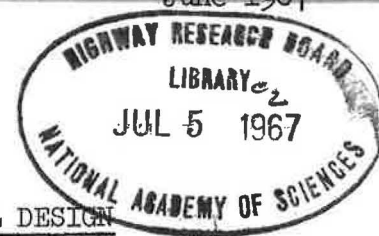


HIGHWAY RESEARCH CIRCULAR

Number 65

Subject Area: Pavement Design,
Pavement Performance, Bituminous
Materials and Mixes, Construction
Foundations (Soils)

June 1967



SECOND INTERNATIONAL CONFERENCE ON THE STRUCTURAL DESIGN OF ASPHALT PAVEMENTS

The University of Michigan's Civil Engineering Department and Extension Service, the Michigan State Highway Department, and The Asphalt Institute are co-sponsoring the Second International Conference on the Structural Design of Asphalt Pavements during the week of August 7-11, 1967, at the University of Michigan.

The conference theme is "Fundamental Concepts of Design of Asphalt Pavements Structures and Their Correlation with Performance Under Field Conditions." Included in the program are such subjects as pavement performance criteria, strength evaluation of the total pavement structure and individual elements including soil, drainage, dynamic factors, and construction influences. Papers on such topics as skid-resistance, proportioning of paving mixtures, and investigations of asphalt or aggregates are not included in the scope of the conference.

Preprints of papers are available to all registrants. Papers will not be delivered at the conference. Instead, moderators will summarize papers prior to discussion of them in the session for which they are scheduled. On the final day of the conference there will be a summary session to review highlights of the entire meeting. The sessions chairmen represent eight different nations.

HIGHWAY RESEARCH BOARD

**NATIONAL RESEARCH COUNCIL NATIONAL ACADEMY OF SCIENCES - NATIONAL ACADEMY OF ENGINEERING
2101 CONSTITUTION AVENUE, N.W. WASHINGTON, D.C. 20418**

Professor William S. Housel of the University of Michigan is in charge of the conference. Further information regarding registration, cost, the availability of preprints and other conference data may be obtained by writing Professor W. S. Housel, P. O. Box 619, Ann Arbor, Michigan 84107.

Listed below are the titles and authors of the 85 papers slated for presentation during the conference:

SESSION I - Asphalt Pavement Structures - Design and Performance

Chairman: W. N. Carey, Jr., Executive Director, Highway Research Board.

The Measurement of Highway Pavement Performance

— B. G. Hutchinson

Thickness Determination of Flexible Highway Pavements for Mixed Loads and Traffic Volume.

— M. Livneh and E. Shklarsky

Design of Subgrade Base and Surface Against Detrimental Compaction and Shear in the Finished Structure.

— John L. McRae

Flexible Airport Pavement Design and Performance

— G. Y. Sebastyan

A Method for Strengthening Flexible Pavements

— J. Lassalle and G. Langumier

Developments in the Application in Practice of a Fundamental Procedure for the Design of Flexible Pavements.

— G. M. Dormon and J. M. Edwards

Prediction of Pavement Deflections from Laboratory Tests

— H. B. Seed and C. L. Monismith

Consideration of Calculated Strains at Various Depths in Connection With the Stability of Asphalt Pavements.

— W. Heukelom and A. J. G. Klomp

The Behavior of Asphalt Pavements Under Variable Repeated Loads

— Paolo Ferrari

Evaluation of Applicability of AASHO Road Test Results to Corps of Engineers Flexible Pavement Design Criteria.

— W. J. Turnbull, R. G. Ahlvin and D. N. Brown

SESSION II - Theoretical Treatment of Structural Design of Asphalt Pavements
Chairman: Sir William Glanville, Engineering Consultant, England.

Analysis of Stresses and Displacements in a Three-Layered Viscoelastic System.

— J. E. Ashton and F. Moavenzadeh

Dynamic Phenomena in Pavements Considered as Elastic Layered Structures.

— A. Avramesco

An Analysis of Stresses and Displacements in Road Pavements

— D. A. Cumming

Stresses and Displacements in Viscoelastic Layered Systems Under Circular Loaded Areas.

— Y. H. Huang

The Theory of Viscoelastic Two-Layer Systems and the Conceptions of Its Application to the Pavement Design.

