iJRASET
International Journal For Research in Applied Science and Engineering Technology



INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Volume: 13 **Issue:** VI **Month of publication:** June 2025

DOI: https://doi.org/10.22214/ijraset.2025.72169

www.ijraset.com

Call: 08813907089 | E-mail ID: ijraset@gmail.com

International Journal for Research in Applied Science & Engineering Technology (IJRASET)
ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 13 Issue VI June 2025- Available at www.ijraset.com

Modelling and Layout of Coffee Lounge by Using Revit

Siddartha. C[1], Alekhya.A[2], Ashwitha.B[3], Bharath Chandra.B[4]
[1]*Assistant Professor, Department of Civil Engineering, Guru Nanak Institutions Technical campus, Hyderabad, India*
[2, 3, 4]*U.G. Student, Department of Civil Engineering, Guru Nanak Institutions Technical Campus, Hyderabad, India*

Abstract: ***In this project we are detailed explanation how do we design and modelling of Design of COFEE SHOP house Building by Autodesk Revit architecture, which renders complete vision of construction. With BIM new technology it is easy to model the building and we can connect to Revit architecture, Revit MEP, Revit structure, Built for Building Information Modelling (BIM). In general, for building design and model can be employed by the architecture of Autodesk Revit. In addition, it can give you an exact vision via design, construction and documentation. Use the information -rich models that Autodesk Revit Architecture is useful for make more informed Building designs decisions to support sustainable design, construction planning and fabrication installation. Revit Architecture will clear picture of building excellent visualization by using v-ray software, that is make for Rendering purpose. For residential buildings it will very helpful for visualize building before construction is made in the field. When the Revit Architecture window is displayed, there we can see the different types of templates such as constructional templates, structure template, Architecture template. To accomplish this project i.e. for design and modelling we use to select Architecture template.***

Keywords: Families, components, Mass in site, levels, Grid lines.

I. INTRODUCTION

Autodesk Revit is a software which help the create the modelling and layout of the tree dimensional building information modelling software for architects, landscape architects. structural engineering layout engineers, designers and contractors developed by Autodesk. it allows users to design a building and structure and shape of the 3d model by defaults furniture setup and its components in 3d, annotate the model with 2d drafting elements, and access building information from the building model's database. statement of the problem. Revit can be used as a very powerful collaboration tool between different disciplines in the building design sphere. the different disciplines that use Revit approach the program from unique perspectives. each of these perspectives is focused on completing that discipline's task. companies that adopt the software first examine the existing work flow process to determine if such an elaborate collaboration tool is required.

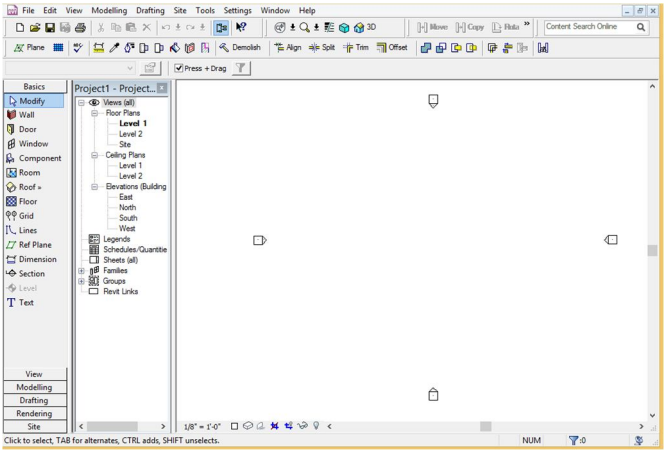


Fig. 1 Drawing Area

The drawing area in Autodesk Revit is the central workspace where you create, view, and modify your building model or documentation. It's where the actual design work happens—whether you're drawing floor plans, editing sections, or navigating 3d views. This is where views such as floor plans, elevations, sections, schedules, and 3D models are displayed.

