ABSTRACT

Existing theories for Shear failure of reinforced concrete beams are either empirical or are based on criterion for failure of plain concrete under combined stresses. All these theories however, do not reveal any satisfactory mechanism of failure. A theory of failure of non-homogenous materials proposed by Prof. B.R. Seth is found to agree fairly well with published data from tests of concrete under combined stresses. This failure criterion forms the basis of the theory proposed herein for failure of reinforced concrete beams with plain webs under the combined action of moment and shear.

Three different types of failure are considered and seperate criterian are proposed for "Shear-Compression", "Diagonal-Tension" and Shear-Proper" types of failures. In the case of Shear-Compression failures, a distinction is made between the 'failure' crack and the 'Critical' crack, whose location can be predicted satisfactorily.

Tests on 30 simple-span beams are described, the results of which serve to illustrate

the concepts put forth in the thesis. Figures showing details of crack are given.

Results from certain published American tests also show excellent agreement with theory.

Extension of this theory to cases of beams under uniformly distributed load is also indicated.