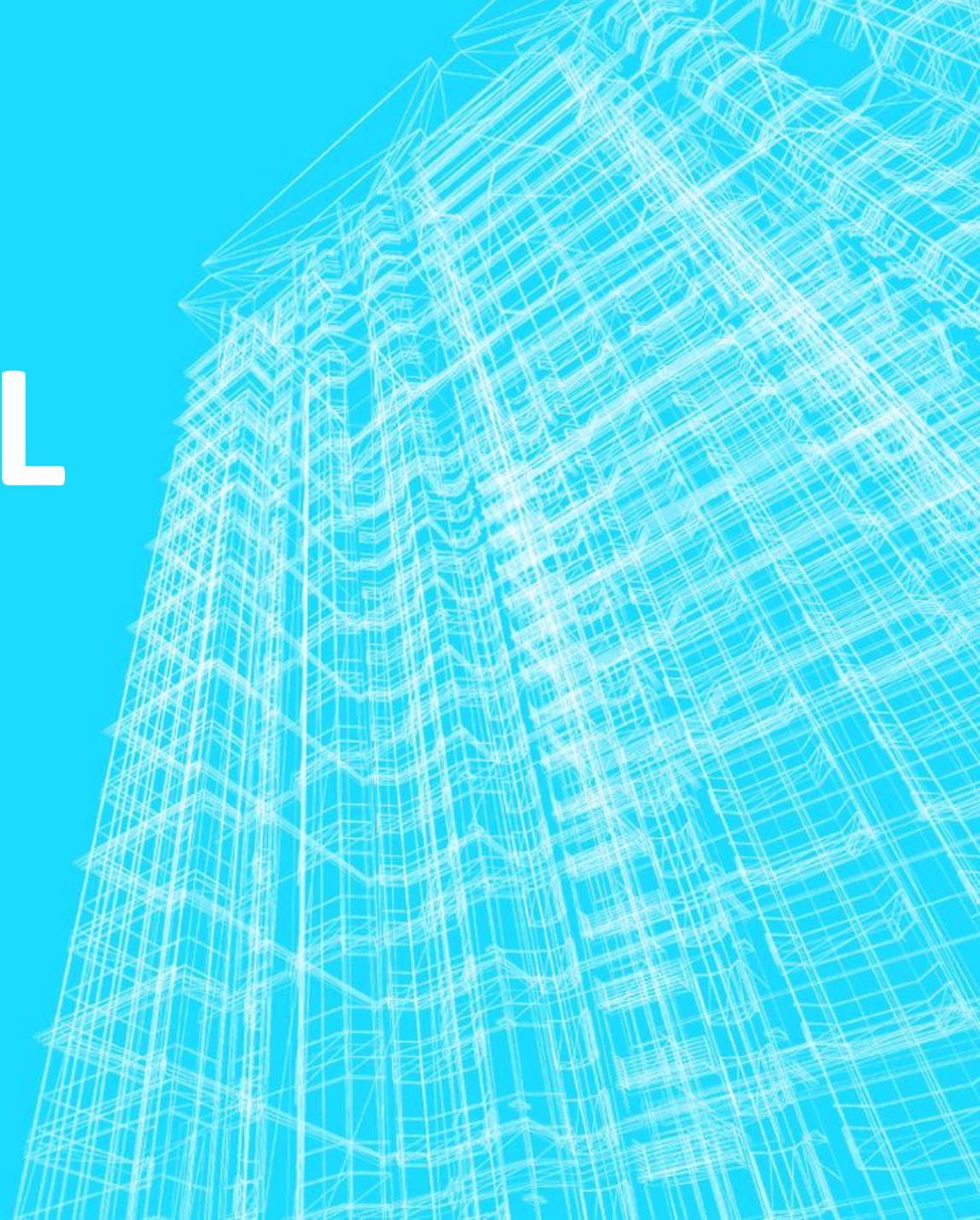
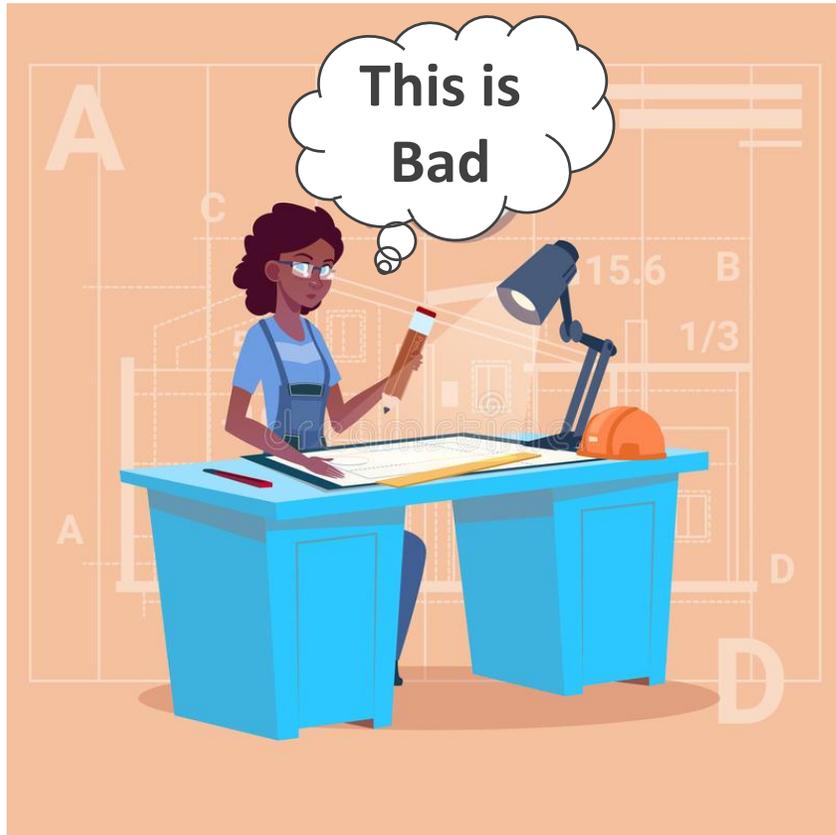


