



NATIONAL SOCIETY OF
PROFESSIONAL ENGINEERS

BOARD *of* ETHICAL REVIEW



CASE REVIEW:

Sustainability-Lawn Irrigation System Design

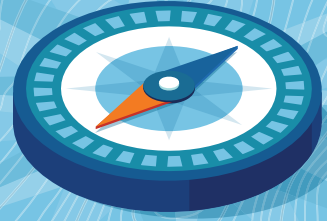
CASE NO. 22-10
APPROVED FEBRUARY, 2023

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FACTS:

Engineer Jaylani is a firm principal for Cutting Edge Engineering and is under contract to complete the mechanical, electrical, and plumbing work for a new resort that will be located in a semi-arid region of the southwestern United States. The project's landscape architect specifies a traditional lawn irrigation system for the resort's golf course as part of the project. Engineer Intern Wasser is a new employee at Cutting Edge, and Engineer Jaylani assigns Wasser the task of sketching out details for the irrigation system.

Wasser refuses to perform the task and says the traditional irrigation system will waste fresh water, cites a recent hydrogeological study indicating that the proposed use would lower the water table, and asserts that Cutting Edge should not do this kind of work. In a formal memorandum to Jaylani, Wasser argues the proposed lawn irrigation system is not consistent with several United Nations sustainable development goals including but not limited to Goal 6– Ensure availability and sustainable management of water and sanitation for all, Goal 11– Make cities and human settlements inclusive, safe, resilient and sustainable, and Goal 15– Protect, restore,

and promote sustainable use of terrestrial ecosystems, sustainably manage forests, combat desertification, and halt and reverse land degradation, and halt biodiversity loss.

Further, Wasser points to NSPE Code of Ethics Professional Obligation III.2.d, “Engineers are encouraged to adhere to the principles of sustainable development,” and claims the proposed lawn irrigation system does not conform to sustainability principles.

QUESTIONS:

1. Was it ethical for Cutting Edge Engineering and Engineer Jaylani to accept the irrigation system design task?
2. Was it ethical for Engineer Intern Wasser to refuse to perform the task of design development for the proposed irrigation system?
3. If the traditional lawn irrigation system design is an ethical expression of engineering work, what can Engineer Jaylani's firm do to complete the design since Wasser refused?

NSPE CODE OF ETHICS REFERENCES:

Canon I.1. Engineers, in the fulfilment of their professional duties, shall hold paramount the safety, health, and welfare of the public.

Canon I.4. Engineers, in the fulfilment of their professional duties, shall act for each employer as faithful agents or trustees.

Rule 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.

Rule 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, and cooperate with the proper authorities in furnishing such information or assistance as may be required.

Professional Obligation III.1.b. Engineers shall advise their clients or employers when they believe a project will not be successful.

Professional Obligation III.2.a. Engineers are encouraged to participate in civic affairs; career guidance for youths; and work for the advancement of the safety, health, and well-being of their community.

Professional Obligation III.2.d.

Engineers are encouraged to adhere to the principles of sustainable development in order to protect the environment for future generations.

Professional Obligation 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.

NSPE BER CASE REFERENCES:

[05-4](#), [07-6](#), [15-12](#)

DISCUSSION:

The sustainability ethic has been identified by the United Nations as a “blueprint for peace and prosperity for people and the planet, now and into the future” and thus is broadly expressed in economic, social, and environmental dimensions. Sustainability considerations are far-reaching and touch all of humanity; however, the adjudicating body for this case is the NSPE Board of Ethical Review, so interpretation of the ethics of this case is specific to the NSPE Code of Ethics.

This case illustrates the increasing priority and reach of sustainability principles relative to ethical decision-making of professional engineers who use their knowledge, expertise and skill to shape, design and create the built environment. This case is also about competing ethical obligations, specifically an engi-

neer's right to dissent in the belief that an assigned task is unethical. Further, this case engages the engineering profession's ethical obligation to respond to complex sustainability challenges.

