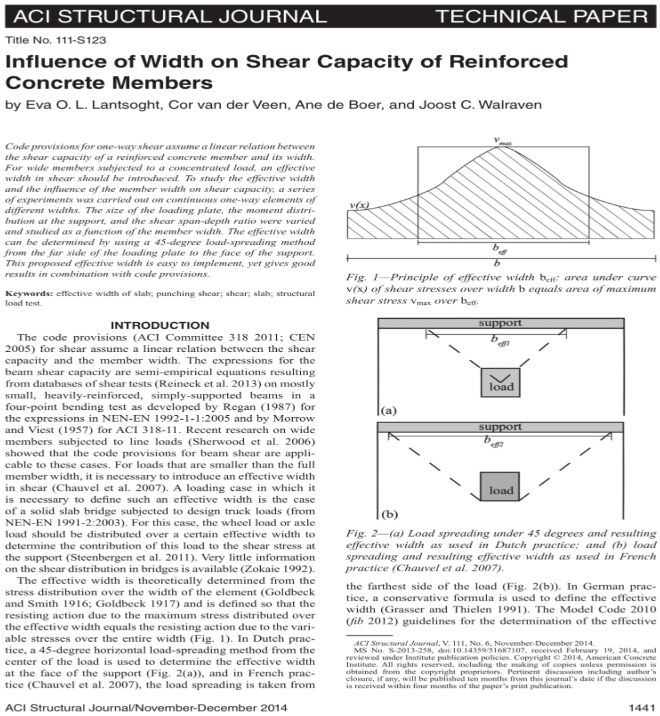
Kani On Shear In Reinforced Concrete



ACI STRUCTURAL JOURNAL TECHNICAL PAPER

Title No. 111-S123

Influence of Width on Shear Capacity of Reinforced Concrete Members

by Eva O. L. Lantsoght, Cor van der Veen, Ane de Boer, and Joost C. Walraven

Code provisions for one-way shear assume a linear relation between the shear capacity of a reinforced concrete member and its width. For wide members subjected to a concentrated load, an effective width in shear should be introduced. To study the effective width and the influence of the member width on shear capacity, a series of experiments was carried out on continuous one-way elements of different widths. The size of the loading plate, the moment distribution at the support, and the shear span-depth ratio were varied and studied as a function of the member width. The effective width can be determined by using a 45-degree load-spreading method from the far side of the loading plate to the face of the support. This proposed effective width is easy to implement, yet gives good results in combination with code provisions.

Keywords: effective width of slab; punching shear; shear; slab; structural load test.

INTRODUCTION

The code provisions (ACI Committee 318 2011; CEN 2005) for shear assume a linear relation between the shear capacity and the member width. The expressions for the beam shear capacity are semi-empirical equations resulting from databases of shear tests (Reineck et al. 2013) on mostly small, heavily-reinforced, simply-supported beams in a four-point bending test as developed by Regan (1987) for the expressions in NEN-EN 1992-1-1:2005 and by Morrow and Viest (1957) for ACI 318-11. Recent research on wide members subjected to line loads (Sherwood et al. 2006) showed that the code provisions for beam shear are applicable to these cases. For loads that are smaller than the full member width, it is necessary to introduce an effective width in shear (Chauvel et al. 2007). A loading case in which it is necessary to define such an effective width is the case of a solid slab bridge subjected to design truck loads (from NEN-EN 1991-2:2003). For this case, the wheel load or axle load should be distributed over a certain effective width to determine the contribution of this load to the shear stress at the support (Steenbergen et al. 2011). Very little information on the shear distribution in bridges is available (Zokaie 1992).

