

PAPER • OPEN ACCESS

Preface

To cite this article: 2020 *IOP Conf. Ser.: Mater. Sci. Eng.* **852** 011001

View the [article online](#) for updates and enhancements.



The banner features a background of a globe with a grid overlay. On the left, there are three circular logos: the top one is 'ECS' in a white circle, the middle one is 'The Electrochemical Society' with a stylized 'ECS' logo, and the bottom one is 'THE KOREAN ELECTROCHEMICAL SOCIETY'. The main text in the center reads 'Joint International Meeting' in white, 'PRIME 2020' in large blue letters, and 'October 4-9, 2020' in white. Below this, a blue bar contains the text 'Attendees register at NO COST!' in white. On the right side, there is a logo for 'PRIME™' with 'PACIFIC RIM MEETING ON ELECTROCHEMICAL AND SOLID STATE SCIENCE' underneath, and '2020' in large white letters. At the bottom right, a blue bar contains the text 'REGISTER NOW' in white with a right-pointing arrow.

2nd Tarumanagara International Conference on the Applications of Technology and Engineering 2019

Preface

On behalf of the organizing committee of 2nd Tarumanagara International Conference on the Applications of Technology and Engineering (TICATE) 2019, I would like to welcome all delegates to Jakarta, Indonesia with great pleasure. Being held from November 21 to 22, 2019 at Campus I- Jl. Letjen. S. Parman No. 1, Jakarta, the international conference is organized by Universitas Tarumanagara (UNTAR) and technically sponsored by IOP Publisher.

TICATE 2019 has attracted many academicians, scientists, engineers, postgraduates and other professionals from many countries. This conference accepted 215 papers from 7 different countries, those are Australia, Taiwan, India, Malaysia, Japan, Peru and Indonesia. The aim of the conference is to promote exchange of ideas among engineers, researchers, and scientists active in the related areas of technology and engineering.

Our special thank goes to our Rector, Prof. Dr. Agustinus Purna Irawan, who has initiate this international conference, to our Plenary Speakers, Dr.-Ing. Joewono Prasetijo from Universiti Tun Hussein Onn, Malaysia, Prof. Dr. Tjokorda Gde Tirta Nindhia from Udayana University, Indonesia, Prof. Dr. Srikantappa A.S. from Cauvery Institute of Technology, India, and Prof. Dr. Mohd. Zulkifli Abdullah from Universiti Sains Malaysia, Malaysia, and Prof. Yasuyuku Nemoto, Ph.D. from Ashikaga University, Japan.

Our special thank also goes to Tarzan Photo and PT. Astaguna Wisesa as our patrons. Also to all individuals and organizations such as the members of international editorial board, the conference organizers, the reviewers and the authors, for their contribution in making TICATE 2019 as a successful international conference and a memorable gathering event. I am also grateful for the support of publication service of IOP Publisher. We hope that the conference could present you wonderful memories to bring home in addition to new insights and friendship congregated during the event.

We truly value your participation and support for the conference. We hope that you will enjoy TICATE 2019 and culture and tradition in Jakarta.

Dr. Hugeng, S.T., M.T. (SMIEEE)



2nd TICATE 2019
Conference Organisation

INITIATION & ORGANIZING INSTITUTION

Universitas Tarumanagara, Jakarta

Supporting Institution

IOP Publisher, Tarzan Photo, PT. Astaguna Wisesa

Honorary Chair

Prof. Dr. Agustinus Purna Irawan
R. M. Gatot Soemartono, Ph.D.

Chairman

Dr. Hugeng, S.T., M.T. (SMIEEE)

Co-chairperson

Dr. Fransisca Iriani Roesmala Dewi

Secretary

Bagus Mulyawan, M.M.

Program & Sponsorship

Mei Ie, M.M.

Herlina Budiono, M.M.

Parallel & Scientific Session

Dr. Hetty Karunia Tunjungsari

Sinta Paramita, M.A.

Treasurer

Wulan Purnama Sari, M.Si.

Keynote Speakers

Prof. Dr. Tjokorda Gde Tirta Nindhia, Universitas Udayana, Indonesia

Dr.-Ing. Joewono Prasetyo, Universiti Tun Hussein Onn, Malaysia

Prof. Dr. Srikantappa A.S., Cauvery Institute of Technology, India

Prof. Dr. Mohd. Zulkifli Abdullah, Universiti Sains Malaysia, Malaysia

Prof. Yasuyuku Nemoto, Ph.D., Ashikaga University, Japan

Editorial Board / Reviewers:

Prof. Dr. rer. nat. Alexander Ferrein, University of Applied Sciences Aachen, Germany

Dr.-Ing. A. Ruggeri Toni Liang, Karlsruhe Institute of Technology, Germany

Dr. -Ing Stephan Herzog, TU Kaiserslautern, Germany

Dr. Thomas Marconi, Inside Secure, France

Prof. Yifan Chen, Ph.D., University of Waikato, New Zealand

Dr. Soh Sie Teng, Curtin University, Australia

Dr. Channing Chuang, Kun Shan Univeristy, Taiwan

Prof. Mohd Zulkifli bin Abdullah, Universiti Sains Malaysia, Malaysia

Prof. Zaidi Mohd. Ripin, Universiti Sains Malaysia, Malaysia

Dr. -Ing. Joewono Prasetyo, Universiti Tun Hussein Onn, Malaysia

Dr. Filbert H. Juwono, Curtin University, Sarawak Malaysia

Prof. Dr. Tresna P. Soemardi, Universitas Indonesia, Indonesia

Dr. -Ing. Eko Adhi Setiawan, Universitas Indonesia, Indonesia

Prof. Dr. Jamasri, Universitas Gadjah Mada, Indonesia

Dr. Bambang Kismono Hadi, Bandung Institute of Technology, Indonesia

Prof. Eko Sedyono, Universitas Kristen Satya Wacana, Indonesia

Prof. Tjokorda Gde Tirta Nindhia, Universitas Udayana, Indonesia

Dr. Rianti Ariobimo, Universitas Trisakti, Indonesia

Dr. Richard Napitupulu, Universitas HKBP Nommensen, Indonesia

Prof. Dr. Dyah Erny Herwindiati, Universitas Tarumanagara, Indonesia

Prof. Dr. Leksmono Suryo Putranto, Universitas Tarumanagara, Indonesia

Harto Tanujaya, Ph.D., Universitas Tarumanagara, Indonesia

Jap Tji Beng, Ph.D., Universitas Tarumanagara, Indonesia

Lina, Ph.D., Universitas Tarumanagara, Indonesia

Dr. Steven Darmawan, Universitas Tarumanagara, Indonesia





This site uses cookies. By continuing to use this site you agree to our use of cookies. To find out more, see our Privacy and Cookies policy.



Table of contents

Volume 852

2020

◀ Previous issue Next issue ▶

The 2nd Tarumanagara International Conference on the Applications of Technology and Engineering (TICATE) 2019 21-22 November 2019, Jakarta, Indonesia

Accepted papers received: 21 April 2020

Published online: 20 July 2020

Open all abstracts

Preface

OPEN ACCESS 011001
 Preface
 + Open abstract View article PDF

OPEN ACCESS 011002
 Peer review statement
 + Open abstract View article PDF

Part 1

OPEN ACCESS 012001
 Cipali Toll Road Safety Audit
 Niluh Putu Shinta Eka Setyarini, Leksmono Suryo Putranto and Najid
 + Open abstract View article PDF

OPEN ACCESS 012002
 Factors affecting residential choice in Greater Jakarta
 L S Putranto and P Louis
 + Open abstract View article PDF

OPEN ACCESS 012003
 Mechanical properties of powder concrete with a geopolymer bond
 W Kushartomo and Sofianto
 + Open abstract View article PDF

OPEN ACCESS 012004
 Whitmore Section and Block Shear Failure Analysis on a Bolted Gusset Plate using Finite Element Method
 Yosés Riadi and Leo S Tedianto
 + Open abstract View article PDF

OPEN ACCESS 012005
 Traffic Management and Engineering Analysis of the Manahan Flyover Area by using Traffic Micro-Simulation VISSIM
 Budi Yulianto
 + Open abstract View article PDF

OPEN ACCESS 012006
 The compressive strength behavior of mahogany wood connections with bolt-ring connectors
 Wiryanto Dewobroto, Ika Bali and Lodia Semaya Amnifu
 + Open abstract View article PDF

OPEN ACCESS 012007
 Maintenance Building Strategies in a private University in Jakarta
 F Triwijayanty and W I Sakti
 + Open abstract View article PDF

OPEN ACCESS 012008
 Application of life cycle cost in the construction of soil retaining wall replacing soldier pile with diaphragm wall (case studi of Pejaten Apartment Projects)
 L Monalisa and C A Makarim
 + Open abstract View article PDF

OPEN ACCESS 012009
 Whole Effluent Toxicity (WET) Test On Microalgae Reactor and Acute Toxicity on *Daphnia* sp.
 Ika Bayu Kartikasari, A Yulianto and A Asmarany
 + Open abstract View article PDF

OPEN ACCESS 012010
 Control of Quality Concrete Base on Curing Methods
 Anisah and Prihantono
 + Open abstract View article PDF

OPEN ACCESS 012011
 Correlation of Undrained Shear Strength and Liquidity Index of Fine-Grained Soils in West Java, Indonesia
 Gilberta Miranda Hutabarat and Budjanto Widjaja
 + Open abstract View article PDF

OPEN ACCESS 012012
 Correlation between Plasticity Index and Methylene Blue Value to Determining Soil Classification
 Andrias Suhendra Nugraha, Paulus P. Rahardjo, Bigman M. Hutapea and Imam A. Sadisun
 + Open abstract View article PDF

