

**Public Health, Safety, and Welfare—  
Discovery of Structural Defect Affecting Subdivision**

**Case No. 17-3**

**Facts:**

Engineer A is a professional engineer and registered architect with extensive design and forensic engineering experience. In performing a forensic engineering investigation for an insurance company, Engineer A is asked to look at a beam that had been burned, as a result of arson, in a residence that was at the time of the arson under construction. Following the initial arson investigation, Engineer A learns that the construction contractor determined that the beam could be reused on the project. Engineer A examines the 15-foot-long beam and determines that it is slightly charred, and it had been located next to a dining room with a two-story ceiling. On the other side, the beam had supported a second-floor bedroom, a wall, and (on both sides of the beam) a significant amount of roof of the residence. Engineer A initially observes that, aside from the slight fire damage, the beam looks too light to provide adequate structural support. Engineer A measures the tributary area of roof, floor, and wall bearing on the beam and runs a series of structural calculations.

Following his review, Engineer A determines that the beam was seriously under-designed. Engineer A observes that since the house was a tract home, there are other identical designs in the subdivision. Engineer A writes his report and identifies the design defect, and expresses his larger concern regarding the possibility that an inadequate structural member was used in other houses in the subdivision. Engineer A submits his report to the insurance company that retained him. Engineer A, still concerned with his obligation to the public beyond just informing the insurance company, calls the State Board of Professional Engineers, apprises them of the situation, and asks what more could and should be done about the situation. The Board's response is that Engineer A fulfilled his professional obligation by notifying the insurance company, in writing, of the defect.

**Question:**

Did Engineer A fulfill his ethical obligations under the NSPE Code of Ethics by providing the report to the insurance company that retained him?

**NSPE Code of Ethics References:**

- Section I.1. - *Engineers, in the fulfillment of their professional duties, shall hold paramount the safety, health, and welfare of the public.*
- Section I.2. - *Engineers, in the fulfillment of their professional duties, shall perform services only in areas of their competence.*
- Section II.1.a. - *If engineers' judgment is overruled under circumstances that endanger life or property, they shall notify their employer or client and such other authority as may be appropriate.*
- Section III.1.b. - *Engineers shall advise their clients or employers when they believe a project will not be successful.*

**NSPE BER Case References: 00-5, 07-10****Discussion:**

This case presents another example of a fundamental ethical dilemma faced by professional engineers in their professional practice. In this case, a professional engineer is presented with a situation involving a potential impact on the safety and welfare of members of the public. In such cases, professional engineers must decide, after pointing out the situation, how far their obligation to seek corrective action reaches.

The NSPE Board of Ethical Review has considered this ethical dilemma on several occasions and has determined that each of these situations is dependent upon the facts and circumstances involved. While there can be no black-and-white standard that can be applied to these types of cases, there are basic values and principles contained in the NSPE Code of Ethics that provide important guidance to professional engineers who are faced with such situations.

An illustration of how the Board has addressed this dilemma can be found in BER Case No. 00-5. In this case, Engineer A worked for a local government and learned about a critical situation involving a bridge that was 280 feet long and 30 feet above the stream. This bridge was a concrete deck on wood piles built by the state in the 1950s. It was part of the secondary roadway system given to the counties many years ago. In June 2000, Engineer A received a telephone call from the bridge inspector stating that the bridge needed to be closed due to the large number of rotten pilings. Engineer A had barricades and signs erected within the hour on a Friday afternoon. Residents in the area were required to take a 10-mile detour. On the following Monday, the barricades were found dumped in the river, and the “Bridge Closed” sign was found beyond the trees by the roadway. More permanent barricades and signs were installed. The press published photos of some of the piles that did not reach the ground and the patchwork installed over the years. Within a few days, a detailed inspection report prepared by a consulting engineering firm, signed and sealed, indicated seven pilings required replacement. Within three weeks, Engineer A had obtained authorization for the bridge to be replaced. Several state and federal transportation departments needed to complete their reviews and tasks before funds could be used. A rally was held, and a petition with approximately 200 signatures asking that the bridge be reopened to limited traffic was presented to the County Commission. Engineer A explained the extent of the damage and the efforts underway to replace the bridge. The County Commission decided not to reopen the bridge. Preliminary site investigation studies were begun. Environmental, geological, right-of-way, and other studies were also performed. A decision was made to use a design-build contract to avoid a lengthy scour analysis for the pile design. A non-engineer public works director decided to have a retired bridge inspector, who was not an engineer, examine the bridge, and a decision was made to install two crutch piles under the bridge and to open it with a five-ton limit. No follow-up inspection was undertaken. Engineer A observed that traffic was flowing and the significant movement of the bridge. Log trucks and tankers crossed it on a regular basis, while school buses went around it. In determining Engineer

