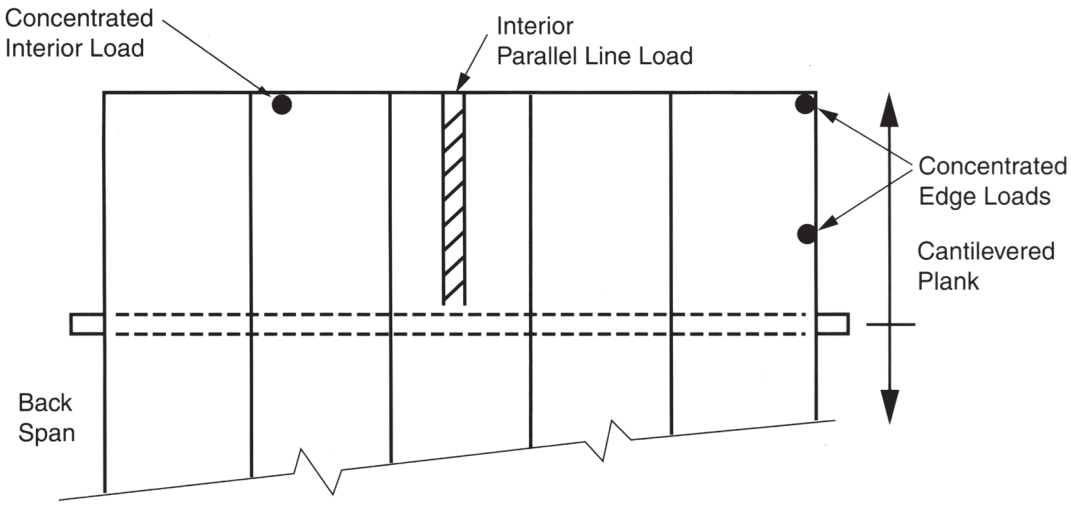
SPANCRETE MANUFACTURERS ASSOCIATION

RESEARCH NOTES

CANTILEVER LOAD DISTRIBUTION

The Spancrete Manufacturers Association has been conducting research and testing since the 1960's to further the technical development of Spancrete® hollowcore design and enhance its use throughout construction. Using the considerable data accumulated from full scale testing on simple spans, we developed a three-dimensional computer analysis technique to model recommended cantilever load distribution widths for non-uniform loads.



CANTILEVER LOAD TYPES

CONCLUSIONS:

Non-uniform loads applied to Spancrete cantilevers may be distributed over effective widths that are a funciton of the load location and the cantilever length. The recommended distribution widths for parallel line loads and point loads are:

1.Edge loads	for moment	DW = 1 + 0.45 L	ft
	for shear	DW = 1.5	ft
2.Interior loads	for moment	DW = 1.6 + 0.8 L	ft
	for shear	DW = 1.5 + 0.2 L	ft

where L = distance from support to point load or to end of parallel line load.

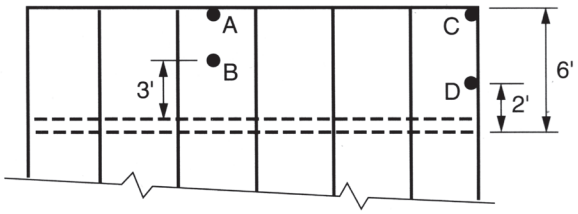
SPANCRETE MANUFACTURERS ASSOCIATION

DESIGN EXAMPLE

CANTILEVER LOAD DISTRIBUTION

GIVEN:

An untopped 10" Spancrete® hollowcore layout as shown. Assume plank weight = 75 psf, superimposed dead load = 10 psf and live load = 80 psf. Concentrated loads:
(A) P_d = 0.7 k P_L = 0.5 k
(B) P_d = 1.0 k P_L = 0.5 k
(C) and (D) P_d = 0.25 k P_l = 1.4 k



PROBLEM:

Determine the unit design shears and moments for the interior and edge conditions.

SOLUTION:

INTERIOR LOAD CONDITION		EDGE LOAD CONDITION
Point load at end of cantilever		Point load at end of cantilever
1.2(0.7) + 1.6(0.5) = 1.64 k	P_u	1.2(0.25) + 1.6(1.4) = 2.54 k
1.6 + 0.8(6) = 6.4 ft	DW mom	1 + 0.45(6) = 3.7 ft
1.5 + 0.2(6) = 2.7 ft	DW shear	1.5 ft
Intermediate point load		Intermediate point load
1.2(1.0) + 1.6(0.5) = 2.00 k	P_u	1.2(0.25) + 1.6(1.4) = 2.54 k
1.6 + 0.8(3) = 4 ft	DW mom	1 + 0.45(2) = 1.90 ft
1.5 + 0.2(3) = 2.1 ft	DW shear	1.5 ft
1.2(10 + 75) + 1.6(80) = 230 psf	W_u	1.2(10 + 75) + 1.6(80) = 230 psf
1.64(6)/6.4 + 2.00(3)/4 + .230 (6^2)/2 = 7.18 ft-k/ft	M_u	2.54(6)/3.7 + 2.54(2)/1.9 + .230(6^2)/2 = 10.93 ft-k/ft
1.64/2.7 + 2.00/2.1 + .230(6) = 2.94 k/ft	V_u	2.54/1.5 + 2.54/1.5 + .230 (6) = 4.77 k/ft

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.
Irwindale, California

KIE-CON
Division of Kiewit Pacific Co.
Anitoch, California

Owell Precast
Sandy, Utah

SOUTHWEST
Manco Structures, Ltd.
Schertz, Texas

SOUTH
Cement Industries, Inc.
Fort Myers, Florida

Florida Precast Industries, Inc.
Sebring, Florida

EAST
Mid-Atlantic Precast, LLC.
King George, Virginia

EGYPT
Samcrete Eqypt
Ahram, Giza

MEXICO
ITISA
Mexico City, Mexico

Spancrete Noreste
Monterrey, Mexico

CROATIA
Mucić & Co
Dugopolje, Croatia

CARIBBEAN
Preconco Limited
Barbados, West Indies

TURKEY
Yapi-Merkezi
Camlica-Istanbul, Turkey

UAE
Hi-Tech Concrete Products LLC
Abu Dhabi, UAE

MACHINE MANUFACTURER
Spancrete Machinery Corporation
N16 W23415 Stoneridge Drive
Waukesha, WI 53188
Telephone: 414-290-9000
Fax: 414-290-9130
www.spancrete-machinery.com

SPANCRETE IS ALSO MANUFACTURED IN:

Armenia, China, Denmark, Guatemala, Hungary, Ireland, Japan, Russia, South Korea, Switzerland

SPANCRETE MANUFACTURERS ASSOCIATION MEMBERS