

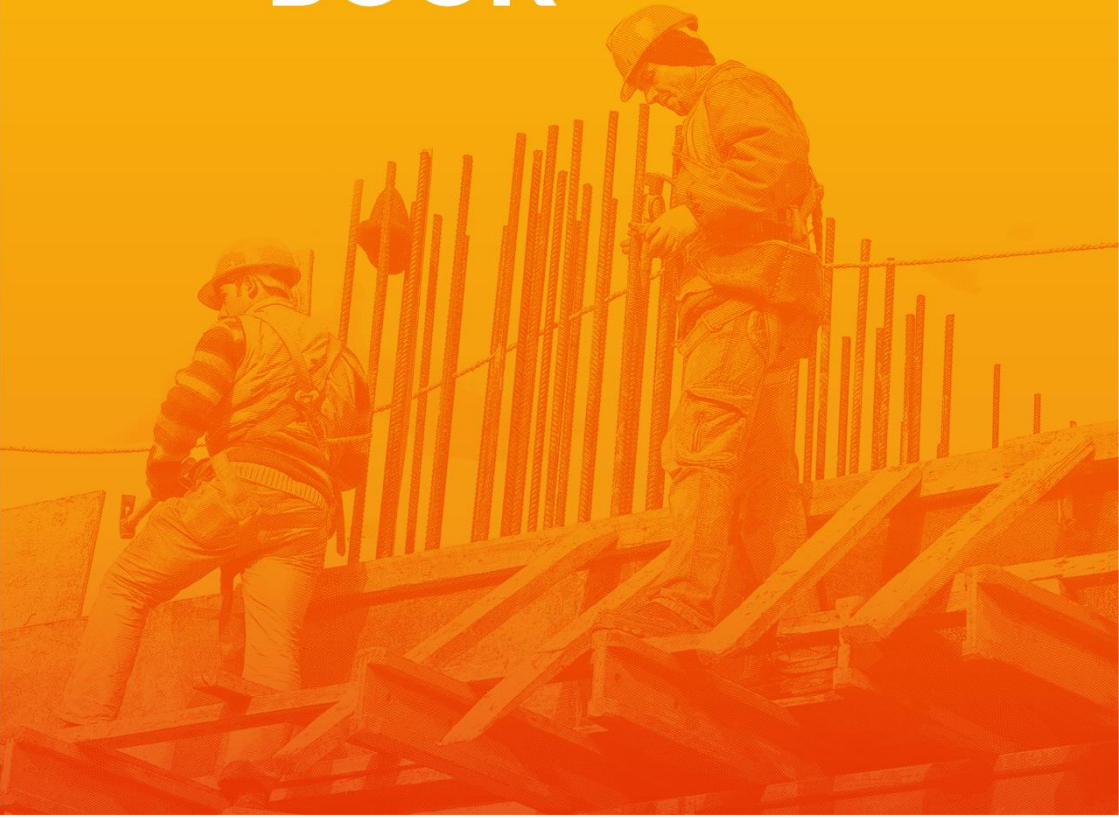
1st INTERNATIONAL CONFERENCE & SYMPOSIUM ON CONSTRUCTION INDUSTRY DEVELOPMENT



I-CENTROID2021

**24-25 AUGUST 2021,
ONLINE FROM UNIVERSITAS ANDALAS, INDONESIA**

PROGRAM & ABSTRACT BOOK



**1st INTERNATIONAL CONFERENCE &
SYMPOSIUM ON CONSTRUCTION
INDUSTRY DEVELOPMENT**

I-CENTROID2021 Conference
Program & Abstract Book

I-CENTROID2021 Conference Program & Abstract Book

Editor : Benny Hidayat

ISBN: -

Credits

Cover photo: edited from photo by freestockcenter,
www.freepik.com

Published by :

Lembaga Penelitian dan Pengabdian Masyarakat (LPPM),
Universitas Andalas.

Kampus Unand Limau Manis, Pauh, Kota Padang
Sumatera Barat.

2021

i-Centroid2021 Website:

<http://unand.net/i-centroid2021>

The committees have been trying to check the typos and the contents of this program & abstract book. If there were still errors and omissions, the committee would fix them in the digital version of this book stored on the i-Centroid2021 website.

Doc. Version: 2.b – 23/08/2021

Preface

We all at Andalas University would like to welcome you to the International Conference & Symposium on Construction Industry Development (i-Centroid). We are delighted to meet you all during this Covid-19 pandemic. Many of our colleagues have been affected by Covid-19; hopefully, they can recover as soon as possible.

We have prepared this Program & Abstract book to help participants join the conference. In this book, there are welcome remarks, a schedule for implementing the conference, presentation schedule, abstracts from the manuscripts, and others. There is also a zoom link to follow this online conference.

Thank you, I hope we have a pleasant conference experience.

Padang, 24 August 2021.

I-Centroid2021 Conference Committee

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Welcoming Message – Rector of Andalas University

Assalamu'alaikum Wr Wb



I am delighted to welcome all participants of the 1st International Conference & Symposium on Construction Industry Development or i-Centroid in Padang, West Sumatra. It is a great honour for Universitas Andalas to host the 1st i-Centroid. This Conference and Symposium are possible by collaborating with our strategic university partner from Indonesia, Malaysia, India, and industry partners.

The construction industry is one of the important sectors that has a significant contribution to the economic growth of a nation. However, it faces many challenges in providing added values in the demanding building and infrastructure provision for all societies. Engineering, social, economic, and environmental aspects have to be taken into account and managed carefully. Therefore, there is a need for cross-discipline and cross-stakeholders to address strategic efforts to create value-added construction. I hope this Conference and Symposium can meet this demand.

I want to send my gratitude to our keynote speakers: Dr. Basuki Hadimuljono (Ministry of Public Work and Housing of the Republic of Indonesia), Prof. Charles Egbu and Prof. George Ofori from the United Kingdom, Dr. Jayaprakash from Mangalore Institute of Technology and Engineering India, Dr. Moh. Fadzil Arshad from UiTM Malaysia, Prof. Krishna S. Pribadi from ITB, and Dr. Akhmad Suraji from Universitas Andalas. I also would like to extend our

great appreciation to our invited speakers, speakers and all participants. I believe the 1st i-Centroid will be a great success and can accelerate Andalas University's vision of becoming World Class University.

I appreciated all the organizing committee members at the Centre for Construction Industry Development of Universitas Andalas who have worked so hard in preparing the Conference. I just noticed that this Centre had just been established in December 2020. With less than one year of its establishment, being able to hold an international conference of this size, I put a lot of hope for this research centre advancing the construction industry world. Congratulations to all of you.

Finally, special thanks also go to all the keynote speakers, authors, reviewers, and participants for their outstanding contribution to this Conference and symposium. Have a great conference.

Wa'alaikumsalam Wr Wb,

Prof. Dr. Yuliandri

Rector of Universitas Andalas
rektor@unand.ac.id



Scan this QR code to view video of welcoming message from Rector of Andalas University.

Welcoming Message - Conference Chair



It is a great pleasure to welcome you to this first International Conference and Symposium on Construction Industry Development 2021 or I-CENTROID 2021. I am delighted to acknowledge high-level participants and delegates joining us online today. It is a pity that we cannot meet face-to-face in Padang City because of the Covid-19 outbreak.

Padang is a lovely city with beautiful scenery and delicious cuisine. Hopefully, the pandemic will diminish soon, and in the future, we can conduct an offline conference in this city.

I would also like to warmly welcome representatives from universities, civil society, postgraduate students, and other stakeholder groups.

Today we are holding a topic discussion about Value Added Construction. In this first I-Centroid 2021, we would like to provide the time and place where delegates worldwide can share excellent opportunities and new ideas and findings. As we all know, the construction industry must provide many added values, such as technology value, economic value, financial value, environmental value, institutional value, political value, social value, and management value for the current and future built environment. This international seminar blended with the symposium disseminates research findings, project case studies, and lessons learned while providing a new progressive consolidated thought among scholars, researchers, practitioners, industry players, and policymakers. In this conference, we propose theories, methodologies, and strategic practices for transforming construction by all industry players for more value-added building and infrastructure development.

By participating in I-CENTROID 2021, one can promote his/her research and professional work, learn and discuss the latest accomplishments, innovations, and potential future directions. We have selected more than 80 qualified papers. All the accepted papers will be published in Scopus indexed proceeding, that is AIP Conference Proceeding. Besides, the symposium will produce a position paper to policymakers and industry players for further consideration in the transforming construction industry.

On this valuable occasion, we have excellent keynote speakers with us. Those are the Minister of Public Works and Housing or his representative, Prof. Charles Egbu and Prof George Ofori from the United Kingdom, Dr. Akhmad Suraji, Prof. Krishna S. Pribadi from Indonesia, Dr. Jayaprakash MC from India, and Dr. Moh. Fadzil Arshad from Malaysia. Many thanks to all keynote speakers who have to give your time and valuable sharing with us today. Appreciation also we say to all invited speakers who also will provide a good remark of this meeting.

Also, more authors and participants are engaged with this conference for this two-day meeting, coming from the United Kingdom, India, Malaysia, South Africa, UAE, Myanmar, Kuwait, and Indonesia.

We thank Prof. Yuliandri - Rector of Andalas University, Dr. Uyung Gatot S. Dinata - Head of LPPM Andalas University, and Prof. Ikhwana Elfitri - Dean of the Faculty of Engineering, Andalas University, who has given his trust and helped organize the first conference by the Center for Construction Industry Development. Also we thank all participants, all co-hosts, all committees, and all sponsorships. This conference can be conducted because of all of you. Without your supports, we will not be here to have this valuable forum.

Hopefully, you all can enjoy this event and may have a good impression for you all. I wish you all a fruitful sharing and discussion.

Benny Hidayat, PhD

I-Centroid2021 Conference Chair

centroid@unand.ac.id

Conference Committee

Steering Board

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Pusat Pengembangan Industri Konstruksi (Puspik) or Center for Construction Industry Development (Centroid) is one of the units at the Institute for Research and Community Service (LPPM) Andalas University.

The Center for Construction Industry Development is tasked with carrying out research, community service, utilizing innovation, publications, and intellectual property rights in the construction industry.



-  <http://centroid.lppm.unand.ac.id/>
-  [centroid.unand](https://www.instagram.com/centroid.unand)
-  centroid@unand.ac.id



Conference Schedule

Day 1: Tuesday, 24 August 2021 (all times in Indonesia Western Time / GMT+7:00)

Time	Activity	Speaker / PIC
07.45-08.00	Conference preparation. Participants can enter the online Conference platform (Zoom Meetin).	Committee
08-00-10.00	<i>Breakout Session: Paper presentation</i> Parallel Session 1 (see page 15)	
	Theme: 1. Material, Engineering & Technology 2. Human Capital, Corporate & Business 3. Organization, Institutional & Regulatory 4. Environmental & Project Management 5. Investment and Financial Development	
10.00-10.45	<i>Opening Ceremony</i>	
10.00-10.10	Indonesian Anthem: Indonesia Raya	Committee
10.10-10.20	West Sumatra Traditional Dance	Committee
10.20-10.25	Report from Conference Chair	Dr. Benny Hidayat
10.25-10.30	Welcome speech from Dean of Engineering Faculty	Prof. Ikhwana Elfitri, PhD
10.30-10.35	Welcome speech from Rector of Universitas Andalas	Prof. Dr. Yuliandri
10.35-11.30	Conference Opening and Keynote Speech from Minister of Public Work and Housing	Dr. Basuki Hadimuljono
11.30-13.00	Break	
13.00-14.30	<i>Plenary Session: Keynote Speech II</i>	
	<ul style="list-style-type: none"> • Keynote Speech 2 	Prof. Charles Egbu (UK)
	<ul style="list-style-type: none"> • Keynote Speech 3 	Prof. George Ofori (UK)

Time	Activity	Speaker / PIC
	<ul style="list-style-type: none"> Keynote Speech 4 	Dr. Akhmad Suraji (Unand, Indonesia)
14.30-16.00	<i>Plenary Session: Keynote Speech III</i>	
	<ul style="list-style-type: none"> Keynote Speech 5 	Prof. Krisna S. Pribadi (ITB, Indonesia)
	<ul style="list-style-type: none"> Keynote Speech 6 	Dr. Jayaprakash MC (India) Anil Cherian
	<ul style="list-style-type: none"> Keynote Speech 7 	Dr. Moh. Fadzil Arshad (Malaysia)
16.00-16.15	Break	
16.15-17.45	<i>Breakout Session: Paper presentation</i>	
	Parallel Session 2 (see page 19)	
	Theme:	
	1. Material, Engineering & Technology	
	2. Human Capital, Corporate & Business	
	3. Organization, Institutional & Regulatory	
	4. Environmental & Project Management	
	5. Investment and Financial Development	

Day 2: Wednesday, 25 August 2021 (all times in Indonesia Western Time / GMT+7:00)

Time	Activity	Speaker / PIC
07.45-08.00	Conference preparation. Participants can enter the online Conference platform (Zoom Meetin).	Committee
08.00-10.00	<i>Breakout Session: Paper presentation</i>	
	Parallel Session 3 (see page 23)	
	Theme:	
	1. Material, Engineering & Technology	
	2. Human Capital, Corporate & Business	

Time	Activity	Speaker / PIC
	3. Organization, Institutional & Regulatory 4. Environmental & Project Management 5. Investment and Financial Development	
10.00- 16.00	<i>Participant can Joint the Symposium*</i>	See page 128
16.00- 16.10	Announcement of Best Presenter	Committee
16.10- 16.15	Closing remark from the Head of Centre of Research and Community Services	Dr.Ing. Uyung Gatot S. Dinata

*Note: The symposium will focus on Indonesian Construction development, so presentation and discussion will be conducted in Indonesian language. The participants which did not attend the symposium please join later the closing ceremony at 4 PM.

Zoom

Please join our conference in zoom meetings with the following setting:

Day 1 (Tuesday, 24-08-2021)

Meeting ID: 815 1947 3550

Passcode: icentroid

Day 2 (Wednesday, 25-08-2021)

Meeting ID: 827 2352 0464

Passcode: unand

Note to Presenters:

- Ready to join the session 5 minutes before the event starts.
- Set zoom name with this name pattern: ID Paper_Full Name (example: 1792_Jati Sunaryati)
- Present your paper effectively and deliver any answer precisely for each question raise during Q&A session. (9' presentation and 3' Q&A, total 12' for one presented paper)
- During the presentation, you shall turn on your video.
- If you are not presenting your paper, you may either turn on or turn off your camera, depends on your internet connection condition.
- Always turn off the microphone when you are not presenting.
- Keep the session running smoothly and avoid any unintentional deeds which may interrupt the session.

- Raise your hand by pressing the reaction button (raise hand) when you want to deliver any comments and/or questions in Q&A session.
- Presenters/authors shall consider all comments and/or questions to their revised manuscript before submitting it to the committee.

General Participants:

- Ready to join the session 5 minutes before the event starts.
- Use this name pattern: Full Name_Institution (example: Jati Sunaryati_UiTM)
- You may either turn on or turn off your camera, depends on your internet connection condition.
- Keep the session running smoothly and avoid any unintentional deeds which may interrupt the session. By default, please turn off your microphone.
- Raise your hand by pressing the reaction button (raise hand) when you want to deliver any comments and/or questions in Q&A session.