OPEN ACCESS 012013
 Structural design of airport runway Case study: Jos Orno Imsula MOA Airport
 Kelly V Khoemarga and Anissa Noor Tajudin

+ Open abstract	View article	PDF	
OPEN ACCESS			012014
Natural Flocculant VS Chemical Flocculant Where Is Better To Used In Wastewater Treatment			
Badrus Zaman, Nurandani Hardyanti, M. Arief Budiharjo, S. Budi Prasetyo, Aldiansyah Ramadhani and Arum Tri Listiyawati			
+ Open abstract	View article	PDF	
OPEN ACCESS			012015
Benefits of the Opex Pro Application in Online Project Monitoring and Evaluation at PT. XYZ			
Manlian A. Ronald Simanjuntak and Mustafa Nahdi			
+ Open abstract	View article	PDF	
OPEN ACCESS			012016
Encapsulated Lime Peel Essential Oil (<i>Citrus hystrix</i>) Into Chitosan Nanoparticle: New Entity to Enhanced Effectivity Against Propionibacterium Acne in Vitro			
Linda Julianti Wijayadi and Taty Rusliati Rusli			
+ Open abstract	View article	PDF	
OPEN ACCESS			012017
The Study of Quality Control Management that Influence the Implementation of Technical Standards for Class C Hospital Buildings in Tangerang Districts			
Milla Andina Fajriah and Manlian Ronald A. Simanjuntak			
+ Open abstract	View article	PDF	
OPEN ACCESS			012018
The study of the identification of using the supply chain to increasing financing efficiency of management project for building construction x in Jakarta			
Mukhamad Risa Diki Pratama and Manlian Ronald A Simanjuntak			
+ Open abstract	View article	PDF	
OPEN ACCESS			012019
Designing Press Tool For Carton Finishing Process To Improve Productivity And Efficiency			
Lamto Widodo, Adianto, Siti Rohana Nasution and Priadi Wijaya			
+ Open abstract	View article	PDF	
OPEN ACCESS			012020
Curve Number Method to Determine the Runoff Height in the Upper Cimanuk Watershed			
Dwi Ariyani, Vera Aprilia, Atie Tri Juniati, Atri Prautama Dewi and Fadli Kurnia			
+ Open abstract	View article	PDF	
OPEN ACCESS			012022
Industry 4.0 and Society 5.0 through Lens of Condition Based Maintenance (CBM) and Machine Learning of Artificial Intelligence (MLAI)			
Abdul Rahman, Elias Pasaribu, Yudhiana Nugraha, Fauzi Khair, Khristian Edi Nugroho Soebandrija and Dendhy Indra Wijaya			
+ Open abstract	View article	PDF	
OPEN ACCESS			012023
Calibration and Validation Indonesian Highway Capacity Manual 1997 Model			
Budi Yulianto, Setiono, Rizki Dewayani Putri, Stevani Tia Pratisca and Felix Fernando Hartono			
+ Open abstract	View article	PDF	
OPEN ACCESS			012024
Land mapping with least median of squares regression using landsat imagery: a case study Jakarta and surrounding area			
Bagus Mulyawan, Nicholas Jovianto, Janson Hendryli and Dyah Emy Herwindiati			
+ Open abstract	View article	PDF	
OPEN ACCESS			012025
Cost Risk Analysis Method for Construction Project in Kuala Tanjung			
Eko Handoyo Cahyo Pranoto and Manlian Ronald A. Simanjuntak			
+ Open abstract	View article	PDF	
OPEN ACCESS			012026
Development of Transit Oriented Development (TOD) Areas in Improving Public Transport Services and Traffic Engineering in DKI Jakarta Province			
Baidowi, Enriko, Pius and Yanti			
+ Open abstract	View article	PDF	
OPEN ACCESS			012027
Risk analysis of toll road construction project by using soft system methodology (ssm) a case study of Sumatera trans toll road section 1 Bakauheni – Kalianda			
M. Enriko Tosulpa and Najid			
+ Open abstract	View article	PDF	
OPEN ACCESS			012028
Development of unskilled labour into skilled labour at the jetty project of PLTU Tanjung Jati B Units 5 and 6			
Jegoteluko and Wahyu Indra Sakti			
+ Open abstract	View article	PDF	
OPEN ACCESS			012029
Utilization of roof garden installation to reduce rainwater runoff in urban residential			
Endah Lestari, Muhammad Sofyan and Buddy Pamuji			
+ Open abstract	View article	PDF	
OPEN ACCESS			012030
Cost Performance Study on EPC Projects in Banten Province (Case Study: Substation and Transmission lines 150 kV EPC Project)			
Arif Deni Rahmat and Manlian Ronald A. Simanjuntak			
+ Open abstract	View article	PDF	
OPEN ACCESS			012031
Project Cost Risk Identification and Construction Performance Indicators of High-rise Building in DKI Jakarta (Case Study: PT. X)			
Manlian Ronald A. Simanjuntak and Intan Virginia Suryaningrum			
+ Open abstract	View article	PDF	
OPEN ACCESS			012032
Performance evaluation, violations and driver's perception of the Yellow Box Junction in the city of Surabaya (Case study of the junction of Jl. Ir. Sukarno - Jl. Dharmasada and the junction of Jl. Kutai - Jl. Adityawarman)			
Leksmono Suryo Putranto and RPX Rooswan Hapmono			
+ Open abstract	View article	PDF	

<p>OPEN ACCESS</p> <p>Implementation of Transit Oriented Development (TOD) Concept To Increase Public Transportation User in the city of Jakarta</p> <p>Baidowi and Najid</p> <p>+ Open abstract View article PDF</p>	012033
<p>OPEN ACCESS</p> <p>Concept design for adjustable motorcycle handlebar</p> <p>Aldo Salim, Sandy Yehezkiel, Bready Fernando, Tasya Monica, Joshua Ricardo and Agustinus Puma Irawan</p> <p>+ Open abstract View article PDF</p>	012034
<p>OPEN ACCESS</p> <p>Study Of Factors Affecting Productivity Of Pouring Concrete Using Portable Concrete Pump In Construction Project X</p> <p>Arianti Sutandi and Grand Wednesday</p> <p>+ Open abstract View article PDF</p>	012035
<p>OPEN ACCESS</p> <p>Risk Analysis of Toll Road Construction Project By Using Soft System Methodology (ssm) A Case Study Of Sumatera Trans Toll Road Section 1 (Terbanggi Besar – Menggala)</p> <p>M. Enriko Tosulpa and Najid</p> <p>+ Open abstract View article PDF</p>	012036
<p>OPEN ACCESS</p> <p>Evaluation of Side Friction in Them for Highway 4 Lanes 2 Ways Divided</p> <p>Najid</p> <p>+ Open abstract View article PDF</p>	012037
<p>OPEN ACCESS</p> <p>Kapuas River sediment settling velocity analysis with withdrawal tube</p> <p>W A Pranoto, J Johan and P Vinsensusus</p> <p>+ Open abstract View article PDF</p>	012038
<p>OPEN ACCESS</p> <p>Ground Water Potensial Analisis in Saolat And Waijoi Area East Halmahera</p> <p>Wati Asriningsih Pranoto and Tri Suyono</p> <p>+ Open abstract View article PDF</p>	012039
<p>OPEN ACCESS</p> <p>Analysis of the Potential of Crust Formation and Corrosiveness in the Way Rilau PDAM Lampung Distribution Network Using the Langelier Saturation Index Method</p> <p>Anwar, Alexander Sembiring and Agustinus Puma Irawan</p> <p>+ Open abstract View article PDF</p>	012040
<p>OPEN ACCESS</p> <p>Design an automatic clothes dryer in a cabinet with wi-fi transmission</p> <p>Henri Nugraha</p> <p>+ Open abstract View article PDF</p>	012041
<p>OPEN ACCESS</p> <p>Socket prosthesis manufacturing process made from bamboo fiber composite materials</p> <p>Agustinus Puma Irawan, I Wayan Sukania, Paula T. Anggarina, Albertus Raditya Danendra and Gregorius Dimas Baskara</p> <p>+ Open abstract View article PDF</p>	012042
<p>OPEN ACCESS</p> <p>Image clustering using genetic algorithm with tournament selection and uniform crossover</p> <p>Gevin Valerian, Tri Sutrisno and Dyah Emy Herwindiati</p> <p>+ Open abstract View article PDF</p>	012043
<p>OPEN ACCESS</p> <p>Flat Plate Type Solar Collector Performance Using Double Thermal Insulation</p> <p>EkoYohanes Setyawan, Arif Kurniawan, Febi Rahmadiano, Richard A. M Napitupulu and Parulian Siagian</p> <p>+ Open abstract View article PDF</p>	012044
<p>OPEN ACCESS</p> <p>Geometry Fin Performance in Vacuum Desalination System Condenser Tubes Using Low Temperature</p> <p>Eko Yohanes Setyawan, Yusuf Ismail Nakhoda, Parulian Siagian and Richard A.M. Napitupulu</p> <p>+ Open abstract View article PDF</p>	012045
<p>OPEN ACCESS</p> <p>Project Manager Classification for Design and Build Construction of State Buildings</p> <p>Jujuk Kusumawati, Krishna Mochtar and Najid</p> <p>+ Open abstract View article PDF</p>	012046
<p>OPEN ACCESS</p> <p>Determine The Value of Mark Up at Bid Price Hotel Buildings</p> <p>M Dwijayanti and J Johny</p> <p>+ Open abstract View article PDF</p>	012047
<p>OPEN ACCESS</p> <p>Risk Identification in Procurement of Glass facade in High-Rise Office Buildings in Jakarta</p> <p>Manlian Ronald A. Simanjuntak and Reinaldi Tanumihardja</p> <p>+ Open abstract View article PDF</p>	012048
<p>OPEN ACCESS</p> <p>Identification of Design And Build Risks in School Building Construction Projects in Central Jakarta</p> <p>Andreas Suharyanto and Manlian Ronald A. Simanjuntak</p> <p>+ Open abstract View article PDF</p>	012049
<p>OPEN ACCESS</p> <p>Study Phase of Operational Management Process X Building</p> <p>Janerizka Bari Putri and Manlian Ronald A. Simanjuntak</p> <p>+ Open abstract View article PDF</p>	012050

