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DE NOTÍCIAS

WIRTGEN GROUP
Close to our customers

NEW APPLICATION:

Recycler at gypsum mine

CIBER arrives in Egypt

FOAMED ASPHALT: agility and quality

BR-116: focus on quality and environmental impact

ROAD AND MINERAL TECHNOLOGIES

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Number 29

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Luiz Marcelo Tegon, President of Ciber >>>

GROWING TOGETHER!!!

2013 was an important year for Ciber. And I'm not just saying that because our revenue grew 46% and we surpassed the BRL 400 million mark. Of course we are very pleased with these statistics, but we're even happier with the path we have taken to arrive at these results. We are seeing our customers grow and know we contribute to their success stories.

And this has only been possible because we made even more progress on a front so dear to the success of our business: being close to our customers. This closeness allows us to identify their needs and think of specific solutions for each of them, thereby delivering much more than a piece of equipment. That's the case with Mr. José Josias Lucena, from Gesso Integral, the subject of this edition's cover story.

With their acquisition of a Wirtgen WR 2500 recycler and Kleemann MS 19 D mobile screen, Gesso Integral was able to modify their extraction process, previously done with explosives, ensuring celerity, savings and most importantly, drastically reducing environmental impact.

This edition also features stories on the innovative techniques that contributed to successful paving work that were the perfect fit for each customer's needs. Among them are SMA technology during paving work on the Transcarioca avenue and foamed asphalt on Ayrton Senna Highway (SP), which made it possible to pave 35 km of road in less than five months without having to completely stop traffic and work at night, so that all the lanes could be used during peak hours.

Stories like these prove we are on the right track by being ever closer to our customers. We are also full of hope for 2014, because your success means Ciber's success!

I hope you enjoy reading these stories as much as we enjoyed participating in them.

Pleasant reading! ■

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BEIRA-RIO ENVIRONS PAVED FOR WORLD CUP

ASIDE FROM INTERNACIONAL'S STADIUM, HAMM COMPACTORS ALSO WORKED ON COMPACTING AT GRÊMIO ARENA ENVIRONS

Beira-Rio Stadium, the host of five World Cup matches in the state of Rio Grande do Sul, is undergoing a large scale renovation. Now during the final stages of the work, paving of public streets in the stadium's environs and the old EPTC (Public Transportation Company) parking lot next to Gigantinho gym is underway.

And to ensure paving quality, the work being done by the City Sec. of Construction and Roads (SMOV), coordinated by the Sec. of Management, has relied on the excellence of the Hamm EID 90 asphalt compaction roller, which provides compaction without fragmentation of additives and excellent road surfaces, in addition to saving on fuel. Another characteristic of Hamm's EID line is complete visibility of the front and rear cylinders, ensuring full control during operation. A water spray bar with removable nozzles and two scraper plates ensure constant cleaning for the cylinders during compaction, resulting in excellent end quality for the work.

The total area to be paved is equivalent to six football fields, or over 45,000 m² and is located between Edvaldo Pereira da Silva and Padre Cacique avenues. Pavement work in the Stadium environs is part of the Responsibilities Grid, a list of the main works required by the World Cup tournament. In addition to Beira-Rio, the Grêmio Arena, completed at the end of 2012, also relied on Hamm compactors for its paving, for which 3411 compaction rollers were used. ■

NEW APPLICATION: RECYCLER AT GYPSUM MINE

EQUIPMENT USED IN MINING EXTRACTION IN GRAJAÚ (MA) IS AN ECONOMICALLY FEASIBLE ALTERNATIVE TO OBTAINING GREATER SAFETY, ENVIRONMENTAL CARE AND COST REDUCTION

Important to a wide variety of economic sectors like civil construction, agriculture and industry, gypsum is a material extracted from nature that has been used for centuries - it is thought that civilizations like ancient Egypt and Rome used it. Its importance to today's society becomes clear when we discover a few of its applications: molds for ceramics, metallurgy and plastics, in addition to its employment in orthopedic and dental materials. It is also used as a soil corrector, a raw material in animal feed and as a setting material in cement, helping during the hardening process.

Therefore, there is immense demand for gypsum on the market. However, from the moment of its extraction from nature to its conversion to applications in the aforementioned products, there is a long process.

Gesso Integral company works with gypsum, extracting it from mines and processing it into end products for later sale to customers nationwide, including the states of Pará, Tocantins, Goiás and Amazonas, to name just a few. "We use ground gypsum in natura for cement manufacturing and calcination, mineral salt, agricultural plaster and calcine, in addition to plates, blocks and paving tiles for civil construction," explained José Josias Lucena Ferreira, director of Gesso Integral.

In order to help in the material's extraction process, the company purchased two Wirtgen WR 2500 recyclers and a Kleemann MS 19 D mobile screen. The machines are operating on a gypsum mine located in Grajaú, in the state of Maranhão, and their presence in the region has not only helped speed up and modify the process, it has also reduced costs. According to Josias Lucena, "We've reduced costs 30% in comparison with the conventional system."

"Before the recyclers, we used to remove the sterile from the mineral, make a hole with a pneumatic drill and detonate the material with explosives. Then, using a bulldozer with tank tracks equipped with a crusher, the stones would be broken down to the proper size for the gravel crusher. One of the greatest advantages is that we no longer need to use explosives," Lucena explained.

The process has become much more practical: all the aforementioned methods have been replaced. Extraction is done through crushing and cutting the gypsum, using an operating concept similar to other machines - surface miners and milling machines. After this stage, the mineral is left on the ground so a front loader can pick it up and dump it into a truck. It is then taken to the screen.

With its 130 ton/hour production, in addition to making explosives obsolete (thus reducing many problems and environmental risks), the WR 2500 has allowed us to reduce costs, doing away with a large part of our procedures. "With the arrival of the recycler and the adaptations we have made to it, the entire previous process is now done by a single machine, since it already supplies the material crushed to an average size of 2 inches. 60% of this production is dust that is ready for calcination," said Lucena.

The Wirtgen recycler has allowed Gesso Integral greater speed in the gypsum extraction process. In a single pass, the material is cut and crushed homogeneously. The machine's depth control system facilitates operations, since it avoids both shallow cuts that can be unproductive and too deep ones that might be beyond the equipment's capacity. "The Wirtgen recycler has the world's most advanced ergonomics. Another positive point is the cutting tool replacement system, which allows fast, accident free bit replacement," explained Ciber after-sales analyst Ney Monteiro.

A second aspect that reduces risks during machine handling is its 4-wheel drive and individual suspension. This allows the equipment to work easier and more effectively on uneven ground, reducing rollover risk.

"We talked to many site leveling companies that use recyclers, and they told us the WR 2500 is the most powerful machine on the market. So we decided to experiment with the equipment. The cost-benefit ratio we've obtained by acquiring the recycler has been very positive," concluded José Lucena.

"One of its biggest advantages is no longer needing explosives," explained Lucena, director of Gesso Integral

>>>

THE OTHER MACHINE IN THE PROCESS

Although very important for gypsum mines, the WR 2500 recycler does not operate on its own in the city of Grajaú. As a matter of fact, though very effective, we need to mention another piece of equipment that completes the work done by the Wirtgen recycler, making it possible to obtain granulometrically classified gypsum products: the Kleemann MS 19 D mobile screen.

The MS 19 D, part of Kleemann's Mobiscreen family of mobile screens, is a self-propelled system on tank tracks, with three screening decks that permit classification of materials resulting from the recycler's crushing process into three granulometric ranges. "It is a robust piece of equipment that can be operated under adverse weather conditions. In addition to optional features like the sliding grill coupled to the feeding inlet, remote control for the machine's functions and track movements, among other advantages," explained Wirtgen Brasil regional sales consultant Jorge Sales.

The screen's mobility and flexibility allows it to go along with the WR 2500 and operate closer to the mine, significantly reducing transportation costs. "The fact the Wirtgen Group has such an extensive portfolio of mobile screens allows us to adapt our screen to customer needs," added Sales.

NECESSARY CARE

The equipment at work in Grajaú has allowed them to place a pioneering business model into practice, an alternative solution for extracting surface minerals at a feasible cost, with low operating costs and high productivity. But in order for 100% of these advantages to be obtained, several preventive measures need to be taken.

On account of the physical properties of gypsum, its comminution (fragmentation into smaller pieces) generates a great deal of fine materials, making it necessary to pay special attention to the WR 2500 recycler's air filters and breathing filter for the hydraulic tank.

The Kleemann MS 19 D requires care for the same reasons as the Wirtgen recycler: large percentages of fine materials can obstruct the flow of material on the screen's decks, consequentially reducing the machine's efficiency. For this reason, the equipment has an ideally sized screening area (1,520 x 6,100 mm), allowing for safe operation and ensuring system productivity. ■

FOAMED ASPHALT: INNOVATIVE TECHNIQUE ENSURES QUALITY IN REPAIRS ON AYRTON SENNA HIGHWAY

THE SP-070 IS ONE OF BRAZIL'S FIRST HIGHWAYS TO USE THE FOAMED ASPHALT TECHNIQUE WITH COLD MILLED ASPHALT PLANT MATERIAL.

