



IGCESH 2014

5th Annual Conference

**International Graduate
Conference on Engineering,
Science and Humanities 2014
(IGCESH2014)**

"Towards Synergy in Multidisciplinary Research"

19th - 21st August

2014

5th Annual Conference
International Graduate Conference on Engineering, Science &
Humanities 2014 (IGCESH 2014)

CONFERENCE PROCEEDINGS

19th – 21st August 2014

Universiti Teknologi Malaysia

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Welcome Message

Prof. Dr. Zaidatun Tasir
Patron

Dean,
School of Graduate Studies, UTM

It gives me great pleasure to welcome all distinguished speakers, oral and poster presenters, and participants to the *5th International Graduate Conference on Engineering, Science and Humanities (IGCESH2014)*. To our international delegates, I bid you a warm welcome to Johor, the southern gateway to Malaysia.

The theme of the conference ‘Towards Synergy in Multidisciplinary Research’ captures the urgent and increasing need for different parties who play a significant role in the production of quality, competitive and creative human capital to interface and work collaboratively to contribute to the betterment of a rapidly changing world. Seeking new knowledge, disseminating, and sharing research findings and discoveries will indeed enhance and strengthen the synergy, without which advancement will be seriously delayed.

It is my hope therefore that this gathering of scholars, researchers, teachers, trainers, practitioners and professionals not only from this country but also from beyond the shores of Malaysia will continue with the tradition set by earlier IGCESH conferences in making significant contributions to meet the ever changing demands of the world. It is also my ardent hope that deliberations and knowledge exchanges do not adjourn here but will continue and flourish even after the conference through formal and informal collaborative and synergetic work, research and consultations.

Lastly, I would like to congratulate the organising committee in laying the foundations for what promises to be an excellent conference. To the participants, I express my appreciation for your strong support without which this conference would not have been possible. Thank you also to all parties who have contributed, in one way or another, to the success of this conference.



Prof. Dr. Nor Haniza Sarmin
General Chair

Deputy Dean,
School of Graduate Studies, UTM

It is with great pleasure that I welcome all participants to the 5th International Graduate Conference on Engineering, Science and Humanities (IGCESH2014).

Inspired by the need to meet the diverse and multifaceted demands of the dynamic, versatile and competitive varying domains, the world has made a quantum leap in making a difference by subscribing to creating multidisciplinary, collaborative and synergetic agents of change to shape the future of a shared world. With this at the heart of our aspiration, this year's conference, aptly themed, 'Towards Synergy in Multidisciplinary Research', is very timely, providing opportunities for researchers to connect with other domains to interact, to share research breakthroughs and to put forward creative ideas and innovative research in ensuring a more effective and relevant collective progress.

These two-day presentation sessions are also crowned with a half-day workshop, an excursion around selected high profile developments in Johor and a dinner with the theme 'Night of International Cultures' to afford everyone a wonderful opportunity to enrich both social and intellectual capital.

Applauding the efforts made in setting the pace for networking, sharing of expertise and collaborative efforts, I congratulate the IGCESH2014 committee and all parties involved in making this conference a success. This success is also due to the impressive number of quality papers that you have submitted owing to your hard work.

For all intents and purposes, this conference is an embodiment of our excellent synergy as a collective, and I urge everyone to celebrate this success by having a fruitful, enjoyable and memorable time.



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PRELIMINARY STUDY ON THE PROPERTIES OF CONCRETE USING IRON ORE TAILINGS

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INTRODUCTION

The main focus of this study is to find ways of utilizing the waste tailings obtained from Iron Ore processing in Malaysia. According to the publications of (Malaysiafactbook.com, 2014), in 2012, iron ore production topped all other minerals in Malaysia, with 10.7million tons mined. The iron ore output in 2011 is just 3.5 million tons. The production of iron ore is increasing on a higher trend up to-date from our investigation, implying that the government is showing much interest nowadays in iron ore production in Malaysia.

While researchers are working in some other parts of the world with similar record of iron ore availability like Malaysia, on how best to make use of the tailings, the only known research conducted on this material in Malaysia up to this present moment is by (Samayamutthirian, 2011). He only conducted research on the particle size analysis of the iron ore tailings. The present increasing trend of iron ore production in Malaysia is the major reason for conducting this research, in order to recommend ways of utilizing the waste tailings generated from the production process.