Parallel Sessions

Parallel Session 1

Date : 24 August 2021
Time : 08.00 - 10.00 (GMT + 7)
Session : Parallel Session I
Room : 1 (ENGR)

Paper Id	Author	Title	Page
1634	Listya Dewi, I Nengah Sinarta, Putu Ika Wahyuni	Analysis Comparison of Moment Resisting Frame System and Concentrically Braced Frame System using Inverted – V Brace	62
1590	Petrus Haryanto Wibowo, Lilis Lilis	Analysis of Strengthening of Existing Foundations and Pile Foundations in Santika Hotel Construction	39
1592	Sunarto Sunarto, Indra Prawira	Experimental Study on the Effect of Fiberglass Admixture Towards Compressive Strength of Lightweight Cellular Concrete	40
1700	Aan Andriawan	Estimation of Local Road Maintenance Based on KRMS (Kabupaten Road Management System) and LCCA (Life Cycle Cost Analysis)	93
1595	Rendy Thamrin, Nada Milani Azrita, Nidiasari	Flexural Analysis of T Prestressed Beams Section with Variations of Reinforcement Ratio and Pre-strain Values	42
1653	Fathol Bari, Julita Andriani Repadi, Abdul Hakam, Febrin Anas Ismail, Andriani, Bayu Martanto aji	Optimization of Gravity Walls and Cantilever Walls	70

Paper Id	Author	Title	Page
1580	Andri Irfan Rifai, Maya Tri Hastuti	Analysis of Urban Public Transport Users' Satisfaction: Tanjung Priok Port Route by JakLingko Integration System Case Study	33
1718	Widya Apriani, Hendri Rahmat, Fadrizal Lubis	Dynamic Response of Arch Bridge Structure with Dynamic Motion Simulator Testing	109
1665	Elsa Eka Putri, S.C Liew, Mohammad Abdul Mannan, Ron Aldrino Chan @ Ron Buking, Larry Silas Tirau	Distress modeling and Analysis using StromPav precast for road flexible pavement infrastructure	82

Date : 24 August 2021
 Time : 08.00 - 10.00 (GMT + 7)
Session : Parallel Session I
Room : 2 (EVPRJ)

Paper Id	Author	Title	Page
1633	Desiderius Viby Indrayana, Krishna Suryanto Pribadi	A Proposed Framework of Measuring Maturity of Safety Leadership in Construction	61
1591	Jody Martin Ginting, Andri Tarmansyah	Correlation Analysis between GPM and GSMAP Satellite Rainfall to Field Rainfall Data on Balo Watershed Batam	40
1596	Tri Rahayuningsih, Yantri Maputra, Jefril Rahmadoni, Anip Febtriko, Suci Windi Dewani	Web-Based Career Planning Guide in The Construction Business for Career Decision Self-Efficacy in Engineering Students (e-CarPlan)	43
1607	Benny Hidayat, Akhmad Suraji, Ilham Akhmad Syauki	Factors Causing Work Stress on Contractor Employees in Padang City	48

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1660	Rico Samuel, Ratih Fitriani	Conceptual Framework of Construction Cost for Improving Construction Safety Performance	78
1664	Erwin Ibrahim, Fathoni Usman, Sumi Amariena Hamim	Evaluation of Village Development Index using Geospatial Analysis in Determining Inequality Development	80
1720	Anita Lesya, Benny Hidayat, Taufika Ophiyandri	Multi-criteria Analysis for Soft Soil Improvement Decision Making Case Study: Padang - Sicincin Toll Road Project	112
1721	Wenda Nofera, Yervi Hesna	Research Synthesis on Construction Crew Design as an Essential Part of Lean Production System Design	113
1727	I Made Budi Atmika, Putu Ika Wahyuni, I Nengah Sinarta	Implementatiom Of Construction Management System Based On Information Technology (IT) And Integrated Towards Digital Construction And Industry 4.0	118

Date : 24 August 2021
 Time : 08.00 - 10.00 (GMT + 7)
Session : Parallel Session I
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1627	Usmanul Hayadi Umar, Rizki Dwi Putra	Price Increase Analysis of Residential Property in Batam	59
1659	Mediana Desfita, Taufika Ophiyandri, Benny Hidayat, Djendrius	Gender Mainstreaming in Post Disaster Reconstruction in Minangkabau	76
1663	Mochamad Yusuf Hariagung, Yusuf Latief, Ahmad Jaka Santos	Housing Provision for Low and Non-fixed Income Communities in Metropolitan City of Indonesia	80
1666	Wawan Setiawan, Muhamad Abduh	Comparative Study of Construction Industry Growth and GDP Growth in ASEAN Countries	83
1668	Yosritzal Yosritzal, Muhammad Ammar Adzdzikri	Attitudes of Cycling Enthusiasts to "Cycle to Work" Policy in Padang City, Indonesia	84
1643	Adriadi, Ariostar, Shendy Irawan, Andiyan	Wood Efficiency as a Supporting Material for Concrete Casting and Ceiling Frames in High-rise Buildings	64
1606	Yervi Hesna, M Rifqi Maulana, Adila Adisti	Life Cycle Cost Analysis of Universitas Andalas Students Flat Building	47

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Date : 24 August 2021
 Time : 16.15 - 17.45 (GMT + 7)
Session : Parallel Session II
Room : 1 (ENGR)

Paper Id	Author	Title	Page
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1628	Salmaliza Salleh, Munir Alhallak, Walisijiang Tayier	Analysis Of Concrete Performance from Different Waste as Partial Cement Replacement	60
1724	Masrilayanti, Jati Sunaryati, Riza Aryanti, Helfial Rizky, Redho Alfaro Zamer	The Behavior of Castellated Beam under Different Holes Distance	116
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GABUNGAN TENAGA AHLI DAN TERAMPIL KONSTRUKSI INDONESIA

GATAKI

GATAKI was formed on January 1, 2009 by several leaders of the National Construction Services community with the aim of being a forum for association of National Construction Experts and Skilled Workers and in realizing the quality of reliable and competent construction service human resources to support national development.

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PERKUMPULAN PELAKSANA KONSTRUKSI NASIONAL



<https://aspeknas.or.id>

ASPEKNAS was formed as a gathering place for construction service business entities, especially those engaged in Construction Implementers with the aim of fostering and developing the ability of the Construction Implementing community to become professional, modern and independent. Establish a dynamic and synergistic partnership relationship with the Government and support the implementation of the construction services business. Discuss and formulate thoughts towards the development of National construction services. Develop the role of community supervision and provide input to the Government in formulating policies, regulations, empowerment and supervision in the field of Construction Services.



Asosiasi Tenaga Teknik Konstruksi Indonesia

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Abstracts

ID-1580

ANALYSIS OF URBAN PUBLIC TRANSPORT USERS SATISFACTION: TANJUNG PRIOK PORT ROUTE BY JAKLINGKO INTEGRATION SYSTEM CASE STUDY

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ABSTRACT

JakLingko is an integrated transportation system for public transportation services in Jakarta, which is currently being developed. This new system approach is one of the government's efforts to increase public interest in switching to mass transportation. This study aims to determine passengers' level of importance and satisfaction with the services provided by urban transportation on the Tanjung Priok port route by the JakLingko integration system with the Importance Performance Analysis (IPA) method. Based on the results of research and analysis related to performance, it shows that fourteen attributes are considered very important with an average weight of 4.31 from a scale of 5.00 in determining customer satisfaction. The highest level of importance is the safety and security of passengers during the trip. At the same time, the passenger satisfaction criteria for service performance assessment are included in the satisfied category with an average weight of 3.54 from a scale of 5.00 with the highest level of satisfaction, namely accessibility to transportation mode.

ID-1582

FACTORS AFFECTING TOTAL QUALITY MANAGEMENT IMPLEMENTATION IN THE CONSTRUCTION INDUSTRY- A STUDY REVIEW

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ABSTRACT

TQM is an organisation idea of regularly enhancing the superiority of the products as well as services by concentrating on the customers necessities and desires to improve customer satisfaction. This paper aimed to review previous literature on various issues affecting TQM implementation in the construction industry such as absence of benchmarking, employee confrontation to change, absence of understanding, inadequate preparation, absence of top management obligation, absence of customer focus, absence of rewards and acknowledgment, inadequate evaluation processes, insufficient fund, inefficient management, inadequate raw materials, lack of proper communication and Unproductive leadership. The findings from the extensive literature review form previous researches are cross-sectional. According to the previous research, it was revealed that those challenges of total quality management are vary.

ID-1585

CONSTRUCTION SAFETY RISK ANALYSIS WITH INTEGRATED QUANTITATIVE MULTIPLE RISK ANALYSIS

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ABSTRACT

In PERMEN RI Number 21/Prt/M/2019 Article 3 Paragraph 1 concerning Guidelines for Construction Safety Management Systems. In the implementation of the Construction Safety Management Systems, the Construction Safety Plan is a complete document for the implementation of the Construction Safety Management Systems in the contract document. Construction Safety Risk Assessment. The Construction Safety Risk Assessment consists of Activity Description, Hazard Identification/Accident Type, Hazard Impact, Frequency, Severity, and Risk Level whose assessment is in the form of linguistic variables. Linguistic variables can be calculated using fuzzy theory. Fuzzy theory provides a way to represent impression values. In the fuzzy logic calculation process, it consists of fuzzification which represents linguistic values into numerical values, inference process to convert fuzzy input into fuzzy output by following twenty-five rules (if-then rules) that have been set, defuzzification, namely changing the process to change the fuzzy output that obtained from the inference engine into a firm value using a membership function that corresponds to the time of fuzzification. This research produces an application that makes this process easier. The application called "IQUMRA Construction Safety v0.1" uses the Python 3 programming language, with supporting libraries namely NumPy, Matplotlib, and Tkinter. The input variables used to make the application are probability (P[E]) and impact (P[I]), and the output variable is the value of construction safety risk by making a fuzzy logic process accompanied by if-then rules from the two inputs. produces a representative output of the value of the calculated linguistic variable. Input the value of the construction safety calculation in this application with a job description of Girder Installation Work, Work Method "Installation of Steel Bracing and Pedestals", Hazard Type "Girder Overturned", Possibility of danger (P[E]) "High", Impact on workers (P [IPE]) Very Large, Impact on the public (P[IPU]) Large, Impact on property (P[IPN]) Very Large, and Impact on the environment (P[IL])

Medium with The fuzzy logic process that has been programmed produces a representative risk value for workers 3.84 (Very Severe), public risk 3.75 (Severe), property risk 4.00 (Very Severe), environmental risk 3.50 (Severe).

ID-1587

BUILDING INFORMATION MODELLING FOR INFORMATION MANAGEMENT IN THE CONSTRUCTION INDUSTRY: A SYSTEMIC REVIEW APPROACH

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ABSTRACT

Information is derived from the interpretation and understanding of information contextually. Information has been adjudged to be very important in any contemporary society. Information in the construction industry is significant as it is the things shared among project stakeholders from inception to completion to achieve the client objective. Tracking, security, retrieval and control of information in the construction industry has become tasking as there is an increase in the production of documents and its distribution channel. Due to this reason, there is a challenge of information fragmentation, non-accessibility, possible loss, and non-traceability. To solve this, there is a need to manage information for day-to-day usage in the industry. This is because information technology is gaining more grounds globally. To solve this menace, this study employs a systematic review of how Building Information Modelling (BIM) can be adopted for information management in the construction industry. Findings from the study revealed that information can be adequately managed using

BIM by applying intelligent management principles of BIM which include planning the information management process, organizing the information into the different categories, as well as the development of control over information and information access and usage.

ID-1588

THE INFLUENCE OF INSTITUTIONAL SUPPORT AND ENTERPRISE AGILITY ON THE PERFORMANCE OF REAL ESTATE DEVELOPERS IN INDONESIA

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ABSTRACT

This scientific writing aims to study the relationship between institutional support and enterprise agility on the performance of real estate developers in Indonesia. Real estate developers play an important role in providing affordable housing for Low-Income Communities in Indonesia. This research deals with the national issue of housing backlog, which reached 11.4 million units in 2019. Previous findings show that the most significant contributor to the provision of low-cost housing in Indonesia is SME real estate developers who are members of the association of REAL ESTATE INDONESIA (REI), which most have managerial and resource limitations. Several literature reviews identified that institutional support, enterprise agility, and network structure positively affect firm performance. The data of housing backlog looks to improve slightly from 13.5 million in 2014 to 11.4 million in 2019. This is in line with the support of the government and REI institutions in enhancing the competence of REI members through LSP-REI and DIKLAT-REI, including increased knowledge about the enterprise agility strategy to face changing business environment

(PESTLE) and build partnerships to strengthen the company resources and capabilities. The research methodology uses literature review and best practices in the real estate industry to find the critical success of real estate developers who have good performance and can manage their real estate business sustainably. The results show institutional support and enterprise agility have a positive effect on firm performance.

ID-1589

A REVIEW OF NATURAL LANGUAGE PROCESSING IN THE CONSTRUCTION INDUSTRY

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ABSTRACT

This paper aims to review previous literatures on Natural language processing (NLP) in the construction industry. Various language theories were reviewed such as innate theory, input theory, and cognitive theory relating to the construction sector. The study also reviewed several applications of natural language processing in the construction industry which consists of word prediction, speech recognition, processing the context, utilizing web-based information, mining the linguistics context, partners recognition, text simplification and summarization, location, and time. Additionally, as part of the NLP benefits, it was discussed that NLP provides hypothetical grounds as well as useful applications for the technology-based computer systems in the construction industry. This study reviewed various research conferences, articles in journals, dissertations, and books. It

is highly recommended that the effective utilization of NLP by professionals in the construction industry should be encouraged.

ID-1590

ANALYSIS OF STRENGTHENING OF EXISTING FOUNDATIONS AND PILE FOUNDATIONS IN SANTIKA HOTEL CONSTRUCTION

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ABSTRACT

In the world of infrastructure, many innovations have been applied to construct buildings, multi-story towers, bridges, and so on related to development. This study aims to analyze the types of existing foundations, find out the function of each of these foundations, and analyze the strengthening of the foundation on the Santika Hotel construction project using bored piles. The method used in this research is the quantitative approach. Data analysis was carried out by observation, literature review, and interview. Based on the results of the calculation, it was found that an additional 75 piles or 32 bored piles were needed to have a strong foundation bearing capacity to prevent building collapse. The cost required to add 75 poles is IDR 710,750,000, then to add 32 bored piles is IDR 992,277,000.00. This calculation indicates that the addition of piles can save more costs than adding a bored pile foundation from a cost-efficiency perspective.

ID-1591

CORRELATION ANALYSIS BETWEEN GPM AND GSMAP SATELLITE RAINFALL TO FIELD RAINFALL DATA ON BALO WATERSHED BATAM

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ABSTRACT

The importance of planning in the network of rain measuring stations in the field of hydrology can provide the amount of rain that falls on a watershed, so that it can be used for various purposes, including to analyze floods, determine flood discharge plans, analyze water availability in rivers and others. Some of data were complete and could be used to be researched, but some of data were missing because of many aspect or factor. The missing data could be replaced by the satellite rainfall data. The are 2 rainfall satellite data that could be used, named GPM and GsMap Jaxa. In this research, authors would like to find the correlation between satellite data and field data. Research method was by comparing data using frequency analysis method. There are 2 methods to analysis the frequency of data, Smirnov-Kolmogorov and Chi Square Method. Frequency analysis method was tested to all rainfall data, field data, GPM and GsMap Jaxa. Testing was conducted on field rain data and then compared to GPM and GsMaP satellite rain data.

ID-1592

EXPERIMENTAL STUDY ON THE EFFECT OF FIBERGLASS ADMIXTURE TOWARDS COMPRESSIVE STRENGTH OF LIGHTWEIGHT CELLULAR CONCRETE

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ABSTRACT

Due to the rapidly developing globalization era on either building or infrastructure during the recent years, the application of concrete is also increasing. The analysis was conducted experimentally. The sample test of concrete was created in 15x15x15 cm by substituting fine aggregate with the fiberglass admixture. As a result, lightweight cellular concrete has been implemented in numerous countries, such as The United States, Great Britain, and Sweden. The advantage of lightweight cellular concrete is the density of concrete less than 1900 kg/m³, low heat conductivity, and decreasing dead loads. The main goal of this research work was to figure out the effect of Fiberglass admixture towards compressive strength of lightweight cellular concrete. In this paper, a block of lightweight cellular concrete was created by mixing 14.53 MPa concrete with 10% of Air Entrained Agent, followed by 1%, 2%, and 3% fiberglass. From day 28 of this experiment, it can be concluded that the lightweight cellular concrete experienced a significant reduction in its compressive strength, which were 62.03%, 86.17%, 91.39%, and 96.77%.

ID-1594

A THEORETICAL REVIEW OF QUALITY FACTORS IN THE NIGERIAN CONSTRUCTION INDUSTRY

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ABSTRACT

This study aims to review literature on quality factors in the Nigerian construction industry (NCI). Quality can be described as the meeting of

requirement of designer, contractor, regulatory authority, and clients. This study discussed various quality factors influencing the performance in the Nigerian construction industry such as conformance to specification, absence of competent staffs, superiority of equipment and raw materials, and quality of evaluation system, unavailability of competent staffs, limitation to finance, issues of labour and wage, weather condition, restriction of building plan and construction details, issues of construction methods, training policies, and inadequate coordination among departments. The study also discussed various theories of quality in the construction industry such as Deming theory of quality, Juran theory, and Ishikawa theory of quality. In this study, various principles surrounding quality were reviewed. The study also discussed various significance of managing quality in the Nigerian construction industry. It is recommended that issues of quality should be taken serious in the Nigerian construction industry.

ID-1595

FLEXURAL ANALYSIS OF T PRESTRESSED BEAMS SECTION WITH VARIATIONS OF REINFORCEMENT RATIO AND PRES-STRAIN VALUES

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ABSTRACT

In Indonesia, there are various types of building construction, one of them is a building. A building structure is composed of several structural components, including beams. Therefore, structural planning is a very important factor and should be considered. Advances in construction technology in today's modern era, also accompanied by the increasing use of concrete in the construction

world, making prestressed concrete can be used as one of the best options and solutions to meet concrete needs because prestressed concrete has many advantages over concrete. Therefore, an analysis of the flexural capacity of the prestressed T-beam was carried out using the software RCCSA (Reinforced Concrete Cross Analysis) V4.3 and Response2000. The beam model used has three types of cross-sections which have the same area of 260000 mm². Variables carried out in this journal are 1) reinforcement ratio 2) the stress value applied to the tendon. The flexural capacity in the cross-section is obtained without taking into account the stresses that occur in the beam due to external loads. From the results of this study, prestressed T-beams with a larger reinforcement ratio have the greater flexural capacity but are accompanied by a decrease in cross-sectional ductility.

ID-1596

WEB-BASED CAREER PLANNING GUIDE IN THE CONSTRUCTION BUSINESS FOR CAREER DECISION SELF-EFFICACY IN ENGINEERING STUDENTS (E-CARPLAN)

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ABSTRACT

Career exploration as one of the tasks of individual development still caused problem that has an impact to lack of confidence on students when they want to decide a career choice after graduated. Career guidance is needed. Although there are many career intervention

models, one of which used a career planning guidebook. The trainer has to make an effort to use innovative ways to capture students attention and make the process become more enjoyable and effective. However, there has been no yet research on the effectiveness of career planning guide measured by web application, so make it easier for students to get an overview of their career planning and helped academicians to predicted career decisions self-efficacy in field of entrepreneurship. Especially during the Covid-19 pandemic, the used of open online course and assessment offered by web application more efficient. Therefore, this study was carried out with the objective to determine the effectiveness of web-based career planning guide (e-CarPlan) toward career decisions self-efficacy in construction business. Online measurement for evaluations were used to collect data from 44 civil engineering students and the scales were tried out among 127 students from three universities. Descriptive analysis and regression were used to forecast the results of the categorization showed factors entrepreneurial career decision. In conclusion, e-CarPlan offers the usefulness a new career planning technology.

