

PAVINGNEWS

A Caterpillar® publication serving the global paving industry



**Wide drum leads to
big production gains**

New Cat® AP555E

Paver meets the needs of
contractors and their customer



CATERPILLAR®

Our Commitment to Transportation



Lieven Van Broekhoven
Worldwide Sales &
Marketing Manager

Welcome to the first global edition of *Paving News*. We hope you find this publication informative and useful as you continue to grow your business.

It's a changing world, to be sure. Today, an article like this can be sent electronically to just about anyone, anywhere, anytime. Of course transporting people and products isn't quite so simple. We still require a surface transportation system for those responsibilities.

Globally, we are more dependent on each other. We have more in common, too. Caterpillar recognises that one such common need is a world-class transportation system that serves both emerging and established economies.

While investment in resource development, agriculture and manufacturing is needed for long-term, global economic growth, there must be simultaneous investment in transportation systems. What good is improving acreage production if crops spoil before reaching a processing centre? Likewise, manufacturing expansion flows to areas where the supply chain can move raw materials in, and finished products out.

Historically, centres of commerce were located near natural transportation hubs such as rivers,

ports, and mountain passes. Today, centres of commerce thrive where there are good highways—and wither where there aren't.

Caterpillar has long been associated with the transportation industry. We continue to support industry associations and invest in technology for better road building equipment. No one is better positioned than Caterpillar to support the global transportation industry. We think in terms of a “connected worksite” and produce technologically advanced equipment for every step of building and maintaining pavement structures.

Caterpillar dealers bring the “connected worksite” to every corner of the world and to every transportation system too. The commitment is obvious: financial solutions, rental services, superior equipment, local parts and service and local operator and technician training.

Anywhere there is a need for airports, ports, highways or even a rural road, you'll find a Caterpillar product ready for the job. Anywhere there is a need for problem solving on a transportation project, you'll find a Caterpillar worker with the knowledge to help.

That's our commitment to global surface transportation. That is Caterpillar.

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^ The 2.2 m drum enabled the crew to mill Motorway E78 in four passes instead of five.



Wide drum leads to big production gains

Gellini Costruzioni annually mills thousands of tons of asphalt—and paves thousands tons more.

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What's common to every facet of the paving process is the need for production. "We are always looking for ways to maximize the use of our equipment, to increase our fleet productivity," says Giampiero Gellini, owner of the firm, based in Arezzo, Italy.

Gellini Costruzioni recently found a key tool for maximizing production while on a cold planing job. The company tested a Cat PM200 Cold Planer with a 2200 mm drum, compared with the standard width of 2010 mm.

The results were impressive, to say the least. "We were able to complete the job in four passes, instead of five," said Gian Giacomo Gellini, son of Giampiero and owner of the firm. "That means a productivity gain of 10 percent. We not only saved time, but also saved fuel. We would have consumed the same amount per pass with the standard drum. The PM200 engine has more than enough power

for the wider drum. We were able to increase production and reduce the amount of fuel consumed with one less pass, and reduce the emissions."

Project description

Motorway E78 called "Due Mari," or "Two Seas" Motorway, connects the Tyrrhenian and the Adriatic and Mediterranean seas. The road is a commerce thoroughfare; besides running between the seas, it also connects the key cities of Grosseto, the chief town of Tuscany's coastal area, and Fano, a coastal resort in the Marche region.

Gellini tested its new wide drum on a portion of E78 in the Tuscany province of Arezzo. The 8.35 m wide road featured a driving lane and a passing lane. Problems in the subbase meant the road had to be rebuilt.

Plans called for milling, recycling and placing new asphalt over a stretch of 1100 m. The Cat PM200 cut at a depth of 23 cm in the driving lane, and 5 cm in the passing lane. The crews used cold recycling techniques to rebuild the subbase. A Cat AP600 Asphalt Paver then placed a 5 cm



Gian Giacomo Gellini
Owner of Gellini Costruzioni

AT A GLANCE

Company: Gellini Costruzioni

Started: 70 years ago, by Giovanni Gellini

Owners: Giampiero Gellini (Giovanni's son) and Gian Giacomo Gellini (Giovanni's grandson)

Headquarters: Indicatore, Italy

Business: Routine and emergency milling and paving; also owns Hot mix asphalt plants and recycling mobile and fixed plants

