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ConcreteWorks is a publication of the **Alabama Concrete Industries Association** and features articles and photographs pertaining to product applications, educational opportunities, as well as innovative construction techniques impacting the industry.

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Helena Middle School Achieves Top of the Class

PHOTOS BY **BILLY BROWN PHOTOGRAPHY**

Put 700 sixth, seventh and eighth graders in a building all day long for five days a week, and you had better make that building out of some pretty strong stuff! But a school building is also part of a community, a component of the educational experience, and even part of fond memories of growing up. It should also be beautiful, and it has to be functional. There's a lot going on inside those walls, from academics to athletics and recreation and enrichment. Of course the solution for this multitude of needs is concrete.

Concrete is a natural choice for a school facility, says architect Shawn Calma of Lathan Associates Architects, P.C. "Concrete block is darn near indestructible and when you're dealing with kids, that's important," he says. "And it's a readily available material, so it just makes sense."

The Helena Middle School in Helena, Ala., opened in August 2008 and encompasses 130,000 square feet, with about 30 classrooms as well as a media center, computer classrooms, band and choral room and a family and consumer science facility complete with stoves for cooking classes. Additionally, there is an administrative suite of offices, a full service cafeteria and kitchen, and a multi-purpose gymnasium. The facility is part of Shelby County Schools.

The school is laid out around a central commons area, with a two-story classroom building at the front, and cafeteria, gymnasium and band/choral areas separated by green space that helps keep these noisier areas from disturbing classes. Additionally, the incorporation of a commons area in the design offers more functionality and versatility for school functions. For example, the school can host a basketball game in the gymnasium in the evening, while keeping the classroom and administrative areas that are not in use for that particular function closed. This increases the facility's security by preventing people from wandering into deserted areas, and adds economy by eliminating the need to supply electricity, heating and cooling in those buildings after regular school hours.

The main classroom building also is designed with wings so that it can be easily expanded as needed if the school population grows. The building is at the core of a new subdivision development, so

this is a likely possibility.

Lathan Associates Architects, P.C. was recognized for its outstanding design work on the Helena Middle School by the Alabama Concrete Industries Association (ACIA) with a Top Block Award. The Top Block award was originally established by ACIA in the mid-1990s to recognize excellence in construction in the concrete industry. In 2002, the award grew to encompass and recognize the design community through a partnership with the American Institute of Architects (AIA).

The first Top Block Award was presented in summer 2002 at the Alabama Council AIA Convention at the Grand Hotel in Point Clear, AL. Since that time, the ACIA has become the presenter of the annual award for the best masonry design and construction of the year. Winners are selected by a panel of industry expert judges. This is the first time Lathan Associates has been chosen as a recipient.

"It's outstanding," Calma said of the award. "Certainly, you don't design a project with the idea of winning an award in mind, so we were surprised and happy to have been selected and recognized in this way. It's very rewarding."

The building project took about 18 months to complete, and includes hollow core, concrete block and metal trusses. The bulk of the construction is a concrete block structure with metal trusses and metal roofing system, and a brick veneer finish. There is a traditional poured concrete slab, and a storefront window system. The classroom wings of the building are masonry block with hollow core.

"Coordinating all those systems together is a challenge. It's a timing issue," said Russ Stone of Gary C. Wyatt General Contractor, LLC, who served as project manager for the Middle School construction. "With block, we can buy it and lay it all day, but there's a longer lead time to get hollow core and metal buildings, so you have to build that into your schedule and blend it with the masonry construction."

Concrete, he says, is definitely a first choice when it comes to a project like this one. Not only is it economical and easy to obtain,

there is nothing better for longevity. “You have more masonry on a school project than another type of project, for durability,” he says. “A school building sees so much traffic on a daily basis, as kids move to different classes, and it’s a very active, wear-and-tear type environment. Concrete easily stands up to that.”

Safety also is an issue in the selection of concrete as a primary building material in schools, as it lends natural fire resistance. And, concrete is naturally insulating, helping to reduce costs for heating and cooling the facility.

