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Discussion - Discussion - Diskussion

Shear Strength of Reinforced Concrete Beams Loaded Through Framed-in Cross-Beams (J. Taub, A. M. Neville, Ia6)¹⁾

Résistance à l'effort tranchant des poutres en béton armé chargées par l'intermédiaire de traverses (J. Taub, A. M. Neville, Ia6)¹⁾

Die Schubfestigkeit von Stahlbetonbalken mit Lastübertragung mittels Querbalken (J. Taub, A. M. Neville, Ia6)¹⁾

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The shear strength of reinforced concrete beams covered by the tests described in the paper by MESSRS. TAUB and NEVILLE should be considered as a rather special case because the beam has full moment at approximately the same point as nearly the full shear stress. High bond strength of the reinforcement in the main beam is therefore more advantageous than usual.

Another point on which the authors will no doubt agree is that tests of shear strength of isolated parts of a reinforced concrete structure must give optimistic results as compared with those same members in the complete structure. It seems to have been generally overlooked that beams forming part of a completed concrete framework will often be prevented from shrinkage by the rest of the structure and accordingly develop shrinkage stress corresponding to a fixed length condition. THOMAS²⁾ gave long ago deduced shrinkage stress at early ages and the decay of stress for constant deformation was estimated by Building Research Station³⁾ and also by Whitney in America some time ago. The maximum shear stress permitted on the concrete must

¹⁾ See "Preliminary Publication" — voir «Publication Préliminaire» — siehe «Vorbericht», p. 77.

²⁾ Journ. Inst. Struct. Engrs. July 1936.

³⁾ Journ. Inst. Struct. Engrs. Feb. 1933.

include allowance for the reduced strength caused by this shrinkage stress and not be based on tests of isolated beams.

By inference precast beams are largely unaffected. Also it is an interesting reflection that just as prestressing so greatly increases the shear strength rapid concreting of ordinary reinforced beams with inadequate freedom to shrink seriously reduces the resistance of the concrete to shear as one well known failure in North America seemed to confirm.

Of course many structures can shrink freely but for those that cannot sequences for the construction can easily be arranged so that the shear strength is not needlessly reduced by restraint to shrinkage.

Summary

The author discusses the shear strength tests described in the paper Ia 6. He points out that the case considered is a rather special one because of maximum shear and bending stresses occurring nearly at the same section. Another point one must not overlook is that in effective structure the shear strength will often be reduced by shrinkage stresses and therefore these tests of isolated elements must give optimistic results.

Résumé

L'auteur discute les essais sur la résistance au cisaillement, dont traite la contribution Ia 6. Il fait remarquer que le cas traité est plutôt une exception vu que les efforts tranchants et les tensions dues à la flexion sont maxima presque dans la même section.

De plus il ne faut pas oublier que la résistance au cisaillement d'ouvrages exécutés est souvent diminuée par les tensions dues au retrait. Il est donc clair qu'on obtiendra des résultats trop favorables lorsque les essais sont effectués sur des éléments isolés.

Zusammenfassung

Der Autor bespricht die Versuche über die Scherfestigkeit, die im Beitrag Ia 6 enthalten sind. Er macht darauf aufmerksam, daß der behandelte Fall eher eine Ausnahme ist, da maximale Schub- und Biegespannungen fast im gleichen Schnitt auftreten.

Ein anderer Punkt, der nicht vergessen werden sollte, besteht darin, daß bei tatsächlichen Tragwerken die Scherfestigkeit oft durch Schwinden reduziert ist, so daß diese Versuche an isolierten Elementen eher optimistische Ergebnisse zeigen.