©IJRASET: All Rights are Reserved

II. LITERATURE SURVEY

John Smith: John Smith's project focuses on designing a sustainable coffee lounge using Revit. The project aims to create an eco-friendly and inviting space that showcases the potential of Building Information Modelling (BIM) in architectural design. It demonstrates Revit's capabilities Showcasing Revit's features and benefits in designing sustainable spaces. Promote eco-friendly design highlighting the importance of sustainable design in architectural projects. Create a functional coffee lounge designing a space that is both functional and inviting. To demonstrate the practical application of Autodesk Revit in designing a sustainable coffee lounge, with emphasis on integrating BIM workflows from concept to documentation. The research also showcases the use of Revit's built-in tools and third-party plugins (e.g., Insight, Green Building Studio) for simulating and optimizing building performance in alignment with LEED or WELL certification standards.

Emily Chen: "Designing a Sustainable Coffee Lounge with Revit," showcases her expertise in using Revit to create eco-friendly and functional spaces. Emily's work likely focuses on integrating sustainable design principles, materials, and systems into her projects. Demonstrated Integration of Sustainable Design Principles in BIM Workflow Emily successfully integrated core sustainable design strategies such as daylight optimization, energy-efficient HVAC layout, and material lifecycle analysis directly into the Revit modelling process, proving the platform's capability to support environmentally responsible design decisions from concept to documentation. The research highlighted enhanced stakeholder collaboration using cloud-based Revit workflows (via BIM 360), allowing real-time feedback and issue tracking related to sustainable systems, reducing design conflicts and improving overall project efficiency.

Michael Davis: Michael Davis seems to be associated with furniture design and Revit resources. There's a Davis Furniture that provides digital assets and tools for designers, including 2D drawings and 3D models of furniture. Creating 2D and 3D models of furniture for commercial spaces, Providing Revit families and templates for furniture design, Utilizing Revit's parametric modelling capabilities to create customizable furniture models. Some relevant resources that are associated with Michael Davis's work include Collections of 2D and 3D furniture families for commercial projects, Resources and classes on creating tools and software for designing and visualizing furniture in Revit

Mehmet F Hergunsel:(2011) The project studied six BIM utilization activities: visualization, 3D coordination, cost estimation, prefabrication, construction planning and monitoring, and record model. The visualization is generally the simplest use of a Building Information Model such as renderings. As soon as the Building Information Model are produced, the quantity take-offs can be generated to provide cost estimations on a construction project. Once the drawings are designed to build, the prefabrication of the components of the construction facility can be built to design. BIM based 4D scheduling helps understanding of the construction components and schedule progress that in turn results better construction planning. Finally, the record model can be generated as the final progress of the construction as the as-builts are completely updated in the Building Information Model.

Sayeed Reza Mohandel:(2005) Due to numerous steps of construction industry and its complicated and extensive structure, errors and reworks often might happen in this section. As such, BIM (Building Information Modelling) is regarded as a beneficial tool in minimizing the waste and improving the efficiency of building construction. This paper reviews and summarizes a substantial amount of requisite information relating to BIM from the literature reviews between 2005 and 2012. It has discussed the concept, explained the history, planning and implementation process and the benefits of using BIM in construction industry. Furthermore, the application of BIM in construction process of two specific projects has been explained. Additionally, the importance of BIM for architects, engineers and construction industry has been taken into consideration. Dr. Peter Smith :(2007) The need for Project Cost Managers to embrace and evolve with BIM is inevitable but the rate of adoption and implementation remains to be seen. Government mandates to use BIM on public sector projects, such has occurred in the United Kingdom and the United States, would certainly accelerate BIM implementation by the profession should not be waiting until their 10 clients require itThe longer firms delay their entry into the BIM and automated quantities world the further other firms with these capabilities will progress and add to their competitive advantage. The ability to simulate a range of design options with Realtime cost advice and continue that real-time cost advice throughout the detailed design, construction and operational stages will arguably place the project cost manager at the top of the 'value chain' for project clients.

