Concrete Parking Lot Promotion: The Opportunity is Now

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Parking lots have long been seen as key opportunities for the concrete industry. Unfortunately, concrete parking lot market share has declined in recent years due to a market that has increasingly focused on first-cost and short-term concerns rather than long-term value. However, indications are that a number of rapidly emerging market developments along with a new level of planning and resolve by the concrete industry are turning the momentum around.

Opportunity Knocks

Estimated by PCA as having a yearly potential of 88 million cubic yards with concrete market share at just 9.1 percent in 2005, there is no question that concrete parking is an enormous opportunity. The factors supporting market share growth for our industry are also compelling, including increasing commercial awareness of concrete as an environmentally friendly material, growing market concerns about the negative environmental impact of asphalt and the rising comparative cost of asphalt. Increasing collaboration among concrete promotion groups, the development and refinement of key promotional tools and new coordinated industry plans and strategies provide a “roadmap” that promises significant strides in coming years.

“With the growing commercial awareness of concrete’s environmental advantages and increasingly favorable life-cycle cost benefit, the concrete and cement industries have a historic opportunity to gain national momentum in parking lot paving over the next few years,” noted Bob Sells of Tarmac America, chairman of the NRMCA Promotion Committee and the working group that developed the new strategic plan for concrete parking lots.

Industry Meeting Leads to Parking Lot Working Group Creation

As the traditional market leader for the promotion of concrete parking lots, NRMCA organized a two-day industry meeting in early 2006 that reviewed existing parking lot promotional efforts and set a course for taking advantage of increasingly favorable market conditions. The group explored many creative ideas and possible initiatives and recommended the creation of a working group to finalize a strategic plan. Key elements endorsed by the group were the participation of all levels of the industry working together with shared goals, the development of innovative new promotional tools and the need for comprehensive market share measurement to evaluate promotion results.

As a broad industry effort, an aggressive, multifaceted plan was developed subse-
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programs and finalized a full strategic plan. An active group developed specific strategies and programs over a nine-month period, the active and enthusiastic group developed specific strategies and programs and finalized a full strategic plan by the end of 2006.

**Parking Lot Strategic Plan**

The strategic plan’s stated mission is to expand markets for concrete parking areas through a collaborative industry effort with coordinated goals adopted by the states, regions and national organizations and their members. The plan calls for national concrete market share of new parking areas to increase to 15.1 percent in 2010 from 9.1 percent in 2005. Based on PCA projections that include the expectation for an expanding parking lot market in general, meeting the plan goal will more than double concrete yards placed in 2010 to 8.24 million cubic yards compared to 2005—just for new construction.

Collaboration, shared goals, dramatic new tools and effective market measurement are set as the foundation for the new plan. General goals and strategies outlined in the plan include:

- Enhance communication and cooperation among stakeholders and promoters.
- Recognize their essential role and encourage the hiring of additional full-time promoters at the state/local level to pursue specific projects.
- Provide new and updated promotional tools and services, including centralized parking lot design assistance and the delivery of local parking lot leads.
- Supply support materials to guide promoters in utilizing promotional tools through model scenarios and “how to” guides.
- Develop measurement systems providing national, regional and state market share results annually.

The following objectives and plans have been established to accomplish these goals:

**Enhance Promotional Communication, Organization and Cooperation**

- Expand industry recognition of the existing parking lot opportunity and the value of full-time local promoters making direct contact with decision makers.
- Gain cooperation and commitment among stakeholders at the local, regional and national levels to set concrete parking lots as a priority supported with market share goal-setting at all levels.
- Establish a national concrete promoter database/directory and regional networks among national and local promoters to maximize results at every level.
- Form a national Steering Committee, with representation from all stakeholder groups, to monitor plan progress.

**Deliver New and Updated Promotion Tools and Services**

- Deliver a low-cost subscription service for delivery of project-focused local leads (Building Under Design’s online “BUD” lead service is now available to NRMCA state affiliates for $50 per year).
- Offer centralized parking lot design assistance service to specifiers through local promoters. (This NRMCA-sponsored program is scheduled for roll-out this summer.)
- Simplify, enhance and update Concrete Pavement Analyst (CPA) software (scheduled for completion this fall).
- Develop a new Web site (www.ConcretePromotion.org) devoted to providing tools and information for concrete promoters (launch date: Sept. 1, 2007).
- Generate additional leads for local promoters through increased Web presence and advertising (on track to deliver 500 quality Web leads for local projects in 2007).
- Provide new flip-chart “pitch book” and PowerPoint for local parking lot promotion (planned for summer).
- Create new “Web Site for the Industry;” www.GreenConcrete.info (launch: June 1, 2008)

**Expand Promoter Education and Develop New Resources**

- Expand promotion education efforts for promoters and specifiers with an emphasis on environmental benefits of concrete.
- Provide “how to” guides, model strategies, Best Promotion Practices Manual and “roadmap” for making use of promotional tools and services (complete by July 1, 2007).
- Encourage and support regional meetings for state/area associations to develop parking lot strategic plans (throughout 2007 and 2008).
- Collect parking lot success reports and “best practices” in standardized format and provide on ConcretePromotion.org.

**Develop Shared Goals and Implement an Effective Measurement System**

- Report parking lot market share through 2010 on a rolling 12-month basis for states, regions and nationally (initially for new construction only) with 2005 set as benchmark. (PCA, working with Reed Construction Data, has developed a project “sampling” methodology showing a 9.1 percent national concrete share for 2005.)
- Create state and regional yearly market share goals through 2010 based on 2005

“With the growing commercial awareness of concrete’s environmental advantages and increasingly favorable life-cycle cost benefit, the concrete and cement industries have a historic opportunity to gain national momentum in parking lot paving over the next few years.”

— Bob Sells of Tarmac America, chairman of the NRMCA Promotion Committee and the working group that developed the new strategic plan for concrete parking lots.
benchmarks that “roll up” to a shared national goal (has resulted in 15.1 percent national goal in 2010, adopted by the Board of Directors as NRMCA’s goal during the March 2007 Annual Convention in La Jolla, Calif.).

• Conduct decision-maker attitude and perception studies as progress measure. (PCA will update 2005 benchmark study in 2008 and 2011.)
• Expand market share reporting to include parking area reconstruction (first integrated new and reconstruction report planned for 2011).

New Tools Support Concrete Parking Lot Promotion

Project-Focused Local Promotion – The consensus of the working group was that local promoters should be responsible for getting their own local leads, but that assistance at the national level would be valuable. In support, NRMCA has subscribed on a national basis to the online service Buildings Under Design (BUD) from National Building News so that state affiliates can access the database for just $50 per year. This service can provide early enough project awareness to assist promoters in improving success. A key additional element will be suggestions to local promoters for making effective use of the information based on successful programs already in place in several states.

Centralized Parking Lot Design Assistance — The innovative concept is that local promoters can offer this NRMCA-supported service to specifiers not familiar with concrete parking lots to encourage them to “go concrete” with good results. An experienced professional parking lot designer will be available to review existing parking lot plans and make design recommendations. The design assistance will provide suggestions for sub-base, thickness, design details, jointing, specifications and maintenance using ACI 330, NRMCA CPA software, ACPA and PCA guidelines.

Utilizing & Enhancing CPA Software — An updated version of CPA software will be available by the end of the year. The key change will allow the user to input the square-foot cost of asphalt instead of requiring the per-ton cost for the life-cycle analysis. This will simplify the process, as asphalt prices are often quoted by square feet, and this is the parameter that specifiers tend to recall. Another CPA improvement will be simplified instructions along with recommendations for how to make most-effective use of the program as a promotional tool.

Parking Lot Market Opening: First-Cost

Asphalt cost is directly tied to the price of petroleum. Asphalt prices are further inflated by constrained supply as petroleum refiners are able to increase profits by devoting an increasing share of each barrel of crude oil to gasoline. Concrete parking is already at first-cost price parity with asphalt in some areas and will have a growing price advantage in most areas if pricing trends from recent years extend a few more years into the future.

The chart shows 20-year life-cycle costs for concrete and asphalt as estimated by Concrete Pavement Analyst software. Estimates for 2002 and 2007 are based on representative national pricing. Estimates for 2012 are based on a cost increase scenario beyond 2007 of percent per year for concrete and 15 percent for asphalt. The chart shows that concrete in 2007 has a first-cost benefit in the “apples-to-apples” comparison with the structural equivalent Asphalt Institute recommendations. Under the scenario charted for the next five years, concrete first-cost is lower than even the structurally inferior “widely specified” asphalt that is commonly placed, with concrete at approximately half the 20-year total life-cycle cost. Prices for asphalt increased 17.8 percent in 2005 and 36.5 percent in 2006, according to an Associated General Contractors report. Public officials in some localities are expecting asphalt increases of as much as 40 percent in 2008.

Representative 20 Year Life-Cycle Costs for 100,000 Ft2 Parking Lot
(2012 estimates are a “what if” scenario based on 5% per year cost increases for concrete and 15% per year increases for asphalt for 2007-2012.)
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Parking Lot Strategic Plan Steering Committee

The Parking Lot Working Group conceived the strategic plan as an ongoing "work in progress," requiring regular review and adjustment to ensure success. Steering committee members have agreed to provide that oversight on behalf of the industry.

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<tr>
<td>Karl Watson, Jr.</td>
<td>Rinker</td>
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<td>Michael Harlan</td>
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<td>Henry Batten</td>
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<td>Bob Sells</td>
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<td>Tom Tietz</td>
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<td>Glenn Ochsenreiter</td>
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Parking Lot Market Opening: Environment

Specifiers are increasingly recognizing concrete’s strong environmental benefits and taking advantage of them in the face of fast-growing “green” consumer awareness. In contrast, asphalt is coming under increasing environmental scrutiny and growing concern. According to a recent study in Texas by the U.S. Geological Survey National Water-Quality Assessment Program and the city of Austin, the black emulsion sealcoat applied to asphalt pavement has extremely elevated concentrations of polycyclic aromatic hydrocarbons (PAHs) and can significantly affect the quality of downstream water resources. PAHs are known to have adverse health effects on animals, plants and people. Small particles of sealcoat flake off as they are abraded by vehicle tires and can wash into urban streams with rain and runoff.

Centralized Parking Lot Design Assistance for local specifiers will provide suggestions for sub-base, thickness, design details, jointing, specifications and maintenance using ACI 330, NRMCA CPA software, ACPA and PCA guidelines, along with an AutoCAD compatible file of the site plan.
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There has been a long running dispute between the courts, federal regulators, environmental groups and industry over what bodies of water fall under the purview of the Clean Water Act. Also, some Members of Congress are concerned that recent Supreme Court cases — Solid Waste Agency of Northern Cook County v. Army Corps of Engineers (the SWANNC case, 2001) and Rapanos v. United States (2006) — have unnecessarily limited federal authority under the CWA.