ETHICS FOR PROFESSIONAL ENGINEERS

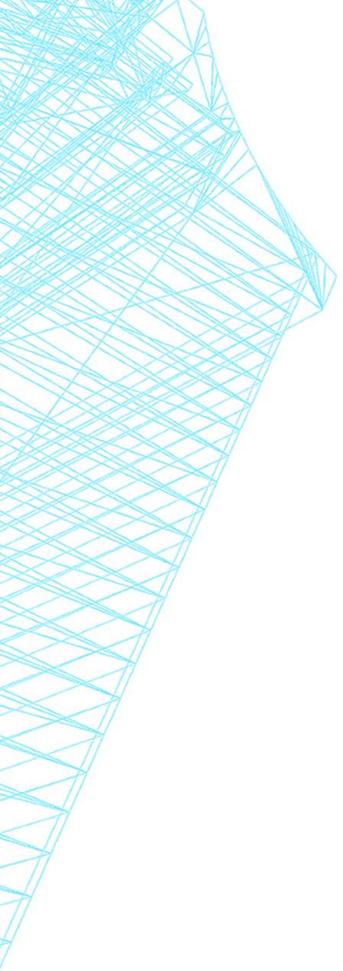
Review of Other Engineer's Work



WHAT DO YOU DO WHEN YOU THINK ANOTHER ENGINEER'S WORK IS SUBSTANDARD?

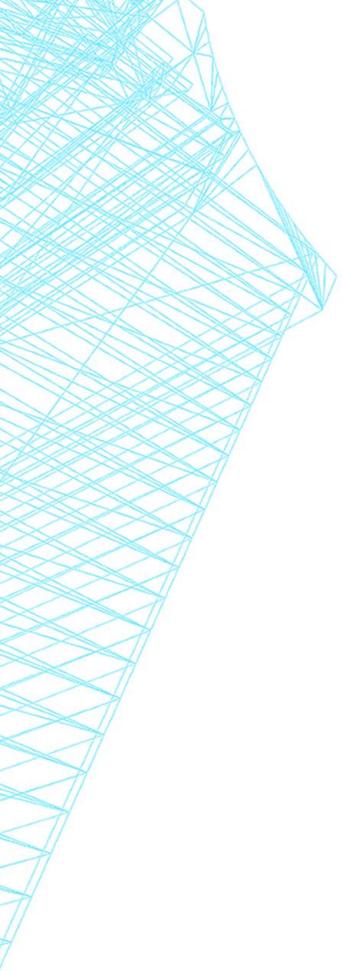


- Is there a violation of state law?
 - Negligence or incompetency?
 - Misconduct?
- Is there a violation of professional ethical standards?
- Or do you just not like the work?



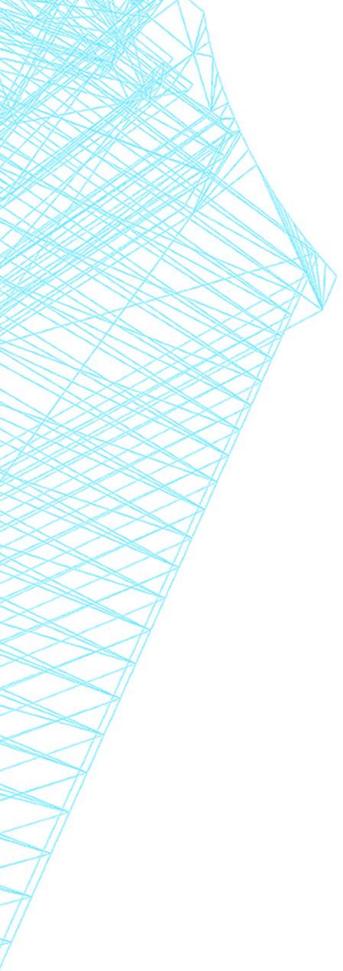
LAWS AND CODES GOVERNING WORK ETHICS

- State law
 - Ch. 443 Wis. Stat.
 - Ch. A-E 8 Wis. Admin. Code
 - Examining board and court decisions
 - Defamation, s. 942.01 Wis. Stat.
- Codes of Professional Ethics
 - National Society of Professional Engineers (NSPE)
 - American Society of Civil Engineers (ASCE)
- Company policy



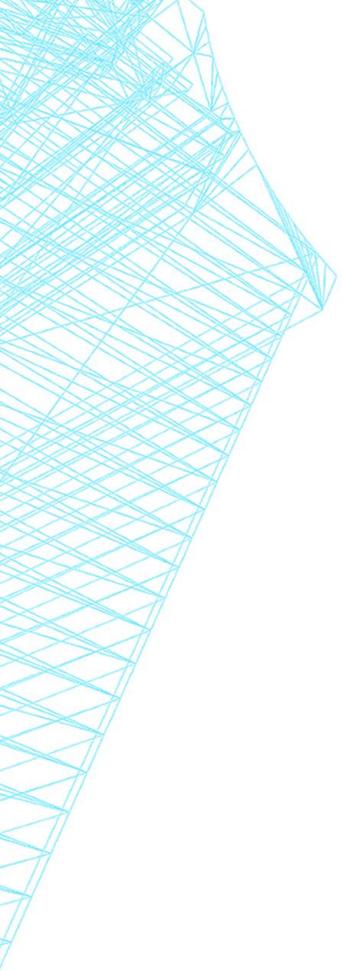
STATE REGULATION OF ENGINEERING

- 443.11 Wis. Stat. Disciplinary proceedings against engineers. The Board may reprimand engineers for:
 - Signing or stamping documents not prepared by him or her or under his or her control.
 - Any gross negligence, incompetency or misconduct in the practice of professional engineering.
 - Any violation of the rules of professional conduct adopted and promulgated by the examining board.
- A-E 8.06(1) Professional obligations.
 - A professional engineer shall use reasonable care and competence in providing professional services.



