

4TH ICCER 2020

BOOK OF PROGRAM

TOWARDS A SAFE AND SUSTAINABLE CONSTRUCTION USING
ADVANCED MATERIALS TECHNOLOGY FOR STRUCTURAL FAILURE
PREVENTION, REHABILITATION AND RETROFITTING



Organized by :



INSTITUT TEKNOLOGI SEPULUH NOPEMBER
ICcer Organizing Committee Office
Laboratory of Concrete and Building Materials - Civil Engineering Department
ITS Campus, Keputih, Sukolilo, Surabaya, East Java, Indonesia 60111

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Conference at Glance

The Fourth International Conference on Civil Engineering Research (ICCER) will be hosted by Civil Engineering Department of Institut Teknologi Sepuluh Nopember (ITS) on July 22-24, 2020. The 4th ICCER is an annual event and it is mainly for scientist, researchers and industry with specialties in Civil Engineering or related area. The previous conference had been successfully held in Surabaya, August 2017 in coincide with The 2017 AUN/SEED-Net Regional Conference in Civil Engineering (RCCE).

Population growth in recent years demands an increase in infrastructure development. Safety and sustainability becoming the most important aspects in the construction. Sharing efforts to improve safety and sustainability in the construction continue to be developed by all stakeholders ranging from practitioners to academics. Therefore, the main theme for The 4th ICCER is **“Towards a safe and sustainable construction using advanced materials and technology for structural failures prevention, rehabilitation and retrofitting”**.

In accordance with the theme of this year, a variety of topics related to safe and sustainable construction, material technology, structural failure prevention, rehabilitation and retrofitting are expected to be presented at this conference. Through this conference, it is also expected that participants may perform research collaborations and define the platforms for their future research directions.

Committee Members

Honorary Committee

Rector of ITS
Dean of FTSLK ITS

Scientific Committee

Chief of Scientific Committee:

Harun Alrasyid, PhD

Scientific Committee Member:

Material and Structural Engineering

Prof. Mario M. Attard (UNSW, Australia)

Prof. Yu Chen-Ou (NTU, Taiwan)

Prof. Tetsuya Ishida (Tokyo University)

Prof. Iswandi Imran (ITB, Indonesia)

Prof. Bambang Suhendro (UGM, Indonesia)

Assoc. Prof. Benny Suryanto (Heriot Watt University, UK)

Assist. Prof. Sawekchai Tangaramvong (Chulalongkorn University, Thailand)

Assoc. Prof. Eichii Sasaki (TIT, Japan)

Assoc. Prof. Nobuhiro Chijiwa (TIT, Japan)

Dr. Ting-Yu Hsu (NTUST)

Prof. Bryan Uy (University of Sydney, Australia)

Prof. Han Ay Lie (UNDIP, Indonesia)

Prof. Rudy Jamaluddin (UNHAS, Indonesia)

Prof. Sofia Alisyahbana (Bakrie University, Indonesia)

Ir. Lutfi Faizal (PUSKIM, Indonesia)

Assoc. Prof. Andri Kusbiantoro (UMP)

Assoc. Prof. Mohd Mustafa Al Bakri Abdullah (UniMAP)

Prof. I. Gusti Putu Raka (ITS)

Prof. Triwulan (ITS)

Prof. Tavo (ITS)

Dr. Hidayat Soegihardjo (ITS)

Faimun, Ph.D. (ITS)

Budi Suswanto, Ph.D. (ITS)

Dr. techn. Pujo Aji (ITS)

Dr. Eng. Januarti Jaya E.P (ITS)

Data Iranata, Ph.D

Geotechnical Engineering

Prof. Junhwan Lee (Yonsei)

Prof. Indrasurya Mochtar (ITS)

Prof. Noor Endah (ITS)

Prof. Herman Wahyudi (ITS)

Dr. Ria Asih Aryani Soemitro (ITS)

Hydrotechnics

Prof. Nadjadji Anwar (ITS)

Dr. Wasis Wardoyo (ITS)

Transportation Engineering

Hera Widyastuti, Ph.D. (ITS)
Ervina Ahyudhanari, Ph.D. (ITS)
Dr. Catur Arif P. (ITS)
Dr. Hitapriya Suprayitno (ITS)

Construction Management

Christiono Utomo, Ph.D. (ITS)
Putu Artama Wiguna, Ph.D. (ITS)
Tri Joko Wahyu Adi, Ph.D (ITS)
Farida Rachmawati, Ph.D (ITS)
M. Arif Rohman, Ph.D (ITS)

Environmental and Geo Engineering

Prof. Joni Hermana (ITS)
Warmadewanti, Ph.D (ITS)
Lalu M. Djaelani (ITS)

Organizing Committee

General Chairman	: Umboro Lasminto, Ph.D.
Chairman	: Prof. Priyo Suprobo,
Vice-Chairman	: Bambang Piscesa, PhD
Secretary	: Dr. Wahyuniarsih Sutrisno.
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Editor	: Dr. Trihanindyo Rendy S.

Organizing Committee Members:

Supani MT.
Dr. Djoko Irawan
Mudji Irmawan, M.S
Heppy Kristijanto, M.S.
M. Basshofi Habieb

Welcoming Speech from Rector of ITS



Assalamualaikum Warahmatullahi Wabarakatuh.

Ladies and Gentlemen,

Allow me in this opportunity to welcome all of you to this conference by praying to the Almighty God for all His blessings, His grace, and His mercies that have made us possible to gather here in excellent condition and good health.

Dear keynote speakers, distinguished guests and all participants,

Institut Teknologi Sepuluh Nopember (ITS) is delighted to host this annual conference. This year, the Fourth International Conference on Civil Engineering Research (ICCER) is hosted by Civil Engineering Department of Institut Teknologi Sepuluh Nopember (ITS) in the virtual format due to recent corona virus outbreak. The main theme of this conference is “towards a safe and sustainable construction using advanced materials and technology for structural failures prevention, rehabilitation and retrofitting”.

The world today is facing many challenges, especially in safety and sustainable development issues. We must address the sustainability agenda to deliver improvements in efficiency and resource productivity. Together with the public and private sectors, non-governmental and intergovernmental organizations, scientists and engineers, we are responsible to build a better life and safety for society through the application of knowledge to transform resources into products and services without compromising the ability of future generations to cope with their needs.

In accordance with the vision and mission of ITS, which is to become a world - class research university, this international conference is one among many efforts to make these vision and mission come true. It is part of our concern on the contribution of science and technology for enhancing nation productivity and competitiveness in international level. Hopefully, we all can significantly give more contributions to the nation advancement in the near future. To all of our distinguished guests and participants, thank you for being here, welcome, and enjoy the conference!

Wassalamualaikum Warahmatullahi Wabarakatuh.

Prof. Dr. Ir. Mochamad Ashari, M.Eng.

Welcoming Speech from Chair of Organizing Committee



Assalamualaikum Warahmatullahi Wabarakatuh!

Good morning to all distinguished delegates, presenters, participants, and colleagues!

On behalf of the committee, please allow me to welcome you through this wonderful virtual conference.

First and foremost, let me express our sincere gratitude to almighty God who has granted us with blessings, health and grace that we are now able to gather here and participate in this conference.

I would like to thank our esteemed Rector of Sepuluh Nopember Institute of Technology – Professor Mochamad Ashari – for his countless support and unconditional policy that we are able to organise this event at University.

I would also like to thank our honourable keynote speakers coming from three different continents, five countries, for taking part to share their expertise and knowledge to us – I am a hundred per cent sure that we will have something to discuss along the way. Please allow me to introduce them.

1. Prof. Yu Chen Ou – from National Taiwan University – in Taiwan
2. Prof. Mario Attard – from University of New South Wales – in Australia
3. Prof. Tetsuya Ishida – from the University of Tokyo – in Japan
4. Dr. Radomir Pukl – from Cervenka Consulting – in the Czech Republic
5. and lastly – Prof. I Gusti Putu Raka – our dearest professor at Sepuluh Nopember Institute of Technology

Special thanks also to our honourable Scientific Committee and International Board of Reviewers who have helped us tremendously in the journey of this conference.