Area served: Northern and central Italy, though recent jobs have included Romania

Equipment: Includes a Cat PM200 Cold Planer, Cat AP600 Asphalt Paver, Cat CB434 Asphalt Compactor, and several Bitelli machines

Firsts: Gellini Costruzioni was among the first to adopt milling in the 1980s, and "cold recycling" in 2000

The PM200 was able to keep the same pace despite using a wider rotor ➤



“Being able to count on a quick and skilled response from the after-sale service, ... enables us to focus on the work, and to achieve the best return on our equipment investment.”

binder course, followed by a 5 cm wearing course. A Cat CB434 Asphalt Compactor compacted the mat.

Milling

The PM200 with the wide drum was able to work at the same pace as when the machine had a standard drum. Breakout size was about 30 mm. The millings were delivered via conveyor to trucks. A portion of the millings was hauled to Gellini's plant for recycling at a later date. A large amount of millings were temporarily stored on site and for use in the cold recycling process.

The rotor and bits performed well, the Gellinis said. Boart bits were used on the rotor. "They typically last about 40 hours on hard asphalt," said Gian Giacomo Gellini. "When a bit is worn out it can be easily replaced. However,

every four to five days all the bits are replaced when working on medium-hard asphalt."

Operator Roberto Zelli was impressed by the durability of the bits, as well as the drum's ability to add production given the added width. He also appreciated the easy operation of the PM200. Specifically, he was able to set the grade and slope controls and let them hold their positions. "I can simply set the depth and go from there," Zelli said.

All other PM200 components and systems were able to keep up despite the wider drum. The water spray system limited the dust and helped keep the bits cool, and the conveyors could easily handle the increased loads.

The wide drum

Gellini was approached about testing



MOTORWAY E78

1. Mill at a depth of 23 cm with the Cat PM200 with 2.2 m drum
2. Mix the lime and cement into subbase
3. Add milling materials back to subbase
4. Make a pass at a depth of 14 cm with a rotary mixer
5. Compact new subbase
6. Place a 5 cm binder course with a Cat AP600
7. Place a 5 cm wear course with a Cat AP600

THE 2.2 M ROTOR

Gellini Costruzioni used a 2.2 m rotor on a recent job. That compares with the typical rotor width of 2 m. Among the benefits and features of the wider rotor:

- Extra width means fewer passes are required
- Is fitted with 194 bits on three wraps for 15 mm of cutting pitch
- Used 12 paddles for optimal discharge of milled material
- Overall width of the machine remains within 2.8 m
- Maximum cutting depth unchanged at 320 mm
- Allows for improved cutting radius when milling in cul-de-sacs and roundabouts

the drum in the field, and agreed to do so. The cold planer was taken into the shop, and the standard 2 m drum was replaced with the 2.2 m version.

The first test was milling a 2300 m long two-lane section on the Firenze-Siena Highway at a depth of 23 cm. The work took a total of a week and the results were excellent: The drum improved productivity and reduced fuel utilization without requiring any additional cost or efforts.

“The benefits coming from the use of the 2.2 m drum are clearly highlighted when operating on big projects such as highways and airfields, where the cold planer never stops milling; in this case you can achieve a 10 percent more production,” he said.

Gellini Costruzioni had such a project coming up after E78: the milling of the Motorway E45 in

Cesena, Northern Italy. Gian Giacomo Gellini planned to use the wide drum on the job, which will run non-stop for 20 days, and keep more than 20 trucks busy. He looks forward to the use of the wider drum given the results from the Motorway E78 job.

Gian Giacomo Gellini said he has consistent expectations from Cat machines. “We buy based on productivity, product reliability, after-sales Dealer service, and price,” he said. “Being able to count on a quick and skilled response from the after-sale service, if needed, enables us to focus on the work, and to achieve the best return on our equipment investment.”

The wide drum helped ensure they got the most out of the equipment on the E78 job. ■



Paver meets the needs of contractors and their customers



New Cat[®] AP555E

Caterpillar's new AP555E medium to high production asphalt paver offers contractors a versatile machine that is powerful and highly manoeuvrable.

Yet its compact dimensions mean that it remains easy to transport from job to job and is very much an 'all-round player' whether it is paving a parking area, on a residential development or on national roads and larger motorway projects.