At this writing, the leadership of the powerful House Transportation and Infrastructure Committee are soliciting cosponsors for the Clean Water Authority Restoration Act, which would dramatically extend the reach of the CWA. In fact, CWARA would provide the greatest expansion of the regulatory reach of the CWA since the law took effect in 1972. While the stated goals of CWARA are to restore the
original intent of the CWA and to provide certainty to the regulated community, it is an open question as to whether the bill will accomplish either.

What is clear is that CWARA would grant the U.S. Environmental Protection Agency and the U.S. Army Corps of Engineers federal regulatory authority over all intrastate waters. This would be accomplished by amending the CWA to take out the term “navigable waters” and replace it with the term “waters of the United States.” Essentially, the new definition would include all wet areas within a state, including ditches, gutters, sloughs, prairie potholes and possibly even groundwater.

CWARA’s principle goal is the protection of vital wetlands. However, these important ecological resources are already protected under the United States Supreme Court’s 1985 unanimous decision in United States v. Riverside Bayview Homes, which the court reaffirmed in its recent decisions in SWANCC and Rapanos. In Rapanos, the justices unanimously rejected arguments that CWA jurisdiction is limited to traditional navigable waters. Their recommendation was not to amend the CWA but rather that the Corps of Engineers and EPA should issue new regulations. Therefore, it is highly dubious that CWARA would serve to reaffirm the traditional scope and clear purpose of the Clean Water Act as its sponsors claim. Instead by usurping the federal agencies’ obligation to provide greater clarity to the term “navigable waters,” it is more likely that CWARA will result in a whole new round of litigation in an effort to define the limits of the new law.

More importantly, CWARA would displace state and local jurisdiction over land and water use. In day-to-day terms it would mean anytime a public infrastructure project is initiated — whether new or maintenance related — if it affects intrastate water, the local government must apply for a CWA permit. This shift in authority would result in an unprecedented increase in federal regulatory control, imposing significant administrative burdens on all levels of government. Currently the backlog of permit requests is approximately 15,000 to 20,000, and the increase in required permits caused by CWARA would necessitate enormous resources to broaden and defend the expanded federal regulatory program. This would produce permitting delays and increased costs thus impeding a host of economic and governmental activities, including such projects as commercial and residential real estate development, water transfer culverts and waste treatment systems.

When it comes to protecting our nation’s water resources, Congress would do well to heed the advice of the noted author and naturalist Henry David Thoreau. Thoreau stated: “I heartily accept the motto, ‘That government is best which governs least,’ and I should like to see it acted up to more rapidly and systematically.” Superimposing a slow and unwieldy federal permitting system over all state and local programs that regulate water quality is regressive, and is certain to cause significant harm to the nation’s economy. Congress should reject the unnecessary and unprecedented federal expansion proposed in CWARA.

For more information on NRMCA’s government relations program, contact Sullivan at 240-485-1148 or rsullivan@nrmca.org.
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Texturing and Stamping with Integral Pigments: Should Integrally Colored Concrete be an Integral Part of Your Business?

Tips on Best Practices for Integrally Colored Concrete Surface Finishes – from the People Who Work with it Most

By Art Tyson, Color Specialist, Grace Construction Products

A sk around in the Western United States where integrally colored concrete has been used extensively in texturing and stamping applications, and the notion of using dust-on or dry-shake coloring over gray concrete is a distant memory. So what has caused the people who work the most with decorative color to shift away from using topically applied color hardeners over gray?

With the demand for colored concrete forecast to lead all other areas of concrete construction in the years ahead, determining best practices now can have a direct impact on maximizing your profit potential.

The use of integrally colored concrete within textured and stamped finish work is becoming an increasingly popular, valuable and economical combination in commercial and residential decorative concrete projects.
The first step to satisfying any colored concrete job is to perform sufficient planning and preparation. Be sure to ensure consistency throughout the project: in the mix design, grading conditions, joint pattern grid plan and the desired decorative finishes and curing. Wind and weather conditions must also be factored in to ensure a successful decorative job.

later. In fact, recent case studies show that simply adding integrally colored concrete to your product offering via liquid pigment dispensed producers can boost your sales the next year at least 30 percent.

Shaking Things Up

Because dust-on colors are manually shaken, or broadcast, over the wet concrete before final surface finishing, the dust-on process can make for a very challenging environment at the job site. It’s not only difficult to attain uniform color hardener thickness over the concrete surface, but hard to keep the color from ending up where it shouldn’t be, such as rooftops, lawns, yards – literally, wherever the wind blows. So in addition to the added step of dusting on the color compared to using integral color, dust-on color requires extensive job preparation to protect surrounding surfaces – added work that’s not needed with an integral color approach.

“We haven’t used dry-shake colors as the primary way to color concrete or achieve desired surface finishes since the mid-1980s. It’s just not done that way in
California anymore,” said Joe Pirro of Pirro Masonry, a highly respected and experienced decorative contracting firm from Simi Valley, California.

Pirro noted that dust-on color hardeners do have their limited place at times when used over integrally colored concrete to achieve specialized modeling looks or for specific vibrant color results, but like other contractors where color is used extensively he steers clear of dust-on as the primary source of concrete coloring.

"On a windy day, the dust-on color can end up all the way on the top of a roof,” he remarked.

“Whenever dust-on color is broadcast, some of it gets airborne – it’s an environmental issue and health concern,” said Jonathan Gomez of Spragues Ready Mix, a leading provider of specialty residential concrete in Southern California. With two busy plants to keep pace with the high demand for integrally colored concrete in the region, Gomez has seen and heard it all. “Dust-on color used to be a concern for our contractors and their workers,” he explained, “But it’s rarely used anymore around here.”

Breathing Easier

Gomez said that nine and a half out of 10 times, his customers will specify integral color for their residential colored concrete jobs.

“With dust-on color, our contractors would find it would catch onto areas surrounding their work projects, which can cause damage or more work to powerwash unintentionally colored areas,” he said. “For stamped concrete finish work, we find our contractors prefer integral color so they don’t have to deal with the dust-on issues.”

Michael Miller, owner of Miller & Associates in Monterey, California, is known as an artist when it comes to using color. His contracting firm has a reputation for top-notch creative ornamental residential and commercial work and he frequently teaches others.

“We do a lot of interior floors and often work inside homes, so dust-on color can be a real mess and requires a lot of preparation and surface masking,” said Miller. “There are occasional times where we’ll use dust-on such as with an integral color pour and we’ll broadcast limited amounts to give the concrete another dynamic, or we’ll use a stain with dust-on color to create a patina to achieve an artistic look. Dust-on can work in small quantities to create an organic look on top of integral color, but in any kind of volume at all, the added labor needed and the issues of timing and control make integral color our choice.”

Extra Care and Attention

A concrete surface that uses topically applied dust-on color takes extra care and attention to achieve a good result. It’s a whole added process.

In addition to the need to manually broadcast or dust-on the color, a more precise water-cement ratio is required that’s typically much higher than needed if using integrally colored concrete. The higher water content creates a greater bleed rate during the initial set and just prior to final finishing, necessary for the dust-on color to be more easily absorbed. If the water-cement ratio isn’t just right, the dust-on color won’t adhere properly.
The water-cement ratio is critical to achieve consistent color. A concrete surface that uses dust-on color requires a more precise water-cement ratio that's typically much higher than needed if using integrally colored concrete. If dust-on color is added too early or too late, it won't adhere correctly. Texturing and stamping over integrally colored concrete is more forgiving on the job’s water management.

As an example, a typical concrete mix with a water-cement ratio of 0.40 may require an increased water-cement ratio of 0.50 to work with the dust-on color. The problem is, while the greater water content may improve finishability, it extends set time and decreases the concrete's ultimate strength. Add the occasional need to manage last-minute weather induced variations to the job site, which typically alter the surface’s water-cement ratio and drying performance, and the process of using dust-on color can put the project at risk.

Two Different Processes

“There’s a lot more work you have to do and more manpower needed when using gray concrete with dust-on colored hardeners for texturing and stamping,” said Joe Pirro. “We probably save three or four steps by using integral color instead.”
Pirro explained that with dust-on color there are the extra steps of preparing for the dust, adding the colored hardener, bull floating the surface again after applying the dust-on color, and after adding the joints, touching up to re-cover the exposed gray concrete.

“The dust-on color also tends to dry only the surface of the concrete a little faster which can present a big problem when you start stamping or texturing if the concrete is already drying,” said Pirro. “Add a little wind and the surface dries even faster. But with integral color we don’t worry about that. We use it for driveways, walkways, pool decks – you name it.”

Miller has seen many of the same issues with dust-on color, including the problems during drying. “Because dust-on color dries the surface faster, and elements like warm weather and wind accelerate the surface drying, the top surface hardens like a crust and doesn’t allow water to release, creating a brittle surface that makes creating joints or working with the concrete more difficult,” he explained. “It’s like working with a dry crust on top of wet concrete that creates a spongy surface. Integrally colored concrete gives us a more uniform surface to tool, which is very important for decorative ornamental work. And using integral color is so much more predictable and less labor intensive.”

Quality and Durability

With dust-on color, it’s critical to achieve a top surface color layer of a uniform minimum thickness. Otherwise, the surface color may not last long, and if the surface layer is too thin or weak, the concrete may chip or crack and expose the gray concrete beneath, resulting in quality problems and callbacks.

“You know the color is going to last longer when using integral color,” said Gomez. “Even if there are chips or cracks, you won’t see underlying gray concrete.”

He notes that in the long run, dust-on color requires more maintenance over time. “If a job was colored with topically applied colors, and properly placed, cured and sealed, then maintained with a water based sealer every two years, the customer could probably keep the concrete looking as vibrant as any integrally colored concrete,” he said. “But that really doesn’t happen in the real world – which is why integrally colored concrete lasts so much longer.”

Creating smooth, even color is also a challenge with dust-on color. “It’s harder to get an even consistency,” said Pirro. “With dust-on hardeners, there can be some moisture entrapment in the concrete, so it’s difficult to get color that’s as true as you get with integral color. The skill and workmanship of your finishers is even more important.”

Of course in placing any concrete, colored or gray, it’s important to follow the proper steps to achieve the best result.”

Spragues Ready Mix in Southern California and Graniterock of Northern California not only provide the product, but also the ongoing expertise to do the job right utilizing best-practice approaches, educational seminars on proper finishing techniques and decorative concrete presentation events.

