ICEED 2019
CERTIFICATE
THIS CERTIFICATE IS GRANTED TO
Ade Lisantono
In Recognition as
Presenter
in The 3rd International Conference on Eco Engineering Development (ICEED),
"Sustainable Environment, Engineering, Energy and Technology Development"
held in Lorin Hotel, Solo - Indonesia, on 13th - 14th November 2019

Dr. Ir. John Fredy Bobby Saragih, M.Si.
General Chair of ICEED 2019

Prof. Tirta Nugrah Mursitama, S.Sos., M.M., Ph.D.
General Chair Binaus Joint International Conference

Dr. Ir. Oki Setyandito, S.T., M.Eng.
Conference Chair of ICEED 2019
Jakarta, Oktober 15th, 2019

Letter Number : 2554/ICEED/IX/2019
Subject : Letter of Acceptance ICEED 2019
To : Ade Lisantono (adelisantono@mail.uajy.ac.id), Y P B Pratama

Dear Author,

On the behalf of the ICEED Organization Committee, it is my pleasure to inform you that your paper, entitled:

**Effect of silica fume on the Compressive Strength and Modulus Elasticity of Self-Compacting High Strength Concrete**

has been accepted for proceeding publication and conference presentation for The 3rd International Conference on Eco Engineering Development (ICEED 2019). Thereby, you are cordially invited to present the paper at ICEED 2019, which will be held in Solo, Jawa Tengah, Indonesia during November 13-14, 2019. We request at least one of the authors listed in the paper must register with the necessary registration fee, and make presentation of the paper in the conference. All of the registered and presented papers will be published in IOP Conference Series: Earth and Environmental Sciences (EES), which is an open-access proceedings publication indexed by ISI Web of Science, SCOPUS and EI Compendex. Once again, Congratulations to you and we look forward to seeing you in the Conference.

Warmest Regards

Dr. Oki Setyandito
Conference Chair ICEED2019.
Rundown and presentation schedule ICEED 2019 Solo 13-14 Nov 2019

ICEED <iceed@binus.edu>
Sen 11/11/2019 13:46
richard_husada@yahoo.com; achristiani73@gmail.com; DEWI HANDAYANI <dewi@ft.uns.ac.id>; Johr

Dear Respected Authors,

Kindly find the link for your presentation schedule at ICEED 2019:
bit.ly/iceed2019

Allow us to inform you again the venue address:
Hotel Lorin D'wangsa
Jl. Adi Sucipto No. 47
Gonilan, Kartasura,
Kota Kartasura, Jawa Tengah, 57714

If you any question do not hesitate to contact us.

Looking forward to seeing you soon.

Warmest regards,
ICEED 2019 Committee

Dr. Oki Setyandito
Civil Engineering Department,
Faculty of Engineering
Binus University, Jakarta
Payment Confirmation - ICEED 2019

ICEED <iceed@binus.edu>
Rab 30/10/2019 18.43
Ir.AM.Ade Lisantino M.Eng 🟢

Dear Authors,

We would like to inform you that we have received the registration fee payment for ICEED 2019 Conference. Thank you so much, and we look forward to seeing you in Conference venue at Lorin Solo Hotel, Solo, Indonesia

Warm regards,

ICEED 2019 committee
[ICEED 2019] Submission Acknowledgement

Oki <iceed@binus.edu>
Kam 24/10/2019 19.47
Kepada: Ir.AM.Ade Lisantono M.Eng <adelisantono@mail.uajy.ac.id>
Ade Lisantono:

Thank you for your submission, "Effect of silica fume on the compressive strength and modulus elasticity of self-compacting high strength concrete" to The 3rd International Conference on Eco Engineering Development (ICEED 2019). With the online conference management system that we are using, you will be able to track its progress through the editorial process by logging in to the conference web site:

Submission URL:
https://conference.binus.ac.id/ocs/index.php/iceed/ICEED2019/author/submission/2569
Username: adelisantono

If you have any questions, please contact me. Thank you for considering this conference as a venue for your work.

Oki
The 3rd International Conference on Eco Engineering Development (ICEED 2019)

THE 3RD INTERNATIONAL CONFERENCE ON ECO ENGINEERING DEVELOPMENT (ICEED 2019)
http://conference.binus.ac.id/ocs/index.php/iceed/ICEED2019/index
Re: Submit paper for ICEED 2019

ICEED 2019 <okisetyanditoiceed2019@gmail.com>

Sel 22/10/2019 10:51

Kepada: Ir.AM. Ade Lisantono M.Eng <adelisantono@mail.uajy.ac.id>
Cc: iceed@binus.edu <iceed@binus.edu>; osetyandito@binus.edu <osetyandito@binus.edu>

2 lampiran (1 MB)
Review 2554-6029_Lisantono and Yoga_ICEED 2019.doc; 2554_LOA_iceed 2019.pdf;

Dear Authors,

Congratulation,

Your papers with have been accepted for proceeding publication with **minor revision** (please revise according to the highlighted comments in the document attached). Also, your paper has been accepted for conference presentation in The 3rd International Conference on Eco Engineering Development ICEED 2019 (kindly find an Letter of Acceptance attached). Thereby, you are cordially invited to present the paper at ICEED 2019, which will be held in Lorin Solo Hotel, Solo, Jawa Tengah, Indonesia during November 13-14, 2019.

We request at least one of the authors listed in the paper must register with the necessary registration fee before November 3, 2019 and please send the copy proof of the payment to iceed@binus.edu as a confirmation.

Rupiah Currency:
Account number : 527-170-6678
Account name : Univ. Bina Nusantara
Bank name : Bank Centra Asia (BCA)
Branch name : Univ. Bina Nusantara
Bank address : Kampus II Univ. Bina Nusantara, JL. Anggrek Cakra 10, Kebon Jeruk, Jakarta 11530
Country : Indonesia
Swift Code : CENAIJDJ

2. Other Currency:
Account number : 527-029-7970
Account name : Univ. Bina Nusantara
Bank name : Bank Centra Asia (BCA)

We would also like to inform you that you still have time to prepare the camera ready paper until November 3, 2019. It has to be noted that the camera ready paper is the final manuscript that not allowed for any revision, thus it is the paper that ready to be published. Therefore, you are encouraged to prepare it more carefully. Please upload your revised manuscript through the ICEED 2019 (see the 2 steps procedure for uploading the manuscript, below)

Thank you so much, and we look forward to seeing you in Conference venue at Lorin Solo Hotel, Solo, Indonesia

https://outlook.office.com/mail/inbox/id/AAQkADY2MjU3NzNLy1ZDMtNGYzY2Z1MGNiLTBIYzgzNjczMDNkOQAB08mWkBVdxMnHiuBJTYBk7Q%3D
Warm regards,

ICEED 2019 Committee

[How to upload Revised Manuscript:

1. Go to ‘Review’

2. Choose ‘Director Decision’, then upload your revised manuscript]

On Sun, Oct 13, 2019 at 10:29 AM Ir.AM.Ade Lisantono M.Eng <adelisantono@mail.uajy.ac.id> wrote:

Dear: Organizing Committee of ICEED 2019.

Here by, I send my full paper for possibility to joint in ICEED 2019 which is carried out by Bimas University (see attachment). Thank you very much for your kind attention and cooperation.

Best regards,

Ade Lisantono
Department of Civil Engineering
Faculty of Engineering
Universitas Atma Jaya Yogyakarta
Jalan Babarsari 44, Yogyakarta 55281, Indonesia.
The 3rd International Conference on Eco Engineering Development (ICEED 2019)

Conference Archives

THE 3RD INTERNATIONAL CONFERENCE ON ECO ENGINEERING DEVELOPMENT (ICEED 2019)

Solo City, Indonesia
TBA
Solo, ID

November 13, 2019 – November 14, 2019

Eco engineering embraces both green and ecological engineering that emphasize to protect human health and environment. The main objective of eco engineering is to develop sustainable ecosystems, manufacturing processes, building design and construction, disaster management and climate change impact, smart material and communication, renewable energy, that have more ecological values as well as to restore the disrupted ecosystems and polluted environment. It challenges for engineering professionals and scientists as well as researchers and academics, to achieve this goal. The appearance of the fourth industrial revolution or IR 4.0 in the direction of automation, big data, cloud, sensors, robotics, predictive maintenance, connectivity, 3D printing, cyber security, augmented reality, digital innovation, etc., can enhanced the performance of eco engineering. Although IR 4.0 is still in its very early stages, the industry, government and academia will all have the role to introduce it for sustainable environment, engineering, energy and technology development. The 3rd International Conference on Eco Engineering Development (ICEED 2019) goal, therefore, is to provide the knowledge enrichment and innovative technical exchange between International researchers/scholars and practitioners from the academia and industries. The conference will cover a spectrum of topics, from theoretical results to concrete applications and solutions.

All accepted papers in ICEED 2019 will be published in IOP Conference Series: Earth and Environmental Science. IOP Conference Series is an open-access proceeding publication indexed by ISI Web of Science, Scopus, EI Compendex.

Link to IOP Conference Series: IOPScience

The 2nd International Conference on Eco Engineering Development (ICEED 2018)

Binus University
Jl. Anggrek Cakra No. 10, Kebon Jeruk
West Jakarta, ID

September 5, 2018 – September 6, 2018

https://conference.binus.ac.id/ocs/index.php/iceed/index/schedConf/ls/archive
The 2nd International Conference on Eco Engineering Development (ICEED 2018) goal is to provide the knowledge enrichment and innovative technical exchange between International researchers/scholars and practitioners from the academia and industries in the field of ecological engineering as listed at the related topic of interests.

