property included staking the lot and locating the house and physical site features.

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ensure improvements are constructed in the correct location. At the front end, services often begin with a survey that will help the owner evaluate the viability of an initial concept. After a project has been completed, surveys are often required as part of securing permanent financing. In addition, record drawings may be required before a jurisdiction will release bonds or accept certain infrastructure into public ownership.

The client and project consultants and contractors should engage in discussions with the surveyor as early as possible in the life of a project. This is the only way the surveyor can determine what services are needed and how best to deliver them for any given building or development project.

Obviously, a building that inadvertently extends into the boundaries of an easement or across a property or setback line will cost time and money to remedy. Such errors can result in significant construction delays or even lawsuits, a fact every party involved in a project should keep in mind. Project team representatives who work together and communicate well are more likely to avoid such errors.

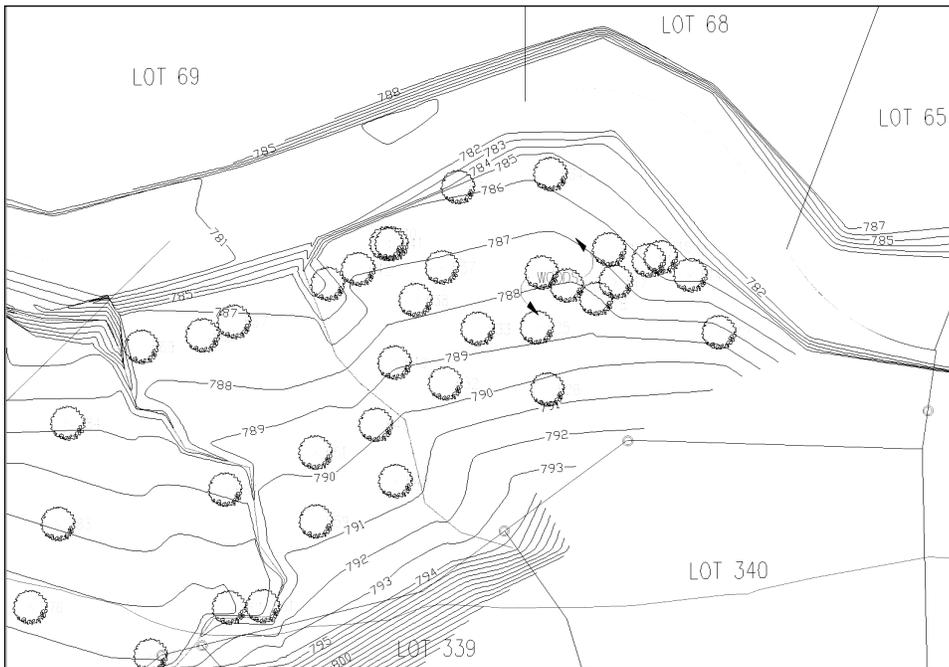
Boundary Surveys

Boundary surveys are frequently necessary to confirm the location of property lines on architectural projects. The location of property lines is a critical element in projects that involve the following issues:

- Subdivisions of land
- Design and development of improvements that are near or cross boundary lines
- Easements or rights of way
- Regulatory setback lines
- Purchase, transfer, or mortgaging of real property

Utility Surveys

Where and how connections to utility systems can occur, as well as the costs for designing and constructing them, are often primary considerations in a building project.



The work for this project involved locating physical features, including aboveground improvements and underground utilities. Elevations on hard surfaces or structures are accurate to within 0.05 foot; elevations on natural surfaces are accurate to within 0.1 foot. Contours are plotted based on interpolation of spot elevations and are accurate generally to within one-half of the contour interval.

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The earlier this information is requested and made available, and the more reliable, complete, and accurate it is, the sooner and more cost-effectively a decision can be made as to the viability of a project.

A surveyor is best positioned to document and present comprehensive utility information in a meaningful way; however, architecture project team members must recognize the limitations and hurdles in gathering such data. Utility companies are often loath to provide accurate maps of their infrastructure. In addition, they are often unresponsive to requests for information that involve design rather than construction, when the information is of more practical and time-sensitive concern to the utility owner.

Some survey companies have chosen to specialize in providing detailed locations for underground utilities. They use specialized equipment to do this, and the cost of their services can be very high. Owners and project managers need to determine for each project whether the cost of obtaining detailed locations is justified.