Mike Chernetsky, a branch manager for Graniterock points out that virtually all of his customers use integral color since it saves steps, is easier to apply and
provides a higher quality product. Chernetsky finds there can be a tendency to over-trowel the concrete during finishing if dust-on color is used, which causes moisture to entrap at the concrete’s surface and make the final color burn or become darker than desired.

“We help make sure our customers know what to do and what not to do to help them deliver a quality product,” said Chernetsky.

The Cost Difference

While the initial cost for integrally colored concrete is greater than that of gray concrete alone, the cost in terms of the overall labor required is typically much less than a dust-on decorative approach because of its ease of use and placement.

“While it might cost an extra 10 percent to purchase integral color, I’d estimate our labor costs to be at least 40 percent higher with dust-on color,” said Mike Miller. “And depending on the type of finish, sometimes you can’t even achieve the same look. The time and place for us to use dust-on color might be a project like a countertop that’s small enough to mitigate any labor issues. But with many of our finishes, there’s so much detail and jointing involved that we wouldn’t even venture to do it with dust-on color.”

Miller estimates that with integral color, his customers end up paying less than they would with dust-on – by about 20 percent for the finished price.

“We’re saving on preparation, labor, and we don’t need smaller pours to manage the process so we can be more efficient,” he said.

Pirro also finds that any additional cost for integral color is offset by decreased overall labor costs. At the end of the day he sees integral color’s up-front hard cost as comparable or better than the dust-on approach yet knows he’ll achieve future savings and a lower life-cycle cost, since integral color requires less maintenance expense over time. Both Pirro and Miller know they can comfortably walk off an integrally colored job and have satisfied long-term customers.
No Margin for Error

One of the factors that led to the growing use of integral color in texturing and stamping is the use of liquid pigment automated dispensing systems right at the ready-mix plant.

“There used to be a lot of potential for error via dry integral color,” said Miller. “Automated color at the plant changed all that.”

These state-of-the-art dispensing systems use specially pre-formulated liquid pigment based colors which are weighed and blended by computer and then mixed into the concrete to ensure consistent color dosing every time. As a result, ready-mix producers provide consistent integrally colored concrete – something that wasn’t always possible when working with dry bags of powdered color at the plant. And contractors can place integrally colored concrete with confidence, knowing that they’ll receive precisely the same color from batch to batch to ensure a consistent finished product.

Since the liquid pigments are pre-mixed to achieve the desired color, the liquid dispensing technology also enables contractors to get the color they want when they want it without having to wait for the ready mix producer to order bags of pigment for any specific color.

Focusing on What You Do Best

One of the most important considerations for any contractor is how to deliver a high quality job. Contractors like Pirro Masonry and Miller & Associates have found from experience that they are able to do what they do better when they use integrally colored concrete. Because they work on decorative concrete jobs that require a high degree of skill, using integral color frees them up to focus on the finer points of ensuring a successful job.

“Without all the extra steps of using dust-on color, we have a lot more time to do detail work and quality control,” said Miller. “Instead of spending our time applying the color, we can focus on preparation, grading, drainage, control joints – and making constant improvements.”

Colorful Prospects

With architects and builders increasingly looking for ways to cost-effectively improve the appearance of buildings, homes, driveways, and patios, the applications for colored concrete are expected to continue to grow. And with the increasing use of textured and stamped finishes to create the appearance of natural materials like stone and brick, as well as the decorative patterns and attractive finishes used in today’s modern construction, integrally colored concrete is becoming an increasingly popular building material to add value and exciting new options to architectural designs.

Offering greater flexibility, easier placement and proven durability, it’s hard to argue against the use of integrally colored concrete. For contractors who place colored concrete day in and day out, using dust-on color as their primary way to color concrete isn’t even an option anymore as they find integrally colored concrete is paving the way to increased sales and customer satisfaction – something to consider before your next colored concrete job.

The views and opinions expressed in this article are those of the author and do not necessarily reflect the views and opinions of the National Ready Mixed Concrete Association.
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Environmental Leadership & Revised SPCC Regulations

Environmental Leadership and the Industry Data Survey

By Doug Ruhlin

So, what does the Industry Data Survey say about environmental performance? Quite simply, it provides tantalizing suggestions that environmental performance, and being a “leader” in this area, contributes in a tangible and meaningful way to the profitability of a concrete company.

Each fall, NRMCA releases the results of the Industry Data Survey, which details financial and operational data that can be extremely useful in benchmarking your operation. The Data Survey says a lot about the performance of a concrete operation in terms of profitability, raw material costs, selling prices, fleet performance and other similar items. But does it provide data on environmental performance as well?

This year the Industry Data Survey provided information on the upper-most quartile of the concrete industry responding to the Data Survey (leaders) and the lower-most quartile of the industry (laggards), based on profitability. While not specifically addressing environmental performance, there are some interesting suggestions in the Data Survey about how industry leaders may be managing environmental issues.
With a considerably higher net price per cubic yard, industry leaders include a cost of $2.63/yard for fuel surcharges and environmental fees, vs. $1.24/yard for the typical NRMCA member and $0.52/yard for the industry laggards. Does this mean that leaders simply include a higher fuel surcharge or incur higher environmental fees? Instead, this likely indicates that they’ve done a better job of documenting their environmental costs and have made these costs a tangible part of their overall financial picture. This also appears to indicate that industry laggards may absorb these costs without a clear indication of their impact to their bottom line; clearly not an indicator of successful environmental performance.

Of the direct fixed costs per plant, industry leaders paid $0.08/yard produced for environmental expenses and services, vs. $0.10 for the typical NRMCA member (25% more) and $0.16/yard for the laggard (100% more). In other words, environmental costs were half for the industry leaders than what they are for others in the industry. This is most likely due to the leader’s having an effective environmental management program that deals with these issues in a pro-active, coordinated manner. In other words, making environmental issues a regular part of operations amongst industry leaders may actually be reducing costs, not increasing them.

Effective water use and recycling is often used cited as a measure of strong environmental performance; the costs of water per yard of concrete may provide yet another clue to environmental leadership. Here, industry leaders experienced water costs of $0.01/yard vs. $0.03/yard for the typical NRMCA member and $0.06/yard for the industry laggards. While this may not seem like much, it does add up — particularly when you consider that the industry leaders were far more profitable than the typical NRMCA members or the industry laggards. Does this indicate that efficient water use, water conservation and recycling make a difference? It clearly seems to indicate so!

There are other clues as well. For example, industry leaders also excelled by generating more income from value-added products than do others in the industry. This could include products such as pervious concrete, the provision of LEED credits via recycling efforts, and the use of jobsite washout techniques — all indicators of leading environmental performance. Once again, a clear indication that a good environmental program pays.

It should also be recognized that the Industry Data Survey likely does not give a complete picture of the entire concrete industry — it has been historically limited to participating NRMCA members, which are likely to be the industry leaders regardless of results. If you were to look at these figures for those who are truly lagging behind the rest of the concrete industry, undoubtedly these “environmental benchmarks” would be a lot worse for many, while making those outstanding results of the industry leaders all the better.

So, what does the Industry Data Survey say about environmental performance? Quite simply, it provides tantalizing suggestions that environmental performance, and being a “leader” in this area contributes in a tangible and meaningful way to the profitability of a concrete company.
Revised SPCC Regulations

One area of environmental compliance that the concrete industry has lagged behind in has been with regards to the Spill Prevention, Control and Countermeasure (SPCC) regulations (40 CFR 112), which require that any concrete plant with over 1,320 gallons of petroleum (diesel fuel, gasoline, motor oils, used oils, etc.) in any aboveground tank (55 gallons and above) is required to develop and implement a facility-specific SPCC plan, which is essentially a spill management and response plan. Failure to do so can result in fines and other enforcement actions, particularly in the event of a spill or release of petroleum. Since this program is administered by the Federal USEPA rather than individual states, this has become an easily overlooked component of a concrete plant’s compliance package.

However, one of the more significant roadblocks toward many facilities’ compliance with this important program has been the need to have a licensed Professional Engineer’s (PE) review and certification (signature and seal) of a facility’s SPCC plan. In many cases, licensed professional engineers have been unwilling to do this unless they have prepared this facility-specific plan. This has usually resulted in significantly higher plan preparation and certification fees than if the facility had prepared the SPCC plan themselves by using in-house environmental professional or non-licensed engineering staff (such as they commonly do for Stormwater Pollution Prevention Plans).

However, this recently changed in a way that will be a huge benefit to most concrete plants, which typically don’t store large volumes of petroleum products as compared to other industries. In December 2006, USEPA Administrator Stephen L. Johnson signed a final rule to the SPCC regulations, which streamlined the requirements for facilities with less than 10,000 gallons of petroleum products on-site. Among these changes is a new “self-certification option” for facilities storing less than 10,000 gallons of petroleum products (in any combination of one or more aboveground storage containers down to 55-gallon size), which eliminates the requirement of a licensed PE’s certification if the facility has less than 10,000 gallons stored on site, and if there has been no “reportable spills” (of petroleum products) within the past 10 years.

This change makes this critical compliance issue well within the reach of many concrete facilities. While the development of an SPCC plan prepared in accordance with the applicable regulations is still a relatively complex task, it is easily within the reach of most concrete companies’ environmental, engineering or other technical staff. As a result, this provides a new opportunity for an enhanced level of compliance for most facilities.

Bear in mind that any facility with 10,000 gallons or more of petroleum product must still prepare an SPCC plan that is certified by a PE. However, many facilities either now no longer need this requirement or may wish to reduce the total volume of petroleum product stored on site to meet this new threshold. Either way, it is important to comply with this critical environmental program.

Doug Rublin is principal environmental consultant for Resource Management Associates. For more information, contact Rublin at PO Box 512, Forked River, NJ 08731 or via email at drublin@verizon.net.
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Spreading the Gospel of Green

Promoting Concrete’s Environmental Advantages

by Frank Cavaliere

Take six determined industry professionals well versed in the varied attributes of concrete’s environmental advantages. Mix with the United States public’s increasing awareness of the dangers of global warming, polluted waterways and a host of other issues. Then sprinkle in a coast-to-coast, comprehensive airline schedule and what do you have?

Six NRMCA national resource directors who have constantly traveled throughout the country to publicize and educate construction, transportation and governmental professionals about how concrete fits into the overall greenbuild movement that has gained in popularity over the past few years. The initial skepticism of how such a durable product used for interstate highways and skyscrapers can be a key part of the greenbuild movement has long since given way to requests for more information on how concrete can be incorporated into architectural and engineering building plans.

One of the most tried and true methods of reaching many decision makers in one place is the tradeshow, and NRMCA’s decision to staff a booth at the premier U.S. event for the greenbuild movement over the past few years has already paid great dividends, said Dan Huffman, one of NRMCA’s promoters and the managing director, national resources.

“A mindblower” was how Huffman described the booth traffic at the most recent show held last November in Denver.