Anyone who has driven along Ayrton Senna Highway (SP-070) recently, from the capital city eastward, will have noticed a great improvement in road quality. A 35 km stretch (between km markers 11 and 46, in both directions) was completely repaired in work done between July and November 2013.

Due to the average daily traffic of 90,000 vehicles in each direction, the pavement, which consisted of a base layer treated with cement, was completely deteriorated.

In search of better technology to replace it, Fremix Engenharia e Comércio Ltda, the contractor responsible for carrying out the work, and Ecopistas, the concessionaire responsible for managing and maintaining the highway, after several experimental sessions employing several forms of technology and studies over the course of twelve months, chose the technology that presented the best performance: recycling and foamed asphalt, produced in the Wirtgen KMA 220 mobile cold recycling plant.

Since the time to carry out the work was scarce, the greatest advantage of the foamed asphalt technology was that it allowed the highway to be opened to traffic immediately after compaction.

"From the São Paulo city limits to the airport, no lanes could be closed to traffic during the day, due to the large quantity of vehicles. This being true, the work was done during the week at night and on weekends," added Elio Cepollina Junior, Fremix commercial director.

The milling and recycling work was done simultaneously, removing the damaged layers of payment and cement treated base – approximately 30 cm – and recycling it on location. To this end, two large scale Wirtgen milling machines were used, the W 1900E and the W 200 - the latter allowing for the use of three different drum assembly sizes (1.5, 2.0 or 2.2 m) -, permitting a wide range of applications.

The milled material was crushed by a Kleemann MR 110 Z EVO, a cutting edge impact crusher. Its tank tracks make it very versatile and it can be used for processing natural stone, as well as asphalt and demolition waste, always producing extremely high quality end products.

For its part, the material removed from the road was recycled by a Wirtgen KMA 220 mobile cold recycler, which has a special chamber where the foamed asphalt is produced. And an even greater advantage, the machine's mobility makes it easy to transport and quickly install at the worksite. So much so that two work sites were set up on the highway near the work to serve the project.

According to Juliano Gewehr, product specialist at Ciber Equipamentos Rodoviários, "Recycling using the cold mixing plant lets us completely make use of the material from the damaged lane, as well as the possibility of reinforcing it with new materials, such as additives, cement and even civil construction demolition scraps, aiming to prolong pavement life," he explained.

Reconstruction was done in two layers, the first being compaction of the RAP (Recycled Asphalt Product), for which the Hamm 3411 P compaction roller and the Hamm HD 90 tandem roller were used; the second was compacted with the HD 90 tandem roller; a fine layer of asphalt mixture with discontinuous grain size was placed above the recycled layer.

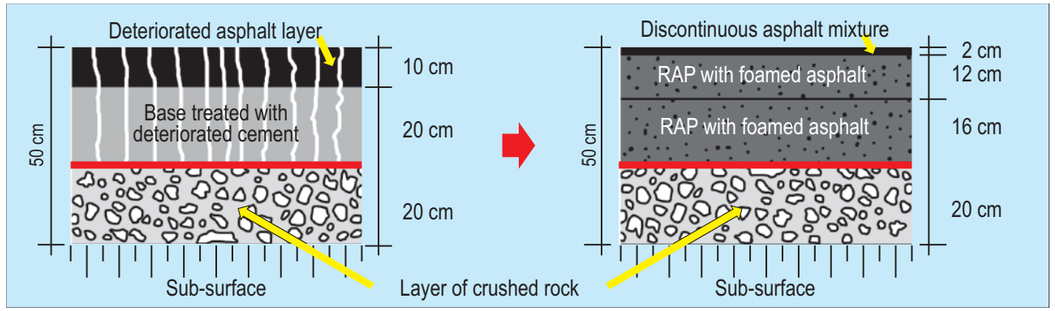
"Without a doubt this work will set new precedents for road work in Brazil, overcoming inertia and resistance to using foamed asphalt on work done on high traffic roads," detailed Valmir Bonfim, technical director of Fremix, the company responsible for the work. Also according to him, the technique was applied on an experimental stretch of the highway in October 2011, and it's still intact.

In all, eight pieces of Wirtgen Group equipment worked on this job, including a Vögele 1800 SprayJet paver, which simultaneously applies the asphalt curing emulsion - a material that promotes adherence between the new layer of asphalt and the base.

QUALITY OF THE WORK

Fremix's technical director explained that their choice of Wirtgen Group equipment was based on its quality, modernity and reliability. "On a job of this magnitude, where you need to complete repair of a determined area in a single day, you can't take risks. This is why we opted for reliable equipment, preferentially new," explained Valmir Bonfim.

Also according to him, in addition to all the machines being monitored close-up by Wirtgen Group employees, another advantage is the fact that in-plant recycling makes it possible to analyze the remaining pavement, at times choosing deeper milling. "On this job, for example, several localized interventions were carried out, as well as drainage reinforcements, aiming to further prolong the pavement's useful life," finished Bonfim.



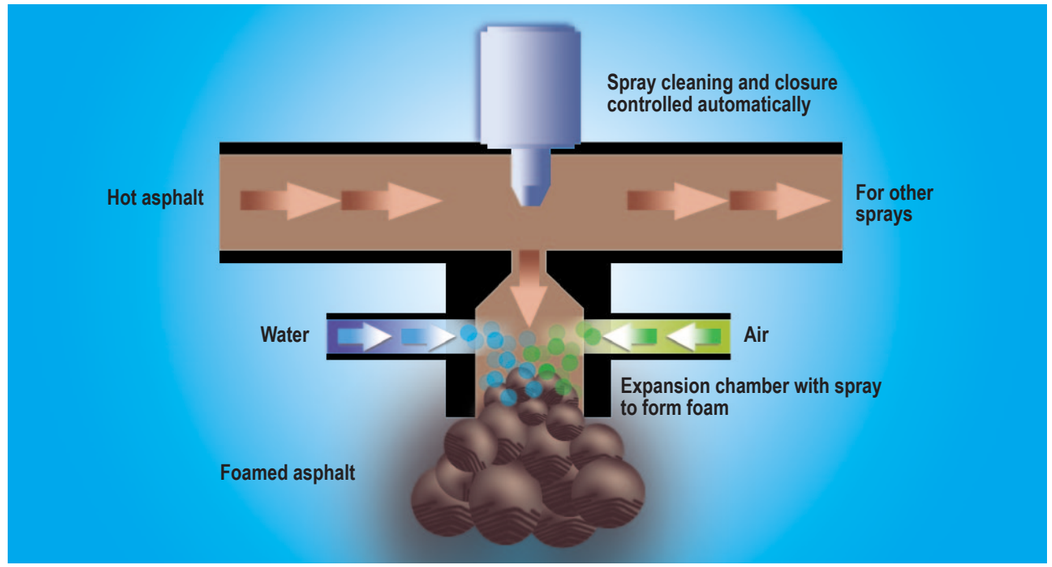
FOAMED ASPHALT: SUSTAINABLE TECHNOLOGY

The foamed asphalt technique involves mixing Petroleum Asphalt Cement (PAC) with water and air at specific temperature and pressure conditions. The PAC is mixed with water in a special chamber known as an expansion chamber. Air is also mixed with the binding agent at a specific pressure to encourage expansion.

Mixing the PAC with the two aforementioned elements makes it expand up to 20 times, generating the foamed effect. This phenomenon remains active until the water in the binding agent ceases to evaporate. This reduces the PAC's viscosity, allowing for better spreading of the binding agent with the additives.

The process can be carried out in the cold mixer and also in self-propelled asphalt recyclers, in the case of recycling processes carried out on site.

The foamed asphalt is a sustainable technology, since it permits control of particle size and material resistance, and mainly, transformation of material resulting from milling into raw material for new pavement, in this way generating environmental responsibility.



SIMILAR TECHNIQUES: WARM FOAMED ASPHALT

The foamed asphalt process is no longer just for sub-base structures and pavement bases. Recently, Ciber has used the foamed asphalt concept to produce warm mix asphalt mixtures (WMA).

Produced in an expansion chamber within an external pug-mill type mixer, the foam results from the forced and controlled introduction of water to the PAC, resulting in volumetric expansion of the asphalt binding agent for a determined period of time. The foam has the effect of increasing the mixture's workability by reducing binding agent viscosity during milling and compaction, allowing the PAC to adhere with binding agents at lower temperatures than possible with the traditional technique.

To produce warm mix asphalt, two parameters are fundamental and should be monitored prior to execution of the mix, as described below:

Expansion rate: defined as the ratio between the maximum volume achieved by the tar in its foamy state and the volume of the tar without foaming. The expansion is related to the reduced viscosity of the binding agent, therefore the greater it is, the lower its viscosity and the easier it will be to cover the additives during mixing.

The half-life period: classified as a time the foam takes to settle to half the maximum volume obtained when foaming ceases. The half-life is indicated in seconds and generally lasts between ten and twenty-five seconds. After the half-life period, the binding agent stays foaming and thus its viscosity remains below specifications for said temperature until the foaming process ends and binding agent volume returns to the initial level.