Topographic Surveys

A topographic map detailing the contour lines on a site can be critical for planning an architecture project. Without accurate and timely topographic information, some important site limitations may not be recognized until embarrassingly late in the design process. For example, a development may require an expensive sanitary lift station, or a substandard design may allow storm water to flood a neighboring property. The latter situation could result in litigation or at least the unnecessary expense of redesign and additional construction costs. If a surveyor is made aware of important design considerations and is engaged early enough in the process, such problems can easily be avoided.

Construction-Related Surveying

Before construction begins, surveyors are often asked to stake out the locations of street centerlines and buildings. This can help prevent or minimize construction damage to other site elements such as trees. When construction itself is imminent, the surveyor will

Factors Affecting Land Survey Costs

Fees for surveys vary significantly in relation to the scope and nature of the work. Some of the factors that influence cost of specific types of surveys are listed here:

- The cost of boundary surveys varies widely, and the most significant influence on cost is the legal description of the property, which determines the extent of research and field-work required. Neither of these tasks can be shortcut, or the final survey result will not stand up to challenge from another surveyor or in court.
- Large parcels of land tend to be more expensive to survey, but the intensity of the effort required is generally independent of the size of the parcel. This fact is not readily apparent to most clients, and if there are questions, the surveyor should be able to explain the level of effort needed to conduct a proper boundary survey.
- The cost for a topographic survey is highly dependent on the size of the property. But the improvements on the site, the amount of vegetation (crops, trees, and undergrowth), and the time of year of the survey also have a significant effect on the cost. For example, more labor is required when there is more vegetation, and the use of time-saving technologies such as the Global Positioning System (GPS) will be severely limited, if not impossible, when plants or trees extend higher than the reach of the surveyor's equipment.
- Underground utility survey work may be expensive, depending on the accuracy and completeness required. In any case, the client must understand that the only way to be absolutely certain of the location and existence—or nonexistence—of underground utility lines is to excavate the area in question. This may sometimes be necessary, but often the designer may simply need contingencies to accommodate the unforeseen. AIA Document G601™, Request for Proposal—Land Survey, provides excellent insight into issues related to surveying underground utilities, including the completeness and accuracy of the information obtained.
- The extent of information required about off-site conditions will affect survey cost. In short, the amount of information the surveyor must include in a topographic or utility survey is generally directly proportional to the fee required to obtain that information, whether the project size is large or small.
- The cost of construction staking depends on the amount of control the contractor requires. During construction, some excavators destroy survey stakes, requiring expensive re-staking. For some buildings, contractors need only basic control for construction, while others may want assistance locating interior column lines or marking finishing details late in construction. Careful consideration should be given to who is responsible for ordering survey work, especially if that person is not authorized to pay for the staking.

be asked to stake the locations of the utility infrastructure elements and other site improvements so they are built in the proper locations, both horizontally and vertically. With careful planning, a project superintendent can ensure that construction surveying proceeds logically and cost-effectively. This will minimize the destruction (and costly re-staking) of survey markers and control points set for other construction activities occurring in the immediate vicinity.

As-Built and Post-Construction Surveys

As-built (record) drawings are prepared to show the horizontal and vertical placement of utility systems. This documentation is often required for release of bonds or payments or for confirmation that utility lines were accurately located. However, regulatory requirements for the preparation of such drawings often vary widely across jurisdictional lines.

Scope Considerations

Clients requiring Land Surveying Services services may include attorneys, government agencies, school districts, churches, residential and commercial developers, excavators, building contractors, banks, and title companies, to name only a few. Although the con-

tract for survey services is usually negotiated between the owner and the surveyor, architects and other building design professionals typically specify the survey services needed for their design projects. For construction layout survey services, which are typically bid as part of construction services, the surveyor is normally under contract to the building contractor or a subcontractor rather than the owner or designer. Post-construction record drawings, sometimes referred to as “as-built drawings,” are often included as part of the construction package. Land title surveys for project financing or conveyance are most desirably contracted directly between owner and surveyor. It is not unusual, however, for an attorney, bank, or title company to contract with a surveyor for a title survey.

