

Guidance on Licensing and Ethical Responsibilities for Civil Engineers

COMPETENCY

SAFETY

INTEGRITY

OBLIGATION



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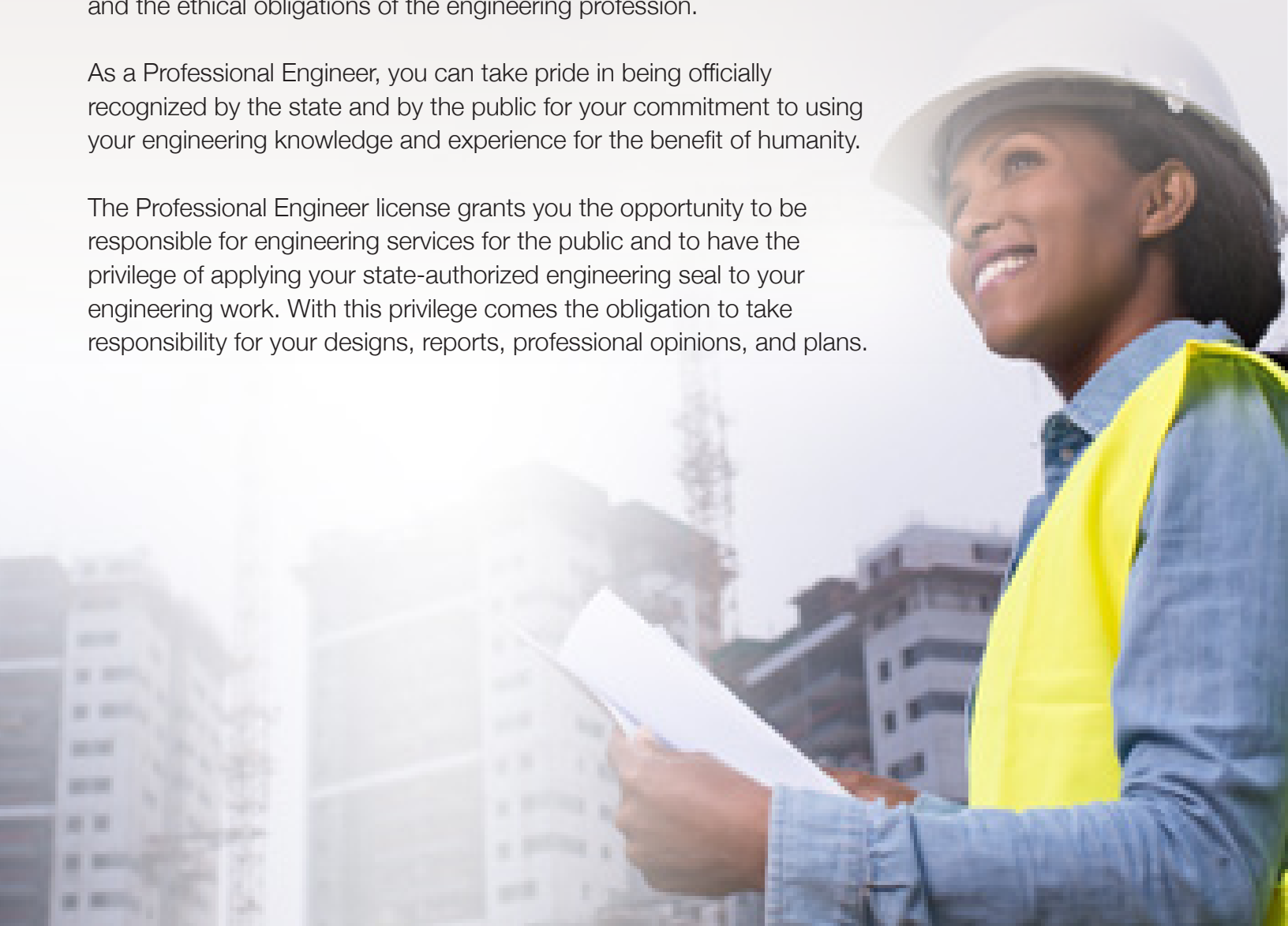
What is a Licensed Engineer?

