

PROFESSIONAL CAREER CASE STUDY

VERSION X: November, 1999

HOW JOE LEARNS ABOUT PROFESSIONAL AND ETHICAL RESPONSIBILITIES OF ENGINEERS

The following is a story about Joe and how he learns about professional and ethical responsibilities of engineers practicing in Texas. He gets guidance from the Texas Engineering Practice Act and Board Rules Concerning the Practice of Engineering and Professional Engineering Licensing, hereafter called the "Act & Board Rules."

THE QUESTIONS ON THIS EXAM ARE INTENDED TO HAVE A SINGLE CORRECT ANSWER. PLEASE CHOOSE WHAT YOU BELIEVE TO BE THE CORRECT ANSWER

When Joe graduated from high school, he was interested in engineering as a profession and prefers to practice in Texas. Joe's older brother Frank was a licensed engineer in Texas so Joe asked him which engineering schools he should attend and which engineering disciplines he should consider. Frank referred to his recent copy of the Act and Board Rules and gave Joe the following guidance: Frank recommended Joe attend a school recognized by the American Association of Colleges and Universities so he could use the term "Graduate Engineer" on his business card after graduation.

Question 1. Which Section of the Act and Board Rules addresses this issue?

- A) Section 12.1
- B) Section 13
- C) Section 1.1
- D) Section 1.2
- E) Section 1.3

Frank further recommended that Joe only consider engineering programs that are approved by the Texas Board of Professional Engineers so subsequent licensing would be better assured.

Question 2. Which Section(s) of the Act and Board Rules concern(s) approved programs?

- A) Section 14
- B) Section 15
- C) §131.91
- D) Section 12(a)
- E) Both C & D

Joe asked why licensing of engineers was important. Frank explained that the licensing process was set up by the state to protect the health, safety and welfare of the public.

Question 3. Which Section(s) of the Act and Board Rules address(es) protection of the public?

- A) §131.151(b)
- B) Section 19(a)
- C) Section 1.1
- D) Section 14(a)
- E) All of these

Frank gave Joe a copy of the Act & Board Rules for reference. Joe later enrolled in a university and majored in engineering. Out of curiosity, he referred to the Act & Board Rules occasionally while attending college and learned, among other things, that the Texas Board regulates the practice of engineering in Texas and establishes standards of conduct and ethics for engineers. He learned that violations of the Act or any rule or regulation of the Board shall be sufficient cause for the Board to suspend or revoke the license, to issue a formal or informal reprimand, or to issue administrative fines.

Question 4. Which Section(s) of the Act and Board Rules concern(s) this Board authority?

- A) **Section 22C**
- B) **§131.171**
- C) **§131.165**
- D) **§131.167(a)**
- E) **All of these**

During his senior year, Joe became very interested in the professional responsibilities of engineers and he requested the latest version of the Act & Board Rules from the Texas Board. He learned that he would need to pass both the eight-hour Fundamentals of Engineering exam (FE) and after experience as an Engineer-In-Training, pass the eight-hour Principles and Practice of Engineering exam.

Question 5. Which Section(s) of the Act and Board Rules concern(s) examination requirements for Licensing as a Professional Engineer?

- A) **Section 12(a)(1)**
- B) **§131.101(a)**
- C) **§131.91**
- D) **§131.164**
- E) **Both A & B above**

Before graduating, Joe takes and passes the FE exam. After graduation, he accepts a job as an EIT working for a small engineering firm under the supervision of a licensed professional engineer. The firm is contemplating submitting a qualifications proposal for the structural design related to a rural school project. Joe's mother is an elected official of the school board in that school district and could be influential in the final selection of an engineering firm. Joe recalls a section in the Act & Board Rules regarding conflicts of interest.

Question 6. Which Section of the Act and Board Rules concerns conflicts of interest?

- A) **§131.152(c)**
- B) **§131.155(c)(7)**
- C) **Section 12.1**
- D) **§131.172**
- E) **§131.183**

Joe discloses this possible conflict of interest to his boss who tells him it's OK with him and proceeds to submit the firm's qualifications for consideration, making no mention of Joe's employment in the submittal. Joe is concerned but believes he has done all he needs to by informing his employer of the possible conflict of interest. Also, Joe talks with his mother and believes that she would not grant any favors because of Joe's involvement in the project.

Question 7. Joe is not yet a licensed engineer. Would Joe be obligated under §131.152(c) to personally inform the client?

Yes or No

Question 8. Is Joe's boss obligated to inform the client under §131.152(c)?

Yes or No

Question 9. If Joe's boss refuses to inform the client, which Section(s) of the Act and Board Rules would give Joe guidance as to whether he should inform the Texas Board?