J Vinoth Kumar :(2009) In India 49% of the respondent use Revit as measure Revit tool. The BIM is new & promising approaching India which is gradually gaining acceptance by the owners, Architects, Engineers & Builders. BIM is in field to better communicate & integrate construction information. The study concentrated on the deployment of the model to support planning scheduling & tracking of the job site operation in India. The survey has supported authors expectation that BIM has remarkable acceptance potential among the AEC firm in India.

©IJRASET: All Rights are Reserved

ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 13 Issue VI June 2025- Available at www.ijraset.com

III.METHODLOGY AND EXPERIMENTAL RESULTS

This project involves the architectural modelling and spatial layout of a coffee lounge using Autodesk Revit. The methodology is structured into the following key phases. The project begins with an analysis of the proposed site, including location context, user needs, and functional requirements of a coffee lounge. A basic concept plan is developed based on research into design trends, ergonomics, and circulation patterns. Functional zones such as seating areas, service counters, kitchen, storage, and washrooms are identified. These zones are organized based on user flow, accessibility, and aesthetics. Hand-drawn sketches and digital diagrams are used to finalize the spatial relationships. The finalized layout is modelled using Revit. Walls, floors, roofs, furniture, lighting, and mechanical components are created using Revit's architectural tools. Attention is given to dimensions, material specifications, and realistic rendering of interior finishes. Construction drawings such as floor plans, elevations, sections, and schedules are generated directly within Revit. Annotation tools are used to label key components, dimensions, and notes for clarity. High-quality 3D visualizations and walkthroughs are produced to present the design. Materials, lighting, and camera angles are adjusted for realistic effects, suitable for client presentations or academic evaluation. The model undergoes review for accuracy, functionality, and design aesthetics. Feedback is incorporated to refine the final layout and ensure compliance with building standards and user expectations.

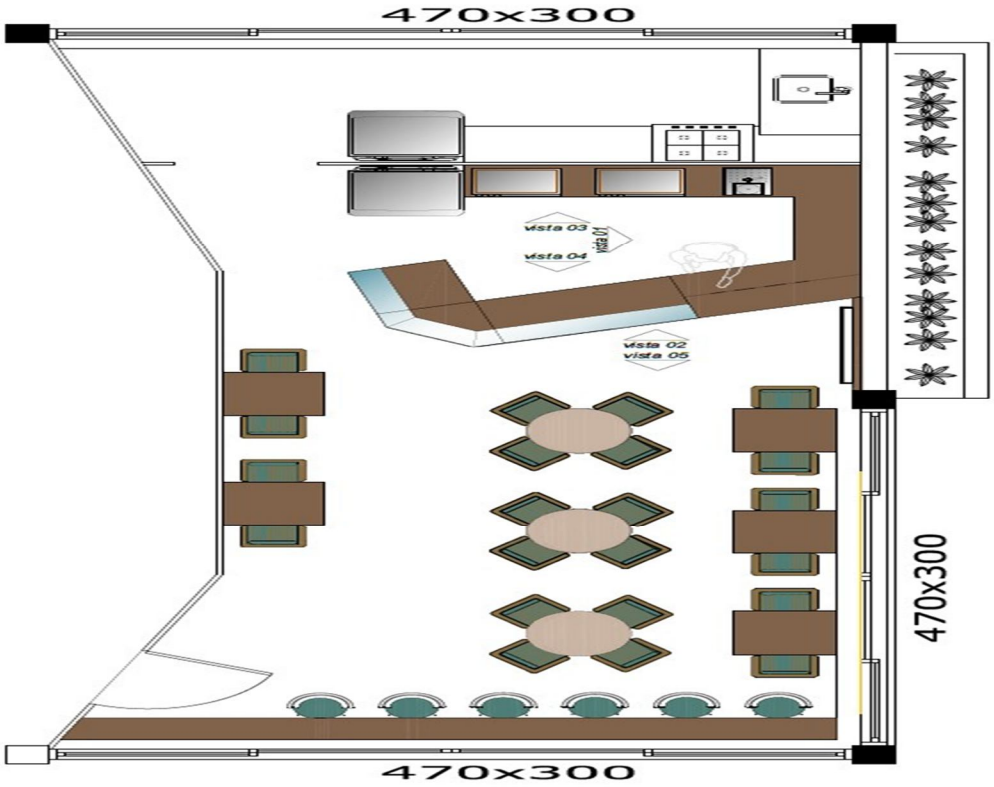


Fig-2 Seating arrangement in coffee lounge

The coffee lounge layout, developed using Autodesk Revit, presents a well-structured and functional seating arrangement designed for optimal user comfort and efficient spatial utilization. The floor plan measures 470 cm x 300 cm, forming a square-shaped lounge with clear zoning between the service area and customer seating.

