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The effect of mixing flyash on the flexural behaviour of fibre reinforced concrete

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The effect of partial replacement of cement by flyash on the bending strength and deformations of the members of fibre reinforced concrete has been studied. Tests were conducted on the fibre reinforced concrete specimen as shown in Figure 1 having three different percentages of fibres i.e. 0.5%, 0.75% & 1.0% by volume of concrete and three beams with each percentage of fibres were cast and tested after 28 days of curing. Aspect ratio of fibres was kept as 100. An equal number of specimen of fibre reinforced cement concrete without replacement of cement by flyash were also cast and tested in each case in order to assess the effect of partial replacement of cement by flyash on the flexural behaviour of fibre reinforced concrete.

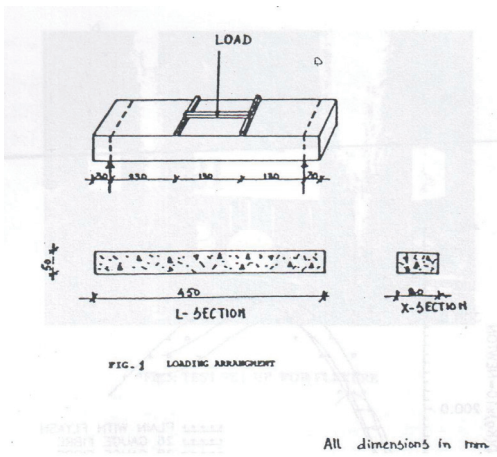

Figure 1: Specimen under Flexure

With 20% replacement of cement by flyash, the strength of fibre reinforced cement flyash concrete members was found to be either equal to or more than the strength of members without replacement of cement by flyash. An improvement in the deformation capability, ductility, load at first crack and workability in the members of the flyash fibre reinforced concrete due to mixing flyash has been observed.

Besides the improvement in the quality of concrete on partial replacement of cement by flyash, the cost of concrete was also reduced and therefore, the concrete on partial replacement becomes economical. The saving as per the data in the present work was found more than 14%, over the cost of concrete without replacement of cement by flyash.

References

1. Shah. S.P. and Ranjan, B.V. (1971). Fibre Reinforced Concrete, ACI Journal, NO.2, Vol. 68, PP. 126-135.
2. Romualdi, J.P. and Batson, G.B. (1963). Mechanics of Crack Arrest in Concrete. ASCE, Vol. 89, PP. 147.168.
3. Synder, M. Jack and Lankard, R. David (1972). Factor Affecting Flexural Strength of Steel Concrete. ACI Journal, Vol. 89, PP. 96-100.
4. Batson, G.B., Lankard L. and Hooks. (1972). Flexural Fatigue Strength of SFRC Beams, ACI Journal, PP. 673.677.
5. Huges and Fattuhi.(1981). Load-Deflection Curves for Fibre Reinforced Concrete Beams in Flexure, Magazine of Concrete Research, Vol. 29, PP. 199-206.
6. Dwarkanth , H.V. and Nagraj, T.S. (1987). Flexural Behaviour of Fibre Reinforced Concrete Beams, Proceedings of International Symposium on FRC, Vol. I, PP. 2.49-2.58.
7. Griffith, A.A. (1920). The Phenomena of Rupture and Flow in Solids, Philosophical Transaction, Roya l Society of London. Series A. Vol. 221, PP. 163-198.
8. Swamy, R.N. (1974). Fibre Reinforced Concrete, Mechanics, Properties. and Application, Indian Concrete Journal, Vol. -l8, No. I, PP. 7-16.
9. Ramakrishnan, V., Brandshoug, T., Coyle. W. V., and Schradu, E.K., (1980), A comparative Evaluation of Concrete Reinforced with Steel Fibres and Fibres with Deformed Ends Glued together in to Bu nb l e s , ACI Journal, Vol. 77, No.3, PP. 135-143.