Ladies and Gentlemen!

This year, the Fourth International Conference on Civil Engineering Research – or you may know as ICCER 2020 – is organised in a unique virtual format due to recent Coronavirus outbreak ramping up globally – which, of course, has been the major cause of cancellation of our face-to-face conference as originally planned in Bali.

In this year, the conference theme is *“towards a safe and sustainable construction using advanced materials and technology for structural failures prevention, rehabilitation and*

retrofitting” which is preferred to resurface our insights into modern and safer infrastructure development – making us more concern about technological advancement in our surroundings.

A variety of topics from different viewpoints will be presented by our keynote speakers in this two-day event and we do hope that this conference is not only a tool to mediate knowledge sharing and transfer but also supports new ideas in creating resilient and sustainable infrastructure in the future.

Ladies and Gentlemen!

We would like to inform you that this conference is organised in two days and is mainly divided into three parts: the first part is the opening ceremony, the second one is keynote speakers presentations; and the third one is, of course, a series of parallel sessions which are provided for authors presenting their research to a group of researchers in separated Zoom invitation links.

We do hope that this conference will not only become a platform for researchers to disseminate their research but also – bigger than that – it could be a medium to facilitate interests among researchers and thus collaborative research in the future is in hand.

Ladies and Gentlemen!

Before I end up my welcoming speech, I would like to express my deepest gratitude to all of our sponsors for their generous financial and moral support – thanks to them that we are able to hold this event amid this global pandemic.

Last but not least, very special thanks also to our organizing committee for dedication, continual support, and hard work in preparing all the materials and ensure that everything is taken care of.

Finally, please allow me to wish you a meaningful and rewarding concrete – thank you for your participation and we do hope to see you again in our next ICCER conference.

Wassalamualaikum Warahmatullahi Wabarakatuh!

Prof. Ir. Priyo Suprobo., MS., Ph.D

Chair of The 4th ICCER

Meet Our Keynote Speakers



Prof. Yu-Chen Ou

Professor

Department of Civil Engineering,
National Taiwan University-Taiwan

Prof. Yu Chen Ou currently works at the Department of Civil Engineering. He received his doctoral degree from The University at Buffalo in 2007. He is a full Professor with research interest in Reinforced Concrete Structure, Prestressed Concrete, Earthquake Engineering and Bridge Engineering. He also serves as President of American Concrete Institute (ACI) Taiwan Chapter and Chair of Concrete Engineering Committee, Chinese Institute of Civil and Hydraulic Engineering, Taiwan.



Prof. Tetsuya Ishida

Professor

Department of Civil Engineering
Tokyo University Japan

Prof. Tetsuya Ishida currently works at the Department of Civil Engineering, The University of Tokyo. He received his doctoral degree from The University of Tokyo in 1999. He received several awards including JSCE Research Paper Award (with Yamazaki) in 2017, JSCE Technology Development award in 2017 and JCI Technology Award (with Watanabe, Sakai and Sakata. His research focused on Thermodynamics of cementitious materials, Nonlinear mechanics of aging concrete, Modeling of durability performance and Multi-scale and Multi-chemo-physics modeling of Structural Concrete.



Prof. I Gusti Putu Raka

Professor

Civil Engineering Department
Institut Teknologi Sepuluh Nopember Indonesia

Professor I Gusti Putu Raka is an Emeritus Professor from Department of Civil Engineering Institut Teknologi Sepuluh Nopember Indonesia. He received his doctoral degree from Institute National des Sciences Appliquées de Toulouse France in 1995. His research mainly focused on Reinforced Concrete and Precast Concrete Structure.



Prof. Mario M. Attard

Associate Professor
School of Civil and Environmental Engineering
The University of New South Wales Australia

Professor Mario M. Attard is an Associate Professor from School of Civil and Environmental Engineering The University of New South Wales Australia. His research is focused on Finite Strain Isotropic and Anisotropic Hyperelastic Modeling, Plasticity Modelling of Confined Concrete and Fracture in Concrete and Masonry. He is also serve as Associate Head (Academic) in the School of Civil and Environmental Engineering



Ing. Radomír Pukl CSc.

Project manager
Červenka Consulting

Ing. Radomír Pukl CSc. is a project manager at Červenka Consulting. He is an expert on fracture mechanics, finite element method, numerical simulation of concrete structures, computer graphics. He graduated in 1980 at the Faculty of Civil Engineering at the Czech Technical University (CTU) in Prague and received his doctor degree at the Klokner Institute CTU in 1985. In 1988-97 he was a research associate at the Institute of Construction Materials, Stuttgart University by prof. Eligehausen where he worked in the field of numerical methods and fastening technology. Together with V. Červenka he is the co-author of the program system SBETA. Author of many of scientific publications, member of FraMCOs.

Conference Schedule at Glance

Wednesday, July 22, 2020	
Time (Surabaya Local Time (GMT+7))	Event
Keynote Session	
07:30-08:00	Registration
08:00-08:10	Opening (MC)
08:10-08:20	Welcoming Speech from Organizing Committee
08:20-08:30	Welcoming Speech from Rector
08:30-09:45	Keynote Session I - Yu Chen Ou (incl Q&A)
09:45-10:00	Sponsor Session (PT. WIKA BETON)
10:00-10:15	Morning Break
10:15-11:25	Keynote Session II - IGP Raka (incl Q&A)
11:30-11:45	Sponsor Session (PT. ADHI PERSADA BETON)
11:45-12:45	Closing and Lunch Break
Parallel Session	
12:45 - 13:00	Parallel Session 1 Registration
13.00 – 15.00	Parallel Session 1
15.00 – 15:30	Parallel Session 2 Registration
15.30 - 17.00	Parallel Session 2
Thursday, July 23, 2020	
Time (Surabaya Local Time (UTC+7))	Event
Keynote Session	
07:30-08:00	Registration
08:00-08:10	Opening (MC)
08:10-09:10	Keynote Session III - Tetsuya Ishida (Incl Q&A)
09:15-09:30	Sponsor Session (PT. WASKITA KARYA)
09:30-10:00	Morning Break
10:00-11:00	Keynote Session IV - Mario Attard (Incl Q&A)
11:00-11:15	Sponsor Session (CERVENKA CONSULTING)
11:15-12:30	Lunch Break
12:30-13:30	Afternoon Registration
13:00-14:00	Keynote Session V- Radomir Pukl (Incl Q&A)
14:00-15:00	Closing (Best paper awards announcement)

Parallel Session Schedule

No	Session	Time	Meeting ID	Meeting Password	Moderator
1	Structure 1	12:45-15:00	936 7044 5515	016017	Data Iranata, Ph.D
2	Structure 2	12:45-15:00	955 6512 8594	418615	Faimun, Ph.D
3	Structure 3	15:00-17:00	956 6524 7567	78466	Data Iranata, Ph.D
4	Disaster Management	15:00-17:00	917 8722 5680	542584	Faimun, Ph.D
5	Construction Management 1	12:45-15:00	933 1671 9655	726917	Farida Rachmawati, Ph.D
6	Construction Management 2	12:45-15:00	996 0955 6818	795542	Arif Rohman, Ph.D
7	Construction Management 3	15:00-17:00	982 7552 6404	659532	Farida Rachmawati, Ph.D
8	Construction Management 4	15:00-17:00	944 5601 0624	116073	Arif Rohman, Ph.D
9	Geotechnics 1	12:45-15:00	963 5802 8383	766471	Dr. Yudhi Lastiasih
10	Geotechnics 2	15:00-17:00	942 3361 2360	447806	Dr. Yudhi Lastiasih
11	Transportation 1	12:45-15:00	962 7935 9001	324673	Hera Widyastuti, Ph.D
12	Transportation 2	15:00-17:00	963 7085 0418	684167	Hera Widyastuti, Ph.D
13	Water Resource 1	12:45-15:00	938 5457 5256	343076	Dr. Mahendra Andiek M.
14	Water Resource 2	15:00-17:00	953 4802 6285	053501	Dr. Mahendra Andiek M.
15	Construction Material and Environment	12:45-15:00	925 3312 3278	896725	Dr. Candra Irawan

