Study on the Strength and Durability of Alkali Activated GGBFS Based Geopolymers Synthesized from Pond Ash, Red Mud and Municipal Solid Waste Reject

Thesis submitted in partial fulfilment for the Award of Degree

DOCTOR OF PHILOSOPHY

By

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I, Rashmi Shrivas, certify that the work embodied in this thesis is own bonafide work and was carried out by me under the supervision of **Dr. Bala Ramudu Paramkusam** and co-supervision of **Prof. Shyam Bihari Dwivedi** from **21/07/2015 to 31/10/2023** at the **Department of Civil Engineering, Indian Institute of Technology (Banaras Hindu University), Varanasi.** The matter embodied in this thesis has not been submitted for the award of any other degree/diploma. I declare that I have faithfully acknowledged and given credits to the research workers wherever their works have been cited in my work in this thesis. I further declare that I have not willfully copied any other's works, paragraphs, text, data, results, etc., reported in journals, books, magazines, reports, dissertations, theses, etc., or available at websites and have not included them in this thesis and have not cited as my own work.

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M	Molarity of NaOH
GGBFS	Ground Granulated Blast Furnace Slag
MDD	Maximum Dry Density
OMC	Optimum Moisture Content
UCS	Unconfined Compressive Strength
m	% of Pond Ash in Pond Ash-GGBFS Geopolymer
n	% of GGBFS in Pond Ash-GGBFS Geopolymer
a	% of MSW Reject in MSW-GGBFS Geopolymer
b	% of GGBFS in MSW-GGBFS Geopolymer
x	% of Red Mud in Red Mud-GGBFS Geopolymer
y	% of GGBFS in Red Mud-GGBFS Geopolymer
u	% of Pond ash in Pond Ash-Red Mud Geopolymer
v	% of Red Mud in Pond Ash-Red Mud Geopolymer
k	Coefficient of Permeability
XRF	X-Ray Fluorescence
XRD	X-Ray Powder Diffraction
FTIR	Fourier Transform Infrared Spectroscopy
SEM	Scanning Electron Microscopy

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Dedicated to my daughter

Bhargavi Shrivas

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