



## More on Topping Off Your Spancrete® Floor

### Introduction

Span Note No. 11, titled "Topping Off Your Prestressed Hollowcore Floor," discusses the various finishing options available when designing *Spancrete* floor systems. These options include: 1) Structural Topping, 2) Non-Structural Topping, and 3) Skim Coat Underlayments. This Span Note provides additional information regarding the Structural Topping option and is intended to help specifiers, designers, and contractors use the best practices currently available for the design and installation of this material.

Some of the following guidelines will help reduce and control cracking in the concrete topping, but specifiers should understand that the total elimination of cracks is not achievable with today's technologies. Also, appropriate placing and curing procedures must be followed to avoid delamination and/or "curling" of the topping slab. Reference the current edition of the "ACI Manual of Concrete Practice" for numerous reports addressing these issues.

The contract documents prepared by the engineer of record for the project should include detailed specifications addressing the issues discussed in this document. A successful, high-quality project will result when the architect, engineer, contractor, and precaster work together in the beginning phases to ensure that the most practical and economical construction is utilized.

### Benefits From Adding A Structural Concrete Topping

- Levels the floor to compensate for the inherent camber in the prestressed planks. (The specifier should note that the camber in the plank is the result of the plank thickness, span, and the prestress forces required to resist the design loads. Consequently, this "inherent" camber cannot be adjusted to accommodate topping thicknesses.)
- Provides a harder floor surface where self-leveling toppings are not appropriate.
- Adds stiffness and strength to the floor system for resisting gravity loads.
- Increases the strength of the floor diaphragm for horizontal loads.
- Increases the fire rating of the floor system.
- Further reduces floor system vibrations.
- Further reduces the sound transmission between floors.

### Cost From Adding A Structural Concrete Topping

- Curing of the concrete topping adds time to the overall construction schedule.
- Placing topping in cold weather conditions may result in additional costs to enclose and heat the area under construction.



### What To Specify?

- To establish a topping thickness, first contact your *Spancrete* supplier to determine the cambers for the various plank spans and loadings on your particular project. Camber will vary due to several factors noted in the "Benefits" section, and your *Spancrete* supplier has the experience and design tools available to determine the anticipated maximum cambers for your specific design conditions.
- Require a minimum topping thickness of 2" at the center of the plank. The value determined for maximum camber plus the additional 2" will then be the elevation of your finished floor.
- The topping thickness will increase at the ends of the span, with a maximum thickness equal to the camber of the plank plus the specified minimum thickness at the center of span.
- A minimum concrete topping strength of 3000 psi should be specified, unless higher strengths are dictated by design.
- Reinforcement in the topping is not required by the precast manufacturer since it is not a factor in the design of the composite system comprised of the *Spancrete* plank and the bonded topping. However, to control shrinkage it is recommended that reinforcing in the form of welded wire mesh be installed in the topping. Care should be taken to ensure that the mesh is located at the center of the topping layer in order to be effective.

- The top surface of the *Spancrete*® planks should be prepped to provide adequate bonding to the concrete topping. A variety of finishes will achieve the 80 psi horizontal shear requirement in accordance with ACI 318. Consult with local plank producers for available options.
- To minimize cracking due to volume changes, saw cut control joints should be installed as soon as possible after the topping is placed. Common practice is to locate the control joints to divide the footprint of the topped floor into relatively square shapes. The saw cut joints should be a minimum depth of 1/4" of the topping thickness (i.e., 1/2" deep for 2" topping).
- Perpendicular to the plank span, joints should be placed at the ends of the plank and over the supporting walls and beams. Perpendicular joints should never be placed at intermediate or mid-span locations, as this will reduce the structural capacity of the system.
- Parallel to the plank span, the joints should be placed directly over the plank joints.
- Interruptions in the topping by interior walls, conduits, expansion joints, etc., will reduce, or perhaps entirely eliminate, the composite action of the topped floor system. These details must be reviewed and approved by a qualified structural engineer.

### Avoid These Mistakes

- Concrete topping should not be used to grout the precast plank keyways. Standard 1:3 cement-sand grout should be used to fill plank keyways prior to placement of the concrete topping.
- Carefully consider the plank thickness to use on your project. In some cases, a relatively thin composite section may be capable of supporting the required loads, but large cambers may require thicker toppings, offsetting any savings realized by using thinner plank sections.
- Take care when detailing additions to existing buildings to allow for the plank thickness, camber, and minimum topping thickness when setting elevations of support walls and beams.