The effective width is theoretically determined from the stress distribution over the width of the element (Goldbeck and Smith 1916; Goldbeck 1917) and is defined so that the resisting action due to the maximum stress distributed over the effective width equals the resisting action due to the variable stresses over the entire width (Fig. 1). In Dutch practice, a 45-degree horizontal load-spreading method from the center of the load is used to determine the effective width at the face of the support (Fig. 2(a)), and in French practice (Chauvel et al. 2007), the load spreading is taken from the farthest side of the load (Fig. 2(b)). In German practice, a conservative formula is used to define the effective width (Grasser and Thielen 1991). The Model Code 2010 (*fib* 2012) guidelines for the determination of the effective

Fig. 1—Principle of effective width b_{eff}: area under curve $v(x)$ of shear stresses over width b equals area of maximum shear stress v_{max} over b_{eff}.

Fig. 2—(a) Load spreading under 45 degrees and resulting effective width as used in Dutch practice; and (b) load spreading and resulting effective width as used in French practice (Chauvel et al. 2007).

ACI Structural Journal, V. 111, No. 6, November-December 2014.

MS No. S-2013-258, doi:10.14359/51687107, received February 19, 2014, and reviewed under Institute publication policies. Copyright © 2014, American Concrete Institute. All rights reserved, including the making of copies unless permission is obtained from the copyright proprietors. Pertinent discussion including author's closure, if any, will be published ten months from this journal's date if the discussion is received within four months of the paper's print publication.

ACI Structural Journal/November-December 2014 1441

Kani on shear in reinforced concrete. Front Cover. Mario W. Kani University of Toronto, Dept. of Civil Engineering, - Reinforced concrete - pages.Kani on Shear in Reinforced Concrete. Front Cover. Gaspar Kani. Department of Civil Engineering, University of Toronto, - Reinforced concrete - Kani on Shear in Reinforced Concrete. Front Cover. Mario W. Kani, Mark William Huggins, Gaspar Kani, Rudi R. Wittkopp. Department of Civil Engineering.Kani on shear in reinforced concrete [Gaspar Kani] on tmdcelebritynews.com *FREE* shipping on qualifying offers.Get this from a library! Kani on shear in reinforced concrete. [Mario W Kani; Mark W Huggins; Rudi R Wittkopp]., English, Book, Illustrated edition: Kani on shear in reinforced concrete / edited by Mario W. Kani, Mark W. Huggins, Rudi R. Wittkopp. Kani, Gaspar.tmdcelebritynews.com: Kani on Shear in Reinforced Concrete: p.Kani on shear in reinforced concrete / edited by Mario W. Kani, Mark W. Huggins, Published: Toronto: University of Toronto, Dept. of Civil Engineering, The Riddle of Shear Failure and Its Solution. By G. N. j. KANI. Title No. Key words: analysis; beam; diagonal tension; failure; reinforced concrete; shear.Outline of Dr. Gaspar Kani's Shear Mechanism Theory. SPECIMENS AND TEST PROCEDURES. . 1. 2. 3. 4. 5. Reinforcing Steel. Concrete . Framework .Kani on shear in reinforced concrete by Gaspar Kani. ().Vc is the shear contribution of concrete determined using a statically arrived . However, inclined portions of the curve representing the famous Kani's valley [12] .Kani, M.W., Huggins, M.W., and Wittkopp, R.R. Kani on shear in reinforced concrete. University of Toronto Press, Toronto, Canada.Shear failure should not precede flexural failure in reinforced concrete in general, and elegantly portrayed by Kani's* valley of diagonal failure, for mild steel.Although the subject of sheir performance of reinforced concrete structural elements has .. Kani included shear in T-beams and and the shear performance of.

[PDF] One Small Finger: Overseas Mission In A Changing World, 1949-69
[PDF] After Bathing At Baxters: Essays And Notebooks
[PDF] Handbook Of Canine Electrocardiography
[PDF] Agnostos Theos: Untersuchungen Zur Formengeschichte Religioser Rede
[PDF] Fit To Deliver: An Innovative Prenatal And Postpartum Fitness Program
[PDF] Australian Thesaurus Of Education Descriptors
[PDF] Leviathan, Or, The Matter, Forme, & Power Of A Common-wealth Ecclesiasticall And Civill