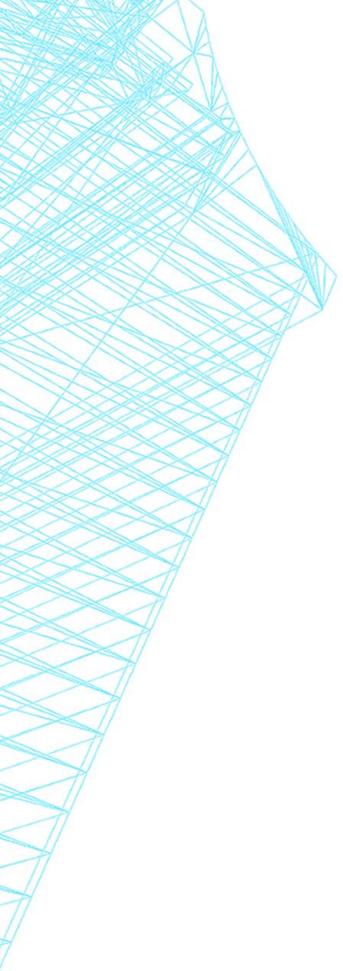
ELEMENTS OF GROSS NEGLIGENCE

- A-E 8.03(1) “Gross negligence in the practice of professional engineering” means:
 - The performance of professional services by a professional engineer,
 - The services do not comply with an acceptable standard of practice,
 - The standard of practice has a significant relationship to the protection of health, safety or public welfare,
 - The services were performed in a manner indicating that the professional knew or should have known the accepted standard of practice, and
 - The professional acted with indifference to or disregard of the accepted standard of practice.



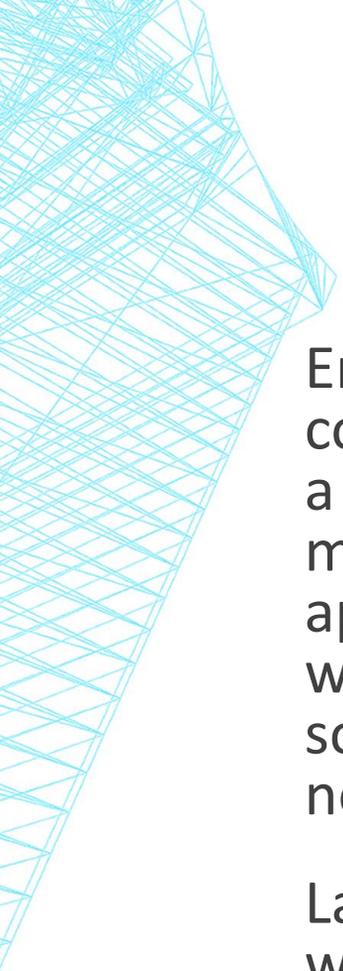
INCOMPETENCY

- “Incompetency in the practice of professional engineering” means conduct which demonstrates:
 - Lack of ability or fitness to discharge the duty owed by a professional engineer to a client or employer or to the public,
 - Lack of knowledge of the fundamental principles of the profession or an inability to apply fundamental principles of the profession, or
 - Failure to maintain competency in the current practices and methods applicable to the profession.



MISCONDUCT

- “Misconduct in the practice of professional engineering” means:
 - an act performed by a professional engineer,
 - in the course of the profession, and
 - which jeopardizes the interest of the public.
- Includes:
 - Violation of laws or rules relating to the practice of professional engineering.
 - Preparation of deficient plans, drawings, maps, specifications or reports.
 - Engaging in conduct which evidences a lack of trustworthiness to transact the business required by the profession.

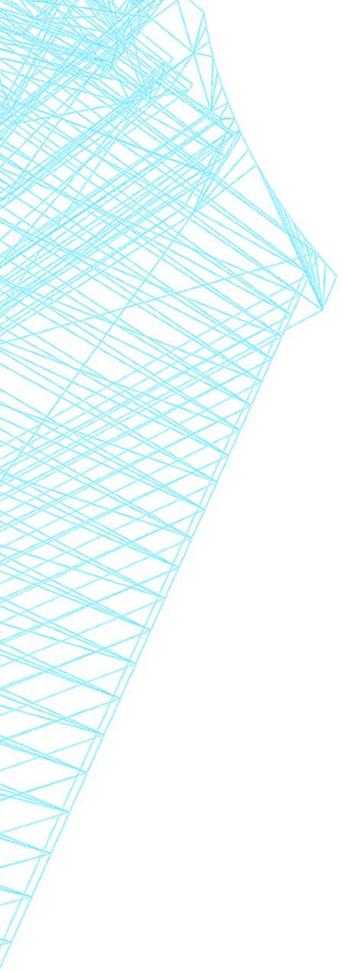


STATE LAW EXERCISE 1

GROSS NEGLIGENCE? INCOMPETENCE? MISCONDUCT?

Engineer has been a PE for 11 years and has successfully designed and overseen construction of multiple buildings. Engineer designs and oversees construction of a garage. His plans were reviewed by the city engineer and approved after some minor changes. During the review, the question of whether the roof was appropriately designed to hold the load was raised and the reviewing engineer was satisfied with the response. During construction, the Engineer carries out some welding work on the door frames for the garage door. He does not hold the necessary certifications to do welding work.

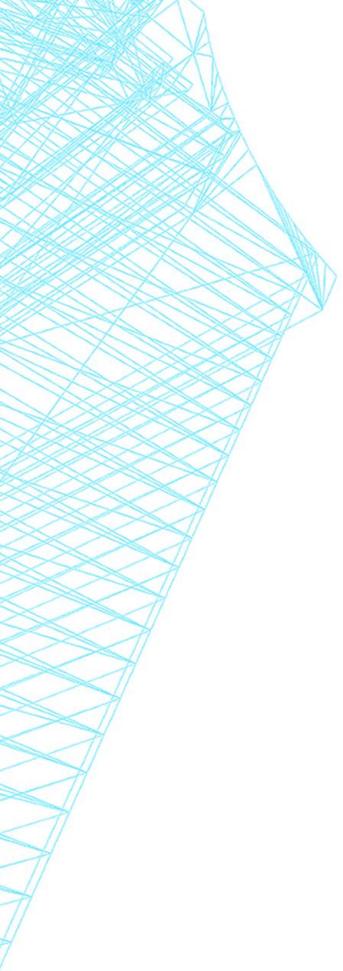
Later, the roof of the garage collapses. No one is hurt. It is determined that there was an error in the design of an open web frame truss that meant the roof could not support a reasonable live load. Engineer agrees that he made the error, and it was the error that was the cause of the collapse. “This has been the first and only failure that I have experienced during the eleven years of private practice, and I can assure you, the last” he said. All the reviewing engineers agree that the design error was not obvious.



