Erudite Journal of Engineering Technology and Management Sciences
Vol. 4, No. 4, December 2024, pp. 37-39
Journal homepage: http://www.ejetms.com

Design and Layout of Residential Buildings using 3D's Max Software

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https://doi.org/10.5281/zenodo.14384209

Received: 16 Octber 2024
Accepted: 07 December 2024

Keywords:
2Ddrawings,3D visualization, layout

ABSTRACT

This project describes design and layout of residential building utilizing 3D's max software, a powerful tool for 3D modelling and visualization. The aim is to create a comprehensive architectural design that harmonizes aesthetics, functionality, and sustainability. The proposed residential building is to be constructed at siddipet, TS. The area of the proposed building 155 sq yards (G+2) will be constructed layout. The process begins with conceptual sketches, which are then transformed into detailed 3D models, allowing for real-time visualization of spatial relationships and design elements. Key features include the integration of natural light, efficient use of space, and eco-friendly materials. This study also emphasizes the importance of user experience and comfort in residential design, demonstrating how 3ds Max can facilitate iterative design processes through rendering and simulation. The resulting model serves as a prototype for modern residential architecture, showcasing innovative design solutions and enhancing the overall living environment.

1. INTRODUCTION

Our project is "Design and layout of Residential Building by using Autodesk CAD and 3D's max." The main objective of our project is to gain sufficient Knowledge in planning, Design, and layout of residential building. All the designs are layout by using National Building Code of India (NBC). SP 7 : Group 1 (2005): NATIONAL BUILDING CODE OF INDIA 2005 GROUP 1 [CED 46: National Building Code]Materials were used as specified by the National Building Code. For all the design, Concrete M20 grade and Fe 500 steel bars. Brick walls are in C.M 1:5 mix with wall external and internal wall thickness of 230 mm and 150 mm respectively. The total area of our building is 139 sq.m. The commercial shops had a glass wall for shops. Commercial space includes three shops, Two Store rooms, One Staffroom and two separate toilets for male as well as female and a staircase of 3 m wide. First floor is a residential floor (2BHK) with all the facilities.

2. LITERATURE

Karan et al. (2019) investigated 3ds Max's advanced rendering capabilities, particularly in simulating lighting and materials. Their findings indicate that realistic lighting simulations are crucial for evaluating how different materials and colours affect the ambiance of residential spaces. The software's ability to create accurate reflections and shadows aids architects in making informed design decisions.

Chen et al. (2020) conducted an evaluation of the software's user interface, finding that an intuitive design significantly enhances productivity and creativity in residential building projects. Simplified workflows enable architects to focus on design rather than technical challenges.

Smith and Zhang (2021). Their research demonstrates that VR applications enable clients to engage interactively with 3D models, offering a more tangible understanding of spatial dynamics and design elements, thereby improving client satisfaction.

Patel et al. (2022) examined the role of 3ds Max in sustainability assessments for residential buildings. By allowing architects to visualize energy consumption and daylighting scenarios, the software aids in creating environmentally responsible designs. This capability aligns with the increasing emphasis on sustainable practices in residential architecture.

Robinson (2023) presented a detailed case study showcasing how a residential building project utilized 3ds Max for visualization and design refinement. The study highlighted how the software helped the design team address client feedback effectively, resulting in a successful project outcome.

Lee and Kim (2020) conducted a comparative analysis of various 3D modelling software, including 3ds Max, focusing on their applications in residential architecture. Their findings

suggest that while 3ds Max excels in rendering quality and flexibility, other software options may offer advantages in specific workflow contexts, emphasizing the importance of choosing the right tool for particular project needs.

