

PAVINGNEWS

A Caterpillar publication serving the global paving industry



Stabilization In The Sahara

New Cat® CD54 Asphalt Compactor

Shaft keeps split drums
connected over extended period



CATERPILLAR®

The Drive to Sustainability



Lieven Van Broekhoven
Worldwide Sales
and Marketing Manager

This issue of *Paving News* brings into sharp focus the goal of global sustainability. The content illustrates how seemingly small steps can pay big dividends when it comes to reduction in consumption of natural resources and extending the usefulness of construction materials and construction equipment. Caterpillar, Cat® Dealers, and their customers are making decisions that include consideration of the impact on sustainability.

A great example is the extended service intervals that are increasingly available on Cat equipment. Due to advanced engineering technology, hydraulic oil change intervals for some Cat models have been extended to 3,000 hours compared to the industry standard of 1,000 hours. Let's say the hydraulic oil capacity is 200 liters (53 gal). If you expect 7000 hours of use from that machine, you'd change hydraulic oil twice on the Cat product and six times for the industry standard machine. You would reduce hydraulic oil consumption and disposal by 800 liters (212 gal).

That's just one machine. Think of the global impact of that one advance

gained through a combination of quality Cat fluids and the integrity of the Caterpillar hydraulic system.

Caterpillar does not build disposable products. Cat equipment is not built to minimal engineering standards. They're purposely built to be re-built. Whether it's a transmission, an engine, or an entire machine, Caterpillar remanufacturing facilities and many Cat Dealers are experts at increasing the useful life cycle of Cat equipment and components.

What about operator training? Do we think of training as contributing to sustainability? Your investment in crew training pays you back in reduced re-work. When we do any job right the first time, we save not just money but also resources. That's why Caterpillar puts such emphasis on training programs and project consulting.

In the asphalt paving industry, we're accustomed to thinking about the recycling of old asphalt structures. Let's get accustomed to considering sustainability whenever we make a decision. At Caterpillar, we believe that everything counts in the drive to sustainability. ■

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Participants also see a boost in profits.



RM500 ROTARY MIXER

Engine:

Cat® C15 ACERT™

Gross power:

403 kW (540 hp)

Weight w/ Universal

reclamation rotor: 28145 kg (62,049 lb)

Maximum width:

2.98 m (9.58')

Width at rear wheels:

2.82 m (9.17')

Travel speed:

9.2 km/h (5.7 mph)

Universal rotor width:

2438 mm (96")

Universal rotor diameter:

1375 mm (54")

Universal rotor max. depth:

406 mm (16")

^ The rotary mixer worked productively in the clay-based soil.

Heavy Trucks and Sun Challenge Rural Road



Cat® RM500 Rotary Mixer stabilizes Sahara haul route

^ A special bonding agent was applied to strengthen the road.

The bonding agent is environmentally friendly, as it is a natural fiber found in trees and plants.

Tamanrasset, Algeria, was established centuries ago along the trans-Saharan trade routes. The routes evolved into the Trans-Sahara Highway, and Tamanrasset remains a key outpost today. It is an oasis where citrus fruits, apricots, dates, figs and other produce are grown.

It's also a key oil center, with several large facilities located nearby. A single clay road serves as a pipeline from the facilities, connecting them to the Trans-Sahara Highway.

The clay road was in need of repair. It came as no surprise given the pounding of both the heavy trucks that use the road, as well as the sun. Temperatures in the desert city of about 70,000 are

among the highest ever recorded. Highs have hit 47.4° C (117° F) in both July and August. The average temperature in July is 35.9° C (97° F).

The baked clay can become brittle as the heavy trucks travel the roads. Yet the road also experiences extreme temperature changes over the course of the year, with average lows falling to 6.4° C (44° F) in January. Those on the jobsite believe that the temperature fluctuations likely had as much to do with the deterioration of the road as did the heat itself.

The Project

The soil road desperately needed repair. Cost was a key consideration, so

the decision was made to go with stabilization. A Cat® RM500 Rotary Mixer was the machine selected for the job by Chebli & Tellawi Corp., the contractor handling the work.

The project called for all 50 km (31 miles) of the connecting road to be stabilized by the RM500. The road was to be stabilized at a width of 9 m (30') and a depth of 20 cm (7.9"). Plans also included the use of a special bonding material to strengthen the road that leads to the oil facilities.