WI SUPREME COURT - *VIVIAN*

- A single acknowledged mistake of the Engineer in the design resulting in the roof collapse under stress of a normal load did not constitute incompetency given his history of competency.
- A non-obvious error which was reviewed by regulatory engineers and approved was not Gross Negligence.
- Welding was conducted in the practice of providing professional engineering services by Engineer. This was an intentional act knowingly done in violation of a known administrative rule which has the force of law and therefore constitutes misconduct.

Vivian v. Examining Bd. of Architects, Prof'l Engineers, Designers & Land Surveyors, 61 Wis. 2d 627, 636, 213 N.W.2d 359, 363 (1974)



STATE LAW EXERCISE 2

GROSS NEGLIGENCE? INCOMPETENCE? MISCONDUCT?

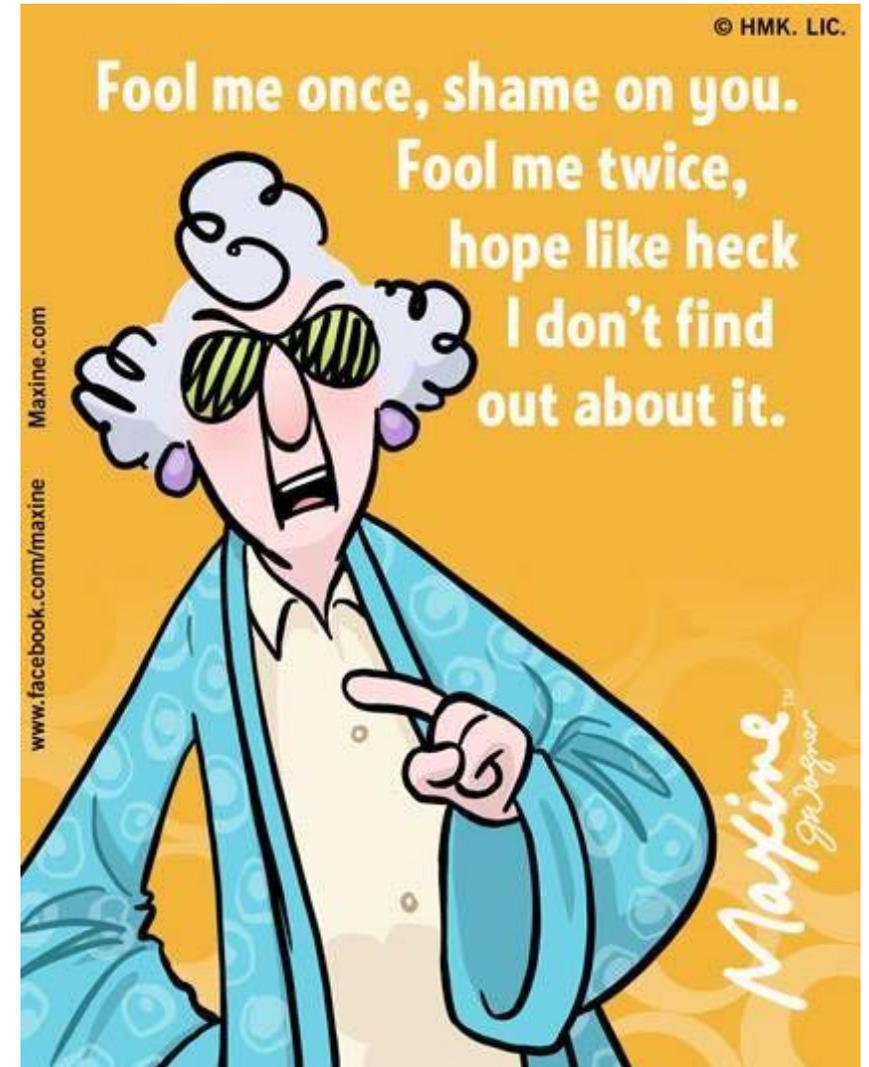
Engineer has been in practice for 10 years and has submitted designs for many runoff control and manure storage systems for permitted CAFOs. Each time she submits a design, the department engineers find errors. The designs do not meet minimum code requirements, commonly in the quality of concrete proposed. Nearly every submittal is returned for correction.

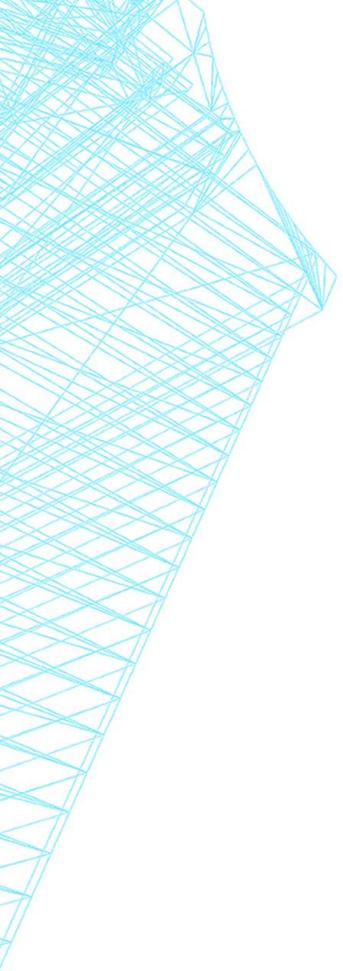
If built according to the proposed design, the systems would initially work as required. But the errors would have resulted in the systems having a shorter than normal useful life resulting in unexpected failure of the systems and significant discharges from the CAFOs. The initial build may be cheaper, but the repairs would be much more costly for the CAFO owner in the long run.

