

# GUIDE BOOK TALENTA

Conference on Engineering, Science  
and Technology

# CEST

“Sustainable Energy and Biomaterial”

THE  
*Character Building*  
UNIVERSITY

Grand Aston City Hall  
Jl. Balai Kota No. 1, Kesawan, Medan  
Sumatera Utara

September 7<sup>th</sup> 2017



Faculty of Engineering  
University of Sumatera Utara

# GUIDE BOOK

## The Book of Abstracts

TALENTA

Conference on Engineering, Science and Technology

“Sustainable Energy and Biomaterial”

THE  
*Character Building*  
UNIVERSITY  
Grand Aston City Hall

Jl. Balai Kota No.1 Kesawan, Medan, Sumatera Utara

Indonesia

September 7<sup>th</sup>, 2017

## Table of Contents

Greeting from the Chairperson .....	iii
Welcome Message from Dean .....	iv
Committee.....	v
Conference Program .....	vi
Session Schedules .....	viii
Parallel Session I.....	viii
Parallel Session II .....	viii
Parallel Session III .....	viii
Parallel Session IV.....	ix
Chemical Engineering 1.....	x
Chemical Engineering 2.....	xii
Architecture, Civil and Environmental Engineering.....	xiv
Industrial Engineering 1.....	xvii
Industrial Engineering 2.....	xviii
Mechanical Engineering 1 .....	xx
Mechanical Engineering 2 .....	xx
Electrical Engineering.....	xxi
Science and Technology .....	xxiii
Keynote Speaker Abstracts .....	1
Abstract Lists .....	6
Chemical Engineering.....	6
Architecture, Civil and Environmental Engineering.....	24
Industrial Engineering.....	41
Mechanical Engineering.....	54
Electrical Engineering.....	58
Science and Technology .....	65
How to Reach the Venue .....	xx
Venue Location .....	xxiii
Venue Layout.....	xxiv
Social Program.....	xxvi
Author Index .....	xxviii

## Greeting from the Chairperson

TALENTA Conference on Engineering Science and Technology (CEST) 2017.

It is a great pleasure that we introduce this special issue of Guide Book, which consists of the abstracts of selected papers at TALENTA CEST 2017 in Medan, Indonesia. The event which is attended by about 150 participants from various countries, is organized by the Faculty of Engineering, Universitas Sumatera Utara (USU), Medan-Indonesia to celebrate the 58<sup>th</sup> anniversary of Faculty of Engineering in 2017, and supported by the Sustainable Energy and Biomaterial Centre of Excellence, Universitas Sumatra Utara on September 7 – 8, 2017.

This special Guide Book encompasses wide areas of engineering such as Mechanical Engineering, Civil Engineering, Electrical Engineering, Chemical Engineering, Industrial Engineering, Environmental Engineering, Architecture, etc. We appreciate the efforts of the conference participants and encourage their current and future personal and collaborative efforts in those important fields of engineering endeavor.

We would like to express our sincere gratitude and our utmost appreciation to Prof. Hiromi Homma (Japan), Prof. Hiroyuki Daimon (Japan), Prof. Masashi Daimaruya (Japan), Prof. Marwan Al-Akaidi (Kuwait), Prof. Nik Meriam Nik Sulaiman (Malaysia), Prof. T. Indra Mahlia (Malaysia), Prof. Hiroyuki Daimon (Japan), Prof. Hideki Kawai (Japan), Assoc. Prof. Edy Harianto Majlan (Malaysia), Prof. Marwan Al-Akaidi (Kuwait), Dr. Edward Halawa (Australia), Dr. Fahmi Ridwan (Indonesia), Mahyuddin K. Nasution (Indonesia), Dwira Aulia, Ph.D (Indonesia), Dr. Eng. Irvan (Indonesia), Dr. Eng. Himsar Ambarita (Indonesia), Dr. Eng. Taufiq Bin Nur (Indonesia), Dr. Halimatuddahlia (Indonesia), and organizing committee for reviewing and giving recommendation on manuscripts from all the participants of TALENT CEST 2017.

