REINFORCEMENT REQUIREMENT ANALYSIS OF T-BEAMS COMPATIBILITY USING SAP 2000 AND MANUAL CALCULATION METHODS IN THE INTEGRATED BUILDING OF DARUL 'ULUM UNIVERSITY, 2ND FLOOR

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ABSTRACT

The concept of this research is to analyze the reinforcement requirements for T-beam compatibility using two comparative methods: manual calculation and SAP 2000 software. The aim of this study is to determine the reinforcement needs for T-beam compatibility using the SAP 2000 software and compare it with the conventional manual calculations commonly employed by engineers and architects. The analysis results demonstrate differences between the manual calculation method and SAP 2000. Manual calculations yield support reinforcement of 7 D 16 (Compression) and 7 D 16 (Tension) with stirrups of 3 D 10, as well as field reinforcement of 7 D 16 (Compression) and 7 D 16 (Tension) with stirrups of 3 D 10. In contrast, the SAP 2000 calculation indicates support reinforcement of 7 D 16 (Compression) and 4 D 16 (Tension) with stirrups of 20 D 8, and field reinforcement of 2 D 16 (Compression) and 6 D 16 (Tension) with stirrups of 12 D 8. Based on the analysis results, it can be concluded that there are differences in the required quantity of reinforcement between the two methods. As a recommendation, the calculation method utilizing SAP 2000 software is considered more efficient, systematic, and provides more accurate data. Therefore, it is suggested to employ the SAP 2000 method in structural calculations to ensure more optimal results and enhance the overall quality of building construction.

Keywords: T-beam compatibility, SAP 2000, Reinforcement, Structural calculation.