Whatever the job, paving has distinct requirements for paving contractors and their customers. Customers demand productivity and a good mat appearance, while paving contractors need a versatile paver that can handle a wide variety of work, and the ability to operate efficiently around obstacles.

The new Cat[®] AP555E asphalt paver is a true 16-17tonne machine that delivers in all these areas and many more too. As an efficient and productive machine, it can complete jobs quickly and with minimal interruptions. This new paver also leaves behind a smooth mat with a

great appearance.

But not every job will be as straightforward as, for example, a parking area, and to cater for this the AP555E's hydraulically variable width screed adjusts quickly from 2.55-5m, with mechanical extensions taking this to 8m.

Here are some of the key features of the new Cat AP555E asphalt paver:

Performance

- Quick adjustments are crucial. Helping optimise performance and increase production, are ratio control of the augers and conveyors; power screed controls; and remote switches on the extenders.
- 144hp Cat C4.4 engine with ACERT[®] Technology offers power and fuel efficiency. An adjustable electronic speed control responds quickly to deliver fuel efficiency in neutral, and on-demand performance when in gear.
- Top-mounted cooling system maintains engine and hydraulic system temperatures even in high ambient conditions. The variable speed fan

directs exhaust air towards the hopper and away from the operators and ground crew for a more comfortable work environment.

- Good visibility from the operator station helps with efficiency, safety, mobility and mat quality. The dual operating stations allow the operator to quickly move from side-to-side when working near obstacles and to communicate with screed operators and truck drivers. Helping to make the switch a seamless one, are controls that are automated, well-labelled and grouped by function.

Precise delivery

- The Cat material handling system is the most advanced in the paving industry. The automated controls and well-designed components help reduce material segregation.
- The mix delivery system utilises four individual pumps to ensure a precise amount of mix is delivered to the screed.
- Left- and right-hand conveyors, and left- and right-hand augers are



controlled independently to ensure mix demand is met when increasing or reducing paving widths.

- Four independent sonic sensors tell the augers and conveyors to run faster or slower when adjusting paving widths. This system automatically adjusts when paving around obstacles.
- Sloped hopper design, narrow chain guards and an optional folding front apron help to keep the mix moving.
- Conveyors have wide slats to deliver material without operating at full speed. The slower speed helps reduce the chances of segregation and component wear.

Powertrain

- The undercarriage provides mobility and high speed capability when moving around the job site.
- A powerful four-cylinder C4.4 engine with ACERT technology meets emission requirements. Quiet running and low emissions are good for the environment, and particularly important when working in residential and commercial developments.
- Excellent flotation characteristics limit disturbance on soft base materials, maintaining a uniform mat thickness. Oscillating bogies and hydraulic accumulators minimise the impact of obstacles such as curbs, mix piles and manholes.
- The paver features three steering modes. 'Pave' mode enables the automatics for mix delivery. 'Travel' mode maximises speed, while 'Manoeuvre' mode allows the paver to rotate within its own footprint for outstanding turning capabilities in tight spaces.

Operator controls

- An advisor display provides access to a startup checklist, operator preferences and engine and machine parameters.
- The system lists fault codes for machine functions, making trouble shooting easy.
- Main display includes operator-friendly features including automatic engine speed adjustment, engine rpm and temperature monitoring, and calibration of machine components.
- The Cat speed control dial provides a consistent speed and smooth mix delivery, which has a direct impact on mat quality.

Other key features

- The compact, lightweight design allows contractors to transport the AP555E paver with ease.
- Folding canopy; optional full width canopy with two extending wings provide optimum comfort and protection.
- Fumes extraction system; this draws air from the conveyor tunnels and auger chamber, sending fumes away from the operator to a dual-purpose exhaust stack that improves operator comfort.
- Quick access is available to components and routine service points.
- A standard 500-hour engine oil change interval keeps service costs low.
- The AP555E paver promotes sustainability by meeting emissions requirements; speed control reduces fuel consumption and emissions; offers clean fluid collection with remote-mounted drain points; and uses durable components that preserve resources. ■

AP555E SPECIFICATIONS

Engine: Cat C4.4 Engine with ACERT® Technology.

