VISVESWARAIAH TECHNOLOGICAL UNIVERSITY
BELGAUM, KARNATAKA

SHRI. B.V.V. SANGHA'S

BASAVESHWAR ENGINEERING COLLEGE, BAGALKOT-587102

2008-2009

DEPARTMENT OF CIVIL ENGINEERING

A Project Report on

"Evaluation of Minimum Shear Reinforcement in RC Beams"

Approved By
Karnataka State Council for Science and Technology,
Indian Institute of Science, Bangalore

PROJECT GUIDE	HEAD OF DEPARTMENT	PRINCIPAL
Dr. S.S. Injaganeri	Dr. C. B. Shivayogimath	Dr. R. N. Herkal

PROJECT ASSOCIATES

Name of Students	University No.
Mr. MANJUNATH N. PATTAR	2BA05CV038
Miss. RAJASHREE V. CHINTA	2BA05CV052
Mr. RAVI B. HOSAMANI	2BA06CV404

ABSTRACT

Keywords: ***diagonal cracking strength; ultimate shear strength; minimum shear reinforcement; reinforced concrete; ductility; shear force; web strain; flexural strain; compressive strength; tensile strength.***

The sheur in reinforced concrete beams has been extensively studied over the last few decades and has been a subject of many controversies and debates ever since the beginning of 20^{th} century, owing to complex behaviour under flexural shear and failures being catastrophic in nature. An extensive experimental and analytical work has been carried out for beams made of normal strength concrete with depth less than 400 mm. The expressions developed are based on the study of beams made of normal strength concrete and the same being used for beams made of high strength concrete, thus leading to vast disparity in prediction of results for members made of high strength concrete.

The transversely loaded reinforced concrete beams may fail in shear before attaining their full flexural strengths, if they are not adequately designed for shear. Unlike flexural failures, shear failures are very sudden and unexpected, even sometimes violent. A thorough knowledge of the different modes of shear failures and the mechanisms involved in resisting is necessary to avoid such failures.

The Existing provisions for predicting shear strength by various national codes of practice for reinforced concrete members differ considerably in magnitude. This only reflects that very little is known about the behaviour and strength of reinforced concrete subjected to flexural shear in spite of considerable amount of research being carried out. Further, there is still not a simple, albeit analytically derived formula to predict quickly and accurately the shear strength of high strength concrete beams. In addition, many of the factors that influence the determination of the required minimum amount of shear reinforcement are not yet known and also accounted for in the code provisions. As a consequence, the current provisions for shear in standard codes of practice such as ACI, IS and BS code are still based on empirical or semi empirical considerations. In this project work an attempt has

been made to show that the minimum reinforcement specified by IS code of practice may not be sufficient in case of members made of high strength concrete.

A total of three beams of different compressive strengths with a constant value of longitudinal reinforcement and shear span-to-depth (a/d) ratios were tested in the laboratory. The beams were cast with shear reinforcement to study the adequacy of minimum reinforcement in shear with increase in compressive strength of concrete. The beams were tested under three point loading under displacement mode. The mid-span deflection, load corresponding to diagonal cracking & ultimate stage and web strains are measured. The test results are analyzed and a comparison is made with the provisions of different codes of practice viz. IS - 456, ACI - 2005 and BS - 1997.