The exact terms of a contract for survey services will depend on the services being provided, the time in the project life cycle when they are provided, and the needs and wishes of the owner, client, and other stakeholders. In all cases, careful thought should be given to issues such as privity of contract, how communications regarding the project will be handled, how potential disputes will be resolved, who will specify the standards to which the survey is to be conducted, and who will be responsible for paying the surveyor’s fees.

Scope. When survey work is done on a fixed-fee basis, the surveyor must fully understand from the outset the range of services that is expected. Additional services beyond those in the contracted scope can be negotiated either as an additional fixed-fee service or simply billed on a time-and-materials basis. If there are too many unknowns to pin down a complete scope of work, a client may wish to contract for services solely on a time-and-material basis. In this arrangement, the surveyor and client must stay in close communication regarding the fee and the evolving scope.

During the design process, an architect or engineer sometimes determines that additional surveying is required. This need may relate to off-site utility connections or access drives that were not considered earlier. Sometimes information on utility lines discovered subsequent to the initial survey, or additional detail on utility lines previously located, is required. The client should be prepared to negotiate an additional fee for such work.

The client, the architect, and the surveyor work together to develop a scope of work that addresses the variety of services a development or building project will require. A meeting with the surveyor will be helpful to set the parameters and critical elements of the project. This information can be used to craft a scope that addresses design concerns but avoids spending the owner’s money for information of marginal value.

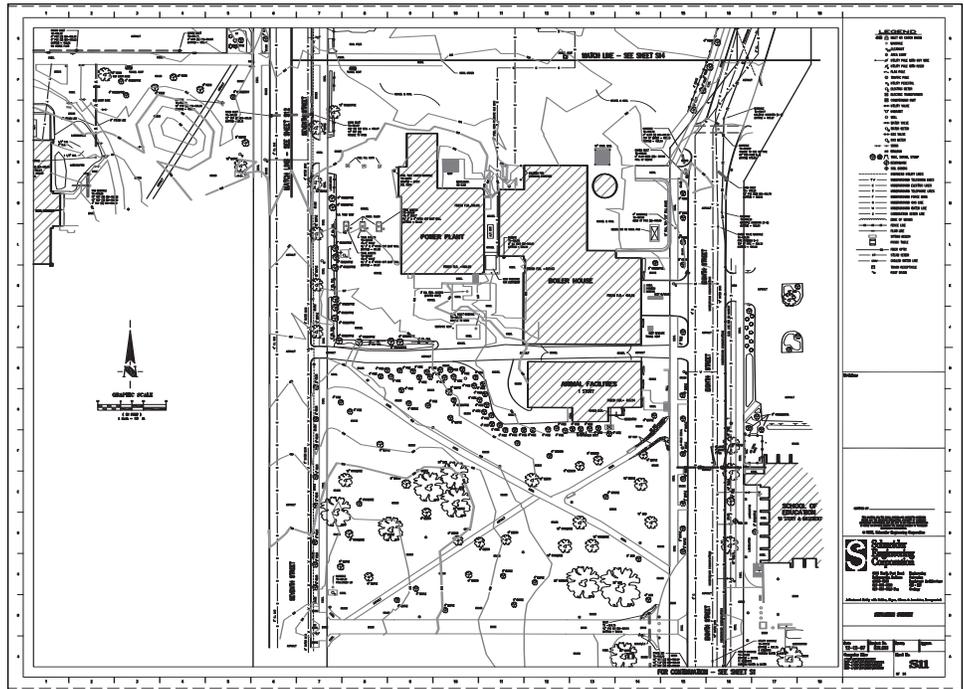
AIA Document G601, Request for Proposal—Land Survey, is useful for specifying survey work required to support the engineering and architectural design aspects of a project. It does not, however, include services such as construction staking or post-construction work (e.g., as-built measurements, land title surveys, and so on) that may be required for the release of bonds or to close construction loans. If these services are required, a professional surveyor can provide guidance on the appropriate scope and standards for that work.

It can be tempting to check off nearly every box on the G601 to maximize the information gathered from a survey. However, since every service comes at a price, careful consideration should be given to the necessity of each requested item. For example, if project construction will be well within the property lines, having the boundary corners set may be unnecessary or offer limited value. Likewise, survey information required for a building addition can be considerably less than that needed for new construction. Another factor to keep in mind is that survey work on a site already developed will generally be more cost- and time-intensive than work on an undeveloped site.