Engine power (ISO 14396):
106 kW (144 hp)

Operating weights

With AS4252C Screed:
16 745 kg

With AS4251C Screed:
17 710 kg

** Approximate figures; weights vary based on machine configuration and fluids*

Extendable Paving Widths

With AS4252C Screed:
2.55 m - 5.0 m

With AS4251C Screed:
2.55 m - 5.0 m

Maximum Paving Widths

With AS4252C Screed:
8.0 m

With AS4251C Screed:
6.5 m

Efficiencies benefit more than the environment

'Sustainability' applies to business operations, too



Sustainability is on the minds of the world's leaders. It's also on the minds of Caterpillar, Cat® Dealers and Cat customers, too.

Cat products promote sustainability on many levels. They increasingly require fewer resources during the manufacturing process, and are built to be energy efficient when they get to the jobsite. Cat equipment also plays a key role in environmentally advantageous processes, such as recycling asphalt with a Cat Rotary Mixer.

The environment is the obvious beneficiary of these efforts, but paving contractors and other business owners also reap rewards.

- Cat paving equipment is built to be energy efficient. Consuming less fuel reduces emissions and operating costs, too.

- Technological products such as the paving calculator and Cat grade and slope control lead to increased efficiencies. The products also help reduce fuel consumption, emissions and operating costs.

- Components and service points on machines are convenient and easy to reach, reducing the likelihood of spills during maintenance. The easy access also is a time-saver for technicians.

- Machines such as Cat Rotary Mixers are on-site asphalt recyclers. Re-using the materials in place takes

the recycling process a step further: It saves contractors the purchase price of new aggregate, as well as the costs associated with hauling materials to and from the jobsite.

- Cat Reman products are built to like-new condition, with like-new warranties, but the remanufacturing process requires fewer resources. Beneficiaries are the environment, and customers who purchase quality parts and components at a reduced price.

- Safety is at the center of Caterpillar sustainability efforts. Cat machines are designed to create safe, comfortable working environments, whether it's routing exhaust away from the operator, or reducing noise levels. ■

Safety tips for cold planers

Cold planers have an abundance of size and power that helps make them productive on the jobsite. That size and power also means crews must be extra cautious before, during and after working with the machines.

How can crews stay safe? Proper training and following the steps in the owner's manual are the best places to start.

Here are some safety highlights:

- Make sure safety messages are properly displayed on the equipment, and that crews understand the meaning of the messages.
- Attach a "do not operate" tag to the start switch or controls before servicing or repairing a machine.
- Know the width of the equipment in order to maintain proper clearance near potential obstacles.
- Wear a hard hat, safety glasses and other protective equipment.
- Do not wear loose clothing or jewelry, which could get caught in the machinery or controls.
- Make sure all protective guards and covers are in place.
- Remove debris, oil, tools and other items from the deck, walkway and steps.
- Secure lunchboxes, tools and other loose items.
- Obey all regulations when discarding liquids.
- Use cleaning solutions with care.
- Never put cleaning or maintenance solutions in glass containers. Drain all fluids into a suitable container.
- Do not allow unauthorized personnel on the machine.
- Be sure there is a fire extinguisher on the operator station, and that crew members know how to use it.
- Stay clear of all rotating and moving parts.
- Make sure no one is near the machine before moving it, or starting the engine.
- Test the horn, backup alarm and other warning devices before work begins.
- Do not allow anyone to stand or walk behind the machine; it could jump if the rotor hits an obstruction.
- Avoid any conditions that can lead to the tipping of the machine.
- Park on a level surface. If you must park on a grade, use blocks behind tires to prevent rolling.

The owner's manual has more guidelines that should be reviewed and understood before work begins. Please call our dealership for more information on training and other ways we can help to keep your crews safe. ■

Watershed Project

RM500 with controlled water injection holds the key



Chicago's O'Hare International Airport is one of the world's busiest, and on a typical day nearly 2,500 aircraft take off and land from the location.

Our love affair with air travel means the demands on the airport are only going to increase, and this is one of the factors that have led to the construction of new runways at O'Hare.

Handling the sub-base work is Rock Solid Stabilization of Ringwood, Illinois, which operates a pair of Cat RM500 rotary mixers with controlled water injection to transform productivity and efficiency on this lime stabilisation project.

Rock Solid Stabilization is one of many subcontractors on this prestigious runway construction project at O'Hare International. Company owner Jonathan Pease says his firm's specialist knowledge of soil stabilisation and modification has helped it to secure 585,000 m² of lime stabilisation at the airport including 36,280 tonnes of lime soil modification.