The Helena Middle School construction does have some unique elements. In particular, for the large open space required for the gymnasium, the construction called for a pre-engineered metal components to be integrated with the structural block. This integrated masonry technique is fairly new, having been introduced in the past several years, to allow contractors to more easily facilitate the long spans required by long open spaces.

“In order to integrate the masonry and steel, you basically have to assemble the entire metal building system, and then build the block building around it,” Stone explains. With traditional block, it can be more difficult and more expensive to get that long open area, he says, but the metal core provides a foundation that can then be enhanced with concrete block to provide additional strength, protection from the elements, insulation and structural longevity. ■ Wendi Lewis

BLOCKING OUT THE STORM

Builder Vincent "Randy" LaCoaste calls the concrete construction of the newly built Wingate hotel at Tillman's Corner in Mobile, Alabama, the "silent giant" lurking within the building. At first glance, the average person wouldn't know concrete was at its core, but that concrete construction provides strength and durability that's hard to beat from a benefits standpoint.

Clothed in stucco on the outside walls and decorated with crown molding in the guestrooms, concrete is hardly visible except in the stairwells and utility rooms, LaCoaste says. "The hotel has concrete holding things up, but it doesn't have to brag about it." LaCoaste is vice president of Brook Cherith, Inc., a Mobile-based contractor specializing in design and build projects. He also boasts a background in engineering, which gives him a keen insight into how building materials work. He says the use of concrete in the construction of hotels especially along the coast is an obvious choice.

The owners of the Wingate consulted with LaCoaste on the project, and all were in agreement early on that concrete would be used extensively in the construction. The approximately 56,000-square-foot, four-story building was built with concrete core slabs on the floors and ceilings and concrete masonry units, or concrete blocks, on the walls. To add strength to the to the walls the designer included rebar and grout. Those blocks are filled with more concrete and reinforcing steel. "The beauty of marrying the materials together is that it adds to the tensile strength of the project," LaCoaste says. The reinforced steel aligns and ties the concrete blocks together. That combination adds strength and prevents them from breaking.

The box-like construction the concrete blocks allow also lends more strength to the overall design. The result is a solid frame that can withstand winds of up to 160 miles per hour, a valuable benefit in a climate that is prone to strong storms and damaging hurricanes. "Concrete blocks exceed most code requirements," LaCoaste says.

Inside the hotel, concrete provides soundproofing so effective that "the silence is deafening," LaCoaste says. That soundproofing is another huge perk for hotels and, especially, their guests,. It also is one of the main reasons why the owners of the Wingate chose concrete for the construction. The concrete slabs contain cores

that help soundproof the ceilings and floors. The concrete blocks on the walls also do not transfer sound like sheetrock over wood or steel framing.

Concrete masonry is a noncombustible construction material that holds up far better than wood framing. It also doesn't transfer heat, like steel framing can.

The owners of the new Wingate hotel made a priority to incorporate design features normally used for more expensive hotels. The first floor of the 100-guestroom building has 10-foot ceilings and the three other floors have 8-foot-8-inch ceilings. "We added another block at the top there just to add another dimension to the guestrooms," LaCoaste says. The walls are topped with crown moulding and bathrooms are adorned with ceramic tile and granite countertops. "When you're in there you will feel like you're in a top-notch hotel," he adds.

From an engineering standpoint, concrete masonry units have another added bonus, LaCoaste says. They help to keep the building stable. In the Wingate, stairwells built of concrete block

are positioned at either end of the hotel building and the elevator shaft, also built with the concrete blocks, is located in the middle of the building. Strategically placing the stairways and elevator shaft helps anchor the hotel and prevent it from swaing in high winds. “Basically, the masonry portion is carrying the burden of this building,” he says.

David Leard with the project’s structural engineers Frank A. Dagley & Associates, agrees. He says concrete plays a role in most any building, and provides something that most other products do not. “It’s the permanence of it. The longevity,” he says. “Concrete doesn’t rust, it doesn’t rot. It can go through wet and dry cycles. And it doesn’t burn.”