<p>OPEN ACCESS</p> <p>Risk Identification in Procurement of Precast Facade Procurement on High Rise Buildings in Jakarta</p> <p>Ardian Sulistianto, Dr. Manlian Ronald and A. Simajuntak</p> <p>+ Open abstract View article PDF</p>	012051
<p>OPEN ACCESS</p> <p>Dry Land Irrigation In Kandar, Tanimbar Islands Regency.</p> <p>Ony Frengky Rumihin, Chaidir Anwar Makarim and Wati A. Pranoto</p> <p>+ Open abstract View article PDF</p>	012052
<p>OPEN ACCESS</p> <p>Flexible Pavement Mechanistic Response to the 2017 Indonesian Road Pavement Manual with Cement-Treated Base (CTB)</p> <p>Anissa Noor Tajudin and Clement Grady Akira Winarko</p> <p>+ Open abstract View article PDF</p>	012053
<p>OPEN ACCESS</p> <p>Utilization of rainwater harvesting installation to fulfil water needs in educational buildings</p> <p>Endah Lestari, Wati A Pranoto and Chaidir A Makarim</p> <p>+ Open abstract View article PDF</p>	012054
<p>OPEN ACCESS</p> <p>Passenger satisfaction assessment on the flight performance of Balikpapan-Yogyakarta route flights (Case study: Sultan Aji Muhammad Sulaiman Sepinggan International Airport, Balikpapan)</p> <p>Yanti, M. Enriko T., Baidowi, Pius and Leksmono Suryo Putranto</p> <p>+ Open abstract View article PDF</p>	012055
<p>OPEN ACCESS</p> <p>The effect of High-Density Polyethylene (HDPE) and Low-Density Polyethylene (LDPE) on characteristics of asphalt concrete with dry and wet mixing process</p> <p>Eduardi Prahara, Fennysia Aswita and E. S. Niluh Putu Shinta</p> <p>+ Open abstract View article PDF</p>	012056
<p>OPEN ACCESS</p> <p>Evaluation And Decrease Of The Likelihood Of Risks In Mass Floor Excavations According To Your Texture In Peru</p> <p>Arteaga Ramos Jhannel and Andia Alvarez Giancarlo</p> <p>+ Open abstract View article PDF</p>	012057
<p>OPEN ACCESS</p> <p>Concrete Structure Condition Rating in Buildings with Non-Destructive Testing</p> <p>Henny Wiyanto, Joshua Chang and Yohanes Dennis</p> <p>+ Open abstract View article PDF</p>	012058
<p>OPEN ACCESS</p> <p>Analysis of online-taxi service quality and passenger satisfaction</p> <p>T A Sitinjak, L Djakfar and A Wicaksono</p> <p>+ Open abstract View article PDF</p>	012059
<p>OPEN ACCESS</p> <p>Analysis of value engineering application at the design stage of a deep excavation system</p> <p>Benjamin and J Johan</p> <p>+ Open abstract View article PDF</p>	012060
<p>OPEN ACCESS</p> <p>Distribution of Story Shear and Reinforcement in Dual System</p> <p>Daud Rahmat Wiyono, Roi Milyardi and Cindrawaty Lesmana</p> <p>+ Open abstract View article PDF</p>	012061
<p>OPEN ACCESS</p> <p>Preliminary cost in industrial building at Sumatra, Kalimantan, and Papua</p> <p>C S Setiawan and O Gondokusumo</p> <p>+ Open abstract View article PDF</p>	012062
<p>OPEN ACCESS</p> <p>Tool characteristics for better performance in machining ohns steel using coated tungsten carbide tool inserts</p> <p>C. M Shivakumara, A. S Srikantappa and B Adaveesha</p> <p>+ Open abstract View article PDF</p>	012063
<p>OPEN ACCESS</p> <p>Innovation of quality improvement to reduce weld defect through six sigma methods in the fabrication process of power plant component</p> <p>Ayu Puspa Wirani, Dana Santoso Saroso and Humiras Hardi Purba</p> <p>+ Open abstract View article PDF</p>	012064
<p>OPEN ACCESS</p> <p>Influence of fillers on tribological behaviour of glass-coir reinforced epoxy composites – An ANN Approach</p> <p>B R Vijay and A S Srikantappa</p> <p>+ Open abstract View article PDF</p>	012065
<p>OPEN ACCESS</p> <p>Smart Brake Monitoring System with Brake Failure Indication for Automobile Vehicles</p> <p>Y C Venkatesh, A. S Srikantappa and P Dinesh</p> <p>+ Open abstract View article PDF</p>	012066
<p>OPEN ACCESS</p> <p>Tensile Behaviour of Kevlar Fibre & Coir Fibre Reinforced with Epoxy Hybrid Composites</p> <p>M J Vinaykumar, A. S Srikantappa and M Ramkumar</p> <p>+ Open abstract View article PDF</p>	012067
<p>OPEN ACCESS</p> <p>Flexural & impact characteristics of kevlar fibre & coir fibre reinforced with epoxy hybrid composites</p> <p>M J Vinaykumar, A. S Srikantappa and M Ramkumar</p> <p>+ Open abstract View article PDF</p>	012068
<p>OPEN ACCESS</p>	012069

Experimental Analysis of Semi-Open Impeller Pump as Turbine D.L. Zariatn, Risdianto, Amat Chaeroni and Ismail + Open abstract View article PDF	
OPEN ACCESS On Preparation of Advance Ceramic for Single-edge V-Notch Beam Fracture Toughness Test of ISO/FDIS 23146:2008(E) Standards Tjokorda Gde Tirta Nindhia + Open abstract View article PDF	012070
OPEN ACCESS Comparative study between MSC Marc/Mentat student version and Simufact Welding for three-passed butt joint Richard A.M. Napitupulu, Chilinton Hutabarat, Charles S.P. Manurung, Yupiter HP Manurung and Marcel Graf + Open abstract View article PDF	012071
OPEN ACCESS Kinematics analyses for robot motion Wandro Siregar, Parulian Siagian, Lin Rong-Shine, Richard AM. Napitupulu, Miduk Tampubolon and Sutan LMH Simanjuntak + Open abstract View article PDF	012072
OPEN ACCESS Reynolds number effects on swirling flows intensity and reattachment length over a backward-facing step geometry using STD $k-\epsilon$ turbulence model Steven Darmawan + Open abstract View article PDF	012073
OPEN ACCESS Slicing Methodology of A CAD File for 3D Printing Frince Marbun, Richard A.M. Napitupulu, Charles SP Manurung, Sutan Simanjuntak and Yung-Chou Kao + Open abstract View article PDF	012074
OPEN ACCESS Comparison of fracture toughness testing by the single edge v-notch beam and the surface crack in flexure method on silicon nitride Tjokorda Gde Tirta Nindhia + Open abstract View article PDF	012075
OPEN ACCESS Flexural properties of bamboo strip composites on lamina configuration Sofyan Djanil, NPG Suardana, Agustinus Purna Irawan, IKG Sugita and Harto Tanujaya + Open abstract View article PDF	012077
OPEN ACCESS Statistical Analysis of CFRP Mechanical Properties using B-Basis Based on Weibull and ANOVA Distribution Analysis Yurviany, Diaz Tamaza, Djarot Widagdo, Muhammad Kusni and Bambang K. Hadi + Open abstract View article PDF	012078
OPEN ACCESS Development of Testing Equipment of Hydrokinetic Turbine Model to Support Implementation of the Laboratory Work Jorfri Boike Sinaga, Novri Tanti and M. Dyan Susiala + Open abstract View article PDF	012079
OPEN ACCESS An experimental study on the response of composite plate due to granade explosion Gunaryo, Andi Kuswoyo, Djarot Widagdo, Bambang K Hadi, Heriana and Manuel S Tappang + Open abstract View article PDF	012080
OPEN ACCESS Design of an autonomous electric vehicle for assistance in the movement of people with visual disabilities using vision algorithms and artificial intelligence Juan José Encinas Cantaro and Mario Chauca Saavedra + Open abstract View article PDF	012081
OPEN ACCESS Characterization of Predictive Control Based on Model (MPC) in Multivariable Process of Milling in a Mineral Concentrator Plant Juan Tisza and Mario Chauca + Open abstract View article PDF	012082
OPEN ACCESS Tool Wear Analysis of Coated Carbide Tools on Cutting Force in Machining Process of AISI 4140 Steel Sobron Lubis, Rosehan, Steven Darmawan and Benny Indra + Open abstract View article PDF	012083
OPEN ACCESS Lead-free solder SAC 305 Volume Reduction and Cold Slump after Stencil Printing Process M. S. Rusdi, M. Z. Abdullah, M. S. Abdul Aziz, M. K. Abdullah, M.H.H Ishak and P. Rethinasamy + Open abstract View article PDF	012084
OPEN ACCESS Experimental analysis on combustion characteristics of single layer porous media for various burner sizes N.C. Ismail, M.Z. Abdullah and N.M. Mazlan + Open abstract View article PDF	012085
OPEN ACCESS Viscosity of Mono vs Hybrid Nanofluids: Measurement and Comparison Khairil Fadli, MZ Abdullah, NM Mazlan, AR Mohamed, Ayub Ahmed Janvekar and FM Nasir + Open abstract View article PDF	012086
OPEN ACCESS Reducing Project Duration of An Apartment Project by Waskita Karya using Crashing Method K.R. Ririh and N.Y Hidayah + Open abstract View article PDF	012087
OPEN ACCESS Concept design of solar cell satellite dish	012088