— Kenji Ishihara and Tsutomu Kimura

Stress-Strain Law for Viscoelastic Flexible Pavements Under Temperature Variations.

— Albert B. Ku

The Analysis of Pavements Under Arbitrary Loading.

— C. A. O'Flaherty, A. L. Yettram and M. E. Fleming

Deflection of Viscoelastic Medium Due to a Moving Load.

— W. H. Perloff and F. Moavenzadeh

Determination of the Stresses and Displacements in Elastic Layered Systems.

— J. Verstraeten

Stresses in Layered Systems Under Static and Dynamic Loading.

— A. Waterhouse

Stress and Deflection in an Elastic Mass Under Semi-Ellipsoidal Loads.

— E. J. Yoder and J. L. Sanborn

The Calculation of Stress, Strain and Displacement in Layered Systems Having Constant and Variable Elastic Parameters.

— A. Jones

A Rational Approach to the Design of Flexible Pavements.

— R. D. Barksdale and G. A. Leonards

SESSION III - Structural Design of Asphalt Pavements—Soil Conditions and Construction Methods

Chairman: P. J. Rigden, Director, National Institute for Roads Research, Republic of South Africa

Field Application of the Resilience Design Procedures For Flexible Pavement.

— J. L. Beaton, Ernest Zube and Raymond Forsyth

The Design and Evaluation of Asphalt Concrete Pavements Using Continuous Waves.

— W. H. Cogill

The Influence of Compaction Methods and Condition on the Structural Behavior of Compacted Subgrades.

— H. E. Wahls and L. J. Langfelder

Structural Effect of Restraint Layer on Subgrade of Low Bearing Capacity in Flexible Pavement.

— T. Yamanouchi

Experience About the Use of Frost Wedges Against Frost Heaving.

— O. A. Taivainen

Considerations on the Structural Number.

— Harumi Takeshita

Interpretation and Measurement of the Elastic Compressibility of the Subgrades and Its Relation to the Behavior of Asphalt Pavements.

— Dr. Celestino Ruiz y Otros

Soil-Cement Properties Determined by Repeated Loading in Relation to Bases for Flexible Pavements.

— James K. Mitchell and Chih-Kang Shen

Hot Mixes With Natural Aggregates on the Structural Design of Flexible Pavements.

— Egberto F. Tagle

Structural Design of Asphalt Pavements With Local Materials For Heavy Loads.

— Louis M. Zalazar

SESSION IV - Structural Components of Asphalt Pavements — Dynamic and Fatigue Properties.

Chairman: S.F. Mehra, Director, Central Road Research Institute, India

Rheological Behavior of Asphalt Pavings Under Traffic.

— O. Anderson

An Experimental Investigation of the Stresses, Strains and Deflections
in a Layered Pavement Structure Subjected to Dynamic Loads.

— S. F. Brown and P. S. Pell

The Surface Wave Method.

— R. Jones, E. N. Thrower, and E. N. Gatfield

Field Measurement of Dynamic Elastic Moduli of Materials in Flexible
Pavement Structures.

— C. T. Metcalf

New Developments in Vibration Techniques.

— L. W. Nijboer

Vibratory Study of Stabilized Layers of Pavement in Runway at
Randolph Air Force Base.

— A. A. Maxwell and A. H. Joseph

Fatigue Fracture of Asphalt Mixes.

— P. Bazin and J. Saunier

An Investigation of the Factors and Flexibility Behavior of
Various Premix Surfacing Mixtures.

— C. R. Freeme and A. N. Other

Results of Fatigue Tests on Different Types of Bituminous Mixtures.

— J. M. Kirk

Fatigue of Asphalt Pavement Mixes.

— P. S. Pell

Effect of Asphalt Aging on the Fatigue Properties of Asphalt Concrete.

— B. A. Vallergera and F. N. Finn

The Behavior and Performance of Asphalt Pavements With Lime-Fly
Ash-Aggregate Bases.

-- Ernest J. Barenberg

SESSION V - Evaluation of Properties of Structural Components in Asphalt Pavements.

Chairman: J. Bonitzer, Ingenieur en Chef des Ponts et Chaussees, France.

Stress and Strain Measurements in Experimental Road Sections Under
Controlled Loading Conditions.

