CHRIST
(DEEMED TO BE UNIVERSITY)
BANGALORE · INDIA

Notice for the PhD Viva Voce Examination

Mr Raghunandan Kumar (Reg. No. 1247003), PhD scholar at CHRIST (Deemed to be University), will defend his PhD thesis at the public viva voce examination on Friday, 26 June 2020 at 3.00 pm. The defense will be conducted online on the Webex Meeting platform.

Title of the Thesis	:	**Passive Control of Four Storied Reinforced Concrete Structure Subjected to Blast Loads**
Discipline	:	**Engineering**
External Examiner (Outside Karnataka)	:	**Dr N Gopalakrishnan** Director CSIR - Central Building Research Institute Roorkee Uttarkhanda - 247667
External Examiner (Within Karnataka)	:	**Dr Udaya Shankar B C** Professor Department of Civil Engineering R V College Engineering R V Vidyanikethan Post Mysore Road Bengaluru - 560059
Supervisor	:	**Dr G R Reddy** Head, Structural and Seismic Engineering Section Senior Professor, HomiBhabha National Institute & Bhabha Atomic Research Centre Trombay, Mumbai-4000 85.

Since it is an open viva, faculty members and research scholars of all the branches of research are cordially invited to attend.

Registrar

Place: Bengaluru
Date: 18 June 2020

ABSTRACT

In the recent past in major cities all over the world, public structures are vulnerable to blast loads caused by explosions either accidentally or intentionally. The intentional causes are not on hardened military targets but on important civilian structures, like commercial, financial and civic centers. The study of reinforced concrete Ground + 3 Storied structure subjected to blast loads have gained importance, as conventionally the reinforced concrete structures are not designed for blast loads as many of the loading codes do not mandate for the same and also due to the fact that quantifying the magnitude of the blast load is difficult to estimate. However, the structures are susceptible to damage from the explosion. To protect the life of people and to minimize the damage to the structure, it has become imperative to consider the effect of blast loads too, in addition to the conventional loads, considered as per the prevailing codes, during the analysis and design of all public buildings. The charge weights of the explosive used on the structure are 8kg, 16 kg and 24kg. The equivalent blast pressure subjected on the structure is determined, to study its corresponding effects for stand-off distances of 3000 mm and 6000mm using surface blast load.

The behavior of the structure is studied by varying the parameters and verified which of these parameters can be critical to the performance of the structure. The response of the ground floor + 3 upper storied reinforced concrete skeletal structure is studied for understanding the variation of the displacements, strains and stresses for the parameters considered. Using PTC CREO 3.0 the 3D modeling of structure and structural elements were generated. HYPERMESH was used for the discretization (meshing) of structure and its elements. Static analysis and blast load analysis was carried out using ANSYS. A reinforced concrete structure can be designed and constructed to passively control the effects of the blast loads on the structure by including steel fibers to the concrete to improve its performance by reducing the deflections and the strain rates based on the standoff distance and the charge weight used in the explosion.

Keywords: RC Structure, Standoff Distance, TNT, High Strain Rates and Transient Analysis, Steel Fibers, Blast Load.