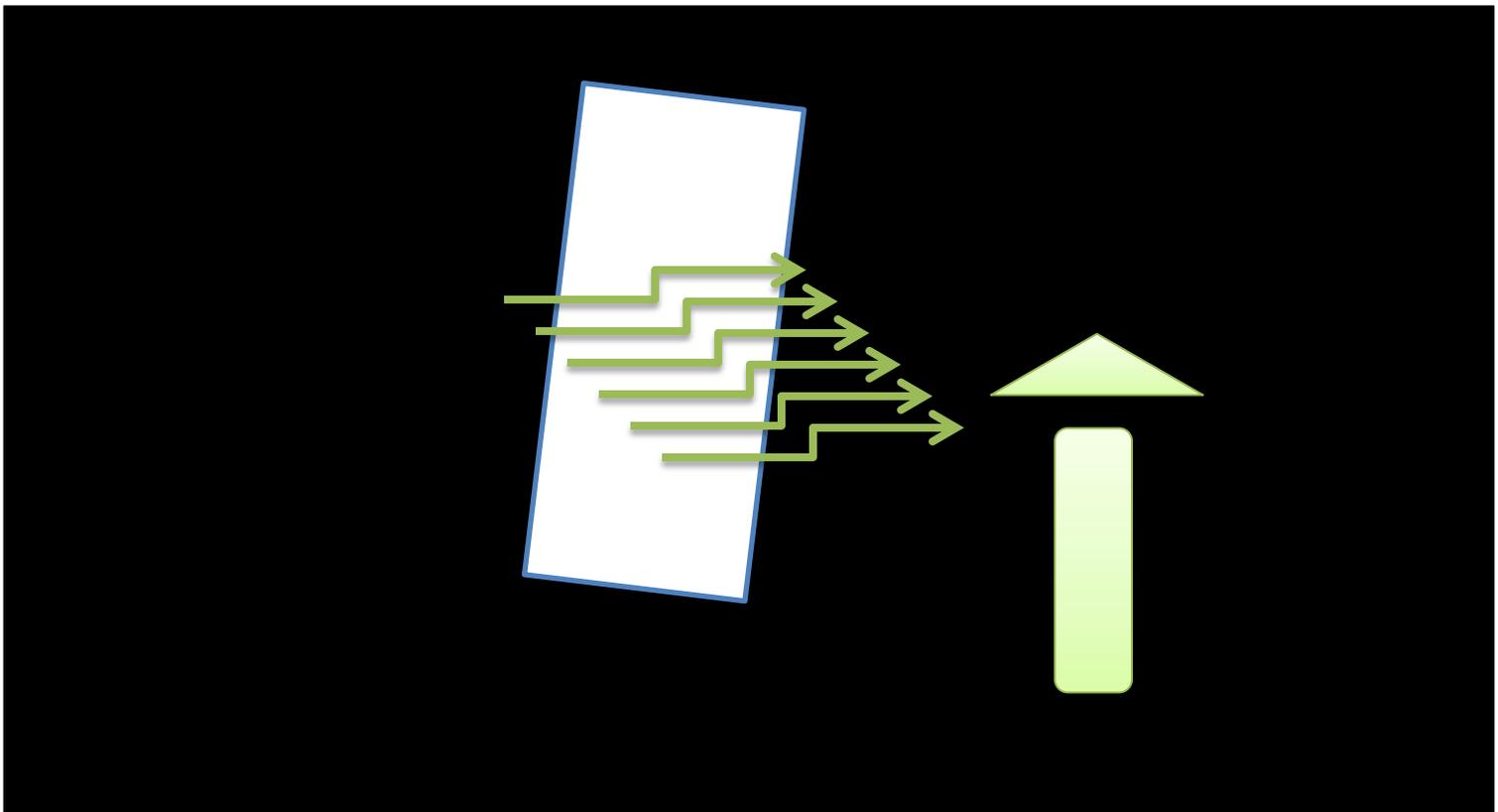


UNIVERSITI MALAYSIA SABAH
ABSTRACTS EBOOK
FYP-CIVIL ENGINEERING



2014

Head of Civil Engineering Program: Prof. IR. DR. Abdul Karimi Mirasa

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UNIVERSITI MALAYSIA SABAH

**FACULTY OF ENGINEERING
FINAL YEAR PROJECTS
ABSTRACTS EBOOK**

Civil Engineering Program

Compiled by Dr. HARIMI DJAMILA

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Supervisor: Associated Professor Dr Nurmin Bolong