Steven Teja, Nicholas Travis Adrianto, JM Louis Martin, Nicholas Kurniawan and Agustinus Purna Irawan

[+ Open abstract](#)
[View article](#)
[PDF](#)

OPEN ACCESS

Concept design of high interface powerbank

012089

Verry Gunawan, Nicholaus Christiardy and Agustinus Purna Irawan

[+ Open abstract](#)
[View article](#)
[PDF](#)

OPEN ACCESS

Comparison study between nearest neighbor and farthest insert algorithms for solving VRP model using heuristic method approach

012090

Wilson Kosasih, Ahmad, Lithrone Laricha Salomon and Febricky

[+ Open abstract](#)
[View article](#)
[PDF](#)

OPEN ACCESS

Community Service Report: Designing The Ergonomic Roasting Machine For Coffee Seed With Additional Electrical Motor At Seduh Kopi Coffee Shop

012091

Frans Jusuf Daywin, Lina Gozali, Lamto Widodo, Carla Olyvia Doaly and M. Wildan Hendri Ross

[+ Open abstract](#)
[View article](#)
[PDF](#)

OPEN ACCESS

Calculation of Labor Amount with Theory of Constraints and Line Balancing Method in PT. XYZ Fish Crackers Factory

012092

Lina Gozali, Frans Jusuf Daywin and Alvin Jestinus

[+ Open abstract](#)
[View article](#)
[PDF](#)

OPEN ACCESS

Assessing the potential of delivery consolidation to campus center

012093

Alfiora Santoni, M.T Dr. Ir. Nahry, Dr. Sarini Abdullah and M. Stats

[+ Open abstract](#)
[View article](#)
[PDF](#)

OPEN ACCESS

Analysis of Supply Chain Risk Mitigation Strategies in the Bogor Compressor Company with the House of Risk Method

012094

Surya Perdana, Ridwan Usman and Nur Arifiya

[+ Open abstract](#)
[View article](#)
[PDF](#)

OPEN ACCESS

Determination Of Priority Criteria Which Influences CPO Factory Productivity

012095

Nurhayati Sembiring and M. Imam Ramzani

[+ Open abstract](#)
[View article](#)
[PDF](#)

OPEN ACCESS

Comparison Study Among Production Planning Research in Some Papers and Industries in Indonesia

012096

F Lefta, L Gozali and I A Marie

[+ Open abstract](#)
[View article](#)
[PDF](#)

OPEN ACCESS

Personal Performance Measurement of Project Manager using Project Manager Competency Development Framework (PMCDF®) (Case Study PT.XYZ)

012097

Sarah Wahyuni, Devi Pratami and Achmad Fuad Bay

[+ Open abstract](#)
[View article](#)
[PDF](#)

OPEN ACCESS

Measurement of Risk Project Maturity Using Organizational Project Management Maturity Model (Opm3): Study Case Of Construction Project In Bandung

012098

Fanjar Arif Wijaksono, Devi Pratami and Achmad Fuad Bay

[+ Open abstract](#)
[View article](#)
[PDF](#)

OPEN ACCESS

Design of Procurement Process Monitoring Dashboard for Supporting Food Security Supply Chain Risk Management System in Indonesian Bureau of Logistics

012099

Detha Aulia Alfazah, Ari Yanuar Ridwan, Femi Yulianti and Putu Giri Artha Kusuma

[+ Open abstract](#)
[View article](#)
[PDF](#)

OPEN ACCESS

The Use of Quality Metric To Control Quality Of Telecommunication Project (Case Study: Regional Metro Junction)

012100

Naufal Muhammad Zaki, Imam Haryono and Devi Pratami

[+ Open abstract](#)
[View article](#)
[PDF](#)

OPEN ACCESS

Implementation of Lean Warehousing to Improve Warehouse Performance of Plastic Packaging Company

012101

Yudha Prasetyawan, Alfa Khairani Simanjuntak, Naufal Rifqy and Lulu Auliya

[+ Open abstract](#)
[View article](#)
[PDF](#)

OPEN ACCESS

Simple automation for pineapple processing combining with karakuri design

012102

Yudha Prasetyawan, Atiya Arifiyana Agustin and Dewanti Anggrahini

[+ Open abstract](#)
[View article](#)
[PDF](#)
Part 2

OPEN ACCESS

Project Acceleration of Outside Plant-Fiber Optic (OSP-FO) Project in PT. XYZ Using Time Cost Trade Off (TCTO) Method by Adding Overtime Hours

012103

Syifa Nur Hasyati, Ika Arum Puspita and Wawan Tripiawan

[+ Open abstract](#)
[View article](#)
[PDF](#)

OPEN ACCESS

Lean Manufacturing Implementation on Extrude Process with Value Stream Mapping: Study Case in Tyre Manufacture

012104

Teguh Sri Ngadono, Muh Rokhim and Zulfia Fitri Ikatinasari

[+ Open abstract](#)
[View article](#)
[PDF](#)

OPEN ACCESS

Comparison Study of Facility Planning and Layouts Studies

012105

K. Bintang Bagaskara, Lina Gozali, Lamto Widodo and Frans Jusuf Daywin

[+ Open abstract](#)
[View article](#)
[PDF](#)

OPEN ACCESS

Analysis Improvement Production Process Of Making Joint Care Air Filter Mitsubishi (Cjm) With Overall Equipment Effectiveness And Six Big Losses

012106

Syahreen Nurmutia, Adi Candra and Muhammad Shobur

[+ Open abstract](#)
[View article](#)
[PDF](#)
OPEN ACCESS

Implementation of Statistical Quality Control to Reduce Defects in Mabell Nugget Products (Case Study at PT. Petra Sejahtera Abadi)

012107

Rini Alfatiyah, Sofian Bastuti and Dadang Kumia

[+ Open abstract](#)
[View article](#)
[PDF](#)
OPEN ACCESS

Analysing Company's Performance by Using Sustainable Supply Chain Management (SSCM)

012108

Nurhayati Sembiring, Mangara M. Tambunan and Elisabeth Ginting

[+ Open abstract](#)
[View article](#)
[PDF](#)
OPEN ACCESS

Comparison Study about Production Scheduling System from Some Paper Case Studies

012109

Vania Eliyanti, Lina Gozali, Lamto Widodo and Frans Jusuf Daywin

[+ Open abstract](#)
[View article](#)
[PDF](#)
OPEN ACCESS

Comparison Study about Inventory Control System from Some Papers in Indonesian Case Study

012110

Shelinsca Hoswari, Lina Gozali, Iveline Anne Marie and I Wayan Sukania

[+ Open abstract](#)
[View article](#)
[PDF](#)
OPEN ACCESS

Comparison Study of the Application of Line Balancing and the Theory of Constraint

012111

Jessica Novelia Sagitta, Lina Gozali and Frans Jusuf Daywin

[+ Open abstract](#)
[View article](#)
[PDF](#)
OPEN ACCESS

Comparison Study about Warehouse Layout from Some Paper Case Studies

012112

Natalia Sudiarta, Lina Gozali, Iveline Anne Marie and I Wayan Sukania

[+ Open abstract](#)
[View article](#)
[PDF](#)
OPEN ACCESS

The Identification of Risk Factors of Quality that Affecting Contractors' Performance at XYZ Company

012113

Edward Rizky Tatimu and Manlian Ronald A. Simanjuntak

[+ Open abstract](#)
[View article](#)
[PDF](#)
OPEN ACCESS

Lean Six Sigma and Business Engineering Perspective of Electrical Energy Optimization

012114

Aminuddin Chasun, Suratno, Khristian Edi Nugroho Soebandrija, Dendhy Indra Wijaya and Fauzi Khair

[+ Open abstract](#)
[View article](#)
[PDF](#)
OPEN ACCESS

The strategy improvement of the engine maintenance

012115

Nurhayati Sembiring and Diva Varian Koto Deli

[+ Open abstract](#)
[View article](#)
[PDF](#)
OPEN ACCESS

Risk Assessment Of Working Posture And Implementation Of New Workstation To Increase Productivity

012116

Wayan Sukania, Silvi Ariyanti, Michael Jayusman and Siti Rohana Nasution

[+ Open abstract](#)
[View article](#)
[PDF](#)
OPEN ACCESS

Increasing Production Efficiency using Karakuri Principle (A Case Study in Small and Medium Enterprise)

012117

Dewanti Anggrahini, Yudha Prasetyawan and Sri Indriyani Diartwi

[+ Open abstract](#)
[View article](#)
[PDF](#)
OPEN ACCESS

Carton Sheet Quality Control In Pt. Xyz Using Six Sigma Approach Method With Dmaic Tools

012118

Ahmad, Silvi Ariyanti, Lamto Widodo and M. G Cristin Natalina

[+ Open abstract](#)
[View article](#)
[PDF](#)
OPEN ACCESS

Performance Analysis of Employees at PT. Sungaiberkat Serani Sukses Using Human Resource Scorecard Method

