



THE UNIVERSITY OF THE WEST INDIES

ST AUGUSTINE, TRINIDAD AND TOBAGO, WEST INDIES

FACULTY OF ENGINEERING

DEPUTY DEAN (RESEARCH & POSTGRADUATE
STUDENT AFFAIRS)

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MEMORANDUM

To: Members of Staff and Postgraduate Students
From: Deputy Dean, Research & Postgraduate Student Affairs
Date: Wednesday, November 26, 2014
Subject: Upgrade from MPhil to PhD- Ms. Davatee Maharaj
MPhil in Civil Engineering

Ms. Davatee Maharaj, a candidate seeking upgrade from MPhil to PhD in Civil Engineering will be speaking on the topic: "***Application of Electric Arc Furnace Slag in Shielding X Ray Radiation***".

ABSTRACT

Due to its high density and high atomic number, lead is the most common material utilized to shield x ray radiation. However, recent work provides evidence that when heavy weight aggregates are used in concrete, an effective x ray radiation shield is formed.

This research investigates the feasibility of using electric arc furnace slag as coarse aggregates in concrete for shielding x ray radiation. Electric arc furnace slag is a by- product from the steel making process and locally, when generated, it is left on stockpiles at the production site. As such, an examination of the physical, chemical and mineralogical composition and effect of the electric arc furnace slag on the compressive and tensile strengths of concrete were conducted.

Preliminary tests were done to deduce the effect of electric arc furnace slag on the tensile and compressive strengths of concrete using water to cement ratios of 0.4, 0.45 and 0.5 respectively and by using the electric arc furnace slag ratios of 0%, 15%, 30%, 45%, 60%, 75% and 100%. The results from these tests indicate that using electric arc furnace slag in concrete produced comparable tensile and compressive strengths as natural aggregates.

The effectiveness of using electric arc furnace slag in concrete to shield x ray radiation was determined by varying the electric arc furnace slag content in the ratios of 0%, 15%, 30%, 45%, 60%, 75% and 100% with an energy of 30kVp from a telxometer. The radiation shielding parameters which were deduced are the linear attenuation coefficient, the mass attenuation coefficient and the half value thickness. The findings show that at this small energy value, as the percentage of electric arc furnace slag increased, the radiation attenuation improved.

Keywords: electric arc furnace slag, aggregates, radiation shield, linear attenuation coefficient, the mass attenuation coefficient, half value thickness

You are all invited to attend this Seminar, the information is as follows:

Date:	Tuesday, December 2nd 2014
Time:	10:00am
Venue:	Lecture Room 1, 1st Floor, Block 13, Faculty of Engineering