In the United States all states have laws that govern the practice of engineering. Often known as an “Engineering Practice Act,” the primary purpose of this legislation is to protect the health, safety, and welfare of the public in that state. These laws, along with their implementing rules and regulations, define engineering practice and establish requirements for an individual to become licensed as a Professional Engineer (PE) in the state. Information about laws and rules for individual licensing jurisdictions is available at the National Council of Examiners for Engineering and Surveying (www.ncees.org).

Having an engineering license means more than just meeting a state’s minimum requirements. It means you have accepted both the technical and the ethical obligations of the engineering profession.

As a Professional Engineer, you can take pride in being officially recognized by the state and by the public for your commitment to using your engineering knowledge and experience for the benefit of humanity.

The Professional Engineer license grants you the opportunity to be responsible for engineering services for the public and to have the privilege of applying your state-authorized engineering seal to your engineering work. With this privilege comes the obligation to take responsibility for your designs, reports, professional opinions, and plans.



Alaska



Hawaii &
Puerto Rico



What are Licensing Requirements in the United States?

Although there are special considerations regarding experience and education requirements in some states, the typical licensure requirements are:

1. Graduating from an ABET accredited engineering program (or in some states, from an ABET accredited engineering technology program);
2. Passing the national Fundamentals of Engineering (FE) exam offered by the National Council of Examiners for Engineering and Surveying (NCEES), which may be taken as early as the final year of a student's undergraduate engineering degree;
3. Obtaining four years (or in some states, three years past a master's degree) of acceptable engineering experience with increasing levels of responsibility, under the guidance of one or more licensed engineers;
4. Submitting a detailed application documenting, among other things, a progressive increase in responsible professional experience and both professional and character references; and
5. Passing the Principles and Practice of Engineering (PE) exam offered by NCEES. Some states have an additional exam offered by the state board that covers their laws, principles of conduct, and ethics.



Why Should I Become a Licensed Professional Engineer?

Civil engineering students and graduates are strongly encouraged to become licensed engineers. Although many engineers in other disciplines work in an industrial setting where a license is not required to do engineering work inside the company (such as Chemical Engineers within the confines of a petro-chemical plant), civil engineers are most often providing engineering services directly for the public.

Let's consider some other reasons to become a licensed engineer:

- **Changing Workplace:** Today's workplace is rapidly changing with instances of restructuring, downsizing, privatization, and outsourcing. Being licensed gives you a broader range of options in the event that your working environment changes.

- **Technical Responsibility:** Your education and experience will prepare you for technical engineering work. Your license legally allows you to take personal responsibility for the engineering work that you may perform for public and private clients.

- **Public Acknowledgment:** For members of the public who are in the market for engineering services, professional licensure is a recognized measure of the engineer's education and experience. Being a licensed engineer puts you on par with other respected professionals, such as physicians, attorneys, and accountants.

- **Private Practice:** If you think you may at some point, now or in the future, want to pursue a career as a consulting engineer, own your own engineering firm, or be in responsible charge of engineering work, you must be licensed.

- **Public Practice:** Many federal, state, and municipal agencies require that certain responsible engineering positions, particularly those considered "higher level," be filled only by licensed engineers.

(ASCE has adopted two public policy statements in support of requiring licensed engineers in such positions; see Policy Statements 385—Licensure Requirements for Government Engineers, and 416—Government Engineering Management Positions).

- **Education Practice:** Engineering educators provide fundamental knowledge to those who study engineering. The responsibility to mentor students and serve as a role model is enhanced through licensure. Faculty who possess an engineering license have direct knowledge of the licensure process, bring practical experience into the classroom, and as a result, can convey the licensure process to students more effectively.