012119

Ahmad, Lithrone Laricha Salomon and Dean Alexander

[+ Open abstract](#)
[View article](#)
[PDF](#)
OPEN ACCESS

CONSUMER PREFERENCE ANALYSIS OF SNACK USING CONJOINT ANALYSIS METHOD (CASE STUDY : TELUR GABUS)

012120

Lithrone Laricha Salomon, Wilson Kosasih, Carla O. Doaly and Cindy

[+ Open abstract](#)
[View article](#)
[PDF](#)
OPEN ACCESS

Application Of Quality Control Of Carton Box In Quality Control Department At PT Purinus Ekapersada

012121

Clara Puspita Ningrum, Lina Gozali and Lamto Widodo

[+ Open abstract](#)
[View article](#)
[PDF](#)
OPEN ACCESS

Redesign Layout Planning of Raw Material Area and Production Area Using Systematic Layout Planning (SLP) Methods (Case Study of CV Oto Boga Jaya)

012122

K. Bintang Bagaskara, Lina Gozali and Lamto Widodo

[+ Open abstract](#)
[View article](#)
[PDF](#)
OPEN ACCESS

Aggregate and Disaggregate Production Planning, Material Requirement, and Capacity Requirement in PT. XYZ

012123

F Lefta, L Gozali and I A Marie

[+ Open abstract](#)
[View article](#)
[PDF](#)
OPEN ACCESS

Analysis the measurement quality system of clearance tappet using measurement system analysis on motorcycle manufacturing company

012124

Carla Olyvia Doaly, Iphov K. Sriwana, Lithrone Salomon and Farrell

+ Open abstract	View article	PDF	
OPEN ACCESS			012126
Reducing of Defects in the Drug Tablets Production Process with DMAIC to Improve Quality – Study Case of Pharmaceutical Industry			
Adha Winatie, Dana Santoso Saroso, Humiras Hardi Purba and Ayu Puspa Wirani			
+ Open abstract	View article	PDF	
OPEN ACCESS			012127
Modeling of Prediction Bandwidth Density with Backpropagation Neural Network (BPNN) Methods			
Cynthia Hayat, Iwan Aang Soenandi, Samuel Limong and Johan Kurnia			
+ Open abstract	View article	PDF	
OPEN ACCESS			012128
Comparative Study Between the Integration of ITIL and ISO / IEC 27001 with the Integration of COBIT and ISO / IEC 27001			
Nur Kholis Gunawan, Raden Budiarto Hadiprakoso and Herman Kabetta			
+ Open abstract	View article	PDF	
OPEN ACCESS			012129
BCube and DCCell Topology Data Center Infrastructures Performance			
Edi Surya Negara, Keni Keni and Ria Andryani			
+ Open abstract	View article	PDF	
OPEN ACCESS			012130
Vowel Recognition Based on Face Images Using Fisher Linear Discriminant Analysis			
Lina and Desi Arisandi			
+ Open abstract	View article	PDF	
OPEN ACCESS			012131
Design System: Networks Status Notification using Telegram Messenger			
Erika Ramadhani, Akhmad Syarifurrahman and G. P. Mahardhika			
+ Open abstract	View article	PDF	
OPEN ACCESS			012132
Web-based application as a communication modeling for street children			
Yuni Widiastrini, Ati Zaidiah and Intan Hesti Indriana			
+ Open abstract	View article	PDF	
OPEN ACCESS			012133
Feasibility of Well Water as a Source of Clean Water in the Coastal Coastal Settlement Area			
Idawarni Asmal, Edward Syarif and Samsuddin Amin			
+ Open abstract	View article	PDF	
OPEN ACCESS			012134
Early Assessment Dyslexia			
R Wiryasaputra and T Williandi			
+ Open abstract	View article	PDF	
OPEN ACCESS			012135
Graph Model of Reporting Engine Performance Results in The Business Intelligence Process			
Bambang Prasetya Adhi, Widodo, Dendy Nanda Prasetya and Hamidillah Adjie			
+ Open abstract	View article	PDF	
OPEN ACCESS			012136
Software-Defi Wireless Sensor Networks: A Systematic Review, Architecture and Challenges			
Tony Tony and Lely Hiryanto			
+ Open abstract	View article	PDF	
OPEN ACCESS			012137
Design of expert system for tool selection in digital forensics investigation			
Erika Ramadhani, Elyza G. Wahyuni and Hanif R. Pratama			
+ Open abstract	View article	PDF	
OPEN ACCESS			012138
Designing the QuickCash Payment System prototype by using cash withdrawal services through minimarket as an alternative solution for secure money transfer from bank customers to non-bank customers			
Prasetyo Adi Wibowo Putro and Gagas Paras Mulati			
+ Open abstract	View article	PDF	
OPEN ACCESS			012139
A review of attacks, objects, and mitigations on web services			
Rafif Masur Rauf, Tubagus Eiffel Rivaldo and Amiruddin Amiruddin			
+ Open abstract	View article	PDF	
OPEN ACCESS			012140
Online product search using gray level co-occurrence matrix, color moments, and histogram of oriented gradients for content based image retrieval			
Henry Halim, J Hendryli and D E Herwindiaty			
+ Open abstract	View article	PDF	
OPEN ACCESS			012141
A brief review of attacks and mitigations on smartphone infrastructure			
Rico Setyawan, Allicia A. Rahayu, K. F. Nur Annisa and Amiruddin Amiruddin			
+ Open abstract	View article	PDF	
OPEN ACCESS			012142
Decision Support System Model Determines the Type of Road Construction in Indonesia			
Henderi Henderi, Endang Kurnadi and Dedi Trisnawarman			
+ Open abstract	View article	PDF	
OPEN ACCESS			012143
Segmentation of White Blood Cell Areas from Colour Degraded Microscope Slide Images			
Lina, Ery Dewayani and Arlends Chris			
+ Open abstract	View article	PDF	

<p>OPEN ACCESS</p> <p>Vehicle Road Accident Prediction Model along Federal Road FT050 Kluang-A/Hitam-B/Pahat Route Using Excess Zero Data</p> <p>J. Prasetijo, W. Z. Musa, Z. Mohd Jawi, Z. F. Zainal, N. B. Hamid, A. Subramaniyan, A.J.L.M. Siang, N. Anting and I. Mohd Hafzi Md</p> <p>+ Open abstract View article PDF</p>	012144
<p>OPEN ACCESS</p> <p>Interior Design Of Postgraduate Library Based On Cyber Technology By Applying Javanese Cultural Ornaments And Eco-Friendly Materials</p> <p>Hartini, Basuki Wibawa, Robinson Situmorang and Stephanie Efendy</p> <p>+ Open abstract View article PDF</p>	012145
<p>OPEN ACCESS</p> <p>Development of wood carving furniture technology in Jepara</p> <p>Eddy Supriyatna Marizar, Maitri Widya Mutiara and Agustinus Purna Irawan</p> <p>+ Open abstract View article PDF</p>	012146
<p>OPEN ACCESS</p> <p>Cardiac Arrhythmia classification using deep learning</p> <p>Alexander R. J. Silalahi and Tumpal Pandiangan</p> <p>+ Open abstract View article PDF</p>	012147
<p>OPEN ACCESS</p> <p>Designing and Building Secure Electronic Medical Record Application by Applying AES-256 and RSA Digital Signature</p> <p>Galih Wening Werdi Mukti and Hermawan Setiawan</p> <p>+ Open abstract View article PDF</p>	012148
<p>OPEN ACCESS</p> <p>Medical Diagnosis System in Healthcare Industry: A Fuzzy Approach</p> <p>N Sevani, A Setiawan, F Saputra, R. K. Sali and O Sunardi</p> <p>+ Open abstract View article PDF</p>	012149
<p>OPEN ACCESS</p> <p>Climate Responsive Architecture in Jakarta's Apartments</p> <p>C Tjje, F Lianto and N W Priyomarsono</p> <p>+ Open abstract View article PDF</p>	012150
<p>OPEN ACCESS</p> <p>Natural Lighting Analysis in Plaza Senayan, Jakarta, Indonesia</p> <p>Silvia Gunawan, Naniek Widayati Priyomarsono and Rudy Trisno</p> <p>+ Open abstract View article PDF</p>	012151
<p>OPEN ACCESS</p> <p>Emergency Shelter Design For Disaster Preparation</p> <p>Abdel Mounaim, Naniek Widayati Priyomarsono and Rudy Trisno</p> <p>+ Open abstract View article PDF</p>	012152
<p>OPEN ACCESS</p> <p>Potential of processed timber for preserving the Chinese traditional buildings</p> <p>J Rilalupa, R Trisno and F Lianto</p> <p>+ Open abstract View article PDF</p>	012153
<p>OPEN ACCESS</p> <p>Design of Multiband MIMO Antenna for 5G Millimeterwave Application</p> <p>Rusmono, Efri Sandi and Teresa Marani</p> <p>+ Open abstract View article PDF</p>	012154
<p>OPEN ACCESS</p> <p>Expanded Coverage Remote Control</p> <p>Hadian Satria Utama, Tryas Honorris and Indra Surjati</p> <p>+ Open abstract View article PDF</p>	012155
<p>OPEN ACCESS</p> <p>Detection of Cholesterol Levels by Analyzing Iris Patterns using Backpropagation Neural Network</p> <p>L B Rachman and Basari</p> <p>+ Open abstract View article PDF</p>	012157
<p>OPEN ACCESS</p> <p>Establishment of an application for photographs' quality detection based on sharpness and light intensity</p> <p>Hugeng Hugeng and Ardis Jevon Tjahyadi</p> <p>+ Open abstract View article PDF</p>	012158
<p>OPEN ACCESS</p> <p>Automatic Statistics Measurement Antenna Performance Towards Virtual Ground Station</p> <p>Arif Hidayat, Hidayat Gunawan, Ali Syahputra Nasution, Andrianingsih and Diki Wahyudi</p> <p>+ Open abstract View article PDF</p>	012159
<p>OPEN ACCESS</p> <p>Tourism Destination Grouping Systems With Partitioning Clustering Method from Geotagged Photo using Android</p> <p>Maya Retnosari, Wasino and Desi Arisandi</p> <p>+ Open abstract View article PDF</p>	012160
<p>OPEN ACCESS</p> <p>Travel App - showing nearest tourism site using Haversine formula and directions with Google Maps</p> <p>G T S Lee, D Arisandi and Wasino</p> <p>+ Open abstract View article PDF</p>	012161
<p>OPEN ACCESS</p> <p>Website application for visualizing intangible cultural heritage integrated with google maps : case study in Balai pelestarian nilai budaya jawa barat</p> <p>Andre Laverius, Ery Dewayani and Wasino</p> <p>+ Open abstract View article PDF</p>	012162
<p>OPEN ACCESS</p>	