With our warm regards,

Indra Surjaya, Ph.D

Chairperson

TALENTA CEST 2017.

THE  
*Character Building*  
UNIVERSITY

## Committee

### Honorary Board

1. Prof. Runtung (Rector, Universitas Sumatera Utara)
2. Seri Maulina, PhD (Dean, Engineering Faculty, Universitas Sumatera Utara)

### International Board

1. Prof. Hiromi Homma (Toyohashi University of Technology, Japan)
2. Prof. Hiroyuki Daimon (Toyohashi University of Technology, Japan)
3. Prof. Masashi Daimaruya (Muroran Institute of Technology, Japan)
4. Prof. Marwan Al-Akaidi (Arab Open University, Kuwait)
5. Prof. Nik Meriam Nik Sulaiman (University of Malaya, Malaysia)

### Scientific Committee

1. Prof. T. Indra Mahlia (Universiti Tenaga Nasional, Malaysia)
2. Prof. Hiroyuki Daimon (Toyohashi University of Technology, Japan)
3. Prof. Hideki Kawai (Muroran Institute of Technology, Japan)
4. Assoc. Prof. Edy Harianto Majlan (Universiti Kebangsaan Malaysia, Malaysia)
5. Prof. Marwan Al-Akaidi ( Arab Open University, Kuwait)
6. Dr. Edward Halawa (Charles Darwin University, Australia)
7. Dr. Fahmi Ridwan (Universiti Malaysia Perlis, Malaysia)
8. Prof. Bustami Syam (Universitas Sumatera Utara, Indonesia)
9. Mahyuddin K. Nasution (Universitas Sumatera Utara, Indonesia)
10. Dwira Aulia, Ph.D (Universitas Sumatera Utara, Indonesia)
11. Dr. Eng. Irvan (Universitas Sumatera Utara, Indonesia)
12. Dr. Eng. Himsar Ambarita (Universitas Sumatera Utara, Indonesia)
13. Dr. Taufiq Bin Nur (Universitas Sumatera Utara, Indonesia)
14. Dr. Halimatuddahlia (Universitas Sumatera Utara, Indonesia)

### Organizing Committee

Chairman : Indra Surya, Ph.D

Co-Chairman : Dr. Eng. Himsar Ambarita

Secretary : Stiherman, Ph.D

Vice Secretary : Maya Sarah, Ph.D

Treasury : Mrs. Adina Sari Lubis

Vice Treasury : Dr. Juliza Hidayati

Members :

- |                            |                         |                                |
|----------------------------|-------------------------|--------------------------------|
| 1. Dr. Benny OY Marpaung   | 7. Dr. M. Sabri         | 13. Dr. Rondang Tambun         |
| 2. Dr. Taufiq Bin Nur      | 8. Mr. Bambang Trisakti | 14. Dr. Ahmad Delianur         |
| 3. Dr. Listiani Nurul Huda | 9. Dr. Dwira Aulia      | 15. Dr. Ahmad Perwira Mulia T. |
| 4. Dr. Fahmi               | 10. Dr. Fatimah         | 16. Dr. Medis S Surbakti       |
| 5. Dr. Bode Haryanto       | 11. Dr. Erni Misran     | 17. Mr. Okta Bani              |
| 6. Mr. Buchari             | 12. Dr. Meilita Tryana  | 18. Mr. Ikhsan Siregar         |

