VISVESVARAYA TECHNOLOGICAL UNIVERSITY

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"COMPREHENSIVE DESIGN OF G+1 RESIDENTIAL BUILDING"

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In

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Under the Guidance of

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CERTIFICATE

Certified that the project entitled **"COMPREHENSIVE DESIGN OF G+1 RESIDENTIAL BUILDING"** has been successfully completed by the bonafide students of Department of Civil Engineering, Alva's Institute of Engineering and Technology in partial fulfilment for the award of BACHELOR OF ENGINEERING in **DEPARTMENT OF CIVIL ENGINEERING** of the **VISVESVARAYA TECHNOLOGICAL UNIVERSITY, BELAGAVI** during the year 2020-2021. It is certified that all corrections/suggestions indicated for Internal Assessment have been incorporated in the report deposited in the departmental library. The project report has been approved as it satisfies the academic requirements in respect of project work prescribed for the Bachelor of Engineering Degree.

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ABSTRACT

The design process of structural planning and design requires not only imagination and conceptual thinking but also sound knowledge of science of structural engineering besides the knowledge of practical aspects, such as recent design codes, bye laws, backed up by ample experience, intuition and judgment. A bye law is a local corporate law outlined by a secondary authority. The building bye laws for residential buildings are set forth in such a way that, it should meet all the standards and specifications designed for necessary protections. The purpose of standards is to ensure and enhance the safety, keeping careful balance between economy and safety. Our nature is abundant with powerhouses of energy sources like the sun, wind, moon, water, earth and fire. The effect of sunrays, flow of winds, pull of earth's magnetic fields and other such cosmic energies influence our lives in unfathomable ways. We can make the most of nature's gifts and live a life replete with wealth, health, and success by learning to balance its five elements (earth, water, fire, air, and space) around us. Vasthu Shastra, an ancient science propounds such theories based on directions, architecture, and astronomy. In the present study detailed plan of G+1 residential building includes drawing of a building layout which includes dimensioning, electrical fittings, plumbing layout etc. in AutoCAD software. To get an architectural view of a building 3D modelling is done using Google sketch up software.

In order to design them, it is important to first obtain the plan of the particular building that is, positioning of the particular rooms (Drawing room, bed room, kitchen toilet etc.) such that they serve their respective purpose and also suiting to the requirement and comfort of the inhabitants. Thereby depending on the suitability, plan layout of beams and the position of columns are fixed. Footings are designed based on the safe bearing capacity of soil. For designing of columns and beams, it is necessary to know the moments they are subjected to. Designing of slabs depends upon whether it is a one - way or a two way slab, the end conditions and the loading. From the slabs, the loads are transferred to the beam. Thereafter, the loads (mainly shear) from the beams are taken by the columns. Finally, the sections must be checked for all the four components with regard to strength and serviceability.

Etabs ultimate 18.1.1 version software is used to analyze and design the building using IS456-2000 "limit state design provisions". Design sections will be optimized using auto selection option in etabs for the bending moments, shear force and axial forces generated in the structural elements due to external loads. Foundations are designed using CSI safe software. Estimation is made by using excel with the reference of schedule of rates. It is done prior to the construction of the building for approximate calculation of the quantity of materials required.