The seating arrangement is divided as Central Area, Side Tables, Wall-Aligned Counter Seating, Service Counter Zone, Spatial Circulation. The process of modelling and designing the layout of a coffee lounge in Autodesk Revit follows a structured, parametric, and data-rich approach that integrates both architectural design and interior planning within a Building Information Modelling (BIM) framework. The methodology begins with an initial stage of project planning and conceptualization, which involves analysing the intended site or space, identifying user requirements, and defining the overall aesthetic and functional goals of the lounge. This stage includes considerations such as customer flow, lighting, comfort, and zoning for different functional areas like seating zones, service counters, storage areas, and restrooms.

©IJRASET: All Rights are Reserved

ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 13 Issue VI June 2025- Available at www.ijraset.com

Once the design brief is finalized, the Revit project environment is established by selecting an appropriate project template, setting the units of measurement, and configuring the levels and grids. These foundational elements provide the structural framework upon which all subsequent modelling is based. Levels are defined for the floor, ceiling, and roof planes, while gridlines help in maintaining geometric alignment and support structural planning.

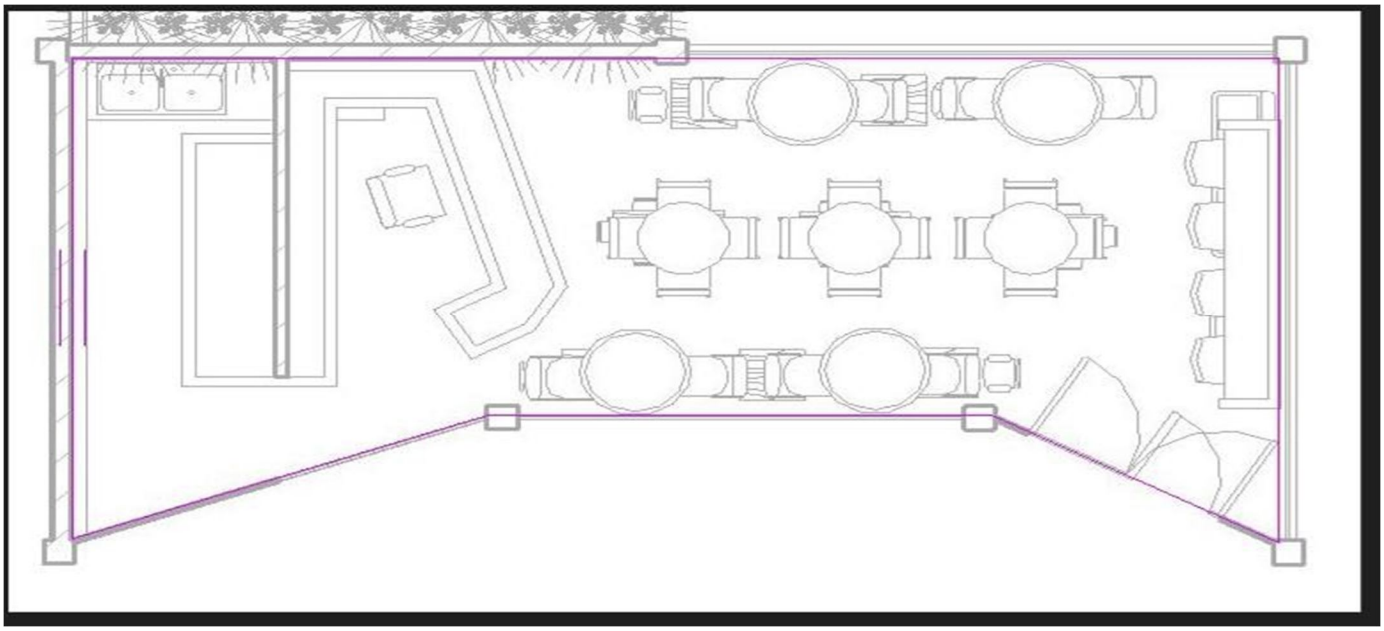


Fig-3 Top view of the seating arrangement in coffee lounge

The top view shown in the layout represents the detailed spatial planning of a coffee lounge, designed using Autodesk Revit. This plan illustrates a thoughtful combination of seating, service, and circulation areas aimed at optimizing both functionality and customer experience.

The architectural modelling phase starts with the creation of structural and partition walls using Revit's wall tool, which allows for material assignments, thickness customization, and parameter control. Floors are then created and assigned appropriate finishes such as ceramic tiles, wood, or polished concrete, based on the design theme. Similarly, ceilings are modelled using Revit's ceiling systems, incorporating lighting layouts and ventilation elements as necessary.

One of the most critical components in the coffee lounge design is furniture arrangement. Revit provides a wide range of furniture families that can either be used directly or customized according to project requirements. These families include lounge chairs, café tables, bar stools, service counters, and shelving units. The placement of these elements is guided by zoning principles and ergonomic standards, ensuring that circulation space is adequate and customer comfort is prioritized.

