

# ekkomaxx™ *Case Study*

ZERO CARBON CEMENT SYSTEM

## GA DOT District 2 I-16 Eastbound Right Lane Dublin GA..... ekkomaxx® Full Depth Slab Replacement

On February 27, 2008, the Georgia Department of Transportation executed placement of 12 cubic yards of **ekkomaxx**®, CERATECH's high performance Non-Portland cement concrete. An area of failed slab sections measuring approximately 30 x 12 x 10" on Hwy I-16 near Dublin, Georgia with large transverse and longitude cracking and with 2-3" of settlement was removed by GA DOT crews.

Once the failed slabs were removed, inspection of the sub-grade revealed excessive moisture and disturbed material. A load of crushed angular stone was spread in a 3" lift across the underlying soil and then compacted prior to the placement of **ekkomaxx**®. This would prevent future settlement in the area to be repaired. A gang drill was then used to re-establish dowel holes across all transverse joints. New epoxy coated dowel bars were inserted thus completing the site preparation.





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**Material Batching:**

At around 9 AM on 27 Feb, the first batch of **ekkomaxx®** was prepared at the B.H. Hall Redi-Mix plant in Dublin, GA. Specifications called for two 6 cu. yd loads to be delivered sequentially within 10 minutes of each other at the project site. B.H. Hall uses rear discharging 9 cuyd mixing drums equipped with dual mixing fins. Tables 1 and 2 below lists the mix design per yard and actual batch weights for each load:

CA @ SSD	FA @ SSD	Binder	Water (Gal)	AEA (Oz)	SCA (Oz)
1713.51	1426.42	750	20.64	13	68

Table 1, mix design

	CA @ 1%	FA @ 5.4%	Binder	Water (Gal)	AEA (Oz)	SCA (Oz)
Load 1	10384	9021	4500	56	78	408
Load 2	10400	9056	4500	56	78	408

Table 2, load ticket summary

The drum turned at mixing speed (16 - 18 rpm) during each phase of the batching process, with each phase lasting 3-5 minutes on average. Weather during batching was clear and sunny with ambient temperatures ranging from 50F-60F. While batching the first truck, the plant received a call from the crew onsite to delay delivery until 1130 due to mechanical problems with the dowel bar machine. Batching of the second truck was delayed by approximately 40 minutes and batching of the first truck continued, since it was near com-



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pletion. After batching, both trucks kept continuous rotation of their drums at slow speed. Per the original mix design, a W/C ratio of .23 was required to achieve a 3-5" slump, with 124 gal of total batch water per load. A review of Table 2 above indicates that the trucks left the plant with approximately 127 gal (if not more from wash down at the slump rack) when you account for the moisture in the aggregates.

## Material Placement & Finishing:

At approximately 11:20 am, the **ekkomaxx®** activator admixture and remaining mix water was added to the 1st transit truck.

Site conditions at time of placement : ambient temp 42°F, surface temp 43°F. 11mph winds with gusts to 20 mph. Material was mixed for 6 minutes after addition of **ekkomaxx®** activator admixture. Material was mixed for an additional minute and discharged into the repair area.



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### Material Placement & Finishing (continued) :

Temperature of material at discharge was 58°F. GA DOT conducted an air content test on the material from the 1st truck which yielded 3.5% air content which was well within GDOT's specification.

The GA DOT crew utilized shovels, pencil vibrator, and vibratory roller screed to consolidate the material. A bull float and hand trowels were used for finishing techniques. A push broom was also applied to provide texture to the surface.

The same procedure was followed for the second truck. The 2nd load was discharged around 12:15 PM and finishing techniques completed by 1:00 PM

After finishing the material, the crew applied a coat of W. R. Meadow's curing compound with a handheld sprayer.



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## Material Placement & Finishing (continued) :

The crew supervisor was advised to re-establish all joints to full depth no sooner than 4:30 PM . He was also advised not to open up the repaired area sooner than 5:30 PM ( just 5 hours after placement ) Temperature of the material at that time was 94°F.

