

FALL 2007 EDITION

CONCRETEWORKS

ALABAMA CONCRETE INDUSTRIES ASSOCIATION MAGAZINE



STRENGTH: RETAINING WALLS STABILIZE SLOPE

**MODERN PAVERS
CLASSIC STYLE**

**TILT-UP BEST CHOICE
FOR PROJECT**

**SYNTHETIC FIBERS
'INSURANCE POLICY'**



CONCRETEWORKS

JOHN SORRELL, Editor | BUTCH WYATT, Technical Editor

page 16



SYNTHETIC FIBERS FOR USE IN READY MIX

ALABAMA CONCRETE INDUSTRIES ASSOCIATION

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02

RETAINING WALL SPANS 30,000 SQ FT:

A five-tiered concrete segmental retaining wall will provide stability to a large slope adjacent to a prime retail spot along Birmingham's Highway 280 corridor. When complete, the wall will provide both strength and aesthetics.

06

TILT-UP BEST CHOICE FOR PROJECT:

At 700,000 square feet and walls 40 feet high, the new corporate office and distribution center for Children's Place Retail Stores Inc. in Fort Payne, Alabama was a project well suited for tilt-up concrete construction.

10

MODERN PAVERS WITH HISTORIC TOUCH:

When the City of Montgomery, Alabama began a project to breathe new life into one of the oldest parts of the city, they turned to concrete pavers to replicate the 19th century feel of a roundabout circling a historic fountain.

14

CONCRETE STREETS AND PARKING:

A Tuscaloosa, Alabama developer says thanks to its long-term durability and clean appearance, concrete is the product of choice for a new upscale apartment community along a golf course called The Links at Tuscaloosa.

16

BENEFIT OF FIBERS NEED PROMOTION:

Steel and synthetic fibers added to ready mix during the batching process can be a built-in insurance policy to prevent cracking. But despite the benefits and reasonable cost, many consumers are not aware of the option.

18

PRESCRIPTION FOR SUCCESS:

A dentist near Wetumpka, Alabama lets the beauty of his new building advertise his dental practice. Thanks to concrete segmental retaining walls, the structure sits high above a busy highway in plain view of potential patients.