The ICEED 2018 invites the unpublished and original research works related to the topics to be submitted to this conference in the form of manuscript paper that should contain 4 - 10 pages, including figures, tables, references, acknowledgements and appendices. Any extra page(s) of your manuscript paper will be charged by US$15 per page.

The 2nd International Conference on Eco Engineering Development (ICEED 2018) will be held at Binus Campus at Alam Sutera, Tangerang, West Java, Indonesia.

All accepted papers in ICEED 2018 will be published in IOP Conference Series: Earth and Environmental Science. IOP Conference Series is an open-access proceeding publication indexed by ISI Web of Science, Scopus, El Compendex.

VIEW CONFERENCE DETAILS

International Conference on Eco Engineering Development 2017

Sheraton Mustika Hotel Yogyakarta
Jl. Laksda Adisucipto KM 8.7, Maguwoharjo, Depok Sub-District, Sleman Regency, Special Region of Yogyakarta 55282, Indonesia

Yogyakarta, ID
November 14, 2017 – November 15, 2017

The International Conference on Eco Engineering Development (ICEED 2017) goal is to provide the knowledge enrichment and innovative technical exchange between International researchers/scholars and practitioners from the academia and industries in the field of ecological engineering as listed at the related topic of interests.

The ICEED 2017 invites the unpublished and original research works related to the topics to be submitted to this conference in the form of manuscript paper that should contain 4 - 10 pages, including figures, tables, references, acknowledgements and appendices. Any extra page(s) of your manuscript paper will be charged by US$15 per page.

The International Conference on Eco Engineering Development (ICEED 2017) will be held at Sheraton Mustika Hotel, Yogyakarta, Central Java, Indonesia on November 14-15, 2017.

All accepted papers in ICEED 2017 will be published in IOP Conference Series: Earth and Environmental Science. IOP Conference Series is an open-access proceeding publication indexed by ISI Web of Science, Scopus, El Compendex.

VIEW CONFERENCE DETAILS

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Welcome to The 3rd International Conference On Eco Engineering Development (ICEED 2019)
The 3rd International Conference on Eco Engineering Development

SUSTAINABLE ENVIRONMENT, ENGINEERING, ENERGY AND TECHNOLOGY DEVELOPMENT

CONFERENCE PROGRAM BOOK
ICEED 2019
13th and 14th November
Puri Nalendra Ballroom
Lorin D’Wangsa Hotel
Solo - Indonesia

"THE KEY TO UNDERSTANDING THE FUTURE IS ONE WORD: SUSTAINABILITY"

-Patrick Dixon
(founder of Global Change)
Prof. Dr. Tirta Nugraha Mursitama, Ph.D.
General Chair of BJIC 2019

Minister for Public Works and Housing
Professor Masayuki Ichinose, Tokyo Metropolitan University, Japan
Professor Radianta Triatmadja, Gadjah Mada University, Yogyakarta
Dr. Imam Santosa, Indonesia Organization of Hydraulic Engineers
Associate Professor SMAN Arosha Semenayoke, Universiti Brunei Darussalam
Professor Koen Venema, Maastricht University, the Netherlands
Professor Danang Parikesit, Bureau of Toll Road Management
Ir. Dwi Agus Rohsetyo, M.Tech., PT. Waskita Karya
Ir. Pujit Ariwibowo, PT. Hutama Karya

Ladies and Gentlemen,
First of all, I would like to thank all invited speakers for taking the time to share your knowledge, insight and experiences with us today.

It is an honor for Ilmu Nusantara University especially Faculty of Engineering become an organizer of ICEED 2019. As Vice Rector of Research & Technology Transfer, this conference is one of our achievements, and it is a result of the growing awareness and willingness of the faculty member for sharing and gathering knowledge with practitioners, researcher, and community toward the green concepts. The appreciation of the participants makes this event rich with update knowledge that are ready to share with the community.

This year Bina Nusantara University (BJIC) consists of 5 international conferences covering many disciplines ranging from sustainability and development, information management, engineering, technology, computer science, business, international relations, social science and humanities, namely:

1. International Conference on Biospheric Harmony (ICOBAR), chaired by Dr. Juneman Abraham, S.Pd., M.Si., was held successfully in Jakarta, 27 – 28 June 2019;
2. International Conference on Information Management and Technology (ICAMTech), chaired by Drs. Suroto Adi, M.Sc., D.M.S., was held successfully in Bali and Jakarta, 19 – 20 August 2019;
3. International Conference on Computer Science and Computational Intelligence (ICCCSI), chaired by Dr. Derwin Suharto, S.Kom., M.T., was successfully held in Yogyakarta, 12 – 13 September 2019;
4. International Conference on Business, International Relations, and Diplomacy (ICOBIRD), chaired by Prof. Faisal Karim, S.Sos., M.A., Ph.D., was successfully held in Jakarta, 9 – 10 October 2019;
5. International Conference on Eco Engineering Development (ICEED), chaired by Dr. Ir. Oki Setyanulita, S.T., M.Eng., will be held in Solo, 13 – 14 November 2019.

These conferences show the strong commitment of BINUS University as world class university that ranked 801-1000 in QS World University Ranking 2020 to continuously produce, share knowledge, foster and empower the society. We collected more than 1,200 papers last year. We hope that we will get a similar number this year. But the most important thing is that these conferences become the best venue for networking for all participants. Therefore, I do appreciate for their tremendous contribution to these conferences.
ICEED 2019 Program Book

Hopefully, this event can be held again in the coming year and become a house to discuss and share an up to date research and thoughts that are useful for Indonesia and the world. We really hope that you will enjoy ICEED 2019 and had a wonderful experience in the beautiful city of Solo as one of the tourist destinations in Indonesia.

Thank you very much.

Prof. Dr. Tirta Nugraha Muridiana, Ph.D
Vice Rector of Research & Technology Transfer BINUS University
General Chair BJIC 2019

Ir. John Fredy Bobby Saragih, M.Si
ICEED 2019 General Chairman

First of all, on behalf of the organizing committee of ICEED 2019, we would like to welcome all delegates, all participants to Solo, Indonesia with great pleasure. Being held on November 13-14, 2019 at Lorin D’Wangsa Hotel Solo, proudly the third event of International Conference on Eco Engineering Development (ICEED 2019) is organized by the Faculty of Engineering, Bina Nusantara University.

The big theme of ICEED 2019 is Sustainable Environment, Engineering, Energy and Technology development, and we would like to give our appreciation and thank you to the conference organizers, all of reviewers, as well as all valuable authors for their contribution for making the successful of the event of ICEED 2019. We also greatly acknowledge our publishing partner, IOP Publishing, for their collaborative support in publishing the conference proceedings.

There are hundreds of manuscript papers have presented in the conference and hopefully become our contribution for the society as a role to bridge the harmony of the human wellbeing and the nature through the new advanced eco technology. In this event, we also spread eco-engineering concept to young generation through student competition consisting of posters and bursary essay.

Thank you very much.

Dr. Ir. John Fredy Bobby Saragih, M.Si
Dean of Faculty of Engineering, BINUS University
ICEED 2019 General Chairman
Dr. Ir. Oki Setyandito, S.T., M.Eng.
ICEED 2019 Conference Chair

Dear distinguished invited speakers, colleagues, ladies and gentlemen.

It gives me a great pleasure to welcome you to The 3rd International Conference on Eco Engineering Development. This event is an annual event in Engineering Faculty, Binus University, where each year it has different theme. For this year the theme is “Sustainable Environment, Engineering, Energy and Technology development”. The first ICEED conference was held in Yogyakarta, in 2017. The main purpose of ICEED is to provide the knowledge enrichment and innovative technical exchange between international researchers/scholars and practitioners from the academia and industries in the field of ecological engineering. Eco engineering development plays an important role to bridge the harmony of the human wellbeing and the nature through the new advanced technology. The second ICEED 2018 was conducted at Jakarta, with the theme of “Sustainable Engineering in Architectural Design, Construction, Industry and ICT Transformation”. The ICEED 2019 aims to developing a better understanding of eco engineering, Industry 4.0 and the Internet of things, considering the key changes towards sustainable development. In order to achieve this objective, ICEED 2019 focuses on five core sub topics:

1. Sustainable Infrastructure and Transportation, Energy, Water and Renewable Energy
2. Sustainable Industry and Green Manufacturing
3. Sustainable Architecture
4. Integrated Smart Computing and Communication
5. Green Food Technology

Ladies and gentlemen, since 2011, when the term Industry 4.0 was first publicly introduced, its revolution has attracted attention from all around the world. The digital technologies’ evolution has become a challenge of an anticipated change in paradigms and approaches to environment, engineering, energy and technology development. The new technological trends and the Internet of things (IoT), therefore, must reflect on development strategies with respect to the new technological context. Eco Engineering development need to define new strategies, new implementation modalities, different methods and tools to succeed in this new scenario. However, it is not possible to talk about innovation and industry without reference to sustainable development and sustainability.

Sustainability represents the main aim of achievement for strong willing to effectively competing in the nowadays scenario. It very important that technological and industrial developments allow the achievement of environmental, economic and, of course, social sustainability objectives. Therefore, stakeholders should be able to effectively use tools and opportunities to adapt to Industry 4.0, by in shaping their organization, strategies, policies and operations to achieve a sustainable development.

I wish you a most fruitful conference, and we will have a wider perspective and knowledge about sustainable environment, engineering, energy and technology development.