"We operate three types of precision lime spreader that can handle any site conditions from hard, solid ground through to wet, very soft conditions," says Jonathan Pease.

The first stage of the process was to apply lime kiln dust as the soil binding

agent, though its scarce supply (it is a by-product of a slowed manufacturing industry) meant that Rock Solid Stabilization had to source the dust from three suppliers.

"Each supplier had a different material density, which meant spread rates needed to be varied accordingly," says Mr Pease. "And this added to the complexity of the job."

With the lime precisely applied, a motor grader made a single ripping pass followed by a water tanker to add a nominal amount of moisture to activate the lime.

Then the big guns go to work. One of Rock Solid's Cat RM500 rotary

mixers first makes a dry cut at a depth of 305mm. In O'Hare's tough soils, the machine worked at a speed of 12-13.7m per minute, covering strips measuring 488m in length with each pass. A second RM500 follows, making a 'wet cut.'

The wet cut process relies on water being injected into the RM500's mixing chamber to allow precise metering of water into the lime and soil mix, which enables the stabilisation team to achieve the correct moisture content in just one pass.

Using the water injection method, the RM500 is fed by a water tanker that runs ahead of the rotary mixer ensuring the rotor is constantly fed with the correct volume of water. A second water tanker runs alongside the first to maintain the supply of water and allows the mixing train to continue uninterrupted.

Running water directly into the path of the rotor is a key process. "It is the best way to control the moisture content," says Jonathan Pease.

And Walsh Construction's quality control manager David Heikkinen agrees. It's his job on site to test the wet density behind the RM500 with a nuclear density gauge.

"On a typical job, a water tanker floods the area and leaves it to the stabilisation team to achieve the proper moisture content, and this often means more passes, and speculation, are required to get the density right."

"With a controlled water injection system, the operator is able to look behind and make a fairly informed judgment based on sight. And I've been following Rock Solid's progress with a 'nuke' gauge and found it's been right on target, every time," says Mr Heikkinen. "We haven't yet had to make any adjustments or additional passes."

Rock Solid Stabilization likes the benefits afforded by the RM500 with water injection.

"The controlled flow saves us time and money because we only inject the water we need," says Jonathan Pease. "Getting the correct amount of moisture into the lime and soil mix in just one pass means we don't have to go back through and make additional adjustments. When you have to do that it adds a lot of extra time to the process and incurs additional costs."

As a result of the twin machine dry and wet cut strategy, productivity remains high.

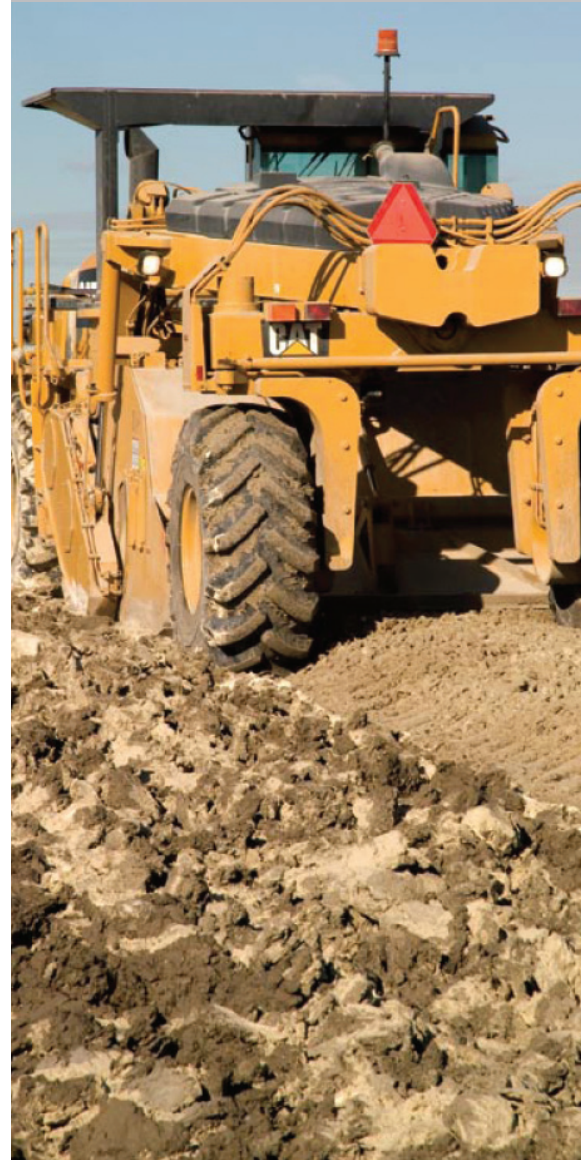
"We can stabilise a minimum of 16,700m² per day with the two reclaimers, one wet and one dry," says Mr Pease.