If the survey services being contemplated are not listed in AIA Document G601, the client may ask the surveyor to write a contract that refers to the G601 but also specifies the scope for other survey services (e.g., construction staking, as-built documentation, land title surveys, etc.).

Standards. The design professional ordering the survey work should be aware that many states have standards for survey services that may conflict with or exceed the requirements on the G601. This is especially true with respect to boundary survey requirements, setting of corner monuments, research requirements, and to a lesser extent, topographic requirements. When this discrepancy in requirements arises, the surveyor should initiate a discussion about it or at least explain it in Article 8 of the G601.

► **The cost of survey services is generally a miniscule percentage of the overall design and construction cost for a project. The larger the project, the lower the percentage of survey costs and the higher the return on investment from good survey data.**



This survey shows the location of aboveground physical improvements and underground utilities. Trees were located and labeled by size and species. Street right-of-way lines are shown.
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► Many well-known Americans have been land surveyors, including George Washington, Thomas Jefferson, Abraham Lincoln, George Rogers Clark, and Henry David Thoreau, to name a few.

Some boundary survey requirements in the G601 are similar to the Minimum Standard Detail Requirements for Land Title Surveys of the American Land Title Association (ALTA) and the American Congress on Surveying and Mapping (ACSM). However, because there are some differences in these requirements, surveyors may want to clarify their responsibilities in the G601 as they often do for the ALTA/ACSM standards. For example, part of the scope outlined in item 4.2 of the G601 reads, “Reconcile any discrepancies between the survey and the recorded legal description.” Different surveyors will interpret this clause differently, and an uninformed opinion could be that the surveyor will “fix” any title problems, when, in fact, surveyors do not have the legal authority to do so.

Selecting a Land Surveyor

Clients should assess surveying firms available for engagement and match project needs with the specialized talents and business practices of the firms. In addition to considering a surveyor’s experience in the type of services being sought, clients should look into how a surveyor has dealt with problems in the past. The surveyor’s ability to manage and pay for errors that may occur should be determined. Does the surveyor carry professional liability insurance? In most states, this coverage is not required.

Following are specific factors relevant in choosing a surveying firm:

- Variety of surveying services that will be required over the life of the project
- Experience and expertise of the surveyor as related to the required services
- Experience of the firm in the jurisdiction that will review and approve the design or subdivision plans
- Ability of the firm to provide necessary specialized services (e.g., expert witness)
- Ability of the firm to provide needed engineering-related services (e.g., site and traffic engineering studies or identification of wetlands locations). (Surveyors are not generally trained to identify and delineate wetlands, but they are best equipped to locate and document them after they have been identified.)
- Size of the surveying firm, number of crews, and ability to perform required work in the prescribed time frame
- Professional liability insurance carried by the surveyor

SKILLS

Professional Land Surveying Services requires specialized knowledge and the ability to use a variety of surveying resources, tools, and technologies. Surveyors also must be able to learn and adapt to changes as surveying methods and equipment undergo rapid advancement. Like many other professional disciplines, Land Surveying Services is regulated through strict licensing laws and regulations.

Knowledge and Abilities

In many states, a college degree or minimum number of college credits in surveying, mathematics, and physical sciences is required to qualify an individual for licensure in Land Surveying Services. In addition, every state specifies a minimum number of years of work experience under the mentorship of a registered land surveyor before a person is eligible for licensure.

The surveying profession is said to be part science, part art, and part law. Having an intimate knowledge of mathematics is a strict necessity. As sophisticated measurement adjustments such as least squares become more common, an understanding of calculus is also desirable. Use of GPS calls for an understanding of the physics, astronomy, and geodesy principles behind it.

Boundary surveying and legal descriptions are also based in common law. Thus, the surveyor must have an intimate knowledge of the legal principles that control property boundaries. This information is necessary for resolving conflicts in the records and between adjoining legal descriptions, and for reconciling evidence found in the field with those records.

► There are approximately 40,000 registered/licensed surveyors in the United States.

