



NATIONAL SOCIETY OF
PROFESSIONAL ENGINEERS

BOARD of ETHICAL REVIEW

CASE REVIEW

Temporary Shelter Design

Case No. 25-3

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Facts

Engineer S, a professional engineer hired by a local nonprofit as a consultant, is tasked with designing temporary shelters for families displaced by natural disasters in State M. The nonprofit requires that the shelters be low-cost, easy to assemble, and rapidly deployable.

Using inexpensive materials, Engineer S develops a design for temporary shelters which are meant to last 6–9 months until permanent housing can be provided. The design meets immediate life-safety requirements, but the shelters will be vulnerable to mold growth in humid climates. Engineer S includes these limitations on the preliminary design sheets and in the final project report.

Then, Engineer S learns that the nonprofit intends to use these shelters for 2–3 years due to chronic housing shortages and funding delays. Further, Engineer S learns that these shelters will be deployed by the nonprofit in a part of State M that experiences high humidity year-round. During a final deployment meeting, Engineer S points to the limitations on the design sheets and in the final report. Further, Engineer S gives a presentation including warnings that the shelters are unsuitable for long-term use and are vulnerable to mold growth in humid climates.

The nonprofit leadership insists that “something is better than nothing” and orders construction. The nonprofit informs Engineer S that it will not inform local governments and families about the risks associated with the structures that Engineer S has raised on the preliminary design sheets and in the final project report.

After some thought, Engineer S signs and seals the final design documents for the shelters without making any additional changes but does include the design life is 6–9 months. These final design documents are then submitted to the local authorities for review and approval. Engineer S decides not to say anything more about their concerns regarding the nonprofit's intention to use the structures longer than 6–9 months. However, Engineer S is still contemplating how they might continue to support the nonprofit and the project.

Questions

1. Was it ethical for Engineer S to sign and seal a design intended for short-term use having been informed by the client that they intend to use the structures as longer-term housing?
2. Was it ethical for Engineer S to disclose the risks (mold, collapse) to the owner and local authorities, and not directly to displaced families (shelter occupants) even if the nonprofit would not be making these disclosures?
3. Was it ethical for Engineer S to remain on the project once they learned of the longer-term intended use in a humid climate with the known risks?

Code of Ethics References:

- I.1** Hold paramount the safety, health, and welfare of the public.
- 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.
- III.2.b** Engineers shall not complete, sign, or seal plans and/or specifications that are not in conformity with applicable engineering standards. If the client or employer insists on such unprofessional conduct, they shall notify the proper authorities and withdraw from further service on the project.
- III.2.d** Engineers are encouraged to adhere to the principles of sustainable development in order to protect the environment for future generations.

BER CASE REFERENCES:

[BER Case 61-10](#); [BER Case 65-12](#); [BER Case 79-2](#); [BER Case 98-9](#); [BER Case 05-4](#); [BER Case 15-12](#); [BER Case 22-10](#); [BER Case 22-5](#)

Discussion

The NSPE Code of Ethics (the Code) makes it clear in Code Section I.1 that engineers shall hold paramount the safety, health and welfare of the public. But, fulfilment of this obligation becomes complicated when multiple aspects of the public welfare simultaneously compete for consideration. In addition, Code Section II.1.a indicates “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.”

These facts point out that Engineer S designed inexpensive, temporary shelters for individuals who may be displaced by natural disasters. The nonprofit for which Engineer S designed the shelters will take ownership and may choose to use the shelters for other than temporary use. Does this potential change in field application alter Engineer S’s professional responsibility? After all, Engineer S made clear the limitations of the design, leading to the question: Is this enough?

We turn to some relatively older Board of Ethical Review (BER) cases for guidance. In [BER Case 65-12](#) engineers at Company A prepared plans and specifications for machinery and turned them over to Company B for production. Company B’s engineers found miscalculations and technical

deficiencies in the machinery that could make the product unsuitable for its purpose and possibly unsafe in that the final product “might endanger the lives of persons in proximity to it.” Engineers at Company A reiterated their confidence in their design, and officials at Company B instructed their engineers to proceed with work.

The BER found that Company B engineers acted appropriately in bringing their concerns to Company A engineers and management. In addition, if differing viewpoints about product safety “cannot be reconciled they should propose submission of the problem to an independent and impartial body of experts: unless and until the engineers of Company B are satisfied that the machinery would not jeopardize the public safety they should refuse to participate in any engineering activity connected with the project.”

It is quite clear that a disagreement between engineers and engineering teams about product safety should not overrule concerns about public safety. The situation at hand is perhaps even more clearcut because Engineer S is not engaged in a technical disagreement with a design professional; they are simply encountering an owner who does not want to hear a design won’t work for the application at hand.

¹ “Sustainable development” is the challenge of meeting human needs for natural resources, industrial products, energy, food, transportation, shelter, and effective waste management while conserving and protecting environmental quality and the natural resource base essential for future development.

Note that Engineer S is not in contention with an owner who wants a lower quality design. [BER Case 65-12](#) references an even earlier case, [BER Case 61-10](#) where the BER found no issue with “complying with a business decision to provide a product of lower quality without a risk to public health safety or welfare.” Engineer S is concerned their design will be unsafe if used outside of design parameters.