Thank you very much,

Dr. Ir. Oki Setyandito, S.T., M.Eng.
Head of Civil Engineering Department, BINUS University
ICEED 2019 Conference Chair
WASKITA

BANGGA BERKARYA
BERSAMA WASKITA

ICEED 2019
OFFICIAL SPONSOR
6  One Day Seminar
7  Conference Day 1
    (13\textsuperscript{th} November 2019)
7  Parallel Session 1
19  Conference Day 2
    (14\textsuperscript{th} November 2019)
18  Parallel Session 2
26  Parallel Session 3
31  Parallel Session 4
36  Parallel Session 5
39  Committee
## PARALLEL SESSION 1

### Nalendra 1

| Time       | Paper Number | Author(s)                              | Title                                                                 |
|------------|--------------|----------------------------------------|----------------------------------------------------------------------|
| 16.00-16.10 | 2257-5454-1  | Tjie Liong Gouw                        | Vacuum preloading, an alternative soft ground improvement technique for a sustainable development |
| 16.10-16.20 | 2264-5475-1  | Fikri Aris, Munandar, Radianta, Triastra, Nur Yuwono | The performance of low crested breakwater as a sand trap for shore protection |
| 16.20-16.30 | 2288-5625-1  | Van Baston, Mohammed Ali Berawi, Yusuf Labie, Igor Corvets | Role of green building developer and owner in sustainability construction: investigating the relationships between green building key success factors and incentives |
| 16.30-16.40 | 2292-5536-1  | Jaza Ikhsan, S M Assabilq, P Harsantorn Nursetlawan | Evaluation of infrastructures and riparian area toward the potency of debris flow effect in Putih river watershed, Indonesia |
| Time       | Paper Number | Author(s)                                      | Title                                                                 |
|------------|--------------|------------------------------------------------|----------------------------------------------------------------------|
| 16.40-16.50| 2305-5559-1  | Ni Komang Ayu Agustini, A Triwiyono, D Sulistyo, Suytno | Effects of water to solid ratio on thermal conductivity of fly ash-based geopolymers paste |
| 16.50-17.00| 2322-5592-1  | Rizky Maulida Zulechatin, G A Kristanto         | Analyzing the stability level of organic waste by the static respiration index and dynamic respiration index |
| 17.00-17.10| 2262-5467-1  | Anthony Gunawan                                 | Geofoam: a potential for Indonesia's soil problem                      |
| 17.10-17.20| 2326-5598-1  | Febrian Hera Pratama, Yusuf Latief, Rossy A Machfudiyanto | Standard operational procedures development for government building's care and maintenance work of structure component to improve work effectiveness and efficiency using risk-based approach |
| 17.20-17.30| 2330-5607-1  | Ayasha Tamara, Yusuf Latief, Rossy Armany Machfudiyanto | The development of safety plan to improve OHS (Occupational Health and Safety) performance for construction of irrigation channel based on WBS (work breakdown structure) |
| Time     | Paper Number | Author(s)                                      | Title                                                                 |
|----------|--------------|-----------------------------------------------|----------------------------------------------------------------------|
| 17.30-17.40 | 2332-5613-1  | Khairunnisa, Yusuf Latief, Leni Sagita Riantini | Standard Operational Procedure (SOP) Auditing Process In integrated management system to improve the efficiency of organizational performance |
| 17.40-17.50 | 2342-5627-1  | Van Basten, Mohammed Ali Berawi, Yusuf Latief, Igor Crèvits | Green building incentive model during design recognition to ensure the reliability of green building operations and maintenance achievement |
| 17.50-18.00 | 2331-5609-1  | Nurul Inayah Wardahni, Yusuf Latief, Rossy Armyn Machfudiyanto | Development of safety plan to improve OHS (Occupational Health and Safety) performance for constructions of dam (Supporting Infrastructure) based on Work Breakdown Structure (WBS) |
| Time       | Paper number | Author(s)                                                                                           | Title                                                                                       |
|------------|--------------|----------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------|
| 16.00-16.10| 2333-5615-1  | Fathiyah Hakim Sagitaningrum, Samira Aliati Kamaruddin, Ramli Nazir, Budi Susilo Soepandji, Idrus Muhammad Alatas | Soil-Solid Interface Shear Strength Review and Its Possibility on Interlayer Slope Stability Analysis |
| 16.10-16.20| 2336-5972-1  | Nisrina Hanan                                                                                      | Effectivity analysis of the application of TIA (Total Impervious Area) and EIA (Effective Impervious Area) in a micro scale watershed (Case Study on Sugutamu Sub-Watershed) |
| 16.20-16.30| 2339-5630-1  | Harsawardana, Reza Rahutomo, Bharuno Mahesworo, Tjeng Wawan Cenggoro, Anif Budiarto, Teddy Supanyanto, Don Bosco Surya Atmaja, Bayu Samodro, Bens Pardamean | AI-based ripeness grading for oil palm fresh fruit bunch in smart crane grabber               |
| 16.30-16.40| 2323-5595-1  | Affah Dewi, Yusuf Latief, Leni Sagita                                                             | Activity and risk identification in audit process on integrated management system to increase performance efficiency of construction services organization in Indonesia |
| 16.40-16.50| 2343-5632-2  | Riana Ayu Kusumadewi, Fahd Ligar Tinimbang, Hemani Yulinawati                                      | The impact of port traffic activities on noise level at Jakarta International Container Terminal I (JICT I) Port of Tanjung Priok, North Jakarta |
| Time   | Paper number | Author(s)                                           | Title                                                                                   |
|--------|--------------|-----------------------------------------------------|-----------------------------------------------------------------------------------------|
| 16.50-17.00 | 2344-5633-1 | Harawardana, Bayu Samodro, Bharuno Mahesworo, Teddy Suparyanto, Don Bosco Surya Atmaja, Bens Pardamean | Maintaining the quality and aroma of coffee with fuzzy logic coffee roasting machine     |
| 17.00-17.10 | 2345-5637-1 | Rendy Sinulingga, G A Kristanto                      | Analysis of biodegradation level and sludge stabilization with Static respiration index and Dynamic respiration index method |
| 17.10-17.20 | 2351-5646-1 | Rivanla Delaroza, Asih Wijayanti, Riana Ayu Kusumadewi, Rosityanti Hadisoebroto | The Effect of mixing speed to absorption heavy metal Cu+2 and color using Kepok Banana Peel Waste |
| 17.20-17.30 | 2352-5649-1 | Muhammad Rifandy Fadhilah, Leni Sagita Riantini, Yusuf Latief | Objective identification from every success factors or clause of the integration process management system to increase performance efficiency of state-owned construction services organization in Indonesia |
| 17.30-17.40 | 2353-5651-1 | Riana Ayu Kusumadewi, Indry Kemala Sani, Winarni Winarni | Optimizing of Cipeperan Water Treatment Plant, Cimahi                                    |
| 17.40-17.50 | 2374-5697-1 | Fida Aulia Sartika                                   | Analysis of classification hydrologic soil group distribution based on infiltration rate of Horton method in the Upper Ciliwung Watershed |
| 17.50-18.00 | 2385-5715-1 | Purnawan Adi Wicaksno, Diana Puspitasari             | Comparison of Simulated annealing, Nearest neighbour, and Tabu search methods to solve vehicle routing problems |
| Time    | Paper number | Author(s)                        | Title                                                                 |
|---------|--------------|----------------------------------|----------------------------------------------------------------------|
| 16.00-16.10 | 2426-5793-1 | Agung Sutrisno                   | Categorization of failure factors affecting fragility in disaster relief operation |
| 16.10-16.20 | 2361-5673-1 | Faray Faray, Wwik Rahayu         | Durability and strength improvement of clay shale using various stabilized materials |
| 16.20-16.30 | 2377-5701-1 | Rossy Armyn Machfuliyanto        | Identification of institutional safety factors affecting safety culture in construction sector in Indonesia |
| 16.30-16.40 | 2380-5707-1 | Chindika Ashilah, Mula Orientilize, Josia Irwan Rastandi | Comparative study of reduced beam section modelling on SMRF steel structure |
| 16.40-16.50 | 2384-5713-1 | Shabrina Asmarani, Josia Irwan Rastandi, Bastian Bangkit Okto Sentosa, Mula Orientilize | Damage assessment of moment resisting frame structures using correlation between damage index and natural frequency |
| 16.50-17.00 | 2453-5901-1 | Jakobis Johanis Messakh, Rolland E. Fanggidae, Daniel Lay Moy | Study on the perception of rural communities in the provision of sustainable clean water in the arid tropics of Indonesia |
| 17.00-17.10 | 2409-5764-1 | Raymond Saerang, David Wiliem, Feraldy Tinggogoy, Deddi Carles, Muhammad Dani Laisono, Endra Oey, Solyan Tan | 3D printed 6-Axis collaborative arm robot using force limiting feature for service robot |
| Time       | Paper number | Author(s)                                      | Title                                                                 |
|------------|--------------|------------------------------------------------|----------------------------------------------------------------------|
| 17.10-17.20| 2489-5895-1  | Jakobs Johannis Messakh, Defritus Punuf       | Study on accessibility to water sources and the effect on meeting the clean water needs of rural communities in semi-arid regions of Indonesia |