— Dr. K. H. Gusfeldt and Dr. R. Dempwolf

Observed and Calculated Strains at Various Depths in Asphalt Pavements.

— A. J. G. Klomp and Th. W. Niesman

Testing Flexible Pavements Under Normal Traffic Loadings by Means of Measuring Some Physical Quantities Related to Design Theories.

-- Dr. L. W. Nijboer and J. Delcour

Evaluations of Shear Stresses and Tensile Stresses in the Reinforcing Layers and of the Transverse Deflection Profile Performance of Asphalt Pavement Systems.

-- D. M. Burmister

Deflection Prediction in Prototype Pavements.

-- J. R. Morgan and J. C. Holden

Analysis of the Elastic Behavior of Flexible Pavements.

-- H. Y. Fang and James H. Schaub

Evaluation of El Toro Airfield by Layered Theory.

-- John P. Nielsen, Phd

A Study of Shearing Resistance in Asphaltic Concrete

-- E. R. Hargett

Viscoelastic Properties of Bituminous Mixtures.

-- G. Sayegh

The Effects of the Rheological Properties of Asphalt on Strength Characteristics of Asphalt Concrete.

-- William L. Hewitt and Floyd O. Slate

A Practical Approach to Flexible Pavement Design.

-- Frank P. Nichols, Jr.

L. C. P. C. Studies on Pavement Design

-- J. Bonitzer and Ph. Leger

SESSION VI - Asphalt Treated Bases - Properties and Performance.

Chairman: The Hon. F. J. Lafontaine, President, Canadian Good Roads Association, Canada

Deflections and Equivalencies from Laboratory Tests and Layer Theory

-- Bonner S. Coffman

Structural Thickness Factors for Three Types of Asphalt Base Courses

-- J. V. Evans and T. L. Speer

The Properties, Behavior and Design of Bituminous Stabilized Sand Be

-- J. S. Gregg, G. L. Dehlen and P. J. Rigden

Strength Contribution of Granular-Cohesive Mixtures in an Asphalt Pavement Structure.

-- W. S. House1 and James H. Ito

Thermorheologic Characterization of Sand-Asphalt Mixtures.

-- F. Moavenzadeh

Load Transmission Characteristics of Asphalt-Treated Base Courses.

— C. L. Monismith

A Field Experiment of Asphalt-Treated Bases in Colorado.

— R. Ian Kingham and T. C. Reseigh

Mechanical Properties of Asphalt Pavement Materials.

— B. F. Kallas and J. C. Riley

Hot Mixed Sand Asphalt Bases in Oklahoma.

— B. C. Hartronft

An Investigation on Some Flexible Base Courses.

— C. G. Swaninathan

The Use of Asphalt Pavement Structures in the Australian Environment.

— E. J. Dickinson

SESSION VII - Structural Performance of Asphalt Pavements.

Chairman: Professor Sergio Miquel, Chilean State University, Chile.

Performance Studies of the Mexico City International Airport.

— L. M. Aguirre-Menchaca and Manuel Zarate-Aquino

U. S. Navy Experience With the Performance of Asphalt Pavements Subjected to High Pressure Aircraft Tires.

— Philip P. Brown and C. E. Rhodes

Use of Viscoelastic Concepts to Evaluate Laboratory Test Results and Field Performance of Some Minnesota Asphalt Mixtures.

— Lawrence J. Gardner and Eugene L. Skok, Jr.

Influence of Design, Construction, and Traffic on Compaction of Asphaltic Concrete Pavements.

— B. M. Gallaway and W. J. Harper

The Behavior of Flexible Pavements Under Moving Wheel Loads.

— R. Jones and N. W. Lister

A New Method in Correlation Study of Pavement Deflection and Cracking.

— Kuang-Yuan Kung

Long-Term Deflection Study of a Maintenance Free Pavement.

— Allan Lee, Stuart Williams and W. G. Mullen

The "LaCroix-L.C.P.C." Deflectograph

— E. Prandi

Recent Full-Scale Flexible Pavement Design Experiments in Britain.

—G. F. Salt

Field Performance Studies of Flexible Pavements.

— Canadian Good Roads Association

SESSION VIII - Summary

Chairman: D. F. McGlynn, Director, Australian Roads Research Board,
Australia