Getting Started

The work began in February. Preparations had to be made before the RM500 could make a pass.

First, a dozer made a very rough grading pass. This work mostly required removal of large stones that had been brought to the surface by the heavy

trucks and temperature fluctuations. The dozer also cleared larger chunks of broken clay.

A water truck then sprinkled the roughly graded surface. Next, the RM500 made a stabilizing pass. Ahead of the RM500 was a truck containing the bonding material. A hose connected the rotary mixer and the truck that contained the binding agent. The emulsion was mixed with the soil in the mixing chamber of the RM500.

The bonding agent is made from calcium and lignin, a complex polymer extracted from paper pulp. Lignin is environmentally friendly, as it is a natural fiber found in trees and plants.

The bonding agent was chosen because of its fit with the existing clay road. The agent helps make clay more elastic, preventing material from breaking loose. The organic binding agent

also facilitates compaction.

A motor grader then made a finished grading pass, followed by a soil compactor.

The Challenges

Hitting the deadline was crucial to the project. Inefficiencies associated with the work would have cost the oil industries time and money. Once the work was started, it had to be completed in a hurry.

Weather also added time pressure. The project started in February, when the average temperatures range from 7.5-20.6° C (46-69° F). But the likelihood of a heat wave increased with every passing day.

Another challenge was that the operators had never previously worked on a rotary mixer. The speed of the project increased quickly as the crews grew in



experience. At the beginning, the crew was stabilizing 58 m (190') per day. By the middle of the project, the pace was 600 m (1,968') per day.

By the conclusion of the project, crews reached a working speed of 1200 m (3,936') per day.

It was a substantial increase and showed how quickly operators can adjust to the new machine and bring productivity to the worksite.

The durability of the machine also impressed Chebli & Tellawi Corp., as did the productivity. Operators, meanwhile, appreciated the sight lines around the machine. "We are impressed by the visibility," said one operator. ■

BUILDING THE RELATIONSHIP

The Cat® RM500 Rotary Mixer used on the job was the first such machine sold in Algeria. Making sure operators and support crew from Chebli & Tellawi Corp. were able to maximize the potential of the machine was crucial to the success of the project.

This led to a week of training arranged through the local Cat Dealer. Trainers from Caterpillar and the dealership provided hands-on instruction a month before the oil road project began. The goal was to train two operators and one mechanic on operating the machine and making routine service

checks to help prevent unplanned downtime.

Chebli & Tellawi chose the RM500 in part because of their relationship with the Cat Dealer. The application and service training provided by Bergerat Monnoyeur is an excellent example of the extra value a Cat Dealer can bring to the customer. Customer support and parts availability are also good reasons to choose Cat.

Support is crucial at any jobsite, but nowhere more than a remote jobsite such as Tamanrasset.





Cat® compactors achieve surface density while protecting base

The Transformation of Bird's Nest Stadium

The Race of Champions (ROC) went off smoothly in the Bird's Nest Stadium in Beijing. But to the paving contractors developing the track, the real race had occurred a few days earlier.

"The project involved a major event with a lot of attention," noted Cao Ying, manager of Beijing Luyuantong Construction Equipment Rental Co. Ltd. "We couldn't afford any mistakes."

The fact that the results of the project would be viewed by thousands added pressure. The extremely tight timeframe added even more. Besides having

only a few days to complete the work, the contractors also faced significant sustainability challenges as well.

Transformation

The race was held Nov. 3-5 in Beijing National Stadium, more commonly known as Bird's Nest Stadium, made famous during the 2008 Olympic Games. The requirements were for the stadium to be converted into an auto race track, then be turned back into an athletic field immediately after the race.

Specs for the ROC called for a surface 1160 m (1,269 yd) long, and covering

10,000 m² (108,00 ft²), with each lane widened to 7 m (23') as opposed to the previous 6.5 m (21'). In addition, the start lane was lengthened to enable a maximum speed of 150 km/h (93 mph) throughout the course.

The tight timeframe and budget made equipment selection crucial. Productivity was a key motivation, but certainly not the only criteria. "Exceptional customer service also contributed to our selection of Cat® equipment," noted Cao Ying, an engineer with more than a decade's experience in road paving and



Photo courtesy of Eddie Fletcher

“The project involved a major event with a lot of attention.”

operations management.

The construction technique and capabilities also were significant factors. Those challenges could be met through Cat equipment and the expertise the contractors provided.