After the wet cut has been made, the firm runs a Cat CP-563C soil compactor over the ground. With a front-mounted blade the soil compactor evens out the surface while its vibratory drum compacts the freshly-mixed soil over a sequence of 6-8 passes.

The firm's motor grader then returns, but to make a shaping pass and get the surface to a pre-defined profile. Then a smooth drum roller makes 1-2 passes to seal the surface before another contractor applies an emulsion.

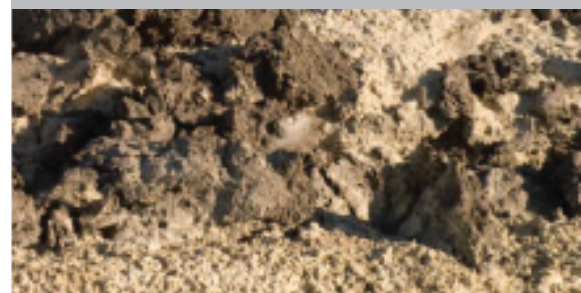
The treated surface is allowed to cure over a period of five to seven days.

"It's a big job, but it is one that's been made much easier by the precision available from the Cat equipment," adds Mr Pease. "With precision lime spreading and controlled water injection on the rotary mixers, we have the potential to bring further cost savings and greater productivity to our customers." ■



^ A key benefit of the RM500, crew members said, is the gradation on reclamation jobs, and the level of mixing on stabilization work.

✓ A view of the soil after the ripping and before the dry cut.



Planers at Bologna



Cooperativa's quick work at Bologna airport

One of the biggest challenges during maintenance activities at a fully operational airport, is how to coordinate a series of conflicting activities.

This was the dilemma facing Società Cooperativa Costruzioni, which was required to repave one of the runway links and some sections of taxiway at Bologna's Guglielmo Marconi Airport, Italy, but without causing any inconvenience to passengers and airlines using the airport.

Repaving the worn sections involved milling and then re-asphalting the surfaces, but the maintenance works had to be completed to an extremely tight deadline, while ensuring the very highest standards were achieved.

The airport authority wanted to avoid any interruption to normal services and so the Cooperativa Costruzioni decided to carry out the job at night when air traffic was

considered to be at its lowest.

The company also chose to use the best machines in its fleet along with its most experienced operators.

"From start to finish, we had a six-hour period in which to complete the projects," explains Nicola Guidetti, technical manager at Cooperativa Costruzioni. "We knew the job had to be carried out without any hitches, so we decided to specify two Cat PM200 cold planers for the task."

But having only one PM200 at his disposal, Mr Guidetti needed to hire a second machine at short notice.

"The most suitable option was hiring through our local Caterpillar dealer, CGT," he says. "CGT provided that second machine for the duration of the works."

Knowing the PM200 could deliver total reliability and the capacity to work long shifts without breaks and without any interruptions or downtime



for maintenance, Mr Guidetti arranged the work in two night shifts, working six hours with each shift.

“The first six-hour period, allowed us to remove and resurface the runway links, then the second night shift, a week later, enabled us to carry out the same process on the taxiway,” he says.

Each six-hour shift gave Cooperativa Costruzioni three hours to remove the worn paving and three hours to carry out resurfacing. This was done with the two planers working in tandem, which saw a total of 5,500m² of runway links removed by both PM200s in just three hours.

Advanced technology on the PM200 holds the key to its productivity, making it an ideal tool for milling work on medium to large sites where there is a need to remove deep layers of asphalt and concrete at high work rates.

Power comes from a C18 engine delivering 583hp at 1,900rpm, and

with a steep torque curve, the PM200 responds rapidly to heavy loads without affecting productivity.

Quick-release conical tool holders make light work of changing tools, while a high-capacity folding conveyor adds versatility and enables high production rates to be achieved on site.

