BORVORNBHUN VONGANAN : GEOMETRICAL EFFECTS ON STRUCTURAL BEHAVIOR OF POST-TENSIONED ANCHORAGE ZONES. THESIS ADVISOR : PROF.EKASIT LIMSUWAN Ph.D., 85 PP.

Stresses in anchorage zones of post-tensioned structures are very complicated and depend on various factors. This research studies the structural behavior of post-tensioned anchorage zones under the influence of anchorage geometry and hoop action of spiral reinforcement. Extensive series of three dimensional linear elastic finite element computer analysis were carried out to study behavior of anchorage zones for 100, 180, 250, 400, 550, and 825 tons, respectively. To study the effect of changing the geometry of the anchorage, the slope of the anchorage was varied from 0 to 10 degrees, and for hoop action, the influence of hoop action was also investigated by varying the percentage of spiral reinforcement.

The analysis results indicated that increasing the slope of the anchorage only slightly increases the bursting stress in the anchorage zone. However, when flat anchorages were used, some increase in bursting stress was clearly evident. The results also show that the use of spiral reinforcement could reduce the bursting stress in the anchorage zone. In addition, the deformation could be controlled as a result of smaller crack widths as well as better distribution of cracks. This in turn leads to improved cracking strength and ductility. Experimental studies were also conducted for 180-ton anchorage to compare the behavior under load in the elastic and inelastic ranges. The results show good agreement with those obtained from the analyses, especially in the elastic range.