## Conference Program

September 7<sup>th</sup> 2017, Grand Aston Hotel, Medan

07.30 – 08.30 WIB	Parallel Session 1	Venue: Rosewood 1, Rosewood 2, Sandalwood, Cahaya 1, Cahaya 2
08.00 – 08.30 WIB	Registration	Venue: Mahogany Grand Ballroom
08.30 – 08.35 WIB	National Anthem: Indonesia Raya	
08.35 - 08.50 WIB	Traditional Welcoming Dance	
08.50 – 09.00 WIB	Welcoming speech by Dr. Indra Surya Chairperson of TALENTA CEST	
09.00 – 09.10 WIB	Welcoming speech and Opening Ceremony by Prof. Runtung Rector of Universitas Sumatera Utara	
09.10 – 09.15 WIB	Prayer	
09.15 – 09.30 WIB	Photograph session	
09.30 – 10.00 WIB	Keynote 1: "Toward Green Society" Prof. Hirommi Homma Toyohashi Institut of Technology, Japan Moderator: Dr. M. Sabri	
10.00 – 10.30 WIB	Keynote 2: "Oil Palm Ash: From Waste to Wealth" Prof. Hanafi Ismail USM, Malaysia Moderator: Dr. Halimatuddahliana	
10.30 – 11.00 WIB	Keynote 3: "Energy Sustainability or Survivability?" Dr. Edward Halawa Darwin University, Australia Moderator: Dr. Taufik bin Nur	
11.00 - 11.30 WIB	Keynote 4: "Processing of Palm Oil Mill Wastes Based on Zero Waste Technology" Dr. Eng. Irvan Universitas Sumatera Utara, Indonesia Moderator: Mr. Bambang Frisakti	

11.30 – 12.30 WIB	Lunch	Venue: Mahogany Grand Ballroom
13.30 – 14.30 WIB	Parallel Sessions II	Venue: Rosewood 1, Rosewood 2, Sandalwood, Gaharu 1, Gaharu 2 and Mahony Grand Ballroom
14.30 – 15.30 WIB	Parallel Sessions III	Venue: Rosewood 1, Rosewood 2, Sandalwood, Gaharu 1, Gaharu 2 and Mahony Grand Ballroom
15.30 – 15.45 WIB	Coffee break	Venue: Rosewood 1, Rosewood 2, Sandalwood, Gaharu 1, Gaharu 2 and Mahony Grand Ballroom
15.45 – 16.45 WIB	Parallel Sessions IV	Venue: Rosewood 1, Rosewood 2, Sandalwood, Gaharu 1, Gaharu 2 and Mahony Grand Ballroom
17.00 – 17.30 WIB	Closing Ceremony by Seri Maulina, Ph.D, Dean of Engineering Faculty	Venue: Mahogany Grand Ballroom

UNIVERSITAS NEGERI  
UNIMED

THE  
*Character Building*  
UNIVERSITY

## Session Schedules

### Parallel Session I

Time: 07.30 – 08.30 WIB

Topic	Venue	Moderator
Chemical Engineering 1	Rosewood 1	Dr. Fatimah
Industrial and Mechanical Engineering 1	Rosewood 2	Dr. Listiani Nurul Huda
Industrial and Mechanical Engineering 2	Sandalwood	Dr. M. Sabri
Architecture, Civil and Environmental Engineering	Gaharu 1	Dr. Medis S. Surbakti
Electrical Engineering, Science and Technology	Gaharu 2	Mr. Soeharwinto

\* Mahogany Grand Ballroom is on the first level of apartment area, the other rooms are on the second floor of the hotel area. Please refer to the venue layout.

### Parallel Session II

Time: 13.30 – 14.30 WIB

Topic	Venue	Moderator
Chemical Engineering 1	Mahogany Grand Ballroom	Dr. Rondang Tambun
Chemical Engineering 2	Rosewood 1	Dr. Bode Hariyanto
Industrial and Mechanical Engineering 1	Rosewood 2	Dr. Meilita Tryana
Industrial and Mechanical Engineering 2	Sandalwood	Dr. Juliza Hidayati
Architecture, Civil and Environmental Engineering	Gaharu 1	Dr. Benny OY M.
Electrical Engineering, Science and Technology	Gaharu 2	Mr. Tigor Hamonangan