Other obstacles, such as time and protecting the existing facility, remained. “The difficulties were less about construction techniques and capabilities, but more about how to complete a quality project in a limited period of time, while also protecting the pre-existing facilities in the Bird’s Nest,” said Geng Jianguo, construction

superintendent for the ROC race track and engineer from Beijing Construction Engineering Group.

To protect the turf, the green grass was temporarily relocated before the course was paved. The existing plastic track also required protection, as it would be used for future sporting events shortly after the ROC.

“Traditionally, 3 cm (1.2”) thick aluminum plates would be laid over the plastic track before placing the asphalt and base layers,” explained Geng Jianguo. But time was an issue. “This method leads to a long construction

period, followed by troublesome removal,” Geng Jianguo said.

After a comprehensive study, the contractor decided to overlay a dust-proof tarpaulin, topped by a layer of bamboo plywood. The plywood was highly flexible, which provided effective protection for the plastic track. It also was light, inexpensive, easy to install and environmentally friendly.

The project to pave the Bird’s Nest race track officially began on Oct. 22 with placement of the bamboo plywood. That took several days, and the plywood was quickly topped by a 15 cm (6”) lime flyash base. Then it was time to pave.

“Paving began only after this ‘double safety’ protective layer was completed,” stated Cao Ying. With the protection in place, the rest of the project was in the hands of the contractors. “The subsequent project depended on high-quality equipment and skilled operators,” Cao Ying said.

Paving Begins

During the paving process, Luyuantong Construction Equipment Rental Company Ltd. provided two Cat

A UNIQUE, SUSTAINABLE PROJECT



Bird's Nest Stadium wasn't the first athletic field to be transformed into an auto racing track. But the Race of Champions project did set many precedents in terms of low costs and sustainability. Among them:

- Great efforts were made to protect the existing facilities. That included the use of bamboo plywood, an environmentally sensitive material.
- Also protecting the existing surfaces were Cat® CB534D Vibratory Asphalt Compactors, as well as a CB14 Utility Compactor. The machines were able to achieve the required density without damaging existing base materials.
- Turf from the athletic field was removed before construction began. It was cared for during the construction and race, and later returned safely.
- At the conclusion of the ROC event, a Cat PM102 Cold Planer removed the asphalt and lime base. Those materials were returned to the supplier and recycled.
- Low emissions of the Cat equipment enabled safe work in the enclosed stadium.



CB534D Vibratory Asphalt Compactors, one small double-drum asphalt compactor, and one Cat CB14 Utility Compactor. Two rented pavers worked in tandem.

"The Cat CB534D Compactors gave not only higher precision, but also the advantage of dual frequency and dual amplitude," explained Cao Ying.

"We were supposed to protect the plastic track in the Bird's Nest while delivering a sufficiently strong race track surface," he continued. "The CB534D has enabled thin-lift application and fully satisfied the project requirements with its multi-amplitude and multi-frequency vibratory systems, as well as a superior control system."

On Oct. 30, the time-sensitive paving project in Bird's Nest Stadium was completed and moved to the test phase. Two days later, a huge race track was ready for the champions to step up and prove their mettle.

Turning It Back

The end of the race was the beginning of yet another round of work for Cao Ying as he and his crew had to return the race track to its earlier state as an athletic field. The major task in this phase was to remove the track within two days.

Cao Ying rented a Cat PM102 Cold Planer for the job. "The machine is powered by an eco-friendly, ultra-efficient engine," he said. "With high-precision controls and durability, the machine is suitable for a wide range of scenarios."

After the race track was removed, the scrapped asphalt and lime flyash were returned to the original manufacturer for recycling.

Then, finally, the job was done. ■

Information and photos provided by Shi Hui, Highway Construction and Maintenance (HCM).

New CD54 Compactor

Shaft keeps split drums connected over extended period

The Cat® CD54 Drum Steer Asphalt Compactor offers a versatile vibratory system that produces desired results on all types of asphalt mixes, from tender to harsh.

Drum connections are a key feature of this new Cat compactor. The exclusive pod design utilizes an axle-type connection with maintenance-free, tapered roller bearings that support each drum-half and eliminate any potential for contact or separation between the two halves. Most other manufacturers utilize large turntable-type bearings that lead to more wear and increased maintenance.

