

# Table of Contents

## Preface and Conference Organizers

## Chapter 1: Pavement Materials

<b>Study on Test Methods for Intelligence-Based Monitoring of Fresh Cement Concrete Quality</b>	
Z.Y. Hou, P. Peng, J.D. Xie, S.P. Zheng and Y.Z. Yuan	3
<b>Study on the Influence of Mix Design Parameters on the Properties of Self-Compacting Concrete</b>	
J.L. Wang, X.Q. Wen, J.H. Shan and Y. Liu	10
<b>Study on Vibrational Liquefaction Behavior of Air-Entrained Concrete</b>	
Z.Y. Hou, Y.Z. Yuan, Z.G. Yuan, Y.D. Liang and Z.H. Zhou	20
<b>Research on Chloride Ion Diffusion of Concrete Water-Based Capillary Crystalline Waterproofers and its Penetration Depth by Using Electron Microscope</b>	
X. Xiao, Q.S. Zhang, X.Y. Liang and X.N. Zhang	27
<b>Concrete Strength Estimation Using the Maturity Method</b>	
X.F. Li, Z. Fu, Z. Luo and S. Li	35
<b>Experimental Study on Gap-Graded Concrete Mixing Uniformity</b>	
H.P. Gao, B. Tian and Z.Y. Hou	42
<b>Effect of Mineral Additives on Internal Relative Humidity and Dry Shrinkage of Light Weight Aggregate Concrete</b>	
S.H. Dong, Y. Ge, D.C. Feng, F.P. Wang and B.S. Zhang	51
<b>Study on the Effect of Different Admixtures on the Early Autogenous Shrinkage of High Performance Concrete of Bridge Deck Pavement</b>	
X.Q. Li, B. Tian, W. Liu and S. Su	56
<b>Experimental Investigation of the Shrinkage Performance of Small Blocks Made by Rock Chips Concrete</b>	
J. Yuan, D.M. Feng, F.M. Liu, Y.Q. Zhang and Y. Liu	64
<b>Interaction between Slag and Clinker during Cement Hydration Process</b>	
S.B. Zhou, A.Q. Shen and G.F. Li	70
<b>Experimental Study on Effect of Recycled Asphalt Mixture Particles on Properties of Concrete</b>	
N. Li, D.S. Zhang, W.W. Han and A.Q. Shen	75
<b>Durability and Applications of Magnesium Phosphate Material for Rapid Repair of Pavements</b>	
Q.B. Yang	81
<b>Characteristics and Methods Research on Heavy Compaction and Vibration Compaction of Graded Crushed Aggregate</b>	
H.H. Liu, Z.G. Zhang, N. Liu and D.C. Ma	90
<b>Study on Hair Crack Rubblization of the Old Cement Concrete Pavement</b>	
C.F. Wu, X.W. Zhang and Z.X. Ma	97
<b>Permeability of Lightweight Aggregate Concrete with Mineral Admixture</b>	
X.H. Zheng, S.J. Song and Y.Q. Zhang	105
<b>Influence of Air Content and Vibration Time on Frost Resistance of Air Entrained Concrete</b>	
X.H. Zheng, Y. Ge and J. Yuan	110
<b>A Study of the Capability for Fire Resistance of Polypropylene Fibre Concrete</b>	
C.P. Chang, S.W. Huang, X.F. Li, B. Tian and Z.Y. Hou	116
<b>Based on the Orthogonal Design to Study the Design and Optimization of Material Composition for Curing Compound</b>	
C.C. Han, B. Tian, J.L. Song and Z.Y. Hou	124

## Chapter 2: Structure and Mechanical Properties of Pavement

<b>Research on Early Cracking of the CRCP in the Tunnel under Low Temperature Difference</b>	
J.W. Liu, D.J. Zhao, S.W. Liu and J.M. Shen	133
<b>The Optimization of ACN-PCN Evaluation Method for Airport Pavement under Operation</b>	
X.Z. Shao, Y.Q. An, X. Su and J. Yuan	141
<b>Sustainability Considerations for PCC Pavement Design and Construction</b>	
L.L. Chen, D.G. Zollinger and B. Tian	147
<b>Study on Dowel Bar Retrofit on Rigid Pavement to Load Transfer Restoration</b>	
P. Peng, B. Tian, X.X. Mo and K.M. Niu	160
<b>Research on Roller Compacted Concrete Graduation with Vibration Liquefaction</b>	
H.W. Liu, B. Tian, R.G. Hou and S. Li	166
<b>Experimental Study on the Performance of Bond-Breaking Layer in Reducing Friction and Improving Anti-Erosion</b>	
J.L. Yao, X.L. Liu and K.K. Feng	173
<b>Development and Challenge of the Overlay Design for Old Cement Concrete Pavement</b>	
F. Ma, D.J. Wang, B. Jin, F.M. Liu and Y. Liu	183
<b>Review of Push-Off Tests for Base Friction of Cement Concrete Pavement</b>	
F. Yin, S. Li, B. Tian and K.M. Niu	190
<b>Influences on the Axle Load Stress of the Cement-Concrete Pavement Structure Caused by the Crack or Cutting Crack of the Semi-Rigid Base</b>	
B. Yang, H. Tan, J.X. Deng and C. Pang	200
<b>Influence of Paving Condition on Longitudinal Cracking of Portland Cement Concrete Pavement</b>	
L.Z. Han, L.L. Chen and B. Tian	204
<b>Study on Freezing-and-Thawing Durability of Cement Concrete Based on Experimental Investigation of Air-Void Parameters</b>	
J.X. Zhang, X.J. Kong and C. Wang	212
<b>Stress Analysis for Cement Concrete around Joint Dowel after Loosing</b>	
R.G. Hou and K.M. Niu	222
<b>Effect of Base Parameters on Mechanical Properties of Cement Concrete Pavement Considering Interlayer Contact</b>	
Y.C. Zhang, L.L. Gao and S. Li	227
<b>Analysis on Mechanical Reasons for Longitudinal Cracking of Cement Concrete Pavement</b>	
S.L. Ma, S. Yue and Z.Y. Zhao	232
<b>Frost-Resisting Property of Bridge Concrete in Alpine Frigid Region</b>	
Y. Guo, A.Q. Shen, J. Wang and H.J. Zhao	239
<b>Research of Built-In Temperature and Zero Stress Temperature of Cement Concrete Pavement at Early Ages</b>	
C.B. Hu, M.L. Du and L.J. Wang	248

### **Chapter 3: Technologies of Concrete Pavement Production and Control**

<b>Equipment Process of Online Testing Fresh Cement Concrete Rheology</b>	
S.P. Zheng, B. Tian, R.X. Meng, R. Fang and Z.H. Cheng	259
<b>Study on Precast Concrete Girders Curing System Based on Automatic Drip Irrigation</b>	
X.B. Sun, S. Li, B. Tian and J.L. Wang	266
<b>The Relationship between Concrete Road Performance and Salt Frost</b>	
S.B. Zhou and A.Q. Shen	271
<b>Statistical Analysis of Early-Age Crack Data from Continuously Reinforced Concrete Pavements in China</b>	
X. Zhang	277
<b>Research on the Construction Technology of Cross-Prestressed Concrete Pavement</b>	
W.W. Han, D.S. Zhang, N. Li, X.J. Xu and D.S. Jia	283
<b>Cement Concrete Pavement Condition and Construction Quality Control in Hengshui City</b>	
S.S. Yang, J.C. Su, X.Q. Yang and W. Zhang	288
<b>A Rapid Method to Determine Joint Opening in JPCP for Sealant Fatigue Test</b>	
Z.G. Zhang and G.Y. Cheng	297