NRMCA staff and local promoters on hand to help were frequently surrounded by quizzical attendees, often standing three deep around the two separate pervious concrete displays — a large slab featuring flowing water and a smaller exhibit were water ran through a 15-gallon aquarium. Instead of goldfish, this smaller display featured only a few inches of water with sand and vegetation that imitated a wetlands environment, complete with live frogs.

With NRMCA’s field promoters traveling throughout the U.S. spreading the word on green concrete, the popularity of the pervious concrete section of NRMCA’s booth reflected such diligent promotional work, Huffman noted. He said the previous greenbuild shows in which he represented NRMCA — 2004 in Portland, OR and 2005 in Atlanta — were successful opportunities for the Association, but not nearly to the extent of the 2006 Denver show.

“All the NRMCA and local staffers ran out of business cards and eventually we ran out of literature in spite of having 20 percent more than the previous year’s event,” Huffman said. “Outstanding leads resulted and where we were able to get a business card from an individual, we stapled the card onto an information sheet and wrote notes for future follow-up as to particular interests and challenges, etc.”

Huffman noted that the designer element most receptive to pervious technology was landscape architects because they understand most of the dynamics NRMCA is trying to benefit through infiltration technology. General build-
 Architects are the largest design sector group that is focused on the USGBC and Greenbuild, so most of the leads NRMCA gets relate to architectural firms followed next by the sector of consultants focused on site development.

At the Denver Greenbuild show in November, various milestone projects were highlighted during concurrent sessions that focused on one or a small number of projects. One such session had the owner and the design and construction team of the LEED platinum-registered Applied Research and Development facility at Northern Arizona University in Flagstaff presenting their project. The facility, built with the goal of being the most sustainable laboratory ever constructed, featured some technical challenges related to building in cold weather and at relatively high altitude (6400 ft. approximately), which is 1,200 feet higher than Denver. The entire parking lot for the project was placed with pervious concrete supplied locally by NRMCA member company Rinker Materials and also placed by NRMCA member contractor, PCI Systems.

Huffman said the project was also notable because while conventional concrete went into the building construction, the pervious concrete represented the first commercial placement in the state of Arizona. A primary facilitator of concrete industry interests was Mark Wilhelm (Green Ideas, Inc, Phoenix), a LEED consultant who at the time was the chairman of the Arizona Chapter of the US Green Building Council. Wilhelm had repeatedly facilitated NRMCA and local promoters into LEED registered projects in the state.

Looking ahead, Huffman expressed optimism over the industry interest in the upcoming Chicago Greenbuild (November 7-9, www.greenbuildexpo.org) show with early projections of 12,000 attendees – a 2,000 person increase over 2006 in Denver. Many of them were international visitors. As a result of the show’s expected attendance increase, Huffman said NRMCA will increase its booth staffing with a minimum of four staffers at all times to field questions. He said the association has also doubled its booth size for 2007 and has an excellent corner location adjoining a major aisle with the Portland Cement Association.

“This is a good thing because we work so well together in all environments, but especially at such a trade show,” Huffman concluded.
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All in the Family

Home-grown Minnesota Producer Thrives Under Becken Ownership

by Frank Cavaliere

With globalization entrenched in the ready mixed concrete industry and key decisions sometimes made oceans away from the batch plant, there remains some companies where shop talk can occur just as easily during Sunday dinner as in the corporate boardroom. In Mendota Heights, MN, between Minneapolis and St. Paul, longtime NRMCA producer member Cemstone Products is one such operation, where the latest generation of Beckens operates a thriving, diversified construction materials company known throughout Minnesota, Western Wisconsin and Iowa.

Celebrating 80 years of excellence in 2007, Cemstone – like many companies in the North Central region – was started by a hard working Norwegian immigrant who arrived in the United States early in the 20th century. Hammon T. Becken founded the Cemstone concrete block company in 1927. Today, well into the 21st century, the company is still privately owned and now operated by a fourth generation of Beckens who preside over a company that owns and operates numerous concrete batch plants, a
fleet of vehicles, concrete placing equipment, aggregate mines, quarries and portable washing and crushing facilities, and contractor supply stores. In addition, Cemstone's subsidiary companies include packaging plants and the national SPEC-MIX® brand of factory blended mortar, stucco, grout, shotcrete and silo delivery systems.

How the company arrived at such a state of continued prosperity in an industry that has seen more than its share of takeovers, failures and tough business climates has everything to do with a sense of familial mission, the vision to diversify and the ability to weather the inevitable business downturns.

Cemstone supplies sand, gravel and other aggregate products while having a hand in almost everything connected with con-
crete and aggregates, ranging from concrete pumping and ready mix to insulating concrete forms, decorative concrete and proprietary high-performance mixes. Its network of contractor supply stores features more than 10,000 professional grade concrete and masonry items that are available online and through 16 locations in Minnesota, Wisconsin and Northern Iowa.

Cemstone is a nationally recognized leader in sustainable concrete technologies and recently hosted more than 1,500 contractors, builders, architects and other industry professionals for a series of seminars on construction materials and building techniques using the increasingly popular Leadership in Energy and Environmental Design (LEED) Green Building Rating System. The company and its LEED Certified professionals assist its customers in the construction of high performance green buildings.

The company also strongly believes in giving back to the communities in which it lives. Its people contribute their time, money and skills to community programs, including The American Cancer Society Hope Lodge, Habitat for Humanity, St. Olaf College, Northfield, MN, as well as many other local community organizations.

Hammon Becken started the business by manufacturing concrete blocks for residential construction. Becken later added sand and gravel production and got into the homebuilding industry himself along with other ventures. The second generation of Beckens arrived shortly afterward, in 1932, when Hammon’s son Thorwald joined the business, which continued to build homes in the summer and haul coal in the winter. Entry into the ready mixed concrete market occurred in the early 1940s when Cemstone worked on a naval depot project in Nebraska.

Another growth spurt occurred in 1957 when Cemstone entered the packaged concrete business. The new division, which operated out of the firm’s Lakeland, MN, facility, packaged sand, mortar and concrete mixes that were a forerunner of today’s Quikrete brand. Further expansion continued throughout the ’70s and ’80s with numerous other acquisitions and continues to grow throughout Minnesota and Iowa.

And with all the growth and technological advances across the years, Cemstone’s upper management remains Becken to its core. The current lineup lists Hammon T. Becken, chief executive officer, Thor Becken, president and Steve Becken, vice president of Cemstone Ready Mix, Inc. Tim Becken is the senior vice president of operations and Kyle Becken the area manager.

Each of the Beckens also remain committed to participating in NRMCA activities, whether it be chairing various committees, participating in seminars, attending the annual convention or sending numerous employees through the association’s numerous education and training offerings. Hammon (Tom), Thor and Tim have all participated on the NRMCA Board of Directors, and five of the Becken’s have been past presidents of the Aggregate Ready Mix Association (ARM) of Minnesota. Currently, Thor Becken is the president of ARM. The family’s commitment to continued improvement undoubtedly ensures that the steady stream of Beckens who enter corporate headquarters won’t stop anytime soon.

More information on Cemstone can be found at www.cemstone.com.
The American Association of State Highway and Transportation Officials’ (AASHTO) Subcommittee on Materials and ASTM International’s Committee C01 on Cement recently passed ballot proposals to harmonize three of five significant differences between the provisions of the standard specifications for Portland cement, AASHTO M 85 and ASTM C 150, published by these organizations. As a result, the 2007 editions of these standards will have consistent provisions for fineness, Type II C₃S requirements (including Type II heat of hydration–related criteria), and use of up to 5 percent limestone in Portland cement. It is anticipated that revised standards will be published by the end of July 2007.

Currently, five significant differences exist between the two specifications:
1. AASHTO M 85 has maximum fineness (Blaine and Wagner) limits for Type I, II, IV and V cements;
2. AASHTO M 85 has a maximum limit of 58 percent tricalcium silicate (C₃S) for Types II and IIA;
3. ASTM C 150 has a 1 percent processing additions limit;
4. ASTM C 150 provides for use of up to 5 percent limestone;
5. ASTM C 150 has removed the minimum 20 percent SiO₂ limit for Type II cement.

The 2007 editions of AASHTO M 85 and ASTM C 150 will have maximum average and single-sample Blaine fineness limits for Type II and Type IV cements of 420 m²/kg and 430 m²/kg, respectively. The two standards will not have a maximum tricalcium silicate (C₃S) limit for Type II cement, but will require Type II cement to meet the following heat index equation:

\[ C_3S + 4.75C_3A \leq 100 \]

For informational purposes, ASTM C 186 heat of hydration testing will be required at least every six months. Finally, both standards will have provisions for the use of up to 5 percent limestone in cement. Work continues to develop harmonization proposals to address differences in processing additions limits and Type II SiO₂ limits.

**Harmonization - Making a Difference by Making Portland Cement Standards Consistent**

These changes are the result of an ongoing, focused harmonization effort that was initiated in the summer of 2003. AASHTO M 85 and ASTM C 150 have existed as parallel standards for Portland cement since the 1940s. U.S. state departments of transportation reference either AASHTO M 85 or ASTM C 150 when specifying Portland cement for concrete construction. Currently, out of 51 state departments of transportation (including the District of Columbia), 31 reference AASHTO M 85, 16 reference ASTM C 150 and four reference both.

While the provisions of AASHTO M 85 and ASTM C 150 have generally been consistent, there have also been some substantive differences and, prior to this harmonization effort, the number of differences seemed to be increasing. However, there are important benefits to users and producers in having consistent requirements in the two specifications. Benefits to users and owners include having Portland cement standards that meet product application needs and not having to worry about whether an “ASTM cement” was used when an “AASHTO cement” should have been used. Thus, user specification and quality assurance would be simplified.

For the concrete producer, the need to maintain different silo and/or sourcing for state highway projects would be eliminated. Quality control for concrete would be simplified, resulting in a more consistent product. Working with a similar product for a given type designation would enable the producer to better predict the performance of the concrete and the compatibility with other ingredients. For the cement producer, harmonization would eliminate the need for special production runs and storage requirements. Improved consistency could be expected from simplified quality control. The net effect would be better quality concrete!

**Establishing a Process for Harmonization**

Recognizing the benefits of harmonization, AASHTO Subcommittee on Materials Technical Section 3a on Hydraulic Cement and Pozzolanic Materials (AASHTO SOM TS3a) and ASTM Committee C01 on Cement (ASTM C01) established a Joint AASHTO-ASTM Harmonization Task Group (JAAHTG) consisting of four members each (subsequently expanded to six members each) from AASHTO TS3a and ASTM C01. Since November 2003, the JAAHTG has met monthly or bimonthly either by conference phone, Web conference or in person to consider existing significant differences between AASHTO M 85 and ASTM C 150 and to develop recommendations for having equivalent requirements in these two standards.