- **Ethical Responsibility:** While many professionals belong to technical societies with codes of ethics, such as ASCE, none of these codes have legal standing in the practice of engineering. On the other hand, licensed engineers are subject to codes of conduct adopted by their state licensing boards that are legally binding. A licensed engineer's acceptance of these binding ethical standards demonstrates commitment to the integrity of our profession and significantly enhances the image of civil engineers.



What are the Responsibilities of Licensed Civil Engineers?

Most of a civil engineer's education focuses on technical matters, and most of the engineer's professional practice is devoted to applying this technical knowledge in service to the needs of society. Another important element of both education and practice, however, involves ethics. "Ethics" is defined as the study of concepts such as "right/wrong," "good/bad," and the understanding of how one ought to live a principled life. In our context, however, ethics simply means an understanding of what is the right thing to do.

Ethics is a vital part of the engineering profession. Civil engineering students, young engineers, and licensed professional engineers all face a variety of moral dilemmas that are not always easy to resolve. Considerations such as time constraints, family commitments, advancement opportunities, job security, peer pressure, supervisor pressure, and professional reputation—to name only a few—complicate matters and make ethical

decisions difficult.

To make matters worse, dilemmas that most engineers face are not choices between "good and bad"—that would be too easy: choose good and be done with it! Real-world dilemmas more often involve choices between competing goods, choosing the lesser of two evils, or even choosing between competing principles. Like any other form of knowledge, understanding these complexities takes time, effort, and experience.

The ASCE Code of Ethics explicitly states that engineers have an ethical responsibility to continue professional development to enhance their technical and nontechnical competencies. Improving an understanding of how to identify, frame, and resolve moral dilemmas is an example of such non-technical competencies. Attending ethics presentations during conferences, and taking ethics-related professional development hour (PDH) opportunities, etc., help engineers hone their ethical decision-making skills.

Real-Life Experiences in the Practice of Civil Engineering: A Prelude to Sara's Story

To help you to be better prepared to face and resolve ethical dilemmas, we present the following story about an engineer named Sara.

Drawn from real-life situations that actually happened to practicing engineers, this story includes some typical ethical situations that may confront civil engineers during the course of their engineering career.

This story was designed with three purposes in mind:

1. To make civil engineers aware of the importance of licensing and how licensure and ethics are related;
2. To encourage civil engineers to become acquainted with the ASCE Code of Ethics; and
3. To help civil engineers develop an ability to recognize and resolve ethical issues.

Note: Some situations are based on cases from the NSPE (National Society of Professional Engineers) Board of Ethical Review.

Remember: The following experiences have happened to engineers in the past and could happen to you. You will benefit most from these experiences if you consider the circumstances from four viewpoints:

1. From a personal viewpoint: think of yourself as being in Sara's situations, viewing them as your own potential experiences.
2. From an impersonal viewpoint: consider being only indirectly involved, like Sara's friend or coworker.
3. From a responsibility viewpoint: consider this as if you are Sara's supervisor and responsible for the final outcome of the situation; and
4. From the viewpoint of a licensing board member: consider this as if you are a member of a state licensing board responsible for considering whether disciplinary action is warranted.



Sara's Story



Dense fog crept up to the lakeshore, and Sara's bare feet scarcely left indentations in the wet sand. The night seemed as impenetrable as many of the dilemmas she had encountered in her years as an engineer.

Last month Sara was reported to her state engineers' board for a possible ethics violation. Tomorrow morning, she would meet with the board. Although she felt she had done nothing unethical, Sara's eyes had been opened to the complexity and gravity of ethical dilemmas in engineering practice. She wished she had sought and/or received better guidance on ethical issues earlier in her career.

Sara reflected on how she got to this point in her career.

When Sara had been a senior civil engineering student in an ABET-accredited program at the state university, she immersed herself in her course work. Graduating at the top of her class assured Sara that she would have some choice in her career direction.