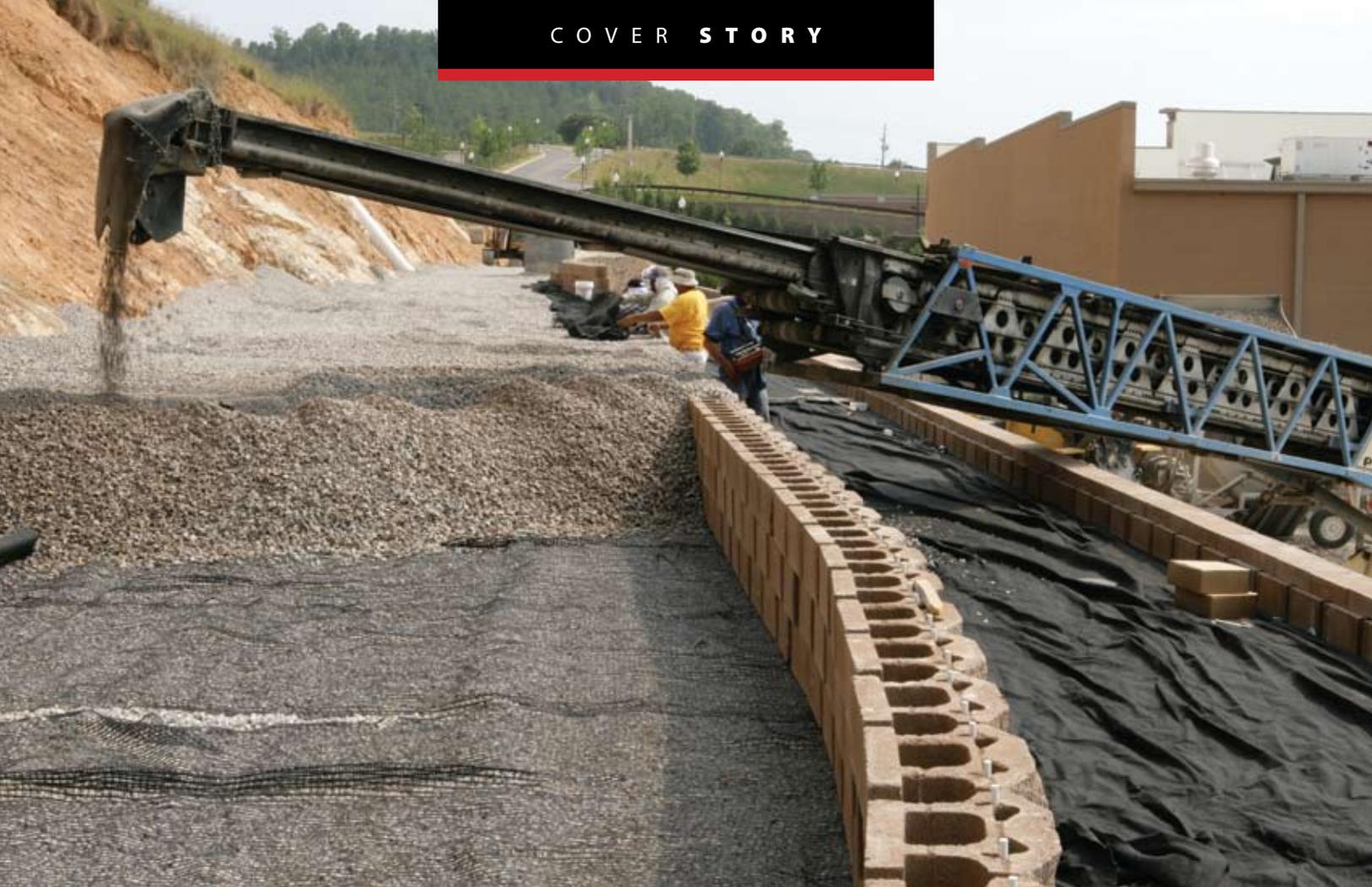
page 10



CONCRETE PAVERS, MONTGOMERY, ALABAMA

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.

Please e-mail jsorrell@alconcrete.org with any comments regarding featured articles in *ConcreteWorks* or to suggest a story idea for a future edition.



CONCRETE SEGMENTAL RETAINING WALL UNITS PROVIDE **STRENGTH AND STABILITY**

Alabama contractors are dealing with less wide-open spaces and more difficult landscape designs. Fortunately, concrete segmental retaining walls can often solve the problems of building on less-than-ideal land.

Take the shopping center on Highway 280 just outside Birmingham—home to retailers like Petsmart and T.J. Maxx. The development at the intersection with Valleydale Road is a prime piece of real estate, but the stability of a large slope on the site has created problems for the property.

Now, thanks to the technology combining retaining wall units with geogrid to stabilize the soil, engineers have come up with a good fix for the project.

It offers exactly what property owner National Real Estate Management was looking for in terms of “durability and aesthetics” according to Sean Wokasien, P.E., Vice President of Synergy Earth Systems, LLC out of Daphne, Alabama.

While Wokasien’s company is used for big, complicated jobs, he predicts this “will be one of the marquee retaining wall proj-

ects for Birmingham and the state of Alabama.” Wokasien says his company not only designs the walls, but also builds them, making his company unique. He says the Birmingham area “offers some very challenging landscapes with plenty of rolling hills. Most commercial sites are going to have some grade separation problems.”

Wokasien explains this particular project had a problem with the existing cut slope and they were called in to come up with a remedy. With several factors affecting stability, the slope was basically falling into the property. They designed and are installing a modular retaining wall using geogrid to hold the soil in place.

Block walls have been around for 20 plus years, and there has been a continual evolution of technology to get to the design methodology used today.

With five tiered, modular block retaining walls ten to eleven feet high that cover 30,000 square feet, designers say the completed project will be "something to behold."