| 17.20-17.30| 2314-5571-1  | Rahmat Khamdani, Dwita Sutjiningsh, Evi Anggraheni | Evaluation of micro-scale drainage systems in Kelapa Gading, North Jakarta |
| 17.40-17.50| 2404-5758-1  | Rheza Maulana, Jamal M. Gawi, Suyud Warno Utomo | Architectural design assessment of Javan Leopard rehabilitation facility regarding the occurrence of stereotypical pacing |
| Time       | Paper number | Author(s)                                | Title                                                                 |
|------------|--------------|------------------------------------------|----------------------------------------------------------------------|
| 16.00-16.10| 2360-5665-1  | Previanto Pradipa, Martha Leni Siregar   | Modeling of severity level causes factors of traffic accident victims in the province of West Nusa Tenggara |
| 16.10-16.20| 2362-5675-1  | Himamul A’la, Wiwik Rahayu, Puspita Lisdiyanti | Effect of increasing urease enzyme concentration on shear strength properties sand clay bio cementation |
| 16.20-16.30| 2416-5777-1  | Danio Putra Nusantara, Dwita Sutjiningaih, Evl Anggraheni | Water quality index response of UI cascade-pond system on catchment imperviousness temporal variation |
| 16.30-16.40| 2456-5844-1  | Richard Husada, Iq. Jaka Mulyana          | Achieving sustainability through Industrial Revolution 4.0: an example in a small company in Surabaya |
| 16.40-16.50| 2466-5861-1  | Helena J Kristina, Agustina Christiani, Eric Jobi | Measurement of perception and implementation of sustainable supply chain management at PT Tetra Pak Indonesia |
| 16.50-17.00| 2529-5977-1  | Dewi Hendayani, RA Dynasty Purnomoasri, Syaffi, AMH Mahmudah | Analysis of car speed reduction due to concrete speed bumps on local roads in Surakarta city |
| 17.00-17.10| 2530-5979-1  | Dewi Hendayani, Widi Hartono, Alfin Wirawan Bagaskara | Factors affecting Junior High school students' bike to school in Surakarta |
| Time       | Paper number | Author(s)                | Title                                                                 |
|------------|--------------|--------------------------|----------------------------------------------------------------------|
| 17.10-17.20| 2569-6138-1  | Ade Lisantono            | Effect of silica fume on the compressive strength and modulus elasticity of self-compacting high strength concrete |
| 17.20-17.30| 2537-6001-1  | J T Hatmoko, L Handoko   | Effect of organic content and cement quantity on the shear behavior of artificially cemented soil |
| 17.30-17.40| 2442-5814-1  | Priskila Christine Rahayu, Agustina Christians, Patrick Supangi     | Analysis of implementation and proposal development of ERP system in CV Indah Jaya |
| 17.40-17.50| 2567-6041-1  | Michael Tedja            | Integrated area based on highest & best use                           |
| Time       | Paper number | Author(s)                  | Title                                                                 |
|------------|--------------|----------------------------|----------------------------------------------------------------------|
| 16.00-16.10| 2387-5721-1  | Eduardi Prahara, Hanna Annisa Rachma | The Effect of cumulative damage factor value on existing runway life service |
| 16.10-16.20| 2389-5725-1  | Eduardi Prahara, Rico Gyar Pionar | Traffic management for MRT construction phase II Bundaran HI – Kota   |
| 16.20-16.30| 2390-5727-1  | Eduardi Prahara, Chesia Claudia Hangawa | Analyze Marshall characteristic and cantabro abrasion loss of Lason-WC with high-density polyethylene variations |
| 16.30-16.40| 2483-5883-1  | Yosica Mariana, Ardhito Yulis | Redesign pedestrian-way in Blok M area as a pathway of sustainable urban mobility |
| 16.40-16.50| 2468-5864-1  | Yosica Mariana, Yulianto Wijaya | Healing garden implementation in rehabilitation center at Jakarta as a concept of Eco-architecture design |
| 16.50-17.00| 2581-62191-1 | Sigit Wijaksono, Sesmoko, Yasinta Indrianti | Information seeking behaviour of residents towards the work of the architect |
| 17.10-17.20| 2574-6048-1  | Rika Ismaila, Michael Isnaeni Djimantoro | Creating healing environment in cancer rehabilitation center - a comparison study |
| Time       | Paper number | Author(s)                          | Title                                                                 |
|------------|--------------|------------------------------------|----------------------------------------------------------------------|
| 17.20-17.30| 2549-6021-1  | Meme Sarjani, John Fredy Bobby Saragih, Vivien Himmyaneti              | Healing spaces: exploring therapeutic concept for breast cancer clinic |
| 17.30-17.40| 2550-6024-1  | Berin Filadelfia Rieuwpassa, John Fredy Bobby Saragih, Vivien Himmyaneti | Therapeutic garden setting in rehabilitation post-stroke building       |
| 17.40-17.50| 2401-5753-1  | Andi Bayu Putra, Caroline Maretha Sujana, Putri Arumsari               | Analysis on construction services laws for civil engineering projects on building failures |
| Time     | Paper number | Author(s)                                                                 | Title                                                                                                                                   |
|----------|--------------|---------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------------------------------------------|
| 08.30-08.35 | Preparation |                                                                           |                                                                                                                                        |
| 08.35-08.45       | 2319-5584-1 | Adelia Dwidarma Nataadmadja, Oki Setyandito, Made Suangga, Sonny Kosasi   | The influence of crystalline material to slump value and compressive strength of concrete                                               |
| 08.45-08.55       | 2348-5642-1 | Adelia Dwidarma Nataadmadja, Eduardi Prahara, Oki Setyandito, Rizma Winna Ananditha | The effect of hydrated lime addition in improving the moisture resistance of Hot Mix Asphalt (HMA)                                      |
| 08.55-09.05       | 2400-5992-1 | Putri Arumsari, Muhammad Malik Ikram                                     | Identification of dominant factors for the delays in building construction project in Kepulauan Anambas                                    |
| 09.05-09.15       | 2410-5767-1 | Putri Arumsari, Christopher Xavier, Andryan Suhendra                      | Cost and time analysis on the selection of formwork installation method                                                                   |
| 09.15-09.25       | 2418-5779-1 | Irpan Hidayat, Andrew John Pierre                                           | Seismic performance of reinforced concrete structures with pushover analysis                                                               |
| 09.25-09.35       | 2388-5723-1 | Oki Setyandito, Alexander Michael, Julastuti, Andrew J. P., Yureana W      | The effect of bridge abutment shape variation toward flow velocity characteristic                                                           |
| 09.35-09.45       | 2055-4615-1 | Ari Ramadhan Hidayat, Radianta Triatmadja, Intan Supraba                    | The impact of earthquake on clean water demand and supply at North Lombok Regency, Indonesia                                                |
| 09.45-09.55       | 2577-6051   | Made Suangga, Yensen Alavianus                                             | Galloping performance of various chape of bridge hanger                                                                                  |
| 09.55-10.05       | 2551-6026-1 | Muhammad Chairul Furqon, Made Suangga                                     | Evaluating performance of different shear wall shapes using pushover analysis method (case study: Green Sedayu Tower 1 Apartments, Cengkareng, Jakarta Barat) |
| Time       | Paper number | Author(s)                                      | Title                                                                 |
|------------|--------------|-----------------------------------------------|----------------------------------------------------------------------|
| 08.30-08.35| Preparation  |                                               |                                                                      |
| 08.35-08.45| 2386-5719-1  | Jimmy Linggarjati                             | Advanced PID simulation for DC motor using Scilab                    |
| 08.45-08.55| 2293-5540-1  | Lukas Tanutama, Ricardo Selika, Albert Hardy  | QR label for handicapped exhibition visitors queue Built-Up Avoidance |
| 08.55-09.05| 2294-5539-1  | Lukas Tanutama, Woenja Atmadja                | Home security system with IOT based sensors running on house infra-structure platform |
| 09.05-09.15| 2297-5553-1  | Jimmy Linggarjati                             | DC Motor Simulation using LTspice                                    |
| 09.15-09.25| 2317-5580-1  | Rionaldy Triantoro, Richard Chandra, Daniel Patricko Hutabarat | Multifunctional aromatherapy humidifier based on ESP8266 microcontroller and controlled using Android smartphone |
| 09.25-09.35| 2358-5662-1  | Daniel Patricko Hutabarat                    | Eco friendly emergency alert system (EFEAS) based on microcontroller and Android application |
| 09.35-09.45| 2371-5691-1  | Suryadiputra Liawatimena                      | Computer vision and fuzzy logic for sustainable Indonesian fisheries |
| 09.45-09.55| 2373-5695-1  | Suryadiputra Liawatimena                      | Drones computer vision using deep learning to support fishing management in Indonesia |
| 09.55-10.05| 2284-5532-1  | Bens Pardamean, Tjeng Wawan, Cenggoro, Bloomest Jansen Chandra, Reza Rahutomo | Data annotation system for intelligent energy conservator in smart building |
# PARALLEL SESSION 2