From the onset, task group members recognized that harmonization would need to be a collaborative effort, requiring direct and open communication and mutual understanding and consideration of user and producer needs. Harmonization would likely result in changes to both ASTM C 150 and AASHTO M 85 as a result of this collaborative approach, and the effort would be a long-term activity since standards must constantly change to remain relevant to the demands of the marketplace.

As task group members focused on developing harmonization proposals that meet the collective needs of AASHTO members and ASTM user, general interest and producer members, they agreed that a cement standard specification should:

1. Ensure concrete performance (recognizing that cement is only part of the concrete performance equation);
2. Provide a means of determining compliance;
3. Provide a consistent material;
4. Use simple, reliable testing and sampling methods;
5. Provide flexibility for optimization of available natural resources and manufacturing technology, and accommodate various user requirements;
6. Ensure understandable communication between buyer and seller.

Discussion revealed differences in the relative value various task group members place on these standardization attributes and differences in opinions held about the contribution of specific standards provisions toward meeting these expectations, but there is consensus that each of these expectations
Developing Solutions to Resolve Differences

From this foundation, the group proceeded to examine current differences, consider the reasons for provisions and collaboratively identify harmonization solutions that work for everyone. In March 2004, task group members agreed to focus attention on developing proposals to harmonize the fineness and Type II C₃S provisions of the standards. Task group members proposed, discussed, balloted and reviewed several concepts for harmonizing these differences between the two standards. By the end of the June 2005 task group meeting, members agreed to forward a harmonization proposal to the appropriate ASTM and AASHTO committees. The harmonization proposal would require changes to both AASHTO M 85 and ASTM C 150 and result in consistent fineness and Type II C₃S requirements. During the remainder of 2005 and 2006, this proposal was submitted to the standards development processes of AASHTO and ASTM. Results of ballots from both organizations were considered by the joint task group and recommendations made to address negatives and comments. The original proposal was slightly modified during this process and, as of this spring, has passed the balloting requirements of both AASHTO and ASTM.

Toward the end of 2005, joint task group members agreed to consider the issue of the use of up to 5 percent limestone in Portland cement. The use of up to 5 percent limestone enables significant reduction in greenhouse gases emitted during the manufacture of Portland cement. Extensive data and experience indicate that, when optimized by the manufacturer, Portland cements containing up to 5 percent limestone provide comparable performance to cements without limestone. Therefore, in 2006 a harmonization proposal to have parallel provisions for the use of up to 5 percent limestone in AASHTO M 85 and ASTM C 150 was developed and submitted to both standards organizations. The proposal has passed ballot requirements of both organizations and will be incorporated in the 2007 editions of AASHTO M 85 and ASTM C 150.

Continuing AASHTO-ASTM Harmonization Activities

The work of the Joint AASHTO-ASTM Harmonization Task Group continues. In addition to addressing remaining differences of provisions for processing additions and Type II SiO₂ limits, the task group is considering several issues highlighted by ballot responses and task group discussion. These include: clarification of the term “sample” as used in the fineness provisions, development of separate designations for cements with moderate sulfate resistance and moderate heat of hydration, and evaluation of sulfate content provisions for Portland cement.

This list of new work items highlights the fact that Joint AASHTO-ASTM Harmonization Task Group accomplishments go beyond this successful development of recommendations for resolving specific differences in AASHTO M 85 and ASTM C 150. This group has elevated the level of communication among AASHTO and ASTM members, established a culture of
working together to develop provisions that meet collective needs and developed mechanisms for implementing improvements to cement standards. Therefore, it has established a new paradigm that promises to enable significant technical advances to both AASHTO M 85 and ASTM C 150, making these standards more effective and relevant to marketplace demands.

What Will Change in AASHTO M 85 and ASTM C 150 Portland Cement Standards?

(1) Harmonization of the **Type II C₃S requirement** will be achieved by including a mandatory provision in both ASTM C 150 and AASHTO M 85 that Type II cement meet the heat index equation:

\[ C_3S + 4.75C_3A \leq 100 \]

Changes to AASHTO M 85 Type II cement are the replacement of the existing mandatory 58 percent limit on C₃S and the optional requirements for the sum of C₃S + C₃A with a mandatory requirement to meet the heat index equation. Changes to ASTM C 150 Type II cement entail removal of the optional requirements for the sum of C₃S + C₃A, and addition of the requirement to meet the heat index equation.

There will be an additional requirement for ASTM C 186 informational testing for Type II cement for both AASHTO M 85 and ASTM C 150 at least once every six months.

(2) Harmonization of the **fineness requirements** will be achieved by requiring a maximum average Blaine fineness value of 420 m²/kg and a maximum individual value of 430 m²/kg for Type II and Type IV cements in both AASHTO M 85 and ASTM C 150. ASTM C 150 will change to include these maximum fineness criteria for Type II and Type IV cements. Changes to AASHTO M 85 entail removing the maximum fineness limits on Type I and Type V cement and increasing the fineness limits for Type II and Type IV cements from the existing maximum average value of 400 m²/kg and maximum individual value of 420 m²/kg. Both AASHTO M 85 and ASTM C 150 will exempt Type II cements from the maximum Blaine and Wagner fineness requirement, if the heat index equation yields a value of 90 or less.

(3) Harmonization for **limestone** will be achieved by permitting the use of up to 5 percent limestone in Portland cement and revising Section 5 (renamed Ingredients) in both standards. Changes to AASHTO M 85 are inclusion of provisions for use of up to 5 percent limestone, reorganizing and revising Section 5, and revision of the definition of Portland cement in Section 3. Changes to ASTM C 150 include reorganization and revision of Section 5 of ASTM C 150. Parallel revisions have also been made to the definition of Portland cement in the ASTM terminology standard, ASTM C 219. No changes will be made to the existing chemical or physical requirements of AASHTO M 85 or ASTM C 150.

For more information, contact Melander at 847-972-9054 or jmelander@cement.org.
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Pervious Concrete is Popular

Sustainable development is increasingly becoming the construction concept de rigueur as more and more companies are demanding that their new construction be “green” in nature. Wal-Mart is a prime example, as many of its planned stores are being designed as sustainable buildings. And as the demand for sustainable construction grows, so too does the demand for pervious concrete. In fact, pervious concrete is one of the most popular research subjects as organizations around the world seek to improve upon this application. The numerous environmental benefits provided by its use and the potential it offers in sustainable projects make it an extremely hot topic, especially for projects seeking certification in the United States Green Building Council’s Leadership in Energy and Environmental Design (LEED) program.

Conclusions from Recently-Released Pervious Studies

In March, the RMC Research & Education Foundation was proud to release two new pervious studies: Construction and Maintenance Assessment of Pervious Concrete Pavements, and Hydraulic Performance Assessment of Pervious Concrete Pavements for Stormwater Management Credit. These studies were researched and prepared by the Stormwater Management Academy at the University of Central Florida and were co-funded by the RMC Research & Education Foundation, the Florida Department of Transportation and Rinker Materials. The following are excerpts from the “Conclusions” sections of each of the two studies:

Construction and Maintenance Assessment of Pervious Concrete Pavements

Overview: Pervious concrete pavement was investigated in both field and laboratory environments to study infiltration rates of pervious concrete after years in service and to determine the effectiveness of various pervious concrete maintenance methods, including pressure washing and vacuum sweeping. In addition, construction specifications for use in the placement of pervious concrete were developed. A literature search was conducted and data collected from the field and laboratory explorations.

By investigating existing pervious concrete pavement systems in Florida, Georgia and South Carolina and reviewing previous construction specifications, more detailed construction methodologies were developed for specific soil characteristics. With more accurate definition of the parent soils, the need for a reservoir layer can be evaluated and potentially eliminated, thus reducing unnecessary soil excavation. Once accepted standards for the design cross-section have been determined, credit can then be given for storage volume within the voids in Portland cement pervious concrete and the coarse aggregate base. This research is intended to contribute to the goal of using pervious concrete for stormwater management. The results were presented to allow the reader to use the conclusions and in anticipation that the reader will want to expand on this research.

Field Investigation Conclusions: The pervious concrete field sites investigated in this study ranged in service life from six to 20 years and exhibited regionally similar structural integrity, infiltration rates, pavement cross-sections and depth. The soils varied from sandy to clay. It was concluded from the results of the field investigation that typically the pervious concrete exhibited minor structural distress at all locations investigated. The average infiltration rates of the properly installed pervious concrete were estimated from field and laboratory data. Typically, for the field sites investigated in the Central Florida area, the concrete infiltration rates were...
the limiting infiltration value because of the sandy soils. However, at the sites located in Tallahassee, Fla., Georgia and South Carolina, the infiltration rates of the soils were the limiting infiltration values. Outside of Florida, the typical pavement cross-section included a gravel reservoir to allow for a larger recharge volume for these less-permeable soils.

In addition to the data collected from this study, a single-ring infiltrometer was also developed for use in studying the infiltration rates of the pervious concrete and subsoil system. It was determined during the course of this research that the single-ring infiltrometer was an effective tool in determining the infiltration rates of in-situ pervious concrete installations. However, it was limited to only those pavement systems with no gravel reservoir and is also a destructive method of testing pervious pavement installations. It is therefore recommended that the single-ring infiltrometer used in the field evaluations only be used to measure an existing pervious concrete system rather than as a tool for infiltration evaluation of newly installed pervious concrete.

At all locations investigated in this study, little to no maintenance was performed during the service life of the pervious pavement. There was no recorded use of vacuum or pressure sweeping. This allowed for the opportunity to investigate the loss of infiltration capability of the pervious pavement over time without maintenance. However, it should be noted that the degree of clogging of the pervious concrete is highly dependent on the location, traffic loading and quality of construction, making any comparison of the sites contingent upon local conditions.

Maintenance Investigation Conclusions: Two clogging-rehabilitation techniques have been investigated in this study – pressure washing and vacuum sweeping. Pressure washing dislodges clogging particles, washing a portion offsite while forcing the remaining portion down through the pavement surface. This method of pavement maintenance is historically very effective; however, care should be taken not to use too much pressure, as this can cause damage to the pervious concrete surface. It is recommended to test the pressure of a pressure washer on a small portion of pervious concrete surface before use to ensure it can safely be used on the concrete. Vacuum sweeping removes clogging particles by mechanically dislodging particles with a sweeper and extracting them from the pavement voids. In addition, a combination of these two methods is also a typical method of rehabilitating clogged pervious concrete surfaces.