ID-1598

MIDDLE EAST EXPERIENCES WITH BIDIRECTIONAL STATIC LOAD TESTING (BDSLTL) ON BORED PILES

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ABSTRACT

Static load tests are considered the most reliable method to assess individual pile performance in the realm of foundation engineering. For the last few decades, an innovative method for testing the bored pile capacity by means of the Bidirectional Static Load Test (BDSLTL), a self-balanced test, has been proved advantageous over the routine

axial load testing method in many aspects. The load applied through the specially designed sacrificial jack makes it possible to measure simultaneously the displacement of upper and lower sections of the foundation element, enabling the separation and accurate measurement of the shaft and tip resistances. Even though the traditional top-down test has several disadvantages including longer preparation time and reaction system influences, many researchers and practicing engineers have been still concerned about the BDSLT method. This paper discusses the successful application of bi-directional static load testing in different projects in the Middle East to give assurance to use in future infrastructure projects.

ID-1599

UPDATING THE SKILLS-SET REQUIRED FOR THE DIGITAL TRANSFORMATION OF THE FUTURISTIC BUILDING INDUSTRY

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ABSTRACT

The skills regarding the building profession have undergone various changes during the evolution in the building industry over the past century. Due to the advancements in the building sector, the inherent disciplines have developed a defined set of skills. This study explores the relevant skills in the building industry, comparing the current skills to the evolving skills to ensure the continued relevance of professionals in the futuristic building industry. In order to fulfil the aim of the study, a descriptive methodology was utilised through a quantitative approach. Data for the research was gathered through a survey of building industry firms in South Africa. The multi-disciplinary nature of the building industry requires professionals to be equipped with

valuable skills applicable and relevant in the professional world. In conclusion, It is pertinent to note that current, evolving, and future skills may transform from time to time. This makes it highly important for building professionals to update their skills from time to time in order to remain relevant in the digitally transformed 21st-century futuristic building industry.

ID-1605

INTERVENTION OF BIOMIMICRY FOR SUSTAINABLE CONSTRUCTION: THE USE OF BIO-CONCRETE

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ABSTRACT

Biomimicry construction is defined as the science and art of solving human construction difficulties through emulating best biological proposition of nature. The benefits of biomimicry includes environmental and aesthetic factor. When building tree-like structures and other typical aesthetics with traditional materials, the looks are functional and stylish. However, biomimicry can innovate a structure which is much more environmentally sound and efficient. The use of materials such as bio-concrete increases environmental impacts exponentially. One of the major benefits of bio-concrete is that it is self-healing and it increases the effectiveness of any project design. Also, it aids and promotes sustainability in the construction industry. Concrete is hard-wearing, economical and safe but harbors crucial environmental concern. Making it necessary to encourage sustainable development through the reuse of buildings as the greenest option. Sustainable construction implies the use of materials that can be renewed and recycled, as well as reduce waste and energy

consumption when building new edifice. To examine this intervention, this study employs a systematic review and site observation of how the use of bio-concrete can be adopted for the construction of buildings in the construction industry. Findings from this study revealed that biomimicry has helped to aid the development of sustainable construction. The use of bio-concrete which is a by-product of biomimicry will enable buildings to last for decades and also reduce maintenance cost. The usage of bio-concrete will also reduce concrete negative impact on the environment. The study concluded that the cost of producing bio-concrete is lesser than that of traditional abiotic reinforced concrete. By using bio-concrete for construction, assurance of a healthy environment is achievable and housing facilities can be easily made accessible and affordable.

ID-1606

LIFE CYCLE COST ANALYSIS OF UNIVERSITAS ANDALAS STUDENTS FLAT BUILDING

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ABSTRACT

Life Cycle Cost (LCC) analysis is a method that applied due to the awareness of engineers that the cost of an infrastructure is not only limited to construction costs. During the service life of the building, the construction project does not only bear the construction costs. There are at least four types of costs that arise during the service life of the building, namely construction costs, operational costs, maintenance costs and demolition costs. The accumulation of the four types of costs

is called life cycle costs. Calculation of the life cycle cost in student flats building will be very important, because during the service life of the building incur a lot of other costs to support their occupants. The purpose of this study was to obtain the life cycle cost of the Student Flats of Andalas University. The method used is to calculate all costs incurred using the present worth method approach. The present worth method itself is to convert current or future costs to a period of time and is usually converted to the time the first expenditure occurs. So during the service life of the building, the annual average interest rate will be estimated as a reference for the increase in the price of construction goods and services. The results of the study found that, construction costs are the costs most incurred during the service life of the building, namely 48.57% of the total LCC. Then the cost of maintenance and replacement cost of 30.54%. While the operational costs 20.01% and demolition costs around 0.88%. It can be concluded that other costs that arise apart from the construction costs are quite significant. With the life cycle cost analysis, it can also provide an overview to the building management and ensure the sustainability of the cost of using the building.

ID-1607

FACTORS CAUSING WORK STRESS ON CONTRACTOR EMPLOYEES IN PADANG CITY

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ABSTRACT

Construction Management Engineers often deal with the safety of every employee in a construction work, because workers are the most dominant and the main motor in resources in the construction world. The quality of a worker can be determined technically or mentally.

Good or bad mental workers depend on how the ability of workers to deal with work pressures. Stressed workers will reduce the quality of their work which will have an impact on work productivity and the success of a construction project. Most work accidents are triggered by workers who experience stress due to decreased concentration of workers. This research was conducted by collecting stress-causing factors obtained from descriptive analysis and then used as questionnaire variables and then processed by factor analysis methods. This study aims to determine the factors that cause stress among contractor employees in the city of Padang. The study was conducted on 51 respondents with 40 variables causing stress factors and obtained 2 factors consisting of 10 variables through factor analysis. The first factor consists of five variables, namely: No career advancement or never given a promotion, Bad relationship with superiors, Employees' opinions are not listened to in decision making, Bosses do not give clear instructions, Bosses in the company in leading create a sense of tension, anxiety and afraid of his subordinates. The second factor also consists of five variables, namely: Doing tasks outside the main task, Poor lighting in the workplace, Lack of privacy in the workplace, Special material requirements for work are not available, and Funding for project work is jammed.

ID-1608

REVIEW ON UTILIZATION OF SOLID WASTE MATERIALS AS ALTERNATIVE FILLER IN SPLIT MASTIC ASPHALT MIXTURE

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ABSTRACT

The use of waste in asphalt mixture is one way to manage the pollution in natural environment as it can reduce the consumption of non-renewable resources. This literature study discusses the utilization of 14 types of wastes from various sectors such as the industrial, agriculture, municipal, mining and construction, as filler in asphalt mixtures. This study investigates the physical and chemical properties of these underutilized wastes and compares their effect on the performance of the pavement mixtures. This literature study aims to motivate researchers working on sustainable engineering and serves as a guide for use of new fillers in construction industry as well as highlighting areas that may require further research and refinement. In conclusion, the study summarized that the use of waste materials as fillers in the Split Mastic Asphalt pavement in optimal levels will result in production of sustainable asphalt mixtures

ID-1609

BEHAVIOR OF REINFORCED CONCRETE STRUCTURE UNDER LATERAL LOAD WITH PERFORMANCE BASED PLASTIC DESIGN (PBPD) METHOD

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ABSTRACT

Indonesia is one of the countries that is currently developing high-rise buildings, not only in the city center but also in the residential areas. With so many high-rise buildings, it raises the question of whether the building can be strong and safe and not endanger the lives of the people inside. This problem is generally caused by natural disasters, namely earthquakes. To withstand the earthquake forces acting on the

building system, a building structure that is planned based on the regulations for earthquake resistant planning is needed. Indonesia is currently using the guidelines of SNI 1726:2019 regarding procedures for planning earthquake resistance for building and non-building structures which is a replacement regulation for SNI 1726:2012. In addition, researchers Liao & Goel (2010) have also developed the Performance Based Plastic Design (PBPD) method which is used for steel structures, but now it can also be used for reinforced concrete structures. In this study, a study was conducted on a 10-story reinforced concrete structure that was given an earthquake load in the form of lateral forces based on SNI 1726:2019 and the Performance Based Plastic Design (PBPD) method. After that, a pushover analysis was carried out where the structure was really pushed (push) to obtain lateral load resistance followed by yielding gradually until plastic deformation occurred. From the pushover analysis, the ductility value for SNI 1726:2019 is 3,052 and for the Performance Based Plastic Design (PBPD) method, it is 3,115. The structural performance level for SNI 1726:2019 is included in the damage control level and for the Performance Based Plastic Design (PBPD) method, it is included in the life safety level

ID-1610

COMPARISON OF FIVE SPANS PRESTRESSED CONCRETE BRIDGE STRUTURAL RESPONSE DUE TO DIFFERENT EARTHQUAKE LOADING

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ABSTRACT

Indonesia is included in an earthquake-prone area so it requires a lot of research on earthquakes. With the increasing number of studies, the

risk due to earthquakes can be better understood and mapped, especially the risk of damage to important structures in the road network system such as bridges. On a toll road section, the bridge structure is an important element to keep the road network functioning. The most common types of bridges built on toll roads in Indonesia are reinforced concrete bridges with superstructures using beam girders (PCI-girders, PCU-girders, Steel Box Girders and others). The bridge is then analyzed relating to response of the bridge structure due to different kind of earthquake in the form of internal forces and displacement both in terms of static and dynamic analysis.

ID-1612

PROJECT QUALITY CONTROL WITH THE IMPLEMENTATION OF ISO 9001 2015 (CASE STUDY CONTRACTORS IN BATAM)

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ABSTRACT

Abstract. Project management is the main thing in a work process/project implementation because running the project becomes more controlled; the project's success rate becomes higher. The success rate is measurable from Triple Constraints, where all three limitations are quality, time, and budget. Quality control plays a core role in the running of a project. The rate in ISO 9001: 2015 is the fulfillment of the requirements. Therefore, correct quality control should be done and applied based on good standardization. ISO 9001: 2015 is now the standard and guideline of many companies, especially contractor companies in Indonesia, in controlling the quality of products/services. The purpose of this study's results is to know how the form of excellent and correct quality control based on ISO 9001: 2015 and the influence gained by the application to contractor

companies Batam. And can know and understand the importance of proper quality control management in implementing construction projects to minimize the failure rate. The method used in this study is a questionnaire/ questionnaire. The questionnaire results obtained from respondents will be conducted validity test, reliability test, and descriptive statistical analysis using SPSS application program Windows 25.0. In this study, as many as 35 workers from 7 different contracting companies in Batam City will be given questionnaires related to project quality control with the implementation of ISO 9001: 2015. Then from the test results, obtained validity rate of 100%, reliability level 0.954, as well as descriptive statistical analysis to find the top 10 variables with the most affect the quality control of the project with the application of ISO 9001: 2015 to contractor companies in Batam, which is the scope of the input, process, and output stages in quality management based on ISO 9001: 2015.

ID-1616

STRUCTURAL PLANNING OF FEB-UNUD BUILDING USING SHEAR WALL SYSTEM

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ABSTRACT

Earthquake is a dynamic load can cause a very large lateral force and often as the main factor causing damage to structures. Shear wall is a wall that functions as a continuous stiffener to the foundation and it is a core wall for rigging a building designed to withstand shear and lateral forces due to earthquakes. In the planning at the FEB Udayana University building, the constituents were carried out by re-planning

the supper structures such as columns, beams, floor and shear walls using reinforced concrete material, the upper structure using heavy steel on the roof frame, in the sub structure still using reinforced concrete material on the tie beam and pile cap, while the foundation will be re-planned with the pile foundation. In the results of manual structural analysis by entering the applicable rules in Indonesia and analysis assistance with the ETABS program for re-planning at the FEB Building, Udayana University, the results of analysis with the addition of shear walls have no effect on the performance of the existing structure. In this plan, there was the addition of longitudinal and transverse reinforcement in beam and column cross sections. The example was taken from beam B2 Existing dimensions 350mm x 700mm, 8D-19, 3 feet stirrup. Due to the addition of the shear walls 350mm x 500mm, 9D19, 4 feet stirrup. As for the example of column cross section, namely column type K1. Existing dimensions of 700mm x 700mm, 20D-22, 3 feet stirrup. Due to the addition of a 600mm x 600mm shear wall, 16D19, 4 feet stirrup. For foundations, the cross-sectional capacity of the existing pile cap on the whole is still able to accept the working load due to the addition of shear walls, so for the planning of a building it is very important to plan shear walls. Therefore, the shear walls can work optimally for a building.

ID-1617

PLANNING OF SUBMERGED BREAKWATER WITH ARTIFICIAL STONE MATERIAL (TRIBAR) IN PABEAN BEACH, GIANYAR REGENCY

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ABSTRACT

Pabean Beach is located in the Ketewel village area which has an area of 6.75 km² with a length of ± 750 m. In the pabean beach area, there is Pura Sang Hyang Aya where the condition of the temple has been severely damaged due to abrasion. Looking at the current conditions need to be planned alternative breakwater building with the aim to break the energy of a large wave before it reaches the beach. In this planning selected building type submerged breakwater with tribar material, tribar was chosen to make it easier to get the weight of materials needed because tribar is precast concrete. The results of the analysis showed the height of the submerged breakwater building was 2.45 m, the weight of the first protected layer stone was 200 kg, the weight of the second layer stone was 20 kg, the weight of the core layer was 1.0 kg. The width of the top is 3.00 m, the width of the foundation is 1.70 m, the thickness of the foundation is 0.90 m. Based on stability control the foundation obtained NS3 results are 21 24 so that the control is safe. The budget plan for planning the submerged breakwater was IDR 6,661,140,000.

ID-1618

USE OF UHMWPE AS AN ADDITIVE IN ASPHALT MIXTURE

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ABSTRACT

Indonesia is the fourth most populated country in the world. Total vehicles in Indonesia is 154,376,369 units in 2018-2020, which means there are around 232 units vehicles every km. However, many roads in Indonesia cant provide minimal conditions for preventing destructions due to failure of the road. The purpose of this study was to investigate the Marshall Tests properties effect (such as: Marshall

Stability, Flow, Marshall Quotient, Density, VFWA, and VITM) of adding crumb of Ultra High Molecular Weight Polyethylene (UHMWPE) into asphalt mixture, as UHMWPE is a polymeric material that known as the strongest. In this study, two different UHMWPEs crumb contents (1% and 2% by weight of aggregates total weight) and two different UHMWPEs crumb sizes (#50 and #3/4) were investigated. A comparative study was done among the unmodified and modified asphalt mixture. The results showed that UHMWPE is recommended as an additive in asphalt mixture, as all the results are within the standard requirements. The addition of UHMWPE tends to increase the strength, higher durability and quality of mixture.

ID-1619

STUDY ON LATERITIC SOIL STABILIZATION WITH LIME AND OPC FOR SUSTAINABLE DEVELOPMENT

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ABSTRACT

The world wide concern for cleanup, protection and enhancement of the environment has development of a sub discipline within the field of geotechnical engineering; namely Geo-environmental, which is concerned with the application of geotechnical engineering to environmental control. It is within this area that the concepts of stabilization, solidification and reuse of waste lime in geotechnical engineering works are popularly encountered. The cost of the construction materials has rapidly increased and hence stabilization of soil using admixtures becomes Cost effective and eco-friendly blocks. Thus waste natural lime (egg/sea shell) considerably promise to reduce the cost of construction or alternative material that would

be suitable for construction activities and also reduces the disposal problem and hence reduces contamination of soil and water.

ID-1620

STUDIES ON THE LOAD CARRYING CAPACITY OF BRICK MASONRY ARCHES

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ABSTRACT

Masonry is an assemblage of masonry units and mortar. Its properties and behaviour are controlled by the characteristics of masonry units and mortar as well as the bond between them. Burnt clay bricks are the most common masonry units used for load bearing masonry construction in India. Apart from burnt clay bricks, stones are also used as masonry units. Stone is one of the naturally available building materials. Many types of stones are available throughout the World. The structural performance of masonry is mainly depends upon the bonding between masonry units and mortar. The two materials are failed to act together in the event of a separation between the two. The failure of masonry prism in compression is often accompanied by a loss of bond between the masonry unit and the mortar. Brick masonry arches can be effectively used in superstructure and also in substructure part of the building. Strength of arch depends on the strength of bricks, strength of masonry, arrangement of bricks in masonry, strength of mortar used and also geometric conditions of arch In the present study, the load carrying capacity of brick masonry segmental arches of two different thicknesses have been determined. Both 75mm and 100mm thick arches were of single course. All the arches were of 2.4m span, 0.45m width and 0.45m rise. Arches

subjected to partially uniformly distributed were casted between stone masonry abutments of size 0.83mx 0.83mx0.75m. The stone masonry abutments were constructed in 1:6 cement mortar over 1:4:8 concrete bed of 0.15m thick. The soil over which has a safe bearing capacity 300kN/sqm. The arches subjected to uniformly distributed load, were constructed in a self straining loading frame. The frame is designed in such a way that the two plates of the frame which supports the arches at the ends can be considered as rigid abutments.