Doors and windows are inserted at logical and accessible locations to maximize natural light, ventilation, and ease of access. Their placement is also informed by Revit's view range and visibility settings, which assist in achieving accurate spatial representation. Lighting, both artificial and natural, is modelled using hosted lighting families and customized luminaires. Parameters such as illuminance levels, fixture types, and mounting heights are fine-tuned to create an inviting ambiance suitable for a coffee lounge.

Following the placement of architectural and interior elements, the application of materials and finishes is carried out using Revit's material browser. Surface materials such as wood, glass, fabric, metal, and paint are assigned to different model elements to enhance visual appeal and realism. This step not only assists in visualization but also plays a role in construction detailing and cost estimation.

Visualization is an essential part of the Revit workflow. Rendered images are produced to present the interior atmosphere of the lounge, showcasing material finishes, lighting effects, and spatial arrangements. Revit's native rendering engine can be used for basic visuals, while more advanced rendering tools like Escape or Lumion may be integrated for photorealistic results and walkthrough animations.

©IJRASET: All Rights are Reserved | SJ Impact Factor 7.538 | ISRA Journal Impact Factor 7.894 |

ISSN: 2321-9653; IC Value: 45.98; SJ Impact Factor: 7.538
Volume 13 Issue VI June 2025- Available at www.ijraset.com

Finally, all design information is compiled into professional construction documentation. This includes floor plans, elevations, sections, 3D views, and legends. The documentation is organized onto drawing sheets with standardized title blocks and exported into required formats such as PDF, DWG, or IFC for use in construction, procurement, and client presentations.

Through this methodology, Revit facilitates an integrated and efficient approach to coffee lounge design, offering a seamless workflow from conceptualization to documentation while ensuring accuracy, coordination, and design quality throughout the project lifecycle.



Fig-4 Front view of the coffee lounge

The image displays a front elevation view of a coffee lounge designed using Autodesk Revit software, showcasing architectural and interior elements in a clean, detailed manner. The drawing appears to be a part of a formal documentation sheet, suitable for design presentations or project reports. From the left to right, the elevation reveals a transparent glazed glass façade that allows visibility into the interior. This glass front spans from floor to ceiling, supported by framing elements, and includes a central door providing access to the lounge. Behind the glass, multiple tables and chairs are visible, arranged neatly to represent a welcoming seating area for customers.