Dual seals provide two layers of protection that prevent contamination and ensure long-term performance. Oil bath lubrication delivers continuous recirculation of oil inside the sealed housing, leading to longer service intervals and lower overall operating costs.

In addition, the CD54 can be used in all phases of asphalt compaction, reducing the need for a variety of rollers. Here are key features:

Four Steering Modes

The CD54 features four steering modes: front, rear, coordinated front and rear, and crab operation. When fully offset, coordinated steering produces a 2.8 m (110") inside turning radius for maximum job site maneuverability.



Sensitive To The Touch Steering

The benefit of electronic steering is combined with the feel of hydraulic steering. When the drum encounters resistance, friction to the steering wheel increases, providing an intuitive feel that is extremely beneficial when operating adjacent to vertical barriers and curbs or when drum articulation reaches the end of travel during tight turns.

Tight Turning Without Tearing

The exclusive split drum propel system provides a tight turning radius without damaging the hot mat. When turning, the outside drum half rotates faster than the inside drum, eliminating the potential for shoving that occurs on standard vibratory drum designs.

Wide Drum Offset

The 1.3 m (51") drum offset provides more coverage for higher production on thin mats while

minimizing heat loss prior to compaction. Ease of operation is provided through fingertip control at the propel lever, enabling one-handed operation. An audio alarm alerts the operator when the drums are aligned.

Balanced Torque

The split-drum drive system features an electronically actuated traction control feature that prevents unequal rotation of the drum halves and assures balanced torque when traveling straight. In order to avoid tearing the mat in tight turns, the drum halves rotate at different speeds. The system features speed sensing propel motors that allow additional flow to the outside drum drive, ensuring proportional speed between the drum halves. The split-drum drive system utilizes maintenance-free tapered roller bearings, for excellent reliability. ■



^ Cat® pavers—including the Cat AP1055D and, above, the AP-1055B—place the base course.

Contractor's commitment to base structure pays off

Laying the groundwork

Extra commitment at the beginning of the project leads to happy customers—and bonus pay—at the end.

That's the philosophy of James Hamilton Construction Co. The paving contractor is so adamant about preparing a proper base that they actually place the materials with their Cat® AP1055D Asphalt Paver.

"It facilitates smoothness on your upper layers," said Clay Kinnikin, Vice President of Materials for Hamilton. "It gives you a leg up when it comes to hitting the specs, and there are cost savings as well."

Project Description

Hamilton recently placed the base material with a paver while working on Highway 128 in Jal, New Mexico, about 64 km (40 miles) east of Carlsbad. A 23 km (14 mile) stretch of road was widened from 7.6-12 m (22-40').

Plans called for developing a compacted base course of 152 mm (6"), placing two 64 mm (2.5") lifts of SP3 SuperPave, and topping that with a 15 mm (5/8") friction course.

Specs called for 25 percent of the hot mix to be recycled material. Density of 92 percent to 96 percent was required.

The project featured 102 000 metric tons (112,000 U.S. tons) of base course, 77 000 metric tons (85,000 U.S. tons) of hot mix and 6350 metric tons (7,000 U.S. tons) of open-grade friction course. The aggregate size for the base materials and first two lifts of asphalt was less than 25 mm (1"). The aggregate in the friction course was specified at less than 10 mm (3/8").

The base and hot mix materials were delivered by belly dump to the jobsite, where a Barber-Greene BG650 windrow elevator transported them to a Cat AP1055D or AP-1055B Asphalt Paver.

Placing the Base

The Hamilton process for placing the base course is almost identical to paving. It begins at the plant, where the

aggregate, fines and water are mixed. "It's developed at a pug mill," Kinnikin said. "We put in 2 percent over the optimum moisture. By the time the materials go through the paver, they're at the optimum level."

Efforts to eliminate segregation are prevalent throughout the process, including multiple drops into the belly dumps. "We're careful how we load it, and we use the pickup machines," Kinnikin said.

The material was dropped into a windrow, and picked up by the Barber-Greene BG-650 windrow elevator. Two loose lifts of 102 mm (4") each were placed to create the 152 mm (6") compacted base. The material was placed by a Cat AP1055D. The paver typically worked at widths of 4-4.2 m (13-14').

Following the paver was a pneumatic roller that made two to three passes. (A movement up and back is considered a single pass.) "It usually doesn't take many passes to reach the density," said James Fields, General Superintendent with Hamilton. Nuclear testing confirmed that the density target had been met. A steel drum roller followed the pneumatic to ensure the base was as smooth as a lift of asphalt.

