



FALL 2010

# Form & Function

NEWS & INFORMATION FROM HAMILTON FORM

## Global Foundries Builds State-of-the-Art Precast Facility with Floors Full of Holes

**Unusual floor design calls for a holey solution**

**H**amilton Form recently delivered a series of “waffle forms” to Unistress Corporation in Pittsfield, Massachusetts to cast floor slabs for a new semiconductor foundry in upstate New York. The \$4.2B facility is being built for Global Foundries, the largest semiconductor foundry in the world, with operations in the United States, Germany and Singapore. According to the company, it will be the world’s largest and most technologically advanced semiconductor manufacturing facility. The building is expected to take three years to complete and will supply chips for everything from computers to cell phones. The chips will be manufactured in a clean room, where the air is completely exchanged and filtered six times per hour. The 210,000 square foot clean room will be located on the second floor suspended on a “waffle table” made from precast concrete slabs produced by Unistress Corporation.

Hamilton Form designed and built formwork to produce the waffle slabs. The slabs have a series of cylindrical holes for ventilation pipes and wire chases in the deck. The holes are 18, 14 and 12 inch diameters. Products are 22 feet long by 8 feet wide with an overall perimeter depth of 4 feet. Two different deck thicknesses were called for, requiring separate base forms. Both ends of the product have a 1 foot, 8 inch tall keyed extension with protruding rebar loops for a final closure pour. The keyed sideforms are hinged, and pivot away from the product for stripping.

The cylindrical holes are formed using Sonotube® voids. Unistress needed a simple and precise method to hold the voids in place during concrete placement. To accomplish this, Hamilton Form fabricated cylindrical steel alignment plates that fit inside the voids. To maintain precise tolerances, the plates were cut on a computer controlled, high velocity plasma cutter, then the edges of the plates were machine beveled to make it easier to set the voids in place.

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Sideforms pivot open for stripping.



Steel alignment plates keep the cylindrical voids in place.



The waffle slabs delivered by Unistress Corporation are enormous, weighing as much as 24 tons each.

# Global Foundries builds state-of-the-art precast facility with floors full of holes

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Bottom alignment plates are welded to the deck of the form at the hole locations. An upper alignment plate assembly is bolted into position at the top of the form. The alignment plates hold the Sonotube voids in place. For ease of stripping, the upper disc assembly is positively pulled out of the product and void by turning its mounting bolt.

Headers are made in two sections that stack and are bolted together. The upper section forms the product end key and has slots for protruding rebar loops. The lower section of the header stays in place, while the upper section is removed for stripping. Protruding rebar loops at the ends of the product presented a particular challenge. The central rebar loops extend straight out of the product, while the two ends protrude out at opposing diagonals. To accommodate this, Hamilton Form modified the header support structure adjacent to the bent rebar.

Not your typical project, the formwork required creative thinking and problem solving to develop a workable design. One of the greatest rewards for Hamilton Form on this type of project is hearing that the customer had no problems and was able to cast the product precisely and efficiently. Shortly after delivery of the formwork, Ralph Schwarzer, manufacturing manager at Unistress contacted Hamilton Form to let us know that the forms worked perfectly. Set-up was easy with the alignment plates and the product stripped easily. 1,362 waffle slabs are being produced for the project, each containing a 350-piece rebar cage. The project is progressing on schedule and within budget, thanks in part to the efficiency and ease of use of the waffle slab formwork.



The waffle slabs form the floor of the clean room for the new semi-conductor manufacturing facility.



The use of SCC made pouring more efficient and contributed to a better finish.



The self contained precast forms allowed for ease of set-up. Twelve forms were unloaded, leveled, mounted and ready for production in three days with a small crew.

## CUSTOM FORMS AND SO MUCH MORE

## Galvanized Steel Embed and Beveled Plates

Over the past several months, Hamilton Form has been busy producing galvanized steel plates. Many projects, especially bridge projects, call for embed plates to be cast into beams. Hamilton Form fabricates **studded embed plates**, as well as **matching beveled plates**, machined for both **grade slope** and **cross slope**. Plates are produced on our state-of-the-art CNC Gantry Mill with computerized interface control to assure accurate dimensions and slope of the plates, as well as placement of studs and holes. Hamilton Form has the capability to make 54" x 54" plates, up to four-inches thick at a 10% slope.

*The next time your project calls for embed plates, call on Hamilton Form; 817 590-2111*



Hamilton Form produces plates made to your specifications on our state-of-the-art CNC machinery.



