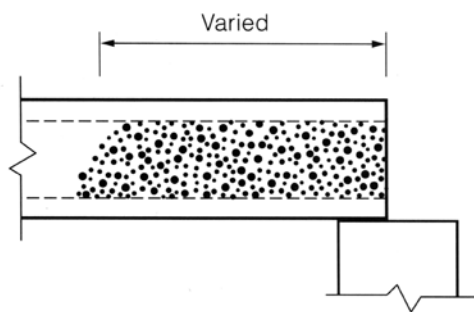
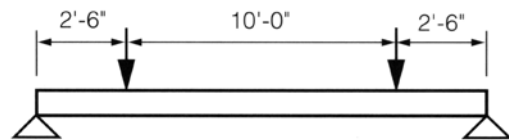


SHEAR STRENGTH WITH FILLED CORES

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)

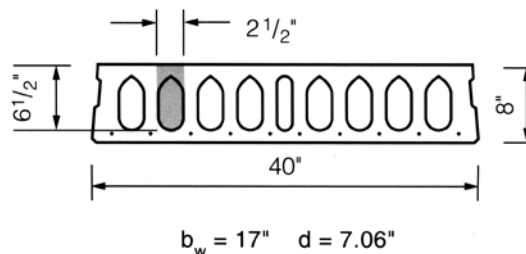
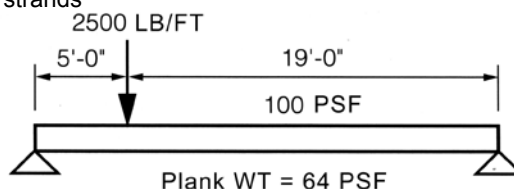
Add grout fill with $f'_c = 3000$ psi

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

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

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.

EAST

Oldcastle Precast, Inc.
 South Bethlehem, NY

Oldcastle Precast, Inc.
 Manchester, NY

Conewago Precast Building
 Systems
 Hanover, PA

MIDWEST
 Spancrete, Inc.
 Green Bay, WI

Spancrete Industries, Inc.
 Waukesha, WI

Hanson Structural Precast
 Midwest, Inc.
 Maple Grove, MN

Spancrete of Illinois, Inc.
 Arlington Heights, IL

WEST
 Hanson Structural Precast
 Pacific, Inc.
 Inwindale, CA

KIE-CON
 Div. of Kiewitt Pacific Co.
 Antioch, CA

Owell Precast
 Sandy, UT

SOUTHWEST
 Manco Structures, Ltd.
 Schertz, TX

SOUTH

Cement Industries, Inc.
 Fort Myers, FL

Florida Precast Industries, Inc.
 Sebring, FL

MC Precast, Inc.
 Atlanta, GA

CANADA
 Burnco Concrete Products Ltd.
 Calgary, Canada

EGYPT
 Samcrete Egypt
 Ahram, Giza

MEXICO

ITISA
 Mexico City, Mexico

Spancrete Noreste
 Monterrey, Mexico

TURKEY
 Yapi-Merkezi
 Camlica-Istanbul, Turkey

CARIBBEAN
 Preconco Limited
 Barbados, West Indies

Spancrete Caribbean, Ltd.
 Trinidad, West Indies

UAE
 Hi-Tech Concrete Products, LLC
 Abu Dhabi, UAE

MACHINE MANUFACTURER

Spancrete Machinery
 Corporation
 Waukesha, WI

Spancrete is also manufactured in

Armenia	Denmark	Russia
Australia	Guatemala	South Korea
Belgium	Hungary	Spain
Brazil	Ireland	Switzerland
China	Israel	
Croatia	Japan	