



Dixie CONTRACTOR

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**Paving with
Perma Flex**



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Dykes Paving, based in Norcross, Ga., uses an innovative repaving technique to help aging asphalt stand up to modern loads.

By Steve Hudson

They start down deep: tiny fissures brought on by the strain of bearing heavy traffic. They grow under the pounding of tires. They spread, reaching upward, until one day there they are — cracks in the asphalt, and a parking lot that's a real mess.

For a long time, there were only two ways to deal with such cracks. One was to pave over them with a new topping layer. The result looked good. But pretty soon the cracks were on the move again, migrating up through the new pavement until it too was a cracked disaster.

The second solution was to start over, tearing out the old pavement and repaving from scratch. That at least eliminated the cracks. But it was expensive. And when a heavy load came along, a tiny fissure would start down deep. You know the rest.

What is the solution to the problem of cracking asphalt? That's the question that began to bother Jim Dykes of Dykes Paving and Construction, a contractor based in Norcross, Ga., near Atlanta.

The answer he came up with is something called Perma Flex paving.

What is Perma Flex paving? Essentially, it's an asphalt paving system designed for economical repairs on large asphalt areas. And how did Dykes Paving get into Perma Flex paving?

"We invented it," Jim Dykes says. It began, he explains, when his company began to get inquiries about repair of badly cracked parking lots. The traditional approach — removal of the old pavement, followed by repaving with new pavement — was expensive. Another approach — an asphalt overlay — did not work over the long haul since the cracks soon migrated through the new pavement to leave it in bad shape too. After all, everybody knew you could not overlay broken pavement that showed any sign of movement under a load.

But overlays were certainly less expensive. Was there some way to design an overlay so that it would work? Dykes

thought there might be.

"So we started looking at how cracks migrate," Dykes says, "and we found that they migrate around the fine particles and not through the solid pieces of rock."

That's what gave him the idea.

"We decided that if we had no fines, we might be able to keep the cracks from coming through," he continues. And so he went to work experimenting with different approaches to a no-fines paving system. That's how Perma Flex paving came to be born.

The Perma Flex system uses three components — liquid asphalt, graded asphalt coated PF aggregate, and traditional asphalt topping — and it is elegant in its simplicity. First, the broken pavement is cleaned with a power broom. Then a tack coat of liquid asphaltic cement is sprayed over the area; it not only seals the cracks but acts as a bonding agent for the next layer too.

It is that next layer which is actual Perma Flex pavement. The Perma Flex layer is made up of #67 or #7 stone which has been heated and then coated with liquid asphalt. It is applied in a layer measuring about 1½ inches thick, then rolled with a steel-wheeled roller until sufficient compaction has been achieved.

"When you roll it, the stone wedges into the cracks in the existing pavement," Dykes says. "That locks everything together to prevent movement and prevent cracks from reflecting into the asphalt topping."

The final steps are straightforward: apply a second heavy coat of liquid asphalt, then finish the project with a layer of asphalt topping. The topping course is finished as usual, and the paving is done.

Dykes Paving recently undertook a mammoth Perma Flex paving job at the Winn Dixie distribution center near Atlanta. There, an asphalt parking lot was faring badly under the stresses imposed by almost constant truck traffic. The lot had originally been paved and later overlaid us-



Left: This Case 252 was one of several rollers used on the project. *Below:* Final paving on a portion of the Winn Dixie project.

ing a fabric, but because there was no mechanical locking bond the fabric was shifting under the lateral forces imposed by sharply turning trucks. As a result, the pavement was deteriorating and cracking badly. It was an ideal situation in which to use Perma Flex paving to arrest the cracking and

restore a smooth surface.

As it turned out, this was not the Winn Dixie site's first experience with Perma Flex paving. Three years ago, Dykes had placed a relatively tiny 30 x 50 section of Perma Flex over some seriously deteriorating pavement at the site's main entrance.

"That little patch of Perma Flex had to handle every truck coming into or out of the distribution center," Jim Dykes explains. "But it didn't develop a single crack in three years."

Needless to say, that went a long way toward convincing the customer to use Perma Flex on the entire lot. "They decided that if anything would hold up for three years," he continues, "then they needed to find out what it was and use it for the whole parking lot."

Work on the parking lot rejuvenation project began on a sunny day last May. It started with milling of portions of the existing surface to bring them to correct grade. Miller Grading, the milling subcontractor, used a Caterpillar PR-450 to handle the milling operation. Milling covered close to 20,000 sq. ft. and ranged in depth from 1/2 to 1 1/2 inches. It yielded several hundred yards of milled material, which was loaded into trucks, hauled a short distance, and used to create a half-acre parking area and a 15 ft. wide driveway extension for the facility. All milling was completed in 13 working hours. Then the area to be paved was mechanically cleaned with a Broce broom, and all holes were leveled with Perma Flex paving.



To further enhance the strength of the finished pavement, all manholes and drop inlets were raised to the finished grade. Doing that, Dykes explains, eliminated the need to feather out the new pavement around such drainage structures. "That meant that the pavement would be the same thickness everywhere on the project," says Bob Atwood, Dyke's vice president, "and that gave the same strength at all drainage structures as on the rest of the lot."

