



The North Carolina Bulletin

The Newsletter of the North Carolina Board of Examiners for Engineers and Surveyors

October 2017 Fall Issue



Inside this Issue

Board and Staff Directory	2	Examination Stats and Dates	8
UAS: Old Dog Learns New Trick.....	3	Transitions and Notes	9
Firm Foundations	3	Board Actions.....	10
Certificate Ceremonies Winter 2017	7		



The North Carolina Bulletin

Published to provide news and information regarding statutory and regulatory changes and to promote a better understanding of the practices of engineering and land surveying in the State of North Carolina.

Board Office

4601 Six Forks Road Suite 310
Raleigh, NC 27609

Telephone

(919) 791-2000

Facsimile

(919) 670-3606

Website www.ncbels.org



[North-Carolina-Board-of-Examiners-for-Engineers-and-Surveyors/](https://www.facebook.com/North-Carolina-Board-of-Examiners-for-Engineers-and-Surveyors/)



[@ncbels](https://twitter.com/ncbels)

Andrew L. Ritter *Executive Director*

Board Members – 2017

Richard M. Benton, PLS *Chair*
Linda A. Thurman, Public *Vice Chair*
Stacey A. Smith, PE *Secretary*
Jonathan S. Care, Public
Carl M. Ellington, Jr., PE
John M. Logsdon, PLS
David L. Pond, PE
Bobbie Shields, PE
Andrew G. Zoutewelle, PLS

Committee Chairs – 2017

Bobbie Shields, PE *Engineering*
Andrew G. Zoutewelle, PLS *Surveying*
Jonathan S. Care, Public *CPC*

Editing and Design

Nicole Scarborough *Editor/Content Manager*
The Signature Agency *Graphic Design*

Board Staff Directory

Name Title	Email	Extension
Stephanie Bryant <i>Administrative Assistant</i>	sbryant@ncbels.org	100
Andrew L. Ritter <i>Executive Director</i>	aritter@ncbels.org	101
Mark D. Mazanek <i>Director of Business Licensure and Compliance</i>	mmazanek@ncbels.org	102
Shirley Ditt <i>Assistant to Executive Director and Board Counsel</i>	sditt@ncbels.org	103
Martha Michalowski <i>CPC/Investigations Administration</i>	mmichalowski@ncbels.org	104
Nicole Scarborough <i>Director of Administration</i>	nscarborough@ncbels.org	106
Laura Parham <i>Applications Processor: Engineering, Surveying, Certifications</i>	lparham@ncbels.org	107
Dawn Taylor <i>Administrative Assistant</i>	dtaylor@ncbels.org	108
David S. Tuttle <i>Board Counsel</i>	dstuttle@ncbels.org	111
William P. Casey <i>Board Investigator, Eastern Region</i>	wcasey@ncbels.org	104
Cathy W. Nicholson <i>Board Investigator</i>	cnicholson@ncbels.org	104
Clyde Alston <i>Board Investigator</i>	calston@ncbels.org	104
Tina Curran <i>Board Investigator</i>	tcurran@ncbels.org	104
David J. Evans <i>Assistant Executive Director/Investigations</i>	djevans@ncbels.org	113
John Stone <i>Information Technology Systems Specialist</i>	jstone@ncbels.org	115
Chimene Link <i>Renewals</i>	clink@ncbels.org	116



Unmanned Aircraft Systems: Old Dog Learns New Trick

by Richard M. Benton, PLS
Board Chair

"It has become appallingly obvious that our technology has exceeded our humanity." –Albert Einstein

I can only imagine what Mr. Einstein would say about technology if he were alive today. Gordon Moore, co-founder of Intel, predicted in 1965 that the number of components in integrated circuit chips would double every 18 months. According to a recent study by researchers at MIT, Mr. Moore was correct in his prediction. This is clearly evident in the emerging technologies used by our professions. One such technology is the Unmanned Aerial Systems (UAS) or drones. In a report by Business Insider, drone sales are expected to top 12 billion by 2021 with shipments of commercial drones quadrupling over the next five years. Advances in software and hardware such as flight planning, geo fencing and collision avoidance are making it easier for beginners to enter the market, in some cases, too easy. I recently attended a seminar that spent the better part of the day focusing on UAS technology. The instructor responsible for the UAS portion was a veteran photogrammetrist with over 300 UAS flights. In his presentation he demonstrated how simple the software made the preflight planning and post processing of the data. The final results of the UAS derived data as compared to the previously established GPS control points were amazingly accurate and considering we had just flown a five acre site in less than an hour made it even more enticing. What the instructor did not explain was how his extensive knowledge of photogrammetry enabled him to make competent decisions on how to setup the software so it could make those preflight and post processing decisions.