### Parallel Session III

Time: 14.30 – 15.30 WIB

Topic	Venue	Moderator
Chemical Engineering	Mahogany Grand Ballroom	Dr. Rondang Tambun
Chemical Engineering 2	Rosewood 1	Mr. Bambang Trisakti
Industrial and Mechanical Engineering 1	Rosewood 2	Dr. Ahmad Dejanur
Industrial and Mechanical Engineering 2	Sandalwood	Dr. Listiani Nurul Huda
Architecture, Civil and Environmental Engineering	Gaharu 1	Dr. Dwira Andia
Electrical Engineering, Science and Technology	Gaharu 2	Dr. Ali Hana Sah



**Parallel Session IV**  
Time: 15.45 - 16.45 WIB

Topic	Venue	Moderator
Chemical Engineering 1	Mahagony Grand Ballroom	Dr. Hilma Tamiami
Chemical Engineering 2	Rosewood 1	Mr. Okta Bari
Industrial and Mechanical Engineering 1	Rosewood 2	Mr. Ikhsan Siregar
Industrial and Mechanical Engineering 2	Sandalwood	Mr. Tulus Burhanuddin
Architecture, Civil and Environmental Engineering	Gaharu 1	Dr. Ahmad Perwira Mulia
Electrical Engineering, Science and Technology	Gaharu 2	Dr. Emerson P. Sinulingga



THE  
*Character Building*  
UNIVERSITY

## Chemical Engineering 1

No.	ID	Title	Author(s)	Page
1	1220	Tensile Properties and Water Absorption Assessment of Linear Low-Density Polyethylene/Poly (Vinyl Alcohol)/Kenaf Composites: Effect of Eco-Friendly Coupling Agent	Pang Ai Ling, Hanafi Ismail, and Azhar Abu Bakar	6
2	1487	Morphology and Thermal Stability of Nano Titanium Dioxide Filled Natural Rubber Prepared by Latex Mixing Method	N Hayeemasael, I Surya and H Ismail	6
3	1176	The Effect of Carbon Black (CB) Loading on Curing Characteristics and Mechanical Properties of Virgin Acrylonitrile Butadiene Rubber (NBRv)/Recycled Acrylonitrile Butadiene Rubber (NBRr) Blends	Muhammad Anas Husnan, Hanafi Ismail, Raa Khimi Shuib	7
4	1482	Biodiesel Production from Rice Bran Oil by Transesterification Using Heterogeneous Catalyst Natural Zeolite Modified with $K_2CO_3$	Taslim, Iriany, Okta Bani, S.Z.D.M. Parinduri, and P.R.W. Ningsih	7
5	E004	Annealing Optimization in The Process of Making Membrane PSf19%DMFEVA2 for Wastewater Treatment of Palm Oil Mill Effluent	Aja Avriana Said, Mustafa	8
6	1338	Influence of the Weighing Bar Position in Vessel on Measurement of Cement's Particle Size Distribution by Using the Buoyancy Weighing-Bar Method	R Tambun, RO Sihombing, A Simanjuntak, F Hanum	8
7	1469	Palm Ethyl Ester Purification by Using Choline Chloride $\rightarrow$ 1,2 Propanediol as Deep Eutectic Solvent	Renita Manurung, M. Arif Athamdi, Ardian Syahputra	9
8	E002	Isothermal approach to predict the removal efficiency of $\beta$ -carotene adsorption from CPO using activated carbon produced from tea waste	Surya Adi Anggi Hardono, Ahlun Nazar, Mia Yuhita, Rizki A Pasaribu, Fery Panjaitan, Erni Misran	9
9	1290	Influence of the Weighing Bar Size to Determine Optimal Time of Biodiesel-Glycerol Separation by Using the Buoyancy Weighing-Bar Method	R Tambun, Y Sibugariang, J Manurung	10
10	1248	The Effect of Addition Nanoparticle Chicken Egg Shell Fillers On Biocomposite Acrylic Resin for Denture Base	M Lubis, M Bangun, MH S Ginting, DM T Hasibuan, NF Dalimunthe	10