Knowing that she wanted to become a licensed engineer, Sara took and passed the Fundamentals of Engineering (FE) exam during her senior year, and after graduation she went to work as an engineer intern (EI) for a company that she felt would allow her to achieve that goal. Sara was excited about her new job; she worked diligently for four years under licensed engineers and was assigned increasing responsibilities. She was now ready to take the PE exam and become licensed.



I. The Confidential Report

Just as Sara was about to take the PE licensing exam, Sara's firm was retained to investigate the structural integrity of an apartment complex that the firm's client planned to sell. Sara's supervisor informed her in no uncertain terms that the client required the structural report to remain confidential. Later, the client informed Sara that he planned to sell the occupied property "as-is."

During Sara's investigation she found no significant structural problems with the apartment complex. However, she did observe some electrical deficiencies that she believed violated city codes and could pose a safety hazard to the occupants.

Realizing that electrical matters were, in a manner of speaking, not her direct area of expertise, Sara discussed possible approaches with her colleague and friend Tom. Also an engineer intern, Tom had been an officer in the student chapter of ASCE in his college years. During their conversation, Tom commented that, based on the ASCE Code of Ethics, he believed Sara had an ethical obligation to disclose this potential health and safety problem.

Sara felt Tom did not appreciate the fact that she had been clearly instructed to keep such information confidential, and she certainly did not want to damage the client relationship. Nevertheless, with reluctance, Sara verbally informed the client about the potential problem and



made an oblique reference to the apparent electrical deficiencies in her report, which her supervisor signed and sealed. Several weeks later Sara learned that her client did not inform either the residents of the apartment complex or the prospective buyer about her concerns.

Although Sara felt confident and pleased with her work on the project, the situation about the electrical deficiencies continued to bother her. She wondered if she had an ethical obligation to do more than just tell the client and state her concerns in her report. The thought of informing the proper authorities occurred to her, especially since the client was not disclosing the potential safety concerns to either the occupants or the buyer. She toyed with the idea of discussing the situation with her immediate supervisor but since everyone seemed satisfied, Sara moved onto other projects and eventually put it out of her mind.



Questions:

- What were the main issues Sara was wrestling with in this situation?
- Do you think Sara had a right or an obligation to report the deficiency to the proper authorities?
- Or is it inappropriate for Sara to offer an opinion about electrical issues, as it is outside her area technical expertise?
- Who might Sara have spoken with about the dilemma?
- Who should be responsible for what happened? Sara, Sara's employer, the client, or someone else?
- How does this situation conflict with Sara's obligation to be faithful to her client?
- Is there a hierarchy of ethical responsibility to guide her potential actions?
- Is it wise practice to ignore gut feelings that arise?



Discussion

Sara could have found guidance in the ASCE Code of Ethics:

I. SOCIETY

- (a) Engineers first and foremost, protect the health, safety, and welfare of the public.
- (i) Engineers report misconduct to the appropriate authorities where necessary to protect the health, safety, and welfare of the public.

III. PROFESSION

- (b) Engineers practice engineering in compliance with all legal requirements in the jurisdiction of practice.

IV. CLIENTS AND EMPLOYERS

- (a) Engineers act as faithful agents of their clients and employers with integrity and professionalism.
- (b) Engineers present clearly and promptly the consequences to clients and employers if their engineering judgment is overruled where health, safety, and welfare of the public may be endangered.
- (c) Engineers keep clients' and employers' identified proprietary information confidential.
- (f) Engineers perform services only in areas of their competence.



Recognizing her obligations to protect the public health, safety, and welfare, Sara could have taken steps to address her concerns without violating her client's confidence, first, by presenting her concerns clearly to her supervisor and second, if the supervisor's response is unsatisfactory, by pursuing this matter through the leadership chain of her organization. Because the area of concern involved matters outside of Sara's technical expertise, ideally she could have sought advice from someone within her organization who was better qualified to evaluate the merits of her concern. While being careful not to suggest that she was offering an engineering opinion outside her level of competence, Sara could also have documented her concerns in writing to her client and communicate the importance of seeking expert advice on the safety concern.

