

UNCIVILIZED TOPICS FOR PROFESSIONAL ENGINEERS

2022 ISPE ANNUAL CONFERENCE
COEUR D'ALENE, IDAHO
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UNCIVILIZED

The practice of engineering is continuously evolving and adapting to industry challenges. Staying relevant means staying current with industry trends, technology and social issues.

Professionalism, artificial intelligence and machine learning, cyber security, technical writing and other topics that impact the engineering profession now and in the future will be presented and discussed in an open forum.

PROFESSIONALISM

We are Professional Engineers, but do we practice “professionalism” in our daily lives, at work and at home?

- Professionalism includes respect, competence, confidence, accountability, integrity, and etiquette.
- Professionalism enhances public, client and employee trust.

PROFESSIONALISM

- Ethics
 - Integrity
- Do your homework, be prepared
 - Confidence
 - Respect
 - Competence
- Value others
- Provide mentorship
- Listen before speaking
- Be polite, courteous and use your manners

PROFESSIONALISM

Work-place etiquette

- Honor your commitments
 - Accountability
- Be on time
- Be attentive, responsive and proactive
 - Meetings
 - Put the cell phone down
- Limit personal matters
- Avoid negative gossip/shop talk
 - Clients, coworkers, bosses, contractors, etc.



ARTIFICIAL INTELLIGENCE AND MACHINE LEARNING

Artificial intelligence in engineering design is already here, how and when should we embrace it?

From Autodesk (Fusion 360) “Designers or engineers can input design parameters such as materials, manufacturing methods, spatial and weight requirements, and cost constraints into their generative design software. Artificial intelligence then analyzes all possible design permutations and composes hundreds or even thousands of alternatives within a few seconds.”

From Columbia Engineering “Artificial intelligence refers to the general ability of computers to emulate human thought and perform tasks in real-world environments, while machine learning refers to the technologies and algorithms that enable systems to identify patterns, make decisions, and improve themselves through experience and data.”

Applications that benefit from AI or ML?

CYBER SECURITY

From Cisco:

“Some of the largest breaches to date began with the compromise and misuse of a single privileged user account. Gaining access to a privileged account can provide hackers with the virtual ‘keys to the kingdom’ and the ability to carry out widespread theft and inflict significant damage.”

Why would a hacker be interested in your engineering firm?

- Intellectual property
- Confidential drawings and client data (you signed the NDA, the hacker did not)
- Corporate banking accounts
- Employee information
- And more.....

CYBER SECURITY

Common ways hackers get in:

- Unsupported operating systems and/or hardware
- Hardware and/or software configuration issues
- Lack of patches and updates
- Untrained employees downloading malicious software or sending confidential information
 - Phishing emails
- Lack of cybersecurity solutions, such as:
 - Firewalls
 - Anti-virus software
 - Spam filtering
 - DNS filtering
 - Intrusion detection software
 - Multi-factor authentication

CYBER SECURITY

What Should Engineering Firms Consider?

- Have a cybersecurity professional train staff on basic safety protocols and security awareness
- Provide firewalls, anti-virus software, DNS filtering...
- Use multi-factor authentication
- Keep software updated and install patches
- Update unsupported equipment and software
- Network monitoring
- Regularly review administrative privileges
- Require regular password changes

TECHNICAL WRITING

As professional engineers, a significant part of our day-to-day responsibilities is communicating in writing with clients, agencies, and the public. Communication may be in the form of proposals, specifications, reports, emails, letters, etc.

Clear, concise and accurate writing skills help our audience understand the intent and the specific requirements of our designs, analysis and professional opinions; as well as convincing them to hire us!

On the other hand, communication that is unclear, contains typographical errors, poor grammar, and structure hampers our professional advancement, confuses our audience and creates misunderstandings.



So, what is the problem? The problem is that not all engineers receive training in technical writing, or they lack the required skills and practice to be proficient technical writers.

For example, technical writing is not required for all new U of I engineering graduates (i.e. BSCE, BSME, BSCHE).

TECHNICAL WRITING

Write with your audience in mind, remember not everyone is an engineer in your field. Your words should convey the appropriate information in a way the audience understands without extraneous information. The goal is to inform without the audience having to ask, "what do you mean?"