In addition to the added strength and long-term durability of this system, the aesthetics are also a huge plus. Manufacturers say the textured face and color of the concrete units give the finished product a polished look as opposed to railroad ties or other lumber applications.

Project Manager David Been says, "we are very pleased with how everything is shaping up." Been says there were a couple of other solutions they could have used, but this one met both the technical and aesthetic qualities they were looking for. He explains they decided against going with "one big massive retaining wall and instead went with the five tiers to soften up the look."

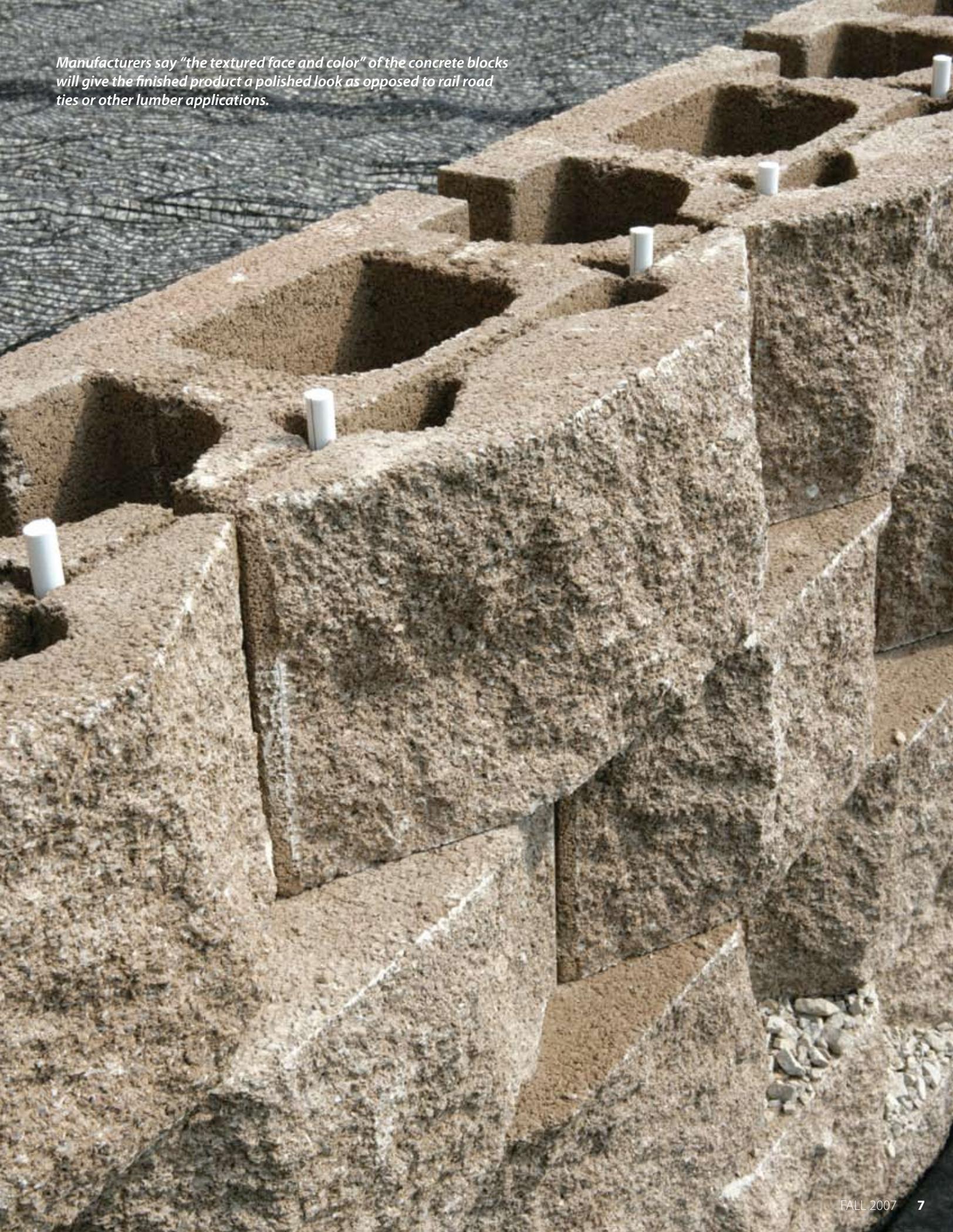
Retaining walls like this one are being built all over the state. If the walls are put in the right way you never have to replace them according to manufacturers.