WI CT. APPEALS – SARKO (UNPUBLISHED)

- Sarko had violated several statutes and numerous administrative code provisions for the practice of his profession, and that his multiple failures to include required items in maps he had signed and sealed demonstrated incompetence.
- Multiple acts of ordinary negligence may not amount to gross negligence but are evidence of incompetence.

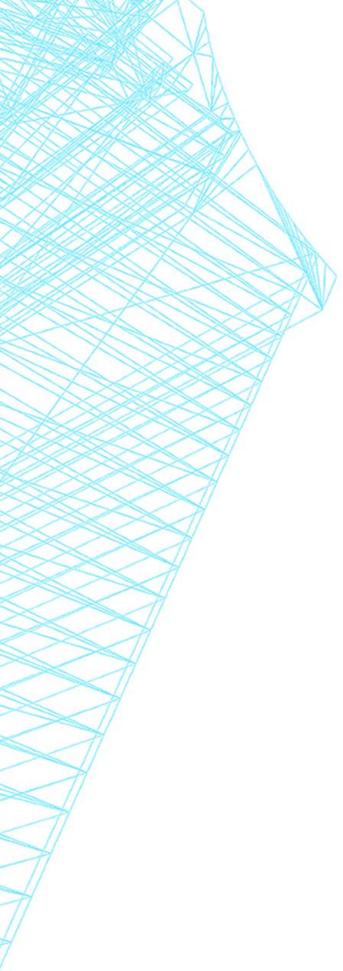
Sarko v. Examining Bd. of Architects, Landscape Architects, 252 Wis.2d 766 (2002)





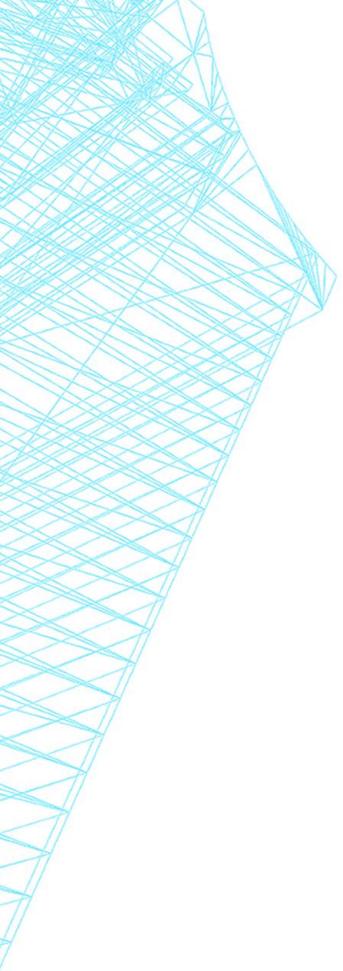
DISCIPLINARY ACTIONS BY THE BOARD

- 2015-2020 - 54 cases before the professional engineer section of the Wisconsin examining board
 - 37 - Failure to report sufficient continuing education
 - 15 - out of state discipline
 - 3 - responsible engineer in a practicing uncertified firm
 - 2 - practicing work outside competency (architecture)
 - 2 - Misrepresentation on application for certification
 - 2 - committed a felony offence
 - 1 - practicing with expired license
 - 1 - failed to use reasonable care in provide professional services
- 0 cases citing incompetency or gross negligence



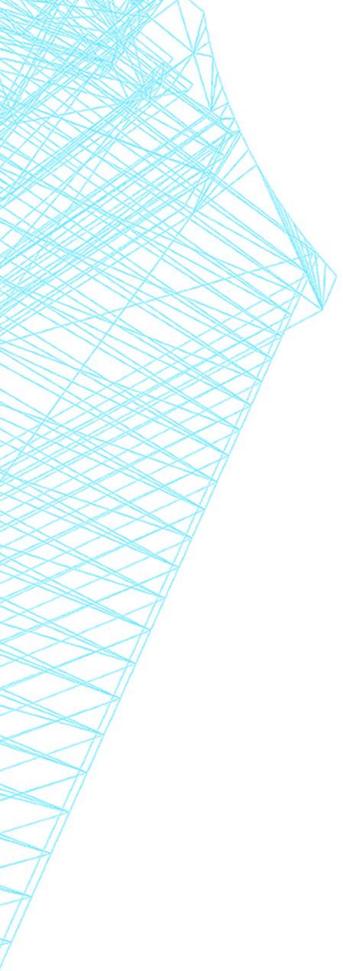
NSPE – FUNDAMENTAL CANONS

1. Hold paramount the safety, health, and welfare of the public.
2. Perform services only in areas of their competence.
3. Issue public statements only in an objective and truthful manner.
4. Act for each employer or client as faithful agents or trustees.
5. Avoid deceptive acts.
6. Conduct themselves honorably, responsibly, ethically, and lawfully so as to enhance the honor, reputation, and usefulness of the profession.



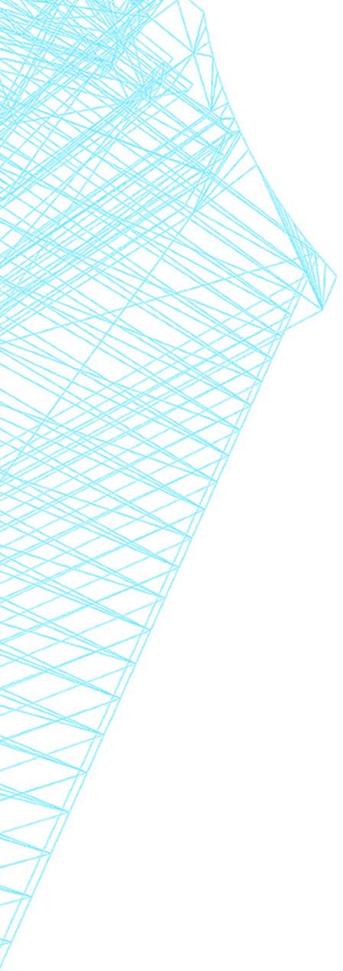
DUTY TO REPORT

- A-E 8.08 (1) A professional engineer ... shall furnish the board with information indicating that any person or firm has violated provisions in ch. 443, Stats., rules in this chapter or other legal standards applicable to the profession.
- NSPE, Rules of Practice II.1.f. Engineers having knowledge of any alleged violation of this Code shall report thereon to appropriate professional bodies and, when relevant, also to public authorities.
- ASCE, 5.i. Engineers shall report violations of the Code of Ethics to the American Society of Civil Engineers.



