

A New Living Concrete Gives Regular Buildings Living Walls

By Hessam Nabavi and Bob Nablo, Directors of Industry Services

Living walls are referred to as Green walls, vertical gardens, or in French, mur vegetal, and are not anything new. The French botanist and artist Patrick Blanc was a pioneer by creating the first vertical garden over 30 years ago. They are self sufficient vertical gardens that are attached to the exterior or interior of a building. Another system that has been used is called green facades (e.g. ivy walls) in which the plants need support structures that stress building walls and requires lots of maintenance.

Spanish researchers have developed a living concrete that may define a new method for creating vertical gardens and living walls on building facades. This new building material is engineered to easily keep plant life living on it to create easy-to-care for green buildings.

In studying this concrete, the researchers at the Structural Technology Group of the Polytechnics University of Catalonia, Barcelona Tech (UPC) have focused on two cementbased materials. The first of these is conventional carbonated concrete (based on Portland Cement), with which they can obtain a material with a pH of around 8. The second material is manufactured with a magnesium phosphate cement (MPC), a hydraulic conglomerate that does not require any treatment to reduce its pH, since it is slightly acidic. On account of its quick setting properties, magnesium phosphate cement has been used in the past as a repair material. It has also been employed as a bio-cement in the field of medicine and dentistry, suggesting that



it does not have an additional environmental impact.

The innovative feature of this new (vertical multilayer) concrete is that it acts as a natural biological support for the growth and development of certain biological organisms, specifically certain families of microalgae, fungi, lichens and mosses.

The next step for the researchers is figuring out how to speed up vegetation growth on this patented concrete. The goal is to succeed in accelerating the natural colonization process so that the surface acquires an attractive appearance in a short time. A further aim is that the appearance of the façades constructed with the new material should evolve over time, showing changes of color according to the season and the type of organisms.

In order to obtain the biological concrete, besides the pH, other parameters that influence the bioreceptivity of the material have been modified, porosity and surface roughness for instance. The result obtained is a multilayer element in the form of a panel which, in addition to a structural layer, consists of three other layers: the first of these is a waterproofing layer situated on top of the structural layer, protecting the latter from possible damage caused by water seeping through. The second layer is the biological layer, which supports colonization and allows water to accumulate inside it. It acts as an internal microstructure, aiding retention and expelling moisture; since it has the capacity to capture and store rainwater. This layer facilitates the development of biological organisms. The third and final layer is a discontinuous coating layer with a reverse waterproofing function. This layer permits the

entry of rainwater and prevents it from

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Virginia Ready-Mixed Concrete Association 250 West Main Street, Suite 100 • Charlottesville, VA 22902 Phone: (434) 977-3716 • Fax: (434) 979-2439 easter@easterassociates.com • www.vrmca.com



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2015 Virginia Ready-Mixed Concrete Association

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escaping; in this way, the outflow of water is redirected to where it is aimed to obtain biological growth.

The new material has various applications, offers environmental, thermal and aesthetic advantages, from an environmental perspective, the new concrete absorbs and therefore reduces atmospheric CO2, thanks to its biological coating. At the same time, it has the capacity to capture solar radiation, making it possible to regulate thermal conductivity inside the buildings depending on the temperature reached. A well-designed green wall on the south side of a building will reduce cooling demands and increase comfort in the summer. The biological concrete acts not only as an insulating material and a thermal regulator, but also as an ornamental alternative, since it can be used to decorate the façade of buildings or the surface of constructions with different finishes and shades of color. It has been designed for the colonization of certain areas with a variety of colors, without the need to cover an entire surface. The idea is to create a patina in the form of a biological covering or a "Living" painting. When the biological concrete is used indoors, green walls can purify the air since plants are efficient pollution filters.

There are also possibilities for its use in garden areas as a decorative element and as a sustainable means of blending buildings and constructions into the landscape.

The material lends itself to a new concept of vertical garden, not only for newly built constructions, but also for the renovation of existing buildings. As mentioned earlier, unlike the current vegetated façade and vertical garden systems, the new "green concrete" supports biological growth on its own surface. Therefore, complex supporting structures are not required, and it is possible to choose the area of the façade to which the biological growth is to be applied.