Mortar is not used and with the geogrid in the soil to act as the traditional "deadman" you do not have to worry about wood or metal rotting and deteriorating over time.

Project Manager Been says the work is scheduled to be complete this fall. He adds, "I have already heard comments about how good the retaining walls look on the property."



Manufacturers say “the textured face and color” of the concrete blocks will give the finished product a polished look as opposed to rail road ties or other lumber applications.





TILT-UP CONSTRUCTION



When contractors building a huge distribution center in Fort Payne, Alabama looked at how they were going to construct the exterior walls for the massive 700,000 square foot facility, there was really only one choice on the table: Tilt-Up Wall Construction.



Tilt-Up Concrete Construction Takes Distribution Center to New Heights

A 700,000 square foot distribution center in Fort Payne, Alabama was built using Tilt-Up Wall Construction and features numerous concrete dolly pads and truck docking areas.

Kirk Stagner, Project Manager with Clayco Corp., says “tilt up is an ideal product especially for distribution centers when you consider cost for a building that height.” Tilt-up construction, a method where the wall panels are cast on site and tilted up into position, has seen huge growth in the industry.

The Fort Payne project includes a new corporate office and distribution center on 120 acres on Airport Road for the Children’s Place Retail Stores, Inc., which is a specialty retailer for children’s merchandise.

The facility has easy access to Interstate 59 and will be the main southeastern distribution center for “The Children’s Place” and “Disney Store” retail outlets.

Sal Pepitone, Vice President for Logistics, says “it will be our largest facility and is being built to meet our company’s growth.”

The Tilt-Up Concrete Association reports that the tilt-up method of construction is “one of the fastest growing building technologies in North America” and is preferred for large commercial projects.

The group’s statistics show “at least 10,000 structures enclosing more than 650 million square feet of space being built every year.” Overall that translates into 15 percent of industrial buildings in this country. Those buildings range in size from 5,000 to 1.5 million square feet.

“Clayco is using tilt-up all over the country. It is very cost effective for buildings 20 to 40 feet high,” says Stagner. The Fort Payne distribution center has walls 40 feet high. Stagner says while they generally use Tilt-Up on exterior walls, they occasionally use it on interior walls for a certain architectural look.

One of the big advantages to tilt-up continues to be the speed in which the walls can be constructed. Tilt-up requires less labor to install and less finishing time. When the walls are cast on-site, another plus is the savings on transportation costs.

There are also a number of ways a builder can finish the tilt-up panels. Options like integrated color panels, special coatings, thin brick, and thin blocks offer designers plenty of flexibility.

When considering tilt-up, several job site factors need to be looked at. Those include whether a crane can easily access the area and if the terrain of the building site is flat. Planners should also note obstructions like ditches, railroad tracks and power lines which affect where panels can be installed.

The supplier for this project says 23,000 cubic yards of concrete was poured at the distribution center. Concrete was also used on the dolly pads and truck docking areas because of its high strength and durability as opposed to asphalt.







*Historic Montgomery
Paves the Way*

DOWNTOWN MONTGOMERY, ALABAMA:

Concrete Cobble Pavers An Ideal Choice for Montgomery's Historic Court Square

Downtown Redevelopment is more than a buzzword in Montgomery these days with the Convention Center renovations underway, the Riverfront Development, and, in the center of it all, the new Court Square Plaza. In April the Plaza was reopened to drivers with a new look and feel drawing from its historic past.