Grammar, punctuation and structure matter; I repeat, grammar, punctuation and structure matter! The reader will wonder if you really know what you are talking about or whether they should hire you as a professional if they see mistakes or perceive your writing to be less than professional.

Poorly written specifications and reports can result in costly or perhaps dangerous misunderstandings.

TECHNICAL WRITING

Solutions

- Have a peer, supervisor, or (fill in the blank) review your report, proposal, specifications, etc., **BEFORE** you send or publish your document. This includes emails if they contain significant information.
- As an employee seek out technical writing education. This will advance your career!
- As an employer provide mentoring and training opportunities. Make this a part of reviews and advancement opportunities. Remember, you want the world to perceive your firm and representatives as professional, knowledgeable and able to communicate efficiently and effectively.

OTHER TOPICS



University of Idaho



Career

Job Openings and
Salary Range >
Career Options >
Employment Trends >



Degree

Degree Prep >
Degree Roadmap >
Degree Requirements >
Professional Licensing >
Questions? >



Financial

Scholarships >
Paid Employment
Related to Your Major >
Internships & Summer
Programs >
Financial Aid >



Get Involved

Hands-On Learning >
Clubs & Organizations >

Professional Licensing

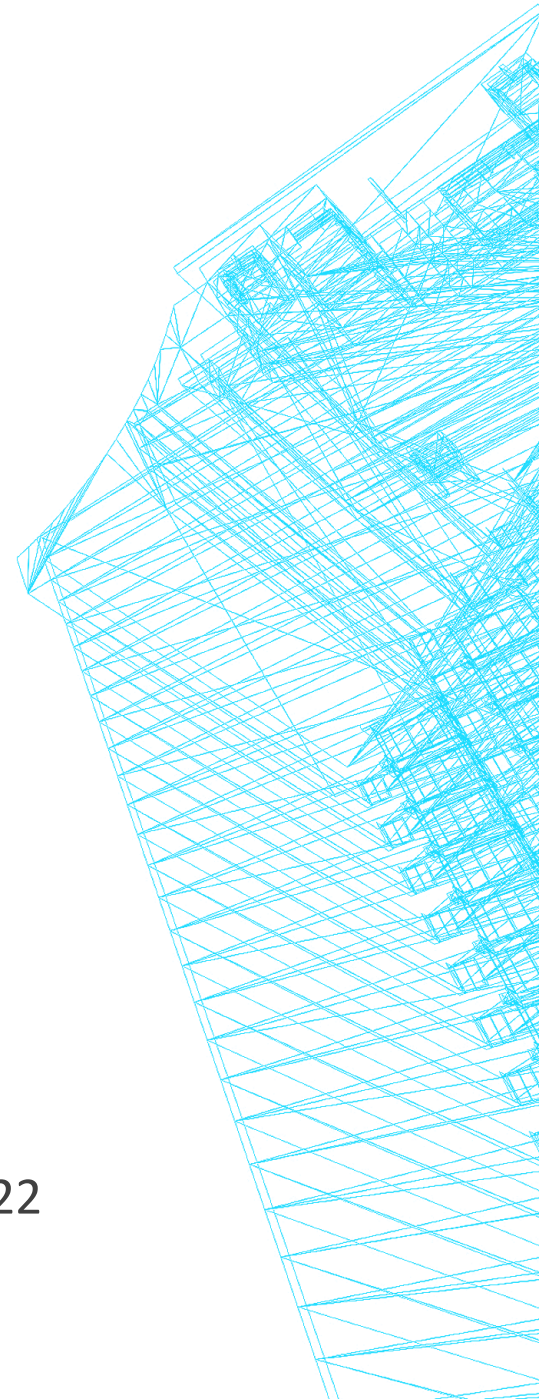
Completion of the program will count towards eligibility for the [Professional Engineer's License \(PE\) to practice Engineering](#), which requires a four-year degree from an ABET-accredited school, four years of experience under a PE, and passing the Fundamentals of Engineering (FE) and Principles of Practice in Engineering (PE) Exams.