In most cases it was found that the three methods of maintenance investigated in this study typically caused a 200 percent or greater increase in infiltration rates over the original infiltration rates of the pervious concrete cores. Based on these results, it is concluded that pressure washing and vacuum sweeping typically resulted in an equivalent increase in infiltration rates, and the use of both methods of maintenance resulted in the greatest increase in infiltration rates. It is therefore recommended that as a general rule of thumb one or both of these rejuvenation techniques should be performed when the system infiltration rates are below acceptable infiltration rates as measured by an infiltrometer testing the pervious concrete and the soil beneath it as a system. A rate of 1.5 inches per hour was recommended by Wanielista (2007).

Construction Specification Conclusions: This study recommended specifications for the installation of pervious concrete pavement in regional conditions typical to Florida, Georgia and South Carolina based on current construction practices and updated as a result of this research. These specifications include details on contractor qualifications, materials and mix design, construction, post-construction and maintenance procedures. The specifications were presented in Chapter 5.

To accurately test the in-situ infiltration capability of pervious concrete installations at any time without the use of current destructive testing techniques, a permanent embedded infiltrometer is recommended to be installed at critical locations in the pervious concrete. It is recommended that at least one embedded infiltrometer installation be installed at each site with a minimum of two per acre of pervious concrete installed. The circular concrete sections can be used to accurately test the infiltration rates of the pervious concrete system with the use of a standard Double-Ring Infiltrometer following the ASTM D3385 standard, provided the rings are embedded into the parent materials. The embedded infiltrometer should be used to annually test the system infiltration capability, and if the infiltration capacity is not acceptable, the pervious concrete should be rejuvenated.

Hydraulic Performance Assessment of Pervious Concrete Pavements for Stormwater Management Credit

Data collected and presented over the course of this study provided evidence that pervious concrete retains an infiltrative capacity, provided proper installation, even after years of use. No maintenance was performed at any of the sites. Sites 1, 2, 3 and 5, the four located in Central Florida, had an average of 12.8 years of operation and produced cores with infiltration rates ranging from 1.4 – 627 inches per hour. Excluding the infiltration rate of 627 inches per hour, the average infiltration rate for those sites was 9.87 inches per hour, and the median value was 5.2 inches per hour. Considering all of the cores, the laboratory infiltration rates ranged from zero to 627 inches per hour. It is important to note that the two cores that produced infiltration rates of zero did so as a result of poor installation or a mix that actually clogged pores at the surface.

Excluding the three values greater than 100 and those that were zero, the average infiltration rate for the cores is 8.1 inches per hour, and the median value is 4.4 inches per hour. These rates indicate that properly installed pervious concrete can continue to infiltrate even without routine maintenance. For new construction, the infiltration rates of the pervious concrete exceeded that of the parent earth sub-soils, as found at the Stormwater Lab. Thus, at first, the limitation to infiltration rate and storage of rain was the sub-soils. After years of operation, however, the system limiting infiltration rate was the pervious concrete in most cases.

Recommendation #1: The single-ring infiltrometer for existing site testing was used. The test was applied for pervious concrete infiltration estimates, while opening of the sub-soil for infiltration estimates and facilitating the extraction of 30 pervious concrete cores. Infiltration data collected in the field were not highly correlated with
laboratory data produced as evidenced in Table 2. The differences in the infiltration measures could have been caused by leakage in the field seal around the embedded ring or a number of other conditions when samples are extracted from the field site to a laboratory setting. Additionally, the field test of existing concrete is labor-intensive and destructive, as it requires drilling cores through the pervious concrete in the system being tested. Another limitation of this testing method is that it only functions well when the pervious concrete system is constructed on a sandy soil. The single-ring infiltrometer could not be embedded in the gravel reservoirs on Sites 6–8. Also, testing at Site 4 was difficult due to the proximity of the clay layer to the bottom of the concrete in some places.

Nevertheless, the concept of testing the pervious concrete and the soil as one system proved valuable and led to the recommendation that a single-ring infiltrometer should be placed in the pervious concrete and about eight inches into the sub-soil during the construction phase and used for testing infiltration rates in the future. Embedding the infiltrometer and filling it with concrete will prevent side wall effects that may cause leakage if the ring were embedded after construction.

*Recommendation #2:* Mass balance modeling shows that the pervious concrete section of this research can significantly reduce yearly runoff volume based on an average year of precipitation data. A performance of nearly 100 percent retention can be expected with concrete infiltration rates as little as 3.5 inches per hour with sandy conditions found at test sites. *Based on the modeling parameters of a level surface, curbing and the mix of pervious concrete,* it is recommended that the pervious concrete section include a sandy sub-base material with at least a two-foot depth to the seasonal high water table. When the system infiltration rate is measured by the embedded infiltrometer and the rate is below 1.5 inches per hour, it is recommended that the pervious concrete be cleaned.

*Recommendation #3:* Based on the modeling using the data collected, it is recommended that credit for infiltration of rainwater on pervious concrete systems be given for stormwater treatment.

**Pervious Projects Currently Under Way**

Some research studies require years of data collection and testing before any study results may be finalized. This is true of the Long-Term Field Performance Study of Pervious Concrete Pavements project taking place at Cleveland State University (CSU). One area of particular concern surrounding pervious concrete pavements is that of the impact that freeze-thaw may have on pervious. The study taking place at CSU will provide an evaluation of the pavement’s long-term field performance.

The Foundation’s popular Ready Mixed Concrete Industry LEED Reference Guide includes a section on the use of pervious pavement and how its use may help the project to qualify for additional LEED points. This publication has been a tremendous resource in educating architects, builders, designers and others of the many green attributes that concrete, including pervious concrete, may bring to a project.
An exciting project approved in late 2006 is of a **Side-by-Side Comparison of Pervious Concrete and Porous Asphalt**. Villanova University is undertaking this two-year study that includes funding from Villanova University, the RMC Research & Education Foundation and the U.S. Environmental Protection Agency. The asphalt pavement industry has also been asked to help fund the project. The EPA was particularly interested in this research and its examination of pollutants that are deposited into the soil from water traveling through both types of pavements. The concrete industry is working closely with Villanova University and has established an advisory panel for the project to ensure the correct specification and placement of the pervious concrete.

Although the Europeans had mixed results with a similar study to develop an appropriate **Pervious Concrete Mix Design for Wearing Course Applications**, the RMC Research & Education Foundation Board of Trustees believe the area merits additional study and have therefore approved funding for a project taking place at the CP Tech Center at Iowa State University. This study will examine the development of pervious mix designs that would have adequate strength and durability for wearing course applications. It is believed that if pervious pavements are adapted for road use, the environmental and safety benefits would be tremendous. Such benefits include increased water removal from pavement surfaces, reduced noise, increased skid resistance and reduced road spray. The intense interest in this study is evidenced by the wide breadth of funding support, including the RMC Research & Education Foundation, the Federal Highway Administration, the Pooled Resource Fund from several State Departments of Transportation and the American Concrete Pavement Association.

Without proper placement and finishing of pervious concrete, the benefits the pavement offers may not be realized. That is why the RMC Research & Education Foundation funded the development of the **Pervious Concrete Contractor Certification Craftsman Text**. The certification, administered through the National Ready Mixed Concrete Association (NRMCA) and offered through certified Local Sponsoring Groups, helps to ensure the proper placement and finishing of pervious concrete. The unique attributes of pervious pavement require specialized placement, which warrants specialized training.

It is of the utmost importance to the RMC Research & Education Foundation’s Board of Trustees that the Foundation not engage in duplicative research. It is for this reason that the Trustees funded the **Pervious Concrete Research Compilation**, assembled by Dr. Heather Brown of Middle Tennessee State University’s Concrete Industry Management Program. This “living” document will be updated periodically and includes information on existing pervious concrete research as well as those studies currently under way, and identifies possible areas for future pervious concrete research.

The potential that pervious concrete brings to the construction industry’s intense “green” movement ensures that it will remain a popular research subject for some time as the industry looks to improve its performance and expand its applications. The RMC Research & Education Foundation looks forward to releasing project updates and final reports on its pervious research studies as new information becomes available. For more information on these and other projects funded by the RMC Research & Education Foundation or to submit a proposal for consideration, please visit www.rmc-foundation.org.
Imagine a world without the Pantheon, the Autobahn or the Hoover Dam. Each of these examples shares one common building material: concrete. Concrete’s significance to society can be seen in its use through history, current applications and possibilities for the future.

While concrete may be believed to be a recently developed material, it has actually been in use for thousands of years. In 300 B.C. through 476 A.D., the Romans made a concrete composed of Pozzolan cement – a powdered mixture from volcanic rock. This was used to build structures such as the Pantheon and Coliseum in Rome and the Pont du Gard aqueduct in Southern France. The fact that these previously mentioned edifices still stand today shows the enduring importance of concrete during these time periods. This material was capable of lasting hundreds of years and thus preserved an important aspect of these ancient cultures.

Declaring that concrete has had a major impact on society is not an understatement. Not a day goes by in which concrete doesn’t touch people’s lives. Homes are built on concrete foundations, airplanes land on concrete runways and waste water flows through concrete sanitary sewers.

Along with being important to daily activities, concrete is environmentally friendly. First, concrete is an excellent choice over asphalt. It keeps urban areas cooler, unlike asphalt which heats urban areas due to its dark color. Another advantage of concrete over asphalt is that concrete doesn’t contain oil. The more concrete used instead of asphalt, the more oil there is to drive trucks to transport goods across America, which in turn drives the economy. Secondly, concrete helps to produce “green” energy when used in dams that create hydroelectric power. Third, concrete can be made using materials that may have otherwise been dumped into landfills. Structural engineer at Columbia University Christian Meyer researched and produced a glass based concrete that used crushed recycled glass. His product has been licensed by Wausau Tile of Wausau, Wisconsin and is currently being used to make floor tiles out of recycled glass.

Concrete’s possibilities for the future seem endless. For example, scientists at LiTraCon, based in Aachen, Germany, developed a concrete that includes layers of glass optical fibers. These fibers run across the concrete and transmit light from one side to the other. This can be used in buildings as floor and wall materials to let in sunshine yet act as an insulating material. There are also possibilities for types of concrete that would help the environment. At the Italcementi Group in Bergamo, Italy, scientists have been researching a self-cleaning concrete. By adding particles of the white pigment titanium dioxide to the cement used in concrete, the resulting concrete reacts and breaks down pollutants that would normally darken the material. Dives in Misericordia, a modern church in Rome, is one of several buildings built from this material. Scientists believe that this building should last more than 1,000 years and remain its original color. Luigi Cassar and his research team at Italcementi found that this concrete could even help to clean the air. They calculated that if 10 to 15 percent of the roads and building surfaces in Milan, Italy (or a similar city) were covered with this concrete, air pollution could be reduced by 40 to 50 percent.