If none of these steps were successful, Sara might have seen that her situation involved a conflict between her ethical obligations under the Code of Ethics, as a decision to protect

her client's confidence might place her at odds with her obligation to the public, and vice versa. Fortunately, the Preamble to the Code offers guidance in such cases: "In case of a conflict between ethical responsibilities, the five stakeholders are listed in the order of priority." Because the obligation to protect confidential information is fourth in the Code's hierarchy, Sara would have seen that her ethical duty to her client is superseded by higher obligations to protect the public and to comply with the law. For this reason, ASCE's Code of Ethics would impose an ethical obligation on Sara to report her safety concerns to the appropriate authorities.



II. The Obnoxious Colleague

Shortly after obtaining her PE license, Sara was assigned to work on a large multi-department project. While Sara was initially excited by the opportunity to take on the exciting new challenge and to work and interact with a group of professionals outside her usual team, her enthusiasm was soon dimmed by one of the senior members of the cross departmental team. Loud and opinionated, the member dominated much of the dialogue in team meetings, and his particular brand of “humor” seemed to consist mostly of mocking other participants. His most regular target was a foreign-born engineer who was one of the newest members of the firm, and many of his so-called jokes were directed at the junior professional’s accent, educational background, and other personal attributes.

Offended and embarrassed by her colleague’s behavior, Sara often found herself struggling to deflect the conversation away from his “jokes,” but the junior member seemed to handle everything with a smile. Still, Sara was relieved on everyone’s behalf when the project drew to a close.

Not long afterward, Sara learned that the junior engineer was leaving for a position in another firm. Sara wished him well, but she privately wondered if his experience on the project team had been a factor in his departure.





Questions:

- What might Sara have done differently to address the team member's inappropriate remarks about his team member?
- Where could Sara have found guidance in the ASCE Code of Ethics, appropriate to this situation?



Discussion

Sara could have found guidance in the ASCE Code of Ethics:

I. SOCIETY

(f) Engineers treat all persons with respect, dignity, and fairness, and reject all forms of discrimination and harassment.

III. PROFESSION

(g) Engineers continue professional development to enhance their technical and non-technical competencies.

V. PEERS

(d) Engineers promote and exhibit inclusive, equitable, and ethical behavior in all engagements with colleagues.

Even though Sara herself did not engage in the harassing or offensive conduct, it could be said that she still bears some culpability for observing the bad behavior and failing to take appropriate action to correct it. Instead of merely deflecting or downplaying the offensive behavior, Sara could have chosen a number of avenues to bring these actions to an end.

If Sara felt secure and comfortable enough to do so, Sara could have confronted the senior team member directly about his inappropriate behavior and warned him to stop. If she did not feel able to do so, or if the engineer did not heed her warning,

Sara could have approached the junior colleague to encourage him to report the conduct to his manager or human resources department, or she herself could have filed a report.



III. The Holiday Ham

As Christmas approached the following year, Sara discovered a gift bag on her desk. Inside the gift bag was a honey-glazed spiral cut ham and a Christmas greeting card from a vendor who called on Sara from time to time.

This concerned Sara as she felt it might cast doubt on the integrity of their business relationship. Still, she also knew that it was far from unusual for colleagues at the firm to receive gifts from companies that did business with the firm. Just the other day, a senior engineer in her division had mentioned receiving an expensive bottle of whiskey from a contractor.



Sara thought that returning the ham might cause awkwardness, but she also didn't want to enjoy the benefit of the gift, so she gave the ham to a member of her staff. Sara also sent a brief note thanking the vendor for the gift.



Questions:

- Was Sara obligated to return the ham?
- Or was this taking ethics too far?
- Could Sara be obligated to pursue the matter further than just returning the gift?



Discussion

Sara could have found guidance in the ASCE Code of Ethics:

I. SOCIETY

(d) Engineer have zero tolerance for bribery, fraud, and corruption in all forms, and report violations to the proper authorities.