REFERENCES & RESOURCES

- Brad Angle, Aaron Miller, Bill O'Rourke. The Business Ethics Field Guide. 1st ed, 2016. ISBN 978-0-9910910-3-4.
- Cisco. 2017 Midyear Cybersecurity Report.
https://www.cisco.com/c/dam/en_us/solutions/industries/government/us-government-solutions-services/docs/state-local-midyear-cybersecurity-report.pdf
- Joe Martin. Cybersecurity For Engineering Firms (A Practical Guide),
<https://www.compunet.ca/blog/cybersecurity-engineering-firms/>
- <https://www.autodesk.com/products/fusion-360/blog/artificial-intelligence-reality/>
- <https://ai.engineering.columbia.edu/ai-vs-machine-learning/>

SIGNATURES

2/11/2021, revised 7/1/2022



SIGNATURE DEFINITION REMOVED

IDAHO ADMINISTRATIVE CODE IDAPA
TITLE 54 PROFESSIONS, VOCATIONS, AND BUSINESSES
CHAPTER 12 ENGINEERS AND SURVEYORS

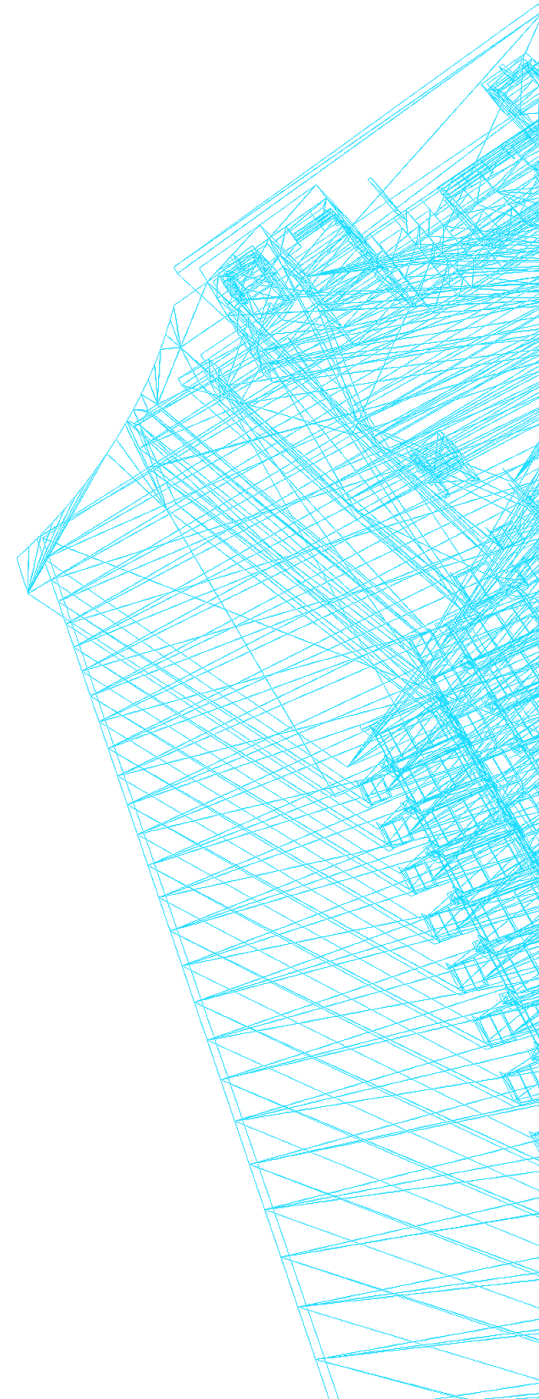
54-1202 Definitions.

This section of Idaho Code no longer defines the term “signature”.

Removed as part of Senate Bill 1235 (effective 7/1/2022)

The intent of removing the signature definition from 54-1202 was to allow signatures to be any form that is legal in the State of Idaho to be used.

A client or agency might have additional requirements; as long as the signature meets both requirements you are ok.