Concrete has been used in our society since time immemorial. From the Roman Coliseum to the current road construction in my hometown of Wausau, Wisconsin, concrete has penetrated numerous aspects of daily life. It is the “duct tape” of the building industry – it binds the world together.

By Samantha Dale Strasser
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By the time this story is printed, the final rule to require the use of electronic on-board recording devices (EOBRs) among certain motor carriers may be final. If the final rule has not been published, then it will be very near.

Over the last several years, the Federal Motor Carrier Safety Administration, or the FMCSA, has issued a variety of rules to address fatigued drivers who operate commercial motor vehicles on public roadways. In fact, on January 18, 2007, the agency proposed that EOBRs should be installed among certain types of carriers so that the FMCSA’s standards for hours of service compliance are followed — to the letter!

The NRMCA first commented on EOBRs back in November 2004, when the agency issued its advanced notice of proposed rulemaking. The association made several important key points that provided the framework for our industry (as well as all short-haul operations) to be excluded in the agency’s January 18 proposal. Central among the items was the fact that the vast majority of drivers in the industry are not required to file a record of duty status, or a ROD, more commonly referred to as the driver’s daily log. The ROD is not mandatory when drivers operate within 100 air-miles of their work reporting locations. Under this RODs exemption, drivers also must meet specific criteria such as not being on duty more than 12 hours, and not driving more than 11 hours during the 12-hour period.

The FMCSA proposed to accomplish distinct objectives on January 18. First, the agency incorporated new performance standards for EOBRs installed on commercial motor vehicles (CMVs) that are manufactured two years after the effective date of the final rule. Additionally, the agency proposed that motor carriers that demonstrate a serious history of noncompliance with hours of service rules must install EOBRs on their entire fleet unless the carrier already has equipped its vehicles with automatic on-board recording devices meeting the agency’s requirements. Finally, the FMCSA proposed to provide incentives for the industry to adopt widespread use of EOBRs.

What Does All This Mean for Ready Mixed Concrete Companies?

To begin, ready mixed concrete companies will not be required to install EOBRs in mixer vehicles for the time being, that is if the proposal is adopted as written. However, the NRMCA anticipates that there will be a broader mandate from FMCSA in the future to expand the scope of carriers who must install EOBRs.

What is the NRMCA Doing to Avoid a Regulation that Doesn’t Add Any Safety Benefit or Value to Our Industry?

The NRMCA is considering a survey to study the use of EOBRs in the ready mixed concrete industry. The purpose of the study is to detail precisely with quantitative data how much time RMC drivers spend “driving,” how much time they are “not driving,” and how much time they are “off duty.” Then the association can provide concrete data to the FMCSA about why we do not need EOBRs in the RMC industry.

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1 A serious history of noncompliance means that the motor carrier has been cited for having more than 10 percent HOS violations in two separate compliance reviews in two years.
Much has been said about added value concrete since RMC 2000 brought the topic to the forefront a number of years ago. Today there are so many choices on the menu that ready-mixed concrete producers need to develop and execute a strategy to focus and excel at a handful while offering any and all when it is profitable and meets the producers’ overall strategic goals. This article, the first in a series, will discuss some of the many options available today in value-added concrete. Future articles will focus on specific types, strategies and tactics that can enhance a ready mixed concrete producer’s offering and value proposition.

Where do we start to discuss these specialty concretes that add value to owners, specifiers and contractors? Let’s start by looking at a representative listing of a few of the options:

- Concrete with fibers
- Quick-setting mixes
- Decorative concrete

- Waterproof concrete
- Flowable fill
- Self-Consolidating Concrete (SCC)
- Easy-finishing mixes
- “Green” concrete
- Pervious concrete
- High-strength concrete
- Corrosion-resistant concrete

All of these types of concrete are applicable to various markets and market segments served by the ready mixed concrete industry. Based on your firm’s focus, there should be a handful that work best in your market, geography, climate and competitive situation.

Fibers are arguably the most penetrated added-value concrete being sold today. Having said that, the economic case for all types of fibers would be that they have barely scratched the surface relative to their overall market potential. Synthetic fibers for plastic shrinkage crack prevention are widely used in the United States at varying penetration rates based on geography. Steel fibers have proven economically viable at much greater acceptance rates in Europe than in the United States. Synthetic macro fibers have exploded on the scene in recent years, as have steel and synthetic-blended products. Newer market entrants like alkali-resistant glass or wood-based fiber products have also made great strides recently. The point is there is a lot of room to grow in this already developed added-value market.

Quick-setting mixes in the not-so-distant past were all about dealing with set time and cold weather concerns. While they still add value in that application, they can be used in another way. Today’s ready mixed concrete salesman should know how to sell the economics of pulling forms quickly and saving contractors money by speeding up the project. A number of portions of the United States are already doing this, but sadly it is a practice which does not have traction in a number of markets or companies. This should be one of the things a producer discusses with a contrac-
tor after he has won a project to establish value for both the contractor and himself.

Decorative concrete is one of the fastest-growing value-added concrete types today, both in sheer cubic yards of growth and in year-over-year percent growth. That is not a small statement to make. With retailers like Wal-Mart, Kroger, Chili’s and the like using integral colored concrete, along with textures, stains, grinding and stamps available today to replicate almost any other finish, the market for color in concrete will continue to grow. The key for us to remember as an industry is that we are replacing other materials and that what we are replacing determines the value.

Waterproof concrete is nothing new. Floating bridges were built in the 1980s in Seattle and are performing well today despite their existence being invisible to many people throughout the United States. Like giant concrete barges, they were built in dry-docks like ships, floated into position and cabled to the ocean floor. While the bridge space has recognized this capability, it is only recently that green roofs, zoos and other more fragmented market segments have started to recognize the value of waterproof concrete. While this may remain a niche market, there are a number of areas where growth will occur.

Flowable fill has been around a long time. It is a great product for ready-mixed concrete producers since it can allow use of out-of-spec aggregate and generally has a rapid unload time at the site. The admixtures that produce high air contents provide a large number of values, not the least of which being the ability to carry large loads to the site without “sloshing” out of the back of the truck. Despite its long list of advantages, flowable fill has only captured a small percentage of the compacted soil marketplace. Just the use of flowable fill when it has rained and an excavation cannot be compacted conventionally provides some significant opportunities for our industry. This is a market which should continue to grow.

Self-consolidating concrete is a frequent topic of discussion inside the concrete industry today. It offers the potential to revolutionize the labor-cost structure of concrete placement. Despite that, it does not have anything close to the level of traction evidenced by its use in Scandinavia or Japan. America continues to be a slow adopter of new technologies in the construction industry. Hopefully, we will learn that these other countries don’t use these technologies haphazardly. They obviously make a profit from them or they would not continue to grow. SCC has great potential, which is only limited by our ability to drive change in the marketplace.

Easy-finishing mixes have been around a while but still have room to grow. “Slicker,” more “buttery” mixes using mid-range water reducers have shown to finish faster and be perceived by finishers in testing. Market acceptance should continue in this space, albeit at slower-than-desired rates. This is a great opportunity for ready mixed producers who have not already “branded” a mix to create their own branded mix in local or larger markets. Branding as a practice in our industry has strong potential but has yet to stick in a large number of markets. Creating a brand takes time. The sooner we start, the sooner it will happen.
Sustainable construction, or green building, is not a trend or a fad – it is here to stay. Embrace it. Capitalize on it. Lead! (or was that LEED). The number of projects utilizing LEED building standards is growing EXPONENTIALLY! Either we as an industry will demonstrate how we have the greenest building material in the world or we will be displaced in the future. I truly believe we are the greenest building material, but what I believe doesn’t matter. It is the perception of owners, specifiers, contractors, the USGBC and others that will determine the future. As a side note, a lot of people in our industry call it “LEEDS” instead of the correct term, “LEED.” Drop the “S” and improve our industry’s credibility. Consider attending a USGBC meeting in your area. You might be surprised at the people you see there. A change this significant in our industry may not occur again in my lifetime or yours. Capitalize on it!

Pervious concrete is one of the most requested topics of the National Account Team at NRMCA. Stormwater is a big green issue today. Pervious concrete provides one solution to the problem. It will continue to grow.

High-strength concrete has been used in columns in high-rise construction as well as in FHWA experimental bridge beams for some time now. It has a number of other niche markets where it can add value. But like the other technologies noted here, it does not sell itself. The value has to be communicated to the owner, specifier or contractor.

Corrosion-resistant concrete has a fairly mature market in parking decks in cold-weather climates as well as bridges in salt-water environments. Corrosion inhibitors, silica fume, fly ash, slag, concrete cover, low water to cementitious materials and superplasticizers all can play a role in this type of concrete. Numerous other warm-weather climate airborne salt areas are still being built with normal concrete. There is room to grow this type of concrete.

There are a number of other types of value-added concrete out there. This is by no means a comprehensive list. White concrete, smog-absorbing concrete and others could be added to the list. The decision as to what a ready-mixed producer should focus on is based on the availability of local materials to make the mixes and, more importantly, the markets in which they operate. If cheap soil is abundant and compaction costs are low in a market, flowable fill might not be an area you want to focus on. Conversely, if you are in a warm-weather coastal market and people keep repairing corrosion on the balconies of the condos and apartments after just a few years from construction, there might be an economic case for high-quality, corrosion-resistant concrete mixes. The point is that every producer should regularly evaluate his market, his added-value product offering and his sales team’s ability to effectively deliver the message associated with an added-value offering. Doing so successfully adds value to the bottom line of both your customer and your own business. Isn’t that what we are here to do?
“In the beginning God created concrete… and it was good. Then he tried to find out where his trucks were… that’s when all hell was created!”

We have come a long way in a very short time in ready mixed concrete industry. We have been traveling at light speed for the last 10 years when it comes to truck tracking. The Command Alkons, the Systechs, the GivenHanscos, the Parady mes and others have melded the emerging technologies of computers and wireless communications and brought them to the ready mixed concrete industry.

No longer does a dispatcher have to sit up in a lonely batch room looking out the window and wondering when truck # 44 will return… or if it will return. No longer does the dispatcher have to be virtually in the dark when he tries to make crucial decisions on fleet utilization or even how the day is going and how the fleet is performing.

The new equipment designed for the ready mixed concrete industry uses real time truck tracking software and hardware that virtually ends the need for mixer drivers to push status buttons. Real time communications is one of the real advances for the ready mixed concrete industry. Some of the new equipment have sensors that are fixed to vehicles that automatically communicate delivery status to those who need to make minute-by-minute decisions… from the time the first truck is started in the morning to the last guy to wash out… all over wireless communication networks that rely on computer technology rather than driver input. Using the newest in GPS software, a user can know where every mixer in his fleet is located with information updated at user-defined intervals. The newest technology uses mapping software with fly-over capabilities and can give turn-by-turn directions for the mixer driver. The newest technology offers reporting systems with documentation that can be emailed and received over handheld devices. And the future is now for vehicle tracking that offers extras like speed and direction, unlock and lock door and even kill ignition.

