

# Everything is Bigger in Texas

## How the Mega Slab went down

by Adrian Rojas

**T**he Mega Slab placement at the General Motors (GM) Arlington Assembly Plant, Arlington, TX, was a successful exercise in planning. At 256,000 ft<sup>2</sup> (23,780 m<sup>2</sup>) and 8 in. (203 mm) thick, the slab placement was a massive endeavor. To meet the scheduled completion date, Barton Malow elected to make one large placement instead of multiple 20,000 ft<sup>2</sup> (1858 m<sup>2</sup>) placements that would be used on a more typical job. The commitment to bringing the best to the Mega Slab project—led by Barton Malow’s team of Brian Willard, Superintendent; Ethan Uhl, Placement and Finish Superintendent; Chris Hofe, Project Director; Josiah Goins, Senior Project Manager; and Craig Lowell, Construction Manager—was showcased throughout the weekend of January 13-15, 2018.

The project required 6470 yd<sup>3</sup> (4950 m<sup>3</sup>) of concrete provided by Redi-Mix Concrete (Fort Worth, Dallas, and Kennedale, TX). The concrete was a 4000 psi (27.6 MPa) blended aggregate mixture with a mid-range water-reducing admixture and a steel fiber content of 23 lb/yd<sup>3</sup> (13.6 kg/m<sup>3</sup>). Finishing operations involved nearly 33 consecutive hours of placing, raking, leveling, troweling, and sawing. To do it,

Barton Malow flew in crew members from Lloyd Concrete Services, Inc., Lynchburg, VA; Unlimited Concrete Solutions, LLC, Central Ohio; and its own team from Southfield, MI. Structural Services, Inc. (SSI), Dallas, TX, served as a consultant to help ensure every step of quality was covered.

According to John J. Raad, Project Manager at GM, “Previously, GM limited placements to no more than 40,000 ft<sup>2</sup> (3716 m<sup>2</sup>). By working as a team with SSI, a plan was crafted and approved to make one pour separated into two lanes by using an armor edge. This helped control the shrinkage and pour geometry to give the team confidence to proceed.”

### Planning for Quality

When the 62 concrete finishers, 42 laborers, eight carpenters, seven equipment operators, four supervisors, four safety representatives, two rodbusters, and two layout engineers gathered at the jobsite, they joked and laughed about the mundane: “Was that coffee too weak?” But they also bonded, with comments such as: “Let’s make some history!” After brief introductions, the workers listened to the project leaders talk about toughness (“Don’t get complacent. Stick with the



Prior to the placement of the Mega Slab, the crew assembled inside GM’s Arlington Assembly Plant, Arlington, TX (photo courtesy of Jon Humphrey)



**Preconstruction meeting before the Mega Slab placement** (photos courtesy of Jon Humphrey)



**Before each concrete truck entered the building, steel fibers were added at a dosage of 23 lb/yd<sup>3</sup> (13.6 kg/m<sup>3</sup>)** (photo courtesy of Jon Humphrey)

plan!”), the importance of safety, and the need for quality control. By going over potential hazards and dutifully crossing off each bullet point in their pre-task list, the team leaders set the stage for something monumental.

Teams were assigned work positions according to a color-coordinated pattern on the floor plan. They were also assigned staggered times at the placement “front” to ensure each worker was well-rested over the extended placement. The job was divided into three 12-hour shifts. The first and third shift required 53 workers each, while the second shift called for 78 workers.

### Jumping into Action

As the sun set on Saturday, planning turned into realization. The project leaders gathered the first rotation of workers together for a final safety reminder and a much-needed stretch before the hard work got started. They then excitedly filed into the jobsite—a multi-bay industrial building illuminated by overhead LED fixtures. They walked the full length of the building and then put on their kneepads and hardhats, stopping for a group photo to commemorate the event, right before it started.

### Project Credits

- General Motors, Owner;
- Barton Malow Company, General Contractor;
- Lloyd Concrete Services, Inc., and Unlimited Concrete Solutions, LLC, Concrete Subcontractors;
- Intertek PSI, Testing Agency;
- Redi-Mix Concrete, Concrete Supplier;
- Structural Services, Inc., Floor System and Quality Control Consultants;
- Bekaert, Steel Fiber Reinforcement Supplier;
- Allen Engineering Corp., Husqvarna AB, Multiquip, Inc., Somero Enterprises, Inc., United Rentals, Inc., and Wacker Neuson Group, Construction Equipment Suppliers;
- Ram Tool Construction Supply Co., Construction Materials Supplier; and
- Teplis Travel Company, Travel Agency.

Then there was a familiar sound at the entrance—the rumble of engines as dozens of concrete trucks awaited orders to enter. Soon, traffic directors wearing head lamps on their hard hats raised their batons and directed the trucks to the workers. As the first trucks discharged their loads and left the building, the relatively small floor area covered by each load dramatically illustrated the immense size of the project.

Like a marching band in sync, the workers began an intricate pattern of controlling the placement in preparation for laser screeds to begin leveling. Although the Mega Slab started with a relatively small section, nearly two-thirds of the entire slab was in place by the next morning. The staggered shifts ensured that everyone got the rest, food, and hydration they needed before jumping back into the action.

As teams started the second half of the placement, concrete finishers on ride-on trowels started blading their way across the surface of the concrete that had been placed the night before. As the trowels moved into adjacent bays, saws soon followed, cutting joints in the slab on a 25 x 25 ft (7.62 x 7.62 m) grid.





Throughout the Mega Slab placement, personnel intently focused on their tasks and equipment use was tightly coordinated (photo courtesy of Jon Humphrey)



Four laser screeds were used during the placement, helping to provide a slab surface that was within 3/16 in. (5 mm) of plane over the huge floor area (photo courtesy of Jon Humphrey)



The operators of 38 ride-on trowels made sure that the finished floor had high FF/FL numbers—achieved values were 56/42 (photo courtesy of Jon Humphrey)



Curing of the finished Mega Slab was accomplished using polyethylene sheeting with a saturated superabsorbent polymer backing. The sheeting was left in place for 7 days (photo courtesy of Jon Humphrey)

## Completing the Mega Slab

By the morning of January 15, the work finished almost as abruptly as it began. And it was a massive success. Not only did the teams place 315 yd<sup>3</sup> (241 m<sup>3</sup>) of concrete per hour, they completed a slab that achieved overall floor flatness and levelness (FF/FL) numbers of 56/42. Moreover, a surveying crew found that the floor was within 3/16 in. (5 mm) of plane across the placement's entire area—an impressive feat

considering that 647 concrete trucks had driven across the subgrade throughout the placement.

For the 131 workers and the project leaders, the Mega Slab project was truly a unique event. For many, it felt like the beginning of something even bigger. Nearing the end of the project, one worker exclaimed that he was ready for another enormous placement: “Man, I don’t wanna stop. Let’s do 500,000 ft<sup>2</sup> next time.”

Selected for reader interest by the editors.



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and 16 offices, the company's core purpose is to “Build with the American Spirit: People, Projects, and Communities.”