III. PROFESSION

- (a) Engineers uphold the honor, integrity, and dignity of the profession.
- (d) Engineers reject practices of unfair competition.

IV. CLIENTS AND EMPLOYERS

(a) Engineers act as faithful agents of their clients and employers with integrity and professionalism.

As an employee, Sara was in a position to recommend for or against the purchase of products. It could be argued that even a gift of nominal value might have some influence on Sara's professional judgment and hence might be unethical for her to accept.

In addition, even if the gift itself did not impair Sara's objectivity, her acceptance of the gift might provoke a reasonable suspicion in others that her acceptance implies favoritism.

Conversely, it could also be argued that a gift may be permissible as an expression of friendship or social custom. It can be said that both the firm and the vendors benefit from the establishment of friendly relationships, and that often this process involves the exchange of small courtesies, such as a complimentary meal or other

tokens. In fact, there are areas of the world where gift giving is an expectation and where rejection of a courtesy gift might damage business relationships.

In this case, Sara might find that the ASCE Code of Ethics allows for some degree of personal interpretation. While it is clear that she cannot ethically accept a gift that would hamper her independent professional judgment, and that it is at best ethically questionable to accept gifts that create even the appearance of undue influence, it is left for her to translate those principles into policy on gift acceptance.

Sara could also discuss this subject with her supervisor. Many uncomfortable questions of this nature can be avoided with a clear corporate policy on gift acceptance.



IV. ON THE CAMPAIGN TRAIL

A few years later, friends and colleagues urged Sara, now a highly successful principal in a respected engineering firm, to run for public office. Sara carefully considered this step, realizing it would be a challenge to juggle work, family, and such intense community involvement. Ultimately, she agreed to run and soon found herself immersed in the campaign.



In support of her candidacy, Sara created a campaign website in which she described her membership in several professional societies and recounted her extensive experience in local planning and design efforts, including a recent revitalization project involving the community's downtown historic district. While most of the work on that project had been performed by other members of the firm, Sara had provided some quality control and technical guidance in the early stages of the project.

The website included her photograph and the following text:

"Vote for Sara! She'll fix our budget crisis, just like she fixed our historic district. We need an engineer like her on the City Council!"



Questions:

- Should Sara use her firm's work on the historic district project to support her candidacy for the public office?
- Is it unethical to say she "fixed" the historic district, or is that just harmless puffery?
- Does the ASCE Code of Ethics even apply to statements made as a political candidate?



Discussion

While it is commendable for Sara to show an interest in running for elected office, Sara should still be mindful that her actions as a candidate will also influence the others' perception of her integrity as an engineer. For that reason, it would be wise for Sara to measure her conduct by the same ethical standards she would use when performing engineering services.

Sara could have found guidance in the ASCE Code of Ethics:

III. PROFESSION

- (a) Engineers uphold the honor, integrity, and dignity of the profession.
- (c) Engineers represent their professional qualifications and experience truthfully.

V. PEERS

- (a) Engineers only take credit for professional work they have personally completed.
- (b) Engineers provide attribution for the work of others.

Even if political campaign statements are not typically held to the same expectations of objectivity and candor as an engineer's professional report, it was inappropriate for Sara to attempt to influence public opinion about her engineering qualifications by making false or misleading statements about her contributions to an engineering project. This false claim was also unfair to her engineering colleagues who did contribute most of the services on the project.

Sara should have given a more accurate description of her limited involvement in the project, or she could have written about another project in which her contributions were more extensive.



V. CONCLUSION

As fate would have it, a few days later, just after announcing her candidacy for City Council, the matter of Sara's investigation of the apartment complex so many years ago resurfaced. Sara learned that the apartment complex had caught on fire and people had been seriously injured. During the investigation of the cause of the fire, Sara's report was reviewed, and somehow the cause of the fire was traced to the electrical deficiencies that she had briefly mentioned. Immediately after this information hit the local news, attorneys became involved, and subsequently the licensing board was asked to investigate her ethical responsibilities related to the report.