The expansion rate and half-life period define the reduction of milling and compaction temperatures. According to Marcelo Zubaran, product specialist for Ciber Equipamentos Rodoviários, expansion capacity and half-life period depend on the type of PAC, in addition to the mechanical system. "Binding agents with greater penetration rates, in other words, the softer ones, present less resistance to foaming and are therefore more recommended."

The production of warm mixes by the foaming process does away with the use of expensive additives necessary to several warm mixing techniques. In this process, water is the only additive. ■

Valmir Bonfim, technical director for Fremix: "Without a doubt, this job sets new precedents for Brazilian road work."

ABOUT SP-070

Now known as "Ayrton Senna" Highway (previously the "Workers Highway") SP-070 is an important route connecting São Paulo's state capital to its Eastern region. It begins at the end of Tietê edge road on the city's Eastside and ends in the city of Guararema, cutting through the cities of Guarulhos, Itaquaquecetuba and Mogi das Cruzes. SP-070 continues towards Paraíba Valley as Governor Carvalho Pinto Highway, also SP-070.

It is managed by Ecopistas concessionaire, on a 30 year contract that began on June 18, 2009. The second stage of the work, which will use the same process on other stretches, is scheduled to begin during the first half of this year.

Repair of Ayrton Senna relied on Wirtgen's cold foamed asphalt and recycling technology

MEXICAN HIGHWAY TO CONNECT MÉRIDA AND PLAYA DEL CARMEN

NEW ROAD WILL FACILITATE TOURISM BETWEEN THE TWO REGIONS, CONTRIBUTING TO GROWTH AND THE LOCAL ECONOMY

City located on the northern part of the Yucatán Peninsula in Mexico, Mérida is a place that sets itself apart by its traditions, culture and beauty. A great characteristic of this place is the fact that its present and past frequently are combined in the form of technological modernity and symbols from other eras.

Its location allows access by land, sea or air, with Mérida Airport (Manuel Crescencio Rejon) handling international and domestic flights. In addition to being a tourist destination, the city is also the port of entry for other locations on the Yucatán Peninsula, such as villages on the Gulf of Mexico, colonial forts and paradise beaches along the coast of Quintana Roo state.

Among the paradise beaches east of Mérida is Playa del Carmen, considered one of the most charming places on the Mexican Caribbean.

But currently, to get from Mérida to Playa del Carmen, you still need to fly to Cancún, since there are no direct land routes between the two. Two tourist destinations of such great importance could not remain disconnected. The job that is set to shorten the distance between the two cities will be 80 km long and the company responsible is ICA (one of Mexico's largest contractors), which subcontracted asphalt mix production to Jaguar Ingenieros Constructores.

Construmac, Wirtgen Group's dealer in Mexico, offered Jaguar a technical visit to its factory and to see other plants in operation in the field. After seeing the potential of Ciber plants and visiting the factory, the contractor decided to buy a Ciber UACF 19 P2 asphalt plant.

Scheduled for completion by the end of this year, the work will rely on a very productive machine that adapts extremely well to different climate conditions. "It's Ciber's most productive plant, and is portable, so it can be easily transported from one job to another. We chose it due to its versatility and robustness, delivering high production in the different climates found across Mexico. From the humid region on the Yucatán Peninsula, where it is operating, to the highest and most desert like regions, where we plan to produce later," explained Rafael Zuchetto, Ciber's sales manager for Latin America.

"The plant's installation and startup were done with support from Ciber and Construmac's technical departments, delivering very positive results even in the face of production difficulties imposed by the type of limestone additive from the Cancún region," added Zuchetto.

According to engineer Horacio Muñoz Jimenez, Construmac's asphalt product manager, in addition to being a very high quality machine with a solid asphalt mixture production rhythm, the Ciber UACF 19 P2 excels at environmental protections, since it uses less fuel than other models of asphalt plants available on the market.

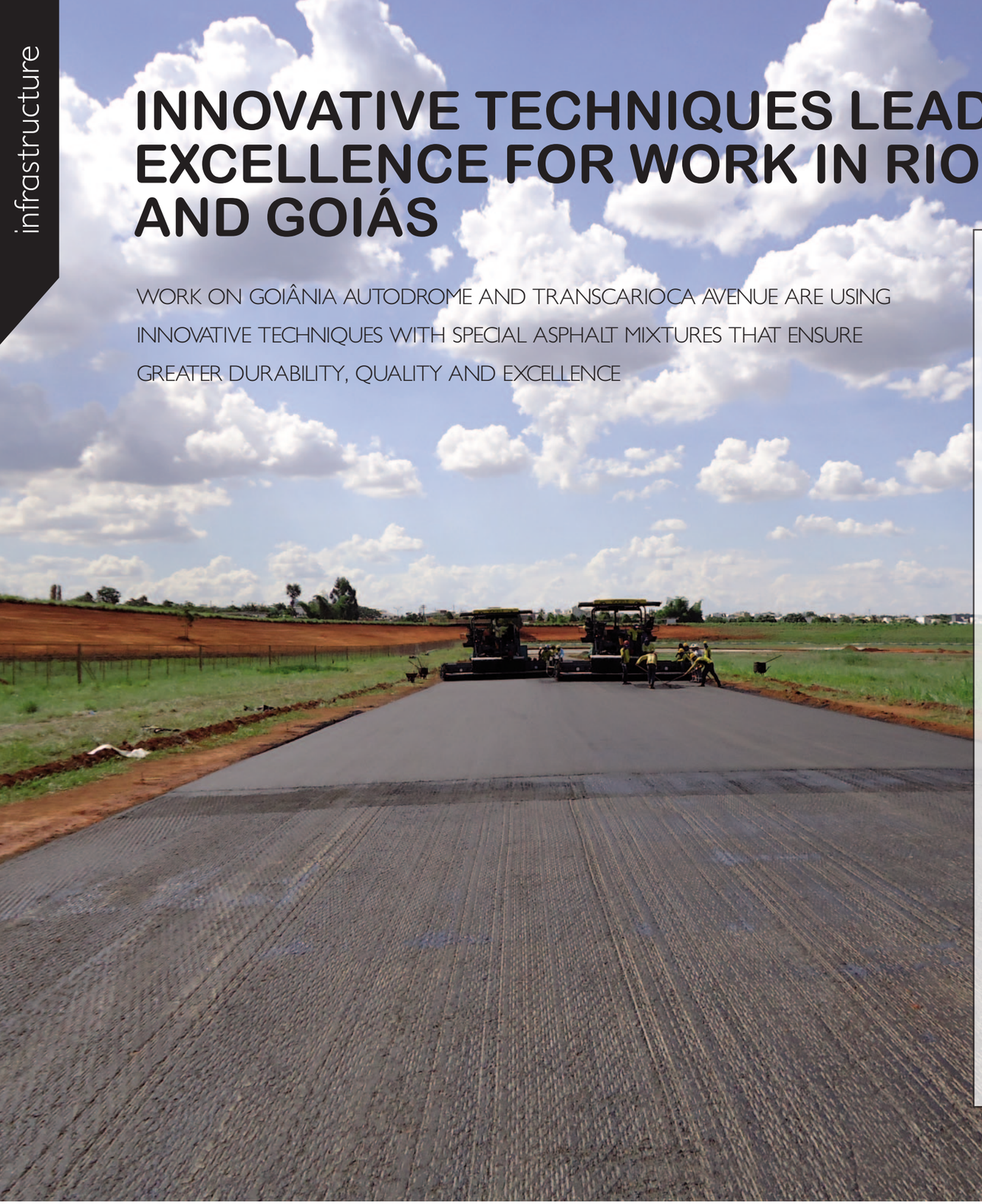
"The plant's ecological aspects and its mixture quality were the factors we weighed during our choice of this machine. It has operated very well and so far has met our expectations," Muñoz said.

After the two cities are connected, a new tourist route will be opened on the Yucatán Peninsula, which should contribute to growth of the region and the local economy.

"It is a very important highway for communication between the cities of Mérida and Playa del Carmen. In addition, it will make everything much more practical in that part of the state, since there will no longer be any more need to stop in Cancún, like you do now," explained Muñoz. ■

INNOVATIVE TECHNIQUES LEAD TO EXCELLENCE FOR WORK IN RIO DE JANEIRO AND GOIÁS

WORK ON GOIÂNIA AUTODROME AND TRANSCARIOCA AVENUE ARE USING INNOVATIVE TECHNIQUES WITH SPECIAL ASPHALT MIXTURES THAT ENSURE GREATER DURABILITY, QUALITY AND EXCELLENCE



The two jobs are using very similar, but different techniques that are both innovative in Brazil regarding their type of asphalt mixture. The Transcarioca, an important job on an avenue that will reduce the distance between Barra da Tijuca and Antônio Carlos Jobim International Airport (Galeão), adopted SMA (Stone Matrix Asphalt). For its part, on the Goiânia International Autodrome, which is having its road surface entirely redone, the technique being used is Gap Graded.

GOIÂNIA INTERNATIONAL AUTODROME

With a capacity for 100,000 people, the autodrome was inaugurated in 1974 and has held high-speed competitions in a variety of segments, such as: stock car, kart, motorcycling in the asphalt and motocross categories, truck, touring, cycling and marathon.