Overall, concrete provides a solid base and sound structure that is unmatched compared to wood or steel framing, LaCoaste says. Because of that, he says, “this building will be there for years to come.” ■ Jennifer Walker-Journey

Security takes form on the coast

When the temperatures begin rising in early May, vacationers from across the county flock to Alabama's Gulf Coast to enjoy the beautiful gulf waters. When planning their trip, most people do not consider the construction materials that went into their hotel. However, hotel owners recognize that if they construct their hotel out of materials incapable of surviving the harsh coastal conditions, the hotel could be forced to close for repairs or in extreme conditions, be destroyed. This can lead to loss of room rentals and high insurance rates.

This was a key concern for Encore Hospitality as it prepared to build two popular chain hotels in the coastal community of Spanish Fort, Alabama – a Courtyard Marriott and a Fairfield Inn. With the increased hurricane activity in the Gulf Coast over the past years, insurance costs in the area were skyrocketing. Building with stronger materials could lower those costs. But what product should they use? Encore Hospitality sought the advice of sister company, Gulfport, Mississippi-based Encore Construction for the answer. Taylor Trochesset with Encore Construction had used a variety of products in commercial buildings and hotels along the coast from wood and steel framing. But he had yet to build a hotel using a product that was winning rave reviews from other builders, insulated concrete form, or ICF. Encore decided to give ICF a try.

ICFs are large, polystiren blocks that are stacked and filled with re-bar and concrete. The result is a high-performing exterior wall that is structurally sound and insulated with a vapor barrier that is ready to accept final exterior and interior finishes.

ICF may seem like a new concept, but the product has actually been around for more than 40 years. Canadian Werner Gergori submitted the first U.S. patent application for a "Foam Form" in 1968, and later secured patents in several European countries. The variations and styles of ICFs have been modified since Gergori developed the first ICF product in the 1960s, with manufacturers incorporating the latest technology to their designs. There are now more than 80 different ICF manufacturers throughout the continent.

"ICF construction has been used along the Gulf Coast for at least 15 years," says Rodney Hubble, president with Force 5 Walls, Inc., a concrete structural subcontractor. "We built our first (ICF) project in March of 1996 and there were ones built in the area prior to that." Interest was slow but has spiked in recent years as word of the product's performance has gotten more media attention.

ICF construction makes up only part of Hubble's company. He also deals in cast-in-place and ground and suspended slabs. But he has become a firm believer in ICF over the years because of the


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benefits it offers. For the construction of a multiple-inhabited structure, like hotels, constructing with ICF can be priceless, he says.

Consider the options. Wood is the most common and least expensive from a building material standpoint. However, wood can warp, expand, contract, twist and even rot over time. It invites termites and carpenter ants, and is susceptible mold and fungus problems. Most wood is also treated with pesticides, which are dangerous to human health. Wood framing can also be a fire hazard. Bottom line, wood just does not stand up well to the heavy winds of a hurricane or tornado.

Steel framing offers more strength than wood structures and, price-wise, it is comparable to wood. Steel resists rust, moisture and fire better, too. However steel-framed buildings allow heat to escape through each steel piece, which can result in excessively high power bills. Cool temperatures also can create extra humidity in steel studs, which can encourage mold growth and increase maintenance costs.

With ICF construction, the obvious plus is that it provides structural strength. ICF buildings are able to withstand high winds and heavy impact, and thus, can help lower insurance rates, especially in areas where storms and heavy winds are prevalent. Because hotels are inhabited by multiple individuals at a time, casualty and fire insurance rates tend to be higher. The forms are highly fire resistant, which can also help reduce insurance costs. The forms are also termite resistant and will not rot or decay, making them better able to hold up over time with very little maintenance. With no air infiltration or cavity walls for mold, mildew, bugs or rodents to fester, ICF also offers better indoor air quality – a plus for hotels in particular. Another added benefit is the noise reduction ICF construction offers. Proximity to busy streets or noisy parking lots becomes less of an issue for the hotel owner.

Beyond strength and sustainability, ICF helps maintain steady temperatures within its structure, which makes the buildings more energy efficient and helps reduce heating and cooling costs. Some studies show that buildings constructed with ICF exterior walls require 44 percent less energy to heat and 32 percent less energy to cool than buildings made of wood or steel. And in some cases, HVAC systems can be downsized because of it.

