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# JAGADAMBHA COLLEGE OF ENGINEERING & TECHNOLOGY,

## YAVATMAL - 445001

## DEPARTMENT OF CIVIL ENGINEERING

## CERTIFICATE

This is to certify that the thesis entitled **"ANALYSIS AND DESIGN OF MULTISTOREY (G+6) RESIDENTIAL BUILDING USING STAAD PRO"**, which is being submitted to Sant Gadge Baba Amravati University, Amravati for the award of degree of **Master of Engineering** in **Civil Engineering (Structural Engineering)** is the result of bonafied research work completed by **Mr. Shrishkumar Diliprao Takwale** under my supervision and guidance. The matter embodies in this thesis is original and has not been submitted for the award of any other degree or diploma.

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## Abstract

In order to compete in the ever growing competent market it is very important for a structural engineer to save time. as a sequel to this an attempt is made to analyze and design a Multistoried building by using a software package staad pro.

For analyzing a multi storied.building one has to consider all the possible loadings and see that the structure is safe against all possible loading conditions.

There are several methods for analysis of different frames like kani's method, cantilever method, portal method, Matrix method.

The present project deals with the analysis of a multi storeyed residential building of G+6 consisting of 5 apartments in each floor. The dead load &live loads are applied and the design for beams, columns, footing is obtained

STAAD Pro with its new features surpassed its predecessors, and compotators with its data sharing capabilities with other major software like AutoCAD, and MS Excel.

We conclude that staad pro is a very powerful tool which can save much time and is very accurate in Designs.

Thus it is concluded that staad pro package is suitable for the design of a multistoried building.



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This is to certify that the thesis entitled **"PREDICTION OF BLAST LOADING AND ITS IMPACT ON BUILDINGS"**, which is being submitted to Sant Gadge Baba Amravati University, Amravati for the award of degree of **Master of Engineering in Civil Engineering (Structural Engineering)** is the result of bonafied research work completed by **MR. CHETAN S. AGRAWAL** under my supervision and guidance. The matter embodies in this thesis is original and has not been submitted for the award of any other degree or diploma.

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# PREDICTION OF BLAST LOADING AND ITS IMPACT ON BUILDINGS


## Abstract

Dynamic responses of structure are been a major concern in design analysis. Passive control techniques are introduced in order to enhance the performance of structure. The first phase of the work is to evaluate the performance of moment resisting RC frame equipped with metallic damper i.e., X-plate damper. Second phase of this work is to evaluate the efficiency of passive systems for a 2D frame and to enhance performance of structure which are subjected to seismic ground excitations and blast induced ground vibrations. Two moment resisting RC frames were analysed and performance of (Lead/rubber Bearing) isolator and the damping device (Fluid Viscous Damper) in alleviating responses of structure is observed. Non-linear dynamic analysis is carried out in SAP2000 for both regular and irregular moment-resisting frames and structural responses are been compared for with and without passive control techniques. Isolators are designed based on isolation period and FVD's used are of M/s Taylor devices. Alleviation of structural responses by passive control techniques are evaluated and comparative study is performed. Introducing of passive control system is influential in mitigating the structural retaliation.



**Keywords** SAP2000, Ground accelerations, Peak particle velocity, Passive control systems, Fluid viscous damper, and Base isolation, X-Plate Damper, Blast Loads and Seismic Loads.