## Spancrete® Manufacturers Association Providing Quality Worldwide

### EAST

**Oldcastle Precast, Inc.**  
**Building Systems Division**  
 South Bethlehem, NY 12161  
 Telephone (518) 767-2269  
 Fax (518) 767-9390

**Oldcastle Precast, Inc.**  
**Building Systems Division**  
 Manchester, NY 14504  
 Telephone (585) 289-3530  
 Fax (585) 289-9263

**Conewago Precast Building Systems**  
 A Division of Conewago Enterprises, Inc.  
 Building Systems, LLC.  
 Hanover, PA 17331  
 Telephone (717) 632-7722  
 Fax (717) 630-8441

### MIDWEST

**Kerkstra Precast, Inc.**  
 Jenison, MI 49428  
 Telephone (616) 224-6176  
 Fax (616) 224-2651  
 Toll-Free 1-800-434-5830

**Spancrete, Inc.**  
 Green Bay, WI 54307-0508  
 Telephone (920) 494-0274  
 Fax (920) 494-7901

**Spancrete Industries, Inc.**  
 Waukesha, WI 53188  
 Telephone (414) 290-9000  
 Fax (414) 290-9125

**Hanson Structural Precast Midwest, Inc.**  
 Maple Grove, MN 55311  
 Telephone (763) 425-5555  
 Fax (763) 425-1277

**Spancrete of Illinois, Inc.**  
 Arlington Heights, IL 60005  
 Telephone (847) 879-2100  
 Fax (847) 879-2105

### WEST

**Hanson Structural Precast Pacific, Inc.**  
 Irwindale, CA 91706  
 Telephone (626) 962-8751  
 Fax (626) 962-8752

**Kie-Con**  
 A Division of Kiewitt Pacific Co.  
 Antioch, CA 94509  
 Telephone (925) 754-9494  
 Fax (925) 754-0624

### SOUTHWEST

**Gate Concrete Products Co.**  
 Pearland, TX 77584  
 Telephone (281) 485-3273  
 Fax (281) 485-7644

**Manco Structures, Ltd.**  
 Schertz, TX 78154  
 Telephone (210) 690-1705  
 Fax (210) 690-1755

### SOUTH

**Cement Industries, Inc.**  
 Fort Myers, FL 33901-5337  
 Telephone (239) 332-1440  
 Fax (239) 332-7144  
 Toll-Free 1-800-332-1440

**Gate Concrete Products Co.**  
 Jacksonville, FL 32226  
 Telephone (904) 757-0860  
 Fax (904) 751-5435  
 Toll-Free 1-800-227-8591

### CANADA

**Burnco Rock Products Ltd.**  
 Calgary, AB Canada T2H 2 P9  
 Telephone (403) 279-8161  
 Fax (403) 279-6027

### ISRAEL

**Spancrete of Israel**  
 Palmachim 76-980 Israel  
 Telephone 972-3-9537500  
 Fax 972-3-9529089

### MEXICO

**ITISA**  
 Mexico, Mexico City 06500  
 Telephone 011-52-55-1500-8500  
 Fax 011-5255-5514-3720

**Spancrete Noreste s.a. de c.v.**  
 Monterrey, NL Mexico 64710  
 Telephone +52 (818) 345-0284  
 Fax +52 (818) 345-2336

### TURKEY

**Yapi Merkezi**  
 Çamlıca-Istanbul, 81180 Turkey  
 Telephone (90) 216-321-9000  
 Fax (90) 216-321-9018

### WEST INDIES

**Spancrete Caribbean Ltd.**  
 Trinidad W.I.  
 Telephone 868-645-4545  
 Fax 868-645-6686

### MACHINE MANUFACTURER

**Spancrete Machinery Corporation**  
 Waukesha, WI 53188  
 Telephone (414) 290-9000  
 Fax (414) 290-9130

### Spancrete products are also manufactured in:

Armenia    Australia    China  
 Denmark    Egypt    Guatemala  
 Ireland    Japan    Korea  
 Spain    Switzerland

Visit our website at [www.spancrete-sma.com](http://www.spancrete-sma.com)