Land Surveying Services Tools and Technologies

Technology for the Land Surveying Services profession has changed radically over the last three decades, with the most dramatic developments occurring in the last ten years. These advancements have ushered in the routine use of computer-aided drafting (CAD), the satellite-based Global Positioning System, and “machine-controlled” technology. As improvements and new innovations are developed, the role of surveyors and the manner in which they gather, record, and document information will evolve even further.

Survey measurements are typically taken in the field and downloaded from the data collector or other instrument into a PC-based CAD package. The data are checked, analyzed, manipulated, and formulated into an understandable, accurate, yet presentable final drawing. Electronic total stations that gather both angular and distance information electronically and transfer those measurements directly into a laptop or handheld computer are standard equipment for most surveyors in the early twenty-first century.

Surveying a site on the ground is often the most time-efficient way to produce a topographic survey (and the only way to properly conduct a boundary survey). However, technology has given surveyors a host of other means for gathering and reporting topographical data. Depending on a variety of factors, data developed through photogrammetric mapping, real-time kinematic (RTK) GPS mapping, LIDAR (light detection and radar) mapping, laser scanning, or even publicly available data, may serve the purpose better than data developed with traditional surveying techniques.

Each project has particular site conditions and client requirements, which may make one technology more suitable than another. The choice depends on such things as the budget; schedule; required level of accuracy; physical size and shape of the project area; vegetation cover, including crops; relief and site contours; current site improvements; access (or lack thereof); and the need for documenting off-site features.

Hardware and software advancements in GPS receivers and in satellites themselves have made the use of GPS for construction staking viable. As well, GPS equipment manufacturers are now teaming with manufacturers of construction equipment such as bulldozers and graders to develop what has been termed “machine control.” This technology puts control of the actual earth-moving into the “hands” of software, GPS satellites, and computer-generated files. With computer files developed by surveyors and engineers, satellite signals can guide and control the earth-moving equipment.

► Site conditions, project parameters, and the actual task at hand will determine which technology is the most effective or most efficient tool for a particular project.

Current Tools and Technologies for Land Surveying

- **Global Positioning System (GPS).** A satellite guidance system developed by the military and used by surveyors. GPS uses satellite receivers and electronic communication devices to precisely determine locations on the Earth.
- **Total station.** An electronic device for measuring angles and distances to determine locations and elevations. This technology uses either laser or infrared beams for measuring.
- **Radial surveying.** Determination of the heretofore unknown horizontal and/or vertical locations of a point by measuring an angle and distance to that point from a point having a known location and elevation.
- **Real-time kinematic (RTK) surveying.** A method of using GPS to rapidly determine the horizontal and vertical locations of points. Accuracies are somewhat less than can be achieved by using longer observation times.
- **Electronic data collection.** Collection and logging of measurement data into a control device, which can be used to download the data into a computer for subsequent processing, analysis, manipulation, and drafting. Analysis of the data used to make determinations regarding property boundaries is the responsibility of the licensed surveyor and is not a function of the computer.

Two factors affect the use of GPS in surveying. First, this technology generally cannot be used in the vicinity of obstructions that extend above the reach of the equipment. This means GPS cannot be used for surveying in forested areas, or near trees and tall buildings, or in the vicinity of bridges, transmission towers, power lines, and so on. Second, a typical survey-quality GPS unit costs thousands of dollars, while a handheld GPS unit can now be purchased for \$100. The accuracies achievable with a handheld GPS unit, however, do not begin to approach the accuracies attainable with more costly survey-quality units.

Licensure for Surveyors

Surveyors are licensed as professionals and regulated by state boards in all fifty states. Some of these boards also regulate the survey-related activities of aerial photogrammetrists and geographic information system (GIS) technicians and professionals. To become licensed in a particular state, a person must meet the specific education and experience requirements of that state and then pass fundamentals and principles/practice examinations of at least sixteen hours. The principles/practice examination has national and state-specific sections. A licensed surveyor in one state may obtain a license to practice surveying in another state through comity or reciprocity. Conditions related to education and experience may apply, but in general, the state-specific portion of the principles/practice examination must be passed.

In most states, boundary surveys and preparation of associated plats and legal descriptions are functions reserved exclusively for registered/licensed surveyors. The preparation of other maps and plats that depict elevations and contours, site features, related geospatial information, and locations for stakes are also regulated activities of licensed land surveyors in most—if not all—states.