Because of the energy efficiency ICF offers, it falls in step with the green movement. ICF construction contributes to USGBC

LEED (US Green Building Council Leadership in Energy and Environmental Design, LEED, Green building rating system). Using it earns builders Energy Optimization credits by providing a high performance thermal envelope, which contributes to down-sizing of the HVAC system and thereby reducing on-going energy consumption while contributing to improved air quality. It also contributes to the Materials & Resource Credits by providing reduced waste reduction, using recycled content and using regional materials. Aside from LEED points, ICF construction contributes to sustainable construction through providing greater insulation, tighter construction, and the moderation of temperature within.

For the most part, the average person standing in a building cannot visually tell the difference between wood, steel or ICF construction in a constructed building unless he looks at the door or window frames, as they tend to be thicker.

The blocks vary in size, but are typically rectangular in shape, which increases their versatility. “The only thing that limits you is the architect’s imagination and creativity,” Hubble says. He’s worked on ICF-constructed homes and commercial buildings that

had stair towers, full rounds, modified eyebrow arches, teardrops, columns, ballast rods and domes. He's adds that ICF also works well on cigar humidors and wine cellars, as the ICF allows for little or no humidity.

Best of all, interior and exterior finishes can be applied directly on to ICF, whether it is sheetrock, stucco, cedar planks, brick, stone or limestone panels.

The stickler is the cost. ICF is more expensive on the front end than traditional methods of construction, but the cost of ownership is far less. According to studies, the five-year cost of ICF has a return-on-investment within three to five years. In many cases, ICF can be installed faster than traditional wood or steel, reducing construction time and allowing the business to open faster and generate revenue earlier, Hubble adds. "This gives you a much better return on investment."

Education, Hubble says, is key. When customers consider their options in building products, IFC will come out the winner, offering lower insurance premiums, energy efficiency, less maintenance comparatively faster construction. Plus, there was the added benefit of noise reduction, key to the Encore hotels as both are situated right of Interstate 10 in the Spanish Fort Town Center.

Last spring, both hotels were completed. Trochesset says he's pleased with the outcome. "I think it's a good product," he says. "I think it'll work well for us."

It seems as if ICF would sell itself, but Hubble says convincing an industry that isn't known to readily accept change to try new products has been a challenge. ICF has become more and more popular in Colorado, Iowa and Washington State over the past decade, but it is only just now catching on in the Southeast.

"It's hard to tell these (builders and contractors) who have been doing the same thing for 40 years to try something new," he says. "But here's the kicker, friends. It works. And, if you believe in something and how it performs, it doesn't have to be convincing. It just works." ■ Jennifer Walker-Journey

stepping up to the challenge CONCRETE FOR CARGO!

Auto parts, electronics, clothing, food, toys. What do these seemingly different products have in common? Need a hint? Find the labels. The answer is surprisingly simple – all of them were imported into this country. Products historically manufactured in US factories are now produced in foreign countries with more competitive labor rates. As a result, U.S. cargo is expected to double in volume by 2020 and drastically exceed the current capacity of many U.S. intermodal facilities. As intermodal trends, such as larger ships, longer trains, higher throughput volumes and heavier loads continue, the need to handle goods efficiently is of paramount importance.

Two of the companies faced with meeting this challenge are APM Terminals, a subsidiary of AP Moller – Maersk Group, and Terminal Link, a division of CMA—CGM. APM Terminals is a multi-national container terminal operator headquartered in Denmark that operates over 50 terminals in 31 countries. CMA—CGM is headquartered in France and is the third largest shipping line in the world, with over 240 vessels calling on 130 countries worldwide. In November of 2005, APM Terminals North America (80%) and Terminal Link (20%) announced a joint venture to develop a new container facility in conjunction with the Alabama Port Authority at Choctaw Point in Mobile, Alabama. The new company, Mobile Container Terminal, LLC, selected the Port of Mobile due to its excellent location as a distribution hub, with immediate access to two interstates, five Class I railroads, and nearly 15,000 miles of inland waterways. The plan is to build the new facility in phases, with an initial build-out of 95 acres capable of handling 350,000 TEU's (20 foot equivalent units) and an ultimate container capacity of 800,000 TEU's.

