

NRC Recommends R&D Focus on Nonconventional Concrete Technologies

Research and development (R&D) in concrete technology has concentrated on modifying or refining traditional raw materials and processing techniques. The National Research Council's (NRC) report, *Nonconventional Concrete Technologies: Renewal of the Highway Infrastructure*, looks beyond near-term developments to identify innovative materials and procedures that have the potential to accelerate the construction process, improve the durability of highway pavement and bridges, and enhance their maintenance under adverse conditions. The committee anticipates that reaching these goals would save money in construction and maintenance.

The committee recommends a systems approach to concrete R&D so that "the behavior of the material is understood quantitatively from the atomic level to the microscopic level to the macroscopic or continuum level." With this understanding, the materials and their processing can be controlled, eliminating routine preventative maintenance.

Without taking costs into consideration, the committee suggests potential nonconventional matrix materials and their synthesis, including the use of organic polymers, wood, paper waste, and swelling clays; reactive inorganic additives such as flyash and silica fume; and steel reinforcement with the use of oxygen scavengers. The committee recommends R&D focus on reinforcement and layered structures and processing capabilities of nonconventional concrete that emulates or exceeds the capabilities of conventional concrete. To obtain a copy of the report, contact the National Academy Press, Box 285, 2102 Constitution Avenue, N.W., Washington, DC 20055; 800-624-6242; 202-334-3313; <http://www.nap.edu>.

DOE Outlines Plan for Million Solar Roofs Initiative

Responding to President Clinton's call in New York at the United Nations Special Session on Environment and Development to "unleash the creative power of our people to meet the challenge of climate change," Secretary of Energy Federico F. Peña outlined the administration's "Million Solar Roofs Initiative."

The initiative calls for the Department of Energy (DOE) to lead an effort to place one million solar energy systems on the roofs of buildings and homes across the United States by the year 2010. Peña said the Million Solar Roofs Initiative will require two steps: leveraging existing fed-

eral resources to promote solar energy sales and working with local communities and other groups to find ways to rapidly expand the use of solar technology. An interagency working group is being formed to identify all of the federal government grant, procurement, and financial assistance programs that already exist and could be used to make the initiative successful. Energy savings, reduced pollution, and other incentives will draw local communities, businesses, state governments, utilities, and other interested parties into the partnership.

NAE to Highlight Achievements of Women Engineers

A project designed to encourage high school and college-age women to consider careers in engineering is being launched by the National Academy of Engineering (NAE). The project, "Celebration of Women in Engineering: Dispelling Myths, Profiling Excellence," will highlight the achievements and careers of women engineers.

"It is our hope that by undertaking this project, the National Academy of Engineering can encourage more women to choose careers in engineering," said NAE President William A. Wulf. "The numbers are simply not as high as they should be."

While the number of women pursuing careers in science, engineering, and medicine has been increasing over the years, the engineering profession is attracting a smaller proportion of women than other disciplines. For example, in 1993, 7.3% of engineers were women, compared to 35.5% of scientists.

The NAE project will begin with a series of conferences—scheduled to begin in 1998—that will bring together women who are on the vanguard of the engineering profession.

Guide Offers Advice on Mentoring Science and Engineering Students

A guide from the Committee on Science, Engineering, and Public Policy—a joint committee of the National Academy of Sciences, National Academy of Engineering, and Institute of Medicine—offers mentoring advice for faculty, administrators, and all others who counsel science and engineering students. It outlines specific steps that institutions can take to improve the quality of the mentoring that their students receive.

"The changing employment conditions of scientists and engineers has also changed what constitutes good mentoring," said David Challoner, chair of the group that oversaw the project.

Third in a series on science and engi-

neering education and careers, the guide was written with input from experienced mentors as well as students. It features a list of the fundamental practices of a successful mentor, vignettes that illustrate good and bad examples of mentoring, advice for new mentors, and pointers on the different kinds of guidance needed by undergraduate, graduate, and postdoctoral students as well as junior faculty.

The most direct way to improve the quality of mentoring is to reward good efforts. The guide stresses that mentoring goals need to become embedded in institutional policies and systems. Evaluations of faculty for promotions and tenure should include an assessment of how well they have served in the role of mentor. Other steps that institutions can take include:

- Offering guidance for new faculty and advisors through briefings, workshops, the assignment of senior mentors, and information about campus and Internet resources. Periodic discussions could permit senior faculty to describe good practices. Other topics to explore include professional standards, ethical values, and the balance between a career and personal life.

- Providing counselors who are not only knowledgeable about various academic choices but also can offer students and their advisors up-to-date information on the full range of educational and career opportunities open to scientists and engineers, including industrial internships, part-time and summer placements, and classes outside their discipline.

- Holding annual seminars that update faculty on the latest employment trends and internship opportunities and on issues such as appropriate faculty-student relations and cultural and ethnic concerns.

- Creating an institutional award for distinguished mentors. The White House Office of Science and Technology Policy and the American Association for the Advancement of Science have recently instituted such awards on the national level. Recognition at the institutional level is a key first step.

Additional sections of the guide address career planning, time management, professional development, responsible scientific conduct, and writing. To assist the mentors, lists of important bibliographical and Internet resources on mentoring and related topics are provided.

Copies of *Advisor, Teacher, Role Model, Friend: On Being a Mentor to Students in Science and Engineering* are available from the National Academy Press, Box 285, 2102 Constitution Avenue, N.W., Washington, DC 20055; 800-624-6242; 202-334-3313; <http://www.nap.edu>. □