11	1274	Activated carbon production from bagasse and banana stem at various times of carbonization	Erni Misran, Seri Maulina, Sari Farah Dina, Ahlun Nazar, Surya Adi Anggi Harahap	11
12	E005	Effect of Solvent Volume Ratio And Time Extraction Of Glycerol Purification	M S Sinaga, G Rico, A N Nababan, T A Manullang	11
13	1297	Utilization of Mango Seed Starch in Manufacture of Bioplastic Reinforced with Microparticle Clay Using Glycerol as Plasticizer	Maulida, M. Hendra S. Ginting, Treecy Kartika, Alissha Tesanika1, Mara Bangun Harahap	12
14	1474	Effect of Nanocrystals Cellulose as a Filler from Corn Cob with Dispersion Agent Polyvinyl Pyrrolidone in Natural Rubber Latex Film After Aging Treatment	Hamidah Harahap, Muhammad Ridha, Halimatuddahliana, Taslim, Iriany	12
15	1400	Utilization of Oil Palm Fronds in Producing Activated Carbon Using Na <sub>2</sub> CO <sub>3</sub> as an Activator	Seri Maulina, and Fikri Naufal Anwari	13
16	1279	Composting of Empty Fruit Bunches Mixed with Activated Liquid Organic Fertilizer in the Tower Composter – Effect of Air Intake Holes	Irvan, T Husaini, B Trisakti, Fatimah, and H Daimon	13
17	1229	Study on Energy Productivity Ratio (EPR) at Palm Kernel Oil Processing Factory; Case Study on PT-X at Sumatera Utara Plantation	Bode Haryanto, Rina Br. Bukit, Elfrida M. Situmeang, Christina Eka P., Florentina Pandiangan	14
18	1189	Effect of Pressing Temperature on the Mechanical Properties of Waste Styrofoam Filled Sawdust Composite	H Nasution, H Harahap, R Riani and A I Pelawi	14


  
 THE  
*Character Building*  
 UNIVERSITY

No.	ID	Title	Author(s)	Page
1	1093	The Use of Glass Powder in Making Batako	Nursyamsi, Ivan Indrawan	24
2	1119	Impact Analysis of Leading Sub Sector on Basic Sector to Regional Income in Siak Regency, Riau Province	Puji Astuti, Idham Nugraha, Firman Abdillah	24
3	1127	The Study of the Influence of Functionalism and International Style on Architecture Development in Medan City	I F Pane, M N Loebis, I Azhari, N Ginting, D D Harisdani	25
4	1154	Green Design Application on Campus To Enhance Student's Quality of Life	Hilma Tamiami Fachrudin, Khaira Amalia Fachrudin	25
5	1269	How Manageable A person Feels The Place to be: Self-efficacy in Supporting Tourism	Nurlisa Ginting, N. Vinky Rahman, Achmad D. Nasution, Amelia Tri Widya	26
6	1042	The Study Of Residential Life Support Environment System To Initiate Policy On Sustainable Simple Housing	Nelson M. Siahaan, Agus S. Harahap, E. Nababan, Ernestasia Siahaan	26
7	1250	Examining of solid waste generation and community awareness between city center and suburban area in Medan City, Indonesia	H Khair AM, C N Putri, R A Dalimunthe and T Matsumoto	27
8	1160	Study of Carbon Dioxide Emission Inventory from Transportation Sector at Kualanamu International Airport	Isra' Suryati, Ivan Indrawan, Karina Nursyafira Alihta	27
9	1504	The Estimation of Parameter Compaction Values For Pavement Subgrade Stabilized With Lime	A S Lubis, Z A Muis and C A Simbolon	28
10	1089	Feasibility study on intersection in North Sumatera	Ika Puji Hastuty, Irwan Sianta Sembiring, Ridwan Anas, and Adina Sari Lubis	28
11	E007	Symbolizing The Chinese Identity As Pekong At The District of Pekan Labuhan	Morida Siagian	29
12	1092	Effect of HDPE Plastic Waste Towards Batako Properties	Nursyamsi, Ivan Indrawan, Vincent Theresa.	29
13	1094	Hydraulic Modeling of Flow Impact on Bridge Structures: A Case Study on Citarum Bridge	R I Siregar	30
14	1163	Soil Settlement Analysis in Soft Soil by Using Preloading System and Prefabricated Vertical	Roesyanto, Iskandar R, Silalahi M S A and	30