Start to End: Recommended Travel Routes Based on Tourist Preference	012163
Vivien H. Wangi, Jap Tji Beng and Wasino	
+ Open abstract View article PDF	
OPEN ACCESS	012164
Prediction Analysis Of Criminal Data Using Machine Learning	
Meiliana, Dedi Trisnawarman and Muhammad Choirul Imam	
+ Open abstract View article PDF	
OPEN ACCESS	012165
Twitter Users Opinion Classification of Smart Farming in Indonesia	
James Nata Salim, Dedi Trisnawarman and Muhammad Choirul Imam	
+ Open abstract View article PDF	
OPEN ACCESS	012166
Grouping of Tourism Objects Using Geotagged Photo with Hierarchical Clustering Method in Bantul and Sleman	
Fenny Lusiana, Jap Tji Beng and Wasino	
+ Open abstract View article PDF	
OPEN ACCESS	012167
Comments Scraping Application For Review Youtube Content	
M. Viny Christanti, Walda and Tri Sutrisno	
+ Open abstract View article PDF	
OPEN ACCESS	012168
The Influence Of IOT (Internet Of Things) Against Industrial Development In Tanah Abang Market	
Yorent Natanael	
+ Open abstract View article PDF	
OPEN ACCESS	012169
Dynamics Of Land Value Change : A Case Of Pantai Mutiara, Jakarta	
Juntrisawati Loi, Nurahma Tresani and Nasiruddin Mahmud	
+ Open abstract View article PDF	
OPEN ACCESS	012170
Does Go-Jek affected Smart City Operational in Jakarta	
Jevon Atmabrata and Nurahma Tresani	
+ Open abstract View article PDF	
OPEN ACCESS	012171
Study of Vertical Residential Development in the Poris Plawad Mass Transportation Development Area (TOD) in Tangerang City	
Megawati	
+ Open abstract View article PDF	
OPEN ACCESS	012172
North Coast Jakarta Land Reclamation as a Solution of Land Requirements	
Agustina Tjoei, Meyriana Kesuma, ST and MT	
+ Open abstract View article PDF	
OPEN ACCESS	012173
Characteristics Analysis of Slum Area in the Region of Rw 16 Kapuk, West Jakarta	
Jemima Devina Halim	
+ Open abstract View article PDF	
OPEN ACCESS	012174
The use of MNCP-5 particle transport program for calculation of flux radiation exposure in object surface	
Tumpal Pandiangan, Ika Bali and Alexander R.J. Silalahi	
+ Open abstract View article PDF	
OPEN ACCESS	012175
Smart Chicken Farming: Monitoring System for Temperature, Ammonia Levels, Feed in Chicken Farms	
Raden Budiarto, Nur Kholis Gunawan and Bagas Ari Nugroho	
+ Open abstract View article PDF	
OPEN ACCESS	012176
Implementation of incognito method and SHA-3 as an alternative to PIN selection in web login	
Gesi Deta Hendika Wardani and Yogha Restu Pramadi	
+ Open abstract View article PDF	
OPEN ACCESS	012177
Aluminum Frame Product Development Using Quality Function Deployment and Value Engineering at PT KSN	
Surya Perdana, Ridwan Usman and Zeny Fatimah Hunusalela	
+ Open abstract View article PDF	
OPEN ACCESS	012178
Cloud computing model in higher education	
Bagus Mulyawan, Raymond Kosala, Benny Ranti and Suhono Harso Supangkat	
+ Open abstract View article PDF	
JOURNAL LINKS	
Journal home	
Information for organizers	
Information for authors	
Search for published proceedings	
Contact us	
Reprint services from Curran Associates	



Jakarta, 4 November 2019

No. : 160-TIM/7440/UNTAR/IX/2019

FULL PAPER ACCEPTANCE NOTIFICATION

Reference Number : TICATE-150

Title : Flexible Pavement Mechanistic Response to the 2017

Indonesian Road Pavement Manual with Cement-Treated Base (CTB)

Authors : Anissa Noor Tajudin

Dear Mr./Madam

Thank you for your paper submission to Tarumanagara International Conference on the Application of Technology and Engineering 2019.

We are pleased to inform you that your submission is accepted for presentation in TICATE 2019. Due to some outstanding reviews for other submissions, however, the review result is not available for viewing yet. We expect to publish the review results will begin on 12 November 2019, you need to register to conference before 9 November 2019.

In the meantime, we recommend that you check your manuscript to minimize obvious errors, such as formatting and grammatical errors.

If you have further questions, please don't hesitate to contact us. We are looking forward to seeing you at UNTAR. Thank you very much for your cooperation.

Sincerely,

Dr. Hugeng, S.T.,M.T.(SMIEEE)

Chairman

PAPER • OPEN ACCESS

Flexible Pavement Mechanistic Response to the 2017 Indonesian Road Pavement Manual with Cement-Treated Base (CTB)

To cite this article: Anissa Noor Tajudin and Clement Grady Akira Winarko 2020 *IOP Conf. Ser.: Mater. Sci. Eng.* **852** 012053

View the [article online](#) for updates and enhancements.

A promotional banner for the PRiME 2020 meeting. The background features a blue and white globe. On the left, there are three circular logos: the top one is 'ECS' in a circle, the middle one is 'The Electrochemical Society' with a stylized 'ECS' logo, and the bottom one is 'THE KOREAN ELECTROCHEMICAL SOCIETY'. The main text in the center reads 'Joint International Meeting PRiME 2020 October 4-9, 2020' in white and blue. Below this, a blue bar contains the text 'Attendees register at NO COST!' in white. On the right side, there is a large 'PRiME' logo with 'TM' and 'PACIFIC RIM MEETING ON ELECTROCHEMICAL AND SOLID STATE SCIENCE' underneath, followed by '2020' in large white numbers. At the bottom right, a blue bar contains the text 'REGISTER NOW' in white with a right-pointing arrow.

ECS

Joint International Meeting

PRiME 2020

October 4-9, 2020

Attendees register at NO COST!

PRiMETM
PACIFIC RIM MEETING
ON ELECTROCHEMICAL
AND SOLID STATE SCIENCE

2020

REGISTER NOW ▶

Flexible Pavement Mechanistic Response to the 2017 Indonesian Road Pavement Manual with Cement-Treated Base (CTB)

Anissa Noor Tajudin* and Clement Grady Akira Winarko

Universitas Tarumanagara, Department of Civil Engineering, Let. Jend. S. Parman Road No. 1, Jakarta, Indonesia

*anissat@ft.untar.ac.id

Abstract. The empirical method, a method developed from experiments or experience, has historically been the usual planning method used in Indonesia for designing flexible pavement thickness. The newest pavement design manual in Indonesia, Bina Marga 04/SE/Db/2017 has introduced the mechanistic method, based on pavement responses such as strain, deflection, and stress. Research was conducted to evaluate the design chart in the manual with KENPAVE program assistance in order to know the mechanistic response for the cement-treated base (CTB) foundation. The loadings for 100%, 150%, and 200% are used to know pavement response to loading variations. Vertical and horizontal strain were reviewed as mechanistic responses. Vertical strain was used to analyse rutting, and horizontal strain was used to analyse fatigue. The research shows that as the California Bearing Ratio (CBR) value increases, the smaller the vertical strain value becomes. However, this was not the case with horizontal strain where the CBR value did not seem to influence the horizontal strain value. The added loading will increase pressure on the pavement so that compressive and tensile strains on the pavement will be higher.

1. Introduction

The structure of pavement usually consists of layers that are relatively weak at the bottom, and gradually stronger in the upper part. This arrangement allows available material to be utilized more economically. The functions of road pavement are to provide a flat/smooth surface for drivers and to distribute vehicle load adequately from the surface to the subgrade so that it protects the ground from excessive pressure. Pavement also works to protect the ground from weather distress.

In Indonesia, pavement design guidelines are issued by the Directorate General of Highway from the Ministry of Public Works and Housing. These guidelines include provisions for new construction, stage construction, and overlays. These guidelines have changed over the years. The 1987 Component Analysis, which refers to AASHTO 1979, was a design guideline in use for some time. When the 2002 Flexible Pavement Thickness Guideline, which refers to AASHTO 1993, was issued, that became the standard. In 2013, a new regulation, named the Pavement Manual, was developed with assistance by Australian Government, the latest version of which (with several revisions of Regulation 2013) was issued in 2017. Significant differences exist between the 2013 and 2017 versions, not the least of which is the use of an empirical method in 2013 and the use of empirical mechanistic methods in 2017. Empirical mechanistic methods have been used extensively in many developing countries. These methods require input material parameters and traffic load because the pavement responses, namely stress, strain and deflection, are considered.



