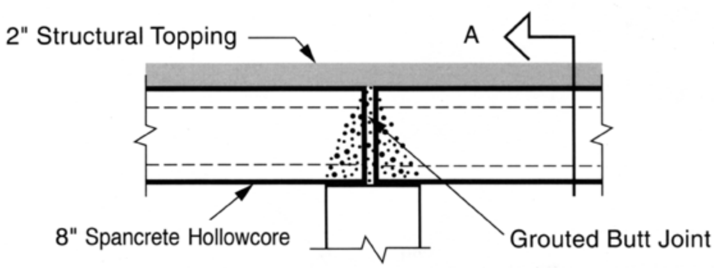
SPANCRETE MANUFACTURERS ASSOCIATION

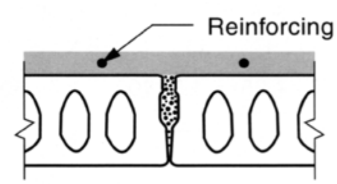
RESEARCH NOTES

CONTINUITY OVER SUPPORTS

Tests were conducted to determine whether mild reinforcements in a structural topping was an effective method to achieve continuity at plank ends. The most common application of this is for an increase in ultimate strength and a decrease in live load deflections.



BUTT JOINT DETAIL



SECTION A

CONCLUSIONS:

1. Negative moments and corresponding increases in ultimate strength can be achieved by using mild reinforcement in a structural topping.
2. Care must be taken to insure adequate bond between the topping and the plank.
3. Mild reinforcing will yield, and moment redistribution can be accomplished with reinforcing ratios ranging from 0.26% to 0.44%.
4. The mild reinforcement will cause a distribution of negative flexural cracking under loading, instead of one crack over the butt joint.

A design example is given on the reverse side.

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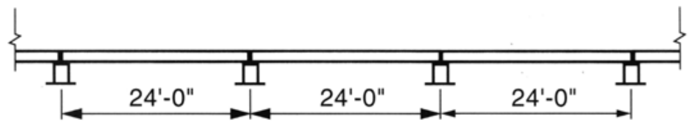
DESIGN EXAMPLE

CONTINUITY OVER SUPPORTS

GIVEN:

A 24 foot multispan 8" Spancrete®
system with 2" structural topping.
Superimposed live load = 100 psf,
plank dead load = 64 psf, topping = 25 psf.



PROBLEM:

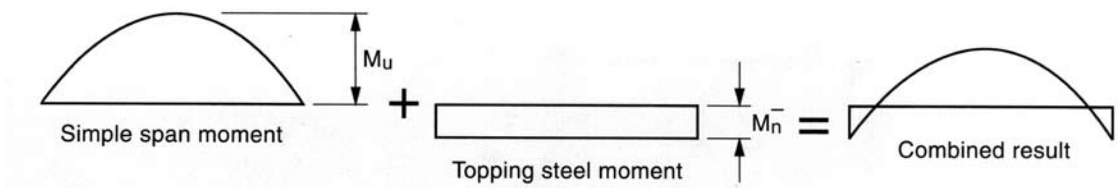
Determine reinforcing requirements of plank and topping.

SOLUTION:

For interior spans (exterior span approach is similar):

M_u = [1.2 (DL) + 1.6 (LL)] L^2 ÷ 8 x 1000

M_u = [1.2 (64 + 25) + 1.6 (100)] 24^2 ÷ 8000 = 19.21 k-ft/ft



Select a plank series less than required by simple span moment alone, since the plank ultimate moment capacity must equal $M_u + M_n^-$ combined.

Try a plank from the load tables with M_u = 15.17 k-ft/ft

If $M_u + M_n^-$ = 15.17 k-ft/ft, then M_n = 15.17 - 19.21 = - 4.04 k-ft/ft

$\varnothing M_n^- = \varnothing A_s^- f_y j_u d$; $A_s^- \cong$ (4.04 x 12) ÷ (0.9 x 60 x .9 x 9) = 0.11 in^2/ft

This can be supplied by #3 bars at 12" or 6 x 6 - W5.5 x W5.5 mesh.

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.
Irwindale, CA

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

Owell Precast
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Manco Structures, Ltd.
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Barbados, West Indies

Spancrete Caribbean, Ltd.
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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	

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