Subsurface Modeling

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Elevation Certificates
A-Z instructions for surveyors

Gear Review
Sokkia SRX Robotic Total Station
The Elevation Certificate
{translated}

PART 1

Over the years we (the authors) keep hearing the crying and moaning from our colleagues about the abuse surveyors endure at the hands of civil engineers, zoning and planning regulators, government officials and all outsiders having no understanding of what surveyors do and especially, no understanding of the knowledge necessary to do the things surveyors do. We as surveyors are simply misunderstood and we get no respect. We fret constantly that we will become irrelevant in the scheme of things and our profession will cease to be. But in the case of the National Flood Insurance Program (NFIP), we deserve all the abuse the public and the government wish to heap upon us.

Floodplain managers, insurance agents, home buyers, community officials, bankers, realtors, builders, and others in the building industry comprise a huge portion of our economy. This massive segment of our country’s economic powerhouse relies on the surveyor through his or her interpretation of flood issues via

>> By C. Barton Crattie, LS, CFM and Wendy Lathrop, LS, CFM
the Elevation Certificate (EC). Though it is a Federal agency, FEMA must recognize state and local policies as well as the rules of various licensing Boards. Depending upon the Board’s definition of practice in a given jurisdiction, an Elevation Certificate may be completed by an engineer, architect, land surveyor, or in some cases, a landscape architect. However, FEMA has repeatedly made clear its preference for the services of a surveyor over those of other professionals permitted by their licenses to collect topographic data. That being said, in reality, the surveyor is the lead individual nationwide preparing Elevation Certificates.

As both land surveyors and floodplain managers, we hear both sides of the story. Certified Floodplain Managers (CFMs) appreciate and respect surveyors and the technical aspects of the profession. However, CFMs spend much time lamenting surveyors’ shortfalls in completing ECs. This is deserved. If a surveyor is not spending at least two hours on the field work (outside of transferring the benchmark), the job is not being performed adequately. Surveyors are the eyes of floodplain managers. Currently we surveyors are doing a mediocre job of this at best. As professionals we should honestly recognize when we may be practicing outside of our level of competency, and take a step back to make a realistic assessment of our skills and knowledge. While FEMA highly prefers the services of a surveyor to those of any other professional in preparing its EC, that doesn’t automatically mean that any surveyor can do the work competently. Unfortunately, both of us have seen a variety of incorrect and incomplete EC forms issued by surveyors.

In 2012, the current level of mediocrity could really come to public attention. The NFIP has a program known as the Community Rating System (CRS), which gives credits to communities for undertaking various proactive steps intended to make that community more flood resistant and better able to recover from flood events. When a certain number of “points” have been accumulated, the community receives a discount as a whole on the quoted flood insurance premiums. This discount can reach as much as a savings of 45%. One of the qualifying activities for CRS is for a community to require and review Elevation Certificates for every new building or substantial improvement to a building in the 1% annual chance floodplain. At present, 20% of those reviewed can have an error of some sort (more than 20% with errors means the community will lose credits).

Recently a CRS rater related a story about going into a community where out of 23 certificates reviewed, 21 had at least one error that needed correction. Why this will become more crucial in 2012 is that at present FEMA is contemplating raising the acceptable rate from 80% up to 90%, meaning that only 10% of the ECs on file can contain an error or omission. If this level is not consistently maintained nationwide, it can be assured at some point FEMA or the local officials will arrive at an alternative method to using the services of surveyors. The local administrator is on your side, as is the FEMA regional office; use their knowledge to your advantage. Do not overlook these valuable resources—ask questions and make sure you understand the responses to know if your questions have truly been answered.

An Elevation Certificate is more than a simple inspection. This two-sheet form can mean much for some family’s future. This is an important document that
Flood openings are not always vents. The openings in the foundation of this elevated structure allow water to flow under the building. Comparison with the building next door reflects increasing awareness of safety standards. (See FEMA Technical Bulletin 1, downloadable from FEMA’s website.)

should be revered as much or more as a survey of a boundary of the family farm. The answers you provide can have some drastic ramifications on the public, those we surveyors are charged to protect. One incorrectly reported figure could mean many unnecessary tens of thousands of dollars in mandatory premiums over the life of a mortgage or commercial loan. On the other hand, incorrectly reported figures may also result in FEMA paying for expensive flood damage compensation on underinsured and repetitively damaged structures, bankrupting the program through losses beyond the income of insurance premiums collected nationwide. It is our professional duty to eliminate possible errors and educate ourselves, thereby improving the product we are delivering to the public. As surveyors, we are good with numbers but often inept when it comes to working through the administrative side of things. The subtle and un-researched issues cause many faults in land surveyors’ Elevation Certificates. We need to apply our knowledge of risk reduction to evaluate variables and minimize or eliminate unknown factors. After all, it is a certification one is sealing. This article is intended to enumerate some of the primary errors surveyors make as relayed to us from individuals associated with the NFIP over the years. If we as surveyors do not shape up, it is entirely possible that we will be replaced by other methodology. Most sections of the standard Elevation Certificate will be visited briefly. As a professional, is it worth putting your license and financial well-being on the line for something you don’t fully understand? The EC is an important document affecting large sums of money, far exceeding a monthly insurance premium.