With over 90 acres of the terminal utilized to transfer goods,

both local and regional concrete industry representatives actively investigated opportunities to utilize Roller Compacted Concrete (RCC) as the pavement of choice at the facility. RCC is a cost competitive, long-term paving option which takes its name from the construction method used to build it. RCC is typically placed with high density paving equipment and compacted with vibratory rollers. Paving widths of 30 feet wide at a ten inch depth are possible in a single pass.

RCC has the same basic ingredients as conventional concrete: cement, aggregate and water, but it has a much drier consistency than conventional concrete. RCC also does not require forms finishing, dowels or steel reinforcement, and consequently can be constructed quickly and economically. These attributes make it an excellent paving option for large projects where strength and durability are paramount but economies are still a driving factor. Container Terminals, which deal with issues such as heavy point and static loads as well as significant end-user cost due to downtime, are an ideal application for Roller Compacted Concrete.

APM employed the services of Han Padron Associates (HPA – A Division of Halcrow), one of the country's largest full service consulting engineering firms dedicated to marine projects, to facilitate designing the terminal. In turn, HPA employed a local engineering firm, Gulf States Engineering (GSE), as the primary engineering service firm for the project. The design team was initially hesitant to specify RCC as a paving alternate as most of their existing facilities were a combination of hot mix asphalt and conventional concrete. The process of convincing the client that RCC was a viable paving option began at the local engineering level and ultimately extended to an in-office visit with the APM Terminal North America Engineering Group in Charlotte, NC. PCA sales efforts focused on two key issues: RCC's positive attributes, including the speed of construction, durability, and low maintenance cost, and the excellent track record of RCC at other major terminals, including recent projects at Bayport in Houston, TX and NIT in Norfolk, VA.

HPA employed the services of Nigel Nixon & Partners, Inc. (NNP), a recognized leader in heavy pavement design, to facilitate preparing the pavement design and plans. NNP was able to review the expected loadings for the terminal and provide an alternate paving option to conventional HMA utilizing roller compacted concrete (Table 1). NNP was instrumental in alleviating APMT's concerns of using RCC, as NNP has significant experience in the design and installation of RCC. Nigel explained, "While RCC is not the most architectural aesthetic finish, its serviceability and durability provides a very cost effective heavy duty pavement, and is particularly suited to open storage, industrial and cargo handling facilities."

RB Baker Construction Inc., based in Savannah, GA, was the successful bidder on the project. Jay McMahan, vice president and group manager, provided two main reasons why the RCC paving option was selected: RCC provided the client significant cost savings on the medium and heavy duty pavement sections and RCC shortened the time of construction, thereby expediting the project schedule, which was of vital importance to everyone on the project team.

AG Peltz Group, LLC, the largest RCC paving contractor in the United States, was subcontracted by RB Baker as the primary paving contractor on the site. The RCC Specification for this facility required a 790 psi flexural strength after 28-days and a correlation was established prior to starting the job to determine the acceptable compressive strength of the field cast cylinders that would assure this minimum. This correlation was established in a test section placed at A.G. Peltz office location in Birmingham, Alabama prior to starting this job. A second on-site test section was primarily performed to show APM Terminals and MCT personnel that the pavement can be constructed using widely spaced longitudinal

Preliminary Paving Design	***Option 1***	***Option 2***	***Option 3***
Section A – Heavy Duty	2 ½" HMA Surface Course 12 ½" HMA Base 13" Granular Base	2 ½" HMA Surface Course 11 ½" HMA Base 13" Stabilized Sand	15"RCC 6" Stabilized Sand
Section B – Medium Duty	2 ½" HMA Surface Course 5 1/2" HMA Base 12" Granular Base	2 ½" HMA Surface Course 4 ½" HMA Base 10" Stabilized Sand	8"RCC 6" Stabilized Sand
Section C – Light Duty	1 ½" HMA Surface Course 3" HMA Base 8" Granular Base	1 ½" HMA Surface Course 3" HMA Base 6" Stabilized Sand	6" RCC 6" Stabilized Sand
CONTAINER STACKING: BPA MANUAL REQUIRES A MIN 15" RCC FOR STACKING LOADED CONTAINERS IN BLOCKS 5 HIGH BPA MANUAL REQUIRES A MIN 8" RCC FOR STACKING EMPTY CONTAINERS IN BLOCKS 3 HIGH			

and transverse joints. Additionally, the test section allowed project personnel to view the pavement firsthand and voice any concerns prior to completing significant paving quantities.