Renovation began in November 2013, and includes all of the infrastructure, including the main track, which is 3,835 meters long and 12 m wide. Its inauguration date has not been defined yet.

The asphalt mixture used is of the highest standard, and to obtain this excellence Construtora Artec, from Brasília, which holds the contract, is relying on Goiânia-based NG Asfalto to carry out the work. Everybody agreed on using Gap Graded type asphalt mixture. This technology provides a more porous asphalt covering, which as a consequence has greater surface roughness, indispensable to autodrome pavement.

The raw materials for producing the asphalt mixture (additives and asphalt cement) were criteriously selected. The additives chosen present good shape index (faces with similar dimensions) and abrasion resistance, fundamental to Gap Graded mixtures. The asphalt cement is modified with polymers, resulting in greater viscosity, thereby making it possible for the petreous skeleton to remain stable even with a mixture flow volume superior to conventional asphalt concrete.

According to Teodoro Schwarz, administrative commercial manager for Wirtgen Midwest, Gap Graded is a frequent paving technique in the United States and Europe, but is still uncommon in Brazil. It is more resistant to permanent deformations and also less susceptible to fatigue cracks, making it appropriate for the demands of an autodrome. In addition, the technology presents an excellent cost-benefit ratio.

For the job, a Wirtgen W200 milling machine was used to remove a 9 cm layer of old asphalt, together with a Ciber UACF iNova 1200 P1 Asphalt Plant, which according to Ciber Equipamentos Rodoviários product specialist Juliano Gewehr, is the best choice on the market for producing discontinuous mixtures, since it has an area for dry mixing additives inside the mixer. This allows you to achieve homogeneity of the additives before adding the binding agent, resulting in higher quality asphalt mixture.

Two Vögele Super 1800-2 pavers are applying the material simultaneously – each one paves 6 meters, adding up to a 12 meter wide track. “The advantage of using this method is being able to apply the joint between the two strips while still hot, ensuring there are no seams, unevenness or surface defects, since the electric heating of the compacting screen prevents temperature differences that might reduce paving quality,” Juliano explained.

The asphalt is being redone in two layers, one with 5 cm of conventional asphalt concrete, and the one above it with 3.5 cm of Gap Graded. “The Gap Graded mixture has discontinuous grain sizes, meaning there is more contact between the large additives, ensuring mechanical resistance to traffic and greater stickiness, making it safer for the drivers,” added the specialist.

<<< Two Vögele Super 1800-2 pavers apply material simultaneously

TRANSCARIOCA

But world-class asphalt mixture is not being reserved for auto racing. The Transcarioca, one of the main mobility improvement works in progress in the city of Rio de Janeiro, is using a mixture called Stone Matrix Asphalt (SMA).

Built with federal and municipal investments of 1.5 billion reals, the Transcarioca is 39 km long and connects Barra da Tijuca to Governor's Island, passing 45 public transportation stations and 14 neighborhoods.

They are planning to use SMA on a 28 km stretch going from Cidade das Artes to Penha. According to Ermano Dewet Moreira da Silva, who works for Andrade Gutierrez (AG), the contractor responsible for the work, the total volume will be 290 tons of Asphalt, which will cover the light vehicle lanes. For concrete, they are planning on using 340,000 m3, with a nearly 5% deviation. AG acquired two concrete plants to produce all the material for sidewalks, curbs, dividers, beams, rigid BRT pavement etc. "The work is already well underway. We only have 5% to go on the first stretch of the project, which reaches Penha and is set to be inaugurated by May," explained Ermano.

Application is being done at night, due to heavy daytime traffic and logistical questions, since at night it takes less time for equipment to supply service fronts, meaning less impact on traffic and increased safety with fewer pedestrians on the streets.

Prioritizing quality, safety, environmental aspects and savings in paving work, Rio de Janeiro City Hall chose to use SMA technology with warm mixture additives. During their search for modified asphalt mixtures that will stand up to the city's high temperatures, where road surfaces can reach a staggering 80°C, SMA technology was the only feasible alternative.

According to engineer Celso Reinaldo Ramos, paving technology manager for the Rio de Janeiro City Hall, manager of the "Asfalto Liso" project that aims to encourage measures that reduce the effects of global warming, Mayor Eduardo Paes is constantly searching for alternatives in every segment that work in favor of this goal and employs the technology in city works, one of the city government's great contributions. "Based on this line of thinking, we were looking for an asphalt mixture that was more sustainable economically (SMA is more durable) and environmentally (warm asphalt emits fewer polluting gases due two lower milling and compaction temperatures)," explained Celso Ramos.

The plant used on this job is a Ciber UACF 17 P2, with a 120 ton/hour production capacity. The equipment meets all of the strict requirements for producing this special mixture, including an external pug mill type mixer and individual bins for incorporation of hydrated lime and cellulose fiber, all computer controlled.

"One of SMA's trademarks is the cellulose fibers in the mixture, which present a large surface area, thereby allowing us to put more PAC (Petroleum Asphalt Cement) in the mixture, increasing the pavement's flexibility. At the same time, its granulometric curve is discontinuous, with a high quantity of large additives, which increases mechanical resistance. It has an unsurpassable combination of flexibility and resistance," commented Marcelo Zubaran, product specialist for Ciber Equipamentos Rodoviários.

The fiber normally comes in pallets. Opening them requires heating in contact with the additives, a process called dry mixing. That needs to happen before mixing it with the PAC. For this reason, the additive is introduced to the plant at the point where the additives transition between the dry mixer and external mixer. The mixture requires a modified, more viscous asphalt cement to maintain the mixture's stability with higher volume of spaces and greater surface roughness.

"This job contains asphalt cement with special polymers that in addition to the benefits of the modified asphalt, allow us to reduce milling and compaction temperatures by increasing the mastic binding agent's lubricity," explained Zubaran.

Due to high binding agent content - around 6% -, it becomes important to use a tandem oscillating compaction roller to avoid breaking the additives. Tire rollers are avoided to prevent losing surface roughness.

Both jobs are expected to be completed in 2014, and if it depends on the technology employed, they will have a much longer useful life than others that do not rely on Gap Graded or SMA in their construction.

Work on the Transcarioca

WARM MIXTURE TECHNOLOGY

The production of conventional asphalt mixtures has an environmental impact, mainly as a result of milling temperatures. The mastic binding agent responsible for lending flexibility and keeping the mixture cohesive needs to be heated to achieve the viscosity necessary for mixing it with the stone materials, which for their part need to be heated and moisture-free if they are to adhere to the binding agent. Adhesiveness between the materials is crucial to asphalt mixture quality. Without that, the mixture is weakened and as a consequence none of the minimum parameters required, volumetric or mechanical, will be achieved. For this reason, with the conventional technology elevated heating of these materials is inevitable.

However, high milling temperatures for asphalt concrete have an environmental impact, resulting mainly from the burning of fossil fuels. Since the ECO92 conference, government and social initiatives have been in operation to reduce emissions of pollutants to the atmosphere. Meetings like the Kyoto treaty and others like it demonstrate how committed nations are to these reductions. To this end, a series of technologies have been studied with the aim to reduce milling and compaction temperatures for the asphalt mixtures used on highway construction and above all to maintain adhesion between the materials in the asphalt mixture. This gave rise to Warm Mix Asphalt (WMA).

Warm mixtures are those produced at temperatures between 110°C and 140°C, and their advantages include: reduced atmospheric emissions of gases like CO2, CO, NOX2 and other fumes harmful to the environment; reduced worker exposure to fumes and odors, both at the asphalt plant and during application; improved technical conditions by facilitating achievement of the density required for the pavement, due to increased workability and reduced compaction temperatures, thereby allowing application at locations far from the plant and less aging of the binding agent, increasing the pavement's useful life.

Currently, there are different forms of technology that aim to reduce milling temperatures, as shown in the figure:

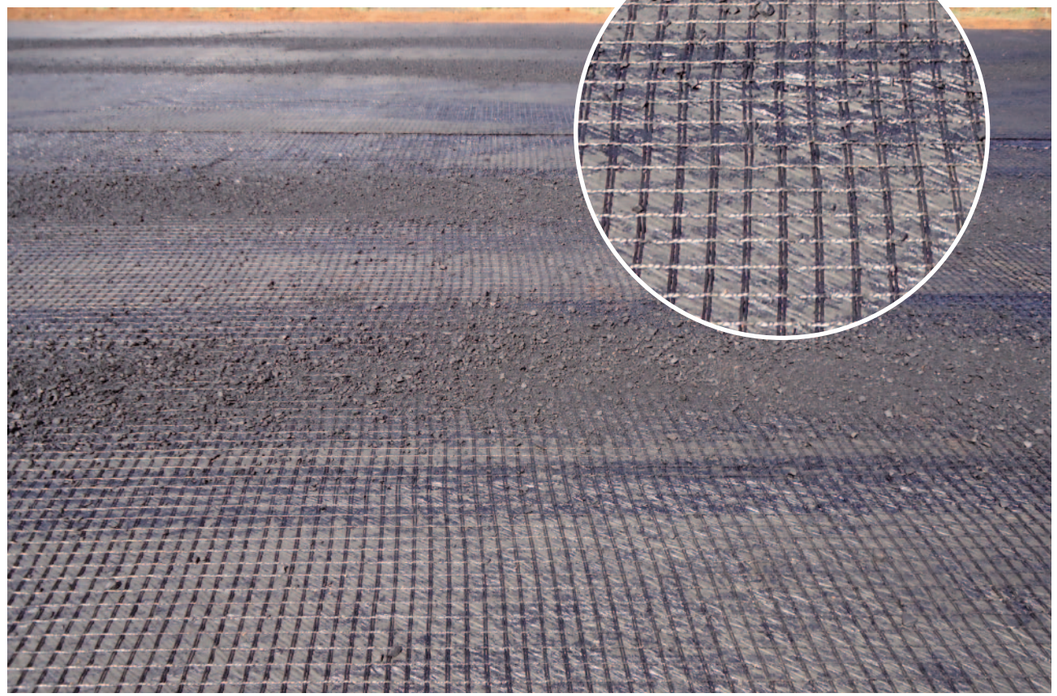
Organic additives or waxes, which when mixed in with the PAC modify its rheological properties reducing viscosity at high temperatures. This phenomenon only occurs during the mixing and compaction stages.