With that portion of the work completed, the next step was to apply the first tack coat. Dykes used a 1500-gallon Etnyre distributor to handle that portion of the job.

Then, using a Blaw-Knox PF172 hydrostatic paving machine, Dykes' crew began to place the Perma Flex pavement.

"We applied 1½ inches of Perma Flex paving," says Atwood. The Perma Flex course — which used larger stone than usual because of the extremely heavy traffic it would have to bear — was compacted with an Ingersoll Rand DA-40 and Case 252 steel wheeled roller.

After the Perma Flex was placed and compacted, a second tack coat was applied. Then one inch of surface mix was placed, compacted, and finally finished with a Caterpillar SP1300 pneumatic rubber-tired roller.

The Perma Flex paving operation went smoothly, although Atwood acknowledges that traffic control was a constant factor on this job. There is a lot of traffic at this site, too — a minimum of 1,100 trucks in and out in an average week.

"One of the stipulations of our contract was that we could in no way impede truck traffic into and out of the facility," he says, adding that careful attention was required to work out the logistics. "Each evening, we got together with the Winn Dixie traffic manager to schedule the next day's work."

"We originally figured the job would take 21 days," Atwood says, "but we finished it about five days ahead of schedule."

Will Perma Flex continue to grow in popularity? Jim Dykes thinks that it will.

"The conventional method has always been removal and replacement," he says. "But when you have to completely remove existing pavement, you're just hauling off structural equivalency. Then there's the time factor — removing and hauling off existing pavement takes time, and that's a big factor when the customer is trying to get the job finished as quickly as possible. Perma Flex helps in both those areas. And Perma Flex paving is much cheaper too."

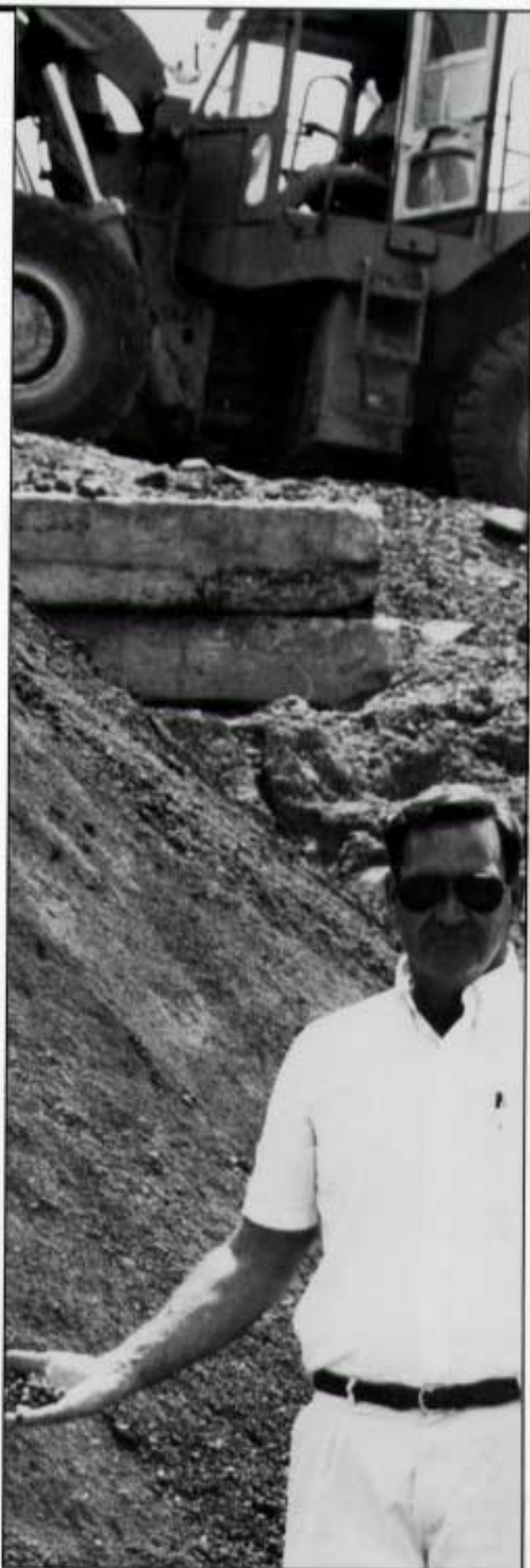
That cost factor, in fact, is potentially enormous.

"There is a savings potential of tens of millions of dollars," he says.

Is Perma Flex the last word in new approaches to paving? Not by a long shot, Dykes will tell you. In fact, he's currently experimenting with several other new techniques in asphalt paving too. One has to do with recycling old tires. Another involves various fiber additives. All show promise, and all are drawing his attention.

But for now, it's Perma Flex that's drawing the attention in the paving world.

"It's old hat to us," he says, "but it's still brand new." □



Jim Dykes checks stock piled material at his company's plant in Norcross.