Virtually every problem encountered when completing the Elevation Certificate can be answered by reviewing the instructions included with the Certificate. If you cannot find the answer, state this fact in the “comments” area in Section D. Keeping these two simple principles in mind could eliminate the vast majority of surveyors’ errors.

Before you even price the certificate, get your maps and background data together. Prior to starting an actual certificate, the first step is the FEMA Map Service Center (http://msc.fema.gov). Failing to check if either a Letter of Map Amendment (LOMA) or Letter of Map Revision (LOMR) has been issued on the property is flirting with danger that can be categorized as incompetency. If the structure on site is in a Zone “A” (with no Base Flood Elevation), there’s an entirely different set of rules from a Zone “AE” (where a detailed study has resulted in establishment
of a Base Flood Elevation). Take this sort of information into consideration before consulting with the client.

If the structure is actually in Zone "X", "B", or "C", meaning it is outside the 1% annual chance floodplain, federal regulations do not mandate flood insurance coverage, although a lender may still require a policy. The lender has not made the determination of the zone affecting the structure itself; instead it has contracted with a flood zone determination vendor to provide this service, and it is fair to ask the lender to have the vendor recheck its determination before requiring your client to spend hard-earned dollars on an unnecessary EC. Provide a survey or other substantive proof of the structure's location in relationship to the property lines, and have the lender forward this material to the vendor along with its request for a redetermination. Remind your client and the lender that only structures trigger the federal mandatory flood insurance requirement, as vacant land is not insurable against flood damage. Too often we see zone determinations that state there is a 1% annual chance floodplain "somewhere" on the property, which may not be where the insurable improvements are. Don’t waste the public’s hard-earned money. Be able to inform both your client and the lender of the ramifications of the NFIP and flood issues: an incorrectly completed EC can mean that a building is over-insured or under-insured. From the floodplain manager’s point of view, an incorrect EC also means that the building can be over- or under-regulated. The point is to complete the form correctly to protect a broad range of interests (including the surveyor’s).

Please, practice within your level of competence. The certificate is fraught with many potential pitfalls awaiting the neophyte thinking his knowledge exceeds that of his fellow citizen. For instance, surveyors will on a regular basis enter the client’s address in Item A2 rather than the subject property address. This is a simple administrative blunder, but one that causes many problems in the insurance industry. There is not much liability there, other than to your reputation.
For Item A5, Latitude and Longitude, just remember that what you report only needs to be within 4 poles (66 feet) of the true location (NAD 1983). On the earth’s surface, one second of arc is equal to about 100.8 horizontal feet or 0.0002778 decimal degrees. 66 horizontal feet will equal to about 0.00018 decimal degrees or 0.64 seconds. Google Earth is usually in pretty good agreement with a hand-held GPS unit. The USGS quadrange maps on its website are another reasonable source of these figures. 

Something overlooked: If the check box in Section D, at the bottom of the first page of the EC identifies the origin of the Lat/Long as being provided by a Licensed Land Surveyor, describe the method of determination. While there is nothing requiring this information, documenting the method used to determine latitude and longitude offers you some protection if someone later complains about the level of accuracy. Consider this information as metadata, since it will primarily be used to place a site and its EC into a geographic information system. Surveyors should help prevent the data from being used for purposes never intended by documenting the source, to overcome the public’s general inattention to and disregard of data’s inherent accuracy or inaccuracy.

As for Item A6, regarding photographs, these are only required for insurance rating purposes. In these cases, take a front and rear picture of the structure. Go ahead and shoot both sides as well. If the structure is unusual, particularly if it doesn’t fit any of the nine standard Building Diagrams included in the EC instructions, take more photos. Concentrate on the foundation and its relationship to the adjoining grade. If the surveyor is in doubt about anything (vent types, structure diagram), take a photograph and include it with the package with a clear label of its orientation and identifying significant features you want to point out (“right side of house showing cantilevered second story deck—no ground posts under deck”). You are not limited to the number of photographs you can include.

