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*Original Article*

# Integrated Digital Setting-Out System for Fit-Out and Joinery Works in Building Projects

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***Abstract:*** *Fit-out and joinery works play an important role in the final stage of building construction, where accurate setting-out is essential to ensure that wall finishes, flooring layouts, ceilings, and joinery elements are installed correctly according to design drawings. Traditional manual setting-out methods often lead to errors, rework, and material wastage, affecting overall project efficiency. This project focuses on developing an integrated digital setting-out system using tools such as AutoCAD and Building Information Modeling (BIM), which enhances precision, improves coordination between design and site teams, and ensures better execution quality. By adopting digital layout planning, the chances of dimensional errors and misalignment are significantly reduced. The project primarily emphasizes digital planning for wall finish layouts, flooring finish plans, reflected ceiling plans, and joinery alignment, thereby improving workflow efficiency and ensuring effective communication among architects, engineers, and construction teams.*

***Keywords:*** Fit-out Works, Joinery Works, Building Information Modeling (BIM), Layout Planning, Construction Accuracy, Interior Finishing, Coordination in Construction , Digital Construction Tools.

## I. INTRODUCTION

The construction industry has undergone significant transformation over the past few decades with the integration of advanced technologies and digital tools. Among the various stages of construction, fit-out and joinery works play a vital role in determining the final usability, functionality, and aesthetic appeal of a building, as they represent the finishing stage where the structural framework is converted into a functional and habitable space. Fit-out works involve the installation of interior elements such as wall finishes, flooring systems, ceiling systems, and partitions, while joinery works include the fabrication and installation of customized wooden or composite elements like doors, cabinets, wardrobes, and vanity units. These works require a high level of precision and coordination, as even minor errors can lead to significant issues in alignment and functionality. Traditionally, setting-out for these works has been carried out manually using measuring tapes, chalk lines, and basic tools; however, such methods are prone to errors due to human limitations, misinterpretation of drawings, and lack of coordination between different teams, often resulting in rework, material wastage, time delays, and increased costs. With the advancement of digital technologies such as AutoCAD and Building Information Modeling (BIM), the industry is shifting towards more accurate and efficient planning and execution methods. Digital setting-out systems enable engineers and site professionals to transfer design data directly to the site with high precision, thereby improving quality and reducing errors. This project focuses on developing an integrated digital setting-out system specifically for fit-out and joinery works, with the objective of enhancing accuracy, improving coordination, and optimizing overall execution processes.

## II. DESIGN AND CHARACTERISTICS OF FITOUT AND JOINERY WORKS

### A. Characteristics of fitout works

Floor finishing is one of the most critical aspects in fit-out works, especially in functional areas such as ablution rooms and public toilets where continuous water usage is expected. The selection of appropriate flooring materials, along with proper slope design, ensures durability, safety, and efficient drainage. In the project, materials such as porcelain tiles and natural stone finishes are used due to their strength, water resistance, and ease of maintenance. Proper slope towards floor drains is essential to prevent water stagnation and maintain hygiene. The slope must be carefully executed during installation to ensure that water flows smoothly towards drainage points without affecting user comfort. Additionally, anti-slip finishes are provided to enhance safety, particularly in wet zones.