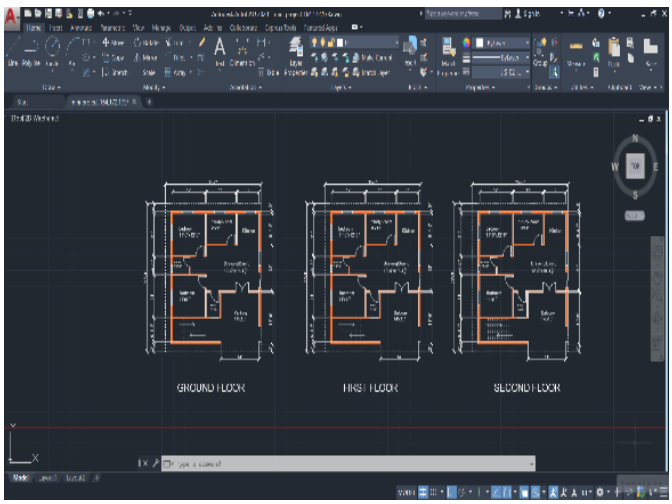
3. METHODOLOGY

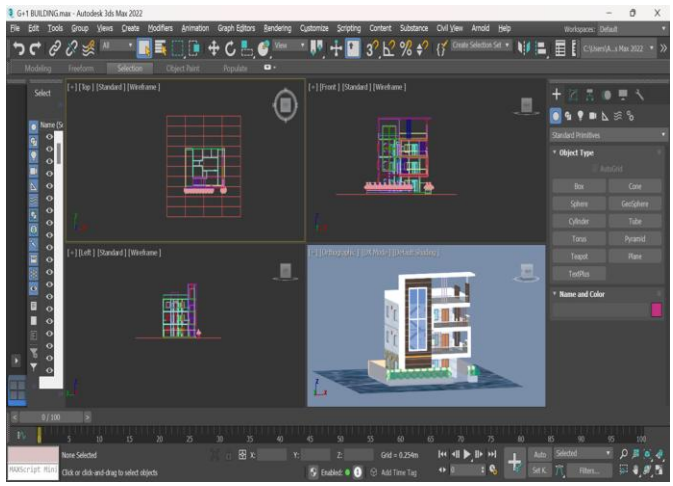
Creating a project: In this first exercise, youcreate and name a project in which you willcreate the building model shown.
New template: You can create a custom project template using the several methods.
Click new project.
Opening new template: Click on "new" below projects option.
Elevations: Use elevation views to look at aproject from different locations, either exterior or interior. Open a plan view
Levels: When you create levels, you canchoose to have the corresponding viewscreated at the same time.

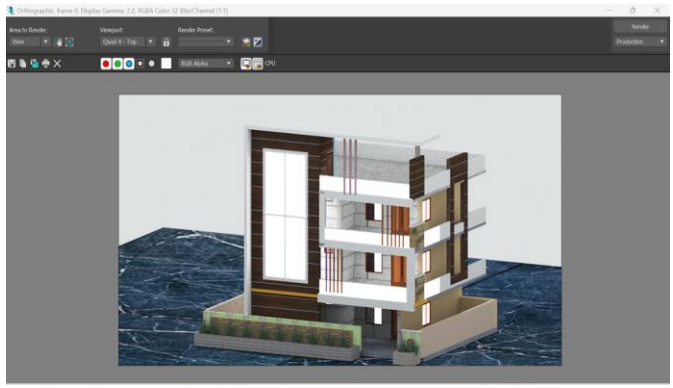
Modify project levels: Open 3D's max , and on

4. EXPERIMENTAL RESULTS

Figures shows the result of the layout of G+2 residential building work outed in AutoCAD Software.
First image show the ground floor plan of the G+2 residential building, Second image shows the First Floor of the residential building plan.
Next, I began the process of creating a 3D model of the residential building using 3Ds max. This involved defining the building footprint, specifying structural elements such as Roads, Main building, Ground, Cricket ground, Parking, waiting areas and incorporating the architectural view and entries. 3Ds max parametric modelling capabilities enabled me to make quick adjustments and iterations as I fine tuned the design to meet the project requirements.




3D model of residential building in 3D'S MAX


Result of residential building.

5. CONCLUSION

The final conclusion of a residential building layout and plan created using 3ds Max software can be summarized as follows:
Realistic Visualization:
3ds Max provides a highly detailed and realistic visualization of the residential layout. With its advanced rendering capabilities (such as V-Ray or Arnold), designers can create photorealistic images of the interior and exterior spaces, helping to convey the design intent clearly to clients and stakeholders. This is crucial for visualizing how the final product will look, which aids in decision-making and further refinements.
Comprehensive Design Representation:
The software allows architects and designers to create comprehensive 3D models of the building, which can include everything from the floor plan, walls, and doors to furniture, lighting, and landscaping. The ability to manipulate these elements in 3D gives a better understanding of how different aspects of the design interact with one another.
Efficient Space Planning:
3ds Max helps with efficient space planning by allowing for the easy adjustment of room layouts, wall placements, and the overall flow of the building. It provides the ability to experiment with various configurations, ensuring that the design makes the best use of available space while maintaining aesthetics and functionality.
Structural and Aesthetic Analysis:
Through 3ds Max, one can analyze both the structural and aesthetic aspects of the residential design. It allows for the

visualization of different materials, textures, and finishes, helping to finalize the look of the building. Designers can experiment with color palettes, lighting effects, and architectural features to enhance the visual

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