- A) §131.156
- B) Section 26
- C) Section 22(a)
- D) §131.152(b)
- E) §131.151(c)

The firm Joe works for is awarded the contract and Joe is assigned to do the structural design of the school. Joe's boss has a relative who manufactures standard prefabricated structural connections which are marketed to both design and construction firms. Joe's boss gets a small percentage of the profit from his relative when he specifies their use. He instructs Joe to specify these connections on the project. This bothers Joe but since he is not personally getting anything for specifying the prefabricated connections, and he believes it to be the best available, he proceeds with the design as instructed.

Question 10. If Joe were licensed, which Section(s) of the Board Rules would guide Joe's actions in this case?

- A) §131.152(d)
- B) §131.155(b)(2)
- C) §131.152(c)
- D) All of the above
- E) None of the above

After completing the preliminary design, Joe gets permission to hire one of his former professors, who is a licensed professional engineer and is employed by a state supported university, to do a computer analysis of Joe's design. The professor uses software and a computer owned by the state. Her computer analysis shows Joe's hand calculations are essentially correct. As required by another Texas state law, the professor has written permission to use the university software and computer.

Question 11. Which Section of the Act and Board Rules best addresses the professor's use of state owned equipment and software?

- A) §131.151(d)
- B) §131.152(e)
- C) §131.151(b)
- D) §131.154(c)
- E) §131.155(b)(1)

As the design is completed, Joe has confidence in his design, but notices that his supervisor, a licensed professional engineer in Texas, is neither checking nor directly supervising Joe's work before sealing and submitting Joe's design to the client to begin the construction phase. Joe wonders if his boss is in violation of the Act & Board Rules and decides to discuss the matter with him.

Question 12. Which Section(s) of the Act & Board Rules should Joe discuss with his supervisor?

- A) §131.155(b)(1)
- B) §131.155(b)(2)
- C) §131.166(c)
- D) Section 19(a)
- E) All of the above

Joe's boss appears to agree with Joe and then studies the design in detail. He notes a few minor errors in the wind loading used in Joe's design but nothing of consequence that would require changes in the design when constructed at that location. Joe is relieved and becomes much more comfortable in his job. However, Joe then learns that his boss has given, for a small fee, Joe's design to a brother (a contractor, not an engineer) in another state who uses it without review or changes in a proposal to a same size (small) school. The other state has an engineering practice act and board rules similar to those in Texas.

Question 13. Which Section of the Act & Board Rules relate(s) to Joe's boss?

- A) Section 19(a)
- B) Section 21
- C) §131.151(b)
- D) §131.155(c)(1)
- E) §131.152(e)

Question 14. Which Section of the Texas Act & Board Rules relates to the brother's actions?

- A) None of the below
- B) § 131.156
- C) § 131.172
- D) § 131.173
- E) § 131.153(a)

The licensing board in the other state requires that the person performing or supervising the engineering design be licensed in their state. Joe's boss is not licensed in that state, but has a good friend who has an electrical engineering degree and is licensed in both Texas and the other state. Joe's boss asks the electrical engineering friend to seal the design for the out-of-state project. Although the electrical engineering friend has no experience in structural design, he seals the design, because of his professional respect of Joe's boss and his awareness that a respected professor has done a sophisticated computer analysis of the local school project.

Question 15. The licensing board in the other state learns that the electrical engineer has illegally participated in "plan stamping" – sealing work that he did not perform or supervise. Which Texas rule would apply to the electrical engineer?

- A) §131.166(k)
- B) §131.155(c)(7)(a & b)
- C) §131.163
- D) §131.154(d)
- E) §131.156

Question 16. If the electrical engineering friend had been qualified by experience to do structural engineering work, could he legally seal Joe's design as requested?

Yes or No

Joe feels that his employer does not follow the intent of the ethics portion of the board rules. He begins to seek other employment and resigns his position. Five board rules discuss the general ethical intent of the enforcement rules.

Question 17. Which of these rules appears to best describe the problems Joe has encountered with his employer.

- A) §131.151(a)
- B) §131.152(a)
- C) §131.153(a)
- D) §131.155(a)
- E) Both A and D

Joe wonders if that is all he should do in light of several issues, including the possible use of his design in another state which may have different code requirements (such as loads from earthquake, wind and/or snow). He is only one year out of college and struggles greatly with the question of whether to report the actions of his boss to the Texas Board. This appears to Joe to be whistleblowing.

Question 18. Joe would like to tell his former boss about his concerns before going to the Texas Board. Can he do this under board rules?

Yes or No

Question 19. If Joe's old boss doesn't correct the situation, does Joe have an obligation to report it to the licensing board or to another appropriate agency?

Yes or No

After Joe quits, he reports the situation in detail to the Texas Board and Joe's boss is sanctioned by the Board.