When it becomes commercialized, the living concrete could give designers the chance to create decorative living walls in places where it previously wasn't possible because of the heavy support structures or intensive maintenance required.

Buildings covered in vegetation aren't just beautiful; they offer benefits to our cities if green walls were to become more widespread. Green spaces wouldn't be limited to just rooftops, parks or street side planting areas, but could instead hide or replace some of the facades on our buildings. Streets would be cooler. At least in a small way, cities could begin to reduce some of the carbon they generate. Living concrete can accelerate the process and offer another sustainable value to our built environment. Just imagine that.







New Generation of Roller Compacted Concrete (RCC) Can Revolutionize the Conventional Concrete Paving Placement as We Know it.

By Hessam Nabavi, Director of Industry Services

Traditionally, Roller-compacted concrete (RCC) has an appearance that is similar to asphalt. What if it was possible to change the appeal of RCC and make it look like conventional concrete with a broom finish, at the same time reducing the upfront cost and increasing the profit margin for the ready mix industry. Recently at the Maryland Concrete Conference, I saw a short presentation by Matt Munsick with Soil and Aggregate Solutions, Inc. Matt talked about a new Patent Pending RCC mix combined with a finishing process which allows them to attain a highly efficient and consistent finish RCC.

The following day I met with Stan Bland, P.E., Pavement Application Director and Andrew Johnson, PHD, P.E., Pavement Design Engineer, both with PCA South East along with Matt Munsick.

Matt said that, comparing to traditional RCC installations, the new RCC compaction and finishing windows are significantly longer. It can be done with less labor and time; finishing and curing can follow directly behind the paver. Overall it significantly reduces grinding, patching, repairing, sawing and sealing after installation. Basically this system removes a lot of additional time and costs to RCC placement and the result is as beautiful as conventional concrete with broom finish. He then showed us a finished sample of his RCC. It did not look like RCC as we know it, but had the appearance of the conventional concrete. Stan and Andy, with combined experience of over 70 years as paving design engineers with Carolina DOT, were thrilled that such a result could be achieved with this system. Andy even coined a phrase for this new RCC, calling it CCP (Compacted Concrete Paving). They both believe that this can and will revolutionize the conventional concrete paving industry.





Virginia Concrete Conference: Winter Weather, Transportation Focus

By Ann-Germaine Danz, Director of Industry Services

VRMCA regional councils worked together to promote the versatility of concrete at the Virginia Concrete Conference. The theme for this year's conference was Concrete: the Durable and Competitive Investment. Attendees from across the state and throughout the Mid-Atlantic braved a threatening winter weather forecast to discuss what is new in concrete, including the latest tools, techniques, and award-winning projects in Richmond.

Many of the nearly 400 registered hail from transportation backgrounds, so the focus of the event is on our state's transportation infrastructure. Day two is divided into sessions on bridges and pavement.

VRMCA's exhibit space focused on concrete's qualities being a versatile, durable, and safe investment for our localities. Notable projects from across Virginia highlighted the versatility of concrete pavement across building type or use type. Photographs of the Martinsville Speedway's concrete racetrack brought back memories for one former race car driver. Pervious concrete pavement was shown in a large application with the 100,000 square foot Fort Belvoir Shopping Center parking lot and a much smaller pervious roadway at White House Cove Marina in Poquosen. Stormwater speaker Scott Blossom, PE and Dr. Celik met briefly in the exhibit hall to discuss the many benefits of pervious concrete pavement.

Light colored pavements have incredible reflectivity for light and heat gain from the sun. The urban heat island effect was demonstrated with two heat lamps, thermometers below the pavement surface and a temperature sensing beam. Heat gun readings consistently found the concrete temperature to be about thirty degrees cooler than the dark asphalt pavement. Conference participants enjoyed the interactive element of being able to test the temperature readings. Projects such as a Sheetz gas station demonstrate the day versus night contrast for concrete parking lots.