What about the factor of time? Engineer S does not express concern about short-term use of the design. In [BER Case 98-9](#), a structural engineer realized an error in design calculations may cause a newly designed building to collapse in severe, but not unusual wind conditions. The engineer developed plans for remedial construction to rectify the error, and after consultation with the client and city engineer for the jurisdiction in question, they proceed with alterations. The involved parties went so far as to prepare a contingency evacuation plan should these severe wind conditions occur, but they all agreed to keep the plan a secret. In response, the BER noted that “[t]he desire to avoid public panic is certainly a legitimate factor in deciding upon a course of action. However, withholding critical information from thousands of individuals whose safety is compromised over a significant period of time is not a valid alternative for the conditions presented.” The BER found fault with both the structural engineer and city engineer for withholding their concerns.

The reasoning in [BER Case 98-9](#) suggests that Engineer S’s concerns for future mold growth and possible structural failure arising from longer-term use of the temporary shelters are directly consistent with their fundamental obligation to public safety, health, and welfare. While the client may feel that “something is better than nothing,” the occupants of the

shelters could decide for themselves if they are properly informed.

The BER believes Engineer S has fulfilled their ethical obligation by including the design limitation on the design drawings that were provided to their client and submitted to the local authorities for review and approval. This aligns with the BER’s conclusion in [BER Case 22-5](#) that, “[c]lear reporting of unresolved public health and safety risks to ‘appropriate authorities’ satisfies [an Engineer’s] obligation to protect public health, safety and welfare.”

Looking back to Code Section III.2.b and Question 3, what are Engineer S’s ethical obligations pertaining to remaining on the project? In [BER Case 65-12](#), the BER concluded that Engineer B should stay off the project as long as they are dissatisfied. In [BER Case 98-9](#), once the public was notified, Engineer A continued to work on an unsafe design to bring the construction into compliance. Similar to [Case 98-9](#), in the instant case, Engineer S is aware of the temporary shelter design limitations and risks and is in the best position to provide solutions.

More recent BER cases discuss how an engineer may continue to provide services under challenging circumstances. In [BER Case 15-12](#), Engineer A, contracted by the state to design the shortest feasible route for a road connecting two towns—potentially saving 30 minutes on a two-hour trip—discovered that the path would impact a historic family farmhouse over 100 years old, whose owners refused to sell, though eminent domain was an option. The BER emphasized that Engineer A (15-12) must act as a faithful agent to the client and strive for public interest, including community well-being. Drawing from prior BER Cases [79-2](#) and [05-4](#), the BER concluded that Engineer (15-12) A’s ethical obligations included advising the state on all feasible alternatives,

such as relocating the farmhouse to another site, to achieve an amicable resolution that serves the greater good without unnecessary controversy.

In [BER Case 22-10](#), Engineer Jaylani, principal of Cutting Edge Engineering, accepted a contract for mechanical, electrical, and plumbing work on a new resort in a semi-arid southwestern U.S. region, including detailing a traditional lawn irrigation system for the golf course as specified by the landscape architect. However, new employee, Engineer Intern Wasser, refused to sketch the details, citing water waste, potential lowering of the water table based on a hydrogeological study, and conflicts with United Nations’ sustainable development goals, invoking Code Section III.2.d on adhering to sustainable development. The ethical questions in BER Case 22-10 addressed whether Jaylani ethically accepted the task, if Wasser's refusal was ethical, and how the firm could proceed if the design is deemed ethical. The BER concluded it was

ethical for Jaylani to accept; Wasser's refusal was permissible as a personal ethical stance but not required and potentially job-ending; and the firm could complete the work by offering alternatives like rainwater harvesting to enhance client service and align with the ethics of sustainability.

In both [BER Case 22-10](#) and [BER Case 15-12](#) we see discussion and conclusion that emphasizes the opportunity for the engineer to stay with the project and provide solutions rather than remove oneself at the point of ethical conflict. In this case, once the structures are deployed and the public notified, Engineer S could work with the nonprofit, local authorities, or the occupants to develop and deploy solutions to mold growth and longer-term stability. If Engineer S steps aside at deployment, they remove themselves from a process they could influence for the public good.

Conclusions:

1. Engineer S developed a design for short-term use that does not endanger the public health, safety or welfare. There is nothing wrong with developing such a design and identifying restrictions on use. There is a problem if Engineer S signed and sealed the documents without restricting use to “temporary.”
2. Engineer S fulfilled their obligation to disclose the risk to the client and proper authorities by including the design limitations in the final report and on the design drawings that were submitted to the local authorities for review and approval. Non-approved use of the shelters (outside design parameters) by the nonprofit would require, at a minimum, further disclosure and informed consent by shelter occupants.
3. If the nonprofit proceeds with longer-term use of the temporary shelters, Engineer S may continue service on the project as they are in a good position to help identify and implement workable fixes. If the nonprofit refuses to notify shelter occupants of risks or does not seek an improved design for longer-term use, Engineer S is obligated to withdraw.



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