Professional surveyors are often referred to simply as “surveyors” or as land surveyors, licensed surveyors, or registered surveyors. Those who actually conduct the field measurements may or may not be licensed or registered. If not registered, they must work under the direct supervision of a licensed surveyor who is professionally responsible for the work performed.

In some states, professional engineers may provide some land survey services. Often, however, activities have become so specialized they are beyond the expertise of some who are otherwise legally allowed to perform them. Most state surveying boards have adopted a set of minimum standards to ensure the public is protected and clients receive services that meet a minimally acceptable level of practice. National standards, most notably the Minimum Standard Detail Requirements for ALTA/ACSM Land Title Surveys, may also apply to the services requested of a land surveyor. A licensed surveyor with an in-depth understanding of the aspects of surveying required for a project will know which standards are appropriate.

PROCESS

The survey work required for a site development or building project typically results in the products and services in the list that follows. These are generally provided in the order given, but this depends on site conditions, project parameters, and contractor requirements. The design professional may or may not be directly involved in all of these activities.

- **Land title survey.** These surveys are often required to obtain initial construction financing and to ascertain the geometry and definitive locations of the boundary corners and lines. A signed and sealed plat of survey certified to the appropriate parties (typically owner, lender, and title company) should be provided.
- **Topographic and utility survey.** This type of survey is required to support the design process. A signed, sealed, and certified survey drawing should be provided, although the design professional may also want a digital copy.
- **Construction staking.** Most often provided before construction begins, this service may be requested at later stages if stakes are moved or destroyed during construction or to mark the locations of interior structural members.
- **As-built (post-construction, or record) measurements/surveys.** This type of survey may be needed for release of bonds or payments or to demonstrate that utility lines were constructed according to the approved plan. A record drawing showing the grades and locations of the utility lines may be required by the jurisdictional authority. Often, such drawings are created by adding as-built information to the approved design plan sheets, rather than making a new drawing of the site.
- **Land title survey.** A land title survey may also be required at the end of a project, to close the construction loan and secure permanent financing. A signed and sealed survey drawing certified to the appropriate parties should be provided.

The major Land Surveying Services activities undertaken to lead to the products and services listed are project definition and planning, data gathering from existing sources, field surveys, recording and documentation of information and data, and construction staking.

Project Definition and Planning

As with any endeavor, proper and thorough planning makes a surveying project more successful. Advance planning for a land survey depends primarily on two factors. The first is the scope of the work required. Establishing a clear definition of a project begins with outlining the initial parameters. What is the geographic extent of the project area? What is the ultimate purpose of the survey? Will the survey or any of the data gathered be used for other than the stated purposes? Are there any wild-card factors critical to the design of the project? The second factor is the document and records research necessary to conduct a proper survey.

Data Gathering from Existing Sources

If a survey involves the resolution of a boundary, the surveyor will need to conduct extensive research into a variety of records, including deeds, subdivision plats, corner reference ties, and older surveys (on record or known to have been performed by other surveyors). Having well-documented historical information is critical for understanding the anomalies that are often uncovered during a boundary survey. Boundary resolutions achieved without this information often cannot stand the scrutiny of a court challenge or of other surveyors at a later date.

If a client or owner has a title commitment or policy for the property in question, it is very important to give the surveyor that information. It will assist in identifying records important to the survey, such as easements and previous surveys.

Even when a survey is conducted only to delineate topography or utilities, considerable research is necessary. The nearest benchmark on which to base the site survey elevations needs to be identified. Is it across the street or two miles away? Is there a floodplain or floodway on or near the site? If so, the survey must be done on the same vertical

datum as the flood determinations, and copies of relevant FEMA flood insurance rate maps will be needed. If utilities must be located, calls must be made to utility companies and the state or local one-call service to obtain copies of any available plans, and so these locations can be marked in the field. Thorough and complete research carried out before the actual survey work commences is critical to achieving a successful survey project.

Data Gathering in the Field

In conducting fieldwork for a boundary survey, surveyors use their professional judgment to identify appropriate reference monuments and tie them into the overall survey. All relevant field evidence necessary for proper resolution of the boundary is then identified and located. Often, this can involve obtaining evidence and recovering control points that are quite distant from the project site.