ID-1626

TRANSFORMATION OF THE NEW CONSTRUCTION SERVICES DEVELOPMENT BOARD TO INTENSIFY THE SINERGY OF COMMUNITY IN BUILDING THE CONSTRUCTION SERVICES SECTOR IN INDONESIA

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ABSTRACT

The transformation of the New Construction Services Development Board (hereinafter LPJK) in 2021-2024 is believed to address the challenges of the construction service sector in Indonesia. Especially about the demands for synergy of the construction service community enhancement and their contribution to building the construction service sector of Indonesia. The new LPJK will develop fast and tactically by sticking to its duties and functions and considering all the basic

assets owned by the construction service sector in Indonesia, both from internal strengths and weaknesses and external opportunities and challenges. This research was conducted using a survey method applied to the Indonesian construction service sector community as outlined in the SWOT matrix analysis and comparisons of best practices from the LPJK-level institutions in several countries around Southeast Asia, Oceania, and Europe. The analysis results are in the form of strategic steps by the LPJK to improve the community synergy in developing the construction service sector in Indonesia. The strategies are adhering to the Four Pillars of Principles: Professionalism, Accountability and Public Transparency, Law Supremacy and Research, and Development that PRIMA Indonesian Construction Service Sector (professional, having integrity, advancing, and promoting Public Accountability).

ID-1627

PRICE INCREASE ANALYSIS OF RESIDENTIAL PROPERTY IN BATAM

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ABSTRACT

House Price Index (HPI) in Batam is increased significantly, with the highest property price growth in Indonesia as of June 2018. This study aimed to determine the price for land and building area in Belian, Batam City. The method used is multiple linear regression using SPSS 21.0 software. The test results obtained on the t-test and from the interpretation of the model obtained $Y = 30,758,000 + 479,000 (\text{Land}) + 3,048,000 (\text{Business Area})$. The independent variables, such as land and building area, are entered into the regression model, the land area

increases by 1 square meter. The house's selling price will increase by Rp. 479.000.00, and if the building area increases by 1 square meter, then the house's selling price will increase by Rp. IDR 3,048,000.00. The predictions for the selling price of the house for a land area of 72 m² and a building area of 36 m² are: $Y = o + 1X1 + 2X2$, $Y = o + \hat{1}^21$ Land_Luas + $\hat{1}^22$ Business_Luas, $Y = \text{Rp } 30,758,000 + \text{Rp } 479,000 \times 72 + \text{Rp } 3,048,000 \times 36$, $Y = \text{IDR } 174,974,000$. Description: $Y = \text{Selling Price of the House to be Marketed}$.

ID-1628

ANALYSIS OF CONCRETE PERFORMANCE FROM DIFFERENT WASTE AS PARTIAL CEMENT REPLACEMENT

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ABSTRACT

The rise in demand for traditional building products and the desire for economic development in the construction industry have driven designers and planners to look for 'alternative materials' that can be used in construction. The usage of chemical waste materials and crop by-products is positive for this reason. The chemical, metal, polymer wastes and agricultural products such as Fly Ash, metal slag, plastics, and Rice Husk Ash may be used instead of cement due to their pozzolanic nature, which otherwise involves a wide area of land for disposal. Besides that, this paper will discuss the results of previous researches on various types of wastes that have been used as the

partial replacement to cement in concrete and their physical properties have been studied as well as the physical properties of these hardened concrete such as strength and workability. In fact, using available resources is important to minimize pollution to the environment since these industrial waste materials are expensive to be disposed of and has negative impact to the society and the environment as well. Hence, this research paper will propose high-strength concrete mix design among the reviewed wastes as a replacement for cement with a variety of ratios.

ID-1633

A PROPOSED FRAMEWORK OF MEASURING MATURITY OF SAFETY LEADERSHIP IN CONSTRUCTION

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ABSTRACT

Construction is an industry with high-risk work safety. The construction industry contributes to many work accidents globally, more than 60,000 fatal accidents per year. To improve safety performance in construction, maturity of leadership could be the key to obtain the safety culture in construction. This research is using Structural Equation Modelling (SEM) method in developing the maturity model. The development indication of the maturity model is to identifying research variables for the assessment using SEM. The first level to determine the leadership maturity is by maturity variable in psychological and sociological aspects of the project owner. The second level represents by the maturity aspect in participative of the project owner. The third level of maturity is the maturity aspect of dialog

between stakeholders. The last level of maturity is by the maturity of the technical aspect of construction engineering.

ID-1634

ANALYSIS COMPARISON OF MOMENT RESISTING FRAME SYSTEM AND CONCENTRICALLY BRACED FRAME SYSTEM USING INVERTED V BRACE

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ABSTRACT

Indonesia is a country located in the path of the Pacific earthquake and the Asian earthquake path that results in a very high risk of earthquakes. Vibrations caused by earthquakes will cause forces on the structure. The design of earthquake-resistant buildings is one of the objectives to prevent structural failure and loss of life. Adding rigidity to a building is a way to overcome resistance to earthquake response. Acquiring stiffness in the structure can be done by combining it with bracing. One type of bracing frame system that can be used is the Concentrically Braced Frame (CBF) system. In this study, structural response analysis to lateral load with static equivalent analysis and spectrum response with comparative analysis of displacement, fundamental period, shear force, and shear lag in buildings. Based on the results of the analysis, the CBF system can reduce the effect of shear lag on the structure. The rigidity of the CBF System is higher than that of the MRF system so that the floor drift and deviation between floors in the system become smaller. The deviation for the x-direction CBF system produces a smaller value of 5% - 32.2%, and for the y-direction it produces 7.2% - 41.7%. In the natural vibrating period of

the MRF System structure of 1,311 seconds, this period is worth greater than the period in the CBF System of 0.453 seconds.

ID-1635

EVALUATION OF PARKING SUPPLY WITH PARKING DEMAND FOR VISITORS IN TANAH LOT TOURISM DESTINATION AREA DURING THE COVID-19 PANDEMIC IN 2021

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ABSTRACT

Parking is a state of immovableness of a vehicle that is temporary. Parking facilities are one of the very important elements in a public space such as a tourist area because parking facilities service become the first and the last impression for tourist who are visiting. In this study, will be evaluated on parking supply with parking demand for visitors during the COVID-19 pandemic in 2021 in Tanah Lot Tourism Destination Area which refers to the primary data of site survei based on Pedoman Perencanaan Parkir (1998) and Hobbs (1995) as a literature studies. This area has a land area of 1.88 Hectares. Based on the result of the calculation of parking characteristics obtained the average number of vehicles entered parking areas during the survey period ere 123 for two wheeled vehicles, 36 for four wheeled vehicles, and 21 for six wheeled vehicles. The parking demand for two wheels are 53 and the parking supply with the SRP are 212, the parking demand for four wheels is 16 and the parking supply with a size of 2.23m x 4.7m are 134, and the parking demand for six wheels is 14 and the parking supply with size of 3.4m x 12.3m are 49. The parking

index is less than ($<$) 1, which means that the parking demand is sufficient from the amount of parking supply.

ID-1643

WOOD EFFICIENCY AS A SUPPORTING MATERIAL FOR CONCRETE CASTING AND CEILING FRAMES IN HIGH-RISE BUILDINGS

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ABSTRACT

The purpose of this study was to efficiently use wood to support concrete casting and ceiling frames, to find out the cost efficiency of implementing two different types of formwork systems, between conventional wood formwork by reusing post-casting scaffold wood for ceiling frame materials, with semi-modern formwork systems. Formwork (Scaffolding) and hollow metal ceiling frame systems. The data collection method in this study was carried out by observing the process of building an office building in JABODETABEK on conventional Formwork, wooden Scaffolding and semi-modern Formwork, interviews, questionnaires on the efficiency of field implementation, and documentation. Tests to compare the two scaffolding formwork systems were carried out in one-story buildings to four-story buildings with a typical floor area of one to a specific four-floor floor area with the same area to compare and measure the two scaffold formwork systems. At the time of project implementation on conventional formwork scaffolding, there is a loss of wood volume of $\pm 40\%$ of the total wood use. Overall calculated from the test results of these two

systems in terms of casting costs, it turns out that conventional formwork with wood scaffold formwork system is much better and more efficient, saves implementation time, saves implementation costs, the difference between the two systems on wood is calculated using SNI 7394:2008, ranging from $\pm 122.7\%$ to $\pm 146.2\%$ wood is more efficient than the formwork system (Scaffolding). Then in terms of efficiency, the volume of post-casting scaffolding wood, of $\pm 60\%$, can also be reused more than enough to meet the needs of the ceiling frame material for the high-rise building itself, which means that there is no need to buy new ceiling frame materials. Meanwhile, the semi-modern formwork system for the ceiling frame needs to spend more on buying ceiling frame materials such as hollow iron. Comparing the test results of these two scaffold formwork systems for simple high-rise buildings and low-rise buildings (one-story buildings to four-story buildings) is recommended to use a conventional formwork system, namely the wooden scaffolding formwork system.

ID-1645

COST OVERRUN ON ROAD PROJECTS IN THE GHANAIAN CONSTRUCTION INDUSTRY: THE CAUSATIVE FACTORS

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ABSTRACT

When determining the success of a building project, cost is one of the most important variables to consider. This is because cost is the project's backbone and driving force throughout the building process. As a result, to assess the cost performance of a building project, the actual cost is compared to the planned cost. This research

aims to uncover the causal variables that contribute to cost overruns on road projects using Accra, Ghana as a case study. Relevant literature was thoroughly reviewed to extract identified factors. This study adopted a quantitative research approach, using a questionnaire developed to collect data from the target audience. The questionnaire survey was conducted using civil engineers and quantity surveyors working in the Ghanaian construction sector. The data that was retrieved was analysed using descriptive statistics and exploratory factor analysis. According to the findings, the main reasons driving cost overruns on road projects include consultant/contractor-related, environment-related, economy-related, risk/uncertainty-related, technical-related, owner/client-related, and other project-related factors. It was determined that cost overruns in construction projects occur because of a lack of professionalism on the part of the stakeholders engaged in the building process from start to finish. Future research may therefore be conducted utilising all of Ghana's regions to obtain a broad view of the research.

ID-1646

EVALUATION OF DISTRIBUTION NETWORK OF CLEAN WATER PIPING PERUMNAS MONANG MANING WEST DENPASAR

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ABSTRACT

Evaluation of the distribution network of clean water piping in Perumnas Monang Maning, Pemecutan Village, West Denpasar District, Denpasar City needs to be done to know the capacity of the current distribution pipeline network. In evaluating the existing

distribution network system, a hydraulic analysis of the distribution network is performed using the WaterCad v8i program. The results of the analysis showed that the network capacity is currently under pressure caused by the large flow speed so that the pressure loss that occurs is also large. This problem can be addressed by increasing the current pipe diameter so that the flow speed and pressure loss on the distribution network can be reduced. The diameter of the pipe used will be adjusted to the development needs for the next 25 years. The total water demand of Perumnas Monang Maning residents in the next 25 years is 116,55 liters/day and the pipes needed to accommodate the discharge are 10 and 12 inch diameter pipes.

ID-1648

THE USAGE OF VALUE ENGINEERING ON MEDICINE BUILDING STRUCTURE

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ABSTRACT

Value engineering is carried out to make technical engineering of existing building plans without reducing the structure or architecture of the building, thus the implementation and work costs are cheaper without reducing the quality of a work item hence the project budget becomes more efficient. Several phases must be done in value engineering to determine the percentage of cost savings from an alternative design that will be used as a comparison with the existing design. There are six phases at the workshop stage, namely the information phase, the function analysis phase, the creative phase, the evaluation phase, the development phase, and the recommendation

phase. The alternative design chosen was conventional concrete on the 4th-floor beam work, 4th-floor slab, and 4th-floor column from the existing design using precast prestress beam, half slab plate, and conventional column. Therefore, the cost savings obtained were Rp.524.340.852,13 from the initial cost of Rp. 2,591,098,402.98 with a saving percentage of 20,24%.

ID-1649

SANITATION BUILDING DESIGN AS AN ALTERNATIVE TO WASTE WATER MANAGEMENT IN SLUMS

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ABSTRACT

The habit of defecating (BAB) and disposing of garbage that does not pay attention to environmental hygiene causes the development of flies that can carry diseases to humans such as diarrhea, vomiting, typhoid. Although the local government is trying to give an appeal to the community to change the habit of defecating in existing public toilets, the condition of the toilets is not maintained so that the appeal cannot inspire people to change these habits. With the new innovation in sanitation technology for the MCK wastewater management system in the form of MCK plus " plus, it is hoped that it can help people who live in slum areas who can also add alternative energy uses in a new way, namely by utilizing methane gas (CH₄) from wastewater decomposition. The design of the biodigester depends on the amount (discharge) and the characteristics of the black water to be processed. In this plan, black water will be processed in the biodigester tank and the gas from this processing will be used as an energy source for the

surrounding community, after which the output from the biodigester will be processed further into the ABR tank.

ID-1652

DETERMINATION OF FOUNDATION TYPES BASED ON SONDIR TEST: CASE STUDIES IN SEVERAL POINTS IN PAYAKUMBUH CITY

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ABSTRACT

Research has been carried out on the Sondir Test in Payakumbuh City, precisely in four sub-districts (North, South, West and East). This study aims to obtain the carrying capacity of the soil and the type of foundation that is suitable at the research location point so that when building physical infrastructure in Payakumbuh City avoids structural failure (collapsed / collapsed buildings). In addition, this study aims to provide a general description of the types of foundations that are suitable for use by Payakumbuh City for any physical infrastructure development. The soil investigation method is carried out by direct testing in the field using a sondir tool. Secondary data was obtained from several literature studies and primary data was obtained from sondir results at four predetermined location points. Data analysis used two parameters at each depth, namely Conus Resistance Value (NK) in kg/cm², and Total Adhesive Resistance (JHP) in kg/cm. Both parameters were recorded for every 20 cm interval to a depth where the value of NK 155 kg/cm² was obtained, with a maximum depth limit of 10 m from the local soil surface. Based on the results of testing and data analysis, the results obtained for the four locations where the research was conducted (Payakumbuh District: North, South, West and East) it is recommended to use Deep Foundations (Bore Pile), while the

dimensions and number of foundations can be adjusted according to the structural analysis obtained.

ID-1653

OPTIMIZATION OF GRAVITY WALLS AND CANTILEVER WALLS

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ABSTRACT

One of the failures in retaining wall construction is caused by errors in design such as the dimensions of the planned retaining wall being too slender, causing collapse. However, dimensions that are too fat will cause waste. This confirms that optimization is very important when planning a retaining wall because with optimization, the optimal dimensions can be obtained according to the construction standards. In addition, the time required for planning retaining walls using optimization is also faster. In this study, 2 samples of retaining walls that are commonly used in retaining wall construction projects were taken, namely the gravity type and the cantilever type. Of the 2 types, the optimization of their external and internal stability was carried out using Microsoft Excel solver. The results of the analysis determined that the optimal design dimension for gravity walls that meet the requirements is only up to a height of 7 m. For walls with a height above 7 m, it is not safe. For cantilever walls, it is still safe up to a height of 12 m.

ID-1654

REGULATORY, INSTITUTIONAL, AND IMPLEMENTATION FRAMEWORKS GOVERNING AFFORDABLE HOUSING DELIVERY SYSTEM: A COMPARATIVE STUDY ON INDONESIA AND MYANMAR

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ABSTRACT

This paper presents comparative analysis of existing regulatory, institutional, and implementation frameworks governing housing sectors of Indonesia and Myanmar, in particular the affordable housing delivery system for low income people. The Law of the Republic of Indonesia Number 1 of 2011 explained that the government provides and facilitates the people on housing and human settlement through the national Affordable Housing program (NAHP) and One Million Houses program. Therefore, it is obvious that providing affordable housing for low-income people is one of the main aims of Indonesia's government. In addition, Strategic Objective 3A of the The Republic of the Union of Myanmar, National Housing Policy & Strategy, 2017 (UN-Habitat) [1] is Expand housing output by all actors to meet objected demand, especially for lower income households. Based on available information, although Myanmar National Housing Development framework and, other law and regulations related to housing supply in Myanmar have not been enacted yet, it is noticeable that the main target of Myanmar government-led housing provision is to provide affordable housing to lower middle income, urban poor and government staff. Hence, Indonesia and Myanmar have the same focus on the role of affordable housing delivery system. The focus of the paper is to identify the differences between regulatory, institutional, and implementation frameworks governing housing sectors in Indonesia and Myanmar for housing sector development. The purpose

of this study is to provide valuable information about housing delivery system (HDS) in Indonesia and Myanmar.

ID-1655

MIX PROPORTION OF PERVIOUS CONCRETE WITH GEOPOLYMER BINDER: A REVIEW

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ABSTRACT

Pervious concrete is one of the innovations used because the advantages can be as a drainage where this concrete can pass water so that it does not stagnate on it. Pervious concrete is usually made of coarse aggregate, water, and cement as a binder. the use of too much cement can cause an adverse effect on the environment so that a more environmentally friendly substitute is needed such as geopolymers. geopolymers are binders made from a mixture of fly ash and alkali activator as an activating material for fly ash to react. This paper focuses on the optimal mix ratio in the manufacture of translucent concrete and geopolymers binder mixtures as a substitute for cement in translucent concrete mixtures based on previous research.

