

CANDIDATE'S DECLARATION

I, **Kamlesh Kumar Pandey**, certify that the work embodied in this Ph.D. thesis is my own bonafide work carried out by me under the supervision of **Prof. Veerendra Kumar** for a period of **4 years 10 months** from **August, 2010 to June, 2015** in the Department of Civil Engineering, Indian Institute of Technology (Banaras Hindu University), Varanasi. The matter embodied in this Ph.D. thesis has not been submitted for the award of any other degree/diploma.

I declare that I have faithfully acknowledged, given credit to and referred to the research workers wherever their works have been cited in the text and the body of the thesis. I further certify that I have not willfully lifted up some other's works, para, text, data, result, etc. reported in the journals, books, magazines, reports, dissertations, thesis, etc., or available at web-sites and included them in this Ph.D. thesis and cited as my own work.

Date: 30.06.2015

Place: IIT (BHU), Varanasi

(Signature of the Candidate)

Kamlesh Kumar Pandey

CERTIFICATE FROM THE SUPERVISOR

This is to certify that the above statement made by the candidate is correct to the best of my knowledge.

Signature of HOD with seal

**Supervisor's Signature
(Prof. Veerendra Kumar)**