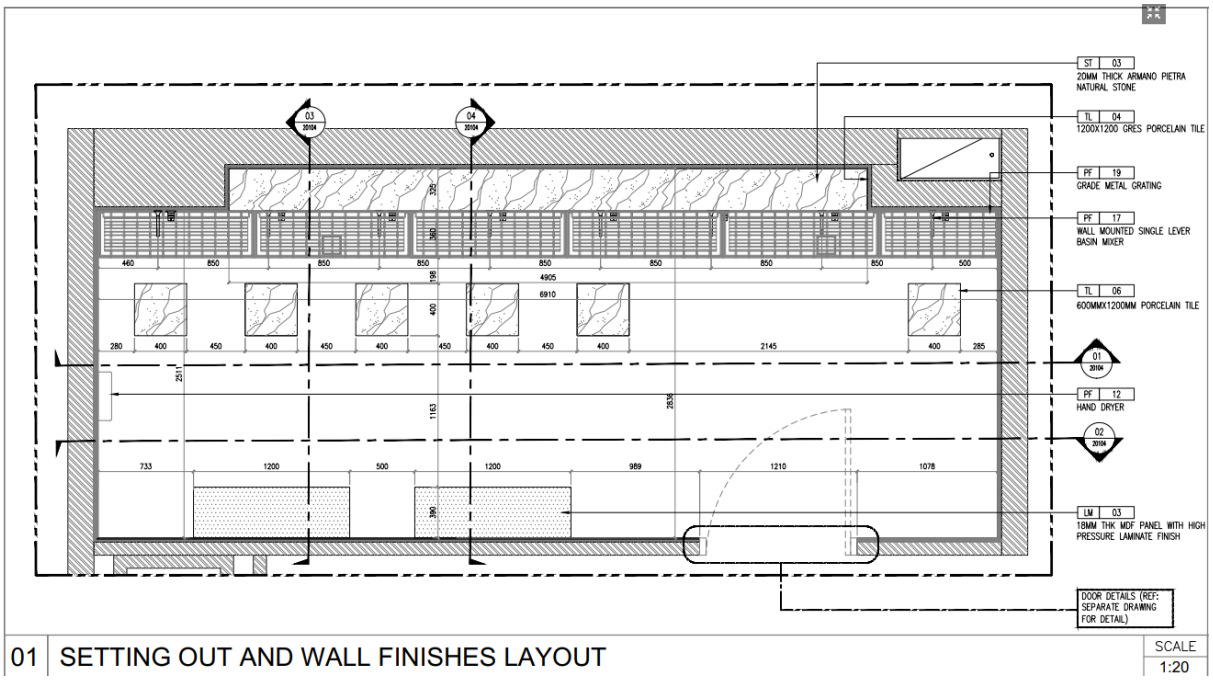


***Figure 1: Setting out and Wall Finishes Layout***

**B. Characteristics of joinery works**

Dimensional accuracy refers to the precision in fabrication and installation of joinery elements such as cabinets, doors, and panels. All joinery components must match the specified dimensions in drawings to ensure proper fitting.

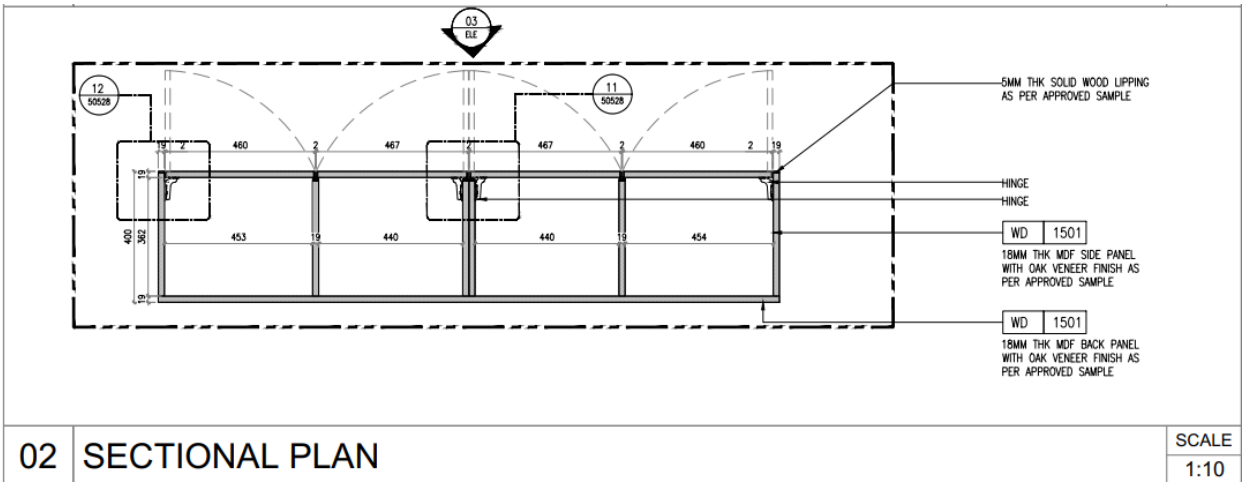


***Figure 2: joinery sectional plan***

## III. RESULTS AND DISCUSSION

The implementation of an integrated digital setting-out system using tools such as AutoCAD and BIM has significantly improved the accuracy and efficiency of fit-out and joinery works. In the company workflow, drawings are first prepared and then reviewed through a structured process involving comment sheets, where senior engineers and consultants provide detailed feedback on dimensional accuracy, coordination between elements, missing details, and overall design clarity. These comments are carefully addressed during the correction stage, ensuring that all identified issues are resolved before the drawings are resubmitted for approval. This systematic review and approval process acts as an effective quality control mechanism, minimizing errors that are commonly associated with traditional manual methods. The adoption of digital setting-out has reduced problems such as misalignment, incorrect placement of elements, and conflicts between architectural and service components. It also improves coordination among different teams and enhances clarity in execution. As a result, the overall workflow becomes more efficient, reducing rework,

saving time, and optimizing material usage. The study clearly demonstrates that the integration of digital tools along with a structured review and approval process leads to higher precision, better coordination, and improved quality in fit-out and joinery project execution.

## IV. CONCLUSION

The present study demonstrates that the implementation of an integrated digital setting-out system significantly enhances the accuracy, efficiency, and quality of fit-out and joinery works in building projects. By utilizing digital tools such as AutoCAD and BIM, the process of layout planning for wall finishes, flooring, ceilings, and joinery elements becomes more precise and well-coordinated. The structured workflow involving drafting, comment sheet review, corrections, and final approval ensures that errors are identified and resolved at the design stage, thereby reducing rework, material wastage, and time delays during execution. Furthermore, the digital approach improves communication between design, planning, and site teams, leading to better coordination and smoother project delivery. Overall, this project establishes that digital setting-out is a reliable and modern methodology that enhances productivity and ensures high-quality outcomes in interior construction works.

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