ID-1656

THE STUDY OF MOTORCYCLE POSITIONS DISTRIBUTIONS ON-ROAD LANES WITH TRAFFIC FLOW VARIABLES

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ABSTRACT

Currently, two-wheeled vehicles or motorcycle dominate more than 80% of motorized vehicles in Indonesia. In traffic environments dominated by motorcycles, motorcyclists are usually not disciplined using road lanes and frequently change lanes and speed. and reduced levels of safety. This study aims to identify the percentage distribution of motorcycle positions on divided roads in Padang City and analyze the correlation between the distribution of motorcycle positions and the percentage of total motorcycle, percentage of light vehicles, degree of saturation, and average speed of light vehicles. Case studies on roads with four lanes 2-way lane divided type, namely on M.Hatta and Sutomo road. The primary data obtained through video recording on road segments. Data of recorded videos were read by using software Avidemux. The highest percentage distribution of motorcycle positions is in the middle sector. At peak hours in the morning, the distribution of the percentage of motorbikes in the right sector on M. Hatta Road was more than 40%, and on Sutomo Road were more than 25%. Correlation coefficient values between the distribution of motorcycle percentages and the degree of saturation are significant for all peak hours and all sectors. The value of r is negative and positive results in unclear patter

ID-1657

U - TURN ANALYSIS ON SAMARINDA CITY (CASE STUDY : JALAN DR. SUTOMO AND JALAN PAHLAWAN)

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ABSTRACT

The U-Turn facility on Jalan Dr. Sutomo and Jalan Pahlawan which are close to market activities, educational and health facilities cause the vehicle speed to stop if a vehicle makes a U-Turn. This research was conducted to determine the time between vehicles, turning time of vehicles, u-turn queue services, number of disrupted vehicles and comparison of u-turn queue service directions. The analysis in queuing discipline in the transportation system uses the FIFO (First in First Out) method, which is first-come-first-out and with the D/D/1 queuing model, which presupposes deterministic arrivals and deterministic departures, with one departure channel. The results of the analysis and discussion regarding the u-turn analysis are for the time between the lowest vehicle MC occurring at u-turn 3, LV at u-turn 4, HV at u-turn 2, for the highest vehicle turning time MC and LV occur at u-turn 1, HV at u-turn 3, for the highest vehicle queue service MC occurs at u-turn 5, LV at u-turn 1, HV at u-turn 3, for the highest disturbed vehicle MC occurs at u-turn 3, LV at u-turn 4, HV at u-turn 2,3,4,5, for the comparison of services in the analysis of the direction of Plaza Mulia Mall - Lembuswana Mall higher

ID-1658

THE EXPERIMENTAL STUDY OF CONNECTION SYSTEM WITH BAMBOO BRANCH AS A CONNECTOR ON BAMBOO TRUSS STRUCTURE

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ABSTRACT

The connection system of bamboo truss structure using Ori bamboo branch (bambusa arundinacea) as a fastener is presented in this paper. This connection system is proposed for temporary residential buildings in disaster-affected areas or buildings in remote areas that have limited availability of construction materials. This connection system is proposed for temporary residential buildings in disaster-affected areas or buildings in remote areas that have limited availability of construction materials. Fasteners from Ori bamboo branch (Bambusa arundinacea) are very suitable to be applied to connection system on bamboo truss structure due to the raw materials are cheap, the construction costs are relatively cheap and do not require modern equipment. Fasteners from original bamboo twigs (Bambusa arundinacea) are very suitable to be applied to the bamboo truss connection system because the raw materials are cheap, the construction costs are cheap and do not require modern equipment. Fasteners of Ori bamboo (Bambusa arundinacea) branch is very suitable to be applied on a bamboo truss connection system since the raw material cost, the construction cost is cheap and does not require modern equipment. In previous study, testing on the bamboo truss connection model using Ori bamboo branch connectors with variations in the direction of the load has been carried out. In our

previous research, testing on the bamboo truss connection model using bamboo twig connectors with variations in the direction of the load has been carried out. In this study, a full-scale test was carried out on the bamboo truss structure using Ori bamboo branch as connectors. The bamboo truss structure testing is carried out by static loading by continuously increasing the load to the specified deflection limit. The structural behavior of the bamboo truss structure during loading is observed. The structural behavior of the bamboo truss structure during loading is observed. The structural behavior that observed on the bamboo truss connection is the strength and stiffness of the structure. The stiffness of the bamboo truss structure is obtained from the load and deflection relationship. Based on the results of the study, it is known that although the bamboo truss structure using Ori bamboo branch has a high enough strength, it has relatively low stiffness, which is indicated by large deflection on a bamboo truss structure.

ID-1659

GENDER MAINSTREAMING IN POST DISASTER RECONSTRUCTION IN MINANGKABAU

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ABSTRACT

The frequency of natural disasters that occur in Indonesia is quite high, ranging from earthquakes, tsunamis, floods, landslides, forest fires, and volcanic eruptions, disasters that are directly caused by human activities. Some of the disasters that occurred in Indonesia were small in scale, but many were very large and powerful, such as the tsunami

in Nangroe Aceh Darussalam, the tectonic earthquake in the Special Region of Yogyakarta, and 30 September 2009 earthquake in west sumatera. The tsunami and earthquake disasters caused enormous damage to property and infrastructure as well as loss of life. Conditions like this require Indonesia to develop and have special policies to deal with or deal with natural disasters properly. If not, then the losses or victims due to natural disasters will be greater. An earthquake on September 30, 2009 measuring 7.9 on the Richter scale struck the west coast of Sumatra. causing loss of life and damage to infrastructure. Most of the victims occurred on the island of Sumatra, especially Aceh and West Sumatra. There were 1,115 killed, 1,214 seriously injured and 1,688 lightly injured. One of the important elements in efforts to build a natural disaster management system is to evaluate and take important lessons from the activities or systems for natural disaster management that have been carried out so far. Strengths and successes as well as weaknesses and failures in natural disaster management that have been carried out will be important lessons for building a better national system for natural disaster management in the future. Therefore, A comprehensive study of natural disaster management activities or systems should be used as learning materials to form a disaster management system. Disaster preparedness by minimizing vulnerability has been identified as a better approach to dealing with disasters than post-disaster response. Creating a culture of prevention is critical to dealing with everyday hazards and the consequences of disasters. Disaster risk reduction is defined as a conceptual framework, which considers the possibility of minimizing the vulnerability and risk of disasters throughout society, to avoid (prevention) or to limit (mitigation and preparedness) harm, Starting from the availability of shelters that are not safe and in accordance with the needs, especially groups of women and children, the location of the shelters is far from their initial residence. Likewise, the distribution of disaster aid has not taken into account the special needs of this group of women and children. Knowing how the gender effectiveness on reconstruction post-disaster in West Sumatra region,

from the data of natural disaster in west sumatera, and collecting data from the field from people who closed related to the process of reconstruction post disasters in west sumatera. This study aims to obtain an accurate description of the gender position in reconstruction post-disaster activities in West Sumatra.

ID-1660

CONCEPTUAL FRAMEWORK OF CONSTRUCTION COST FOR IMPROVING CONSTRUCTION SAFETY PERFORMANCE

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ABSTRACT

Indonesia has moved quickly to keep up with the times, as the country aspires to achieve strong economic growth and create a path to become a developed nation by 2045. The construction industry is one of the most important sectors for Indonesia to develop the economies and thus improve the competitiveness. However, in line with the economy's positive growth, the construction industry contributes to the high accident rate. The absence of implementation of the Occupational Health and Safety Management System throughout the project is the cause of Indonesia's high accident rate in infrastructure projects. The allocation of safety costs is one of the primary indications that influence it. It is important to make the cost of safety as direct cost in order to improve construction safety performance

ID-1661

CONNECTION BETWEEN EXPANDED POLYSTYRENE (EPS) AND CONCRETE - A BIBLIOMETRIC ANALYSIS

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ABSTRACT

Concrete as a building material has become a part of construction worldwide. The development of research on concrete, especially lightweight concrete, is up-and-coming because it can provide benefits related to structures, building insulation. The term of environmentally friendly concrete also has been promoted in recent years. The use of lightweight aggregates as one of the techniques for making lightweight concrete is another research area that has also begun to be widely studied. One of the aggregate materials to be concerned is Expanded Polystyrene (EPS). The type of research carried out is a form of bibliometric analysis using VOSviewer software to create the visualisation that aims to see research development related to expanded polystyrene lightweight material as part of a concrete-forming composition. From the results of the studies that have been undertaken, it can be seen that research related to expanded polystyrene and concrete is still dominated by topics related to mechanical properties and the creation of lightweight concrete. However, research topics related to applications in buildings such as walls, insulation materials, reinforced concrete, sandwich panels have begun to be widely studied.

ID-1663

HOUSING PROVISION FOR LOW AND NON-FIXED INCOME COMMUNITIES IN METROPOLITAN CITY OF INDONESIA

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ABSTRACT

Two-thirds of the world's population in 2030 will live in cities. Urbanization becomes main cause also in Indonesia whereas in 2045 70% of their citizens had moved to cities. There are 39,07% of informal and non-fixed income workers in the cities of Indonesia. They have difficulties to get a house therefore they live in slum areas to survive. Main problems of housing provision in metropolitan cities are limited availability of land and layers of bureaucracy. This paper reports a study of scheme to provide houses for non-fixed income citizens in metropolitan cities of Indonesia. An online questionnaire survey was administered to the total of 38 high-profile respondents and experts. Qualitative and quantitative analysis were conducted to result the effective institutional and scheme of housing provision in metropolitan cities. The urgency of housing provision for low and non-fixed income communities in metropolitan city is enormous. There are three main aspects for the communities to be considered by stakeholders: 1) incorporate the communities in planning; 2) use the rental flat house; 3) ensure the presence of guarantee institution

ID-1664

EVALUATION OF VILLAGE DEVELOPMENT INDEX USING GEOSPATIAL ANALYSIS IN DETERMINING INEQUALITY DEVELOPMENT

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ABSTRACT

The consequence of development, either in an urban or rural area, is still overcoming inequality. Governmental agencies and non-governmental organizations have given efforts to study the factors triggering the inequality by comparing different dimensions and looking for correlations between the factors to mitigate and solve this situation. Traditionally, using conventional statistical analysis, marginal solution, and action gave an appropriate solution. This paper presents a geospatial data analysis that is used to determine inequality in the rural area of a regional government development program. The study area in this paper is the Banyuasin Regency of South Sumatra Province. The inequality in this study was investigated from the village development index (IDM) yer 2018 and year 2019. The data was converted into geospatial information. Geospatial data analysis was conducted to map, explore, and cluster the information. From this study, the main factors that predominantly contributed to the inequality in the rural area of Banyuasin Regency are determined. The finding of this paper can be benefited in justifying appropriate actions and policies to balance development and address inequality.

ID-1665

DISTRESS MODELING AND ANALYSIS USING STROMPAV PRECAST FOR ROAD FLEXIBLE PAVEMENT INFRASTRUCTURE

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ABSTRACT

Rapid development has increased the amount of surface area covered by roads and buildings in urban and rural areas, and the absence of filtering vegetation and an absorbent soil surface has disrupted soil absorption. Additionally, impervious pavement surfaces such as flexible and rigid pavement can increase runoff volumes, erosion of riverbanks, and flash flooding. As a result, pervious pavement, such as precast StormPav, is required to address this issue. Distress models are required during design to ensure the pavement have a longer service life and need to be conducted for different axle weight. This research addresses this gap by modelling and analysing the StormPav pavement under various wheel loads in order to ensure that the pavement structures can withstand these loads. The analysis of the mechanistic behaviour for different structures of pavements (flexible pavement, rigid pavement and precast StormPav pavement), and the mechanistic behaviour of precast StormPav pavements using different wheel loads (24kN, 26kN, 27kN) are performed. WinJULEA and KENPAVE are the software used for this research for modelling the real scenario to obtain the deflection, stress, strain and stress of each layer of the pavement when there is traffic loading acting on top of it. It is found that the total ESAL increases when there is a heavier truck acting on top of the pavement, and precast StormPav pavement receive the lowest total ESAL compared to the flexible and rigid pavement. Among

various types of pavement, precast StormPav has the lesser maximum deflection, which had 65.11% lesser compared to the flexible pavement, due to its largest elastic modulus. Besides, when there is loading from a 24-tonne truck acting on the top of the precast StormPav pavement, the total deflection is 0.761mm and increases 0.064mm (8.345%) when there is loading change to 26-tonne truck, as precast StormPav pavement is made up of concrete grade 50, which can resist to heavier loading. Precast StormPav pavements have the highest maximum allowable load repetitions to prevent fatigue cracking due to their increased flexural strength, which enables them to withstand greater stresses above the structure. As a result, it can be concluded that precast StormPav pavement is a viable alternative to flexible and rigid pavement because it required less time for construction, provided a better drainage system, and sustained less damage when subjected to heavier loads

ID-1666

COMPARATIVE STUDY OF CONSTRUCTION INDUSTRY GROWTH AND GDP GROWTH IN ASEAN COUNTRIES

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ABSTRACT

This paper is examining the role of the construction industry in economic development. The study was conducted in 8 countries (Indonesia, Malaysia, Singapore, Thailand, Timor Leste, Viet Nam, Philippines, and Brunei Darussalam) which are members of the Association of Southeast Asian Nations (ASEAN) organization. The findings of this study indicate there is positive relationship between the construction industry and economic growth in developing countries but not for developed countries. This finding also shows that

construction growth in developing countries will tend to continue to increase following economic growth, while for developed countries construction industry growth tends to be flat or even decline for the foreseeable future. Among all the countries studied, the growth of construction industry both Timor Leste and Indonesia are the fastest. In addition, the contribution of the construction industry to the GDP of the country of Timor Leste and Indonesia in the highest ranking when compared to other countries studied.

ID-1668

ATTITUDES OF CYCLING ENTHUSIASTS TO "CYCLE TO WORK" POLICY IN PADANG CITY, INDONESIA

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ABSTRACT

Sustainability issues are the primary concern of the Padang City nowadays. With an annual traffic growth reaching 10% at some main roads, Padang should be aware of the air pollution and congestion problems. Therefore, the "Cycle to Work" policy should be promoted to enhance the sustainability of the city. "Cycle to Work" was chosen because, many informal cycling enthusiast groups were voluntarily established in the society, recently. With many townspeople getting used to cycling, it is expected that the "Cycle to Work" Policy will work well in Padang. This paper assesses the attitude of cycling enthusiasts to the "Cycle to Work" policy if it is implemented in Padang. A Likert-type questionnaire was distributed to 300 members of cycling enthusiast groups around the city. The respondents were asked to show their preferences about "Cycle to Work" policy concerning situation and condition when the cycling about to conduct, including

the weather, number of luggage, body fit, security, the existence of cycle line facilities. Data were analysed using structural equation model (SEM). The study found that most of the respondents are happy with the policy and will support it and encourage more people to do it.

ID-1672

FEW NEW TYPE OF MARINE STRUCTURES SUITABLE FOR INNOVATIVE DEVELOPMENT OF CONSTRUCTION INDUSTRIES

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ABSTRACT

Ocean wave damping is one of the essential activity required for coastal erosion protection, open sea construction, marine aquaculture development and for reducing wave loads on marine structures. Many different structures are used around the world such as offshore rubble mound breakwater, floating breakwaters, caisson type of offshore vertical walls etc. In the present study, an attempt is made on three different types of wave dampers for different purposes of applications. One is on new type of floating breakwater; another one is wave dampers with series of perforated vertical wall with impervious wall at the rear end; he last one is perforated slotted vertical barriers. Studies on hydrodynamic performances such as wave transmissions, wave

forces etc. were carried out and the innovation fetched three different US patents. This paper discusses in brief the scientific details of these new wave dampers. The knowledge is expected to be used by any coastal countries depends on their needs and economic possibilities.

ID-1673

U - TURN ANALYSIS ON SAMARINDA CITY (CASE STUDY : JALAN DR. SUTOMO AND JALAN PAHLAWAN)

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ABSTRACT

The U-Turn facility on Jalan Dr. Sutomo and Jalan Pahlawan which are close to market activities, educational and health facilities cause the vehicle speed to stop if a vehicle makes a U-Turn. This research was conducted to determine the time between vehicles, turning time of vehicles, u-turn queue services, number of disrupted vehicles and comparison of u-turn queue service directions. The analysis in queuing discipline in the transportation system uses the FIFO (First in First Out) method, which is first-come-first-out and with the D/D/1 queuing model, which presupposes deterministic arrivals and deterministic departures, with one departure channel. The results of the analysis and discussion regarding the u-turn analysis are for the time between the lowest vehicle MC occurring at u-turn 3, LV at u-turn 4, HV at u-turn 2, for the highest vehicle turning time MC and LV occur at u-turn 1, HV at u-turn 3, for the highest vehicle queue service MC occurs at u-turn 5, LV at u-turn 1, HV at u-turn 3, for the highest disturbed vehicle MC occurs at u-turn 3, LV at u-turn 4, HV at u-turn 2,3,4,5, for the

comparison of services in the analysis of the direction of Plaza Mulia Mall - Lembuswana Mall higher

ID-1674

COST AND TIME CONTROL ANALYSIS USING EARNED VALUE METHOD ON YONIF 611/AWL RIFLE COMPANY FACILITY AND BUILDING REPLACEMENT PROJECT SAMARINDA

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ABSTRACT

On workmanship, a project is required to supervise and meet three standards to finish a project, which are time, cost, and quality. On some occasions, some works are unable to complete the predetermined plan. This review is Yonif 611/AWL Rifle Company facility and building replacement project conducted from April to November 2018 for 219 days. This research, using earned value method to analyse the performance of a project, continued to identifying critical paths by using the Microsoft project 2016 program. This research aims to analyse earned value method calculation, time and cost estimation to finish the project, and solutions that could be taken as induced by identified obstacles. Based on data and analysis results conducted on week 19th, identified the BCWS value is IDR 2.708.019.167,97, BCWP value is IDR 2.590.292.728,78, and ACWP Value is IDR 2.346.136.827,99. Schedule Variant (SV) is IDR (117.726.439,19), and Cost Variant (CV) is IDR 244.155.900,79. Schedule Performance Index (SPI) is 0.91, and Cost Performance Index (CPI) is 1.10. The estimated cost to finish the project is IDR 3.076.027.105,02 and the time required to complete the project is 223 days. Time acceleration on the project by incrementing the number of

the workforce could accelerate the time of finish by five days and optimizing the cost to IDR 4.025.035.772,88 therefore, saving the budget by IDR 7.933.223,76.