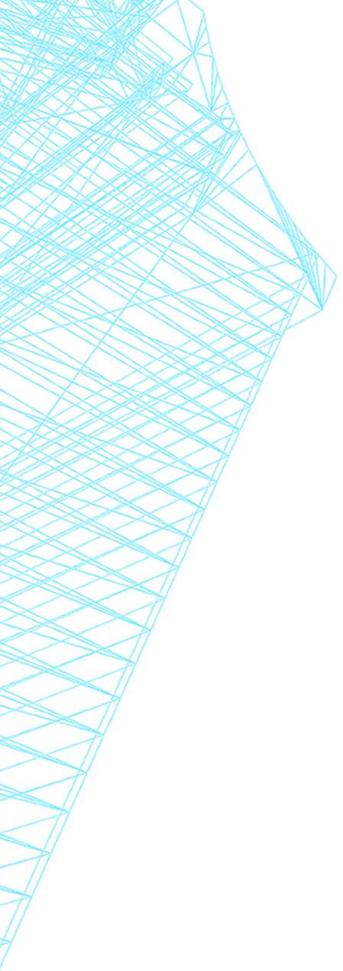
REVIEW OF THE WORK OF OTHERS

- NSPE Professional Obligations, III.7.
 - Engineers in private practice shall not review the work of another engineer for the same client, except with the knowledge of such engineer, or unless the connection of such engineer with the work has been terminated.
 - Engineers shall not attempt to injure, maliciously or falsely, directly or indirectly, the professional reputation, prospects, practice, or employment of other engineers.
- ASCE, 5.h.
 - Comment only in a professional manner on the work, professional reputation, and personal character of other engineers



NSPE EXERCISE

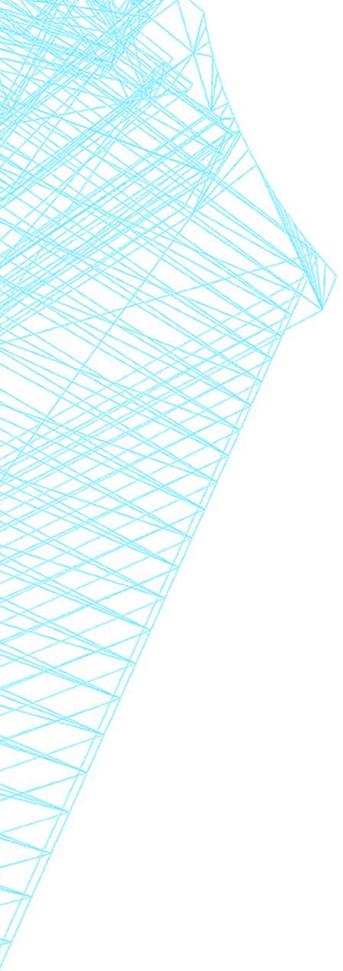
Engineer A practicing in Wisconsin requires the services of a structural engineer in Utah. Engineer A contacts Engineer B, who is the secretary of the Utah Society of Professional Engineers, to request the name of an appropriate engineer to perform the required structural engineering work. Engineer B suggests Engineer C, who Engineer A then retains. Not satisfied with the services provided by Engineer C, notably Engineer C's lack of regular communication, Engineer A later contacts Engineer B and tells Engineer B of his general dissatisfaction with Engineer C, but does not first communicate this displeasure to Engineer C. Engineer B talks with Engineer C. Soon thereafter, Engineer C contacts Engineer A and expresses his strong displeasure toward Engineer A for the comments he made to Engineer B.



NSPE CASE 96-10

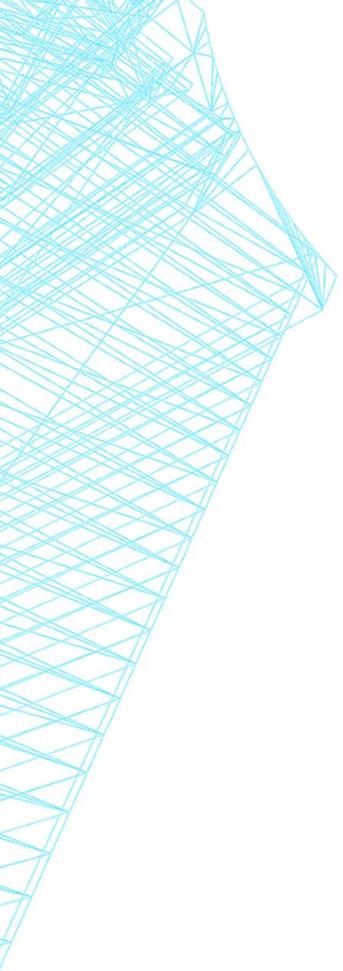
Code of Ethics III.7: Engineers shall not attempt to injure, maliciously or falsely, directly or indirectly, the professional reputation, prospects, practice, or employment of other engineers. Engineers who believe others are guilty of unethical or illegal practice shall present such information to the proper authority for action.

- Engineer A acted ethically in communicating with Engineer B, but acted unethically by not communicating with Engineer C.
- Engineer B did act ethically under the circumstances.
- Engineer C did act ethically under the circumstances but should consider improving his practice.