Detail of Parallel Session

Session Name : Structure 1

No	Paper ID	Author	Paper Title
1	107	Paramashanti Larasati Devi Adani	Determination of LRFD Environmental Load Factor in Java Sea for Unbraced Monopod Structures using Reliability Analysis
2	112	Pamuda Pudjisuryadi	Review on 3D printed concrete as structural beam members
3	118	Djoko Irawan Budi Suswanto Aniendhita Rizki Amalia Data Iranata	Rapid Visual Assessment of Building Vulnerability Due to Earthquake Potential Hazard in Surabaya
4	121	Wahyuniarsih Sutrisno Harun Alrasyid	Structural Performance Investigation of Ship Lift Hoist Pile Structure Exposed to Tropical Marine Environment
5	129	Angga Bayu Christianto Bambang Piscesa Faimun Pujo Aji	3D Finite Element Modelling of Circular Reinforced Concrete Column Confined with CFRP Under Different Eccentric Loads
6	172	Yehezkiel Septian Yoganata Budi Suswanto Data Iranata Djoko Irawan	Analysis Study of Extended End-Plate Connection Due to Cyclic Load Using Finite Element Method
7	159	Adjib Karjanto	Connection System Design Between Beams and Prefabricated Columns on Short Span Bridge Structures With Reinforcement Joint Method
8	215	Indra Komara	Chloride Penetration in Relation to the Microcracking State into Reinforced Ordinary and Engineering Cementitious Composite

Session Name : Structure 2

No	Paper ID	Author	Paper Title
1	105	Leonardus Setia Budi Wibowo	Effect of Reinforced Concrete Beam Confinement under Cyclic Loading on Ultimate Drift Ratio
2	125	Doni Priambodo	Experimental studies of wind flow inside a street canyon between high-rise buildings with angle of attack modifications
3	110	Yongky Sanjaya	The Effect of Street Canyon Width Towards Wind Flow in between High-Rise Buildings
4	92	Indra Sidik Permadi Redrik Irawan	Structural behavior of open truss FRP bridge without side support
5	93	Jimmy Chandra Pamuda Pudjisuryadi Antoni Antoni Hartanto Wibowo	Analytical modeling of 3D-printed reinforced concrete beams

6	209	Warren Don Karen Chong Martin Aitken Asdam Tambusay Benny Suryanto Priyo Suprobo	Influence of link spacing on concrete shear capacity: experimental investigations and finite element studies
7	211	Benny Suryanto Danah Saraireh Asdam Tambusay	Temperature dependence and activation energy of electrical conduction in an engineered cementitious composite

Session Name : Structure 3

No	Paper ID	Author	Paper Title
1	161	Hidajat Sugihardjo, Ahmad Basshofi Habieb	A Simplified Method to Estimate The Fundamental Frequency of Simple Span Bridges Supported on Lead Rubber Bearings
2	162	Prof Sofia W Alisjahbana, Ph.D. Ade Asmi, Ph.D. Safrilah Jouvan Chandra Pratama Prof Buntara S Gan, Ph.D. Irene Alisjahbana	Numerical Analysis of a Friedlander Localized Blast Load on a Rigid Roadway Pavement Using Levy's Problem
3	174	Vicky Wildan Yustisia Budi Suswanto Djoko Irawan Data Iranata	The Structural Behavior Of Castellated Beam With Shape Variation Using Finite Element Methods
4	182	Candra Irawan Faimun Rudy Djamaluddin I Gusti Putu Raka Priyo Suprobo Gambiro Soeprapto	The Increasing of Displacement Ductility and Moment Capacity of Spun Pile using Concrete Infill
5	200	Sivaek Loomba	A Review on Strengthening Concrete Column Via Ferrocement Jacketing
6	205	Chanachai Thongchom Suraparb Keawsawasvong Sayan Sirimontri	Experimental Investigation on Reinforced Concrete Columns Confined with Prestressed Steel Straps
7	212	Danah Saraireh Benny Suryanto Asdam Tambusay	Effect of micro-cracking on the electrical and self- sensing properties of an engineered cementitious composite under tensile straining
8	2013	Asdam Tambusay Benny Suryanto Priyo Suprobo	Nonlinear finite element analysis of reinforced concrete beam-column joints under reversed cyclic loading

Session Name : Disaster Management

No	Paper ID	Author	Paper Title
1	147	Diah Sarasanty	Safety Hazards Identification of Construction Site Layout Based On Geographic Information System (GIS)
2	165	Emil Wahyudianto	Updating the slope movement data on the Batu-Kediri road network using digital information
3	133	Andriani Okta Fara Dita Mohammad Arif Rohman Cahyono Bintang Nurcahyo	Risks of Public Procurement for Construction Works
4	139	Aditya Nugroho	Evaluation of an Occupational Health and Safety Management System in Universitas Indonesia
5	152	Giovianne Friesty Marantika	Identification of Fire Safety Indicators for Shopping Centre Buildings in Surabaya
6	156	Zafira Nadida	Numerical model for flood inundation due to way sekampung dam breach
7	158	Apriadi Simon Harianja	Structural Equation Model (SEM) Relationship Between Risk and Safety Control System of Risk and OHS Program on OHS Costs in Rusunawa Projects
8	210	N.Retno Setiati	The inspection and evaluation of bridge structures for earthquake risk

Session Name : Construction Management 1

No	Paper ID	Author	Paper Title
1	103	Retno Apriyati	Information System Development of Knowledge Base Integration Management System Quality, Safety and Environmental to Improve Organizational Performance in Construction Company [103]
2	191	yusroniya eka putri	Cost Significant Model Comparasion Based on Standard Construction Cost Analysis and Unit Cost of State Building Formula
3	192	yusroniya eka putri	Construction Cost Change Ratio and Index Development of The Standard Construction Cost Analysis for Building State
4	111	Lia	The Influence of Transactional Leadership and Soft Skill on Project Manager for Project Success Factor
5	113	Indra Yanastyapricena	Factor Analysis of Construction Productivity and Developer's Sales at Bekasi Regency Subsidized Housing
6	120	I.P.A. Wiguna, F. Rachmawati, L.B.Setyaning	Green Design, Green Purchasing and Green Transportation As Part of GSCM In Construction Sector
7	140	Feisal Rajab Rivai Mohammad Arif Rohman Supani	A Framework for Mapping Stakeholders Interests Related Social Sustainability in Residential Building

Session Name : Construction Management 2

No	Paper ID	Author	Paper Title
1	141	Freedy Kristiawan Mohammad Arif Rohman Machsus	A Framework To Assess Success Criteria Performance Of Public Private Partnership (PPP) Projects In Indonesia
2	144	Junita Taskia Amin	Work Breakdown Structure (WBS) Dictionary And Checklist Development Of Stadium Architectural And Interior Works For Safety Planning
3	146	Alifa Amalia Ilmi, Leni Sagita Riantini Supriadi, Yusuf Latief, Dan Fadhilah Muslim	Development Of Dictionary And Checklist Based On Work Breakdown Structure (WBS) At Seaport Project Construction For Cost Estimation Planning
4	148	Fikca Ayu Safitri Mohammad Arif Rohman Retno Indryani	Critical Factor That Influence The Success Of Construction Projects Procurement In Surabaya
5	151	Riezka Hadwiansyah	Structural Equation Model (SEM) Correlation Between Work Breakdown Structure (WBS), Work Method,And Risk On Towards Cost Of Safety On Low-Cost Apartment Project

6	89	Kartika Puspa Negara Fiona Lamari Connie Susilawati Bambang Trigunarsyah	Is Technical Competency Necessary For Client Project Manager? An Empirical Study Of Commitmen-Making Officers (PPK) In Indonesian Public Construction
7	160	A Okviana Y Latief	Method For Develop Performance Indicator Based On Performance Criteria At Indonesia National Competency Standard (SKKNI) For Construction OHS Young Expert Competency