ID-1676

THE ANALYSIS OF TRAFFIC IMPACT OF BRIDGE CONSTRUCTION (A CASE STUDY OF JEMBATAN TAWING I)

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ABSTRACT

A traffic impact analysis is the part of an environmental impact analysis required in a development plan for an activity center. It is expected to contribute to the surrounding traffic. The methodology employed in this analysis is by estimating the traffic impact on the existing period, during the construction of the bridge, and after the bridge is completed and is functioning (operation). The application of this methodology is illustrated in the case study of traffic impact analysis of Tawing I bridge construction located in Serang District, Banten. The analysis revealed that some scenarios can be applied during the construction, operation and plan periods to improve traffic performance around the Tawing I Bridge

ID-1692

IMPLEMENTATION OF HEALTH PROTOCOLS DURING THE COVID-19 PANDEMIC IN SAWAH LAWEH TARUSAN IRRIGATION WORKS

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ABSTRACT

The acceleration of infrastructure development plays a major role in revitalizing the economy in Indonesia. Since the discovery of coronavirus disease 19 (Covid-19) and its determination as an extraordinary event, efforts are needed to prevent the spread and reduce the impact in the implementation of construction services. The Ministry of Public Works and Public Housing (PW-PH) issued ministerial instruction number 2 of 2020 regarding the protocol to prevent the spread of Covid-19 in the implementation of construction services. This study identified the suitability of the Sawah Laweh Tarusan Irrigation work with the regulations referred to in three physical work contract packages during the Covid-19 pandemic. This research was conducted by conducting direct interviews with related parties. The results of the research on the three work contract packages are quite good. There was a launch of a work contract from one year to two years of implementation because the funds were used to deal with Covid-19. Compliance with this application health protocol went well only at the beginning of the pandemic, namely in 2020. Since entering 2021, many mechanisms and facilities have not been renewed and are not being adhered to, such as socialization, medicines and vitamins that are no longer supplied, and there are still workers who do not comply with health protocols.

ID-1694

COSTS AND TIME OF WORKING FORM ALUMA SYSTEM AND SCAFFOLDING IN ARANDRA TOWER 3 APARTMENT PROJECT

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ABSTRACT

Cost of formwork is the largest cost component in structure work. Cost of formwork ranges from 40 to 60 percent of the total cost of reinforced concrete and 10 percent of the total construction cost. Formwork work is concern in construction projects, can cause cost overruns and delays in project, after that is concrete work, depends on formwork work (Pratama HS, 2017). This research was in Apartment Project Arandra Tower 3 Jakarta for beam and slab, by 2 types formwork, aluma system and scaffolding. The Arandra Apartment project consists of 30 floors, the beams and slabs use fc '35 concrete. Results of the study, time of the scaffolding formwork 504 days, aluma system formwork was 392 days. Cost scaffolding formwork is Rp. 8,204,316,822, and aluma system is Rp. 6,857,471,478,- Aluma system formwork is 112 days faster and 16.4% cheaper than scaffolding formwork for beam and slab work in the Arandra Tower 3 Jakarta Apartment Project.

ID-1695

THE EVALUATION OF ROAD INFRASTRUKTURE (LANE WIDTH) BASED ON VEHICLE PASSING SIGHT DISTANCE IN PLATOON

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ABSTRACT

Abstract. The type of road in the several segment of Lubuk Alung Simpang Duku Road Section is 2/2 UD, road width is 6.5 meters. Based on The Decree of PUPR Minister, No. 248/KPTS/M/2015 concerning Designation of Roads in the Primary Road Network, according to its function, Lubuk Alung Simpang Duku Road Section is designated as a Primary Arterial Road (JAP). Based on Government Regulation No. 24 of 2006, the road width requirements for Primary Arterial Roads is 11 meters, thus the Lubuk Alung - Simpang Duku road section does not meet the requirement [Government Regulation No. 24 of 2006]. For this road, vehicle use the opposite lane to overtake other vehicles due to 2/2 UD road design were used. This study was conducted to evaluate the width of the Lubuk Alung-Simpang Duku road section based on vehicle passing sight distance. Primary data were taken using a video camera on Lubuk Alung Simpang Duku Road Section, KM 32. Data processing is done by using Stop Program. In data analysis, descriptive statistics and inference are used. The results obtained that, the average of vehicle speed is 50.12 km/hour, where 52.3% of the following vehicles has higher speed than the leader. The average of vehicle passing sight distance is 265 meters. The average travel time for vehicles to overtake other vehicles are 15.37 second. If the study considering the vehicle from the opposite direction, there is an additional time of 5.5 seconds in overtaking other vehicles. It can be concluded that the vehicle passing sight distance in this study is 265 meters, which is this distance exceeds the vehicle passing sight distance that is used in road infrastructure geometric design. Moreover, for vehicle speeds between 50-60 km/hour, the vehicle passing sight distance were between 200 - 250 meters. Even though the road width were not meet the specified requirements, the additional time achieved might be used as a reference to widen the road width in the several segments for Lubuk Alung Simpang Duku Road Section.

ID-1696

IMPACT OF TRAFFIC MANAGEMENT IMPLEMENTATION ON ROAD USERS

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ABSTRACT

Many infrastructures are involved in the development of the construction industry and will have positive and negative impacts, one of which is road construction. Besides to road construction, the negative impact of implementing traffic management on road users can reduce the efficiency of the operation of transportation infrastructure. Basically, risk is the threat of danger or consequences that can occur as a result of an ongoing process or an upcoming event. When viewed from this perspective, it is important for transportation planners and traffic management to find ways to identify situations, and develop actions to reduce or avoid negative risks. Traffic smoothness and safety is the dream of every road user in his daily life. The purpose of this research is to get a negative impact, the priority that must be done and the level of satisfaction of road users based on the applied traffic management. The data were obtained by conducting an online survey of respondents in cities in Indonesia that experienced traffic management changes. The results of data analysis, 64% of respondents considered that the implementation of traffic management had an impact. There are several traffic management that have a negative impact, including the application of one-way roads, the application of odd-even, setting traffic lights at road intersections, the 3 in 1 policy, special bus lanes, road diversion, and turning. far away, and others. The order of priority that must be considered in traffic management is speed, safety, regularity, density, air pollution, socio-economic conditions and others. Dominant road

users (61%) feel less and dissatisfied with the implementation of traffic management implemented by the government. The correlation of the impact of traffic management applied to road users, has a more negative impact on characteristic of occupation and age than on gender. This becomes the basis for conducting further research in determining the points that become traffic variables to carry out a risk analysis before traffic management is applied, so as to minimize any negative impacts that may arise.

ID-1700

ESTIMATION OF LOCAL ROAD MAINTENANCE BASED ON KRMS (KABUPATEN ROAD MANAGEMENT SYSTEM) AND LCCA (LIFE CYCLE COST ANALYSIS)

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ABSTRACT

Abstract. Kabupaten Takalar (Takalar Regency) is geographically located in the north of Makasar City and Gowa Regency. It is adjacent to Flores Sea in the south, Makasar narrow in the west, and Janeponto and Gowa Regencies in the east. From such geographical condition, the roads in Takalar play a strategic role; therefore it should be managed well and costing management should be taken into account to make the cost planning appropriate to the road need. The recent cost budget management from Ministry of Public Works employs KRMS (Kabupaten Road Management System), while the previous one used LCCA Life Cycle Cost Analysis) in which the program has been used before. Therefore, a study is required to show that KRMS can be used by comparing it with LCCA program used previously. Considering the result of research and discussion on the estimation of Road

Maintenance Cost Budget for Takalar Regency, some conclusions can be drawn: cost estimation using KRMS estimates not only the road condition damage but also the condition out of road pavement so that it is very appropriate to use in inventorying and assessing the road condition comprehensively. Meanwhile, the correlation between KRMS and LCCA results in medium correlation.

ID-1701

THE IMPACT OF KNOWLEDGE TRANSFER PRACTICES IN IMPROVING LEARNING PROCESS IN LOCAL UNIVERSITIES

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ABSTRACT

Knowledge transfer (KT) is a term used to encompass a very broad range of activities to support mutually beneficial collaborations between universities, businesses and the public sector. The main purpose of this research study is to determine the significance of Knowledge Transfer (KT) practices in improving learning process in local universities. The main objectives in this research study are to explore the current KT practices in improving learning process in local universities. This research study used the quantitative method which is questionnaire survey to determine the significance of KT practices in

improving learning process in local universities. Altogether, 276 respondents involved in the questionnaire survey consisting of Quantity Surveying lecturers and students. The postal questionnaires were analysed statistically using the SPSS software package and achieved a 30% response rate. Based on the finding, the current KT practices is using internet. In general, the implementation of KT practices is important to enhance the organization to tackle and avoid any problem in more effective and efficient way. The contribution of this study is, therefore, to add to the body of knowledge on KT by providing evidence from a local universities perspective.

ID-1702

A STUDY ON ECONOMIC VALUE OF GREEN BUILDING IN MALAYSIA

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ABSTRACT

Due to the increasing development of the country, it is a necessity to lower the energy consumption of a building and reduce the negative impact on the environment. Therefore, promoting green building is

crucial to sustainable development. Currently, the concept of green building is helping in reducing the waste of resources and being more environmentally responsible to the world. The features of green building include energy efficiency, indoor environment quality, material and resources, water efficiency and others. Besides, due to the increasing environmental awareness, the focus of green consumption has increased the market value of green products. The increase in market value will affect the economic value of the green building too. Economic value is important in making economic choices based on what people want or their preference. The economic value of a particular item is measured by the willingness to pay (WTP) of an individual. Therefore, the primary aim of the research is to study the perspective of home buyers on green building features that influence the economic value of the building which can determine the degree of users aspiration for residential green building (GB) and the Willingness to Pay (WTP) of the building in Klang Valley by identifying the green building features that affect the home buyers' willingness to pay which is the economic value of the building, determining the economic value with respect to the identified green building features of the building and identifying the significant factors in affecting the perspective of home buyers on willingness to pay. The scope of this research is to focus on the Klang Valley area which has the highest number of green register projects among Malaysia. The empirical data collected is through a questionnaire survey and distributed to home buyers in the Klang Valley. The result revealed that innovation is the most preferable feature and has the highest WTP whereby income level is the main factor that affects the WTP on green features. The implication of the findings implies that developers and contractors should consider the features for the construction of residential buildings to maximize the probability of meeting the home buyers need.

ID-1704

IMPROVEMENT OF SUBGRADE ON PEAT SOIL USING LATERITE SOIL AND CEMENT

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ABSTRACT

Indonesia is one of the countries with the largest peatland area in the world. Peatlands are spread over four major islands in Indonesia, one of which is on the island of Sumatra. Road infrastructure development is carried out in peat areas with the aim of accelerating economic growth, but infrastructure development is constrained by properties of peat soil which has a small bearing capacity and large settlement. Chemical soil stabilization is carried out to improve soil properties. The peat soils studied were from the Air Sugihan area, South Sumatra and Bangko district, Jambi. The research used peat soil stabilization by using a mixture of laterite soil and cement. The cement content used in this study was 4%, 6% and 8% of the dry weight of the soil mixture, while the ratio of peat soil and laterite used in this study was 1: 1, 6: 4 and 7: 3. The curing time for each samples were 3 and 7 days with the condition of the sample is unsoaked and soaked. The results showed that the addition of laterite soil and cement caused the value of California Bearing Ratio (CBR) and the value of unconfined compressive strength to increase, while the swelling value decreased. The curing time and the condition of the sample will also affect the value of CBR, unconfined and swelling. The longer the curing time, the CBR value and compressive strength is high, while the swelling value is decrease. The soaked sample has a lower CBR value and compressive strength than unsoaked condition. The greater the CBR value, the

higher the bearing capacity value and the thinner the pavement layer thickness.

ID-1705

COMPRESSIVE STRENGTH, PERMEABILITY, AND POROSITY OF PERVIOUS CONCRETE WITH VARIATION OF W/C AND COMPACTION METHODS

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ABSTRACT

Pervious concrete is known as permeable concrete, no-fine concrete, and porous concrete. This innovation is to create concrete which can be passed by water with the result that can be used for rigid pavement. Variation of water-cement ratio and compaction methods are used for this research. Compaction with rodding stick, proctor Hammer, and vibrator are conducted to each 0,28, 0,30, and 0,32 of water-cement ratio mix. Compressive strength, permeability, and porosity test is taken on 10 x 20 cm cylinder specimen. For the measurement of permeability testing setup is developed based on falling head method. Result of this research shows that compressive strength increases as the increase of water-cement ratio, while the permeability is decreasing. This paper reports the impact of water-cement ratio and compaction methods variation on compressive strength, permeability, and porosity of pervious concrete.

ID-1708

A STUDY ON SOIL BEARING CAPACITY IMPROVEMENT BY MIXING BETWEEN CLAY AND SANDY SOIL

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ABSTRACT

Soil density and bearing capacity are problems that must be considered in the planning of construction building structures. This is because the soil acts as a medium that holds the weight or action of the construction to be built on it. Stability by mixing two materials is one way to meet the required strength. The changes in weather and temperature in the field are factors that make the soil unstable. The samples carried out came from the Pekanbaru - Bangkinang Toll Road Project which came from four observation locations. This research was conducted by mixing two soil materials with a ratio of 1:1 from different locations. After that, testing the CBR, Specific Gravity, Atterberg limits, and volume weight for each specimen. The results of the study were CBR values which indicated that the highest CBR value was in a mixture of Sand 2 and Soil 2 with a CBR value of 34.34%. The lowest CBR value was found in a mixture of Sand 1 and Soil 1 with 21.5%. The mixture between Sand 1 and Soil 2 has a CBR value of 25.3%, while Sand 2 and Soil 1 have a CBR value of 24.8%. The maximum dry density for Sand 1 Soil 1 is 1.944 Gr/cc. Sand 1 with soil 2 is 1,943 Gr / cc. Sand 2 with soil 1 is 1.996 Gr/cc. While Sand 2 with soil 2 is 1,930 Gr/cc. The relative difference in maximum dry density is influenced by grain size and is not in

ID-1709

POTENTIAL OF COAL BOTTOM ASH AS FINE AGGREGATE IN THE PRODUCTION OF LIGHTWEIGHT BRICK

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ABSTRACT

The use of coal bottom ash, a by-product from coal burning process in lightweight bricks production is getting more attention worldwide including Malaysia. The main objective of this research is to assess the extended potential of bottom ash to produce lightweight bricks. The green technology based lightweight bricks in this study are designed using the by-product resulted from the burning of pulverized coal in thermal power plants for electric power generations. These lightweight bricks are produced from the combination of specific graded bottom ash, classified pozzolanic ashes, fine aggregates, Ordinary Portland Cement and water. The lightweight bricks were subjected to a few laboratory assessments including compressive strength test, density test, and water absorption test. It was observed that the C2 brick and C3 brick at 60% and 100% addition of bottom ash, respectively had the comparable compressive strength with other commercialized bricks (cement-sand brick and clay brick). The addition of coal bottom ash also produces the lowest density of the bricks which is about 1.2 kg/m³. Comparison with other commercialized bricks available in the market

in terms of compressive strength, density, and water absorption indicated that the bottom ash-based bricks are stronger and lighter. Comprehensive selection of good quality materials and the selected mix design produced an acceptable quality of bricks that can be considered as part of the actual construction materials. Thus, with the production of this light and strong brick, the volume of the coal ash waste that was dumped in the landfill will be substantially reduced and simultaneously the lighter bricks will reduce the dead loads supported by the main structures of the building.

ID-1710

MECHANICAL PROPERTIES OF BIAXIAL INTERLOCKING BLOCK (BIB) WALLING SYSTEM

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ABSTRACT

This paper presents an investigation findings on the mechanical properties of BIB wall under compressive load. BIB refers to a new interlocking masonry unit design with a multiple biaxial geometry of a groove and tongue to cater a load. The multiple biaxial geometry allowed BIB providing load resistant on x and y axis. In this study BIB unit was used to build a wall at the dimension of 1400mm(L)x1500mm(H)x100mm(T). The BIB wall was loaded with

compressive load to evaluate the mechanical properties specific to compressive strength, flexural strength and Modulus of Elasticity (MOE). All data obtains on BIB wall properties investigated was than compared with normal cement sand brick wall. The properties of BIB single unit was identified and present in this investigation. From all the data and analysis carried out it is found that the utilization of BIB as wall unit has successfully improve the compressive strength, flexural strength and MOE of wall as compared to normal cement sand brick wall. The improvement level of BIB wall to the cement sand brick wall was also presented.