To the uninitiated, the base course can look a little odd, with light-colored materials being left behind by the paver. "It's whatever color the natural fines are," Fields said. "We've even done recycled base course where it looks like hot mix when it comes out."

Because the process is almost identical to paving, longitudinal joints are a consideration as well. "We cut the edge clean with a tractor, and leave the next lift a little high," Kinnikin said. "Then we compact it." Later, when paving, the crew paved 152 mm (6") off the base joint to prevent stacking.

Fields and Kinnikin say the process makes it much easier to hit smoothness specs. It also saves money. "You save time and there is less waste," Fields said. "In fact, there's no waste at all."



SEGREGATION PREVENTION

Supervisors and crews at James Hamilton Construction Co. follow “Paving By The Numbers” principles, as well as a few of their own processes. Here are some of the ways they fight segregation.

1. Continuous movement. It includes keeping the paving train moving uninterrupted from the beginning of the day to the end. It also involves building speed around plant production and trucks—instead of having the paver set the speed.

2. Watch the windrow. Crews are trained to keep the height and width of the windrow consistent. “That keeps the hopper consistent,” said James Fields, general superintendent with Hamilton. “It continues from there. The hopper keeps the flow back to your gates and augers as consistent as possible.”

3. Overlap the windrow. “Our belly dumps drop their load so there is a little overlap with the previous windrow,” Fields said. “If there is segregated material at the end of that earlier dump, we’ve just covered it with quality mix. The basic rule is, ‘Don’t leave gaps.’”

4. Keep it clean. Supervisors are adamant about crews keeping the machines cleaned and greased. “A high number of mat problems are actually a result of poor cleaning of end gates, chains and conveyors,” Fields said.

5. Don’t leave anyone out when it comes to segregation. “You have to watch the process from crushing, to the plant, to the trucks, to laying it in front of the paver, to the windrow elevator, to the paver itself,” said Clay Kinnikin, Vice President of Materials for Hamilton. “You can’t have a weak link.”



The base placement requires no motor graders or surveying crews. “We use the automatics, and that saves a lot of time,” Fields said.

Kinnikin agreed. “We don’t have to tie up two to three blades and the operators that go with them. We also don’t need survey crews. There is very little waste. We place exactly what the specs call for, and that’s it.”

Base course materials can be a bit harder on the paver and screed, though the AP1055D has held up well under the conditions, Fields said.

When the work is done, a seal coat is applied to keep the right amount of moisture in—and out. Asphalt usually is placed within four weeks.

Placing Asphalt

Hamilton placed two 64 mm (2.5") lifts on the Highway 128 project. The paver worked at a width of 6 m (20'), enabling the width of the road to be covered in two passes. The paver was able to easily handle the volume of material the width required.

The Cat AP1055D featured an electric Cat Extend-A-Mat 10-20B Screed. “We really like it,” Fields said. “We don’t have the fumes, and don’t have to worry about the burners at all. It’s very clean.”

The material was transported in 21 metric ton (23 U.S. ton) belly dumps. The mix arrived at a temperature of about 154° C (310° F). The plant was



THE ROLE OF TRAINING

Training is a key component of the paving process at James Hamilton Construction Co.

The training, which consists of both classroom and on-site sessions, is conducted by experts from Caterpillar. The local Cat® Dealer helps arrange the sessions.

"We do some internal training, but there comes a point when we need extra expertise, and that's when we work with the training team from Caterpillar," said Bill Burgess, Vice President of Equipment Planning and Maintenance at Hamilton.

The Caterpillar team has a great understanding of not only Cat equipment, but industry trends as well. "It's the depth of their industry knowledge," Burgess said. "These guys are going all over helping their customers. They bring a lot of good feedback to us as well as taking our information to other places."

The Caterpillar trainers arrive a few days beforehand to observe the crews. The local Cat Dealer, meanwhile, often videotapes the crews so they can see for themselves the areas that need improvement.

The result is a consistent approach. "We involve all levels of the process," said Burgess. "We take maintenance people, operators and supervisors and have them all in the training."

Hamilton will continue to use the experts from Caterpillar. "We never stop training," said Clay Kinnikin, Vice President of Materials at Hamilton. "It isn't something you finish doing."

CAT.COM/Training

located 8 km (5 miles) into the jobsite, so there were little if any cooling concerns.