Name: Dayang Haniza Binti Awang Patra

Metric No: BK10110055

Topic: GEOPOLYMER CERAMIC FROM LOCAL CLAY FOR WATER FILTRATION

Abstract: Geopolymers are being considered for a variety of applications including low producing CO₂ cements, fiber reinforced composites, refractories and as precursors to ceramic formation. In this study, the geopolymer ceramic paste was made by mixing local metakaolin clay, as a source of aluminosilicate, with different types of alkaline solution and curing in a sealed environment. Then, the amorphous paste was crushed and molded prior to firing at elevated temperature. The objectives of this study are to study efficiency of geopolymer in water filtration application, to compare the efficiency of geopolymer water filter and commercial ceramic membrane water filter and to analyse the effect of the material used to the synthesis of geopolymer. The study found that the geopolymer can be used as water filter. When comparing to commercial ceramic membrane water filter, geopolymer water filter was worse in terms of efficiency. Lastly, the molar mass of alkali activator used was the major contribute to the geopolymer produce.

Name: Asnih Binti Abidin

Metric No: BK10110025

Topic: Study on Nanotechnology and Production of Electron Nanofiber

Abstract: Electrospinning is a method for producing micro and nano sized synthetic fibers through the use of electrostatic forces. This phenomenon has been known since early in the 20th century, but has had an increase in interest since the 1990's due to their potential applications in textiles, electronics, and the biomedical field. Titanium dioxide (TiO₂) nanofibers will electrospun from electrospinning process that fabricated using ethanol solution and polyvinyl pyrrolidone (PVP). During this electrospinning process, there many morphology of nanofiber produced in terms of polymer concentration and molecular weight. The parameters that can be seen in this electrospinning process are voltage supply and feeding rate or flow rate. The morphology of TiO₂ nanofiber will be analyzed using scanning electron microscope (SEM). From the SEM pictures, it conclude that when the applied voltage is higher, the diameter lowest diameter along with increasing molecular weight. The diameter is increase when the flow rate used is increased also along with the molecular weight.

Nancy Chua Yin Yee

Metric No: BK10110191

Topic: PHYSICAL CHARACTERIZATION OF DEEP BED COLUMN FILTRATION USING EMPTY FRUIT BUNCHES (EFB) TO TREAT URBAN STORMWATER

Abstract: Oil palm empty fruit bunches (OPEFB) as filter medium is recommended in this study due to its fiber characteristic. Several research has used OPEFB in various applications in improving water quality by reducing the concentration of turbidity and suspended solid, as well as removal phenol, 2,4-Dichlorophenol (2,4-DCP) and dyes. This work utilised OPEFB to treat urban stormwater for reuse purpose by capitalizing on the deep bed filter column. The urban stormwater samples were collected from Sembulan River, which flows through the Kota Kinabalu city area. The investigation found that the sample is classified under Class III in Interim National Water Quality Standard (INWQS). The stormwater is then filtered through combination design of OPEFB and river sand (RS) and their performance are evaluated in terms of Total Suspended Solid (TSS), turbidity, colour and temperature. Different mix-ratio combination in river sand (RS) and OPEFB were conducted and indicated that the optimum mix design abilities to reduce 44.0% TSS, decrease 48.6% turbidity and remove 52.2% colour at mix ratio of 50% OPEFB and 50% RS deep filter column design. This study also reveals that with water wash treatment, better result was gained with TSS removal up to 58.4%, turbidity of 62.7%, and colour of 64.8%. The optimum mix-ratio filtration media also able to produce effluent filtration of stormwater sample to be classified as Class I.

Supervisor: Dr Harimi Djamila

Adoree Megan Bensing

Metric No: BK10110004

Topic: PREDICTION OF INDOOR COMFORT TEMPERATURE IN UMS LIBRARY

Abstract: This study explores the indoor comfort temperature, specifically in the University Malaysia Sabah (UMS) Library building. The thermal comfort study in this research does not only consider the six key factors affecting occupant's thermal comfort, but also the heat exchange processes of occupant's body toward the indoor environment. This research focused on the prediction of thermal comfort by using the regression and Predicted Mean Vote (PMV) analysis. To obtain the required data, a survey was conducted with 100 UMS student. Appropriate tools were also used to collect data regarding the physical climate room. Once all the data was acquired, they were brought to PMV analysis. The PMV method involved the use of a software programme called 'de Dear' which was developed by Professor Richard from the University of Sydney, Australia. The software is available online and its validation was done by comparing the result with the regression analysis. The results of this study identify which indoor temperature is most suited for UMS students whom are the major occupants at UMS Library. This has effect in providing pleasant thermal environment to the students.