		Drain in Runway of Kualanamu Airport	Fadliansyah	
15	1166	A Study of the Effectiveness of the Use of Gypsum and Volcanic Ash against the Stability of Clay Soil in Terms of UCT and CBR Value	Roesyanto, Rudi Iskandar, Ika Puji Hastuty, and Ade Indra Utama Lubis	31
16	1168	Clay Stabilization by Using Gypsum and Paddy Husk Ash with Reference to UCT and CBR Value	Roesyanto, Rudi Iskandar, Ika Puji Hastuty, Windy Oky Dianty	31
17	1224	Alternative of Raw Material's Suppliers Using Topsis Method In Chicken Slaughterhouse Industry	Rahmi M Sari, Indah Rizkya, Khalida Syahputri, Anizar, Ikhsan Siregar	32
18	1271	Impact Of Pozzolanic Binder Addition On Stabilization Of Polluted Dredged Sediments On Its Potential Reuse As A New Material Resources For Road Construction In Basse Normandie, France	Ernesto Silitonga	32
19	1392	The Utilization of Stone Ash on Cellular lightweight Concrete	Rahmi Karolina Yosua Giovannic Christoffer, Sianipar	33
20	1317	California Bearing Ratio (CBR) test on stabilization of Clay with Lime addition	Ika Puji Hastuty, Roesyanto, Johan Oberlyn S and Muhammad Novratama Limbong	33
21	1327	The effect of shearwall location in resisting earthquake	Johannes Tarigan, Torang Sitorus, Joshua Manggala	34
22	1480	Passenger Car Equivalents of Becak Bermotor at Road Segment in Medan	M Surbakti and	34
23	1493	Priority of Road Maintenance Management Based on Haldq Reading Range on NAASRA method	M Surbakti and Doan A	35
24	1494	Roadabout Performance Analysis in the city of Medan	M Surbakti and Iswalyardi F	35
25	1216	Performance Evaluation of Existing Building Structure with Pushover Analysis	M. Agung Putra Handana, Rahmi Karolina and Steven	36
26	E016	The Analysis of Non Autoclaved Aerated Concrete with Substitution Fly Ash and Bottom Ash	Rahmi Karolina and Fadel Muhammad	36
27	E017	Optimization of Fly Ash and Bottom Ash Substitution Against Paving Block Manufacture According to SNI 03-0691-1996 ( Experimental Study)	Rahmi Karolina, Syahrizal, Nirwan Lubis,	37

28	1088	Comparison of compressive strength of paving block with a mixture of Sinabung ash and paving block with a mixture of Sinabung and lime ash	Ika Puji Hastuty, Irwan Suranta Sembiring and Nursyamsi	37
29	1492	The Study of Stiffness Modulus Values for AC-WC Pavement	Adina S Lubis, Z A Muis and Tommy D. Iskanda	38
30	1051	The Effect of Steel Slag as a Coarse Aggregate and Sinabung Volcanic Ash as a Filler on High Strength Concrete	Rahmi Karolina, Alif Lamra Amal Putra, Wafi Muhammad	38
31	1096	The Roles of Weather Modification Technology in Mitigation of the Peat Fires During a Period of Dry Season in Bengkalis, Indonesia	A Sandhyavitri, M.A Perdana, S Sutikno, F H Widodo	39
32	1150	The Success Strategies for Implementing The Public Private Partnership in the Water Supply Scheme in Batam, Indonesia	Ari Sandhyavitri, Herdiansyah, Andy Hendri	39
33	1449	An application of the AHP in water resources management: a case study on urban drainage rehabilitation in Medan City	Perwira Mulia Tarigan, Dedi Rahmad, Robi Arianta Sembiring, Rudi Iskandar	40
34	E015	Post Occupancy Evaluation of Energy-efficient Behavior in Informal Housing of High Density Area	Dwira Nirfalini Aulia, Beny OY Marpaung	40