**Nalendra 3**  
**Thursday, 14th November 2019**

| Time        | Paper number | Author(s)                                      | Title                                                                                   |
|-------------|--------------|------------------------------------------------|-----------------------------------------------------------------------------------------|
| 08.30-08.35 | Preparation  |                                                |                                                                                        |
| 08.35-08.45 | 2417-5852-1  | Bagus Wira Pratama, Fabian Glenn, Wiedjaja Atmadja, Suryadi Putra, Liewatimena, Rudy Susanto | Design and implementation artificial grow light for germination and vegetative growth    |
| 08.45-08.55 | 2571-6157-1  | Ata Aditya Wardana, Nastasya Hermawan, Andreas Romulo | Development and texture profile of wood-ear mushroom (*Auricularia auricula*) sausage formulated with carrageenan |
| 08.55-09.05 | 2310-5567-1  | Reggie Surya                                   | Mechanistic hypotheses on colorectal cancer and red meat intake: a review               |
| 09.05-09.15 | 2370-5689-1  | Ronald Horison, Ingrid Suryanti Surono         | Half-life estimation of encapsulated enterococcus faecium IS-27526 by accelerated shelf life testing (ASLT) |
| 09.15-09.25 | 2441-5812-1  | Said Naufal, Hibaturrahman, Hiroshi Kayama, Satria Kameo, Kameo, Priyo Waspodo, Ata Aditya Wardana, Ingrid Suryanti Surono | Effect of cocoyam modified starch (xanthosoma sagittifolium), beetroot juice, cocoyam modified starch adsorbing beetroot on plasma selenium and glutathione peroxidase of pre-diabetic rat |
| 09.25-09.35 | 2372-5693-1  | Nathalia Hosiana, D I Astuti, Ingrid S Surono | Physio-chemical, Microbiology, and Preference of Probiotic Fresh Soft Cheese Using *Lactobacillus plantarum* IS-10506 and *Streptococcus thermophilus* as Mixed Starter Culture |
| Time       | Paper number | Author(s)                                      | Title                                                                 |
|------------|--------------|-----------------------------------------------|----------------------------------------------------------------------|
| 09.35-09.45| 2324-5593-1  | Leonardus Wahyu wasono Mihardjo, Sasmoko Sasmoko, Firdaus Alamsjah, Elidjen Elidjen | Moderating effect of green IS on relationship between organizational agility, customer experience and digital service innovation to achieve sustainable performance |
| 09.45-09.55| 2311-5605-1  | Andreas Romulo                                | The Principle of Some in vitro antioxidant activity methods: Review    |
| 09.55-10.05| 2281-5518-1  | Andreas Romulo                                | Extraction of phenolic compounds using subcritical hot water extraction: a review |
| Time       | Paper number | Author(s)                                      | Title                                                                 |
|------------|--------------|------------------------------------------------|----------------------------------------------------------------------|
| 08.30-08.35| Preparation  |                                                 |                                                                      |
| 08.35-08.45| 2285-5542-1  | Reynetha Dwi Sollandra Rawendra, Vini Octavieli Puspita | Use of Six sigma methods to reduce packaging defect in sweetened condensed milk sachets: a case study in XYZ milk industry, Indonesia |
| 08.45-08.55| 2494-5903-1  | Dwiyantari Widyaningrum, Bayu Meindrawan        | The application of microbial extracellular polymeric substances in food industry |
| 08.55-09.05| 2394-5736-1  | Vivien Himmayani Soebiyani                      | Thermal comfort mapping on Paser Gedhe Hardjonegoro to obtain passive cooling strategy in warm humid tropics. |
| 09.05-09.15| 2398-5749-1  | Kevin Kristofer Kosasih, Winda Astuti, Endra Oey | License plate recognition system based on principal component analysis and one-against-one multi-class support vector machine |
| 09.15-09.25| 2399-5751-1  | Hadistian Muhammad Hanif, Zener Sukra Lie, Winda Astuti, Sofyan Tan | Road detection system design with proximity sensor to provide electric motor driver warning |
| 09.25-09.35| 2367-5679-1  | Hauw Sen Rimo Tan                               | Conceptual development of learning factory for industrial engineering education in Indonesia context as an enabler of students’ competencies in industry 4.0 era |
| 09.35-09.45| 2397-5747-1  | Muhammad Rangga Dzulfiqar Agung, Adrian Adhe Ilan, Winda Astuti, Muhammad Nurul Puji | Development of fish separator conveyor based on fish identification system |
| Time       | Paper number | Author(s)                         | Title                                                                 |
|------------|--------------|-----------------------------------|----------------------------------------------------------------------|
| 09.45 - 09.55 | 2406-5762-1 | Rosiana Hutabarat, Tan Hauw Sen Rimo, Melani Mollani, Aditya Andika | Improving delivery performance by using simulation, FMEA and FTA       |
| 09.55 - 10.05 | 2378-5704-1 | Aina Sofia Sari, Ingrid Surono     | The effect of different starter cultures and dextrose on viability of lactic acid bacteria and h of fermented milk at 43°C |
| 10.05 - 10.15 | 2460-5854-1 | Nesti Fronika Sanipar, Khoirunnisa Assidji, Bahtiar Saleh Abbas         | The effects of subculture on the mutant plant regeneration of rodent tuber (typhonium flagelliforme) in vitro mutagenesis using gamma-ray irradiation |
# PARALLEL SESSION 2

**Bale Raos**  
**Thursday, 14th November 2019**

| Time     | Paper number | Author(s)                          | Title                                                                 |
|----------|--------------|------------------------------------|----------------------------------------------------------------------|
| 08.30-08.35 | Preparation  |                                    |                                                                      |
| 08.35-08.45 | 2296-5550-1 | Dian Pramudianti Sabar, Michael Isnaeni Djaminoto | The application of healing space concept in holistic care facilities: a brief for design |
| 08.45-08.55 | 2328-5601-1 | Sigit Wijaksono, Sasmoko, Yasinta Indrianti | Architect's adaptive capacity: public perception of the Architect Adaptive Capacity in coping with disaster |
| 08.55-09.05 | 2532-5986-1 | Albertus Galih Prawata | Playful urban intervention as creative place making strategy in Jakarta |
| 09.05-09.15 | 2578-6207-1 | Sigit Wijaksono, Sasmoko, Yasinta Indrianti, U Rosyidi | Architect's earthquake readiness |
| 09.15-09.25 | 2552-6112-1 | Albertus Galih Prawata | Creative sustainability initiative for Jakarta's Urban Spaces |
| 09.25-09.35 | 2551-6109-1 | KA Salim, R Hendarti, R Tomasowa | Parametric facade for an office design in Jakarta to reduce the irradiance level |
| Time       | Paper number | Author(s)           | Title                                                                 |
|------------|--------------|---------------------|----------------------------------------------------------------------|
| 09.35-09.45| 2559-6033-1  | Saputra, Hendarti, Tomasowa | A study of an adaptive building façade in West Jakarta               |
| 09.45-09.55| 2560-6034-1  | Nurdiani, Katarina, Gresto | The universal design approach on sport center in Jakarta to create livable public facilities |
| 09.55-10.05| 2337         | Reynetha Dwi Sollandra Rawendra | Enrichment of soft ice cream with different fibrous fruit Puree: physicochemical, Textural characteristics and sensory properties |
| Time       | Paper number      | Author(s)                          | Title                                                                 |
|------------|-------------------|------------------------------------|----------------------------------------------------------------------|
| 10.30-10.35| Preparation       |                                    |                                                                      |
| 10.35-10.45| 2564-6038-1       | Yanita Mila Ardiiani               | Application of Biofilic architecture in apartment design fixed       |
| 10.45-10.55| 2565-6039-1       | Yanita Mila Ardiiani               | Lay out typology in medium housing                                  |
| 10.55-11.05| 2562-6036-1       | Dennis, Nurdiani, Katarina          | The application of threshold space concept on culinary center in Jakarta for sustainable architectural design |
| 11.05-11.15| 2252-5445-1       | Dave Mangindaan, Ronald Horison, Evi, Michelle Muliawidjaja, Vini Octaviani Puspita | Preliminary design and sustainability study of rosetta jam factory utilizing renewable solar energy |
| 11.15-11.25| 2576-6050-1       | Tota Pordo Kasih, Dave Mangindaan, Ovitalani Ayuputri, Andreas Romulo, Dwiyantari Widyaningrum | Corona discharge development and its application to eliminate microorganism in raw milk |
| 11.25-11.35| 2251-5443-1       | Dave Mangindaan, Tota Pordo Kasih  | Innovation and development of polyetherimide-diaminethane nanofiltration membrane for textile wastewater dye removal towards sustainable environment of Indonesia |
| 11.35-11.45| 2521-5962-1       | Andryan Suhendra, Eduardi Prahara, Putri Arumsari, Titut Wulandari, Juliastuti | Efficiency measurement of Transjakarta corridors towards people activities using DEA method (study case: corridor 1 and corridor 2) |
# PARALLEL SESSION 3