The empirical mechanistic method is a relatively new approach in Indonesia, so it is necessary to conduct several research projects in order to support and develop this method. In addition, the output calibration mechanical analysis of road pavement, especially for the Indonesian climate and ungoverned vehicle loads, needs to be further investigated [1]. The purpose of this research is to use KENPAVE to evaluate the mechanistic method of pavement design, with standard loading and overloading, in the 2017 Pavement Manual.

1.1. Cement-Treated Base (CTB)

The cement-treated aggregate base (a mixture of aggregate, water, and cement) is a foundation layer which was developed utilizing techniques of cement soil construction. The gradation and controlled quality implementation method (mixing and spreading) resembles paving work with high carrying capacity. The reaction between cement and water will bind the aggregate particles, thus increasing the strength, stiffness, durability, and permeability of this material. [2, 3]

For roads with medium to heavy traffic, CTB is an effective material to use as the foundation layer as the cost is significantly less than using granular foundation. CTB can also reduce the amount of asphalt and granular materials and is, therefore, less sensitive to damage from moisture. [1]

1.2. Mechanistic empirical pavement method

Traffic loads, environmental conditions, and material properties of pavement can all cause responses in the forms of stresses, strains, or deflections. The relationships between these responses and their physical causes are typically described using mathematical models. In the mechanistic approach, empirical models are used when defining the relationships between the calculated responses and pavement failure. As a result, the number of loading cycles before failure can be predicted. This approach is called a mechanistic empirical based design method. This approach requires pavement designers to ensure that the design inputs are implemented correctly and to avoid inaccuracies in determining the values of stresses, strains, and deflections, which will subsequently be used in distress models [4,5].

1.3. Pavement Critical Point in Layered System

Flexible pavement is a layered system with superior strength characteristics in the upper layer compared to the layer below it. The theory of a Burmister layered system can be applied in planning, initially developing a two-layer system which can later be developed to a three-layer system. With technological advancement, that theory was further developed by Huang in that it can be applied to multilayer systems with any number of layers [6,7].

The values generated by modelling using multilayer systems are stress, strain, and deflection, the KENPAVE program can measure these values in several points of the pavement structure. Some of these points are used consistently in pavement analysis, such as deflection on the pavement surface, horizontal tensile strength on the bottom of the surface layer to predict fatigue, and vertical compressive strength on the upper subgrade layer to predict rutting [8].

2. Research method

2.1. Pavement Design

Road Pavement Design Manual Number 02/M/BM/ has provided a pavement design with various types of CBR subgrade, Cumulative Single Axle (CESA), and other materials in each layer. The structural design for the CTB foundation has an ESA value of 10 million to 500 million vehicles with a designed life of 20 years. As seen in Table 1, pavement designs are divided into five pavement structures.

Table 1. Pavement Designs

	F1	F2	F3	F4	F5
Cumulative Single Axle Loads (10^6)	> 10 - 30	> 30 – 50	> 50 – 100	> 100 – 200	> 200 – 500
AC WC	40 mm	40 mm	40 mm	50 mm	50 mm
AC BC	60 mm	60 mm	60 mm	60 mm	60 mm
AC Base	75 mm	100 mm	125 mm	160 mm	220 mm
CTB	150 mm	150 mm	150 mm	150 mm	150 mm
Class A aggregate foundation	150 mm	150 mm	150 mm	150 mm	150 mm
Subgrade support (compacted subgrade)	350 mm for CBR 2,5; 300 mm for CBR 3; 200 mm for CBR 4; 100 mm for CBR 5 ^a				

^aNo subgrade support needed for CBR above 5

2.2. Design Evaluation

Road Pavement Design Manual Number 02/M/BM/ will be evaluated for various CBR values (from 2,5 up to 15) and loading scenarios (100%, 125%, and 175%) with the mechanistic empirical method using the KENPAVE software. The pavement thickness shown in Table 2, critical point location, modulus for each layer (Table 2), and loads are inputted into KENPAVE. The outputs of vertical compressive and horizontal tensile strain are used in the analysis.

Table 2. Layer Modulus

Layer	Modulus for each CBR Value (Mpa)							
	2,5	3	4	5	6	8	10	15
AC WC	1.100	1.100	1.100	1.100	1.100	1.100	1.100	1.100
AC BC	1.200	1.200	1.200	1.200	1.200	1.200	1.200	1.200
AC Base	1.600	1.600	1.600	1.600	1.600	1.600	1.600	1.600
CTB	500	500	500	500	500	500	500	500
Class A aggregate foundation	350	350	350	350	350	350	350	350
Subgrade support	130	120	101	80	0	0	0	0
Natural subgrade	25	30	40	50	60	80	100	150

2.3. Pavement Distress Model

The outputs issued from the KENPAVE program are pavement structure responses, such as vertical compressive and horizontal tensile strains that are later processed by using the rutting prediction, (Eq 1) and fatigue prediction models (Eq 2) [9].

$$N_d = 0,0685x\varepsilon t^{-5,671}xE^{-2,363} \quad (1)$$

N_d = Number of allowable ESA repetitions to prevent rutting; εv = Vertical compressive strain at the top layer of the subgrade

$$N_f = 6,15x10^{-7}x\varepsilon t^{-4} \quad (2)$$

N_f = Number of allowable ESA repetitions to prevent fatigue; εt = Horizontal tensile strain at the bottom of the asphalt layer; E = Surface layer modulus (psi)

The Shell Research formula is used to calculate the N_d and N_f values in this paper due to the fact that this formula has been found to have a reliability level of 44.5% compared to the Asphalt Institute formula which is only 19.9%. [10,11]

3. Result and discussion

Road Pavement Design Manual Number 02/M/BM/2017 has provided the pavement design with several types of CBR subgrade, ESA, materials, and layer thickness. The structure design for the CTB foundation has an ESA value from 10 million to 500 million vehicles with 20 years of design life. Besides the ESA value, several factors affect pavement design, such as the thickness of each pavement structure layer and layer material.

3.1. Vertical Compressive Strain and Rutting

Table 3. The Relationship of Vertical Compressive Strain to CBR and Loading Scenario

CBR	Vertical Compressive Strain ($\times 10^{-4}$)														
	FFF1			FFF2			FFF3			FFF4			FFF5		
	100%	150%	200%	100%	150%	200%	100%	150%	200%	100%	150%	200%	100%	150%	200%
2,5	3,11	4,67	6,23	2,87	4,31	5,75	2,66	3,98	5,31	2,33	3,49	4,65	1,96	2,94	3,92
3	3,17	4,76	6,34	2,91	4,37	5,83	2,68	4,03	5,37	2,34	3,50	4,67	1,96	2,93	3,91
4	3,35	5,03	6,70	3,06	4,58	6,11	2,79	4,19	5,59	2,40	3,60	4,81	1,98	2,98	3,97
5	3,61	5,41	7,22	3,27	4,90	6,53	2,96	4,44	5,93	2,52	3,78	5,04	2,05	3,08	4,11
6	4,03	6,05	8,06	3,62	5,43	7,24	3,27	4,90	6,53	2,75	4,12	5,50	2,21	3,32	4,43
8	3,52	5,28	7,04	3,17	4,75	6,33	2,86	4,29	5,72	2,41	3,62	4,82	1,95	2,92	3,89
10	3,14	4,71	6,29	2,83	4,24	5,66	2,56	3,84	5,11	2,16	3,24	4,32	1,75	2,62	3,50
15	2,51	3,76	5,01	2,26	3,39	4,52	2,05	3,07	4,10	1,74	2,60	3,47	1,41	2,12	2,82

In general, based on Table 3, the greater the CBR value, the lower the vertical compressive strain value obtained is. This is because the CBR value rises as the soil conditions improve, as seen on pavements with CBR values ranging from 6 to 15. However, with CBR values of 2.5 to 6, the vertical compressive strain values obtained are increasing due to subgrade support and a thicker base layer. The vertical compressive strain value increases in a lineal fashion, with the addition of load.

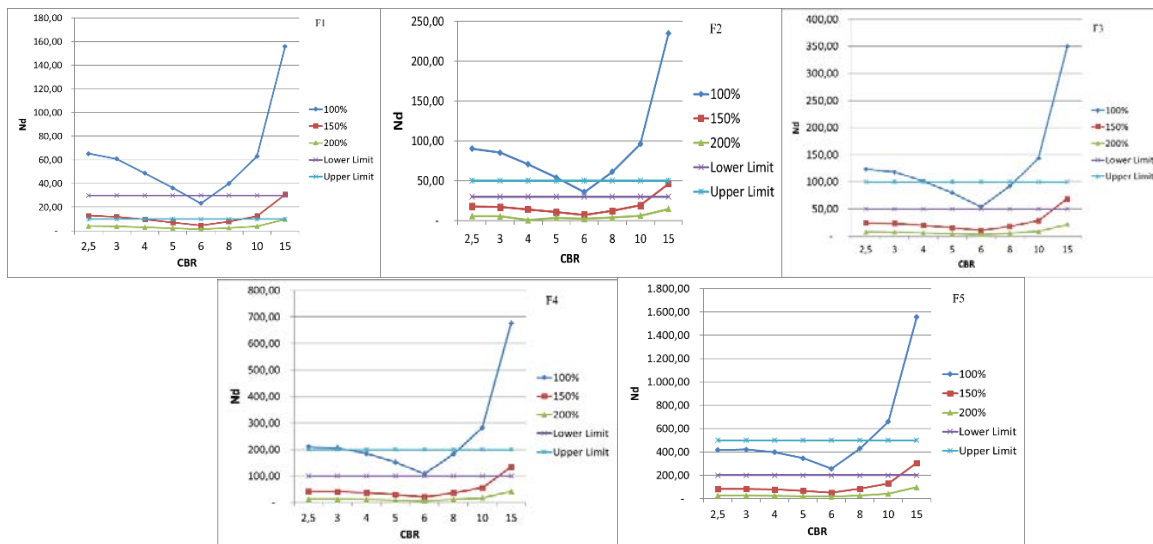


Figure 1. The Relationship of Nd Value

Pavements will experience rutting distress if the Nd value is smaller than the lower limit value, or the actual repetition, which is equal to 10 million. Based on Figure 1, F1 pavement design at 100% loading does not experience rutting damage. For 150% loading, rutting is found at CBR 4, 5, 6, and 8. The 150% load does not experience rutting at CBR 10 or 15. As for the 200% load, rutting distress is seen in all CBR subgrade variations due to the Nd value of less than 10 million.