The NSPE Canons of Ethics for Engineers trace to 1946, and for 60 years the NSPE ethics code did not mention sustainable development. In July 2007, the NSPE House of Delegates approved the addition of a sustainable development provision to the Code, Section III.2.d, which read "Engineers are encouraged to adhere to the principles of sustainable development in order to protect the environment for future generations." A footnote defines sustainable development: "...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."

BER Case 05-04, written before NSPE included sustainable development in the NSPE Code of Ethics, is fairly representative of the BER's earlier perspective on environmental sustainability. In finding it was not unethical for Engineer A to fail to volunteer the fact that an anticipated commercial development could increase traffic, as well as noise and air pollution, the BER noted that "environmental considerations are often subject to varying arguments, reflecting differing considerations and interests." The BER's unanimous opinion was Engineer A's ethical obligation "did not require him to disclose such information if, in his professional judgment, the information was not 'relevant and pertinent' [per Code section II.3.a]." The Board took the view that no unique solution existed to the 'trade-offs' involved in the many competing concerns about environmental dangers for particular projects, and "professional judgment was the final arbiter of the best bal-

ance between society's needs for certain facilities and the level of environmental degradation which may be unavoidable in filling those basic needs."

Contrast BER case [05-4](#) with [BER Case 07-6](#), the BER's first impression case following introduction of the sustainable development provision in the NSPE Code of Ethics. The BER unanimously found it was unethical for Engineer A not to include information about a threat to a bird species in a written report about wetlands development. Moreover, under NSPE Code Section II.3.a., engineers have an obligation to be objective and truthful in professional reports, statements, or testimony and include all relevant and pertinent information in such reports. Engineer A had an obligation to include information about the threat to a bird species in the written report and advise the client of its inclusion.

Cases [05-4](#) and [07-6](#) reflect a shift in the BER's perspective away from individual professional judgment as the final arbiter of the best balance between society's needs for certain facilities and the level of environmental degradation involved in meeting those needs. While engineering designs and solutions continue to reflect professional judgment, the BER's current perspective is toward the engineer's judgment being increasingly informed by a broader and deeper emphasis on global sustainability considerations in environmental matters.

Engineering work is not performed in a vacuum, and service to the public good is not without consideration of competing interests. In [BER Case 15-12](#), Engineer A was a professional engineer with JKL Engineering and this firm had a contract with the state to specify the route for a road connecting two towns. Engineer A determined that the shortest workable route would save approximately 30 minutes from what would oth-

erwise be a two-hour trip. However, in order to build the shortest route, the state would be required to address the impact to an historic family farmhouse that existed for over 100 years on the land required for the route. Engineer A visited the farmhouse’s owner, who indicated that the family had no interest in selling the farmhouse to the state or to anyone else. Engineer A was aware that the option existed for the state to exercise eminent domain and condemn the farmhouse and allow the state to proceed with the design and construction of the new route between the two towns.

It was the BER’s position that Engineer A had an ethical obligation to balance the interests of all interested and relevant parties, including the state, the two towns in question, and the owners of the historic family farmhouse. While in general the Board was of the view that the rule in favor of ‘the greatest good for the greatest number’ should prevail under circumstances such as those presented in this case—which would suggest potential condemnation proceedings—there might be alternative creative solutions to address the issue.

A third ethical aspect of the present sustainability case is the engineer’s right to responsibly dissent on matters of ethical concern. This is seen in Wasser’s ethical obligation to act as a faithful agent to Cutting Edge, while simultaneously acknowledging the Code’s encouragement to adhere to the principles of sustainable development. Is Wasser’s refusal to perform the irrigation system design task the best ethical path to resolve this tension?

Turning to the present case, the project’s landscape architect specified installing an irrigation system and Cutting Edge accepted work with that specification in

mind. Further, Engineer Intern Wasser was assigned a design task to include provisions for a “traditional” irrigation system. Cutting Edge (and Wasser) should follow through with the task they agreed to perform.