A's ethical obligation under these circumstances, the Board decided that Engineer A should have taken immediate steps to go to his supervisor to press for strict enforcement of the five-ton limit, and if this was ineffective, contact state and/or federal transportation/highway officials, the state engineering licensure board, the director of public works, county commissioners, state officials, and other such authorities as appropriate. Engineer A should have also worked with the consulting engineering firm to determine if the two-crutch pile with five-ton limit design solution would be effective and report this information to his supervisor. In addition, Engineer A should have determined whether a basis existed for reporting the activities of the retired bridge inspector to the state board as the unlicensed practice of engineering. Reviewing earlier Board of Ethical Review Case Nos. 89-7, 90-5, and 92-6, the Board noted that the facts and circumstances facing Engineer A "involved basic and fundamental issues of public health and safety which are at the core of engineering ethics." Said the Board, "For an engineer to bow to public pressure or employment situations when the engineer believes there are great dangers present would be an abrogation of the engineer's most fundamental responsibility and obligation." The Board continued by noting that Engineer A should have taken immediate steps to contact the county governing authority and county prosecutors, state and/or federal transportation/highway officials, the state engineering licensure board, and other authorities. By failing to take this action, Engineer A had ignored his basic professional and ethical obligations.

In BER Case 07-10, the Board was faced with a case in which Engineer A had designed and built a barn with horse stalls on his property. Four years later, Engineer A sold the property, including the barn, to Jones. Later, Jones proposed to extend the barn and, as part of the extension, removed portions of the columns and footings that supported the roof. The changes were approved by the town and the extension was built and a certificate of occupancy was issued. Engineer A learned of the extension and was concerned that the structure may be in danger of collapse due to severe snow loads. Engineer A verbally contacted the town supervisor, who agreed to review the matter, but no action was taken. The Board concluded that while Engineer A had fulfilled his ethical obligation by taking prudent action in notifying the town supervisor—the individual presumably with the most authority in the jurisdiction—Engineer A should have also notified the new owner about the perceived deficiency in writing.

In reaching its conclusion, the Board distinguished BER Case 00-5 from BER Case 07-10, noting that the facts and circumstances of 07-10 were different in several respects from the situation involved in BER Case No. 00-5. First, the danger involved, while possibly significant, was not nearly as imminent or widespread as the potential bridge collapse in BER Case No. 00-5. In addition, in BER Case No. 00-5, as an employee of the local government, Engineer A had a specific responsibility for the bridge in question and was compelled both as a professional engineer and a public employee to take appropriate measures to address the issue. Finally, in BER Case No. 00-5, the circumstances dictated a "full-bore" campaign to bring this matter to the attention of public officials in positions of authority who could take immediate steps to address the situation. The BER concluded that in the present case (07-10), the limited nature of the danger does not appear to require this (higher) level of response. Instead, the BER determined that the prudent action would involve Engineer A notifying the town supervisor—the individual

presumably with the most authority in the jurisdiction—in writing. At the same time, in the Board’s view, it would have been more appropriate for Engineer A to first notify the current owner of his concerns regarding the structural integrity of the barn. According to the Board, Engineer A should have made a written record of his communication with the owner and town supervisor and follow the verbal communication up with a written confirmation to the town supervisor, restating his concerns, while continuing to monitor the situation. If appropriate steps are not taken within a reasonable period of time, Engineer A should again contact the town supervisor in writing and indicate that if steps are not taken to adequately address the situation within a specific period of time, Engineer A would be required to bring the matter to the attention of county or state building officials, as appropriate.

Drawing from the Board’s discussion in BER Case Nos. 00-5 and 07-10, this Board is of the view that while the State Board of Professional Engineers determined that “Engineer A had fulfilled his professional obligation by notifying the insurance company, in writing, of the defect,” under the NSPE Code of Ethics, Engineer A had an obligation to go further. A state engineering licensure board, while an important guidepost in determining appropriate conduct, establishes the legal minimum standards of practice under which an individual may be subject to disciplinary action for failing to fulfill the appropriate requirements. However, the NSPE Code of Ethics establishes a higher threshold of ethical conduct.

This Board agrees and believes that the facts and circumstances in the present case fall somewhere between those outlined in BER Cases 00-5 and 07-10, and would require Engineer A to take steps beyond merely submitting a written report to the insurance company. Although a threat isn’t imminent, since this matter had the potential to affect several other homeowners in the subdivision, Engineer A should have explored additional steps, including contacting local building officials, as well as the local homeowners or community civic association, to advise them of his findings.

**Conclusion:**

Contrary to the advice of the State Board of Professional Engineers, Engineer A did not fulfill his ethical obligations under the NSPE Code of Ethics by only providing the report to the insurance company that retained him. Engineer A had a responsibility to take additional steps beyond merely submitting a written report to the insurance company, including contacting local building officials, individual homeowners, and the local homeowners or community civic association to advise them of his findings.

**Board of Ethical Review:**

John C. Branch, P.E.  
Vincent P. Drnevich, Ph.D., P.E., F.NSPE  
Kenneth L. McGowan, P.E., F.NSPE  
Luke Patterson, P.E.  
Susan H. Richard, P.E., F.NSPE  
Susan K. Sprague, P.E., F.NSPE  
Francis “Frank” J. Stanton Jr., P.E., F.NSPE (*Chair*)

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