

Tattiya Lucksanaprom 2010: Strength of Simply Supported Reinforced Concrete Deep Beams. Master of Engineering (Civil Engineering), Major Field: Civil Engineering, Department of Civil Engineering. Thesis Advisor: Associate Professor Trakool Aramraks, Ph.D. 159 pages.

The objective of this research is to investigate the experimental failure load of simply supported reinforced concrete deep beams with cylinder compressive strength of 585 kg/cm^2 under two-point loads compared with the load capacities calculated using the procedures given in the ACI 318-99 and the ACI 318-02 codes. The 18 specimen deep beams with varied arrangement of web reinforcements are considered. The specimens are divided into 6 groups, namely: without web reinforcement, with vertical web reinforcements only, with horizontal web reinforcements only, with both vertical and horizontal web reinforcements, with vertical web reinforcements in the shear span only, and with vertical web reinforcements in the range of the constant bending moment only. All specimens have the cross section of $0.15 \times 0.45 \text{ m}$ and the span length of 1.20 m , the clear span-to-effective depth ratio (l_n/d) of 2.25 and the shear span-to-effective depth ratio (a/d) of 0.56 with the strut angle of about 55° . The main steel ratio of 1.05% and the vertical and horizontal web reinforcement ratios not greater than 0.47% are used. The results show that the load capacities calculated using the procedures given in the ACI 318-99 code are lower than the ACI 318-02 code. The experimental failure loads of the specimens are $61\text{-}71\%$ and $34\text{-}37\%$ greater than the calculated load capacities using the ACI 318-99 and the ACI 318-02 codes respectively. According to the ACI 318-02 code and test results, there are no significant difference of failure load between the deep beams with vertical web reinforcements only in shear span, and the beams with vertical web reinforcements only in the constant bending moment region.

Student's signature

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