At the end of the second night’s intensive workload, Cooperativa Costruzioni’s pair of PM200s had milled 670tonnes of material from the airport.

Milling was followed by the resurfacing team, which used a Bitelli BB760 paver to place a 4cm layer of bituminous mix that was compacted using a Bitelli DTV370 roller. By 5am, the airport was returned to full service with the repaired runways ready to receive the first flights of the day.

“The resources, operators, equipment, experience and expertise available for this project enabled the work to be completed on time,

guaranteeing immediate return to service for scheduled airport operations,” says the airport’s systems and infrastructure maintenance manager Paolo Sgroppo.

Maintaining recommended safety standards and keeping runways in peak operating efficiency while air traffic continues to increase are just some of the reasons why the Guglielmo Marconi Airport at Bologna trusts its scheduled maintenance operations to the Società Cooperativa Costruzioni.

It is a general construction company located in Bologna and one of the leading contractors in the road-building sector with over 75 years’ experience. It has 500 employees and a predominantly Cat-based fleet of 80 earthmoving and road building machines. ■



Training programs of all types available

Developing exceptional crews

Asphalt paving contractors face tremendous challenges. Because of the nature of hot mix asphalt, installation of the product must be done correctly in a time frame that is only minutes long. Mistakes—roughness, inadequate density, improper yield, and segregation—are so costly that their occurrence often eliminates any chance of profitability.

Most of these mistakes are man-made and avoidable. The plain fact is that when we put the placement and compaction of hot mix asphalt in the hands of inadequately trained crews, we invite costly errors in workmanship.

In order to minimize quality problems, crew members must understand both the equipment they are using and the techniques required to meet all the particular specifications of a project. Cat Paving Products understands this training requirement and has created training programs and training materials that help develop exceptional crews that deliver professional, high-quality work.

Cat training, or more properly called Solutions & Services, consists of a wide variety of options. There are standard training classes with a fixed curriculum and set of objectives. But, because Cat understands that organizations have different needs,

we also offer customized training tailored for unique objectives.

Cat employs professional instructors who have hands-on experience. Crew members appreciate instruction that is realistic and presented by people who know equipment and who have application knowledge.

All Cat training is coordinated by Cat Dealers. Dealers can help enroll students in scheduled classes or can organize local training that is specific to one organization. The training can be classroom seminar instruction, hands-on training in lab sessions, on-the-job training, or some combination of all these elements.

“It takes exceptional crews to deliver all the requirements the industry now demands.”

Paving Operations Training

Paving Operations Training is one of Caterpillar's most popular courses. The 40-hour curriculum consists of about 25 percent classroom explanation and 75 percent hands-on practice of paving skills. The curriculum starts with the fundamentals of asphalt paving and asphalt paver setup. In each session, new skills and techniques are introduced. At the end of the course, students complete both a written and hands-on examination.

There is particular emphasis on the construction of smooth transverse joints, on the adjustment of the material feed system, and on all aspects of the paving under automatic grade and slope control.

Attendees of all experience levels benefit. Graduates are prepared to return to the job site and help train other crew members.

Scheduled Paving Operations Training courses are held at Cat training facilities or at Cat Dealer locations. The course can also be conducted at a contractor location if logistical considerations can be met. Paving Operations Training courses are currently available for North American operations and soon to be available worldwide.

Paving Operations Seminars

Caterpillar schedules Paving Operations Seminars at a variety of locations. These classroom events are attractive to organizations that want to send large groups to training activities. Seminars can also be arranged on-demand.

Typically, the seminar is a two-day event. Day One covers aspects of asphalt paving and Day Two covers asphalt compaction. The curriculum includes fundamentals, best practices, and project studies. Paving and

compaction can be combined in a one-day seminar. Paving Operations Seminars are currently available for North American operations and soon to be available worldwide.

Product Support Training

Technical, or service, training is scheduled at Cat training centers, at Dealer training centers or at customer locations. Service training covers in-depth systems operation, testing and adjusting, and troubleshooting on Cat Paving Products models.

The curriculum is approximately 50 percent classroom and 50 percent hands-on lab sessions. What the student reviews in the classroom is immediately reinforced in lab sessions. Length of training varies by model. You can schedule on-demand training through your Cat Dealer. Product Support Training is available worldwide.