Chemical additives based on oily and surfactant amines that do not modify the asphalt's rheological behavior, that is, its viscosity. They act by modifying the interfacial tension between the additives and asphalt binding agent, thereby improving adhesiveness between the materials, workability and compactability of the mixtures.

Indirect production of foam in the binding agent through incorporation of hydrophilic material (synthetic zeolites) or incorporation of moist sand during production of the asphalt mixture. In the next step, the water incorporated into the zeolite crystals is continuously released when heated. Then, mixing this element into the hot PAC results in volumetric expansion of the binding agent and as a consequence a reduction in its viscosity. The second form of producing foam indirectly and reducing the binding agent's viscosity temporarily is to add moist additives (part sand) during the mixing process.

Foamed asphalt process, result of mixing the tar with water in a proper expansion chamber. When the water enters into contact with the hot asphalt, the water temperature rises quickly to 100°C. Then the water evaporates, increasing the binding agent's volume over twenty times, producing the foamed asphalt. This foam acts by lubricating the additives in the asphalt by reducing their viscosity, thereby improving product workability and facilitating its mixture and application at lower temperatures.

Technology employed ensures high precision, higher-quality and longer useful life for the road work <<<



STONE MATRIX ASPHALT - SMA

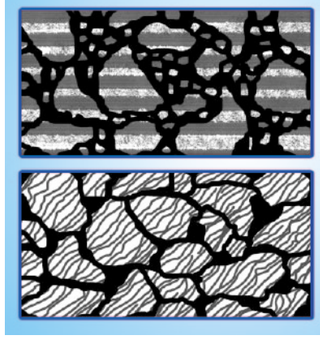
One of the main asphalt mixtures with discontinuous grain size is SMA, developed in Germany at the end of the 1960s with the aim to reduce permanent deformations. This pathology was common on highways at that time, but can still be found on roads with medium and high traffic volumes, in addition to being a serious problem on bus lanes.

According to Celso Ramos, "In Brazil, the majority of asphalt mixture used is composed of continuous grain sizes, such as the ones specified by the National Department of Infrastructure and Transportation in the A, B and C ranges, which are used with conventional binding agents. These mixtures are easy to make and execute without causing difficulties to highways. However, when we start talking about discontinuous mixtures, which perform better, several measures and modifications to the process are necessary to avoid unsuccessful applications."

SMA is characterized by its high content of additives greater than 4.75 mm. In the majority of cases, the mixture of additives in SMA consist of over 70% large additives, while a conventional continuous mixture uses approximately 45%. The structure or mineral skeleton is discontinuous, forming a mortar composed of a high percentage of fine additives, lime, fiber and modified PAC. This mortar is called mastic. In order to finish out the equation, the SMA has a very low percentage of intermediate 4.7 mm and 0.075 mm screen size additives.

In SMA, the use of modified asphalt is indispensable to keeping the grains in the mixture stabilized and increasing flexibility. The behavior of these mixtures in service is obtained through a structure composed of abrasion resistant additives united by elevated cohesion of an asphalt mortar, which fills in the spaces between the additives. ■

DIFFERENCE BETWEEN CONTINUOUS AND DISCONTINUOUS ASPHALT MIXTURE STRUCTURE



Asphalt Concrete (HMAC)

Stone Matrix Asphalt (SMA)

Plant operates on Transcarioca producing SMA

BR-116: HIGH QUALITY, LOW ENVIRONMENTAL IMPACT EQUIPMENT

HIGHWAY IN THE PROCESS OF WIDENING IS 240 KM LONG AND CONNECTS PORTO ALEGRE AND PELOTAS IN SOUTHERN RIO GRANDE DO SUL

With the aim to improve traffic flow and contribute to the Pelotas region's economic and social development, Highway BR-116 is being widened, as is the ring road around Pelotas.

With the Federal Government's Growth Acceleration Program (PAC2) investing BRL 953 million, the work includes construction of eleven overpasses and widening of three bridges and is being managed by the National Department of Infrastructure and Transportation (DNIT). In order to get the work done, three companies entered a consortium: SBS Engenharia, Construtora Pelotense Ltda. and MAC Engenharia Ltda.

Among the equipment being used are two Ciber UACF 17 P2 asphalt plants, one Ciber USC 20 E soil plant, one Wirtgen SP 15 paver, seven Hamm 3411 compaction rollers and one Hamm 3520 compaction roller. The latter equipment are of the 11 and 20 ton operating weights, respectively.

Also on the job are two Ciber 5000 Plus asphalt pavers, widely used on medium to large projects. This equipment has an undercarriage composed of two crawler tracks that provide broad soil coverage, thereby ensuring full traction to carry out work.

The plan is for the company's new machines to take part in changes to the highway, since the paving stage is just getting underway. "I'm estimating that more equipment by the group will participate on the job, which is divided into nine lots with different consortiums consisting of mostly companies from Rio Grande do Sul and Minas Gerais," explained Wirtgen parts sales specialist Éder André de Melo.

According to Waine Souza, director of works for SBS Engenharia, the choice of Wirtgen Group equipment for such an important job came about due to the brand's high quality, low cost and attention to the environment. "We obtained the necessary compaction quality to meet project requirements, at lower operating costs," he explained.

According to Waine, This is not the first time SBS Engenharia has used Hamm compaction rollers. "Hamm compactors, in comparison with others available on the market, present great advantages in cost reduction, since they use less fuel than similar equipment by other brands. We also saw improved compaction quality, and lower fuel consumption, which contributes to greatly reducing air pollution."

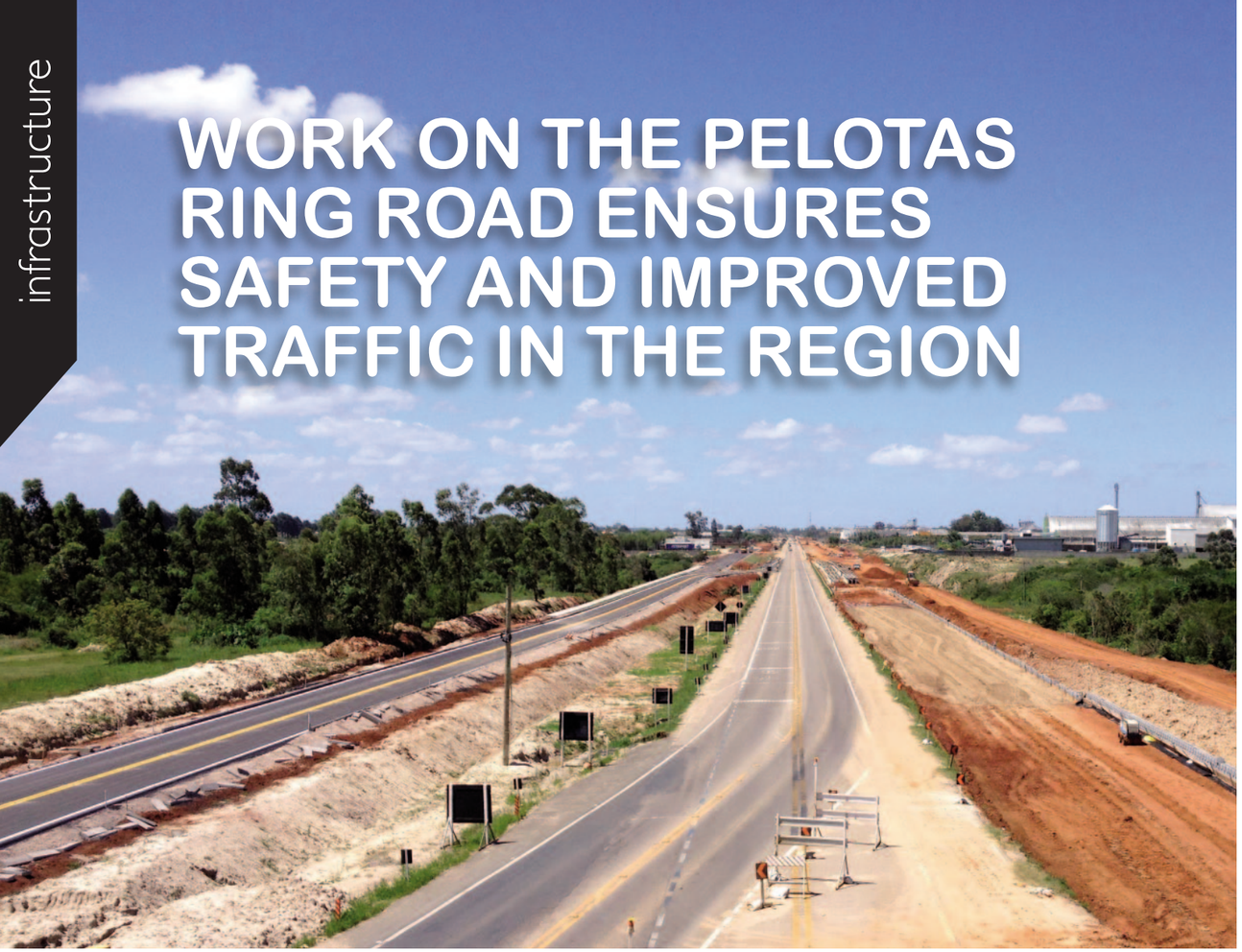
The machinery's ease of operation was another decisive factor in SBS's purchase of the equipment. "Even with such high technology embedded, operating the Hamm equipment is extremely simple," concluded the director of works.