SIGNATURES – COMMON DEFINITIONS

DEFINITIONS:

BLACKS LAW DICTIONARY

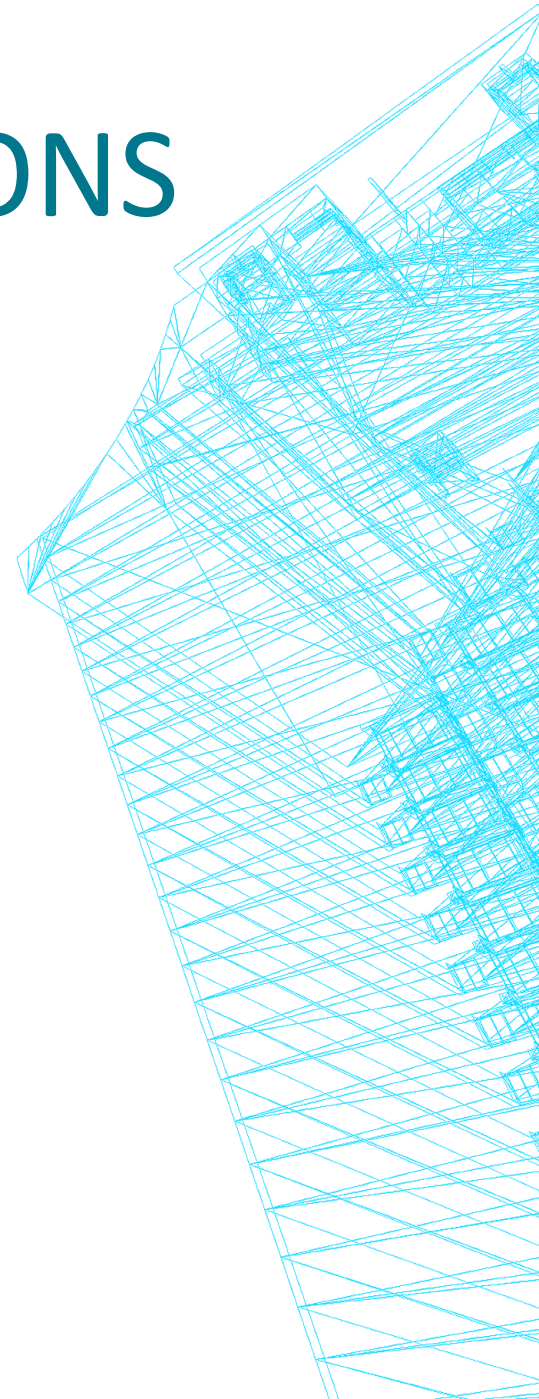
The act of writing one's name upon a deed, note, contract, or other instrument, either to identify or authenticate it, or to give it validity as one's own act. The name so written is also called a "signature."

MERRIAM – WEBSTER DICTIONARY

The act of signing one's name to something

UNIFORM ELECTRONIC TRANSACTIONS ACT

28-50-102(8) "Electronic signature" means an electronic sound, symbol or process attached to or logically associated with a record and executed or adopted by a person with the intent to sign the record.