An estimated 40,000 square feet of Belgian Cobblestone Pavers replaced the pavement on the roundabout that circles the 1885 Court Street Fountain. "The look and the response have been beyond what we had hoped for," remarked City Engineer Chris Conway on the finished product.

The Plaza sits at the foot of the state capitol and surrounds the fountain. It is the center piece for downtown functions like state inaugurations, Christmas parades and festivals. Conway calls it "a grand space that deserved a better treatment than just asphalt."

In addition to the look, the classic cobblestone pavers also serve another function by creating a rougher surface to help slow drivers down. "The intent is that when drivers come up on the bumpier ride they will pay attention and let up on the gas pedal," explained Project Manager Dewayne Carver of Hall Planning and Engineering in Tallahassee, Florida.

The goal is to have drivers in the 20-25 mph range so pedestrians will feel comfortable using the area. Pedestrian crosswalks were marked with different color pavers instead of painted lines, and for the most part street signs were eliminated.

"Again, the goal is to have drivers paying more attention and dropping their speed. This is really a test case with this type of paver to see how well this goal can be met." Carver says past studies have actually shown fewer accidents in similar areas.

The idea for the Belgian pavers came from a development in Alys Beach near Seaside in Walton County, Florida. Those pavers looked similar to what crews found when they removed the

pavement from the Court Square Plaza. They discovered some of the original granite cobbles brought over from Great Britain, but there were too few of the stones to rebuild the entire street.

So using those cobbles and old photos as a guide, architects found the Belgian Cobblestone Pavers with their tumbled, distressed texture a good way to replicate the look.

Engineering experts anticipate a 50 to 75 year life span on the pavers. The pavers can handle all types of vehicles and loads on the street. While it is more expensive to lay pavers than to pour concrete, the longer life span and the low maintenance for the pavers make them a sound investment over the long term.

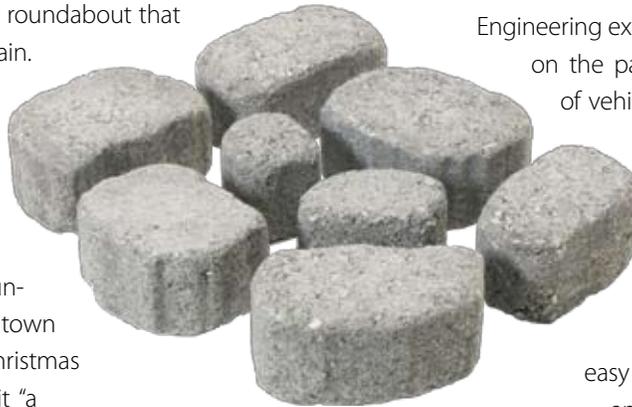
Another advantage: the pavers are easy to install. This project took only two and a half weeks which is a big plus when working on a city street. The pavers can be taken up in sections and reinstalled to provide easy access to underground utilities.

Polymeric sand was used as the binding agent for the paver units to strengthen the entire surface. The high strength product was essential to stabilize the pavers under vehicular loads. Additionally, polymeric sand remains in the joints better than any other sand or gravel. The charcoal color compliments the slate blend pavers.

This was the first project of its kind in Alabama. The reaction has been so positive that the City of Montgomery is considering pavers for other projects.

Project Manager Dewayne Carver says his company will continue to experiment further with the product. He predicts "you will see a lot more of this concrete paver when it comes to designing communities, especially as governments focus more on walkability and creating streets as public places again."

The City of Montgomery may have just helped pave the way for making that dream a reality.



The pavers can handle all types of vehicles and loads. With their long life span and low maintenance requirements, the units become an attractive investment for any job.

When crews began work on Court Square they discovered some of the original granite cobbles under the pavement. Using those stones and old photographs as a guide, architects found the Belgian Cobble pavers would recapture the 19th century flavor of the plaza.



THE LINKS OF TUSCALOOSA, ALABAMA:

Apartment Home Community Achieves High End Appearance With Concrete

A new Tuscaloosa apartment community is designed to give residents a unique and stylish place to call home with much more than the usual amenities.