Kisia Kimmons from Roanoke Cement dedicated her time and technical expertise to answering questions from the many Department of Transportation employees. The exhibit hall was packed with products, tools, admixtures, and testing agencies. We found this concrete core drill bit to be incredibly light weight. Innovations in products along with unique applications of concrete for buildings and bridge structures were honored at the conference.



Upcoming ACI classes:

April 7, 8 & 9
April 21, 22 & 23
April 28, 29 & 30
May 12, 13 &14
June 9, 10 & 11
June 23, 24 & 25

Questions? Contact George Boykin at (434) 906-2186 or email george.boykin@easterassociates.com.



Pervious Concrete Demo on the Peninsula

By Ann-Germaine Danz, Director of Industry Services

Vulcan Materials hosted a Pervious Concrete Contractor Certification Course for Hampton Roads contractors at their Denbigh Plant. This central location on the Peninsula drew attendees from Richmond to Norfolk. National Ready Mixed Concrete Association course material was taught by Titan America's William Denison, Jr. Ben Golden of Vulcan coordinated the seminar space, while Jim Murray facilitated the on-site placement of pervious concrete.

The NRMCA program consists of a full day of classroom work covering material in a presentation and accompanying textbook. Bill moves quickly through the slides, but covers all of the information thoroughly. He is able to effectively communicate the technical considerations for speed of placement and working under varying weather conditions. Attendees are encouraged to ask questions during the day and relate their own experiences on the job site to promote discussion of proper technique. We were fortunate to have Jay White of East River Construction recertifying in our class. Jay has many years working with pervious concrete using the two-step finishing method. In this technique, risers strips are placed on forms then concrete is struck off about a half inch high. This is followed by a pass with a full width weighted roller to achieve compaction. The one-step method by contrast uses a counter roller to strike off and compress the surface, then a cross roll to achieve remaining compaction. One pass with the screed equipment may achieve the majority of compaction.

A rainy morning threatened our job site, but skies cleared by the afternoon in time for the pervious concrete demonstration. Humidity in the air is preferable to retain the moisture content in the concrete. When dry and windy conditions exist it is better to postpone the placement of pervious concrete. NRMCA instructs contractors to observe the consistency of a wet metallic sheen with smooth paste. If the concrete has a dull look, then water may need to be added. Pervious concrete that is too dry can lead to surface raveling; if it is too wet then the surface will seal and not drain stormwater properly.

Jobsite adjustments are not uncommon. Our mix was a little dry to start, so adjustments were made at the truck to allow for workability. The crew from Denbigh Construction set up forms earlier in the week and brought their tools to learn how to use them. Bill Denison shared that



concrete should be placed with a semicircular motion with the chute. The less chute extensions the better to minimize drying out or getting held up coming out of the truck. Under the guidance of Bill Denison and Jim Murray, the contractors picked up the necessary skills to work with pervious concrete. This was a great example of the advisory council working together to promote technique in the industry for a shared customer.



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VRMCA 2015

The VRMCA Ready-Mixer newsletter is distributed monthly to the entire membership and other industry individuals. Total circulation is approximately 350.

<u>Ad size</u>	Dimensions	<u>One Issue</u>	Four Issues	Six Issues	Twelve Issues
Full page	7.5" x 10"	\$276	\$992	\$1,406	\$2,646
Half page (horizontal)	7.5" x 5"	\$165	\$595	\$843	\$1,587
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NLRB Adopts New Election Procedures

By John G. Kruchko and Jacquelyn L. Thompson

On December 12, 2014, the National Labor Relations Board ("NLRB" or the "Board") announced that it has adopted the final rule amendingits procedures for union representation elections. The new rule's primary purpose is to permit union representation elections to occur as quickly as possible. The final rule implements changes to the Board's election procedures that are substantially identical to changes proposed by the Board in 2011. A federal court struck down those changes on technical grounds because the Board did not have a quorum when it issued the rules.

Although the rule is being challenged, it is likely to go into effect next month. On March 19, 2015, the House of Representatives passed a resolution to do away with the rule in a 232-186 vote, sending the measure to President Obama's desk. Congress used the Congressional Review Act to eliminate the election rule, which they have denounced as an attempt to help labor unions surprise employers with organizing drives. Under the seldom-used Congressional Review Act, lawmakers can block any regulation they disapprove of from going into effect. On March 31, 2015, President Obama vetoed the resolution. While the Senate voted 53-46 to pass the resolution, that is fourteen votes shy of the total needed to override a veto.