ID-1711

COMPRESSIVE STRENGTH OF SOLID WASTE POLYURETHANE IN CEMENT SAND BRICK

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ABSTRACT

The demand for sand in making sand cement bricks as an infilled material for wall construction is increasing, thus alternative material in replacing the use of sand is indeed deemed important to be looked into, and if possible should be lightweight. Local river sand is one of the natural materials which widely used for many applications in the construction project. There are mainly three types of disposal technology, landfill, incineration and recycling in the world. Polyurethane foam wastes can be recycled in various ways, and all kinds of methods have their advantages and disadvantages. The

procedure of making cement sand brick is based on the BS EN 771-3:2003. This study focused on the replacement of sand with 50% and 60% of solid waste polyurethane to produce new cement sand bricks. The compressive strength will be presented by graph analysis and tabulated data. The objective of the compressive strength is to determine the response and behaviour of the material with the understanding of the values associated with a specific material it may be determined whether or not the material is suited for specific applications or if it will fail under the specified condition. The data required in absorption testing is the percentage of water absorption and the age of the structures. The experimental results show that the tested samples give a higher value of compressive strength compared to the control sample. Thus, tested samples can be achieved to 50% replacement and satisfied the specified requirement of compressive strength under the specification of masonry unit in BS-EN 771-3:2003. The values of water absorption for the tested sample were a quite low and satisfied requirement of the BS EN 12390-8:2009. Thus, tested samples achieved 50% replacement of solid waste polyurethane. Therefore, the results of the research suggested that the materials can be utilized as partial sand replacement in brick production for sustainability.

ID-1712

SEISMIC ANALYSIS OF GEOMETRICAL PATTERN FOR PUTRA MOSQUE MINARET

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ABSTRACT

The main role of geometry patterns in structures is discussed in this paper. Geometry has been around for many years in many buildings and structural styles. There are specific strengths and weaknesses in each geometry pattern that are considered when building a structure. In Islamic Architecture, geometric patterns are one of the main decoration elements. It is widely used as a decoration element of the building element in the Islamic architecture world. In this paper, STAAD.Pro software is used to obtain Finite Element Analysis. Finite element is a numerical method for solving complex problems involving a thousand equations. The parameter used in the modelling process is the wind loading of 8 m/s, 16 m/s, 24 m/s, 32 m/s and 40 m/s. Since this research is subjected to lateral loading, the seismic/earthquake loading of 0.02g, 0.05g, 0.075g, 0.10g and 0.15g were used as an alternative checking in this study. The height of the minaret for all model will be exactly as the minaret of Putra Mosque which is 116m. The results of the analysis will then be compared between the geometric patterns of the minaret of Putra Mosque with the octagon and non-rotating eight-point star shape. As expected, the result obtained show that the geometrical pattern of Putra mosque minaret itself give the best performance in cater the loading compared to others.

ID-1714

**SUSTAINABILITY COMPETENCIES FOR CONSTRUCTION
INDUSTRY DEVELOPMENT: EXPLORING THE NEXUS BETWEEN
INDUSTRY EXPECTATIONS, PEDAGOGICAL APPROACHES AND
CURRICULA**

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ABSTRACT

The advocacy for sustainable construction industry development is gaining traction in developing countries like South Africa. This is evident in the plethora of publications detailing studies concerning various facets of sustainable construction and project delivery practice. Despite this observation, there appears to be limited emphasis on the need to develop the relevant sustainability competencies among future professionals towards adopting appropriate practices required for sustainable industry development. Industry continued dependence on universities for skilled labour predates the present day. It is expected that current knowledge acquisition pathways in universities, mainly within the pedagogical and curriculum remits, should equip learners with these sustainability competencies. Yet, few studies have explored the utility of several pedagogical approaches available and the extant curricula in facilitating their attainment. Also, a paucity of studies seeking to identify and prioritize industry requirements pertaining to these competencies has been observed. This study aims to bridge these observed gaps, relying on the sustainability competencies for Built Environment disciplines (Construction Management, and Quantity Surveying) exemplar. Accordingly, the study established the sustainability competencies being demanded by industry employers; determined the most suitable pedagogical approaches for impacting these competencies and reviewed the existing curriculum. Adopting a case study research design, data was elicited at various intervals from different sources thereby depicting a sequential mixed method methodological choice. Initially, data was elicited from three major job advertorial websites using text mining; administration of questionnaires to staff in the Department of Built Environment to enable an identification of the sustainability competencies, and elicitation of their perceptions on the suitability of different pedagogical approaches in engendering the development of sustainability competencies and a review of 32 study guides. The data

from these sources where analysed using a mixture of qualitative and quantitative content analysis respectively and subsequently triangulated to enable the achievement of the study objective. From the study plethora of findings, industry prioritization of sustainability competencies like justice, responsibility, and ethics; communication and use of media; assessment and evaluation; and social responsibility, was observed. It was also discovered that the curricula made strong contributions to the development of the previously elucidated sustainability competencies. The data also shows that the use of case studies and problem-based learning proved to be more potent in the delivery of these sustainability competencies. The study findings holds salient implications for academic staff as it serves as a guide towards the development of graduate attributes in learners thereby ensuring improved chances at employability.

ID-1715

ENERGY CONSERVATION AND EFFICIENCY OF HOTEL BUILDING BASED ON GREENSHIP AND GREEN BUILDING INDEX

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ABSTRACT

Currently, Indonesia is the country with the largest energy consumption in Southeast Asia, which counts for more than 36% of the region's energy needs. To reduce the use of fossil and coal energy resources that harm the environment, a green building concept is needed. A Green building is a building that operated by taking care of environmental or ecosystem factors. The hotel is a building that consumes a large amount of energy, so efforts to save energy are

needed. One of the big hotels in Palembang City is The Alts Hotel. The Alts Hotel is located in residential areas and buildings with wasteful energy use such as hotels, ballrooms, restaurants, cinemas, and supermarkets. So it is necessary to research conservation and energy efficiency at The Alts Hotel. The data collection method used in this research is primary and secondary data collection. The data obtained is then processed based on the GreenShip standard and the Green Building Index where The Alts Hotel has complete 4 GreenShip criteria with a total of 24 points, while the Green Building Index The Alts Hotel has complete 7 criteria with 16 points. For the percentage obtained, based on GreenShip The Alts Hotel got 66.6% while for the Green Building Index 42.1%. The results of this study indicate that The Alts Hotel has not been maximal in carrying out energy conservation and efficiency because the value obtained in both standards GreenShip and Green Building Index does not reach maximal points.

ID-1716

DEVELOPING STRATEGY TO IMPROVE TRANS PADANG BUS OPERATIONS USING LOGICAL FRAMEWORK ANALYSIS FOR EFFECTIVE USE OF ITS TRANSPORTATION INFRASTRUCTURE

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ABSTRACT

Trans Padang bus route IV has been operated since 1 February 2020, this route through to minimum central of community activity and little housing areas, this condition could produce negative impact to the bus operation. This paper develop strategies to improve Trans Padang bus operation using Logical Framework Analysis approach, field survey has been collected to identify the performance of bus operation, and the

travel characteristics of responden have been identified using on board interview survey and secondary data was collected from several institutions. From the result of analysis, it has been identified that several strategies for bus operation planning and improving bus operation facilities.

ID-1717

FLEXURAL CAPACITY OF COMPOSITE LIGHT GAUGE STEEL AND CONCRETE OF A PLATE STRUCTURE

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ABSTRACT

owadays, light gauge steel has been used in various residential and industrial buildings. However, in general, it applies so far to the roof truss-structures. This material is identified by two main characteristics, i.e., light weight section and high yield strength. In this paper, application of the light gauge steel to composite plate structures was studied experimentally. Observations were carried out for 12 specimens; they consist of six specimens of conventional reinforced concrete structures and other six specimens of composite light gauge steel and concrete structures. Dimension of the specimens were varied for two section width of 300 and 450 mm, and three section depths: 80 mm, 100 mm, and 120 mm. The specimens were placed on the simple supports with 2000 mm effective span length. Two-point loads loading scheme were subjected to the specimen. The load increased monotonically until ultimate condition obtained. The delayed first crack was found on the composite specimens. Different types of ultimate condition were observed: crash on the top fiber of composite specimen, flexural crack on the concrete part, and fracture on the cold-formed steel. Ultimate flexural capacities of composite specimens from

experimental test were compared to analytical formula and good agreements were achieved.

ID-1718

DYNAMIC RESPONSE OF ARCH BRIDGE STRUCTURE WITH DYNAMIC MOTION SIMULATOR TESTING

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ABSTRACT

Based on the recordings of 164 seismographs installed by the Meteorology, Climatology and Geophysics Agency (BMKG) in a number of regions of Indonesia, 4394 earthquakes have occurred. Among the thousands of earthquakes, seven of them were earthquakes that caused damage to buildings. According to Widjokongko, an earthquake and tsunami researcher at the Agency for the Assessment and Application of Technology (BPPT) revealed that currently earthquake risk-based development has not become a reference, even though from seismic data it is clear the frequency in Indonesia is very high. So we need a tool that is able to represent earthquakes to test the design of a building that is able to withstand earthquake loads and determine its dynamic response. The tool that is usually used in structural testing is a vibrating table. The Vibrating Table represents the input of the earthquake that occurred. The working mechanism of the earthquake test equipment uses a slider crank system in which the movement of the vibrating table comes from a motor that is connected to the slider crank. The movement of the vibrating table that is used as input is only translational motion. To determine the dynamic response of the test equipment, a variation of 0.025 g was carried out. By using the acceleration of the imperial valley earthquake which has been scaled with the Pekanbaru earthquake, the ground acceleration is

0.025 g. The subgrade acceleration has become the input in the test, so that the maximum acceleration value of the structure at the top of the bridge is 0.4 m/s² while numerical analysis obtained a maximum acceleration of 0.43 m/s². So it can be concluded that the use of a vibrating table in predicting the dynamic response of the bridge can be done with a limited scale.

ID-1719

THE CHARACTERISTICS OF ASPHALT CONCRETE LAYER FLEXIBLE PAVEMENT USING AGREGATE FROM WASTE MATERIAL CONCRETE OF PILE CONSTRUCTION

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ABSTRACT

Rapid economic growth has resulted in the proliferation of infrastructure developments such as buildings, bridges, ports, roads, and various other public facilities. The result of this development is the increase in the amount of construction waste material which has a negative impact on the environment. Utilization of construction waste or residual material into aggregate in road pavement is expected to reduce the amount of construction and mining on rocks and sand. This study aims to provide input to several parties regarding the potential of concrete waste to be used as a substitute for aggregate in road pavements. This study used experimental methods in the laboratory with five different asphalt content. The residual construction material used as aggregate is derived from the residual piles which had quality of concrete K-450 from the construction of shop houses in Spring Hills

Residence, Palembang. The separated concrete is then reprocessed using a stone crusher located in Linggau City into 2-3 aggregates, 1-2 aggregates, 1-1 aggregates and dust (stone ash). The VIM value produced by the asphalt concrete mixture from the residual concrete aggregate is bigger than the value obtained from the mixture using standard aggregate in the AC-WC layer of 4.51%, the AC-BC layer of 4.362% and on the AC-Base layer of 4.45%. The VMA value produced in the residual concrete aggregate asphalt concrete mixture in the AC-BC and AC-Base layers is bigger than the standard aggregate asphalt concrete mixture, namely 18.627% and 17.75%, but in the AC-WC layer the VMA value is bigger in the standard mixture compared to residual concrete aggregate. For the VFA value produced in the residual concrete aggregate asphalt concrete mixture in the AC-WC and AC-Base layers is bigger than the standard aggregate asphalt concrete mixture, namely 85.99% and 74.94%, but in the AC-BC layer the VFA value is greater in the standard mixture standard compared to the mixture using residual concrete aggregate, which is 76.549% for the standard mixture and 77.238% for the mixture using residual concrete aggregate. Meanwhile, the stability value produced from the standard concrete AC-WC mix is greater than the stability value generated from the AC-WC mixture from the residual concrete aggregate, but on AC-BC and AC-Base mixture with residual concrete aggregate stability shown a better value than standard asphalt concrete mixture. And the value flow resulting from the mixture of asphalt concrete layer on AC-WC and AC-Base with standard aggregate is greater than the mixture of asphalt concrete layer with aggregate from residual concrete. The MQ value produced in the asphalt concrete mixture from the residual concrete aggregate is greater than the MQ value produced in the asphalt concrete mixture from the standard aggregate

ID-1720

MULTI-CRITERIA ANALYSIS FOR SOFT SOIL IMPROVEMENT DECISION MAKING CASE STUDY: PADANG - SICINCIN TOLL ROAD PROJECT

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ABSTRACT

The construction of Padang-Sicincin Toll Road has to deal with soil problems. This research aims to determine the optimum soil improvement method using multi-criteria analysis. The types of soil improvement method to be analyzed are Mini Piles, PVD-Preloading, Vibro Stone Column and Modular Grout Columns. They will be analysed using four criterias: technical design, construction method, time, and cost. Questionnaires survey and observation were conducted in collecting data and then analyzed using Analytical Hierarchy Process method. The results show that the highest priority scores between criteria are [1] technical design with score of 56% and [2] Cost with score of 22.3%. The priority score for each soil improvement alternative is obtained from soil improvement planning analysis for technical design criteria, risk assessment for work methods criteria, comparison of site-construction's time for time criteria, and comparison of work costs for cost criteria. The results show that the highest priority scores for soil improvement alternative is [1] technical design with score of 25% for every alternative, [2] work method with score of 31.3% for the PVD-Preloading alternative, [3] Implementation time with score of 57.4% for the Vibro Stone Column alternative, and Cost with score of 54.9% for PVD-Preloading alternative. The results of the scoring between criteria and alternatives for each criterion were combined to obtain the final priority score to determine the most optimum soil improvement alternatives on Padang-Sicincin Toll Road

project. The most optimum soil improvement alternatives used on Padang-Sicincin Toll Road project is PVD Preloading with score of 30.5%.

ID-1721

RESEARCH SYNTHESIS ON CONSTRUCTION CREW DESIGN AS AN ESSENTIAL PART OF LEAN PRODUCTION SYSTEM DESIGN

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ABSTRACT

Lean construction emphasizes an explicit production system design as well as product design. While the objective of product design is to provide maximum value to the purchaser, the users, the production system is designed for the benefit of those who deliver the system, the producers. The actual production in construction takes place at the crew level. Therefore, crew design is essential to the production system design. Some studies show that modifying crew make-up and size substantially improvement construction operations, despite implementing the same construction method. This paper presents a synthesis of the existing lean construction literature related to construction crew design guided by a meta-analytic approach. This paper connects the dispersed crew design method proposed by researchers and professionals in lean construction to one of the foundations of lean construction, the TFV (transformation-flow-value) theory of production. The study also presents how the crew design methods affect performance metrics, such as waste, work in progress, wait/idle time, and rework.

ID-1722

ASSESSING PUBLIC KNOWLEDGE OF EARTHQUAKE-RESISTANT BUILDING CONSTRUCTION CAN HELP INCREASE COMMUNITY RESILIENCE: LITERATURE STUDY

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ABSTRACT

The uncertainty of large-scale earthquake disasters will pose a risk in people living in disaster-prone areas. For this reason, it is necessary to assess the knowledge of community resilience to face these risks. Assessing community resilience to disaster risk can be identified through public knowledge of earthquake-resistant building construction. This step needs to be taken early to assist the government in implementing policy strategies to reduce disaster risk. General knowledge of earthquake-resistant building construction can be used as an initial benchmark in making policy strategies to anticipate the risk of failure in post-disaster reconstruction efforts. A holistic approach is needed to reduce harmful risks to community resilience, infrastructure, and the construction industry in adapting to the risk of a large-scale earthquake. This study provides an overview of public knowledge of earthquake-resistant buildings construction and the efforts that can be made to reduce the negative impact of the risk of a major earthquake that will occur by comparing it to previous studies related to efforts to increase community resilience. The recommended policy measures include information and socialization, efforts to detect early post-disaster reconstruction failures, and the construction industry efforts to increase the success of post-disaster reconstruction. This paper also identifies to provide further research directions by strengthening the benefits and finding appropriate and rapid decision-making strategies to increase the resilience of disaster-resilient

communities. *Keywords: Public knowledge, Earthquake-resistant building construction, Construction industry, Policy strategy.*

ID-1723

KNOWLEDGE MANAGEMENT IN MALAYSIA- RESEARCH TREND

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ABSTRACT

As globalization intensifies, knowledge as a vital competitive asset is becoming more and more important. Managing knowledge is becoming a must in light of this scenario. In Malaysia, the awareness of knowledge management is growing in various organizations. However, the practice of knowledge management is still in the infant stage, comprehensive review of academic literature on knowledge management in the context of Malaysia is scarce and fragmented. Therefore, this study aims to conduct a systematic literature review to investigate the research trend of knowledge management and identify the future directions from the perspective of Malaysia. Through a comprehensive content analysis to the 55 articles from Scopus database. The results show that the research interest has been a slight increase in recent several years, but the number of publications on knowledge management in the context of Malaysia was very small compared with worldwide. The findings also indicated that the research on knowledge management involves all industries, including business activities, government organizations and agencies, social life and healthcare and education. The most research publications focused on business field. In addition, seven categories of research topics identified by an in-depth analysis. Moreover, a variety of

qualitative and quantitative research techniques like Delphi method, Canonical Action Research, and Observation were used in this field of study.

ID-1724

THE BEHAVIOR OF CASTELLATED BEAM UNDER DIFFERENT HOLES DISTANCE

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ABSTRACT

Steel is an alternative material in the construction of civil engineering structures, because the steel material has several advantages compared to other construction materials. Castellated steel is one form of innovation in the use of steel in building structures. In this study, observations were made on the effect of variations in the distance between holes and the diameter of the circle on the castellated beam. In this research, IWF 150.100.6.9 steel is used which will be converted into circular castellated beams with 3 different shapes of circle diameter variations and different distances between holes. The placement used in this research is pins, with a beam span of 6.5 meters which has a yield stress (f_y) of 300 MPa and an ultimate stress (f_u) of 450 MPa. The loading is given statically monotonic in the middle of the beam span until the ultimate condition is reached in the cross section. The results are then recapitulated and plotted in the form of graphs to be analyzed in terms of strength, stiffness and ductility.