Fig-5 Exterior Elevation

The image provided is a 3D exterior elevation view of a coffee lounge, created using Autodesk Revit software. This rendered visual is intended for architectural documentation and presentation, showcasing the structural form, façade treatment, surrounding context, and outdoor interaction. The design features a modern, single-storey structure with clean lines and a minimalist form. The building presents a sleek, angular roof profile that adds a dynamic architectural element to the otherwise rectangular form. The front façade prominently incorporates a large glass wall system, revealing the interior seating arrangement and establishing a strong indoor-outdoor visual connection. This full-height glazing allows natural light to flood the space and enhances the visibility of the coffee lounge from the street, creating a welcoming and open feel.

©IJRASET: All Rights are Reserved | SJ Impact Factor 7.538 | ISRA Journal Impact Factor 7.894 |

IV. CONCLUSION

The design and modelling of the coffee lounge using Autodesk Revit demonstrate a comprehensive, coordinated, and efficient approach to architectural planning and visualization. From conceptual development to detailed documentation, the use of Revit facilitated the creation of a functional and aesthetically pleasing space that balances form and usability. The top view layout emphasizes strategic spatial arrangement, efficient circulation, and optimized seating capacity, while the front elevation view illustrates the integration of natural lighting and openness through a transparent façade. By leveraging Revit's robust tools for modelling, rendering, and documentation, the project achieves precision in both design execution and presentation. This approach not only ensures design accuracy but also enhances communication among stakeholders, making it an ideal workflow for contemporary architectural practices. Overall, the coffee lounge project stands as a well-rounded example of how Building Information Modelling (BIM) supports creativity, functionality, and technical excellence in architectural design.