AG Peltz began paving in May of 2008 and used a variety of equipment on the site, including both Titan-ABG and Vogele high density pavers. Paving widths have averaged 30 feet and production rates have routinely exceeded 2000 CY per day. The paving plan for the project required both single lift (8") and dual lift construction (15 ½"), all placed on 6" of cement stabilized sand. Material transfer devices have routinely been used to help ensure that the second lifts are placed within 60 minutes of the first lift in order to ensure the creation of a monolithic slab. The RCC is being saw cut both transverse (30 foot intervals) and longitudinally along the cold joint.

AG Peltz is mixing all materials on-site utilizing an ARAN Modumix II continuous mixing plant with a capacity of 1000 tons per hour. A second ARAN ASR280B pugmill with a capacity of 400 tons per hour is the backup plant to ensure that the paving operation remains continuous. A variety of rollers have been used on-site, including pneumatic rubber coated and tandem rollers.

AG Peltz completed the 400,000 SY project in February of 2009. Phase I paving was completed in August of 2008 and the first vessel arrived to Mobile Container Terminal on October 2nd, only five months after the start of paving. The paving was completed in the first quarter of 2009.

Although time will ultimately decide whether the pavement is effective, initial feedback from both project and outside personnel who have viewed the RCC has been overwhelmingly positive.

Project test parameters have routinely been exceeded, with flexural strengths averaging over 800 psi and compressive strengths averaging 5800 psi at 28 days.

Other parties were highly impressed by the surface quality of the pavement, many noting that it was difficult to tell the RCC apart from conventional concrete. Will Gray, managing partner with AG Peltz, spoke about the mix quality, "One of the challenges with RCC paving is to obtain quality surface textures while meeting structural requirements. This mixture provided a unique combination of outstanding structural characteristics, excellent constructability and pleasing aesthetic attributes."

Bob Ardary, lead engineer with GSE on the project, stated, "AG Peltz has provided a quality product. Normally slip form pavers are limited to 2% slopes to prevent standing water. This project was limited to a 1% slope. AG Peltz was able to provide the 1% slope with their pavers with minimal standing water. Other engineers visiting the site were impressed and stated this was the best RCC project they have examined. The quality was due to the care with which AG Peltz selected the RCC mix material and the workmanship of their employees."

RCC's combination of strength, durability, speed of construction and economy continues to meet the growing need for value added pavements in the industrial sector. For additional information on Roller Compacted Concrete – including case studies, suggested specifications, and technical support –please contact Robert Taylor at rtaylor@pavementse.com. ■ Chris Carwie

A Clean Look for Luxury Living

A new luxury apartment community in Montgomery, Alabama, has a lot of little extras – crown moulding, 9-foot ceilings and garden tubs. The property goes that extra mile, too, offering amenities like a WiFi hot spot around the beautiful resort-style pool and splash pad, and a media room with billiards table. These are the amenities that catch a tenant's eye, but there is more luxury at Carrington Park literally right under their feet – concrete.

While some might not consider concrete exactly luxurious, in reality the selection of this durable material adds value by ensuring the longevity of the development, while also adding beauty in an unexpected place – the parking lot. Concrete's clean look creates a good first impression and a lasting sense of quality for customers, tenants and employees.

The Carrington Park project used 501,000 square feet of concrete for the parking lot, sidewalks and slabs, as well as an additional 12,200 square feet for curbs and gutters. The pool also is made of concrete; an additional 10,000 square feet, stamped into a tile pattern and then dyed.

The choice of concrete for the extensive parking area surrounding the complex is unusual, but becoming less so, according to industry experts. Traditionally, parking lots have been constructed of asphalt, but more and more often today owners and developers are requesting concrete parking lots for their durability, ease of maintenance, long service life, beauty and initial cost competitiveness.