ID-1725

OPTIMIZING WASTE MATERIALS USAGE IN RECLAIMED ASPHALT PAVEMENT WITH BASE A AGGREGATE

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ABSTRACT

The continuous use of new materials can result in material scarcity. Therefore, it is crucial to develop a recycling method to reduce new materials and solid waste from scratching the old road. Cement Treated Recycling Base (CTRB) is one of the recycling technologies for reconstructing the road foundation layer by utilizing the material from scratching old road that has been damaged and reused as a material in the pavement mixture using cement as a binder. This study used an experimental method in soil mechanics laboratory of Sekolah Tinggi Teknologi Pekanbaru (STTP). The mixture composition for this study is 50% Reclaimed Asphalt Pavement (RAP) + 50% Base A Aggregate with variations of Portland Composite Cement (PCC), which is 0%, 2%, 4% and 6% by the weight of 50% RAP + 50 % Base A Aggregate. This study tested the Property Index and Mechanical Properties to determine the optimum level of cement usage in CTRB work, the best composition of RAP mixture with Base A material, Unconfined Compression Strength (UCS) value and California Bearing Capacity Ratio (CBR) test. The tests results show that 50% RAP + 50% Base A Aggregate without cement mixture does not meet its bearing capacity general specifications with a value of 64.1% for its compressive strength test. The minimum general specification value is 3.0 MPa, and it is achieved at 6% cement mixture with a compressive strength test value of 3.04 MPa. It is concluded that the combined gradation of CTRB mixture with the proportion of 50% RAP + 50% Base A Aggregate does not meet the standard specifications but still meets the requirements for

compressive strength and the value of bearing capacity, which is 3.04 MPa and 240% respectively.

ID-1727

IMPLEMENTATION OF CONSTRUCTION MANAGEMENT SYSTEM BASED ON INFORMATION TECHNOLOGY (IT) AND INTEGRATED TOWARDS DIGITAL CONSTRUCTION AND INDUSTRY 4.0

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ABSTRACT

The world of construction from time to time does not stand still, but continues to develop in various ways. Developments in the construction world aim to make it easier for the parties involved in completing their respective responsibilities. As time goes by and demands to speed up the process of completing work, nowadays we find more and more software and applications that are used to support construction work. The use of this software will make the work products of construction actors more efficient, effective and productive where this is the goal of all construction actors. Several construction companies that develop information technology infrastructure in the form of software are PT Tunas Jaya Sanur, PT Mardika Griya Prasta and PT Sanur Jaya Utama with their Integrated Project Management System (IPMS) software. This study aims to compare the company's performance after and before using information technology (IT) infrastructure and to find out the advantages and disadvantages of using information technology infrastructure, especially at PT Tunas Jaya Sanur, PT Mardika Griya Prasta and PT Sanur Jaya Utama. Comparison of the performance of PT Tunas Jaya Sanur, PT Mardika

Griya Prasta and PT Sanur Jaya Utama after using information technology infrastructure, the whole process can be faster in terms of time, and in terms of costs, this system can reduce operational costs and staff costs so that the company can become more efficient. efficient, effective and productive. The advantage of using this information technology infrastructure is that it is faster in terms of time, more efficient in terms of operational costs, more environmentally friendly because it uses less paper and can be done anywhere. While the drawback is that it requires investment costs at the beginning and must be connected to the internet.

ID-1728

IDENTIFYING FACTORS BEHIND DELAYS OF MATERIAL SUPPLY AT ROAD CONSTRUCTION PROJECTS IN SIAK COUNTY, RIAU PROVINCE

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ABSTRACT

Siak County is one of the counties in the Riau Province, Indonesia. The county government is currently aiming to develop the local infrastructures, including a better and more expansive road network to its hinterlands. An effective and efficient construction project management is needed in order to ensure the quality of the road network. Another important thing is also the availability of materials for road construction, in order to ensure the project could be finished on time. Observing the situation on the ground, material supplies are often late in arriving at construction projects in Siak. This research seeks to examine the major factors behind the delayed arrival of materials for construction projects in this area. It is done methodologically by distributing questionnaires to respondents, which

are the Commitment-Making Officers (PPK) at Siak County Department of Public Works, followed by contractors and consultants that are involved in road projects around Siak for the past five years. The analyzed data found five major factors behind the late arrival of materials: the distance between source of the materials to the project location, location of source of the materials, the unavailability of materials within the Siak County, delayed payment of invoices by project owners, and occasional breakdowns of transportation vehicles that carry the materials. We recommend making a material procurement plan for the equipment and workers in the most detailed way possible, better coordination between the contractors and the material suppliers, on-time payment of material costs by project owners, and a more effective and efficient project management.

ID-1730

WATER- SUSTAINABILITY IN CONSTRUCTION INDUSTRY

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ABSTRACT

Water is an essential resource for the survival of mankind. The "Water is an important natural resource to touch all aspects of human civilization from agricultural and industrial development to the cultural and religious values embedded in the society." The World Economic Forum's Global Risks Report survey (2005), states that the "Water crises are considered as the biggest of all risks, higher than weapons of mass destruction, interstate conflict and the spread of infectious diseases". Sustainable water is to ensure that, there is enough water to meet multiple needs, from agriculture to municipal and industrial. Water sustainability also mean energy neutrality by coupling traditional water treatment technologies with renewable

energy resources. Sustainable water management is multidisciplinary and holistic approach of technical, environmental, economic, landscape aesthetic, societal and cultural issues. Sustainable water systems may not include the use of water, but include systems of water traditional water usage. Studies have proved that US\$15 to US\$30 billion investment in improved water resources management can have direct annual income returns of US\$60 billion. Every US\$1 invested in watershed protection can save from US\$7.5 to US\$200 in costs for new water treatment and filtration facility (SIWI, 2005). In order to achieve water sustainability it is necessary to produce more with less water and adopt integrated water& waste water resource management. It is also necessary for implementation of measures to improve the efficiency of water use, to reduce losses and to increase recycling of water. Promotion of multiple water-use systems and assessing and communicating the values associated with different water-related goods. It is imperative to state that conducting Water Resource Accounting studies for efficient allocation of resource and making water scarcity as every body's business. Typical conservation measures include using treated water for toilet flushing, gardening, agriculture, construction industry, preparation of cement blocks, concrete, pavements, curing, and etc.

ID-1731

ANALYSIS CRITERIA FOR DETERMINING THE SELECTION OF BRIDGE / SHORTCUT CONSTRUCTION ON NATIONAL ROAD TABANAN – GILIMANUK

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ABSTRACT

Bali has variable contours (from ramps to steep) so that roads in Bali have a level of difficulty in vertical or horizontal alignment, also a heritage road that does not match the demands of current traffic such as the number of vehicles that are getting bigger, the size of the vehicle is getting bigger and the weight of the vehicle is getting heavier. In the area reviewed is a national road that is quite dense and has been made improvements - improvements in the bridge and shortcut road on Tabanan road – Gilimanuk including Samsam Shortcut and Megati shortcut. Preliminary survey results with geometric data processing methods with maps there are 77 bend points that are not in accordance with Bina Marga standards. Furthermore, the government urgently needs to process data from these 77 points into a priority point of handling given the very limited funds. The purpose of this study is to find a priority scale to make alignment repairs because the costs are still limited so that other methods such as determining accident and congestion prone points, as well as vertical alignment checking. The results of the survey and analysis obtained 10 points that are priority improvements because in terms of vertical, horizontal, and from points prone to accidents or congestion. It is recommended to be handled with the construction of bridges or shortcuts.

ID-1732

RISK ANALYSIS ON THE USE OF HEAVY EQUIPMENT WITH HIRARC METHOD

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ABSTRACT

Reclamation work on the West Side Coast Land Maturation and Apron Construction project at I Gusti Ngurah Rai International Airport has

been started since 2018 for phase I, namely land maturation work with an area of 357,500 m². In addition, the work of phase II has reached the area worked on is 121,500 m², so that the total of land maturation work is 479,000 m². In this reclamation work, heavy equipment is very helpful because of the area of land, the large volume of work, and limited work time. Therefore, bulldozer, excavator, dump truck, dredger, backhoe, front shovel, drum shell, loader, roller, and compactor are important factors in helping this reclamation work. Work accidents can be caused by heavy equipment or worker negligence factors. Potential work accidents can occur in any work activity. In this study, efforts to prevent the occurrence of work accidents will be carried out using the Hazard Identification Risk Assessment and Risk Control (HIRARC) method by identifying hazards (hazard identification), risk assessment, and risk control. The results of this study concluded that there was a development of potential hazards that have not been previously identified as many as 23 hazard findings or 30% of previous studies. 7 were at moderate risk, 22% of the 5 were low risk while 48% of the 11 were high risk.

ID-1733

BUILDING SUSTAINABLE CONSUMER BEHAVIOR IN THE CONSTRUCTION INDUSTRY

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ABSTRACT

Achieving a sustainable Consumer Behavior has become increasingly paramount in our world to date. Climate change issues and consequent effects are increasingly on the rise. However, across the

industries, our consumers and producers are still mainly govern by the economies of scale based on financial concerns rather than social and environmental concerns. This paper attempts to look at ways to SHIFT consumer behavior in the construction industry to be more sustainable by using the SHIFT framework. The premise that behavior can be shaped and built is the under lying thought of this paper. This paper suggests ways that stakeholders in the construction industry can develop in order to build a sustainable consumer behavior within the industry.

Organizers

I-CENTROID2021 is hosted by Universitas Andalas, Co-hosted by Universitas Mataram, Universitas Warmadewa, Mangalore Institute of Technology and Engineering (MITE, India), University Teknologi MARA (Malaysia), Sekolah Tinggi Teknologi Pekanbaru, Politeknik Negeri Padang, Universitas Sriwijaya, Universitas Internasional Batam, Universitas Mulawarman, Sekolah Tinggi Teknologi Payakumbuh, University Malaya (Malaysia). The conference is supported by Civil Engineering Departement Universitas Andalas, Faculty of Engineering Universitas Andalas, LPPM Universitas Andalas, Concrete Society of Malaysia, Jakarta Internatinal Stadium, Inkindo (Sumbar), Gataki, Gataki, Aspeknas, Astekindo, Istakindo, PT. Hutama Karya Kadin, and Dinas BMCKTR Pemprov. Sumbar.



Symposium

SIMPOSIUM BERSAMA

MENGGAGAS RENCANA STRATEGIS PENGEMBANGAN INDUSTRI KONSTRUKSI

Pembukaan:



Prof. Dr. Yulandri, SH, MH
Rektor Universitas Andalas



Dr. M. Arsjad Rasjid, P.M.
Ketua Umum KADIN



Ir. Yudha Mediawan M.Dev.Plg
Dirjen DJBK Kementerian PUPR

Keynote Speech:

Salah satu agenda dalam i-Centroid2021 Conference adalah simposium tentang peningkatan nilai tambah industri konstruksi nasional.

Pusat Pengembangan Industri Konstruksi (Puspik) Universitas Andalas mengajak semua masyarakat jasa konstruksi dari para akademisi, para peneliti, para praktisi, para pelaku usaha dalam rantai pasok konstruksi seperti konsultan perencana atau konsultan disain, konsultan pengawas, konsultan manajemen konstruksi, kontraktor, vendor/ supplier dan pabrikator, para pengurus asosiasi profesi dan pengurus asosiasi badan usaha dan para pelaku usaha investasi dan pengembang properti bangunan gedung atau bangunan sipil (infrastruktur) menyampaikan pemikiran pada simposium ini untuk menjadi masukan dalam bersama menggagas rencana strategis pengembangan industri konstruksi untuk periode sekarang hingga 2030.

Pokok Bahasan:

- Inovasi untuk Kemajuan Investasi dan Pembiayaan,
- Inovasi untuk Kemajuan Rancang Bangun dan Rekamata,
- Inovasi untuk Kemajuan Kompetensi SDM,
- Inovasi untuk Kemajuan Material, Peralatan dan Teknologi
- Inovasi untuk Kemajuan Model Bisnis Rantai Pasok Konstruksi,
- Inovasi untuk Kemajuan Project Delivery System, Procurement System dan Contract Form,
- Inovasi untuk Kemajuan Operasi, Pemeliharaan, Rehabilitasi Aset Bangunan,
- Inovasi untuk Kemajuan Penerapan Teknologi Informasi untuk Precision Construction

Keluaran:

- Rekomendasi Kebijakan Pengembangan Industri Konstruksi
- Rekomendasi Rencana Strategis Pengembangan Industri Konstruksi

Moderator



Dr. Akhmad Suraji
Ketua Dewan Peneliti PusPIK Unand

Hari & Tanggal:

Rabu, 25 Agustus 2021.
Mulai jam 10:00 WIB

Online Via Zoom:

Meeting ID: 827 2352 0464
Passcode: unand

GRATIS
+ E-CERTIFICATE

CO-HOST



Universitas Yabuan



Universitas Maritim
Sultan Muhammad Ali



Universitas Pendidikan
Ekspresia



Universitas Sebelas Maret



Universitas Trilogi



Universitas Bina Nusantara



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Universitas Andalas



<https://conference.ft.unand.ac.id/index.php/i-centroid/2021>

Symposium Schedule

25 August 2021, 10:00 – 15:00 WIB

(conducted in Bahasa Indonesia)

Waktu	Kegiatan	Penanggungjawab/ Pemateri
09.55- 10.00	Persiapan Pembukaan	Panitia
10.00- 10.10	Kata Sambutan Ketua Dewan Peneliti PusPIK	Dr. Akhmad Suraji
10.10- 10.15	Pembukaan oleh Rektor Unand	Prof. Yuliandri
10.15- 15.00	<i>Plenary Session: Keynote Speech</i>	
10.15- 11.00	Keynote Speech 1	Ketua Umum KADIN: M. Arsjad Rasjid, P.M.
11.00- 11.45	Keynote Speech 2	Dirjen Bina Konstruksi: Ir. Yudha Mediawan, M.Dev.Plg
11.45- 12.00	Istirahat untuk persiapan Pemaparan Position Paper	Panitia
12.00- 15.00	Pemaparan Position Paper - Pemerintah - Perguruan Tinggi - Kontraktor - Konsultan	Dr. Akhmad Suraji
15.00- 15.05	Penutupan	Panitia

Sambutan Rektor

Assalamu'alaikum Wr Wb

Saya mengucapkan selamat datang kepada seluruh peserta Simposium Bersama Pengembangan Industri Konstruksi dengan tema "Menggagas Rencana Strategis Pengembangan Industri Konstruksi". Merupakan suatu kehormatan bagi kami, Universitas Andalas, untuk menjadi penyelenggara kegiatan ini.

Kita sama-sama mengetahui bahwa pemerintah saat ini sedang giat-giatnya melakukan pembangunan infrastruktur untuk memacu pertumbuhan ekonomi bangsa kita. Hal ini tentu saja membutuhkan dukungan industri konstruksi yang kuat untuk mewujudkannya. Akan tetapi, banyak sekali tantangan yang harus dihadapi untuk menciptakan suatu industri konstruksi yang tangguh tersebut. UU no 2 Tahun 2017 tentang Jasa Konstruksi telah mengamanatkan bahwa pelibatan-pelibatan seluruh stakeholder atau masyarakat jasa konstruksi adalah salah satu kuncinya. Oleh karena itu, bersama-sama dengan seluruh para pelaku usaha jasa konstruksi, Universitas Andalas melalui Pusat Pengembangan Industri Konstruksi (PUSPIK) bermaksud untuk menyumbang pemikiran dalam menyusun gagasan rencana strategis pengembangan industri konstruksi nasional melalui simposium ini.

Melalui simposium ini, kami mengharapkan dokumen advokasi bertema Agenda Bersama Pengembangan Jasa Konstruksi (APJK) 2030 atau Construction Industry Transformation Agenda (CITA) 2030 dapat diwujudkan untuk disampaikan kepada Presiden Republik Indonesia melalui Menteri Pekerjaan Umum dan Perumahan Rakyat.

Selanjutnya kami mengucapkan terimakasih banyak kepada keynote speaker simposium ini: Ketua Umum KADIN Indonesia

Bapak M. Arsjad Rasjid P.M.; Dirjen Bina Konstruksi Kementerian Pekerjaan Umum dan Perumahan Rakyat Bapak Yudha Mediawan yang telah menyediakan waktu dan menyumbangkan ide pemikirannya untuk acara ini. Selanjutnya juga kepada seluruh pihak yang telah mengirimkan position papernya, peserta dan sponsor simposium.

Tidak lupa kami juga mengucapkan terimakasih kepada teman-teman penyelenggara di Pusat Pengembangan Industri Konstruksi (Puspik) Unand, terkhusus kepada Bapak Dr. Benny Hidayat selaku Direktur dan Bapak Akhmad Suraji sebagai Ketua Dewan Peneliti. Saya sangat mengapresiasi Puspik ini, walaupun baru didirikan, kemudian sanggup untuk menyelenggarakan dua acara besar konferensi internasional dan simposium tentang industri konstruksi, ini adalah suatu hal yang sangat luar biasa. Semoga di kemudian hari Puspik semakin berkembang, lebih maju, dan terus berkontribusi untuk Kedjajaan Bangsa.

Demikian, semoga acara simposium berjalan lancar dan sukses menghasilkan Agenda Bersama Pengembangan Jasa Konstruksi 2030.

Wa'alaikumsalam Wr Wb,
Prof. Dr. Yuliandri



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