Machine Commissioning

Cat instructors perform machine commissioning in the field for both dealers and product users when new models are first put to work. Instruction covers basic machine operation and machine maintenance with both classroom and hands-on sessions. Machine Commissioning is available worldwide.

On-the-job crew training

Cat instructors work with your crew on the job to help them meet both production and quality goals. Caterpillar offers simultaneous classroom sessions to complement the on-site lessons. Before the training starts, we develop specific goals and bring to the project the necessary tools and information to complete the assignment. On-the-job crew training is available worldwide. ■

Crews practice paving with sand as

✓ Caterpillar instructors offer hands-on training.

CAT.COM/Training

A look at the future of the paving industry



Cat® 'connected worksite' to offer substantial improvements in productivity, safety

Imagine if your paving team could calculate final smoothness numbers while the mat was still hot. These and other possibilities are all closer to becoming reality thanks to the “connected worksite,” a proven portfolio of products and technologies from Caterpillar.

Applying lessons learned

The connected worksite is well-known in several industries, particularly mining and earthmoving. In mining, among other improvements, these technologies increased productivity by measuring loads and monitoring productivity and machine health. On construction sites, a connected worksite technology's GPS system helped eliminate the need for survey stakes.

Paving products will benefit from both applications. Using GPS will help keep pavers working at

the proper grade and slope. The machines also will take a lesson from mining and “talk” about workloads, productivity, and even potential equipment failures.

The Cat® AP555E Asphalt Paver is the first piece of paving equipment to feature the factory-installed grade and slope control. The software, wiring and displays are installed at the factory.

“It’s tied into the machine’s electrical system,” said Bob Ringwelski, Business Development Manager for Caterpillar Connected Worksite Products & Services. “There are no extra wires. It’s seamless, all integral with the machine.”

The advantages go beyond the organization of wires. “You can plug a computer into the machine, and the default codes will tell you if there are issues with the system,” Ringwelski said.

Tying to the machine’s electronic

control module means grade and slope settings and offsets only need to be downloaded once, while after-market products typically require daily installation. In addition, the factory-installed systems have durable clamshell boxes that prevent damage and theft. The display screens also are more user friendly.

Down the road

Cat Cold Planers will have a Cat grade and slope system installed at the factory later this year or early next year. Cat Asphalt Compactors likely will follow with a compaction and positioning system in the future. Eventually all the equipment will be integrated and communicate with each other.

“A milling machine will know exactly where the road is,” Ringwelski said. “It will set the paving train on a precise course.”



◀ Display screens on new products, such as the Cat® AP555E Asphalt Paver, are user friendly and include information to make troubleshooting easy.

The paver will more precisely calculate slope and grade and know the road's precise center. Compactors will monitor the number of passes, mat temperature and final mat thickness.

"Sometimes crews place too much asphalt when trying to reach the desired final mat thickness," Ringwelski said. "With a GPS-enabled product, the compactor will communicate the exact thickness of the compacted mat. The paver operator then can make adjustments. That can save a lot of money in terms of materials if a crew is placing a mat that is too thick."

Smoothness also could be measured immediately. "There will be no coming back later and making a final determination about mat smoothness," Ringwelski said. "Crews will know if they are on target. If they're not, they can correct the problem immediately."

Additional benefits

The owners and operators of paving equipment who use connected worksite technologies will see other benefits in the future. Among them:

Health monitoring.

Productivity gains will be significant in terms of downtime avoided through health monitoring. "The machines will be able to monitor themselves," Ringwelski said. "We want to know ahead of time if there will be a problem. For example, maybe the exhaust temperature on one side of the engine is higher than the other. That could indicate a potential problem."

The machine will electronically communicate data to the Dealer service department. The Dealer technician then will discuss maintenance plans with the customer and solve the problem before a breakdown occurs.

Payload monitoring.

The systems will be able to monitor performance much more closely. "You could learn exactly how much you milled, or how much asphalt went through a paver," Ringwelski said.

The productivity of crews could be monitored as well. "You could use the data to determine what areas of the process require more training," Ringwelski said.

He expects the discovery of additional benefits as the technology becomes more widely used. "As those in the paving industry start to work with it, they'll find uses we didn't even consider," Ringwelski said. "There will be benefits we aren't yet aware of." ■