Nalendra 2  
Thursday, 14th November 2019

| Time       | Paper number   | Author(s)                                                                 | Title                                                                 |
|------------|----------------|----------------------------------------------------------------------------|----------------------------------------------------------------------|
| 10.30-10.35| Preparation    |                                                                            |                                                                      |
| 10.35-10.45| 2287-5525-1    | Rienna Oktarina, Sigit Wijaksono                                          | Model of stakeholder collaborative for disaster logistics in Indonesia |
| 10.45-10.55| 2289-5528-1    | Safarudin Hazali Herawan, Mohd Azhar Ahmad                                | Study on adsorption of methylene blue using activated carbon from Pinang frond to determine the optimum operating parameters |
| 10.55-11.05| 2290-5530-1    | Dwiyantari Widyaningrum                                                   | Beneficial potency of algae-based polyunsaturated fatty acids (PUFAs) for cancer therapy |
| 11.05-11.15| 2346-5639-1    | Rienna Oktarina, Senator Nur Bahagia, Lucia Diawati, Krisha S. Pribadi      | Artificial neural network for predicting earthquake casualties and damages in Indonesia |
| 11.15-11.25| 2341-5623-1    | Safarudin Hazali Herawan, Anjas Bagaskara                                | Design an innovative waste recycling trash bin based on the requirements from customers (Bnusian) in Bina Nusantara University |
| 11.25-11.35| 2273-5544-1    | Januar Nasution, Karunya Agung Maharadhi                                  | Economic analysis for solvent recovery system (solvent as cleaning liquid for the processing equipment) |
| 11.35-11.45| 2335-5628-1    | Usin Darmalim, Ferdinan Darmalim, Sutristo Darmalim, Alain Ahmad Hidayat, Arif Budiarso, Bharuno Maheshworo, Bens Pardamean | IoT solution for intelligent pond monitoring |
| Time         | Paper number | Author(s)                                      | Title                                                                 |
|--------------|--------------|------------------------------------------------|----------------------------------------------------------------------|
| 10.30-10.35  | Preparation  |                                               |                                                                      |
| 10.35-10.45  | 2277-5511-1  | Robertus Nugroho Perwiro Atmojo, Toto Pirdo Kasih | Alternative financing model for smart cities initiatives programme in Indonesia |
| 10.45-10.55  | 2334-5617-1  | Wahyu Sardjono, Harisno Hariano, Widihaga Gia Perdana | Improve understanding and dissemination of disaster management and climate change by using knowledge management systems |
| 10.55-11.05  | 2570-6044-1  | Vivien Himmayani Soebiyanto, J F Bobby Saragih, K Wondoamiseno | Model development of Pasar Gedhe Hardjonegoro, Surakarta for sustainable tourism |
| 11.05-11.15  | 2355-5655-1  | Dyah Lestari Widaningrum, Aditya Andika       | Analysis of campus locations in relation to its nearby point of interests and public facilities |
| 11.15-11.25  | 2356-5657-1  | Nabil Gangsaarwijaya, Ritscha Anindhitia, Dyah Lestari Widaningrum | Decision tree analysis approach to determine factors that affect the quote order lead time fulfillment |
| 11.25-11.35  | 2412-5773-1  | Denny Setiawan                                | Designing co-living housing with green and ecology architecture concept |
| Time       | Paper number | Author(s)                                             | Title                                                                 |
|------------|--------------|-------------------------------------------------------|----------------------------------------------------------------------|
| 10.30-10.35| Preparation  |                                                       |                                                                     |
| 10.35-10.45| 2286-5523-1  | Fransisca Dini Aryanti, Senny Chan                     | Kansei engineering, Manova and Quality Function Deployment to design bottle packaging and seasoning quality |
| 10.45-10.55| 2563-6169-4  | Fransisca Dini Aryanti, Anastasia Aloysius Joseph       | Partial least squares structural equation modelling approach: How E-service quality affects customer satisfaction and behavior intention of E-money |
| 10.55-11.05| 2552-6027    | Yosua Christian and Taufik Roni Sahroni               | Green productivity methodology for furniture industry                  |
| 11.05-11.15| 2566-6165-1  | Taufik Roni Sahroni                                    | Heat transfer analysis for new product development                     |
| 11.15-11.25| 2525-5967-1  | Caroline Maretha Sujana, Wehandi Nobellio Salim       | Project delay analysis of high rise building project in Jakarta        |
| 11.25-11.35| 2270-5491-1  | Caroline Maretha Sujana                                | Contractor project manager leadership style based on path goal theory to support construction sustainability |
| 11.35-11.45| 2579-6210-1  | Sasmoko, S Wijaksono, and Yasinta Indrianti            | Disaster awareness scale                                             |
| 11.45-11.55| 2329-5603-1  | Sigit Wijaksono, Sasmoko, Yasinta Indrianti            | Urban planning Jakarta settlement area based on earthquake mitigation: socio-cultural ecology study |
| Time     | Paper number  | Author(s)                        | Title                                                                 |
|----------|---------------|----------------------------------|----------------------------------------------------------------------|
| 10.30-10.35 | Preparation  |                                  | A study on crime prevention through environmental design concept application in a private house in Yogyakarta, Indonesia |
| 10.35-10.45 | 2569-6043-1 | Bunga Sakina                    | Material conservation as part of environmental sustainability in architecture—case study: Mesvra house, Yogyakarta, Indonesia |
| 10.45-10.55 | 2303-5557-1 | Bunga Sakina                    | Experimental testing the effect of teaching method with multimedia    |
| 10.55-11.05 | 2568-6042-1 | Wiyantara Wizaka                 | Eco friendly emergency alert system (EFEAS) based on microcontroller and android application |
| 11.05-11.15 | 2358-5662-1 | Daniel Patricko Hutabarat       | Equitone fibre cement for exterior wall                               |
| 11.15-11.25 | 2274-5505-1 | Welly Wangidjaja                 | Modified Clay Material As An Alternative For Wall Covering            |
| 11.25-11.35 | 2275-5507-1 | Welly Wangidjaja                 | The implementation of biophilic design in coworking space design as a concept of healthy sustainable architecture |
| 11.35-11.45 | 2555-6054-1 | Suharjanto, Salim, Mariana, Wijaksono | Perforated metal made from recycled material in the application of building Facade |
| Time       | Paper number | Author(s)                               | Title                                                                 |
|------------|--------------|-----------------------------------------|----------------------------------------------------------------------|
| 13.00-13.35| Preparation  |                                         | Displacement and curvature ductility in mid-rise reinforced concrete buildings |
| 13.35-13.45| 2269-5488-1  | Kahfi Ridho Santoso, Ipan Hidayat        |                                                                          |
| 13.45-13.55| 2432-5804-1  | Christanto Roesli, Sri Rachmayanti, Polin. M Simanjutak | The application of Batak Karo ornaments in the architecture of the Catholic Church as an effort to design sustainable traditions |
| 14.05-14.15| 2437-5836-1  | Riza Suwondo, Lee Cunningham, Martin Gillie | Progressive failure modelling of steel moment frames exposed to localized fire |
| 14.15-14.25| 2438-5826-1  | Riza Suwondo, Sohaib Alama               | Seismic assessment of RC building designed by local practice          |
| 14.25-14.35| 2445-5820-1  | Riza Suwondo, Sohaib Alama               | Seismic evaluation of reinforced concrete moment resisting frame using pushover analysis |
| Time     | Paper number | Author(s)                                               | Title                                                                 |
|----------|--------------|---------------------------------------------------------|----------------------------------------------------------------------|
| 13.00-13.35 | Preparation  |                                                         |                                                                      |
| 13.35-13.45 | 2428-5797-1 | Sri Rachmayanti, Christiano Roesli, Polin, M. Simanjutak | Eco friendly concept in colonial residential in Lasem                 |
| 13.45-13.55 | 2545-6011-1 | Nida Nurli
Fauziyah, Eko
Prasetyo, Nugroho
Adi Sasonko                                      | Study of green gasoline life cycle assessment (ICA) with crude palm oil (CPO) as raw materials |
| 13.55-14.05 | 2479-5871-1 | Hwi-Chie Ho, Armansyah, Juri Sardon, Shahrman Adenan     | Temperature distribution in friction stir spot welding of aluminum alloy based on finite element analysis |
| 14.05-14.15 | 2480-5873-1 | Hwi-Chie Ho, Armansyah, Juri Saedon, Shahrman Adenan     | Back propagation (BP) algorithm for property prediction in friction stir spot welding of aluminum alloy |
| Time       | Paper number | Author(s)                                      | Title                                                                 |
|------------|--------------|-----------------------------------------------|----------------------------------------------------------------------|
| 13.00-13.35| Preparation  |                                               |                                                                      |
| 13.35-13.45| 2405-5761-1  | Rida Zuraida, Bahtiar S. Abbas               | The differences of workload, fatigue, emotional intelligence and driving behavior based on age, experience, time on task per trip among Indonesian inter-city bus drivers |
| 13.45-13.55| 2316-5578-1  | Karyawan Setiadi, Muhtadi, Rida Zuraida      | Musculoskeletal disorders and posture analysis of ethylene dichloride (EDC) production operator |
| 13.55-14.05| 2350-5648-1  | Susanti Margarethra Kuway, Edi Abdurahman, Ngatindriyant MP, Wendy | The influence of information technology capabilities and E-Tenun on the business performance of weaving SPI's in West Kalimantan Province |
| 14.05-14.15| 2464-5877-1  | Octaviana Sylvia Caroline, Silvia Mellana, Ade A.S. Fajarwati, Yunida Sofiana | Nostalgic element to support the sustainable reasons for architecture preservation – case study Metropole XXI, Jakarta |
| 14.15-14.25| 2422-5805-1  | Dian Safira, Fakhnida Safitri, Hlwa Kamal, Meliani Meliani, Caroline Maretha Sujana, Adly Aydika | Time acceleration of offshore EPC project using FMEA, FTA, CPM and Crashing method at PT XYZ |
| 14.25-14.35| 2559-6136-1  | Rudy Susanto, Walllanda Oktavianus, Willy Prayogo, Santoso Budijono, Rico Wiljaya | Wearable device for restaurant operational that employs deaf people |
## PARALLEL SESSION 4