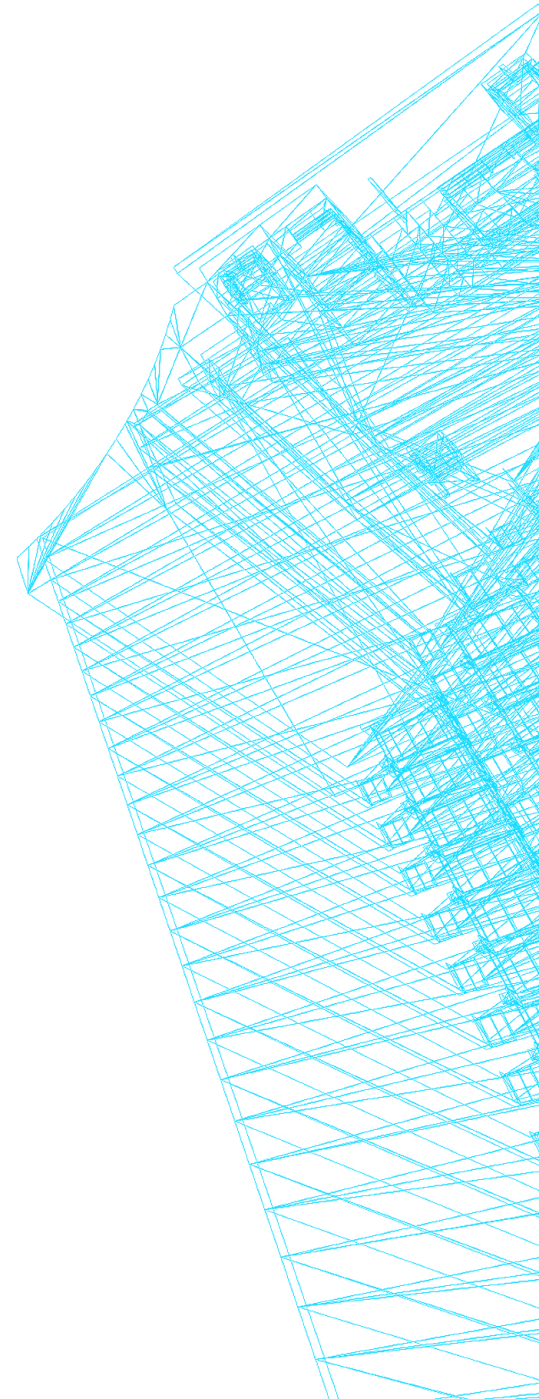
SEALING OF DOCUMENTS

*TITLE 54 PROFESSIONS, VOCATIONS, AND BUSINESSES
CHAPTER 12 ENGINEERS AND SURVEYORS*

54.1215(3)(a)

The seal may be a rubber stamp, crimp or electronically generated image. Whenever the seal is applied, the licensee's signature and date shall be included adjacent to or across the seal.

The specific digital signature requirements have been removed along with the prohibition of facsimile signatures.



SIGNATURES – EXAMPLES



Facsimile or Electronic
Signature and Date



Manual Signature and Date

Raymond J Watkins

Digitally signed by Raymond J Watkins
DN: CN=Raymond J Watkins,
OU=A01427D00000167BD99F36E00007E4C,
O=Unaffiliated, C=US
Reason: Engineer in Responsible Charge
Date: 2021.01.13 08:57:42-08'00'



Digital Signature



Original Signed By: Raymond J. Watkins
Date Original Signed: 01/14/2021
Original Stored at AEI Engineering, Inc.

Distributed for Informational Uses

DISCUSSION AND QUESTIONS

- Digital signature capable of independent verification? Now left up to the Licensee.
-
-
- **WORK TO BE COMPLETED**
- Update Board Opinion / White Paper on Electronic documents.
- Work with State Agencies to achieve uniformity in signature submittal requirements.





EXAMPLES OF SPECIFIC SIGNATURE REQUIREMENTS

- 50-1304. ESSENTIALS OF PLATS. (1) ...Signatures shall be in reproducible black ink...
- 55-1905. RECORDS OF SURVEY -- FILING. (1) ...Signatures shall be in reproducible black ink...



TITLE 28 - COMMERCIAL TRANSACTIONS - CHAPTER 50 UNIFORM ELECTRONIC TRANSACTIONS ACT

- 28-50-107. LEGAL RECOGNITION OF ELECTRONIC RECORDS, ELECTRONIC SIGNATURES AND ELECTRONIC CONTRACTS — ELECTRONIC TRANSMITTAL IN LIEU OF CERTIFIED MAIL.
 - a) A record or signature may not be denied legal effect or enforceability solely because it is in electronic form.
 - (b) A contract may not be denied legal effect or enforceability solely because an electronic record was used in its formation.
 - (c) If a law requires a record to be in writing, an electronic record satisfies the law.
 - (d) If a law requires a signature, an electronic signature satisfies the law.
 - (e) If a law requires any notice or other record to be sent by certified mail, the record may, with the express consent of the recipient, be transmitted electronically.

<https://legislature.idaho.gov/statutesrules/idstat/Title28/T28CH50/SECT28-50-107/>



IDAHO SUPREME COURT - RULE 9: ELECTRONIC SIGNATURES

Idaho Rules for Electronic Filing and Service (partial)

- (a) Forms of electronic signature. A document may be electronically signed by:
- (1) inserting a digital image of the signing party's handwritten signature into the document; or
 - (2) scanning the individual's handwritten signature after the document has been signed; or
 - (3) using a signature block that includes the typed name of the individual preceded by a "/s/" in the space where the signature would otherwise appear. An example of a signature block with "/s/" is:

/s/ John Q. Smith

JOHN Q. SMITH

If the person signing is not either an attorney representing a party in the case or a party in the case and the document is signed using the person's name preceded by "/s/," a duplicate of the document must be conventionally signed by the person signing and maintained by the attorney or party submitting the document until the expiration of the time to appeal or the determination of the appeal, whichever is longer.

<https://isc.idaho.gov/irefs9>