

Yuthakarn Maneejun 2010: Three-Dimensional Finite Element of Reinforced Concrete using Embedded Reinforcement Technique. Master of Engineering (Civil Engineering), Major Field: Civil Engineering, Department of Civil Engineering. Thesis Advisor: Assistant Professor Kitjapat Phuvoravan, Ph.D. 113 pages.

The objective of this research is to develop a three dimensional (3-D) finite element for reinforced concrete structures. The new element is created by combining eight nodes solid element with two nodes bar element. The technique is to apply the theory of embedded element to distribute the stiffness and resisting forces from bar element to the new solid element. By this manner bar nodes are eliminated from the final mesh of the model. Thus, the meshed model does not depend on the shape and the location of the reinforcing steel. The results from the developed finite element give the exact correlation to the manual calculation. Furthermore, when compared with other finite element program the results are acceptable.

Modeling with embedded technique is easy to meshing and when compared with discrete model the results are acceptable. Therefore it is concluded that embedded technique is suitable to be used for reinforced concrete model.

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Thesis Advisor's signature