Question 20. In which Section of the Act & Board Rules would you find "suggested sanctions" for specific infractions?

- A) Section 22(a)
- B) §131.156(a)
- C) §131.156(b)
- D) §131.167(h)
- E) §131.165

Joe updates his resume and sends it to several engineering design firms in Texas. Because he is concerned that his former employer will give him a bad reference, he wonders whether to include that experience in his resume. He asks his former boss for a reference anyway.

Question 21. Which Section in the Act & Board Rules should his former boss consider before deciding to give Joe a bad reference?

- A) §131.152(c)
- B) §131.152(d)
- C) §131.155(c)(2)
- D) §131.155(c)(3)
- E) §131.164

Question 22. Although he is still not licensed, Joe turns to the Board rules for guidance. Which Section(s) in the Board Rules would give Joe guidance in deciding whether or how to include that experience in his resume?

- A) §131.155(b)(3)
- B) §131.155(c)(3)
- C) §131.155(c)(6)
- D) §131.152(a)
- E) Both C & D above

Joe decides to include his first engineering job in his experience record. During his first personal interview, he explains the entire situation, including his reporting the matter to the Texas Board. He is immediately offered a job during the interview. The new company respects his integrity and judgment. Joe is very satisfied with his new employer and after several years of experience working under several licensed engineers, he takes and passes the Principles and Practice of Engineering exam. After a few more years, Joe is promoted to manager of the structural design group.

Over many years of successful practice, both Joe and his firm prosper, although he has many instances where he had to stand firm regarding the integrity of his firm, and on many occasions, refused to accept work that would be in violation to both his personal code of ethics and the Professional Conduct and Ethics of the Texas Board. He becomes a principal in the firm and is promoted to vice president. Joe then moves to another city to open a new branch for his firm.

Over his entire professional career, Joe has been very involved in community affairs and supportive of political candidates who represent what he believes to be better government. However, the new branch office is in a city where several politicians ask for significant support and, in some instances, it appears that political contributions are necessary to be considered for contract work. Again, Joe is concerned about the practice and turns to the Act & Board Rules for guidance.

Question 23. Which Section in the Board Rules would give Joe guidance in this matter?

- A) §131.152(b)
- B) §131.152(c)
- C) §131.152(d)
- D) §131.155(c)(5)
- E) §131.155(c)(4)

Although Joe's firm struggles for years with the political contribution issue, Joe continues his tradition of contributing to individual candidates and to the engineering political action committee. He is satisfied that he is doing so to promote better government and is not contributing amounts that would be construed to be "buying" work. In time, his firm becomes one of the most highly respected and sought after firms in the state.

Joe becomes the president of his firm and puts in place a company code of ethics, using several codes as models. His early experience had convinced him that professional responsibilities go beyond just obeying the law.

Just before retirement, Joe's firm had a contract with the city, which included the design of a detour around the construction of an overpass. He specified the use of concrete barriers between opposing lanes of traffic. After submitting the final design, sealed in accordance with state law, the city called and requested, for financial reasons, that the detour use plastic cones instead of concrete barriers. Joe opposed the change based on his own engineering judgement. He was concerned that the change would reduce the level of confidence that he believed was needed in this situation. However, the city's transportation engineer decided that the additional risk was acceptable, implemented the change and took professional responsibility for it.

Question 24. Which Section(s) in the Board Rules would give Joe and/or the transportation engineer guidance in this matter?

- A) §131.166(n) & (l)
- B) §131.152(e)
- C) §131.151(c)
- D) §131.166(c)
- E) All of the above

An unfortunate tragedy later occurred at the detour site which might have been prevented if different decisions were made regarding the use of concrete barriers instead of plastic cones. In a court case involving this matter, the courts ruled that Joe's firm was partially liable because the firm did not object "strongly enough" to the change.

This experience, late in his career, was a sobering reminder to Joe that a high standard of care in engineering practice was crucial in engineering work. Although greatly saddened by the tragedy, Joe continued his engineering work, always striving for excellence and high standards.

Joe reflected back on his early days when he first read: "...in order to protect the public health, safety and welfare, that the privilege of practicing engineering be entrusted only to those persons duly licensed..."

Question 25. Which Section of the Act would Joe be recalling?

- A) Section 1.1
- B) Section 1.2
- C) Section 15(c)
- D) Section 8
- E) Section 15(a)

Joe retires the next year, and continues to consult when needed. He enjoys his family and many friends.

You have now had a brief look at just a few of the experiences in an engineer's career and had some time to consider how you might react to similar experiences.

After marking the correct answer to the questions on the answer sheet on page 1, sign and return the answer sheet to the Board office at the time you file your application.