Concrete's price has been getting more competitive as compared to asphalt partly because asphalt is a petroleum-based product and reflects the impact of higher oil prices. Even when fuel prices drop, asphalt can still be expensive because the availability of liquid asphalt has decreased because oil refineries are producing less of it. Concrete, on the other hand, is readily available in ample supply, with a dependable price point. It's something developers can count on for long-range planning.

Concrete is certainly comparable in cost, but contractors will often choose it in spite of any price difference because of its advantages, says Pep Pilgreen, president of Pilgreen Engineering, which handled the Carrington Park project. Very often the decision to use concrete is based on the contractor's preference and its ease of installation based on an individual project's requirements, he says.

Concrete was an ideal selection for Carrington Park, Pilgreen says, because the area includes a number of buildings in close proximity to one another. In that type of situation, concrete lends a precision that other materials simply cannot, he says.

"This is a very dense apartment complex, as far as the number of units and acres, so the buildings are fairly close together," he explains. "This is complicated by the fact that there are varieties in the apartment buildings that makes grading for drainage away from the buildings very complicated. Concrete is much more precise when you're trying to get fine grading points as opposed to asphalt. You can pour concrete as flat as you want it, exactly like you want it," he says.

In close quarters, as in the Carrington complex, concrete also is easier to manage physically, as far as installation. "With concrete, you can use smaller equipment to get in there where the buildings are tight and the driveways are close together," Pilgreen says.

Constructed by Morrow Construction Company, project contractors for the Carrington Park apartments first placed the curb and gutter to establish a grade, then prepped and poured the concrete, cast in place, tailgated from a ready-mix truck. They installed the concrete in phases, and were able to place and finish between 15,000 to 20,000 square feet per day.

"It's much, much easier to phase with concrete than it is with asphalt," Pilgreen said. "So, in a lot of ways concrete really was much better suited for this job," Pilgreen said. "We've done similar projects with asphalt, and I can promise you this one was easier."

Placing concrete does take a bit more time and care than using asphalt, as it must be done in sections during the drying phase to prevent cracking. However, once the concrete has properly cured and dried, it has a naturally strong tensile strength that holds up extremely well under daily use. Contractors should use proper uniform subgrade support when pouring the concrete, and should use expansion or isolation joints where necessary to separate slabs from fixed objects like walls or columns that may cause stress. Steel mesh or the addition of synthetic fibers also might be options for increasing the impact, shatter and abrasion resistance of the finished surface.

Concrete is a cost-saver in the long run. Normal maintenance costs of asphalt pavements, which include sealing, re-striping, resurfacing and loss of business during maintenance operations, greatly exceed those needed for concrete, which is a more durable paving material that will require much less maintenance over the course of its lifetime.

"Concrete typically holds up longer than asphalt," Pilgreen says. "Almost all of the complexes we put in have some concrete in them, simply because of the load-bearing requirements of different areas, even if asphalt is used in other sections. It depends on what kind of traffic loads will be on it. For example a place with a dumpster or with heavy equipment or heavier traffic, concrete is better."

Pilgreen says a possible drawback of concrete is that it can more difficult to replace, but that is countered by the ability to replace or repair small portions, in sections, without disturbing traffic flow and activity in other areas. And, once a section of concrete is replaced, it won't have the appearance of being patched unless the original section is particularly old.

Another possible hitch when using concrete is protecting the repair until it has properly set. Pilgreen points out that when doing a patch on asphalt, it is less likely that the material will be affected if disturbed in the interim, even if it's run over before completely set. Alternatively, "Kids do like to write their name in concrete before it sets up," Pilgreen said. "Nobody does that in asphalt!" he says with a laugh.

Concrete parking areas and pavements are also environmentally friendly in many ways. Concrete's light-colored surface is brighter, requiring less lighting, reducing energy use and cost. Also, concrete's lighter finish attracts and retains less heat, and as a result, its cooler surface leads to cooler stormwater runoff, which benefits groundwater, streams and lakes.

