

Study on Two Way Reinforced Concrete Slab Using ANSYS with Different Boundary Conditions and Loading

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Abstract : This paper presents the Finite Element Method (FEM) for analyzing the failure pattern of rectangular slab with various edge conditions. Non-Linear static analysis is carried out using ANSYS 15 Software. Using SOLID65 solid elements, the compressive crushing of concrete is facilitated using plasticity algorithm, while the concrete cracking in tension zone is accommodated by the nonlinear material model. Smeared reinforcement is used and introduced as a percentage of steel embedded in concrete slab. The behavior of the analyzed concrete slab has been observed in terms of the crack pattern and displacement for various loading and boundary conditions. The finite element results are also compared with the experimental data. One of the other objectives of the present study is to show how similar the crack path found by ANSYS program to those observed for the yield line analysis. The smeared reinforcement method is found to be more practical especially for the layered elements like concrete slabs. The value of this method is that it does not require explicit modeling of the rebar, and thus a much coarser mesh can be defined.

Keywords : ANSYS, cracking pattern, displacements, reinforced concrete slab, smeared reinforcements

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