WORK STAGES

During the first stage, until 2014, BRL 780 million should be spent on widening Highway BR-116. After this stage, another BRL 173.9 million will be invested, for a total of BRL 953 million. The work on the Pelotas ring road will cost BRL 430 million. The money is coming from the federal government.

The stretch of the BR-116 where the work will be done is one of Brazil's main areas of cargo traffic and is the main access to Rio Grande do Sul's port zone. It is estimated that 10,000 vehicles circulate on the Southern stretch of the highway every day, 70% of which are trucks. ■

WORK ON THE PELOTAS RING ROAD ENSURES SAFETY AND IMPROVED TRAFFIC IN THE REGION



HIGH TECHNOLOGY AND COMPANY PHILOSOPHY ENSURE MAXIMUM CARE AND ENVIRONMENTAL PRESERVATION AROUND THE WORK

Just like the widening projects along Highway BR-116, which connects Pelotas to Porto Alegre, the widening of the Pelotas ring road also aims to improve traffic flow, contribute to the region's economic and social development and especially, provide improved safety for drivers and local residents.

Since the BR-116 passes through urban areas and is used as an access road to several neighborhoods, in addition to widening the road, access ramps to urban areas and side streets are being built, ensuring that highway traffic does not mix with local traffic.

Initiated in August 2012 and scheduled for completion in August 2015, the work under the responsibility of HAP Engenharia, one of the companies that won the bid notice, relies on the technology of Ciber and Wirtgen Group equipment. Especially for the job, they acquired two Ciber AF 5000 Plus Pavers with innovative systems that incorporate operating practicality and intelligent automation, one USC 50 P Soil Plant and one 17 P2 Asphalt Plant.

According to Wirtgen parts sales specialist Éder André de Melo, "the models offer excellent profitability for medium and large size jobs, since they are practical to operate and flexible enough to operate with different trucks."

In the opinion of Ednilson Fernandes, mechanical engineer for HAP Engenharia, before they acquired the machines they made technical visits to the country's main manufacturers. "Our choice of Wirtgen Group equipment was due to the equipment's quality and technology, which ensures greater mechanical availability and reliability, since their breakage rates are almost zero and also because they are appropriate for the job in question," the engineer explained.

ENVIRONMENTAL CARE

The HAP Engenharia- CONVAP consortium values its commitment to combining quality, health, work safety and environmental protection in its activities and practices. For this reason, according to Ednilson Fernandes, ELAP complies with environmental legislation, acting preventively so as to avoid polluting in its administrative and operational activities. For the company, one of the ways to achieve this objective is to only work with companies that meet proper health, work safety and environmental preservation standards and practices.

"Well-maintained equipment avoids excessive consumption of raw materials and environmental pollution," stated Ednilson Fernandes, mechanical engineer for HAP Engenharia

Ciber USC 50 P asphalt plant installed in Capão do Leão, a city near Pelotas/RS

"One example that shows our environmental concern is the structure set up in Capão do Leão, on Highway BR-293, on HAP's Ciber 17 P2 asphalt plant, which took all of the environmental legal requirements into consideration established by Rio Grande do Sul's strict legislation," the mechanical engineer explained.

The location where the plant was set up is surrounded by a permanent nature reserve and HAP took care to keep those areas isolated, with signs to orient workers. Also according to him, in the area where the plant is installed there is a Ficus organensis (tiny-leaf fig) tree, a species protected by law according to the forest code. The tree also received special attention and a sign.

All equipment is monitored regularly, in addition to undergoing strict pollution controls and being installed on an impermeable floor with channels to retain and guide waste, separating bins and containment basins with control valves and exhausts. "Well-maintained equipment avoids excessive consumption of raw materials and environmental pollution," stated Ednilson Fernandes.

The waste generated by the asphalt plant is correctly disposed of through properly licensed companies or institutions according to the solid waste management plan (PGRS), a document that defines the necessary actions for correct collection, storage, treatment, transport and disposal of solid waste. FRAGET Recycling Cooperative, which is in good standing and internally serves nearly 20 families, is sustained by recycling and donations, such as those carried out by HAP ("trash donation"), which are fundamental to their existence.

In order to ensure even more excellence for the work, an audit was carried out in December 2013 to maintain the following certifications: ISO 9001 Quality Management System; ISO 14001 Environmental Management System; OHSAS 18001 Safety Management System; PBQP-H Brazilian Program for Quality and Productivity in the Habitat and Qualihab for the HAP Engenharia, Rbr Empreendimentos e Construções and Realidade Engenharia.

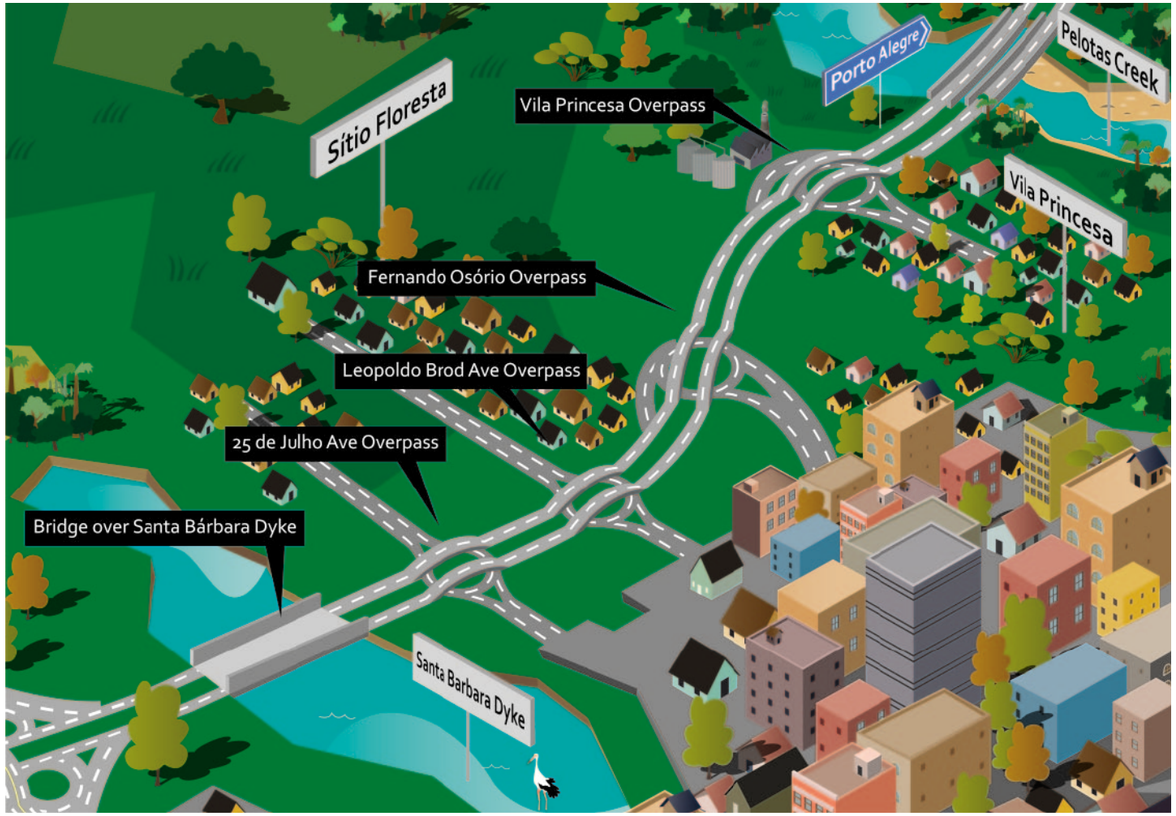
THE RING ROAD

The work on the Pelotas ring road is managed by the National Department of Infrastructure and Transportation (DNIT), and has received an investment of BRL 430 million. Funding came from the Federal Government.