NSPE EXERCISE

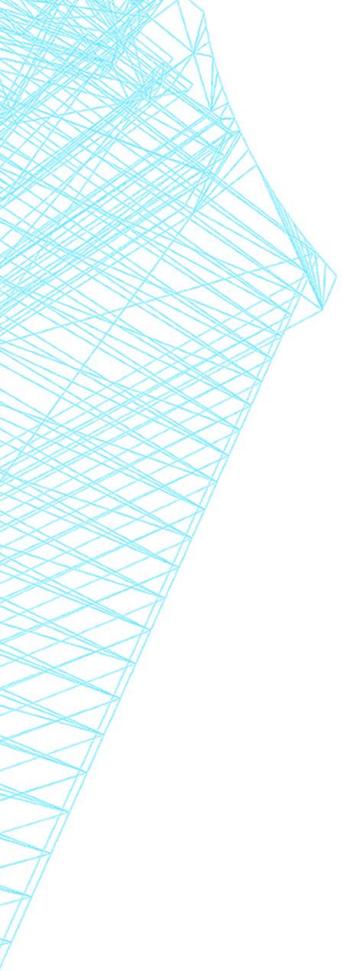
Engineer A, a professional engineer works with a construction contractor on a design/build project for the construction of an industrial facility. During the construction of the project, the construction contractor retains the services of Engineer B, a professional engineer, to design structural footings. Engineer B's degree and background is in chemical engineering. Engineer A has been unable to establish that Engineer B has any apparent subsequent training in foundation design and Engineer A has reservations concerning the competence of Engineer B to design the structural footings. She reports her concerns to the contractor. Engineer B proceeds with the design work.



NSPE CASE 96-10

Code of Ethics II.2: Engineers shall perform services only in the areas of their competence.

- It would be unethical for Engineer B to perform the design of the structural footings as part of the facility.
- Engineer A has an ethical obligation to confront Engineer B to make her concerns known to Engineer B, recommending that Engineer B withdraw from the project.
- If Engineer B refuses to acquiesce, Engineer A has an obligation to bring the matter to the attention of her client and to the authorities as appropriate, and if necessary, withdraw from the project if her concerns are not met.



GENERAL EXERCISE - 1

Following an inspection of records at a facility permitted under WPDES, it becomes clear that the facility has been misreporting discharge monitoring data required by the permit. The facility discharges effluent from industrial processes to a river used for drinking water supply.

- The lab reports show different results than reported and demonstrate a clear violation of permit terms that has been ongoing for many years.
- The manager, a professional engineer said during the inspection that he was solely responsible for reporting. When asked about the lab report, manager said he did not trust the lab reports, so he reported what he thought were the right numbers.

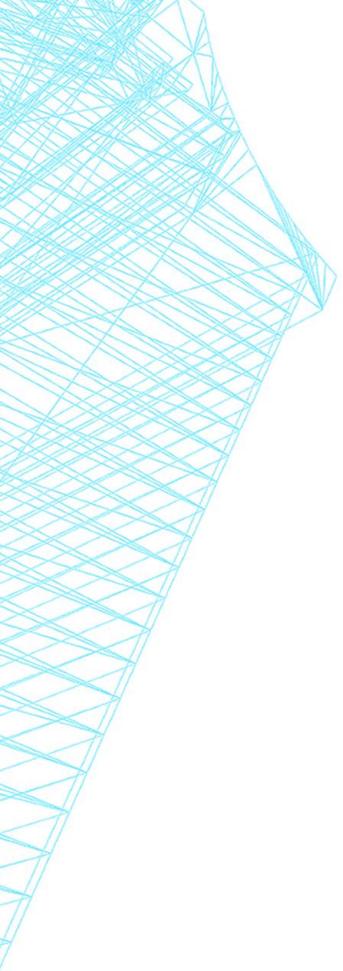
GENERAL EXERCISE - 2

NR 507.21(3) requires a solid waste disposal facility to sample all leachate head wells for leachate head levels on a quarterly basis and report the data to the department semi-annually. For a number of years of operation, PE Consultant has submitted landfill reports on behalf of the landfill under her PE stamp. The leachate head level data was collected by a technician. Technician provides the results to the landfill manager who passes it on to the PE Consultant. The PE Consultant wrote the landfill's reports discussing the data in the narrative and generated tables of the data.

The data collected showed no leachate had been removed from certain phases of the landfill and the leachate head levels were zero for a number of years. During this time, significant decisions relating to operation of the landfill and the leachate collection system were made, on the advice of the PE Consultant. These decisions were made on the basis of the reports and the leachate data.

Another manager of the landfill company reviewed the reports and noticed things didn't "add up." The company had a 3rd party perform leachate head level monitoring and discovered leachate head levels in excess of 1 foot in violation of code. The company reported this to the DNR and DNR issued an NOV impacting the reputation of the company. An internal investigation revealed:

- The monitoring technician said he didn't know how to use the different meters (he had been working as the technician for over 3 years).
- Manager said he trusted his employee and was not aware he had not been adequately trained in use of the equipment. He agreed to establish a more thorough training regimen.
- PE Consultant questioned whether the historical data was actually wrong and maybe there had been a recent change in conditions that resulted in the leachate level readings. She insisted that there was no evidence that the data in the prior reports was in error.