“There is nothing like this in the Tuscaloosa area where you have an apartment community with a golf course, Olympic sized swimming pool, tennis and basketball courts, and even a lake,” says the complex’s Community Director Jamie Nelson. Concrete has played a major role in the construction at The Links of Tuscaloosa located at Mimosa Park off Highway 69.

From the roads to the parking lots and golf cart paths, concrete has helped shape the upscale look on this project which includes 864 apartment units at last count. Developers call it “affordable luxury living.”

The project’s manager, Skip Croft, says concrete is one thing you will find at all of the Lindsey Developments. “Owner Jim Lindsey hates the look of patched asphalt with potholes,” says Croft. “His goal is to have neat and well maintained roadways, and he looks at concrete as a long term investment.”

Lindsey Construction always looks at the long term because the company also manages the apartments it builds and wants to keep maintenance costs down. There are also plans for similar developments in Auburn and Starkville to add to the 30,000 units Lindsey has already built.

The entire project calls for about 40,000 yards of concrete. It was used for the roads and parking lots with more than 1,728 parking spaces on the property. Concrete was also poured for the slabs, golf cart paths, second story decks and stairways.



The golf cart paths at The Links of Tuscaloosa are also concrete.

The cost of concrete, once considered a luxury on an apartment project like this, is now in line with the cost of asphalt on the front end. When you consider the longer life of concrete and less maintenance, many consider it a better investment.

Another added benefit of concrete is the safety factor.

“It is easier to light up parking lots at night with the white color. It just shows the light better than a dark surface,”

says Croft. That is especially important for college towns like Tuscaloosa with a lot of students in and out of the apartments. The lighter shades of concrete also mean less of a heat factor than you see with asphalt. “Asphalt gets hot and spongy and is hot to the feet,” adds Croft.

Concrete’s natural light color reduces the so called “urban heat islands” because it reflects solar energy more than darker colored materials. Scientists report that urban areas with more pavement and buildings are usually warmer, as much as eight degrees higher in temperature than nearby rural areas. Experts partially attribute that to the dark surfaces on roofs and paving.

While the main selling point for tenants at The Links of Tuscaloosa may be the idea of living on a golf course, for the builders it’s been as much about quality construction which includes a lot of concrete because of its competitive cost, durability, safety, environmental and aesthetic qualities.

“There has been a great interest in the properties,” says Community Director Nelson. The complex which opened in August has done so well, builders have moved on to Phase Two with concrete again being the product of choice for many key aspects of the development.

Jim Lindsey, developer of The Links of Tuscaloosa, prefers concrete for roadways, sidewalks, and access areas because of its clean appearance and ease of maintenance and views the product as a long term investment.





More Public Education Needed to Promote Benefits of Fiber in Ready Mix

As the doctor says, “an ounce of prevention is worth a pound of cure.” And when it comes to preventing concrete cracks, manufacturers say synthetic fibers are just what you should order.

The tiny fibers, added at the ready mix plant during the batching process, are said to give concrete longer life and prevent cracking. “Fiber is like an insurance policy to reduce cracking,” says Jim Brandon of Durafiber Inc.

The use of fibers first took hold in the market about 20 years ago and to date they are being used at varying levels.

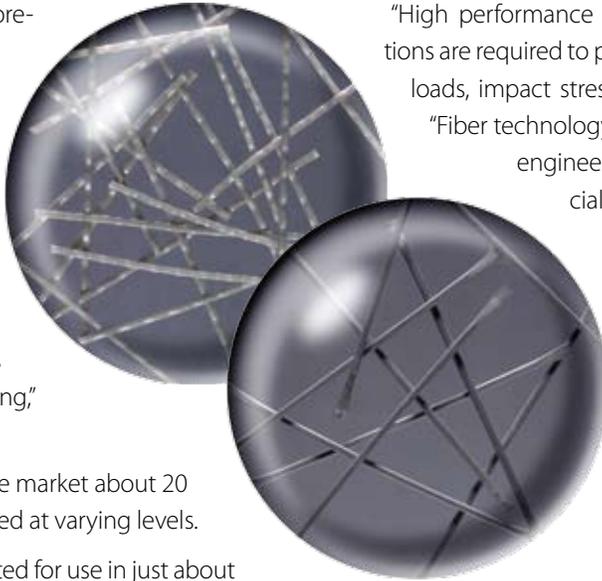
Steel and synthetic fibers are promoted for use in just about everything such as driveways, sidewalks, slab-on-grade, patios, curbs, gutters and parking lots. Experts say “fiber should never be used to replace rebar or other steel used as a primary structural reinforcement.”