  
 THE  
*Character Building*  
 UNIVERSITY

ID: 1224

### Alternative of Raw Material's Suppliers Using Topsis Method In Chicken Slaughterhouse Industry

Rahmi M Sari, Indah Rizkya, KhalidaSyahputri, Anizar, IkhsanSiregar  
University of North Sumatera, AlmamaterKampus USU. St. Padang Bulan Medan 20155, Indonesia  
Email: rahmi.m.sari@usu.ac.id

**Abstract.** Chicken slaughterhouse industry is one of the fastest growing industries and depends on the freshness of raw materials. The quality of raw materials that arrive at the company depends heavily on the supply of suppliers. Fresh chicken and frozen chicken meat are the main raw materials for this industry. Problems occurred by the supplier is catering the amount of raw material needs that are not appropriate and the delay in the delivery process. This condition causes disruption of the production process in the company. Therefore it is necessary to determine the best suppliers to meet the needs of the main raw materials of fresh and frozen chicken meat on the slaughterhouse chicken industry. This study analyzes supplier capability by using TOPSIS method to find out the best supplier order for raw material suppliers. TOPSIS method of supplier best order is supplier A followed by supplier D, supplier B, supplier C, supplier E, supplier F, and supplier G. Based on the rank order obtained from each company, it will assist the company in prioritizing the order to the supplier with the best rank. Total supply from All suppliers are 885,994 kg per month. Based on the results of research, the top five suppliers have been sufficient to meet the needs of the company.

**Keywords:** Suppliers, chicken slaughterhouse, TOPSIS

ID: 1271

### Impact of Pozzolanic Binder Addition on Stabilization of Polluted Dredged Sediments on Its Potential Reuse as a New Material Resource for Road Construction In Basse Normandie, France

Ernesto Silitonga  
Universitas Negeri Medan, Jl Willem Iskandar Pasar V Medan Estate 20221, Indonesia  
Email: ernestosilitonga@unimed.ac.id

**Abstract:** Due to the increase of the amount of marine dredged sediments (MDS) and the cost of managing the disposal site is very high, a reutilization of dredged sediment is urgently needed in France. The primary goal of this research is to find a domain for reuse of MDS materials as a new material regarding the environmental issues and other requirement needed. The MDS were used as replacement material in road construction. Hence, serial-tests need to be realized to identify if MDS could achieve the requirement needed or this domain. The secondary objective is to enhance the geotechnical characteristics and to reduce the pollution content of the MDS, by incorporating binders and sediments, and revealed the identification of the geotechnical characteristics measured on the mixes is compatible with their as replacement material in road construction. The Geotechnical test results show that the stabilization by hydraulics binders improve the geotechnical characteristic and could fulfil the requirement needed. The present of Fly Ash and Silica Fume is specially used in this study in order to reduce the pollution level, especially the heavy metal content. However, the proportion of hydraulics binders Fly Ash and Silica Fume needed to meet prescribed specification is important, so the reuse of the MDS as an alternative material could be achieved. Laboratory results show as expected, the study to identify the chemical characteristic realized. To evaluate the environmental impacts of the used material, leaching test is performed. The Leaching test result show that with 7% of Silica Fume and 10% of Fly Ash the polluted MDS could be safely used (in term of environmental impact) as a new material in road construction