Based on the facts of the case, the community has no zoning rules, building code provisions, or other restrictions to prevent installation of an irrigation system. For this reason, the BER infers that Cutting Edge providing provisions for a traditional lawn sprinkler system would be technically and legally permissible, and not unethical. Specific to sustainability principles, such a project would lie within the space of “client choice,” similar to how a client might choose (or not) to design and construct its project per green building options that result in LEED certification. This interpretation is fully consistent with NSPE Code Section III.2.d where engineers are encouraged to adhere to the principles of sustainable development. The facts do not support an engineer’s required adherence to a supreme sustainable development ethic.

What about Engineer Intern Wasser’s refusal to perform the irrigation system design task? Wasser has an ethical obligation to act as a faithful agent to his employer, while simultaneously upholding the Code’s ethical encouragement to adhere to sustainability principles. Previous discussion showed that the Code of Ethics provision to act as a faithful agent is mandatory (engineer shall act ...), but adherence to sustainable development is “encouraged.” As a matter of personal conviction, Wasser can dissent and not perform the task (i.e., dissent is ethically permissible), but if Cutting Edge’s position does not align with Wasser’s view, this would create significant career issues for Wasser. Further, as noted above, broader social, economic

and political considerations relative to sustainable development indicate that design and construction of a traditional lawn irrigation system is not unethical, so refusal to perform the design cannot be viewed as ethically obligatory.

But is a traditional lawn irrigation system the “best” solution for this project? Can sustainability principles improve the project and enhance outcomes? The Board believes Engineer Intern Wasser could be in a unique position to meaningfully serve the client – and his company. By introducing and offering sustainable alternatives to a traditional lawn irrigation system, Wasser and Cutting Edge can harmonize code provisions I.4 and III.2.d. One approach might be “green” options that intelligently and cost-effectively achieve sustainability goals through such tools as natural resource conservation, integrated water management, and stormwater management. Perhaps the project is a suitable candidate for rainwater harvesting and reuse? The point is, given Wasser’s education, knowledge and passionate beliefs about sustainable development, he seems more likely to fulfill his ethical obligations and aspirations – not by refusing the task, but by performing the task with technical expertise, mature leadership and dedicated service to the client’s needs. Cutting Edge and Wasser can act as faithful trustees by sharing with the client sustainable options for irrigation. Should the client refuse and insist upon the traditional irrigation system – which is not illegal, Cutting Edge and Wasser must act as the client’s agent and complete the task they accepted and were assigned.

As was noted, engineers shall act for each employer or client as faithful agents or trustees, but are encouraged to adhere to the principles of sustainable devel-

opment. It is not enough to simply look at the situation and conclude an engineer’s obligation to the client/ employer takes precedence over the sustainable development principles. This case helps to illustrate that endeavoring to integrate all code of ethics provisions when developing a solution is critical. Suggesting sustainable options for an irrigation system as a means to resolving the ethical tension presented in this case is a path the BER endorses. Furthermore, suggesting sustainable options will inform the client; refusing to perform the task, or quitting, will not.

CONCLUSIONS:

1. It was ethical for Engineer Jaylani to accept the irrigation system design task.
2. As a matter of personal conviction, it was ethically permissible, but extreme, for Engineer Intern Wasser to refuse the task of design development for the proposed irrigation system. Performing the design task would not have been manifestly unethical, and refusal likely cost Wasser his job.
3. Under the facts, traditional lawn irrigation system design is an ethical expression of engineering work. In awareness of sustainability principles, Engineer Jaylani’s firm is in a position to better serve its clients and the public by introducing and offering “green” irrigation alternatives.

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NOTE: The NSPE Board of Ethical Review considers ethical cases involving either real or hypothetical matters submitted to it from NSPE members, other engineers, public officials, and members of the public. The BER reviews each case in the context of the NSPE Code of Ethics and earlier BER opinions. The facts contained in each case do not necessarily represent all the pertinent facts submitted to or reviewed by the BER.

Each opinion is intended as guidance to individual practicing engineers, students, and the public. In regard to the question of application of the NSPE Code of Ethics to engineering organizations (e.g., corporations, partnerships, sole proprietorships, government agencies, and university engineering departments), the specific business form or type should not negate nor detract from the conformance of individuals to the Code. The NSPE Code deals with professional services, which must be performed by real persons. Real persons in turn establish and implement policies within business structures.

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