There are also several federal lawsuits pending regarding the constitutionality of the rule. However, none will likely prevent the rule from going into effect in April.

A. The Rule

A full quorum of Board members issued this most recent version of the election rule on a 3-2 vote. Thus, it does not suffer from the same procedural infirmities as the 2011 rule. The final rule was published in the Federal Register on December 15, 2014 and is scheduled to take effect on April 14, 2015. The new election procedures, when ultimately effective, will have the following consequences:

• The rule shortens the time period between the filing of a petition for an election and the holding of the election. Currently, the standard time period is 42 days. The new "quickie election" procedures will allow an election in under 20 days.

• The rule substantially limits the opportunity for a full pre-election evidentiary hearing of contested issues, such as the appropriate bargaining unit, supervisor determinations, and individual voter eligibility. The rule eliminates the pre-election request for review. Employers will have to seek review of all Regional Director election rulings through a single, post-election request.

• The rule requires that employers provide additional contact information of unit employees, including personal email addresses and cell phone numbers, to the union.

B. Practical Effect of the Board's Rule Changes
Once an employer receives the election petition, it will have a very short time period to assess appropriate bargaining unit issues and prepare for a representation hearing;

• If an employer does not become aware of a union organizing campaign until after it receives the petition, it will have less time to make an effective case against unionization;

• It will be easier for unions to win NLRB representation elections; and

• It will be more difficult to overturn the results of an election in favor of a union

C. Employers' Bottom Line
As mentioned, the Board's final rule is due to take effect on April 14, 2015. In the interim, employers who wish to remain non-union should take the following action:

 Quick discovery of employee discontent and covert union organizing is now imperative.
 Review your union avoidance training for supervisors to ensure they are receiving periodic instruction on the signs of union organizing and how to respond if they see union activity.

• Effective communication skills must now be an essential qualification for every manager. Assess your leadership team and work with individual members of management to improve their communication skills.

• Revise personnel policies to allow for legal workplace restrictions on union organizing. There are numerous ways to slow down potential organizing by employees and outside union agents. Consult with employment counsel to determine which policies are legal and effective.

• Communicate your position on unions to employees with various techniques and media. Given the new "quickie election" rules, employers must become more aggressive in communicating their position that employees are better off in a non-union environment. Use new employee orientation, employee handbooks, and "Don't Sign the Card" meetings.

• Create a workplace that fosters employee participation in the operation of the company. Utilize employee committees to address safety or greater efficiency in operations. Schedule regular "state of the company" meetings to communicate with employees.

• Survey wages and benefits provided by other employers in your locality and industry. Company wages and benefits should not be so far below the norm so as to provide organizing issues for union adherents.

• Ensure that your employees are treated with respect, dignity, and fairness. Audit your employee relations program to ensure that supervisors are treating employees fairly. There must be uniform discipline and opportunities for advancement, without discrimination.

• Monitor the activity of unions that are specific to your industry and which might conceivably approach your employees. Appoint a Human Resources associate to review local union websites and organizing activity in the community.

The shortened time period for union elections will place a premium on swift reaction by employers to union organizing activity. Employers are encouraged to speak with their labor counsel now about putting in place a rapid response plan for management because they may not get a second chance to prepare for sudden union organizing activity.

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John G. Kruchko is a Partner with the Labor & Employment Law Firm of FordHarrison, LLP in Tysons Corner, Virginia; Jacquelyn L. Thompson is also an associate in the firm's Washington, D.C. office. Paul M. Lusky, Of Counsel in the firm's Baltimore office, prepared an original version of this article. For more information, please contact Mr. Kruchko or Ms. Thompson at (703) 734-0554 or by e-mail at jkruchko@fordharrison.com or jthompson@ fordharrison.com. This article is published for general information purposes, and does not constitute legal advice.