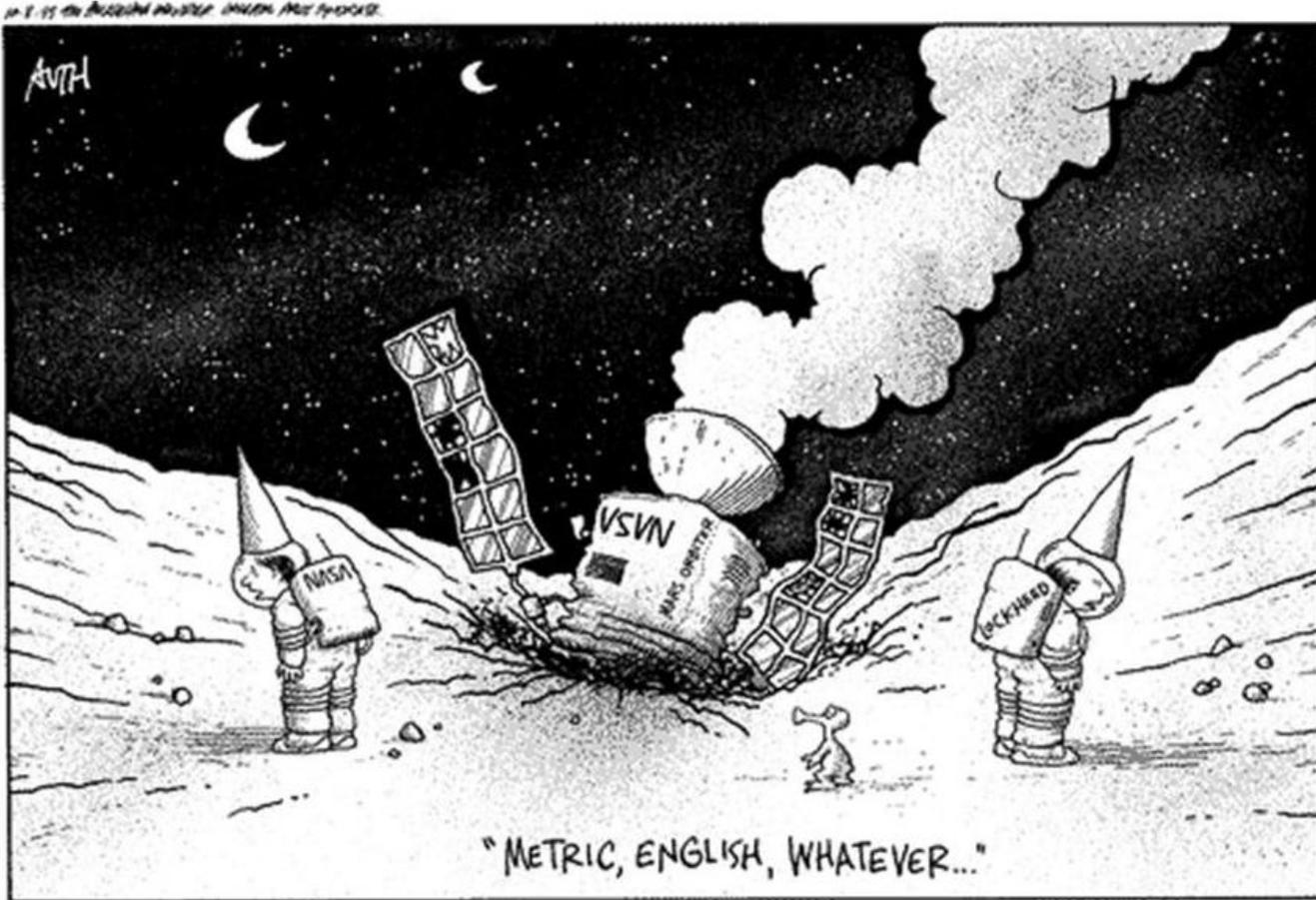
GENERAL EXERCISE - 3

Professional Engineer A works for SmallCo which has just been acquired by BigCo. A has had her PE license for 2 years. BigCo is building a landfill in Wisconsin and Engineer B is the PE overseeing construction. The landfill liner is 70% complete when B leaves the jobsite due to illness. BigCo assigns A to take over.

A inspects a delivery of clay and finds it is not to specification. There is visible debris and boulders in it. When she rejects the delivery, the supplier complains that the load is from the same source as the prior deliveries that were accepted. The tests all show the clay meets specification but it clearly does not. A confirms the information with BigCo staff. She visits the clay source and finds that the clay is not been excavated from the right location.

Engineer B returns to work and A outlines the issue. Construction is behind schedule and most of clay layer is now covered by the drainage layer. B is angry with A. He says the tests show the clay is to spec. He has not visited the source and relied on staff to inspect the deliveries. He reports A to management as being incompetent. He also tells the other engineers at BigCO what he thinks of A and advises them not to use her on other jobs. A eventually leaves BigCo.

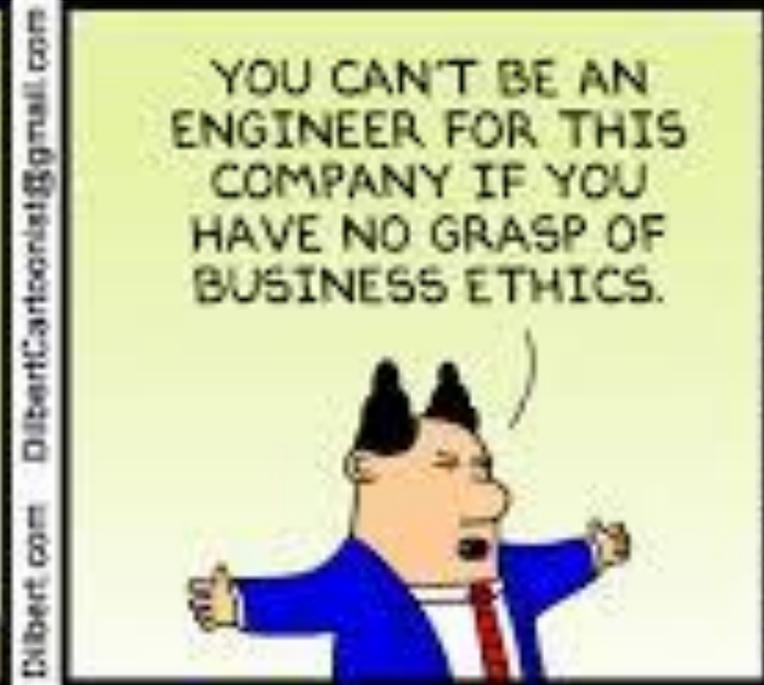
1999 NASA'S MARS CLIMATE ORBITER



During the design phase, the propulsion engineers at Lockheed Martin in Colorado expressed force in pounds.

Engineers at NASA's Jet Propulsion Lab responsible for flying the mission assumed the numbers were metric.

This navigation mishap pushed the spacecraft dangerously close to the planet's atmosphere where it presumably burned and broke into pieces, killing the mission on a day when engineers had expected to celebrate the craft's entry into Mars' orbit.



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