The fibers work by relieving stress that develops during shrinkage. Adding millions of these fibers to ready mix requires no extended mixing or time. The fibers will not rust or deteriorate and will cut down on the permeability of most concrete according to manufacturers.

Mark Haas, ABC Polymer Industries in Birmingham, says there are two types of synthetic fibers. The first type is the “one that leaves a hairy finish where you can actually see the fibers which go away with sunlight or foot traffic.” These fibers are known as fibrillated fibers.

Another type, known as monofilament fibers, has less fibers visible in the finished product. Haas says “the market is dominated by the synthetic plastic polypropylene fiber, although there are fibers in the market made of other materials.” Haas says the advantages to using fibers are overwhelming with “studies on some fibers showing in excess of 80 percent reduction in initial cracking.”

Another type of fiber consists of tiny slivers of steel. Eric Campbell, an engineer with Propex Concrete Systems says both steel fiber and macro synthetic fibers improve the physical properties of concrete slabs under a variety of stressed conditions.



“High performance concrete systems for industrial applications are required to perform under intense static and dynamic loads, impact stresses and flexural fatigue,” says Campbell.

“Fiber technology has advanced over years to give design engineers several options to reinforce commercial and industrial slabs,” he says.

The major competition for fiber is welded wire mesh, but Haas says too often it is not properly installed and lays useless on the bottom of the concrete.

Campbell agrees, pointing out that the latest version of ACI 360 *Design of Slabs on Ground* released in 2006 warns engineers on the use of welded wire reinforcement. “Because of the placement problems that have plagued this technology, they actually caution engineers on welded wire reinforcement.”

Campbell says the fiber industry now has an entire chapter in ACI 360 dedicated to giving perspective for designing industrial slabs with fiber reinforcement.

“We now have institutions such as the Steel Deck Institute endorsing both steel fibers and macro fibers as suitable products to reinforce elevated slabs,” he says.

As for the price of fiber, Durafiber’s Jim Brandon says it costs about 5 to 6 dollars a yard to add fiber to ready mix depending on which region of the country you live in.

There are no firm numbers on fiber use. Estimates range from 10 to 60 percent of ready-mix concrete, depending on the region of the country.

With all those advantages you may ask: Why isn’t everyone using fibers? Brandon says it all comes down to the need for more “education in the industry” to let consumers know that synthetic fibers are available.

Haas adds that unfortunately many customers don’t know the products are available. He advises, “if someone is planning to pour concrete, they should always ask the contractor about using fiber because it is such a superior product when properly used.”

Just What the Doctor Ordered:

Thanks to three concrete segmental retaining walls, this dental office is perched atop a prime spot along a busy highway corridor right in view of many potential patients.

In real estate they say it is all about “location, location, location.” Dr. Brian Barrett, D.M.D. certainly got that when he bought nearly six acres of prime real estate along the booming Highway 231 just outside of downtown Wetumpka. With 46,000 cars passing through the area every day, it is the perfect location for his new Family and Cosmetic Dentistry office.

There was one major problem with the plot of land: a little mountain was standing in the way making it a tricky spot to build on. Engineer Ron Bell of Sanford-Bell and Associates, Inc. described it as a “difficult site, certainly not your normal situation.”

Their design options were narrowed down to an “elevated building with retaining walls and moving a lot of dirt” to make room for the office and parking lot.