A friend of mine, who happens to be a PLS with over 30 years of experience in photogrammetry, recently relayed an experience he had while attending a two week class on the rules and regulations for operating commercial UAS in North Carolina. His company was considering implementing UAS technology as a service and wanted additional education and training before making

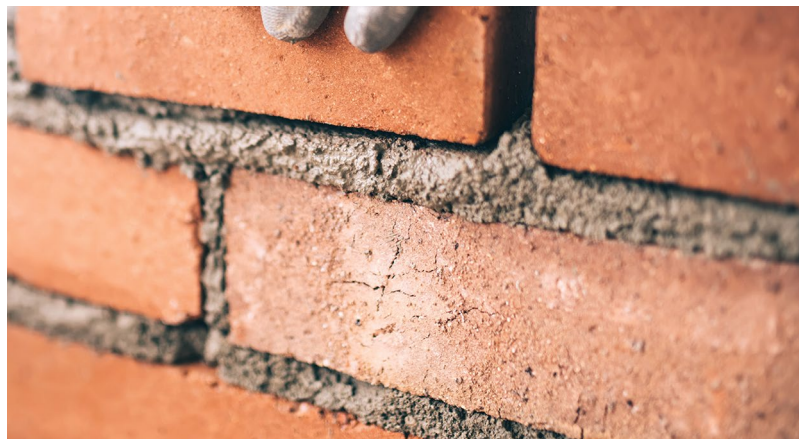
continued on next page

Firm Foundations

by Stacey A. Smith, P.E.
Board Secretary

How many times have you, as the Professional Engineer, been asked to provide construction certification but discouraged from going to the site? How many times have you come behind another engineer on a project and been requested to accept their work? These situations are similar to many that the Professional Engineer faces due to misunderstandings in Responsible Charge. Just as we physically develop our projects, we must develop our design file on a "firm foundation."

We discussed the premise of Responsible Charge¹ in our last newsletter and will further explore this concept by way of example. NCEES Model Law and NC General Statute 89C-3(10) defines "Responsible Charge" as the *direct control and personal supervision of engineering or surveying work, as the case may be*. Board rule 21 NCAC 56.0701(c)(3) provides the requirements for responsible charge. The Board remains focused on proactive education and assistance to aid our licensees through these situations.



Design Basis

When undertaking a renovation project, what is the burden of the engineer to confirm base elements as acceptable? Perhaps the renovation is a second floor addition, or partial removal of walls for lateral expansions previously designed by others.

We know the old adage about assumptions, but we also understand that design basis begins with what is given and what must be determined. So, how may an engineer be prudent in their discovery and satisfaction? Our fundamental purpose is to *safeguard the life, health, property and welfare of the public* as recited in our rules of

¹ "Responsible Charge" by Stacey A. Smith, P.E., *The North Carolina Bulletin* (newsletter of NCBELS) in the fall issue dated October 2016.

continued on next page

Unmanned Aircraft Systems

continued from the previous page

the decision. He said there was a licensee attending the class who admitted to already using UAS in his business. During one of the breaks the licensee approached my friend and began asking him questions. My friend, being curious about the licensee's experience in photogrammetry, began asking him questions about how he handles certain situations based upon existing conditions. The licensee's response was "I don't have to know that, the software does it for me." Herein lies the problem. As professionals we must practice in the area of our competency. Relying on technology to give us answers without an understanding of how the technology is determining those answers is not practicing within the area of our competency.

The practice of land surveying as defined in § 89C-3 (7) a. 5. states *"Determining the configuration or contour of the earth's surface or the position of fixed objects on the earth's surface by measuring lines and angles and applying the principles of mathematics or photogrammetry."*

Photogrammetry has been defined by the American Society for Photogrammetry and Remote Sensing (ASPRS) as the art, science, and *technology of obtaining reliable information about physical objects and the environment, through processes of recording, measuring, and interpreting images* and patterns of electromagnetic radiant energy and other phenomena.

I remember very well when photogrammetrists were grandfathered in as surveyors. The concern among many of the "traditional land surveyors" was that these individuals would start practicing boundary surveying without having the required experience and education to do so. That turned out not to be the case. Now it seems the tables have turned. Because of this new technology, the "traditional land surveyor" has decided to practice photogrammetry, and in most cases, without the required education and experience. UAS technology is photogrammetry from A to Z. It is incumbent upon the licensee to acquire the additional education and experience needed to competently offer this service. Can that education and experience be acquired through an eight hour seminar or a two hour sales presentation? The Board does not regulate tools but does regulate the practice of engineering and surveying. Should the licensee find themselves in a position having to explain their procedures, an answer like "the software did it for me" will not bode well. Remember, it's your license on the line, or in this case, in the air.



Firm Foundations

continued from the previous page

professional conduct². Therefore, engineering judgment must be applied based on the collective of our knowledge, experience, and the situation at hand.

The Successor Engineer

In the case of new projects, the design investigation may be straightforward but when projects seek to modify or assume prior work, the concept of the "successor engineer" comes into play. 21 NCAC 56.0701(c)(4) describes the successor engineer in cases *where a licensee in responsible charge of the work is unavailable to complete the work*. The regulation states *a successor licensee may take responsible charge by performing and documenting all professional services to include developing a design file including work or design criteria, calculations, code research, and any necessary and appropriate changes to the work*. Three (3) categories where succession may be foreseen are as follows:

- Installation of another engineer's work without modification;
- Installation of another engineer's work where modification is required;
- Completion of another engineer's work that may be incomplete or adapting prior work.

In **Category 1**, the original design remains unchanged and is constructed properly without modification. A third party engineer may verify acceptance through certification under seal and signature without becoming the "successor engineer." This may be normal practice for some for quality assurance and to generate unbiased opinions on projects. It is noted that 21 NCAC 56.0701(e)

² 21 NCAC 56.0701

continued on next page