Masnih Binti Mansur

Metric No: BK10110149

Topic: INVESTIGATION ON THE DYNAMIC ASPECT OF NATURAL AIR MOVEMENT BY USING SECONDARY DATA IN TRACY, CALIFORNIA

Abstract: The purpose of study is to investigate the dynamic characteristics of natural air flow in an outdoor area. This is due to growing environmental awareness and energy demand to the present day. Designers were using more practical and intuitive methods in finding solutions for indoor climatic control due to the energy crisis that become one of the crucial issues in the world. The study area is located in Tracy, California (Google.Org 2011). Objectives of the study are to investigate the similarities and the differences of wind profile and to describe methods to characteristic of natural and mechanical airflow in the terms of descriptive analysis, turbulence intensity and Weibull distribution using secondary data from Tracy, California.

Siti Rabiah Binti Samsu

Metric No: BK10110276

Topic: Prediction of Window Temperatures for Indoor Thermal Comfort Analysis

Abstract: The project objectives are: (1) Investigating the heat transfer through window at the time of solstice (21st June, 21st December) and at the time of equinox (21st March, 21st September) and (2) To estimate and compare the window surface temperatures and heat gains based on glass thicknesses (2mm, 19mm) and frame types (aluminium, wood). The results of this study can be used as a benchmark to make the proper choice of glass types (clear glass with thickness of 2 and 19 mm) and frame materials of the window (aluminium and wood) for thermal comfort of the buildings. The scope of this work is more focused on predicting glass temperature in Kota Kinabalu, Sabah area. The required climatic data include hourly bulb temperature and hourly solar radiation. The type of glass is clear glass of 2 and 19 mm thicknesses. Two window frames are considered. These are wooden and aluminium frames. This study will focus on four orientations East, West, North and South. The selected dates for the predictions are 21st March, 21st June, 21st September and 21st December. The collected data will be analysed using Microsoft Excel as a tool to predict the window surface temperatures. The obtained and calculated data in this research are analysed and presented in graph and table. No experiment has been carried out in this research. It was concluded that, those glass windows which have 19mm glass thickness with wood frame types give the lowest value of surface window temperature (t_s) and heat gain (Q) while the highest is the windows which having 2mm glass thickness with aluminium frame types. The 2mm glass thickness gave the highest surface temperature and heat gain to the window compare to 19mm glass thickness, whereas, it was observed that the wood frame types gave the lowest surface temperature and heat gain to the window compared to aluminium frame types. Overall average windows temperature was ranging from 26 to 30°C. The heat gain of a window values were varied linearly with the total transmittance of the glass windows due to solar radiation received at the window. The transmittance of the glass varied with the different thicknesses of the glass (2mm, 19mm).

Sabarinah Binti Batling

Metric No: BK10110262

Topic: PREDICTION OF INDOOR COMFORT TEMPERATURE IN UMS HOSTEL

Abstract: This study is prediction of comfort temperature in UMS hostel located in main campus of Universiti Malaysia Sabah, Kota Kinabalu. The objectives of this research are to predict the comfort temperature, acceptable indoor temperature and preferred indoor temperature in UMS Hostel. This research will be carried out only in UMS hostel and the 120 of subjects been selected. The subjects were about 19 to 29 year olds. Data was collected in two approaches which are subjective and objective measurements. The subjective method is based on questionnaires that have been elaborate for this study. Meanwhile the objective measurement is field measurements of environmental parameters using anemometer and hygrometer. The air temperature was between 29.9 °C – 32.2 °C with relative humidity range from 56 % to 73 %. In addition, the air movement was 0.07 m/s to 0.62 m/s. The acceptable temperature in this study was 30.6 °C. The range of clothing ensembles in this study was between 0.24 clo to 0.44 clo and metabolic rate was 1 Met.

Saleha Binti Abdul Han

Metric No: BK10110266

Topic: PREDICTION OF INDOOR COMFORT TEMPERATURE IN SKTM CLASSROOMS

Abstract: This thesis presents the study of thermal comfort that have been carried out in SKTM (Faculty of Engineering) classrooms, University Malaysia Sabah, Kota Kinabalu, Sabah, Malaysia. It focuses on thermal comfort, which may have a significant effect on the students' performance, in terms of attention, comprehension and learning levels. The aim of the study was to investigate the thermal comfort and acceptability as well as to predict the differences thermal comfort requirements between genders in the classrooms. The study was made in 3 weeks in May of 2014, from 8am to 10pm, during lesson hours. This study employed subjective and objective assessments through questionnaire and physical measurements. The thermal comfort variables were measured when the students were filling in the subjective questionnaires on thermal comfort. A total of 481 sets of questionnaire responses were obtained. The measured environmental parameters are temperature, air movement and relative humidity values. The subjective responses concerned the respondents' judgments about their thermal environment. The regression analysis revealed that the air temperature in neutral scale was 27.98°C for classrooms with air conditioning, while for classrooms mechanically ventilated (fan) was 28.79°C. Air conditioned classrooms have lower temperature acceptability than classrooms with fan. It was also found that the comfort temperature and acceptability for males and females are different.

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