MAIN RESULTS

In this work, Iron Ore Tailings, waste product (with particle size range from (850 μ m - 75 μ m) obtained from Iron Ore Processing has been utilized as fine aggregate to produce concrete. The properties of fine and coarse aggregate such as specific gravity and particle size distribution were determined. The values obtained were used for the concrete mix-design based on British Standard (BS) guidelines. Based on BS guidelines, the properties of fresh and hardened concrete produced using experimental mix-design, were tested for consistency, compacting factor, density, initial surface water absorption, permeability, compressive strength, pulse velocity, dynamic Young's modulus, flexural strength, and splitting tensile strength tests. The particle size distribution curve for the studied tailings, granite and natural sand are shown in figure 1, while Table 1 is summary of some previous researcher's findings on the properties of iron ore tailings.

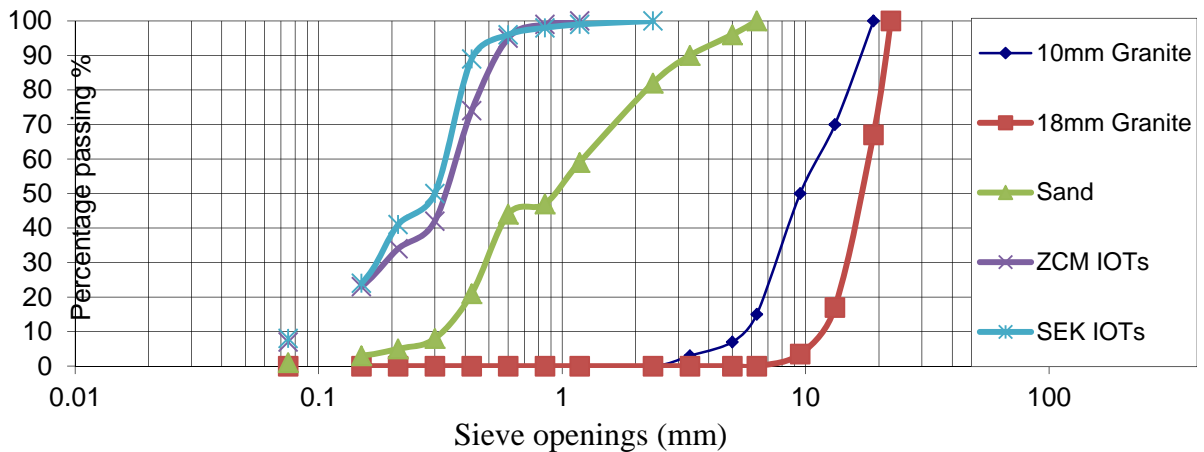


Figure 1. Particle Size Distribution Curve for Sand, Tailings and Granite

Table 1. Chemical Compositions of Iron Ore Tailings from Selected Previous Researches

Properties of IOTs	Compositions from various Locations							
Chemical Xtics content (wt %)	Itakpe Nigeria	Miyun China	Ansha China	Goa India	*Rui China	*Rui China	*Rui China	Sujing China
Fe ₂ O ₃	15	8.13	14.39	44.36	11.99	7.04	10.41	9.13
SiO ₂	66	69.52	82.26	51.12	68.63	70.27	58.76	52.06
Al ₂ O ₃	3.8	7.44	0.8	1.22	6.72	8.43	11.84	17.14
CaO	1.8	4.14	0.57	0.22	2.76	3.92	5.14	12.74
MgO	1.2	3.72	-	-	3.82	3.03	6.11	3.68
Mn ₂ O ₃	1.0	-	0.034	-	-	-	-	0.25
Na ₂ O	-	1.38	-	-	1.6	1.66	2.71	0.97
K ₂ O	-	1.97	-	-	1.98	2.62	1.62	0.30
SO ₃	-	0.03	-	-	1.91	2.02	0.10	-
TiO ₂	-	0.016	-	-	-	-	-	0.45
L O I	-	2.5	-	2.95	-	-	-	3.23

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