Code Requirement and Deicer (salt) Damages of Concrete

By Hessam Nabavi, Director of Industry Services

At the NOVA March Quarterly Business Meeting, Teck Chua spoke about the latest Code requirements on concrete, including those in the 2014 Virginia Uniform Statewide Building Code for low rise homes. Teck Chua, P.E., M.ASCE, LEED® GA is the Director of Technical Services at Vulcan Materials Company's ready mixed concrete division, servicing the markets in Virginia, the District of Columbia and Maryland. Teck's duties include concrete product research and development, concrete trouble shooting and QC/QA. Teck is a registered Professional Engineer in Virginia, DC and MD. He is a member of ACI 301. Specifications for Structural Concrete, ACI 207 Mass Concrete, ACI 211 Proportions for Concrete, the National Ready

Mixed Concrete Association Research, Engineering and Standards Committee, and a LEED Green Associate. He is also a member of the technical committee of the Virginia RMCA and Maryland RMCA. Teck's 30-year concrete industry experience includes precast, pre-stressed and ready mixed. Teck is a graduate of Purdue University, where he received both a bachelor and a master's degree in Civil Engineering.

In his presentation, Teck focused on the following topics:

- The building code of Virginia
- Code requirements for residential and commercial concrete
- Deicer (salt) damages
 why it happened?
- Rock salt and other types of deicers

• How to prevent/ minimize deicer scaling

Teck described the causes and prevention of damage to concrete surface due to winter application of salt and other deicers and expert recommendations on how to take care of new concrete surface.

Nearly 50 residential and commercial contractors, superintendents, inspectors, engineers and members were in attendance.

To view the entire presentation, please visit the link below: http:// www.vrmca.com/regions/default. aspx?region=4





On the Horizon Calendar of Upcoming Events

APRIL 8, 2015 SWCAC Education Committee Meeting 12 PM - 1:00 PM Jersey Lilly's Restaurant

APRIL 9, 2015

NVCAC Executive Council Meeting 11:30 AM - 2:00 PM Bob O's Restaurant Chantilly, VA

APRIL 14, 2015

Hampton Roads Council Meeting 11:30 AM - 1:00 PM Crazy Buffet and Grill, Chesapeake, VA

APRIL 21, 2015

Central VA Council Lunch Meeting 11:30 AM - 1:00 PM American Tap Room

APRIL 22, 2015

VRMCA Technical Committee Meeting 10:00 AM - 1:00 PM The Place at Innsbrook Glen Allen, VA

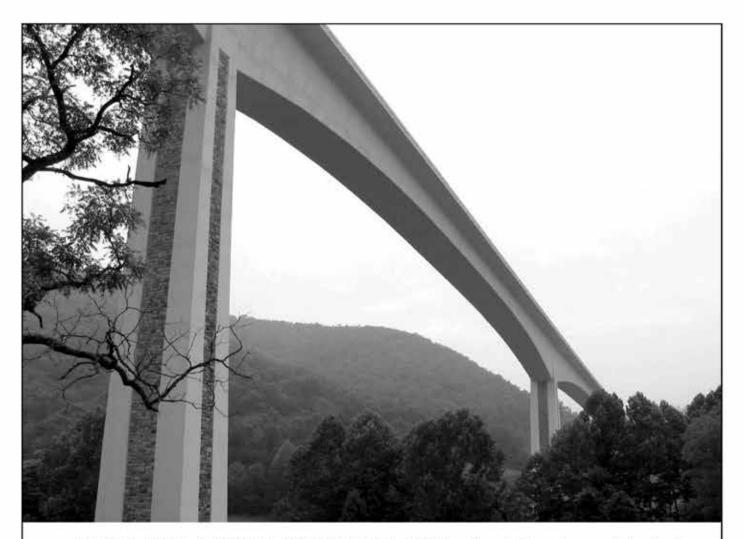
MAY 4, 2015

VRMCA Mixer Truck Roadeo 9:30 AM - 5:00 PM The Meadow Event Park Doswell, VA

MAY 17-19, 2015

VRMCA Spring Convention The Greenbrier White Sulphur Springs, WV

Please visit the online calendar for an up-to-date list of events. www.VRMCA.com/calendar



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