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Feasibility Study of Hexagonal Building Projects

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Abstract - *The focus of the study is to plan, analyse, and design a three storey hexagonal shopping mall with an inbuilt basement parking for an area of 4500 sq.m. In hexagonal shape and exhibit its functional and economical feasibility in comparison to conventional models .The Hexagonal building aims to plan a space in an effective manner such that the functional area is best utilized leading to a cost efficient building. In addition it provides a safe and secure functional space which is both sustainable and aesthetically appealing. Rather than a normal building, shaped square or rectangular, the project approaches to analyse and design the various structural elements in a different prespective of varying the column positionin, member designs. To extend the study on utilization of surcharge loads in designing basement parking. The planning of G+3 with basement parking was carried out as per the norms and specifications formulated by National Building Code(NBC). The Analysis of various structural elements were completed using STAAD.pro software.*

Key Words: **Hexagonal building, sustainable, aesthetic, space efficiency, functional efficiency, etc**

1. INTRODUCTION

Building is one of the basic need of all sectors. The conventional shape of the building prefered mainly by the people are in box shape. Though the technology is developed and the different shapes of building has been implemented the first preference in box shaped building. This study shows the feasibility of constructing the building in hexagonal shape efficiently and economically. We aims to made a study on the shopping mall which should be constructed in the main city.

1.1 Basement parking

Efficient parking as a part of transportation system is one of the crucial issues now a days. As the number of automobiles increases exponentially around the world, the need to house them in close proximity to destinations creates a challenging design problem. This is a very complex challenge as automotive, engineering and traffic issues relative to site locations must be integrated to create the appropriate solution. Therefore designing the parking facility requires an integrated design approach of basement parking which can be used almost exactly the same manner as an additional above-ground floor of a house or other building. However, the use of basements depends largely on factors specific to a particular geographical area such as climate, soil, seismic activity, and real estate economics.

2. OBJECTIVES

To design a safe and secure functional space which is both sustainable and aesthetic appealing.

The Hexagonal building aims to plan a space in an effective manner such that the functional area is best utilized leading to a cost efficient building.

Rather than a normal building, shaped square or rectangular, the project approaches to analyses and design the various structural elements in a different prespective of varying the column positioning, member designs.

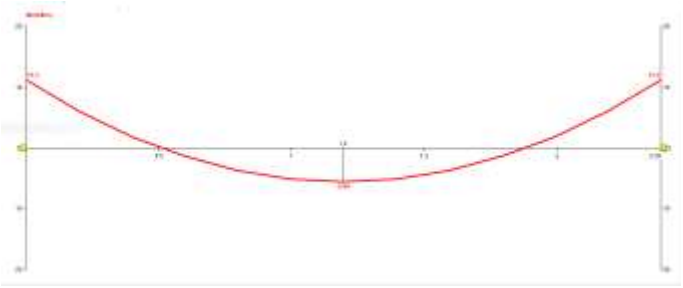
To extend the study on utilization of surcharge loads in designing basement parking.

3. PLANNING

Good environment is highly essential for the well-being of the people and can be achieved improving their living condition through proper planning of the layout. The functional planning of man-made environment is the pre-requisite of any type of building construction. With the development of cities and increased population there is problem a of irregular shaped sites and lands. People are forced to make their accomodation in such lands and also in buildings like shopping mall which should be constructed in the center of city will face such problem increasingly. In this cases planning a building in hexagonal shape will help in utilizing the irregular sites in efficient manner. As it is a six cornered building the space can be utilized in efficient manner. The structure outcome of hexagonal planning increases the wind resistance.

4. Analysis

STAAD.Pro V8i At-A-Glance Interactively view stresses on a profile at any cross section on a selected member and load case. The STAAD.Pro V8i interface is configured to suit the model to ease access to the required data. For the analysis the loads are provided according to the codal provision. From the analysis result of hexagonal structure it is clear that the moment value of the beam is comparatively less than the regular structure. This is because the load is transferred equally among the element.



5. DESIGN

The design of Hexagonal building is based on IS 456:2000 and National buildings code (NBC) the loads are taken from IS 875.The design of hexagonal building is similar to the normal square building. The only challenging factor is that the design of cross beams. As the moment value is less the A_{st} is also less. Hence the hexagonal structure is economical than square building. The T beam and L beam is highly preferable which reduced the depth of the beam in case of large column spacing to provide isolated footing.

6. RESULT AND DISCUSSION

Hexagonal building has a better aesthetic appearance than a normal building. The different kind of roof shapes can be implemented with hexagonal geometry. Large buildings with hexagonal shape will be better and economical than buildings in box shapes. Giving a hexagonal shape to the building makes it heat efficient and good wind resistance.

7. CONCLUSION

Modern civil structures play a major role in the country's economy and safety of people. Construction of buildings with more sustainable design will be very helpful in increasing the standards of civil engineering. Overall Hexagonal shopping mall – A cost effective, energy efficient building that will utilize the space and resource in a best effective manner.

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