The section on building diagrams is an ever-evolving project, an ongoing effort with each update of the EC in an attempt to produce a clearer set of choices for such a complicated issue. Match as best you can. If you have a structure that doesn’t match any of the building diagrams, you can draw your own diagram and include it with the package as an attachment, mixing diagram types if it is appropriate. But be extremely cautious about including your own drawing rather than using one of the nine in the EC. A supplemental sketch (not a replacement drawing) is fine, but some insurance writers are not adept enough at reading drawings to
figure out something beyond the norm. Remember that both lowest adjacent grade (LAG) and a building diagram have been required for all insurance applications made after October 1997 (see the Insurance Agent’s Manual, CERTI, available online from FEMA’s website).

A note of caution: If the circumstance arises requiring the inclusion of a supplemental diagram, be careful to avoid even implying which is the “lowest floor”—that is a flood insurance matter, a determination not to be made by the surveyor. Years ago the insurance folks wanted surveyors to circle the line and elevation in Section C on which the policy writers should rate the structure, thereby placing the burden of determination on the surveyors rather than the policy writers. We should not volunteer our necks for them by practicing outside our area of expertise. Our responsibility is to be eyes in the field, not insurance maven. A surveyor would need to be very, very careful in labeling things clearly and thoroughly if drawing a separate building diagram. Adding many photographs can accomplish a similar outcome without incurring the liability of stating which is the lowest floor for rating purposes.

One last point about buildings: if you find multiple structures on site, such as a principal residence and a garage or a variety of farm buildings, do not try to use one EC to accommodate them all. The buildings may be in different flood zones, they may be subject to different Base Flood Elevations, and they very likely are best described by different building diagrams rather than a single uniform one. A separate form should be filled out for each such structure, clearly identifying which of the multiple buildings on site is the subject of each EC. Include a survey or sketch showing all the buildings, labeling them in a way that can be carried over to and referenced in Section A of the EC.

Items A8 and A9 address enclosures and vents or openings. Reported incorrectly, the client will pay dearly for years to come. Reported incorrectly, you, the surveyor, possibly could pay dearly for years to come by order of a judge. Go to FEMA’s website and look up 44 CFR 59.1 to read the definition of “Lowest Floor”. If you provide an incorrect answer, the insurance agent will misinterpret what is intended to be the “lowest floor” and guess who will be blamed for the overpayment of premiums when the error is discovered? As for vents or openings, make sure they can never be placed in a closed position. If they have moving parts requiring human action to open them (such as sliding panels, levers, or cranks), make sure that they are disabled in the “open” position. If louvered or panels can be closed they must be discounted from square inch calculations. Count for open square inches only what will allow water to flow through. Fancy grillwork is difficult to measure as an obstruction to flood water, and the EC instructions do allow some leeway in this calculation. Here is where another set of labeled photographs will be worth many words (and document against liability).

While never mentioned in the instructions for Elevation Certificates or in the NFIP Flood Insurance Manual, there is another important consideration besides the vent being no more than 1.0 foot above the adjacent grade. Yes, the vent must be within a foot of grade, but more significantly, the vent must not be above the Base Flood Elevation (BFE), in order to allow the flood waters into the enclosed area. Please see FEMA Technical Bulletin No. 1 (TB-1), pages 13-17. Ideally, this means we should never have to report anything above BFE in our square inch calculation for the vent, only counting and listing the portion of the vent below BFE in A8 and A9. Vents located above the BFE are unable to equalize the hydrostatic pressure by allowing entry and exit flow.

But here we find a discrepancy between the technical guidance in TB-1 and real life. While TB-1 does say that only portions of flood openings below BFE count toward compliance, that doesn’t mean that flood openings otherwise within a foot of adjacent grade should be ignored. It may in fact be physically impossible to have the opening below BFE, depending on the relationship between the structure and the ground. If LAG is right at BFE (thereby complying with 44 CFR 60.3 requirements for structures to be at or above BFE, but meaning the building is in the SFHA), no part of the flood opening can be below BFE without being down in the dirt. Here’s where Section D comments are useful once again.

In Part 2, we will wrap up our discussion of proper completion of the Elevation Certificate.

All images courtesy of FEMA.

Bart Crattie holds a BFA degree from Murray State University and is a licensed surveyor in Georgia and Tennessee. He is a Certified Floodplain Manager through ASFP and has been featured on national television networks regarding the Georgia water shortage and the location of the state’s northern line. Bart serves on the Board of Directors for the Surveyors Historical Society and is a regular contributor to the magazine.

Wendy Lathrop is a licensed Professional Land Surveyor in NJ, PA, DE, and MD. She holds a Master’s degree in Environmental Policy, and has been involved since 1974 in surveying projects ranging from construction to boundary to environmental land use disputes. She is a Professional Planner in NJ, and a Certified Floodplain Manager through ASFP. Wendy is a popular presenter at national seminars and a regular columnist for the magazine.