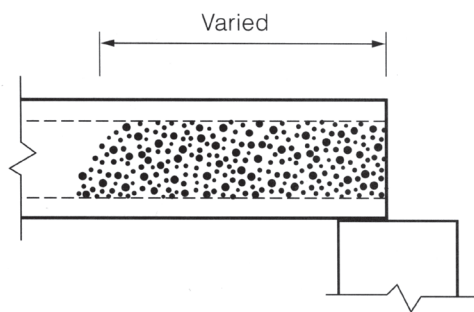
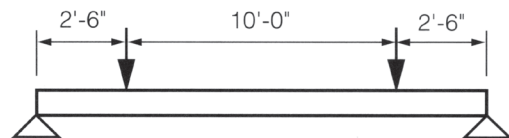


## SHEAR STRENGTH WITH FILLED CORES

Tests were conducted to determine whether filling the cores of Spancrete® hollowcore plank with grout was an effective method of increasing the shear capacity of the plank. A method to conservatively predict the increased shear capacity was also developed.



**FILLED END DETAIL**



**TEST ASSEMBLY**

### CONCLUSIONS:

1. A grout fill will increase shear capacity, even when added after prestressing is completed.
2. A 3 :1 sand-cement grout gave adequate bond to act compositely in shear with the plank.
3. Non-shrink grout did not appreciably increase the shear capacity over regular grout.
4. Extending the grout fill only to the critical section gives satisfactory results, provided the reduced section is considered at the end of the grout fill.
5. Shear capacity of the total section can be conservatively calculated by a superposition of the base slab capacity and the grout capacity.

*A design example is given on the reverse side.*

## SHEAR STRENGTH WITH FILLED CORES

### GIVEN:

8" Spancrete® hollowcore reinforced with (12) 3/8" dia., 250 ksi strands  
 Superimposed live loads as shown.

### PROBLEM:

Determine the number of cores to be filled to satisfy the required shear capacity.

### SOLUTION:

At 5 feet from left support

$$V_u = 16.1 \text{ k/plank} \quad V_c / \phi = 12.6 / 0.75 = 16.8 \text{ k/plank}$$

from ACI (318-02) Eqn. (11-10) or (11-12)

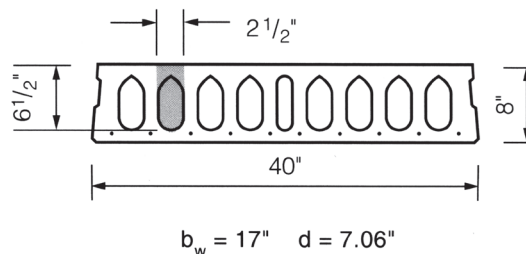
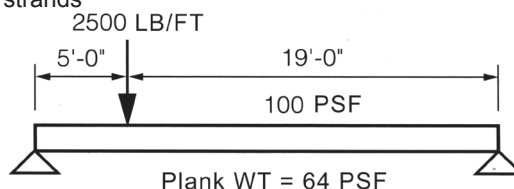
Add grout fill with  $f'_c = 3000$  psi

$$V_c = 2 \sqrt{f'_c} \times b_{\text{core}} \times d_{\text{core}} = 2 \frac{\sqrt{3000}}{1000} \times 2.5 \times 6.5$$

$$= 1.78 \text{ k/core}$$

For  $V_u \leq \phi V_c$

$$16.1 \leq 0.75 [16.8 + (N \times 1.78)] \quad N = 2.61 \quad \text{Say 3 cores}$$



**Note:** Sample calculations are intended to illustrate the concept presented and do not represent all considerations necessary for the complete design. This research was done using 40" wide, 8" thick Standard Spancrete. However, this concept applies to all Spancrete cross sections.

#### MIDWEST

Hanson Structural  
 Precast Midwest, Inc.  
 Maple Grove, Minnesota

Spancrete, Inc.  
 Green Bay, Wisconsin

Spancrete Industries, Inc.  
 Waukesha, Wisconsin

Spancrete of Illinois, Inc.  
 Arlington Heights, Illinois

Wells Concrete  
 Wells, Minnesota

#### WEST

Hanson Structural  
 Precast Pacific, Inc.  
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Division of Kiewit Pacific Co.  
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 Camlica-Istanbul, Turkey

#### UAE

Hi-Tech Concrete  
 Products LLC  
 Abu Dhabi, UAE

#### MACHINE

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#### SPANCRETE IS ALSO MANUFACTURED IN:

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Denmark	Russia
Guatemala	South Korea
Hungary	Switzerland

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