**Secretariat**  
Thursday, 14th November 2019

| Time       | Paper number | Author(s)                  | Title                                                                 |
|------------|--------------|----------------------------|----------------------------------------------------------------------|
| 13.00-13.35| Preparation  |                            |                                                                      |
| 13.35-13.45| 2354-5653-1  | Religiana Hendarti         | Economic analysis on the application of solar panels on an aquaculture |
| 13.45-13.55| 2515-5954-1  | S Chadjjah and Ade A S Fajanwati | Re-programming Sa'0, pursuing sustainable architecture in Ngada traditional house: a recommendation |
| 13.55-14.05| 2557-6031-1  | Bob Saragih               | Play on the street: children's strategy to fulfill play needs          |
| 14.05-14.15| 2455-5842-1  | Wiyantara Wizaka, Gatot Suherjanto, Welly Wangidjaja | The new teaching method using Virtual Reality technology in Building Technology Subject |
| 14.15-14.25| 2315-5576-1  | Noegi Noegroho            | Spatial plan based on disaster mitigation in the city of Mukomuko, Bengkulu |
| 14.25-14.35| 2573-6047-1  | Noegi Noegroho, Y M Ardiani, F A Khafiz | Home industry area based on sustainable urban neighbourhood study case: SMEs industry area in Puleagdung Jakarta |
| 14.35-14.45| 2408-5771-1  | Bonny Suryawinata         | Portable architecture studio recording video as solution for space limitation |
| Time     | Paper number | Author(s)                                      | Title                                                                 |
|----------|--------------|-----------------------------------------------|----------------------------------------------------------------------|
| 13.00-13.35 |              | Preparation                                   |                                                                      |
| 13.35-13.45 | 2573-6179-1  | Tota Pindo Kasih, Rudy Purwondho, Doliaysyah Danil, Reinhart Radjagukguk, Anjas Bagaskara | Germination enhancement of green bell pepper (Capsicum annum L) by using non thermal argon plasma |
| 13.45-13.55 | 2572-6163-1  | Muhammad Nasir, Putri Putih Puspa Asri, Rana Ida Sugri | Electrosprn SiO2/PVDF Copolymer Composite Nanofiber: effect of SiO2 Content on nanostructure, morphology, and thermal property |
| 13.55-14.05 | 2567-6131-1  | Riva Tomasowa                                | An exercise on a sustainable design aspiration with the situated FBS ontology of designing |
| 14.05-14.15 | 2280-5514-1  | Nina Nurdiani, Taufik Taufik                  | The study of application green architecture concept at residential area in Jakarta |
| 14.15-14.25 | 2561-6035-1  | Nurdiani, Katarina, Masytoth                   | The behaviour architectural approach on children public space in Jakarta to create sustainable environment |
| 14.25-14.35 | 2306-5561-1  | Fauzi Khair, Dendhy Indra Wijaya, Hubertus Davy Yulianto, Khristian Edi Nugroho Soebandrija | Designing the performance measurement for sustainable supply chain of the crude palm oil (CPO) companies using Lean & Green Supply Chain Management (LGSCM) approach (case study: Indonesia's Palm oil company) |
| 14.35-14.45 | 2273-5544-1  | Januar Nasution, Karunia Agung Mahardini       | Economic analysis for solvent recovery system (solvent as cleaning liquid for the processing equipment) |
| 14.45-14.55 | 2563-6037-1  | Aror, Nurdiani, Katarina                      | The study of physical condition of settlement in Penjaringan – Jakarta to build liveable human settlement |
## PARALLEL SESSION 5

*Nalendra 1*  
Thursday, 14th November 2019

| Time       | Paper number | Author(s)                                      | Title                                                                 |
|------------|--------------|------------------------------------------------|----------------------------------------------------------------------|
| 15.25-15.35| preparation  |                                                |                                                                      |
| 15.35-15.45| 2553-6028    | Yureana Wijayanti, Markus Fitkow, Kadarwati B, Purwadi, Oki Setyandito | Sustainable water management: a review study on integrated water supply (case study on special district of Yogyakarta) |
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| 15.55-16.05| 2368-5687-1  | Khristian Edi Nugroho Soebendrija, Fauzi Khair, Dendhy Indra Wijaya | Sustainable industrial systems through strategic laboratory equipment industry |
| 16.05-16.15| 2246-5928-1  | Juliestuti, S W Alijahbana, D M Ma'soem, R Soegiarso, Najid, O Gondokusumo, R Lopa, Widagdo, A Jatiwiryo | Build the assessment model of vegetation performance on embankment dam by using knowledge based system |
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| 16.00-16.10| TF-4         | N F Ramadhan, P utri Arumsari       | Study priority assessment of building component maintenance (Case study : traditional market building) |
| 16.10-16.20| TF-5         | Rhomy Prasetyadi, E Prahara         | Comparison analysis of operational costs vehicles (BOK) and perception of Transjakarta bus passengers type of Zhongtong LCK6180GC and type of Scania K3201A (Case studies: Transjakarta corridor 9) |
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| 15.25-15.30| preparation  |                                  |                                                                        |
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| 16.10-16.20| TF-13        | A A Permatasari, F N Pramandha, M I Kanima, E Santoso | Re-layout factory facility to reduce material handling cost |
| 16.20-16.30| TF-14        | K Agusiarto, T Chandra, A T Wijono, A C Sari | Android-base member card "DigiCard" storage application |
| 16.30-16.40| TF-15        | A Sulaiman, Devin, S N F Almunawaroh | Analysis of quality control in the production process of making NYY cable using DMAIC method in PT. Kabelindo Murni Tbk. |
| 16.40-16.50| 2291-5534-1 | Radyta Eko Prabowo, Nicholas Julian, Johannes Mae, Rudy Susanto, Rinda Hedwig | Navigation assistant for vision impaired people using ultra sonic (sonar vision) and Global Positioning System (GPS) |
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Effect of silica fume on the compressive strength and modulus elasticity of self-compacting high strength concrete

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Abstract. Self-compacting high strength concrete is one of the concrete that is needed in a green construction of building. In order to improve the workability of self compacting high strength concrete with silica fume which can be applied on the green construction building is needed. This study is aimed to get the optimum percentage substitution of silica fume by 0%, 5%, 10%, 15%, and 20% of cement on the self-compacting high strength concrete. The workability of the concrete will be tested using slump flow test and L-shaped box test then compared to EFNARC requirement for self-compacting concrete. The results show that the slump flow test and L-shaped box test of the concrete comply with the EFBARC requirement. The compressive strength of the concrete tested at 28 days with substitution of silica fume of 0%; 5%; 10%; 15%; and 20% were 34.33 MPa, 36.78 MPa, 50.98 MPa, 52.82 MPa, and 36.78 MPa, respectively. While the modulus elasticity of the concrete tested at 28 days with substitution of silica fume of 0%, 5%, 10%, 15%, and 20% were 21883 MPa, 22410 MPa, 22590 MPa, 22680 MPa, and 21874 MPa, respectively. So the optimum substitution of silica fume in self-compacting high strength concrete using local quartz sand and quartz powder is 10% up to 15%.

1. Introduction
Concrete is one of useful materials in construction building which is composed of cement, coarse and fine aggregate, water, and sometimes added by additives (admixture) if necessary. Generally, concrete that is used in the construction building is normal weight concrete. The normal weight concrete usually has the compressive strength between 20-40 MPa and pouring, flowing, and compacting in the formwork by using a vibrator and it has a noise in the construction of building. One of concrete technology to reduce the noise and support the green construction is self-compacting concrete (SCC).

Self-compacting concrete is a new type of concrete that differs from the normal weight concrete. The self-compacting concrete can fill any part of formwork by the gravity. According to Okamura and Ouchi [1] that the concept of Self-Compacting Concrete (SCC) was proposed by Okamura and developed by Maekawa et al. at the University of Tokyo [2] and [3]. It is a good alternative for structural elements which has complex and difficult shapes, e.g. very thin or curved members, especially in the element of structures which has the presence of congested reinforcement. Moreover, SCC offers many health and safety benefits. The elimination of vibratory compaction on site means that the workers are no longer used the vibrator and providing a quieter working environment. The

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SCC also has many advantages, such as good filling ability, passing ability and segregation resistance. However it still prone to be low durability and low tensile capacity similar to the normal weight concrete.

In building of structures, sometimes it is needed to have a higher compressive strength for some reasons, for examples an element of structures such as column which has a dominant compressive forces needs high compressive strength of concrete. Therefore, it is needed a high strength concrete to accommodate a higher compressive strength. According to SNI 03-6468-2000 [4] that concrete which has a compressive strength more than 41.4 MPa can be classified as high strength concrete. One method to make a high strength concrete is adding silica fume in the concrete.

Silica fume is an ultrafine powder materials which has the particle sizes 50 to 100 times finer than cement and can fulfil the voids created by the free water in the cement matrix. Chemically, it reacts with Calcium Hydroxide (CH) to produce additional Calcium Silicate Hydrate (CSH). The reaction between hydrated Portland cement compounds and Silica fume produces a very dense microstructure and thus improves the bond between the cement and the aggregates.

Chen and Kwan [5] analysed the effects fly ash microsphere and condensed silica fume on packing density and measure the flow spread, flow rate, cohesiveness, adhesiveness, and cube strength of cement paste samples mixed with different fly ash microsphere, condensed silica fume and water contents. The result show that fly ash microsphere and condensed silica fume significantly increase the packing density; the finer condensed silica fume is recommended. Also, adding fly ash microsphere and/or condensed silica fume can more substantially increase the flow spread, flow rate, and compressive strength (10%) at low W/CM ratio than at high W/CM ratio. Al-Şanusi [6] analysed the influence of silica fume on the properties of self-compacting concrete by preparing nine trial mixes with three level of silica fume (3%, 6%, 9%) of powder volume, and three level of water powder ratio (0.3, 0.34, 0.37). The study suggested that no more than 6% silica be replaced by mass and gave recommendation that Slump test, U-Box Test and L-box at the minimum should be performed for the laboratory verification test.

Turk et al. [7] analysed the effect of fly ash and silica fume on compressive strength, sorptivity and carbonation of Self-Compacting Concrete. They experimented adding different volume of fly ash (25%, 30%, 35%, 40%) and silica fume (5%, 10%, 15%, 20%) as the replacement of the Portland cement. The study concluded that SCC with silica fume had the highest compressive strength at 7, 28, and 130 days. Viviek and Dhinakaran [8] also analysed the effect of silica fume in flow properties and compressive strength of self-compacting concrete. He experimented adding different volume of silica fume (5%, 10%, 15%, 20%) as the replacement of the Portland cement. The result showed that the compressive strength increased with increasing of fly ash and silica fume.