Now sitting alone by the shore of the lake, Sara pondered her situation. Legally, she felt she might claim some immunity since she was not a licensed engineer at the time of her work on the apartment complex. But professionally, she keenly felt she had let the public down, and she could not get this feeling—or those who had been hurt in the fire—out of her mind.

ASCE's Code of Ethics establishes a clearly defined hierarchy or ordering of ethical responsibilities. The hierarchy of the five stakeholders is intended to provide clarity of responsibility in the ethical duties assigned to each of the five stakeholders, with the goal of eliminating uncertainty in cases of conflicting ethical principles.

A careful study of the ASCE Code of Ethics reminds Sara that there is no priority of responsibilities within a given stakeholder group, with one exception; in the Society stakeholder group, provision I(a): Engineers first and foremost, protect the health, safety, and welfare of the public, takes precedence over all other ethical responsibilities.

The meeting with the licensing board began early the following morning. While the state licensing board only enforces their own rules of conduct and ethics, they noted that their rules are very similar to the ASCE Code of Ethics. They carefully reviewed the issue brought before them and asked for Sara's input.

In the discussion that ensued during the informal hearing, several points were brought out:

1. It is important for Sara, or any licensed engineer, when faced with an ethical dilemma, to realize that an engineer's first and foremost responsibility is to protect the health, safety, and welfare of the public.
2. The occupants of the apartment complex were not aware of the electrical deficiencies.
3. Although not an electrical engineer, Sara had some knowledge of city building codes and the ability to foresee the potential dangers of the inadequacies with the electrical systems.
4. Sara had informed her client of the possible electrical deficiencies, but she failed to mention possible consequences of ignoring her concerns.
5. Sara could have referred to the ASCE Code of Ethics before making a decision.

The Board ultimately reached the conclusion that Sara should have followed expectations for sections I(a), I(d), and I(i), in the ASCE Code of Ethics. In their summary findings, the licensing board acknowledged that Sara was not a licensed engineer at the time of the incident; thus, they only issued a formal reprimand and did not suspend her license to practice engineering, which was the fate of her former supervisor. But the Board took the opportunity to remind Sara that all licensed engineers, as professionals, have an obligation to understand and keep in mind their ethical responsibilities.

In her review of the ASCE Code of Ethics, Sara was reminded there is a clearly defined hierarchy or ordering of ethical responsibilities. Thus, the expectations for stakeholder I, Society, take precedence over the expectations for stakeholder IV, Clients and Employers.

Though the placement of clients and employers near the bottom of the ethical hierarchy may seem startling, this should not be read to suggest that an engineer's duty to clients and employers is unimportant. Rather, this structure is an illustration of how strong the engineer's commitment is to professional integrity and the public good; in cases of ethical conflict, those values take precedence over even the engineer's basic duty of service to clients and employers.

After the licensing board meeting, Sara discussed her ethical reprimand in a series of interviews and articles. She understood fully what had gone wrong, and she had gained an awareness and understanding of the principals and guidance of the ASCE Code of Ethics. Sara did not know what the outcome of the election would be, but she knew that her new found confidence in ethics would serve her well.

Conclusion and Additional Resources

The American Society of Civil Engineers wishes you a long and prosperous engineering career.



Question:

Where can I find requirements for licensure and ethical responsibilities in the various states and U.S. territories?

The website of the National Council of Examiners for Engineering and Surveying (NCEES) contains links to all state licensing boards. (www.ncees.org)



Question:

What websites would help guide civil engineers on ethical issues in engineering?

- American Society of Civil Engineers (www.asce.org and www.asce.org/ethics)
- National Institute for Engineering Ethics (www.niee.org located at Purdue University)
- National Society of Professional Engineers (NSPE.org) Board of Ethical Review Ethics Tab

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