The belly dumps left behind a windrow of about 20-21 m (65-70'). The material passed through the paver at about 152° C (305° F). The breakdown roller, working immediately behind the paver, hit the material when it was about 149° C (300° F). That roller covered the area from immediately behind the paver to as far back as 91 m (300'). It made two passes on one side of the mat, then two passes on the center, then two passes to the far side. When there was a longitudinal joint, the roller's first job was to pinch the joint, then work inside from there.

A second double-drum roller worked further back, at a temperature of 138-141° C (280-285° F), while a finish roller worked at 115° C (240° F).

Hitting the Mark

The project proved to be successful, with specs being hit. This came as no surprise to the experienced Hamilton officials. "You shouldn't have problems if you follow basic paving best practices," Kinnikin said.

One of those practices is making sure the asphalt is placed on a quality base. "That's where the process of hitting our numbers starts for us," Kinnikin said. ■



The best improvements often go unnoticed

Sustainable Technology, Built Right In

New technology often draws attention. But the key question we always ask: “Is the technology practical?” Often, it is difficult to consider a new feature a “technological advance” if an operator can’t interface with it on the jobsite. Out of sight, out of mind.

In fact, some of the best technology on Cat® machines works behind the scenes. Some of the most significant developments are so inconspicuous that those in the field don’t notice—but the accountants back at the office do. And other technologies that interface

with the operator are designed to be so intuitive that they hardly appear to be technological at all—they have seamlessly integrated operator input with machine response.

That’s the goal of Caterpillar: To build technology into the machines. Such technology requires no training, yet it reduces wear and helps components, machines and even fluids last longer.

The benefit of this technology to your bottom line is obvious. Longer life also has some significant sustainability implications as well.

Here are a few examples of built-in technology, as well as more visible technologies, that benefit your business and the environment.

Robust Machines

The robust design of Cat machines is a perfect example of the “practical” approach. Cat machines and components are thick, strong and well protected. Wear and tear is reduced because of the engineering and manufacturing processes utilized by Caterpillar. The result is not only longer component life, but extended

mainframe life as well. This enables remanufacturing of the machine to original OEM specs at a fraction of the cost of purchasing a new machine.

Robust Engines

Engines in Cat machines are properly sized for the task. They don't operate at peak load, but rather in a middle range. This means operation at a lower temperature, which reduces wear and helps extend component life.

The engine, too, can be rebuilt to original OEM specifications at a fraction of the cost of purchasing a new engine. Remanufactured parts cost less but are as good as new, and come with same-as-new warranties.

ACERT™ Technology, meanwhile, reduces emissions while continuing to deliver the power you need.

Service Intervals

Technology has led to longer service intervals for Cat machines. These extended timeframes contribute to sustainability and reduce your costs.

For example, Cat HYDO™ Advanced 10 hydraulic oil offers better protection than off-the-shelf hydraulic fluids. New Cat CS44 and CP44 Soil Compactors come with a factory fill. Utilizing the Cat oil enables customers to extend service intervals for the CS44 and CP44 to 3 years/3,000 hours—the longest available in the industry. (Most other manufacturers offer a maximum of 1 year/1,000 hours.)

In a typical lifetime of about 6,000 hours, the owner of a Cat machine could change hydraulic fluid once or twice, compared with five to six times for owners of equipment built by other manufacturers. The resulting benefits are financial and environmental. Much less fluid and fewer filters will require disposal, benefiting both the business and the environment.

Caterpillar also offers sustainable fluids. Many Cat Paving machines can be used with Bio HYDO Advanced hydraulic fluid as an option.

Bio HYDO Advanced is a fully biodegradable product that offers the performance of premium mineral-based oils with a minimal impact on the environment.

Ecology Drains

These drains allow service personnel to conduct maintenance with less risk of a spill. An ecology drain is a device that controls how and when the fluid is drained, preventing the accidental release or the splashing surge created upon the removal of a drain plug. As a technician engages the drain, fluid is slowly released in a controlled manner, allowing the technician to position collection containers before fully engaging the drain for maximum flow.

The sustainability benefits are obvious, but there also is a financial gain. By preventing spills there is no time loss for cleanup, allowing

maintenance work to proceed with maximum efficiency. And, because the process is relatively clean and easy, it is less likely that service will be delayed. This protects your machine investment and maximizes the life of components.