The approximately 24 km long stretch was divided into two lots. For the first, where BRL 218.18 million were invested on an 11.01 km stretch, a consortium between HAP Engenharia and CONVAP Engenharia e Construções S.A. was created. For the second lot, the consortium consisted of SBS Engenharia, Construtora Pelotense Ltda. and MAC Engenharia, Ltda. where BRL 212.47 million are being invested on the remaining 12.68 km. ■

VVV Widening of the Pelotas ring road includes the building of bridges and overpasses and connecting it to highways BR-116, 392, 293 and 471. Together, these highways form important corridors between the state's main productive regions and the port of Rio Grande

Illustration: Hap Engenharia promoters



GUACARA: 4 YEARS IN 1

PROJECT IN VENEZUELAN CITY AIMS TO IMPROVE ALL ROADS; INCOME AND JOB CREATION ARE OTHER POSITIVE POINTS

Guacara has decided to put its foot on the accelerator, with City Hall stepping up its road paving rhythm, driving growth for this important region of Venezuela.

A city located in the state of Carabobo, Guacara has intense industrial activity, with over 100 large companies and 700 medium-sized companies in many different fields, such as: automotive, paper, food, aluminum processing, household appliances, textiles, plastic, chemicals and others. Considered one of the country's industrial powerhouses, it represents 5% of Venezuela's production apparatus and stands out due to its companies with foreign and domestic capital.

An outstanding region of Venezuela, Guacara is in constant need of renovation and economic improvement. Aware of this, Mayor Gerardo Sánchez announced in September 2013 that they would be gearing up the asphalting project. The measure will create jobs in the region, in addition to improving quality of life for residents.

In order to achieve this objective, the Venezuelan city chose to use a Ciber Equipamentos Rodoviários asphalt plant, the UACF iNova 1200 PI, which has the most modern technology for producing asphalt mixtures. It is a piece of equipment with qualities that perfect the excellence of the asphalt it produces, making it an excellent purchase for any buyer: the new chassis and suspension provide greater stability; four feed bins with individual weighing in a single mobility; a new dryer that reduces fuel consumption; in addition to a new more robust mixer designed for the dry mixing stage.

Luciano Sackis, Ciber product support coordinator, who was present at the event to deliver the UACF iNova 1200 Pl, emphasized the importance of correct installation, a Ciber standard procedure that demonstrates the company's concern with always helping customers, instead of just delivering the machine. "We're here to make sure the installation was done well, that all the components are working properly, and to make sure the plant meets our own operating requirements," Luciano stated.

As explained by Mayor Gerardo Sánchez, acquisition of the UACF iNova 1200 will allow EMAG, the city asphalt company, to produce an impressive thousand tons of asphalt a day. "Now that we're using this plant, EMAG will be able to repair the city's streets in 2014," the mayor told journalists attending the machine's inauguration.

The asphalt plant's presence in Guacara, in addition to offering this amount of asphalt production to the city, will also help the region sell asphalt to other locations that need the material. "In 2014, we're going to surpass the quantity of asphalt we laid during the last four years of my administration. We are going to lay over 160,000 tons to be produced by this plant, and that will certainly help us rationalize the financial investment of the production," the mayor explained.

Interviewed at the end of January 2014, EMAG Director Juan Rosales confirmed that their production rhythm has been fast. "The daily routine we have established has allowed us to produce 2000 tons since November, when we started producing. The process continues to run splendidly."

"For 2014, our goal will be 192,000 tons, or 800 tons a day. We could ratchet up that number even further, depending on demand and conditions as the year progresses," Rosales added.

JOB CREATION

The fact the Guacara government is investing in paving its streets has benefits beyond the work itself: it creates jobs. That's because there is much to be done on location and besides Guacara, demand from other regions will allow them to keep working at full steam for a long time to come.

According to Juan Rosales, an engineer from the city asphalt company, using the Ciber asphalt plant creates at least twenty direct jobs, in addition to others indirectly. "For the first quarter we are estimating 500 tons/day production, and before the middle of the year we should be up to 800 tons/day," Rosales explained. ■

Left to right: engineer Riben Romero, Pres. of Guacara City Asphalt Company (EMAG); Luciano Sackis, Ciber product support coordinator; Gerardo Sánchez, mayor of Guacara; Elomar Stein, Ciber technical assistant; and engineer Juan Rosales, manager of EMAG

MG-050: EXCELLENT *IN SITU* REPAIRS USING COLD RECYCLING

STRETCH CONNECTING BELO HORIZONTE TO SÃO SEBASTIÃO DO PARAÍSO USES COST-AND-ENVIRONMENTAL-IMPACT-REDUCING MACHINERY

The MG-050, also known as Newton Penido Highway, goes from Belo Horizonte to the city of São Sebastião do Paraíso in the state of Minas Gerais. Due to structural and functional defects, since August 2013, a stretch of approximately 50 km underwent structural pavement repairs, using in situ cold recycling with the addition of cement.

For the repair, they used two Wirtgen recyclers (WR 240 and WR 2500 S), one Streumaster SW16 MC cement distributor, four Hamm compactors (two 3411s and two 3520s, 11 and 20 tons, respectively) and one Wirtgen W 100 milling machine. Tecnopav Engenharia was responsible for doing the work at the service of Nascentes das Gerais concessionaire.

The locale had already undergone innumerous interventions in attempts to improve the pavement, but due to the many layers placed one on top of the other, they did not achieve the desired results. The solution found by the company was to recycle the asphalt.

For field engineer Vinícius Franco, a contract manager for Tecnopav, what influenced them in choosing the technique, in addition to needing fewer pieces of equipment, was the environmental question, since the process requires fewer natural resources, reusing the material from the road itself: "Recycling processes require fewer pieces of equipment, which means less machinery on the road. This not only reduces costs, it has less of an impact and improves safety for road users."

The project, which aims to improve the road's traffic capacity, consisted in cutting 18 cm deep into the asphalt layers that have been applied over the years. For correct pavement repair, one thing that set the work apart was the Streumaster distributor, which by electronically controlling uniform distribution of the binding material ensures ideal cement application, avoiding both wasted material and money.

Ciber product specialist Juliano Gewehr emphasized the importance of adding the correct amount of product: "Too much cement leads to the emergence of splits and fissures due to high stiffness, while too little means the pavement will not have the necessary mechanical strength. This made it extremely necessary to use a distributor," Juliano explained.

Streumaster SW 16 MC cement distributor

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With precision distribution, the Streumaster SW 16 MC's intelligent system interconnects the conveyor belt, transversal augers, feed bins and control terminal with high precision, always maintaining the same application rate, regardless of any variations in displacement speed.

Also according to Juliano, the distributor is a recent arrival to Brazil, with Tecnopav buying the first one last year. The specialist points out that in cement recycling jobs a significant portion of the cost comes from this raw material and for this reason he pointed out: "If the recycling unit changes speed, the machine's automated system automatically corrects the applied dosage."

For their part, the 20 ton drums, though they first arrived in Brazil some years ago, are still considered a new development. They save 35% on fuel in comparison with 11 ton drums. In addition, their participation has played an important part in keeping work productivity higher than average, without compromising on quality.

With the cold recycling technique and use of the distributor, they were able to repair an average 600 to 1000 m of half lane per day, depending on weather conditions. The job was completed on January 27. ■

MOBILE CRUSHERS ENSURE GRAVEL COMMERCE FOR ALL OF MARANHÃO

EXCLUSIVE PROJECT IN THE STATE RECEIVED ATTENTION IN NORTHERN AND NORTHEASTERN BRAZIL

Combining the useful and the pleasant. That was exactly what Rodoprado Transportes did when they decided to expand their area of business, expanding from the highway transportation sector to the extraction of granite and gravel sales. In 2010, the company started "an unparalleled project in the history of Northern and Northeastern Brazil," as described by Dantas Prado, director of Rodoprado.

Nearly 10 years ago, Maranhão (Rodoprado's home state) began to stand out in the Northeast due to the contingent of jobs it received. Faced with this new market, Rodoprado saw a great opportunity in reselling gravel in the area. After having won the trust of professionals in the field and obtaining stability and sales volume, the company decided to start a new stage of its trajectory: Rodoprado members opened PG Mineração and purchased a quarry in Bacabeira, as well as equipment to process its own gravel pit. That was how an important partnership for all of Maranhão began, with PG supplying crushed materials and Rodoprado transporting them.

In order to stand out in this field, PG Mineração knew the material needed to correctly meet the market's quality requirements. Successful extraction involved the use of good crushing equipment. Knowing this, in 2013, PG Mineração purchased three pieces of Kleemann equipment from Wirtgen Brasil Northeast, Ciber Equipamentos Rodoviários' branch in the region.

The equipment, all by Kleemann, are: one MC 125 Z primary jaw crusher on tank tracks, one MCO 11 S cone crusher with three coupled decks on tank tracks, and one mobile screen, also with three decks, the MS 19 D.

"Based on what we know of other projects in the-

se two regions, we can safely say that we are the largest crushing and mobile screening project around," assured Dantas Prado, director of Rodoprado.

