USE OF CD-ROM FOR HIGHWAY DESIGN

Case No. 98-3

Facts:
Engineer A, a chemical engineer with no facilities design and construction experience, receives a solicitation in the mail with the following information:

“Engineers today cannot afford to pass up a single job that comes by - including construction projects that may be new or unfamiliar.

Now - - thanks to a revolutionary new CD-ROM - specifying, designing and costing out any construction project is as easy as pointing and clicking your mouse - no matter your design experience. For instance, never designed a highway before? No problem. Just point to the ‘Highways’ window and click.

Simply sign and return this letter today and you’ll be among the first engineers to see how this full-featured interactive library of standard design can help you work faster than ever and increase your firm’s profits."

Engineer A orders the CD-ROM and begins to offer facilities design and construction services.

Question:
Was it ethical for Engineer A to offer facilities design and construction services under the facts presented?

References:
Section II.2. - Code of Ethics: Engineers shall perform services only in the areas of their competence.

Section II.2.a. - Code of Ethics: Engineers shall undertake assignments only when qualified by education or experience in the specific technical fields involved.

Section II.2.b. - Code of Ethics: Engineers shall not affix their signatures to any plans or documents dealing with subject matter in which they lack competence, nor to any plan or document not prepared under their direction and control.

Section II.2.c. - Code of Ethics: Engineers may accept assignments and assume responsibility for coordination of an entire project and sign and seal the engineering
documents for the entire project, provided that each technical
segment is signed and sealed only by the qualified engineers who
prepared the segment.

Section III.2.b. - Code of Ethics: 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.

Discussion:
The issue of whether an engineer possesses the appropriate level of competence to
perform specified services is one of most basic professional and ethical issues faced
by practitioners (See Code Section II.2.a.). NSPE has been supportive of the
concept that a qualified individual engineer, regardless of his or her particular area of
technical discipline, should be licensed as a “professional engineer”. However, this
position should not be understood to suggest that all engineers are free to practice
without restriction in any and all areas within the practice of engineering. Instead, all
engineers are implored to exercise careful professional judgment and discretion and
practice solely within his or her area(s) of competency.

Over the years, the Board of Ethical Review has examined the issue of professional
competency on numerous occasions under a variety of factual situations. For
example, in Case 94-8, Engineer A, a professional engineer, worked with a
construction contractor on a design/build project for the construction of an industrial
facility. During the construction of the project, the construction contractor separately
retained the services of a Engineer B, a professional engineer to design structural
footings as part of the facility. Engineer B’s degree and background was in chemical
engineering. Engineer A had been unable to establish that Engineer B had any
apparent subsequent training in foundation design, and Engineer A had reservations
concerning the competence of Engineer B to design the structural footings and reported
his concerns to the contractor. The Board decided that it would be unethical for
Engineer B to perform the design of the structural footings as part of the facility and that
Engineer A had an ethical responsibility to question Engineer B’s competency and report
his concerns to the contractor.

In BER Case 71-2, a case involving the brokerage of engineering services by two firms
competing for government work and the question of professional competence, the
Board recognized "the propriety and value of the prime professional or client retaining
the services of experts and specialists in the interests of the project" and noted that a
prime professional will be expected to retain or recommend the retention of experts and
specialists in situations in which the prime professional is performing substantial
services on the project. Likewise, BER Case 78-5 involved an effort by a consulting firm
under consideration to perform services to a public utility, in which the firm sought to alter its qualifications following its interview with the public utility in order to improve its position to secure the contract. The Board affirmed its decision rendered in BER Case 71-2 that in the field of consulting practice, engineers have an ethical obligation to seek work only in areas where they possess educational background and experience or to retain individuals who possess the necessary educational background and experience to perform the work.

It is clear that Engineer A, a chemical engineer, has no apparent substantive background or experience in the area of facilities design and construction. A CD-ROM that permits virtually anyone to "specify, design and cost out" a project clearly is not an appropriate basis upon which an individual can obtain professional competency to perform facilities design and construction services. An individual seeking to obtain an acceptable level of competency in the basic elements of facilities design and construction (e.g., civil, structural, mechanical, electrical engineering) should seek and be able to demonstrate appropriate engineering and related education and experience. Relying on a "how to" CD-ROM appears to show a general disregard for the fundamental role that professional engineers play in protecting the public health and safety and minimizes the high level of knowledge and expertise necessary to perform these critical responsibilities. Professional engineering cannot be reduced to an activity whereby practitioners rely upon computers and technical information instead of time-tested professional experience and engineering judgment.

In a sense, the direct mail product described under the facts is not unlike mail order certifications offered by so called "diploma mills" whereby individuals "self certify" their competency based upon a perfunctory review process that rarely involves comprehensive study, examination, or practice. By ordering and using the CD-ROM, Engineer A in a sense was "self-certifying" his competency to perform facilities design and construction services without obtaining the substantive education, experience, and qualifications to perform those services in a competent and professional manner. The Board considers such activities completely contrary to the basic ethical principles established in the Code of Ethics.

In closing, the Board’s decision should not be understood as a wholesale rejection of the use of computers, CD-ROMs and other technological advances. Rather, it is the Board’s position that technology has an important place in the practice of engineering, but it must never be a replacement of a substitute for engineering judgment.

**Conclusion:**
It was not ethical for Engineer A to offer facilities design and construction services under the facts presented.
NOTE: The NSPE Board of Ethical Review (BER) 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 of 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, university engineering departments, etc.), the specific business form or type should not negate nor detract from the conformance of individuals to the NSPE Code. The NSPE Code deals with professional services -- which services must be performed by real persons. Real persons in turn establish and implement policies within business structures.

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