Session Name : Construction Management 3

No	Paper ID	Author	Paper Title
1	142	Patrisius Valdoni Sandi Mohammad Arif Rohman Christiono Utomo	Evaluation Of The Procurement Principles Implementations In Public Construction Project
2	163	Maretha Piselia	4D BIM implementation to improve EPC project performance from contractor's perspective. A case study
3	178	Sesde Asrul Stani	The Role Funding Based Non Cash Loan in The Form of Supply Chain Financing on Elevated Road Project Performance (Case Study Joint Operation Project PT. X)
4	179	Rezi Berliana Yasinta Christiono Utomo Yani Rahmawati	A Review of Research Methods in Green Building Implementation on Operation and Maintenance Cost
5	181	Ayu Fatimah Sari Christiono Utomo Yani Rahmawati	Real Estate Investment Trust (REIT) As Real Estate Financing for Developers in Indonesia: Literature Review of Previous Study
6	100	Fikry Eswara Adi Ayomi Dita Rarasati	Modelling of Operational Costs (Tipping Fees) and Incentives to Improve Solid Waste Management Services in Indonesia
7	185	Ade Widya Septari Yusuf Latief	Evaluation of Maturity Level and Critical Success Factors of Knowledge Management Implementation at State-Owned Construction Company in Indonesia

Session Name : Construction Management 4

No	Paper ID	Author	Paper Title
1	168	Guntur Pinandhita	Implementation strategy of total quality management and quality culture to increase the competitiveness of contractor companies in Indonesia
2	127	Ario Cahya Gemilang	Optimization of the project selection process using analytic hierarchy proses method: a study of application of project portfolio management in pt.x
3	196	Lisda Nita Suryani Simbolon I Putu Artama Wiguna Tri Joko Wahyu Adi	Weighting Variables for Building Performance Evaluation

4	197	Bimo Yudha Prawiro	Study of Partnership Form to Improve Idle Land Based in Risk Management
5	201	Mahendra Perdana Sopaheluwakan Tri Joko Wahyu Adi	Adoption and Implementation of Building Information Modeling (BIM) by the Government in the Indonesian Construction Industry
6	203	Akhbar Ariefianto Suprpto I Putu Artama Wiguna	Analysis of the Category of Variation Order in X Project at XYZ Ltd.
7	204	Elok Dewi Widowati Farida Rachmawati	Identifying Factors Affecting Schedule and Cost Performance on Building Project
8	207	Wahyudi P Utama	Risk allocation of PPP waste to energy projects in Indonesia: A research framework

Session Name : Geotechnics 1

No	Paper ID	Author	Paper Title
1	157	Amelia Yuwono Widjojo Adi Prakoso Yuskar Lase	Preliminary 3D numerical pushover analysis of laterally loaded pile groups
2	167	Hanif Audina Rahmawati Widjojo A Prakoso Astri Rahayu	Vs and CPT Based Evaluation of Location with High Liquefaction Damage During 2018 Palu Earthquake
3	169	Suyuti	Compared Methods of Empirical and FEM to Evaluate Soil Foundation Capacities for Coastal Dike
4	183	Putu tantri kumala sari Yusroniya Eka Putri Yang Ratri Savitri Anienditha R. Amalia Nastasia F. Margini Danayanti A.D. Nusantara	The Comparison of 2-D and 3-D slope stability analysis results based on reinforcement requirements
5	184	Yudhi Lastiasih Putu Tantri Kumala Sari	Comparison of Ultimate Bearing Capacity Based On Empirical Method, Interpretation of Loading Pile Tes and Finite Element

Session Name : Geotechnics 2

No	Paper ID	Author	Paper Title
1	186	Fathurrizal Muhammad	Circular Lining Behaviour due to Earthquake Load In MRT Jakarta Underground Tunnel Area CP-106
2	187	Muhammad Afief Ma'ruf Rusliansyah Friski Irma Damayanti Ritonga Balqis Azizah	Stabilization Of Soft Soil Using Admixture Of Palm Oil Boiler Ash And MATOS
3	190	Suraparb Keawsawasvong Teerapong Senjuntichai	Pullout capacity of cylindrical caissons in anisotropic clays based on AUS failure criterion
4	193	Danar Ariangga Windra Gautama Bambang Soesilo Supanji Wiwik Rahayu	The effect of skirt footings for road settlement on peat soil

Session Name : Transportation Management and Engineering 1

No	Paper ID	Author	Paper Title
1	130	Hera Widyastuti Wahyu Satyaning Budhi	Railway Capacity Analysis Using Indonesian Method And UIC Code 405 Method
2	149	Christian Gerald Daniel	Assessing The Mechanical Properties Of Modified Hot-Recycled And Warm Mix Asphalt Using Aramid-Polyethylene By Wet And Dry Process: A Review
3	206	Anak Agung Gde Kartika Indrasurya B. Mochtar Hera Widyastuti	The modelling of volume and duration of vehicle parking for shopping stores in Surabaya, Indonesia
4	88	Romaynoor Ismy Husaini Sofyan M. Saleh M. Isya	Flexural Resistance Analysis On The Modeling Of Wire Mesh Layer Placement As Reinforcement In Hot Asphalt Mixtures
5	136	Puspita Dewi Hera Widyastuti	Intercity Dwell Time Estimation By Using Robust Regression Method
6	137	Sutoyo	Design Of The Strong And Durable Of Flexible Pavement On Road Segment With The Heavy Traffic And Overloads
7	170	Akbar Bayu Kresno Suharso Ervina Ahyudanari	Demand Analysis At Tanah Grogot Airport East Kalimantan
8	173	Michel Kasaf Catur Arif Prastyanto	Analysis the use of steel slag as a replacement of natural aggregate on flexible pavement

Session Name : Transportation Management and Engineering 2

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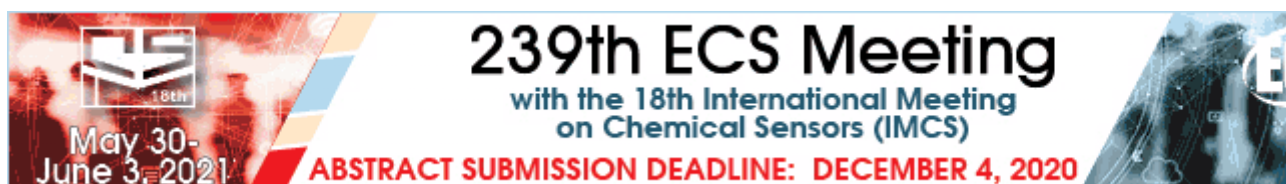
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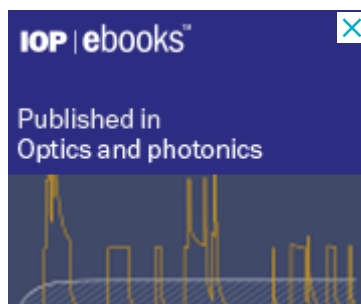
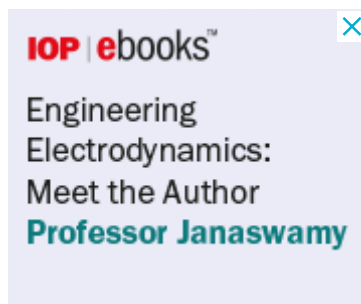
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Online ISSN: 1757-899X

Print ISSN: 1757-8981

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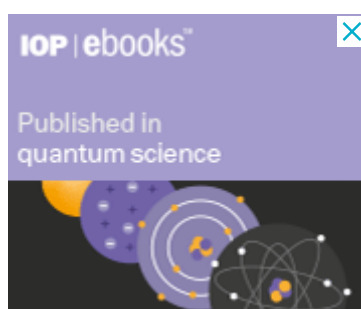
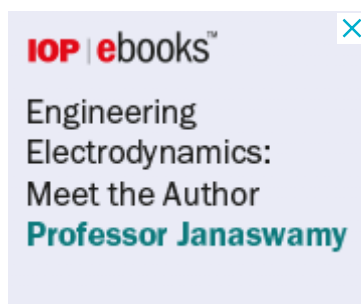
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To cite this article: J Chandra *et al* 2020 *IOP Conf. Ser.: Mater. Sci. Eng.* **930** 012041