AccuGrade™ Technology

Like most of the other technological features, AccuGrade technology has an impact on both profit and sustainability. Jobsite efficiencies can be significant, frequently eliminating extra passes. The benefit to you is reduced labor costs, equipment wear/usage, and fuel consumption. Sustainability efforts are realized as well when less fuel is burned, and fewer emissions are created. Reduced equipment wear also has a positive impact on sustainability as well, as fewer components end up as waste, and there is less need for newly manufactured parts. ■



Wear and tear is reduced because of the engineering and manufacturing process utilized by Caterpillar.





Using fewer resources benefits paving contractors

Training boosts sustainability and profits

What does training have to do with sustainability? Everything. And what does sustainability have to do with your business? The answer, again, is everything.

Sustainability is about accomplishing the job with as few resources and as little impact on the

environment as possible. It's also about extending pavement life.

Training helps you accomplish both goals. Doing so—in other words, having a sustainable focus—also helps your business. Using fewer resources lowers your costs and improves your bottom line. It also helps you win more bids. Longer

pavement life, meanwhile, helps you increase value to your customers, and gives them a reason to use you in the future and spread the word about your capabilities.

Extending Life

Training helps paving crews achieve exceptional mat density and

smoothness. This has implications beyond hitting specs, said Terry Humphrey, Training Consultant with Caterpillar Global Paving.

“If we achieve the correct smoothness and density, the life cycle of that pavement structure is longer,” Humphrey said. “The life cycle of a ‘great’ road can be 15 percent longer than a ‘good’ road. That’s a significant improvement.”

A heavily traveled urban highway might need repaving to repair cracks and ruts every seven years. That timeframe could be increased to eight or nine years if the crew has been properly trained, resulting in a “great” project, Humphrey said.

“If the road lasts longer, we gain an extra year or two where we don’t have to set up traffic control,” he said. “We don’t have to slow down traffic, which creates a great deal of emissions. We reduce our carbon footprint because we’ve lengthened the interval. That’s a big difference.”

The training also makes a difference in ways that initially appear small—but aren’t, Humphrey said.

Transverse Joints

A specific example is having crews properly trained to create longitudinal and transverse joints.

“If the crew has created good transverse joints when starting the paver, you don’t need a grinding machine to make that transition flat,” Humphrey said. The grinding is inefficient in many ways: It requires transport and use of a machine, which both burn fuel. It requires traffic to be reduced to a single lane, which can lead to traffic jams—and wasted fuel and increased emissions.

“Think of how many thousands of gallons of diesel fuel wouldn’t be used if we eliminated all the grinding that takes place on highways,” Humphrey said. “Traffic wouldn’t have to slow down, either, which would be another advantage.”

The transverse joints are also an example of how working toward sustainability has economic benefits for the paving crew. “Think of the cost savings for that firm if they don’t have to return and grind the transverse joints,” Humphrey said. There are savings in labor, fuel to get to the jobsite, fuel burned at the jobsite, and wear on the machine. In some cases, bonus pay also could be at stake.

Longitudinal Joints

If placed properly, longitudinal joints won’t need to be crack-sealed. “Again, it’s not just the construction vehicles themselves, it’s how much we delay traffic when we do the work,” Humphrey said. “An idling car creates a lot more emissions than a car going the speed limit.”

Training is about more than educating crew leaders and operators, Humphrey said. “We need to train and encourage engineers to come up with innovative ideas to do more asphalt recycling,” Humphrey said. “We need to find ways to do more reclaiming, to do the work in-place instead of hauling old materials away and bringing new materials in.”

Such innovations will also reduce costs, while delivering a similar and perhaps improved product. Firms that can accomplish such feats will be rewarded with additional business.

“If everyone is trained, we don’t do rework, and the road lasts longer,” Humphrey said. “If everyone is trained, we can fully take advantage of all available efficiencies.”

“Those efforts lead to sustainability, which is the right thing for everyone on this. Doing the right thing in terms of sustainability is easy, because it also helps businesses succeed.” ■

TRAINING’S ROLE

- Enables crews to work more quickly, which reduces both fuel consumption on the jobsite and inefficient traffic delays
- Helps crews avoid rework and all the associated equipment, traffic delays and fuel consumption that goes with that rework
- Keeps crews safer
- Enables crews to reach compaction goals in fewer passes, requiring less fuel and even less machinery



Classroom lessons are later tested in the field as part of the training.

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