Douglas R. Marks, D. R. Marks Contractor Inc., designed the

retaining walls. “We used engineered concrete segmental retaining wall units with plastic matting behind them to keep them in place— known as a geogrid. There is a whole lot going on behind the wall that you don’t see,” says Marks.

While the technology has been around for awhile, Marks says his company is doing more and more of this type



of retaining wall around Wetumpka. "You can take a very difficult piece of land to develop and make it attractive and usable."

Dr. Barrett likes the fact that the retaining wall units are made using integral color. This means that the color is added to the concrete units during the manufacturing process. This ensures that the color will look great for the life of the wall system. "The textured finish on the concrete blocks give the wall a 3-D look," says Dr. Barrett.

To give the project a bright clean look, concrete was chosen for the parking lot and driveway. Dr. Barrett's father who oversaw the construction felt concrete was the best and "longer lasting" option. Bobby Barrett says with a minimal cost difference among other products, concrete

has become much more attractive. The concrete driveway gives patients a smooth drive in and the parking lot has 22 spaces all convenient to the office entrance.

"People look at the office and are blown away. I am very pleased with how it turned out," says Dr. Barrett of his investment. He adds that "with the way the office building is positioned, it serves as its own billboard and I have to do very little advertising to the public."

Engineer Marks agrees saying the finished product looks great. "I have had so many people tell me how attractive those walls are. It is really a two-fold benefit. The construction looks good and it pays for itself."

While Dr. Barrett works to create beautiful smiles inside his office, the outside design with the help of concrete on several levels helps make this office a beautiful and inviting place to welcome patients.





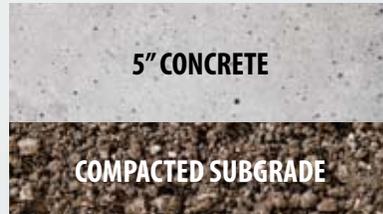
The concrete driveway gives patients a smooth drive in and the parking lot has 22 spaces, all convenient to the office entrance.

What is the price for concrete and asphalt parking lots?

Let's Look at the Real Costs.



5 inches of concrete will last
20 years



Initial Cost: \$65,184
Price plus maintenance costs over 20 years:
\$65,184



3 inches of asphalt on 8 inches of stone will last
9 years



Initial Cost: \$61,292
Price plus two overlays:
\$75,450



5 inches of asphalt will last
8 years



Initial Cost: \$53,312
Price plus two overlays:
\$68,400



3 inches of asphalt on 6 inches of select soil will last
3 years



Initial Cost: \$51,100
Price plus five overlays:
\$94,200

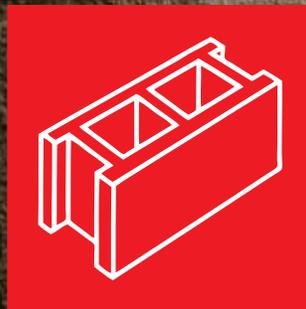


Notes: Design life is based on the 1993 AASHTO *Guide for Design of Pavement Structures*. Each parking lot is loaded with five heavy 18-wheelers each day. Prices include 1211 feet of curb and gutter and are based on paving 28,000 square feet. Asphalt overlays are required to extend asphalt pavement life to 20 years.

CONCRETE MASONRY THERE IS NO EQUAL.

The Town of Mt Laurel near Birmingham features a concrete segmental retaining wall that is 52 feet high and extends across the entire downstream side of a dam.

Walls like the one at Mt. Laurel are constructed using individual concrete units. While these units are strong and durable, they are not your ordinary concrete. They come in a variety of shapes, colors, and textures. When installed they become a functional, beautiful wall.



**Alabama
Masonry
Institute**

Rip Weaver, resident architect at Mt. Laurel, states "of all the options investigated, the segmental retaining wall met our aesthetic goals and what we were after engineering wise."

Look into the advantages of a segmental retaining wall for your commercial property, residence, or lake front and you will agree "there is no equal".

For more information, call 1-800-732-9118 or visit www.alconcrete.org.

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