In the F2 design, rutting will occur if the Nd value is smaller than the lower limit value of 30 million. In the F3, pavements will experience rutting if the Nd value is smaller than the lower limit value or the actual repetition of 50 million. In the F4 design, pavements will experience rutting if the Nd value is smaller than the lower limit value or the actual repetition of 100 million. In the F5, the pavement will experience rutting if the Nd value is smaller than the lower limit value or the actual repetition of 100 million. Based on Figure 4, the pavement design at 100% loading did not experience rutting. For 150% loading rutting occurs in the CBR 2.5, 3, 4, 5, 6, 8, and 10. As for 200 % loading, rutting occurred in all CBR values.

3.2. Horizontal Tensile Strain and Fatigue

Table 4. The Relationship of Horizontal Tensile Strain to CBR and Loading Scenario

CBR	Horizontal Tensile Strain ($\times 10^{-4}$)														
	FFF1			FFF2			FFF3			FFF4			FFF5		
	100%	150%	200%	100%	150%	200%	100%	150%	200%	100%	150%	200%	100%	150%	
2,5	3,11	4,67	6,23	2,87	4,31	5,75	2,66	3,98	5,31	2,33	3,49	4,65	1,96	2,94	3,92
3	3,17	4,76	6,34	2,91	4,37	5,83	2,68	4,03	5,37	2,34	3,50	4,67	1,96	2,93	3,91
4	3,35	5,03	6,70	3,06	4,58	6,11	2,79	4,19	5,59	2,40	3,60	4,81	1,98	2,98	3,97
5	3,61	5,41	7,22	3,27	4,90	6,53	2,96	4,44	5,93	2,52	3,78	5,04	2,05	3,08	4,11
6	4,03	6,05	8,06	3,62	5,43	7,24	3,27	4,90	6,53	2,75	4,12	5,50	2,21	3,32	4,43
8	3,52	5,28	7,04	3,17	4,75	6,33	2,86	4,29	5,72	2,41	3,62	4,82	1,95	2,92	3,89
10	3,14	4,71	6,29	2,83	4,24	5,66	2,56	3,84	5,11	2,16	3,24	4,32	1,75	2,62	3,50
15	2,51	3,76	5,01	2,26	3,39	4,52	2,05	3,07	4,10	1,74	2,60	3,47	1,41	2,12	2,82

Based on Table 4, in each load, the CBR values from F1 to F5 design increases and decreases the horizontal strain value, because the CBR value does not significantly affect the horizontal strain. Fatigue damage is located below the upper surface layer, so the CBR value is not too influential even though changes occur.

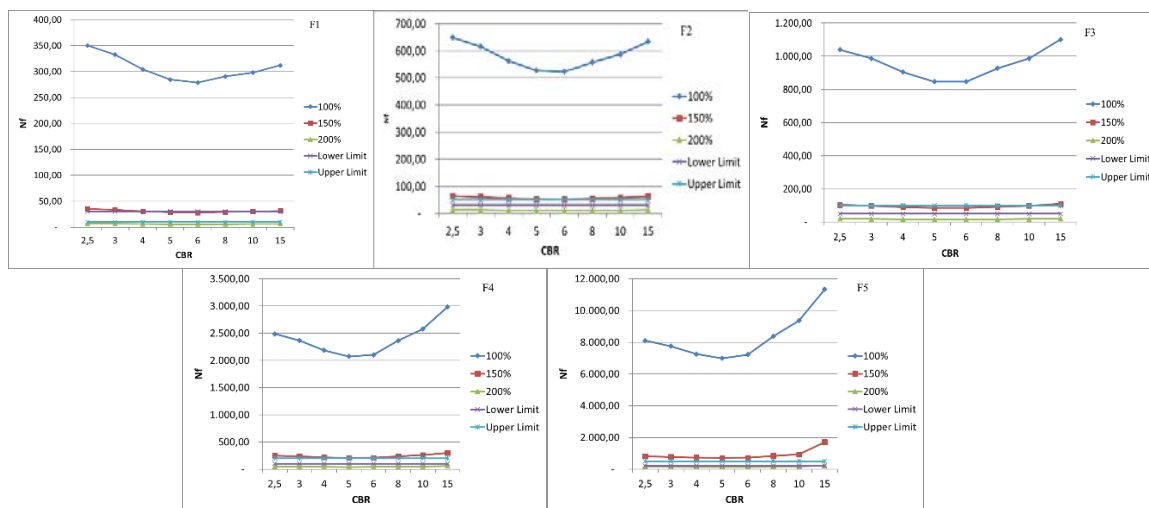


Figure 2. The Relationship of Fatigue Value to CBR

In F1, F2, F4 and F5 designs, the pavement will experience fatigue damage if the Nf value is smaller than the lower limit value. Based on Figure 2, the F1 design at 100% and 150% loading do not experience fatigue damage. Whereas with 200% loading, there is fatigue damage in all conditions of CBR subgrade. This shows that the F1 Pavement design is not designed for loads in excess of 200%.

In the F3 design, pavement will experience fatigue damage if the Nf value is smaller than the lower limit value. Based on Figure 13, F1 pavement design at 100% loading does not experience fatigue damage. With loading of 150%, fatigue damage is not experienced in CBR 2.5 or 15, whereas fatigue damage occurs at CBR 3, 4, 5, 6, and 8. For 200% loading, the grooves are damaged in all CBR values.

4. Conclusion

- Vertical compressive strain values are increased linearly with the addition of loads. This is seen in F1 pavement where normal loading conditions have a vertical strain value of $3.11\text{E-}04$, at 50% loading, a vertical strain value of $4.67\text{E-}04$ is seen, and when excess loading is 100%, there is a vertical strain value of $6.23\text{E-}04$. Likewise, with horizontal strain values.
- Subgrade support and CBR value greatly affect the vertical compressive strain value. In CBR 2.5 to 6 the vertical strain value increases as in F1 pavement from $3.11\text{E-}04$ to $4.03\text{E-}04$ because the thicker the repair, the thinner is the soil. Whereas the CBR 6 to 15 has decreased the vertical strain value as in F1 pavement from $4.03\text{E-}04$ to $2.51\text{E-}04$ because it has increased the CBR value of subgrade.
- The CBR value does not significantly affect the horizontal tensile strain value, because the rutting is located under the upper surface layer.
- The horizontal tensile strain value is affected by the thickness of the paved layer.

References

- [1] Direktorat Jenderal Bina Marga 2017 *Manual Perkerasan Jalan 2017* (Jakarta: Kementerian Pekerjaan Umum dan Perumahan Rakyat)
- [2] Halsted G E, Luhr D R and Adaska W S 2006 *Guide to cement-treated base (CTB)* (Skokie, IL: Portland Cement Association)
- [3] Lv S, Liu C, Lan J, Zhang H, Zheng J and You Z 2018 Fatigue Equation of Cement-Treated Aggregate Base Materials under a True Stress Ratio *Applied Sciences* **8** 691
- [4] Li Q, Xiao D X, Wang K C P, Hall K D and Qiu Y 2011 Mechanistic-empirical pavement design guide (MEPDG): a bird's-eye view *Journal of Modern Transportation* **19** 114–33
- [5] Caliendo C 2012 Local Calibration and Implementation of the Mechanistic-Empirical Pavement Design Guide for Flexible Pavement Design *Journal of Transportation Engineering* **138** 348–60
- [6] Huang Y H 2012 *Pavement analysis and design* (Upper Saddle River: Pearson Prentice Hall)
- [7] Mallick R B and El-Korchi T 2013 *Pavement engineering: principles and practice* (Boca Raton, FL: CRC Press)
- [8] Tajudin A N and Priyatna R 2019 Effect of Axle and Tire Configurations on Flexible Pavement Response *IOP Conference Series: Materials Science and Engineering* **508** 012004
- [9] Behiry A E A E-M 2012 Fatigue and rutting lives in flexible pavement *Ain Shams Engineering Journal* **3** 367–74
- [10] Mu A A and Olow A T 2012 Evaluation of Rutting Models Using Reliability for Mechanistic-Empirical Design of Flexible Pavement *Journal of Engineering and Applied Sciences* **7** 123–7
- [11] Mu A A and Olow A T 2014 Distress Model for Nigerian Empirical Mechanistic Pavement Analysis and Design System *Journal of Engineering and Applied Sciences* **10** 1-5