While not used in this particular project, another even more environmentally friendly option available for concrete parking areas is pervious concrete. Pervious concrete pavement is a unique mixture that actually allows water to seep through it, back into the ground. This material is very ecologically friendly, and helps save project costs by reducing the need for retention ponds and other stormwater management devices. Pervious concrete may actually be required in some geographical areas, such as shoreline developments, where drainage is a particular concern.

■ Wendi Lewis

Publix Goes Green with Pervious

When developer Regency Centers set out to build its new retail plaza, The Shoppes at Fairhope Village, they made a promise to the City of Fairhope to make the development more environmentally friendly. One way it met this promise was to install a pervious concrete parking lot.

Regency's Carl Baker understood how incorporating a pervious parking lot into the plan could have far-reaching benefits for the Publix-anchored retail center, and he relayed this to city officials. The city officials were intrigued with the idea of pervious – especially since they wanted to protect a nearby sensitive wooded area as much as possible. As city officials learned more about the product, they embraced the idea wholeheartedly, and Regency was granted the right moved forward with plans to build the development and pour what may be the largest pervious concrete parking lot in the state.

Using pervious concrete in parking lots and pathways is a concept that is gaining interest throughout the country, especially because it offers "green" qualities, says Don Wade with McGruder Construction Co. Inc., the company serving as the development's general contractor.

The average person takes pavement for granted, but walkways and parking lots often play an important role in commercial developments. Many factors must be taken into consideration, such as strength and durability. Location is vital, too, not just for flow of traffic but also for water runoff. And that is where pervious can shine.

Pervious concrete is similar to traditional concrete in that it is comprised of a mixture of cement, aggregates and water. However, unlike typical concrete, pervious concrete contains no sand or fine aggregates, making it porous which allows water to easily pass through rather than puddling or

flowing over it like traditional concrete.

When used for paving, pervious pavements can soak in rainwater at a rate of 3 to 5 gallons per minute per square foot of surface area. As it soaks through the pervious, water is either stored underneath the pavement in a gravel catch or allowed to "perk" into the underlying soil, says DJ Chambers, project manager and superintendent with Sunbelt, the site contractor. "It eliminates storm runoff water," he says.

Since the development is positioned on an embankment, water runoff would have been an issue. A retention pond is in place to serve as a catch basin, but having a pervious lot takes pressure off that pond by allowing water to flow through into the earth below.

While water passes through the concrete, the pervious core actually absorbs much of the pollutants in the rainwater, says Judi O'Nelia, with McGruder. This filtering process purifies the water that passes through, ridding it of harmful pollutants and chemicals and making it safer for the environment, like the wooded area near the parking lot that the city was adamant about protecting.

Pervious concrete walkways and parking lots are also people friendly. This product eliminates puddling on the pavement, making it a safer surface for pedestrians and drivers. Additionally, pervious pavement helps reduce the urban heat-island effect, says Baker with Regency. Its light color and porous design prevents it from absorbing or storing heat and radiating it back into the environment like a typical asphalt lot. The light-colored pavement also reflects light, reducing the need for lighting at night.

In many cases, pervious concrete pavements eliminate the need for retention ponds. These ponds tend to be expensive to build and are often unsightly. By eliminating the need for retention ponds, developers and property owners are able to make more effective use of the land as well as leave more reusable land behind, O'Nelia says.

There are some limitations to previous concrete pavement. Pervious is not recommended for heavy traffic areas because tire loads can wear down the concrete's surface and cause cracking. For this reason only a 26,000-square-foot of the parking lot at The Shoppes of Fairhope Village is made with pervious concrete. The pervious concrete also can come at a steeper price on the front end compared to conventional concrete or asphalt, but the long-term benefits help even the scale. Pervious can cost less to install as there is typically no need for gutters, curbs or storm drain inlets or retention basins. The pavement also doesn't need to be sloped to allow water to flow toward storm drains.

If constructed properly, the lots and walkways can last 20 to 40 years. And once in place, pervious pavements need little maintenance. Cleaning them involves occasional sweeping or pressure washing to remove any debris that may have clogged the pores.

The sustainable and environmentally friendly qualities of pervious concrete help contribute to a project's LEED certification, O'Nelia says. Which is why, there is a growing interest in pervious concrete, even in Alabama, says Wade with McGruder. ■ Jennifer Walker-Journey