Rahul, et.al [9] studied about macro level properties of SCC using silica fume and fly ash by using robosand. Their experiment to replace Portland cement with either silica fume (10%) or fly ash (25%) using fineness modulus of fine aggregates are 2.5, 2.7, and 2.9. They concluded when cement is replaced with silica fume by 10% and Fly ash 25% both fresh and hardened properties were optimum. They added, mix (10% Silica fume, 25% Fly ash powder, and 65% Cement) has the maximum compressive strength and fineness modulus of 2.7 is recommended.

Quartz powder usually can be used for high strength concrete. In some part of Indonesia produces local quartz powder that can be used for high strength concrete. However, it is still few studies of utility of local quartz powder for self-compacting high strength concrete. Also, it is still a question the optimum amount of silica fume for self-compacting high strength concrete using local quartz powder.
Therefore, it is needed to study the optimum amounts of silica fume for self-compacting high strength concrete using local quartz sand and quartz powder through an experimental program.

2. Experimental Program
2.1 Materials
2.1.1 Portland Cement
Portland Pozzolanic Cement (PPC) which is classified as Portland Cement Type II.

2.1.2 Aggregates
Coarse aggregates were taken from Merapi Mountain which is passed to sieve number 12.

2.1.3 Quartz Sand
Quartz sand were taken from Bangka Belitung Island with diameter of 0.125 mm – 0.5 mm and quartz powder with diameter size less than 0.074 mm were also taken from Bangka Belitung Island.

2.1.4 Silica Fume
Silica Fume was used in this study which has density of 0.65 kg/L. The silica fume in this study was taken as 0%; 5%; 10%; 15%; and 20% with respect to total cementitious materials.

2.1.5 Admixtures
Superplasticizer that is used in this study was Sika Viscocrete 1003. The superplasticizer percentage that is used in this study was 2% - 2.2% with respect to the Portland cement.

2.2 Mix Design and Specimens
2.2.1 Mix Design of Concrete
Water cement ratio (WCR) of self compacting high strength concrete was taken 0.35. The example mix design of the self-compacting high strength concrete with silica fume 15% can be seen in Table 1.

| No | Materials                        | Kg/m³ |
|----|----------------------------------|-------|
| 1  | Portland Cement                  | 510   |
| 2  | Silica Fume (15%)                | 90    |
| 3  | Water (WCR 0.35)                 | 178.5 |
| 4  | Fine Aggregates (Quartz Sand)    | 485.52|
| 5  | Quartz Powder                    | 208.08|
| 6  | Coarse Aggregates                | 749.7 |
| 7  | Superplasticizer                 | 10.2  |

2.2.2 Cylinder Specimens
The variation of silica fume substitution were 0%; 5%; 10%; 15%; and 20% with respect to total cementitious materials. Sixty (60) cylinder specimens with the size of (150×300) mm² were made and tested in this study. Twelve cylinder specimens were made in every variation substitution of silica fume. The mechanics properties of concrete were tested at the age of concrete of 7 days, 14 days, 21 days, and 28 days. In addition, the specimen at age of 28 days was also tested to investigate the modulus of elasticity of the concrete.
2.3 Testing Specimen
2.3.1 Testing of Fresh Concrete
The requirement test for self-compacting concrete (SCC) were slump flow test and L-Shape box test. These testing were conducted in this study to carry out the filling ability and passing ability of the fresh concrete mixture EPNARC [10]. The slump flow test was depicted in Figure 1.

![Figure 1. Slump flow test](image1)

While the L-shape box testing is using the standard L-shape box size as shown in Figure 2.

![Figure 2. L-Shape box test](image2)

2.3.2 Testing of Cylinder Specimens
Universal Testing Machine (UTM) with the capacity of 30,000 kgf as shown in the figure 3 was used to conduct the testing of compressive strength and modulus of elasticity of concrete.
3. Results and Discussion

3.1 Slump flow and L-shape box test
The slump flow test of self-compacting high strength concrete was conducted in this study (see Figure 4).

![Figure 4. Slump Flow Test](image)

The result of slump flow test of the self-compacting high strength concrete can be seen in Table 2. The slump flow results of the self-compacting concrete were in the range of EFNARC requirement. The requirement for the slump flow is 600 to 800 mm. It can be seen from the result of slump flow of this research were in the range of EFNARC requirement.

| Silica Fume (%) | Mixing for testing of 3 Day | Mixing for testing of 7 Day | Mixing for testing of 14 Day | Mixing for testing of 21 Day | Mixing for testing of 28 Day | EFNARC |
|----------------|-----------------------------|-----------------------------|----------------------------|----------------------------|----------------------------|---------|
| 0%             | 640                         | 630                         | 630                        | 620                        | 640                        | 600 up to 800 |
| 5%             | 730                         | 740                         | 730                        | 690                        | 700                        |         |
Another testing of fresh concrete was L-shape box test. The L-shape box test can be seen in Figure 5.

![Figure 5. L-Shaped Box Test](image)

According to EFNARC that one of the tests of the self-compacting concrete is L-Box test. This test is measuring the block ratio which is the comparison between two ends (starting point is when concrete poured and the end point when the concrete stopped). Regarding to EFNARC that the standard number of blocking ratio should be in the range of 0.8 – 1.0.

The result of L-shape box test was shown in Table 3. It can be seen that the result of L-shape box test of the concrete follows the requirement of EFNARC. The result of L-shape box test of the concrete in this research was in the range of 0.8 to 1.0. According to the slump flow test and L-shape box test, it can be said that the concrete in this study can be classified as self-compacting concrete.

| Silica Fume (%) | Mixing for testing of 3 Day | Mixing for testing of 7 Day | Mixing for testing of 14 Day | Mixing for testing of 21 Day | Mixing for testing of 28 Day | EFNARC |
|----------------|-----------------------------|----------------------------|-----------------------------|-----------------------------|-----------------------------|--------|
| 0%             | 640                         | 640                        | 700                         | 710                         | 700                         | mm     |
| 5%             | 640                         | 640                        | 650                         | 680                         | 680                         |        |
| 10%            | 620                         | 620                        | 630                         | 630                         | 630                         |        |
| 15%            | 620                         | 620                        | 630                         | 630                         | 630                         |        |
| 20%            | 620                         | 620                        | 630                         | 630                         | 630                         |        |

Table 3. The L-shape box test of self-compacting high strength concrete

Compressive strength testing of the concrete was conducted at the age of concrete 7 days, 14 days, 21 days, and 28 days. The result of compressive strength of the concrete can be seen in Table 4.
Table 4. The compressive strength of self compacting high strength concrete

| Silica Fume | 7 days | Average | 14 days | Average | 21 days | Average | 28 days | Average |
|-------------|--------|---------|---------|---------|---------|---------|---------|---------|
| 0%          | 28.29  | 28.48   | 31.12   | 30.75   | 28.29   | 33.01   | 35.08   | 34.33   |
| 5%          | 29.43  | 32.07   | 36.22   | 34.33   | 38.48   | 36.97   | 37.91   | 36.78   |
| 10%         | 33.95  | 35.84   | 45.27   | 43.38   | 49.80   | 51.12   | 52.06   | 50.93   |
| 15%         | 39.05  | 38.67   | 44.14   | 44.52   | 50.93   | 50.74   | 53.19   | 52.82   |
| 20%         | 31.12  | 32.63   | 37.35   | 36.56   | 31.12   | 35.08   | 35.08   | 36.78   |

The average compressive strength were plotted to compare among the variation of silica fume was shown in Figure 6.

![Figure 6](image)

**Figure 6.** The comparison of average compressive strength

Figure 6 shows that the average compressive strength of self-compacting concrete with substitution of silica fume 10% and 15 % have the compressive strength more than 41.4 MPa. It means that the optimum of silica fume for self-compacting high strength concrete were 10% and 15% which gave the average compressive strength 50.93 MPa, and 52.82 MPa, respectively. While others percentage of silica fume (0%; 5%; and 20%) gave the compressive strength less than 41.4 MPa which cannot be classified as high strength concrete.
The modulus of elasticity of the self-compacting high strength concrete was conducted at 28 days. The comparison of modulus of elasticity of the concrete was depicted in Figure 7. Figure 7 shows that modulus elasticity of self compacting high strength concrete with silica fume 10% and 15% were 22,590 MPa, and 22,680 MPa, respectively. These confirmed to the results that the optimum compressive strength of self compacting high strength concrete were 10% and 15%.

![Figure 7. The comparison the modulus elasticity of concrete](image)

### 4. Conclusion
Based on the result of experiments program, several conclusions can be drawn as follow:

1. Based on the testing of fresh concrete it can be concluded that the concrete can be classified as self-compacting concrete, because the fresh concrete testing of slump flow test and L-shape box test comply to EFNARC standard.

2. The average compressive strength of self compacting high strength concrete with silica fume 10% and 15% were 50.93 MPa, and 52.82 MPa, respectively.

3. The modulus elasticity of self compacting concrete modulus elasticity of self compacting high strength concrete with silica fume 10% and 15% were 22,590 MPa, and 22,680 MPa, respectively. These confirmed to the results that the optimum compressive strength of self compacting high strength concrete were 10% and 15%.

4. Recommendation the silica fume for self-compacting high strength concrete using local quartz sand and quartz powder were 10% up to 15%, because these percentages gave the optimum compressive strength and modulus of elasticity.

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