

Proceedings



Concrete Pavement Design and Rehabilitation

**April 18-20, 1989
Purdue University**

Proceedings

4 TH INTERNATIONAL
CONFERENCE ON

**Concrete Pavement Design
and Rehabilitation**

**April 18-20, 1989
Purdue University
West Lafayette, Indiana 47907
USA**



Eldon J. Yoder Outstanding Paper Award

Professor Eldon J. (Eldy) Yoder was born in Goshen, Indiana on December 11, 1918. Eldy received his BS degree in Civil Engineering from Purdue University in 1945, and his MSCE in 1946, majoring in Highway Engineering and minoring in Soil Mechanics and Structures. In 1946, he accepted employment with Ohio State University as an Assistant Professor in Civil Engineering. In 1949, he returned to Purdue as Assistant Professor of Highway Engineering. He was promoted to Associate Professor in 1954 and, in 1962, became Professor of Highway Engineering.

Professor Yoder's record of educational, technical and professional accomplishments in the field of highway engineering, especially pavement design serves as an inspiration to us all. He was an outstanding teacher, an excellent researcher, and served as an engineering consultant on major highway projects worldwide. He was very active in professional societies, and especially enjoyed the Transportation Research Board. In 1983, he received TRB's Roy W. Crum Award "in recognition of outstanding achievement in the field of transportation research."

Professor Yoder was very active in the development of continuing education programs in the highway field. He was the organizer of TRB's First International Conference on Low-Volume Roads in 1975, and served as chairman of the Third conference until his death. He also organized the First and Second International Conferences on Concrete Pavement Design, and was initiating plans for the Third International Conference at the time of his death in 1983. In memory of Eldon J. Yoder and his many contributions to the highway design profession, the Third International Conference was dedicated to him and an award set up in his name for the outstanding paper for each conference. This award will be presented during the conference closing.

Foreword

These are the proceedings for the Fourth International Conference on Concrete Pavement Design and Rehabilitation. This is the fourth in a planned series of such conferences to bring together experts from all over the world to discuss state-of-the-art issues in this subject area. The conference will cover all aspects of the design, evaluation, performance and structural rehabilitation of Portland Cement Concrete pavements, including new and innovative techniques. Papers on bases, joints and drainage will also be presented.

The First International Conference on Concrete Pavement Design was held at Purdue University on February 15-17, 1977. The Second International Conference on Concrete Pavement Design was held in Indianapolis, Indiana on April 14-16, 1981. Both of these conferences were quite successful, thanks to the tireless efforts of their chairman, Eldon J. Yoder, Professor of Civil Engineering at Purdue University. Eldy was very active in planning the Third International Conference until his untimely death in June 1983. The Third Conference was dedicated to his memory and to his many contributions to the engineering profession. It was held on April 23-25, 1985, at Purdue University.

The papers presented in this proceedings were selected from the 111 synopses that were submitted in response to the initial call for papers in January of 1988. The papers selected for presentation at the conference resulted from a two stage review of the synopses and then the papers of the selected synopses. Due to the many fine papers submitted, the Program Committee decided to also publish some of the excellent papers which could not be included in the conference program. The papers published in this proceedings have been organized in the same format as that of the general program as follows:

Session 1	—	Keynote Addresses
Session 2A	—	Design Theories and Performance
Session 2B	—	Rehabilitation
Session 3	—	Pavement Evaluation and Overlays
Session 4A	—	Pavement Design and Economic Analysis
Session 4B	—	Design and Rehabilitation of Airfields
Session 5A	—	Evaluation and Testing
Session 5B	—	Recycling and Construction
Session 6	—	Joints, Bases and Drainage
Session 7	—	Conference Closing

The format of the conference allows each presenter to make a formal presentation of his paper, followed by time for questions from the audience and responses by the authors. Interaction between authors and attendees will be encouraged throughout the conference.

The compilation of this proceedings and the conference program would not have been possible without the generous efforts of the members of the Program Committee in reviewing and selecting the final papers and presentations. The Program Committee members are identified on the next page. Special thanks are expressed to the Federal Highway Administration for its financial assistance in publishing this preprint, and in setting up the final program. Finally, the efforts and cooperation of the authors of the papers in this proceedings are deeply appreciated. These efforts have enabled us to publish a quality document that will constitute an excellent reference tool for engineers engaged in highway design, construction and maintenance for many years to come.

Charles F. Scholer and Thomas D. White, Conference Co-Chairmen
School of Civil Engineering
Purdue University
West Lafayette, Indiana 47907 U.S.A.

Program Committee

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Sponsors and Supporting Agencies

The Fourth International Conference on Concrete Pavement Design and Rehabilitation has been made possible by the cooperation of various organizations in the United States and other countries. The conference has been planned by a Program Committee representing the following agencies:

Sponsors:

Purdue School of Civil Engineering
Federal Highway Administration
Portland Cement Association
Transportation Research Board
Indiana Department of Highways
Federal Aviation Administration
U.S. Air Force Engineering and Services Center

Supporting Agencies:

American Concrete Institute
American Concrete Pavement Association
American Road and Transportation Builders Association
American Society of Civil Engineers
Cembureau (European Cement Association)
Concrete Reinforcing Steel Institute
International Road Federation
Permanent International Association of Road Congresses (PIARC), Technical
Committee on Concrete Roads
Roads and Transportation Association of Canada
U.S. Army Corps of Engineers, Waterways Experiment Station
U.S. Naval Facilities Engineering Command
Wire Reinforcement Institute

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The European Experience: Summary of the Workshop on Theoretical Design of Concrete Pavements, Held June 5-6, 1986 in EPEN, The Netherlands — **Jan J. M. van der Vring**, Centre for Research and Contract Standardization in Civil and Traffic Engineering, Ede, The Netherlands (former secretary of the Workshop on Theoretical Design of Concrete Pavements)

Managing our National Airport System into the 21st Century - The Changing Federal Role — **Leonard E. Mudd**, Director, Office of Airport Standards, Federal Aviation Administration, Washington, D.C.

Report on the Strategic Highway Research Program — **Damian Kulash**, Executive Director, Strategic Highway Research Program, Washington, D.C.

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