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Analytical modeling of 3D-printed reinforced concrete beams

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Abstract. Three-dimensional (3D) printing for cementitious materials such as concrete has become increasingly popular. Numerous research efforts have been undertaken to fabricate structural elements, such as beams, using 3D-printed concrete. Because the behavior of 3D-printed reinforced concrete (RC) beams is not well understood, research in this area is still ongoing to investigate the behavior and compare it with conventional RC beams. In this paper, the results of an analytical study using finite element software on 3D-printed RC beams are presented. The main challenge was to determine a constitutive material model of the 3D-printed concrete for nonlinear analysis that was quite different from normal concrete. The developed model was validated using the results from several past experimental tests on 3D-printed RC beams. The results showed that the analytical model can accurately predict the maximum flexural strengths of the 3D-printed RC beams. However, the analytical model overestimated the initial stiffness of the beams. Furthermore, several local failures, such as shear failure of nodal points and bond failure between rebars and concrete, could not be well simulated by the analytical model. Thus, future research is needed to correctly define the constitutive material model for 3D-printed RC beams.

1. Introduction

In recent years, new technology to produce concrete has been developed using three-dimensional concrete printing (3DCP) [1]. 3DCP is done by extruding mortar mixture gradually to form layers of concrete mortar and finally producing the expected shape according to the design. Therefore, in 3DCP, there is no need to build formwork as in conventional concrete construction. 3DCP uses an automatically controlled machine to produce any shape or geometric model of structural elements as desired [2].

3DCP for buildings is an environmentally friendly construction method that provides limitless possibilities for the realization of buildings with complex geometry [3]. With 3DCP, the paradigm of building designers is expanded as each building component can be unique without the need to spend extra cost on complex formwork as well as casting process. Other advantages of 3DCP are automation and timing optimization, lower construction cost, and reliability of the results [4, 5].

However, until now, the manufacturing process of 3DCP still encounters many obstacles, e.g., the concrete mixture condition is still inconsistent and requires a special base material [6, 7]. Moreover, there is limited research on the behavior of structural elements made using 3DCP in which the material



properties are quite different than that of conventional concrete [8-10]. Thus, research in this area is still needed.

This paper focuses on studying the behavior of 3D-printed reinforced concrete (RC) beams. The study was done analytically using a finite element computer software [11] by comparing the available experimental results [12] with the numerical results of simulating said experiments in the software. Of particular interest is the load-deflection relationship of the specimens as well as their maximum strengths.

2. Past research on the structural behavior of 3D-printed RC beams

Al-Chaar et al. [12] have studied the flexural behavior of 3D-printed RC beams by performing bending tests on nine specimens with various combinations and types of meshes and bars. The objective of their study was to obtain flexural capacity of these beams whereby the behavior was different from that of conventional RC beams because the interfacial bonding between concrete mortar layers is limited. The beams were 4.88-m long, with a clear span of 4.57 m and shear span ratio of 6 or greater. The beams were truss beams with total depth of 203 mm and width of 140 mm. The longitudinal view of a typical beam is shown in figure 1.

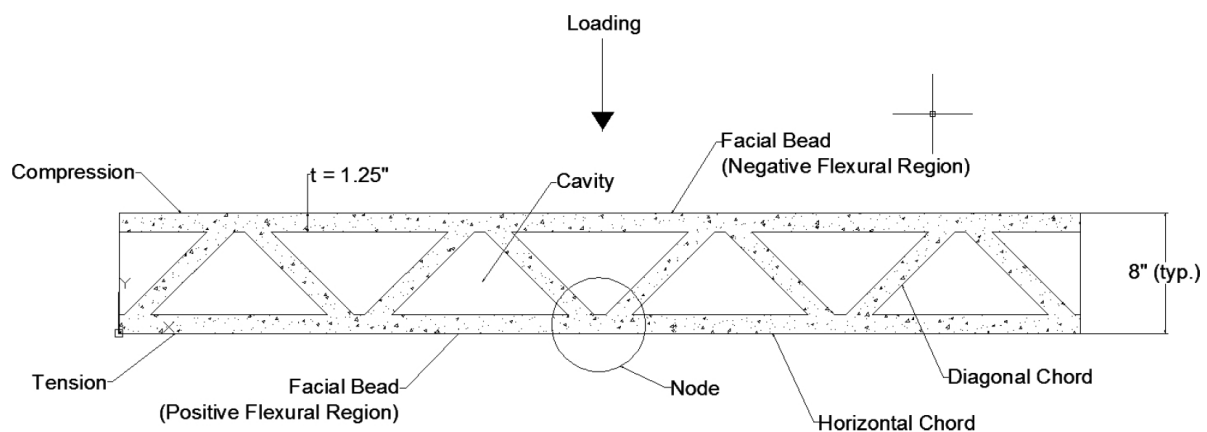


Figure 1. Longitudinal view of 3DCP RC beams tested by Al-Chaar et al. [12].

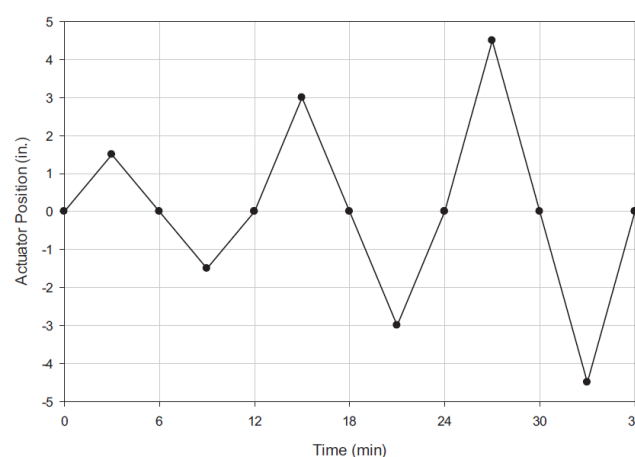


Figure 2. Loading protocol used by Al-Chaar et al. [12] (1 inch = 25.4 mm).

In this paper, only three out of nine specimens tested by Al-Chaar et al. [12] were investigated due to the limitation of the analytical model to simulate the basalt mesh used between the concrete mortar layers. These specimens are 1SR-S-0, 4DR-S-0, and 5DR-B-0. Specimen 1SR-S-0 was a singly-

reinforced beam with three 10-mm diameter steel bars in the tension side while specimen 4DR-S-0 was a doubly-reinforced beam with three 10-mm diameter steel bars each in the tension and compression sides. Specimen 5DR-B-0 was a doubly-reinforced beam with three 10-mm diameter basalt bars in the tension and compression sides. Because specimen 1SR-S-0 was a singly-reinforced beam, it was cyclically loaded in one direction only, whereas specimens 4DR-S-0 and 5DR-B-0 were subjected to cyclic loading in both positive and negative directions. The loading protocol for the specimens is displayed in figure 2.

3. Analytical modeling of the 3D-printed RC beams

In this paper, the analytical modeling of the 3D-printed RC beams as tested by Al-Chaar et al. [12] was done using SAP2000 computer software [11]. The truss beams were modeled using frame elements for its tension, compression, and diagonal chords. Furthermore, fiber P-M-M hinge that is available in SAP2000 [11] was used to account for the material nonlinearity. The elevation view of the analytical model of the 3D-printed RC beams can be seen in figure 3.

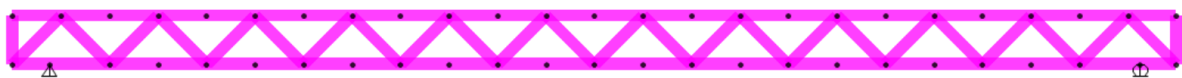


Figure 3. Elevation view of the 3D-printed RC beams as modelled in SAP2000 [11].