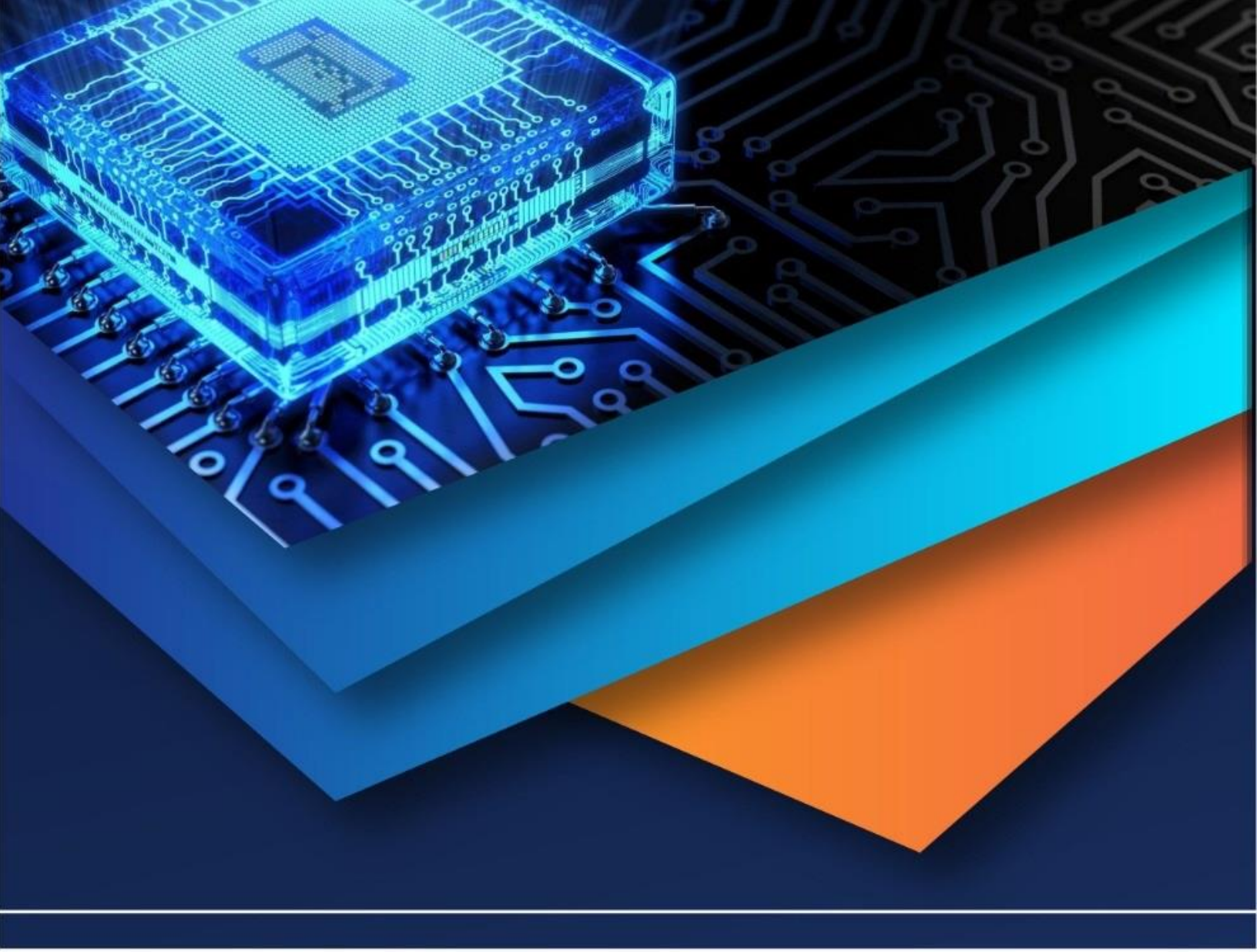
V. ACKNOWLEDGMENT

We sincerely thank our project guide, Mr. Siddartha.C and R & D coordinator of Civil Department Dr. A. Narender Reddy, for their invaluable guidance and support throughout our project titled "Modelling and layout of coffee lounge by using Revit software." We are grateful to the Civil Engineering Department for providing the necessary resources and encouragement. Special thanks to our peers and families for their constant motivation. This project enhanced our technical skills and deepened our understanding of Revit software.

REFERENCES

[1] Autodesk. (2023). Revit User Guide. Autodesk, Inc. Retrieved from: https://help.autodesk.com
[2] Stine, D. M. (2022). Design Integration Using Autodesk Revit 2022: Architecture, Structure and MEP. SDC Publications
[3] Bansal, P. (2021). Application of Building Information Modeling (BIM) in Interior Design. International Journal for Research in Applied Science and Engineering Technology, 9(6), 1210–1217. https://doi.org/10.22214/ijraset.2021.34668.
[4] Chidambaram, M., & Vigneshwar, P. (2017). Interior space planning and layout optimization using BIM. International Journal of Civil Engineering and Technology (IJCIET), 8(4), 1295–1303.Discusses methods for optimizing small commercial spaces such as cafés using BIM.
[5] Liu, R., & Issa, R. R. A. (2014). Design for maintenance accessibility using BIM tools. Facilities, 32(3/4), 153–159.
[6] Kensek, K., & Noble, D. (2014). Building Information Modeling: BIM in Current and Future Practice. Wiley. A comprehensive source exploring BIM tools and Revit workflows used across design phases.
[7] Azhar, S. (2011). Building Information Modeling (BIM): Trends, benefits, risks, and challenges for the AEC industry. Leadership and Management in Engineering, 11(3), 241–252. https://doi.org/10.1061/ (ASCE)LM.1943-5630.0000127
[8] Arayici, Y., Coates, P., Koskela, L., Kagioglou, M., Usher, C., & O'Reilly, K. (2011). Technology adoption in the BIM implementation for lean architectural practice. Automation in Construction, 20(2), 189–195. https://doi.org/10.1016/j.autcon.2010.09.016
[9] Krygiel, E., & Nies, B. (2008). Green BIM: Successful Sustainable Design with Building Information Modeling. Wiley Publishing.

©IJRASET: All Rights are Reserved | SJ Impact Factor 7.538 | ISRA Journal Impact Factor 7.894 |



10.22214/IJRASET

45.98

IMPACT FACTOR: 7.129

IMPACT FACTOR: 7.429

INTERNATIONAL JOURNAL FOR RESEARCH

IN APPLIED SCIENCE & ENGINEERING TECHNOLOGY

Call : 08813907089 (24*7 Support on Whatsapp)