Reference monuments include points such as section and quarter-section corners, lot or block corners, street and highway right-of-way markers, and curb lines, pipes, iron pins, and other markers referred to in the records. In downtown areas, it will include buildings. The location of boundary lines and corners may depend on any or all of these elements, so a rigorous analysis of all evidence and application of common law principles will be involved.

Relevant field evidence includes site elements on or near boundary lines, such as fences, buildings, and drives, together with survey markers found in the area, which may or may not have been referenced in record documents. Such evidence is vital to developing a boundary resolution that has integrity.

As site elements, improvements, and features are located by survey measurements, the location and descriptive information of each point are either recorded by hand into a field book or electronically downloaded into a “data collector.” If GPS is used, the data is always collected electronically. This data is then downloaded over a hard or wireless connection or physically taken back to the office for data entry.

A utility survey normally includes location of infrastructure items such as power poles and water valves, but other data elements such as sewer pipe inverts, types, and sizes may also be an important design criterion. The time and cost involved in a utility survey may increase considerably because of OSHA confined-space regulations if a surveyor must enter a manhole to get such information.

Documentation of Data and Information

Proper documentation of gathered survey information is critical. Field notes are considered admissible in court as evidence of the work conducted in the field. Therefore, they must be clear and exceptionally well documented. The use of and reliance on electronic methods for collecting data changes the dynamic and methods involved, but not this principle.

The decisions made by a surveyor in resolving a boundary also must be documented, so they can be recalled and supported if challenged. The issuance of a boundary survey is the issuance of an opinion formulated by weighing all field and record evidence and applying to these the appropriate location theory and legal principles. If challenged, the opinion is subject to review by a court. Consequently, it is important for surveyors to document how they arrived at their conclusions and why the decisions affecting a boundary were made.

Construction Staking

Before construction begins, staking is typically undertaken to mark locations such as the clearing limits on a wooded site or the outlines for erosion control measures. After actual construction begins, staking activities may include, but are not necessarily limited to, the following:

- Rough staking (for mass earthwork)
- Staking out the building pad (does not include detailed layout of building corners)

- Building control staking (may include staking column lines on a large building or marking for the brick/block after a foundation is in place)
- Marking the locations of lakes, swales, and mounds
- Marking the locations of water lines and structures, both storm and sanitary
- Marking the locations of curbs

The general contractor (or subcontractors) generally dictates what needs to be staked for a project. These needs typically depend on the complexity of a project and the expertise of the general contractor's staff. Staking tasks may only require one visit (e.g., marking column lines for a new building), or they may require a series of visits to address items such as those just listed.

Almost every architectural design and construction project requires some level of Land Surveying Services services. Complete and timely survey work prior to and during construction provides a basis for site design, building placement, and accurate construction layout. Land Surveying Services services are vital to the building design and construction process, and architects can capture the value of these services by ensuring they are an integral part of project delivery.

“Land Surveying Services” was originally published in *The Architect’s Handbook of Professional Practice, Update 2005*, ©2005 by the American Institute of Architects, published by John Wiley & Sons, Inc.

The AIA provides a contract document designed especially for land survey services, G601-1994.

Another option is to specify the services in AIA Document B102-2007, which is designed for alternative services.

G601–1994, Request for Proposal—Land Survey

AIA Document G601™–1994 allows owners to request proposals from a number of surveyors based on information deemed necessary by the owner and architect. G601–1994 allows owners to create a request for proposal through checking appropriate boxes and filling in project specifics, thus avoiding the costs associated with requesting unnecessary information. G601–1994 may be executed to form the agreement between the owner and the land surveyor once an understanding is reached.

B102–2007, Standard Form of Agreement Between Owner and Architect without a Predefined Scope of Architect’s Services.

AIA Document B102–2007 is a standard form of agreement between owner and architect that contains terms and conditions and compensation details. B102–2007 does not include a scope of architect’s services, which must be inserted in Article 1 or attached as an exhibit. Special terms and conditions that modify the agreement may be included in Article 8. The separation of the scope of services from the owner/architect agreement allows users the freedom to append alternative scopes of services. AIA Document B102–2007 replaces and serves the same purpose as AIA Document B141–1997 Part 1.

For more information about AIA Contract Documents, visit www.aia.org/contractdocs/about

May 2011 The American Institute of Architects