The most important parameter to be defined in this analysis is the constitutive material model for the 3D-printed concrete. According to a study by Le et al. [13], the hardened properties of 3D-printed concrete is different than that of conventional concrete due to anisotropy in the layered concrete mortar. The compressive strength of 3DCP was reduced by 5 to 15 percent, depending on the loading direction, for a straight-line printing structure and the reduction can go up to 30 percent for a curvy-shaped printing structure as compared with conventional concrete. In addition, because of the gap between its layers due to the printing process, the tensile bond strength between the layers of 3D-printed concrete is weaker. However, because the truss beams were modeled using frame elements, the reduction of tensile bond strength was not able to be taken into account in the analytical model.

In this analysis, the Mander's model for unconfined concrete [14] that is available in SAP2000 [11] was used as the constitutive material model for concrete as displayed in figure 4a. For rebars, Park's model for reinforcing bar [15] was used as displayed in figure 4b.

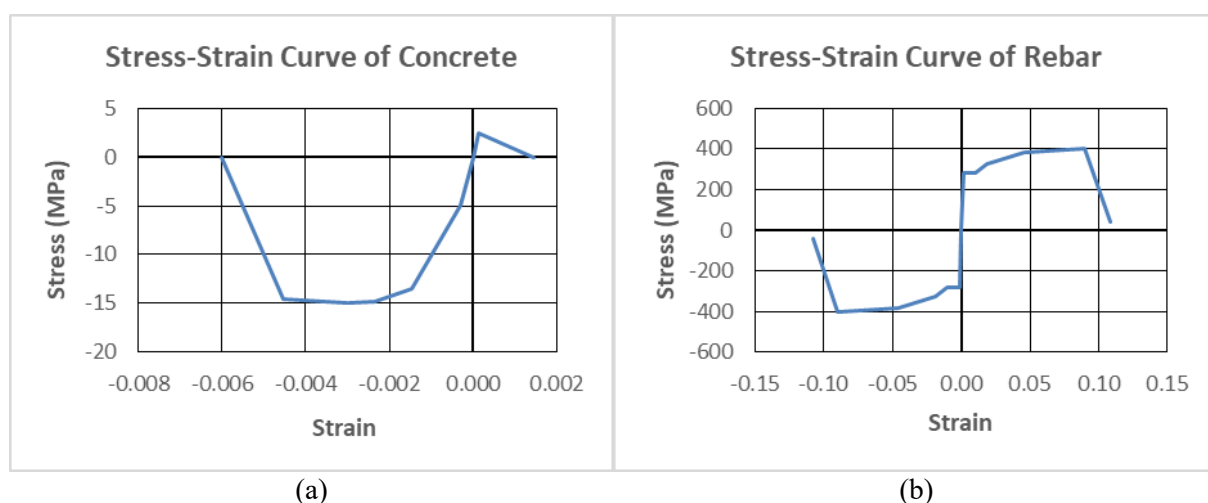


Figure 4. Stress-strain curve of materials used in the analytical model: (a) concrete and (b) rebar.

The analyses were carried out using nonlinear static analysis with several load cases to simulate cyclic loading conditions as defined in the experiment by Al-Chaar et al. [12]. Displacement control was

used to monitor the nodal displacement in order to simulate the loading protocol used in the experiment. From the analysis results, reactions in the supports were combined to obtain the total force applied to the 3D-printed RC beams. Subsequently, force-displacement curves of the beams obtained from the analyses were compared with those obtained from the experiment by Al-Chaar et al. [12] in order to see whether the analytical model could well simulate the behavior of 3D-printed RC beams.

4. Analysis results

The analysis results were compared with experimental results from a study by Al-Chaar et al. [12] in terms of the load-displacement curves of the specimens and their maximum strengths. The comparison of maximum strengths between experimental and analytical results can be seen in table 1 while the comparison of load-displacement curves between experimental and analytical results are displayed on Figures 5, 6, and 7 for specimens 1SR-S-0, 4DR-S-0, and 5DR-B-0, respectively.

Table 1. Comparison of maximum strengths between experimental and analytical results.

Specimen ID	Maximum Experimental Strength (kN)	Maximum Analytical Strength (kN)
1SR-S-0	12.881	11.898
4DR-S-0	14.154	12.924
5DR-B-0	7.958	8.416

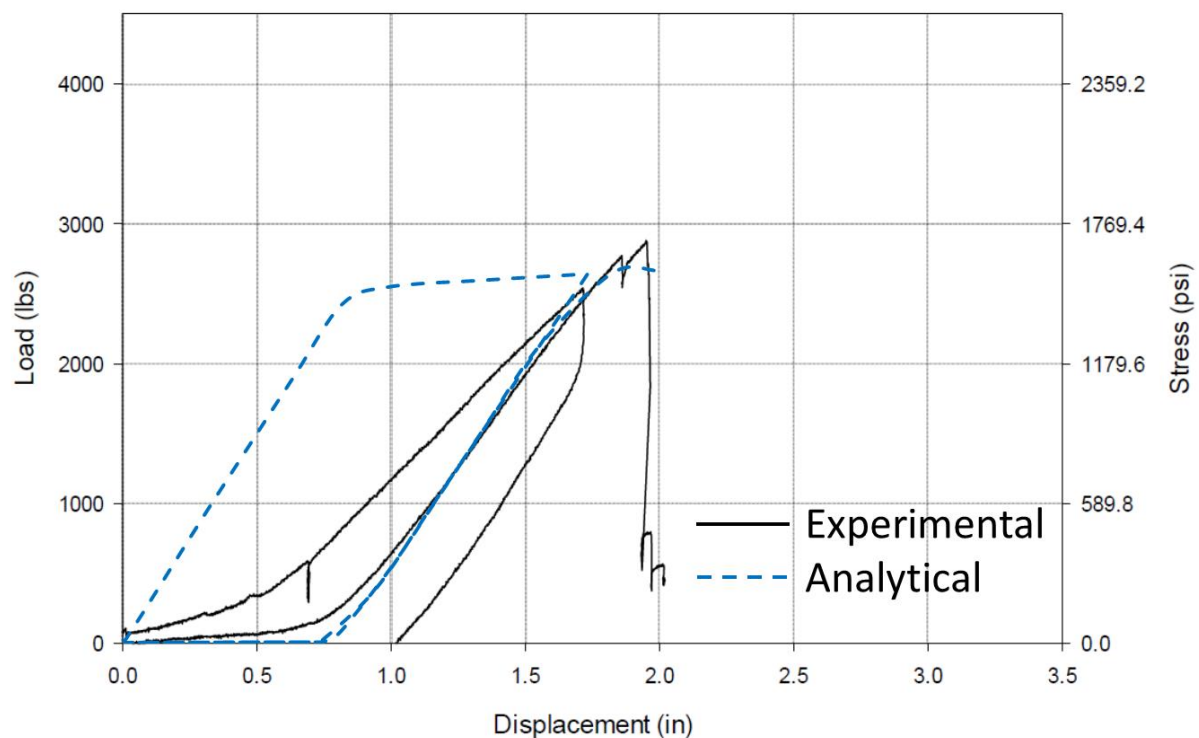


Figure 5. Load-displacement curves of specimen 1SR-S-0.