The undertaking is considered a new development in the region precisely because all the equipment involved in the crushing and screening plant operate on tank tracks. In addition to being designed to optimize the continual flow of material and generate higher quality end products, Kleemann's mobile units are robust and ensure perfect operational stability, which ends up reducing impact on their internal components. These factors increase the systems' useful life, reduce operating costs for the plant and avoid premature part wear. According to Jorge Sales, regional sales consultant for Wirtgen Brasil, "The pioneerism and ongoing renovation of our technology ensures these systems' high processing capacity." One example of this innovation is their Dual Power technology, which allows the plants to run on either fuel or electricity.

Another of Kleemann's concerns is with the machines' operational safety. Aiming to meet this requirement, the company designed a vibrating shoot for unloading, located below the crushing system to protect the conveyor belt against unnecessary wear.

"Out of all the equipment we have seen, the Kleemann crushers have the most robust, strongest and most reliable construction. The choice of the world's best components for the equipment is a strong point. In this way, the probability of technical shutdowns due to mechanical work and technical problems is very low," Prado said.

PROJECT RESULTS

Crushing activities began in September 2013, and PG Mineração now supplies gravel to several cities – even ones that are far from the capital city of São Luís, oftentimes up to 600 km away –, across the state of Maranhão.

The bold project, which plans to reach the mark of 60,000 tons per month, is located just outside Bacabeira, approximately 40 km away from São Luís.

"Our goal in this new field is to always improve our results, because that way we can provide our customers with excellent service and products," Prado explained.

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Customers see Kleemann crushers as the most resistant, robust and reliable

"CLOSE TO OUR COSTUMERS"

Staying true to the Group's well known slogan "Close to our customers," Wirtgen Brasil Northeast is keeping a close eye on the entire after-sales process for PG Mineração's machines. Thus, everything from plant start-up to constant technical-operational monitoring of the equipment was ensured to the customer.

"Our product support structure is yet another competitive advantage during the after-sales stage. We offer mobile workshops, engineers and technicians that ensure our customers we stand by our commitment, one of the brand's characteristics," Jorge Sales said.

"It was excellent. From the technical assistance provided by their application engineers to the correct sizing of the machines, to the technicians and engineers who participated in its startup. We had a team with us for thirty days to make absolutely sure the equipment was working properly, and their response time was ideal," finished Dantas Prado. ■

EGYPT ACQUIRES HIGH QUALITY ASPHALT PLANT

CIBER EQUIPMENT DELIVERED TO THE CITY OF CAIRO ADAPTS WELL TO DIFFERENT MATERIALS AND CLIMATE CONDITIONS

The UACF 17 P-2 ADVANCED is the first Ciber asphalt plant in Egypt, marking the company's arrival in the important North African country. Ciber's Cristiano Lameira, sales manager, and José Martins, service manager, went to the city of Cairo to provide on-site training for customers and technicians working with the equipment. "The plant's asphalt quality and production satisfied the customers," Cristiano said.

The Ciber UACF Advanced asphalt plant combines complete portability with continuous production technology that ensures mixture quality comparable to gravimetric plants. The Petroleum Asphalt Cement (PAC) is not exposed to high temperatures, thereby ensuring greater useful life for the asphalt mixture, and as a consequence, higher end product quality. It's a versatile and reliable piece of equipment that adapts well to different materials and climate conditions.

After the training, on the first two days of operation, 2000 tons of hot mastic asphalt concrete (HMAC) were produced. ■

PA-150: FAST EXECUTION REPAIR WITH MINIMUM TRAFFIC INTERFERENCE

REPAIR PROJECT FOR ONE OF THE MAIN ROUTES CONNECTING BELÉM AND RURAL PARÁ USES *IN SITU* TECHNOLOGY

Inaugurated in the 1970s, one of the main arteries connecting Pará's capital of Belém to the rest of the state, Highway PA-150, is undergoing its first complete repair project. In order to ensure not only speed and savings, but sustainability while carrying out the work, CFA Construções, Terraplanagem e Pavimentação Ltda, which won the bid notice, and Ameta Engenharia, the company sharing execution with them, chose on-site cold recycling technology.

This method ensures complete reuse of the milled material, reducing expenses with materials and consumption of petroleum derivates and additives, thereby contributing to the environment, in addition to producing easy to control mixtures that are similar to entirely virgin mixtures.

To this end, CFA and Ameta are working with four Wirtgen cold recyclers, two WR 240s and two WR 2400s. According to Juliano Gewehr, product specialist for Ciber Equipamentos Rodoviários, the use of this machinery is the best choice for this type of work, since recyclers reuse 100% of the integrated material as raw material. "Using recyclers on highway repair jobs is the best technical choice, as well as offering the best cost-benefit ratio. There are studies proving that the on-site cold recycling technique reduces transportation costs over 95%. This is in comparison with the old methods of removing the entire pavement and rebuilding it layer by layer. Execution is also much faster, quickly opening the road up to traffic again," the specialist emphasized.

According to Juliano, the advantage of working with a WR 240 on this type of job is the equipment's versatility, since it does soil stabilization and asphalt recycling with the same efficiency. The fact it has four-wheel traction makes it possible to work on soils with low mechanical resistance, in addition to having a quadruple pendular axle, allowing regularity to the work even on uneven terrain. Its variable volume recycling box maintains high cutting efficiency, homogenization and mixing, even at greater working depths. There's also a binding agent dosing system for applying asphalt emulsion or foamed asphalt, and a recycling cylinder with Wirtgen bits technology and bits-holder, with proven efficiency and great durability.

The stretch in question (approximately 40 km long and 12 m wide including road surface and shoulder) goes from the city of Jacundá to Morada Nova, in the city of Marabá, with a sub-stretch in the integration region of Tucuruí Lake, approximately 400 km from Belém.

According to José Irineu Ramos Junior, commercial manager for Deltamaq, the Wirtgen Group's dealer in the Amazonas region, "The WR 240 is more advanced than the previous generation, the WR 2400. It features technical developments like: complete visualization of the work with lateral movements of the operating cab, a rear camera, a smaller turning radius for work in urban spaces, and the possibility of using up to nine different cutting speeds, depending on the type and hardness level of the material to be recycled. In addition, the Wirtgen recyclers are the only ones on the market that provide independence between the recycling bin and the machine's chassis," he explained.

The work was separated into three stages: asphalt repair, construction of the shoulder and signage. For the shoulder paving stage, Ameta and CFA used other Wirtgen Group machines, such as the UACF 17 P2 asphalt paver, Vögele Super 1100-2 and Ciber AF 4500 pavers.

At 35.5 km long, the stretch being worked on by Ameta Engenharia Ltda lies between Morada Nova and Nova Ipixuna. According to Rodrigo Souza, civil engineer for Ameta, previously, the stretch was shoulderless and very deteriorated. "We are creating a two and a half meter wide shoulder on each side, in addition to recycling all of the road's pavement and rebuilding bridges. We are applying a 10 cm layer of hot mastic asphalt concrete to the road surface and 3 cm on the shoulders," Rodrigo explained.

The interventions began in August 2013 and are scheduled for completion in May of 2014. ■

TRAINING INCREASES SAFETY, PRODUCTIVITY AND USEFUL LIFE OF EQUIPMENT

Ciber has a busy schedule of trainings in 2014, with fifteen seminars for customers, aiming to spread its great knowledge on equipment operation and techniques for building and repairing roads.

The trainings include theory and practice classes on real machines or simulators. Anybody involved in jobs that make use of the equipment can take the trainings, from operators to engineers, on technical aspects of operation and maintenance.

Between January and February, four seminars have been held. Along with this edition of Usina de Notícias, you will be receiving a complete calendar of what will be happening for the rest of the year. This calendar can also be found on the company website at www.ciber.com.br. ■

INVESTMENTS AND INNOVATION TO SUPPORT GROWTH IN 2014

The **Wirtgen Group** presents the most modern roadbuilding technology at the 2014 Brazil Road Expo. One of the highlights is the debut of a new line of Vögele pavers, the "dash 3" generation.

The "dash 3" generation pavers are even easier to use, more silent, economic and ecological. Among the innovations are the ErgoPlus 3, AutoSet Plus functions and a state-of-the-art Cummins engine.

"Our equipment is recognized for its technology by engineers and operators around the world. Their performance puts them at the top level of the best asphalt pavers. We are extremely happy in being able to offer this technology to our customers and as a consequence, to the Brazilian market," commented Ciber commercial Chief Executive Officer, Luiz Marcelo Tegon.

The event

With a 460 m2 stand, the Wirtgen Group is presenting nine machines at the fair: five models of Hamm compaction rollers (341 IP; 3520P; HD 14 VT; HDO 90V; GWR 280-16), a Wirtgen WR-240 cold recycler; a Wirtgen W100 milling machine; a Ciber iNova 1200 PI asphalt plant and a Vögele Super 1800-3 Super paver. In addition to the equipment being displayed there, visitors will be able to access complete information regarding the entire line of Wirtgen pavers, the Streumaster cement distributor, as well as the high technology in crushing and screening provided by Kleemann equipment. ■

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