Embed as well as beveled plates are fabricated to your specifications.

## PRACTICAL, EFFICIENT VIBRATION SOLUTIONS

## Mach™ 1 External Vibrators

Vibration is used to consolidate concrete in steel forms to increase the concrete's compressive strength and strengthen the bond between concrete and rebar. Vibrators "liquefy" the mortar, allowing entrapped air to escape and the mix to flow in the form. Removing excessive entrapped air benefits concrete by decreasing its permeability.



An easy and convenient method for applying vibration is with a **MACH™ 1 External Vibrator**. The design of the MACH vibrator has proven to be durable and trouble-free. It requires no bearings and only has three moving parts. The MACH Vibrator can be attached to a bracket on the outside of the form, used with Vibrotrack or used with vibratory screeds.

*No matter how you attach them, the MACH 1 high frequency pneumatic vibrator will provide deep consolidation of concrete in your forms and will last for years.*

*Call 817 590-2111 to order.*

## Vibration Tips

External vibration is designed to get the mechanical oscillations through the form skin and into the concrete. When vibrating concrete in a steel form, remember:

- Concrete should be significantly above the vibration level and a good distance laterally before applying vibration.
- Never use vibrators to move concrete laterally in the form, which can cause flow lines.
- If more than one lift is being made to place concrete in the form, vibrate the first lift, then the next to thoroughly blend the lifts together.
- When vibrating, observe visual clues to determine when vibration is complete, such as when large air bubbles stop to escape and the surface of the concrete takes on a gloss or sheen.
- Apply vibration so that vibration occurs in overlapping areas of influence. You should be able to easily observe the area of influence.
- Stagger the locations of the vibrators when vibrating. Do not operate vibrators directly across from each other because they can synchronize and cancel each other out.
- Never vibrate an empty form. It will damage the form. Over vibration also causes form damage.

## Carts Dispense Blankets and Tarps with Ease

**A**s cold weather begins to set in, it's time to pull out the blankets. Draping insulated curing blankets over your beds captures the heat of hydration to help concrete cure faster. Faster curing means you can turn your beds quicker. If production is outside, using insulated blankets is critical as summer fades and we get ready for cooler weather.

Hamilton Form insulated curing blankets are made of 1/4" closed cell foam insulation, adhesive bonded between two layers of abrasive-resistant vinyl with heat welded seams. Because one size does not fit all, our blankets are custom made to any size so they work for your specific application.

An insulated curing blanket from Hamilton Form is heavy and durable, and will last for many years if handled properly. The easiest and most efficient method of handling our blankets, especially on long line beds, is with a Roller/Dispenser Cart.

A Roller/Dispenser Cart gives you the power to quickly and easily roll and unroll curing blankets and tarps. Our carts are customized to work with a plant's individual requirements. Carts can be designed to ride on the form, on a ground mounted steel track or on steerable rubber tires. A bow rack can be built into the cart. The blanket is placed over the bows so it doesn't touch and disturb the finish on the product.



**Carts help protect your investment in insulated blankets and tarps by keeping them off the ground and neatly rolled when not in use. Two men can quickly and easily cover and uncover a bed, saving time and labor.**

A single cart can work multiple beds by adding a quick-release mechanism on the reel and storage racks at the end of the beds. That way, each bed has its own reel, storage rack and blanket. The cart is moved by crane from bed to bed. For even more flexibility, a steerable cart with rubber tires can be driven from bed to bed without the assistance of an overhead crane.

## The Cleaner™ Piling Form Cleaner



**F**orm cleaning is one of the most difficult and labor intensive operations in a precast plant. Save time and effort when cleaning forms with a form Cleaner Machine. Designed expressly for use in precast plants; Hamilton Form Cleaner Machines clean steel forms quickly and easily. Daily cleaning of forms will prevent heavy build-up from developing and help keep forms in good shape.

Three different machines are available; a Double Tee, Flat Deck and Piling Form Cleaner. The Piling Cleaner has roller wheels that allow the machine to roll on 10" to 24" piling forms. Longer rollers are available for wider forms. The machine features a self contained 13hp electric start gas engine.

Brushes are custom made to fit individual form size and shape. Different brushes can be used on the same machine for different size pile forms. The brush assembly is easy to attach and remove. Lifting lugs are located on each side of the engine and can be used to lift the machine.

Proper maintenance is always a good investment. Invest in maintaining your forms with a form Cleaner Machine from Hamilton Form.