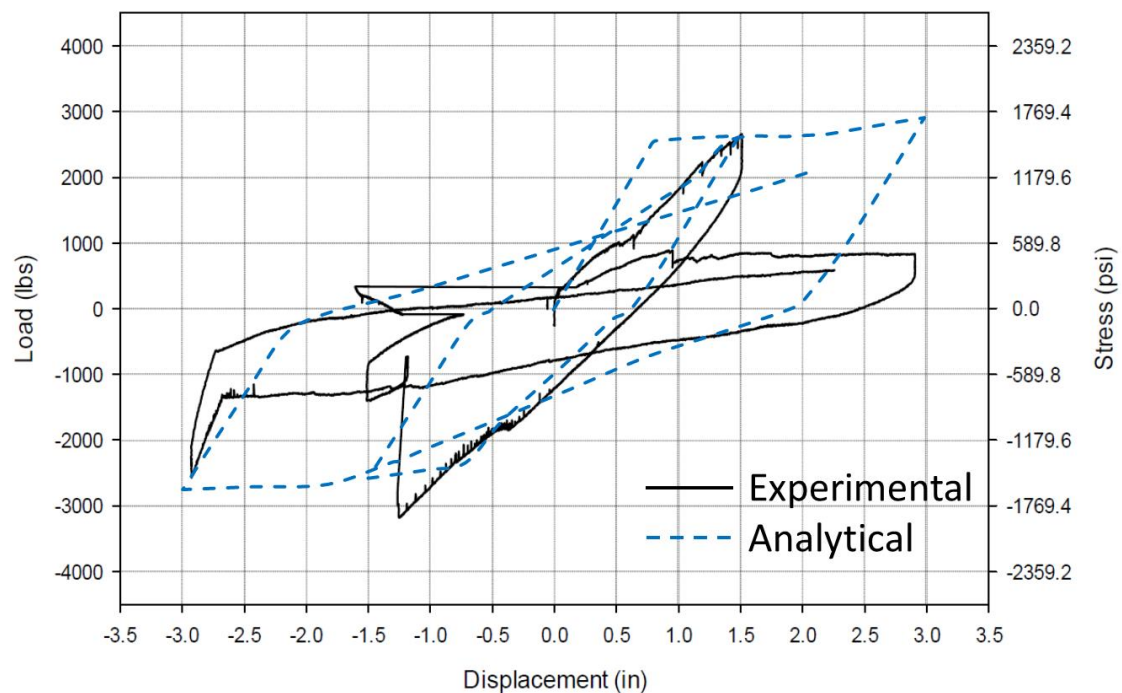


Figure 6. Load-displacement curves of specimen 4DR-S-0.

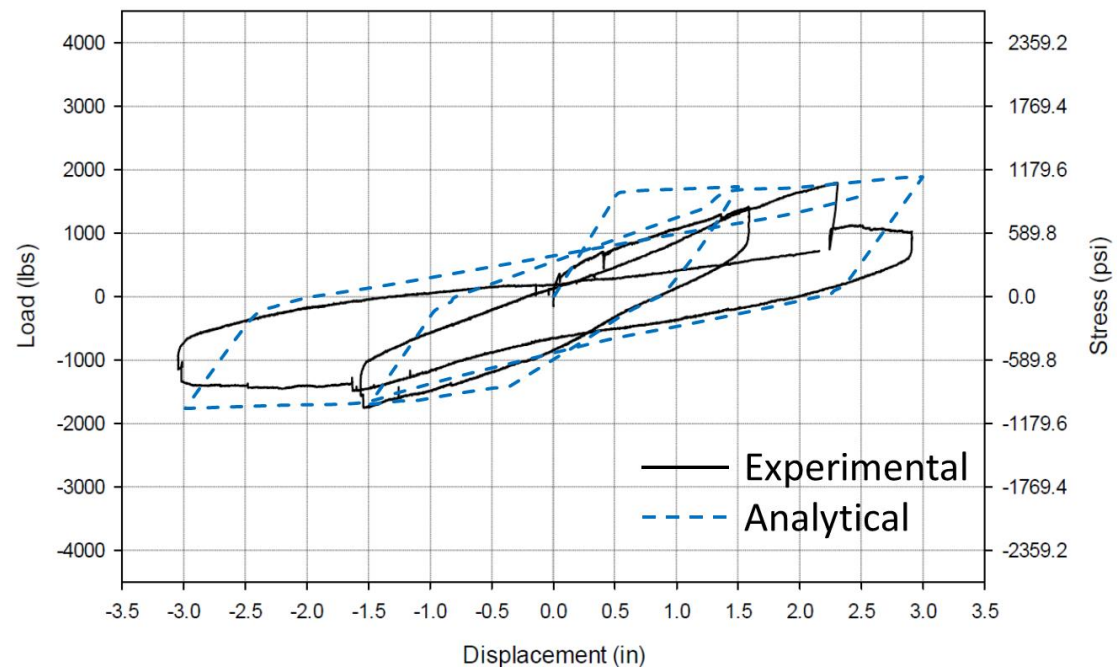


Figure 7. Load-displacement curves of specimen 5DR-B-0.

The observations and comparison for each specimen modeled analytically are presented as follows:

1. Specimen 1SR-S-0: For the load-displacement curve, it can be seen in figure 5 that the analytical model predicts higher initial stiffness compared with the experimental result. The experimental results, however, did not follow common behavior as there was a significant increase in the beam stiffness starting from displacement of 0.7 inches onwards. Usually, for RC beams, the

stiffness will decrease as the displacement increases because of crack propagation. For the second cycle, it can be seen in figure 5 that the analytical model can predict the reloading curve quite accurately, including the maximum strength. Nevertheless, for the degrading branch, the analysis could not proceed further due to convergence problems after the beam strength started to decrease. From table 1, it can be seen that the maximum experimental and analytical strengths for specimen 1SR-S-0 do not differ much, only by 7.63%.

2. Specimen 4DR-S-0: For the load-displacement curve, it can be seen in Figure 6 that the analytical model predicts a higher initial stiffness compared with the experimental result. Moreover, from the hysteretic behavior, it can be seen that the analytical model shows a ductile flexural response, whereas for the experimental result there was a significant reduction in strength and stiffness after the beam reached its maximum strength in negative direction. This was due to shear failure of the nodal points near the supports (complete detachment of the nodes from the horizontal chords). Nevertheless, this failure mode could not be simulated well by the analytical model that uses frame elements. From table 1, it can be seen that the maximum experimental and analytical strengths for specimen 4DR-S-0 only have 8.69% difference.
3. Specimen 5DR-B-0: For the load-displacement curve, similar to the other cases, it can be seen in figure 7 that the analytical model predicts a higher initial stiffness compared with the experimental result. Furthermore, the analytical model shows a ductile flexural response, whereas for the experimental result there was a reduction in strength after the beam reached its maximum strength in positive direction. This was due to bond failure between basalt rebars and concrete. However, this behavior could not be simulated well by the analytical model that assumed a perfect bond between the rebars and concrete. From table 1, unlike other cases that underestimate the experimental strengths, for this specimen, the analytical model predicts slightly higher strength with a difference of 5.76%.

5. Concluding remarks

From this initial study, the following remarks can be made:

- The analytical model consistently predicts a higher initial stiffness compared with the experimental result. This can be due to the stiffness of the 3D-printed RC beams being less than that of the conventional RC beams. The constitutive material model used for concrete in the analysis is the Mander's model for unconfined concrete [14], which is actually for conventional concrete and, thus, it results in higher initial stiffness of the beams. Furthermore, another possibility is that the analytical model assumed perfect geometry and no damage in the specimen before loading, whereas in the experiment there might be some imperfections in geometry as well as slight damage in the specimen before testing, as seen in specimen 1SR-S-0 that did not follow common material behavior (increase in beam stiffness as the displacement increasing).
- The analytical model can accurately predict the maximum flexural strengths of 3D-printed RC beams. The comparisons show that the difference between maximum experimental and analytical strengths are below 10% for all specimens.
- From the hysteretic behavior, it can be concluded that the analytical model that used frame elements with fiber P-M-M hinges could not predict some modes of failure of the 3D-printed RC beams, i.e., shear failure of the nodal points and bond failure between rebars and concrete. It is highly recommended to use a more advanced analytical model (i.e., solid element) in order to simulate the cyclic behavior of 3D-printed RC beams correctly.
- Future research is needed to define correctly the constitutive material model for the 3D-printed concrete which is different than that for conventional concrete, especially in terms of the stress-strain curve and its hysteretic behavior, the interfacial bonding between concrete mortar layers, and the bonding between rebars and concrete.