For more information call 817 590-2111  
or visit [www.hamiltonform.com](http://www.hamiltonform.com)

## Stressing Frame Provides Economical Solution for New Stadium



**A**s is the case with most small stadiums, it is not cost effective to purchase individual forms for each component. That's why, when NAPCO Precast in San Antonio, TX needed forms for the University of North Texas's new Mean Green Stadium, Hamilton Form went to work developing a cost-effective solution.

The challenge was to develop only a few forms to minimize the investment in formwork for the project, but make them highly adjustable to cast all of the required products. The customer also wanted to utilize the formwork for future stadium projects or to cast other prestressed products.

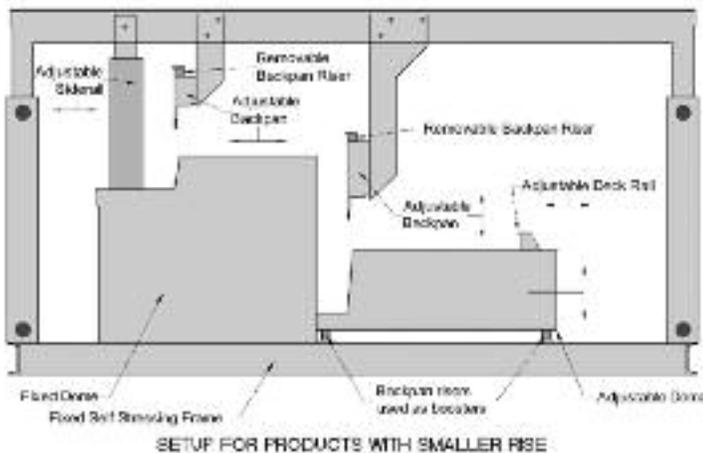
To accomplish those goals, Hamilton Form built self-stressing frames to handle the prestress force independent of the stadia formwork. The non-self-stressing forms are installed within the stressing frame. The components that make up the formwork are designed to be highly adjustable. Whereas most stadia forms are designed to cast only a few products, the components that make up these forms can be configured to cast many different products. For example, the side rail adjusts laterally for varying deck widths, the back pans and domes are adjustable for different riser heights, and the deck rail moves laterally. The forms also feature removable back pan risers. When removed, the risers are used as shims to raise the dome.

This solution made the forms more economical to build than typical self-stressing stadia forms. Because flexibility was built into the design, only two forms were required to cast the entire stadium. The first form will cast four of the higher volume products with an adjustment in riser height and width. The second form will cast the remaining nine riser sections and the tub unit. The entire stadium calls for 800 precast products, 600 of them are being cast in the two stadia forms. NAPCO reports the forms are working well in production with change-overs taking less than a day.

Given the variety of adjustments that can be made, NAPCO plans to make use of the forms for a future stadium project. In addition, the stressing frame can be used to cast other prestressed products such as spandrels or beams.



**Some risers called for a broom finish with a sand blasted vertical face and were poured in 3 stages with no cold joints. Lower sections were allowed to initial set before the broom finish was added. A second pour filled the top section. Finally, the vertical face that required sand blasting was poured with a dryer mix.**





## Hamilton Form Company, Ltd

7009 Midway Road • Fort Worth, Texas 76118  
Ph 817.590.2111 • Fx 817.595.1110  
[www.hamiltonform.com](http://www.hamiltonform.com)

### Yanyong Srianant

**C**ommunication is the key in any efficiently run organization. That's why Yanyong Srianant plays a critical role at Hamilton Form. Known simply as "Young," he is the key interface between engineering and production. Young reviews designs and drawings with the engineering department to make sure forms are designed for production efficiency. He is also responsible for inter-departmental scheduling in production, making sure resources and tools that are needed are available. He assures projects flow efficiently in the plant. He also manages our safety and compliance programs.

Young is originally from Thailand, immigrating to the U.S. forty years ago. He is married and has one son. His son recently graduated from Southwestern University and is now pursuing a graduate degree at the University of Texas in Dallas in preparation for a career in medicine. The Srianant's live in Hurst with their family dog, who loves to play. The family enjoys sports, especially football.

Young has been with Hamilton Form since 2005. During that time, his keen instincts and ability to communicate between departments has improved efficiencies many times over. His commitment to continual improvement continues to do so.

### Employee Profile



Ask Young what he enjoys most about Hamilton Form, and he'll tell you it's the people. He enjoys working with people who like their job and are engaged in their work. Hamilton Form is fortunate to have many people who, like Young, enjoy working for the company and are committed to improving the business.