Acknowledgments

The authors are grateful for the funding provided by the Deputy for Research Empowerment and Development, Ministry of Research and Technology/National Research and Innovation Center, Republic of Indonesia under PDUPT scheme no. 002/SP2H/LT-MULTI/LL7/2020.

References

- [1] Schutter G D, Lesage K Mechtcherine V Nerella V N Habert G and Agusti-Juan I 2018 Vision of 3D printing with concrete technical, economic and environmental potentials *Cem. Conc. Res.* **112** 25-36
- [2] Gosselin C, Duballet R Roux P Gaudillière N Dirrenberger J and Morel P 2016 Largescale 3D printing of ultra-high-performance concrete - a new processing route for architects and builders *Mat. Design* **100** 102-9
- [3] Duballet R, Baverel O and Dirrenberger J 2016 Classification of building systems for concrete 3D printing *Auto. Const.* **83** 247-58
- [4] Hager I, Golonka A and Putanowicz R 2016 3D printing of buildings and building components as the future of sustainable construction *Proc. Eng.* **151** 292-9
- [5] Buswell R A, d Silva W R L Jones S Z and Dirrenberger J 2018 3D printing using concrete extrusion: A roadmap for research *Cem. Conc. Res.* **112** 37-49
- [6] Kazemian A, Yuan X Cochran E and Khoshnevis B 2017 Cementitious materials for construction-scale 3D printing: Laboratory testing of fresh printing mixture *Cons. Build. Mat.* **145** 639-47
- [7] Ma G, Li Z and Wang L 2018 Printable properties of cementitious material containing copper tailings for extrusion-based 3D printing *Cons. Build. Mat.* **162** 613-27
- [8] Lim S, Buswell R A Le T T Austin S A Gibb A G F and Thorpe T 2012 Developments in construction-scale additive manufacturing processes *Auto. Cons.* **21** 1 262-8
- [9] Bos F, Wolfs R Ahmed Z and Salet T 2016 Additive manufacturing of concrete in construction: Potentials and challenges of 3D concrete printing *Virt. Phys. Prot.* **11** 3 209-25
- [10] Perrot A, Rangeard D and Pierre A 2016 Structural built-up of cement-based materials used for 3D-printing extrusion techniques *Mat. Struc.* **49** 4 1213-20
- [11] Computer and Structures Inc. 2019 *SAP2000 Structural Analysis Program* (Computer and Structures, Inc.)
- [12] Al-Chaar G K, Stynoski P B and Banko M L 2018 Structural behavior of layer-printed reinforced concrete beams *Open. Cons. Build. Tech. Jour.* **12** 375-88
- [13] Le T T, Austin S A Lim S Buswell R A Law T Gibb A G F and Thorpe T 2012 Hardened properties of high-performance printing concrete *Cem. Conc. Res.* **42** 558-66
- [14] Mander J B, Priestley M J N and Park R Theoretical stress-strain model for confined concrete *ASCE Jour. Struc. Eng.* **114** 3 1804-26
- [15] Park R and Paulay T 1975 *Reinforced Concrete Structures* (Canada: John Wiley & Sons, Inc.)



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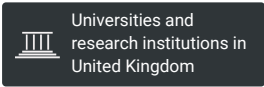
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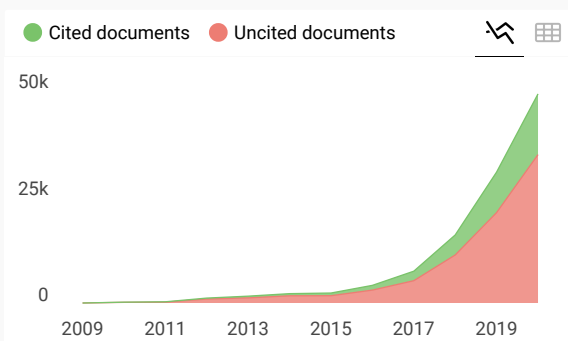
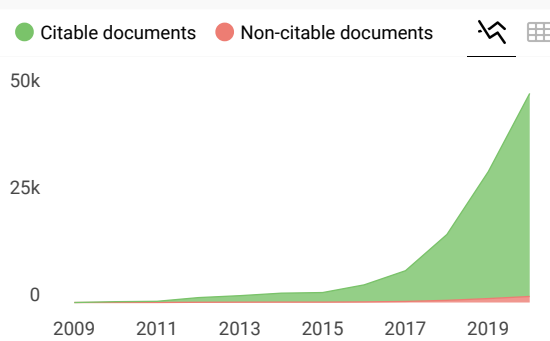
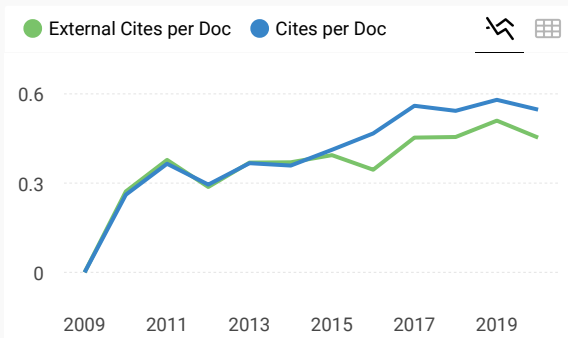
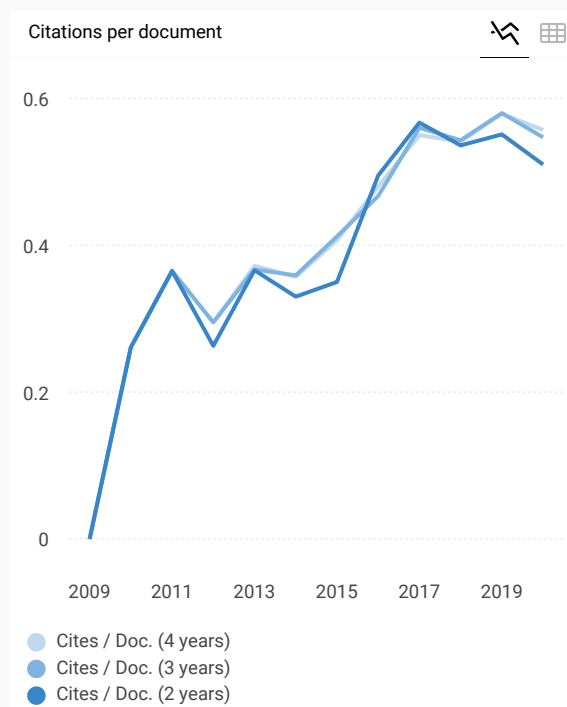
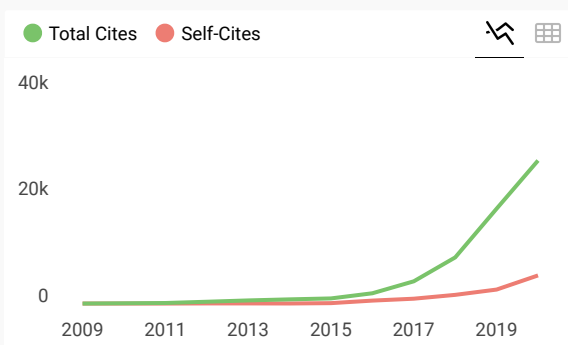
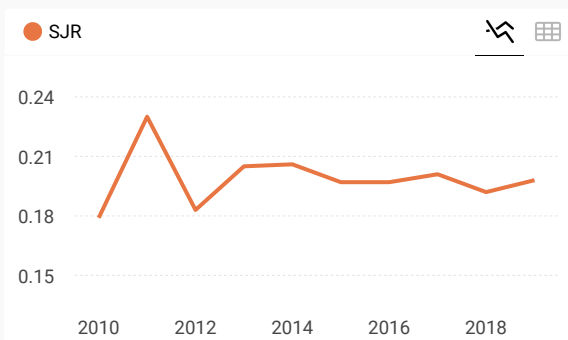
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