Display screens are getting better day by day. Handwritten charts have given way to mechanical graphs, which in turn have given way to computer screens, which have now gone by the wayside. The new multi-screen plasma and LED displays have brought the dispatch office to the cutting edge of today’s technology.

All this technology is designed with one thing in mind: to raise the bar for the ready mixed concrete industry in ways that will be beneficial, cost effective, improve customer service and fleet utilization, and, most importantly, provide additional profits to your company. And where does one have to look to find out more about the latest in truck tracking? Technology to the rescue again. Simply go to www.nrmca.org then link to the online Buyers’ Guide, where you will find members of NRMCA’s Manufacturers Division who are the preferred providers for equipment for the ready mixed concrete industry.
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The cream of the crop, the best of the best, the professional’s professional – this is the common description of those who were nominated and competed for the National Ready Mixed Concrete Association’s inaugural National Mixer Driver Championships at the Fall Conference in Orlando last October. More than 30 drivers representing state association rodeo winners and company-sponsored driver competitions were among those who participated in the three-day event.

After all the scores were tabulated from the driver challenge course, the pre-trip inspection and the two written exams, Michael Hennekam of Rinker Materials, driving out of Cocoa, FL, was crowned the champion mixer driver.

The second annual National Mixer Driver Championships will be held again in conjunction with the NRMCA Fall Conference. This year’s event will be sponsored by the Truck Mixer Manufacturers Bureau. Manufacturers of the best mixers in nation met earlier this year and offered a large donation to ensure that this year the event is even bigger and better.

Defending champion Hennekam will be invited back to compete against this year’s best. Up to 50 driver applications will be accepted and offered official invitations to the championship. All winners of state affiliate associations’ driver rodeos will receive an automatic invitation to the 2007 National Driver Championships. Joining the state winners will be a limited number of “at-large” entrants. At-large drivers include any NRMCA member companies that would like to send their company’s best driver. All drivers must be employees of a member of the National Ready Mixed Concrete Association.

The 2007 event will be completely revised with a new challenge course, a new written exam and a spruced-up truck inspection area. Participants will drive generic trucks provided by members of the Truck Mixers Manufacturers Bureau. More prize money, bigger signs and more fun and games promise to make the 2007 National Mixer Driver Championships a great success.

As exciting as this year’s event promises to be, the Operations, Environmental & Safety Committee of NRMCA met earlier this year and agreed to start work on plans to hold an “International Mixer Driver Competition.” If all goes well, the plan is to hold the first “best mixer driver in the world” event during the next CONEXPO-CON/AGG show in March 2008 in Las Vegas. Tom Pittman, vice president of Aggregate Industries Mid Atlantic region, might have said it best: “Mixer Driver of the World – how cool a title is that?”

For more information and news on the driver competitions, visit the National Ready Mixed Concrete Association online at www.nrmca.org.
Precision Air Entrainment for High-Performance Concrete

By Charles H. Welker, President, Miracon Technologies and Douglas Watson, President of CMT Engineering Laboratories

Abstract

Polymer air entrainers promise to reduce the variability in the properties of high-performance concrete, and especially the compressive strength. Conventional surfactant-based air entrainers produce entrained air that can cause significant reductions in compressive strength and can fluctuate widely in air volume. In tests, a polymer-based air entrainer reduced compressive strength significantly less. The volume of the air achieved with the polymer-based entrainer also varied little in extended mixing time as well as when the carbon content of the mix (from fly ash) was increased to high levels.

Background

High-performance concrete is so named because of its precise and sometimes extreme properties. Of these, predictable, repeatable, high compressive strength is typically the most important.

A vexing source of variability in concrete’s properties in general, and strength in particular, is the air entrainment. Properly entrained air improves the freeze-thaw durability of concrete and is therefore required in most concrete that will be exposed to the elements. One can view entraining air as a fundamental method of ensuring long-term performance of the material. However, the volume of air entrained in concrete has a direct, inverse impact on strength.

Air volume, which consists of air bubbles, is commonly measured as the percentage of the total concrete mix material volume. Researchers estimate that each percentage point of entrained air reduces concrete strength by 2 percent to 6 percent (Kozikowski et. al. 2005). Since the volume of air specified for durability purposes is commonly around 6 percent, the total strength reduction is clearly significant.

Inadvertent deviations from specified air volume can be critical (Hulshizer 1997).

Unfortunately, concrete producers have explained that their control over the amount of entrained air is limited (VanderWerf and Kokonowski 2006). Suppliers of the air-entainment products themselves identify approximately 30 common factors that affect the volume of the air entrained to varying and sometimes unpredictable degrees (W.R. Grace 2006). These can lead to air volume that is either higher or lower than the design volume. When air volume exceeds design, concrete strength is reduced and may not meet minimum specifications. This in turn necessitates expensive replacement of the failed concrete. The consequence of too little air is concrete that deteriorates earlier than planned.

New, polymer-based air entrainment technology promises to offer properties useful for maintaining concrete strength and reducing the variance of air volume and strength. To date, however, a set of controlled tests of the properties of polymer air entrainment have not been available.

Figure 1 depicts the major categories of air-entraining admixtures, also called “AEAs” (Whiting and Nagi 1998).
Air entrainer properties

Figure 1 depicts the major categories of air-entraining admixtures, also called “AEAs” (Whiting and Nagi 1998).

AEAs fall broadly into a few categories. Surfactants are the more traditional products. Most of them technically qualify as a type of soap or detergent, and they form bubbles in the same manner as the common household versions of these substances. When mixed with water and agitated in the presence of air, they froth up into many tiny air bubbles. Polymer air entrainers share some of the behavioral properties of surfactants, but chemically they are not surfactants at all.

Traditional surfactant AEAs consist of long molecules that are charged (“ionic”) at one end and uncharged (“nonionic”) at the other. The nonionic ends of the molecules mingle with the entrapped air in the concrete, forming discrete “bubbles” of air that are protected by a ring of the AEA. The ionic ends of the molecules protrude from the bubble and are attracted to the surrounding water and cement particles, which also are ionic. The attraction to water and cement helps disperse the bubbles.

Many factors can increase or decrease the amount of air entrained with surfactants between the time the AEA is added and the time the concrete is placed. Perhaps the two considered the most universally problematic are:

- Carbon in the mix (usually from fly ash); and
- Agitation (mixing in the truck, internal vibration)

These factors can vary significantly from day to day, from batch to batch, and even from minute to minute within a batch.

Entrained air’s impact on concrete strength is believed to be a simple result of the reduction in total material when air bubbles replace concrete. The more air, the less concrete, and therefore the less resistance to compression. The strength reduction is magnified when the air bubbles are unevenly distributed, leading to “clusters” of air that act as areas of weakness (Kozikowski et al. 2005).

Carbon in the mix reduces the amount of entrained air because carbon consists of largely nonionic (uncharged) particles. Surfactant air entrainers consist of molecules that surround and “protect” nonionic air bubbles. When carbon is present, some of the surfactant gravitates to the carbon. This surfactant is therefore not available for entraining air, and the unprotected air bubbles gradually leave the mix (Gebler and Klieger 1983). The exact amount of air loss is difficult to predict, however, because it depends on many properties of the carbon beyond the amount.

Agitation is believed to reduce air volume by mechanically breaking up the protection provided to the bubbles by the AEA (Yingling et al. 1992). Tests of this effect have used prolonged time in a concrete mixer as the agitation. The rate at which entrained air declines can vary widely. However, it is common for the air volume of a mix to fall somewhere between 10 and 50 percent after 90 minutes of mixing (Plante et al. 1989).

The mechanics of polymer AEAs are sharply different from those of traditional surfactants. The polymer AEA is converted to bubbles in dedicated aeration equipment. The resulting air bubbles go into the concrete mixer. By chemical design, the AEA is highly inert, so that the bubbles are not particularly attracted to carbon or most other substances. Instead, they disperse because of a natural repulsion of the polymer to itself. The material is also designed to be relatively unaffected by mechanical action.

Test Procedure

The researchers prepared 15 mixes. All were of the same cementitious materials content except for the carbon contents of some of the fly ashes used. All were, by design, intended to be 4000 psi (281 kg/sq.m.) class compressive strength at 28 days. Five included air entrained with a “natural” vinsol resin-based surfactant AEA. Five more used a “synthetic detergent” AEA, and the last five used a polymer AEA. The vinsol resin and detergent are among the most popular AEAs in current use in the United States, are sold by major admixture companies and are generally considered to be good products.

For each AEA, one mix (the “baseline” mix) included a low-carbon fly ash and a dosage of the AEA projected to produce 6 percent entrained air. Other than the AEA, all ingredients in the baseline mixes were identical. Table 1 includes the quantities of the components.

Table 1. Components of Baseline Mixes

<table>
<thead>
<tr>
<th>Component</th>
<th>Quantity/cu.yd.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coarse aggregate</td>
<td>1705 lbs.</td>
</tr>
<tr>
<td>Fine aggregate</td>
<td>1208 lbs.</td>
</tr>
<tr>
<td>Cement</td>
<td>423 lbs.</td>
</tr>
<tr>
<td>Fly ash</td>
<td>141 lbs.</td>
</tr>
<tr>
<td>AEA</td>
<td></td>
</tr>
<tr>
<td>Neutralized vinsol resin (NVR)</td>
<td>1.70 oz.</td>
</tr>
<tr>
<td>Synthetic detergent</td>
<td>1.70 oz.</td>
</tr>
<tr>
<td>Polymer</td>
<td>3.65 oz.</td>
</tr>
<tr>
<td>Low-range water reducer</td>
<td>33.8 oz.</td>
</tr>
<tr>
<td>Water</td>
<td>255 lbs.</td>
</tr>
</tbody>
</table>

For each baseline mix, two additional mixes were produced with higher dosages of AEA that targeted production of 9 percent and 12 percent entrained air. These we refer to as “medium-air” and “high-air” mixes, respectively. The water reducer dosage in the medium- and high-air mixes was lower than in the baseline mixes to maintain slump but was the same for all AEAs. The dosages of the AEAs are in Table 2. The dosages of the water reducer are in Table 3. All other ingredients were in the same proportions as in the baseline mix.

Two further mixes were produced for each baseline mix that used fly ashes with

Table 2. Air Entrainier Dosages (oz./cy)

<table>
<thead>
<tr>
<th>Mixes</th>
<th>Synthetic</th>
<th>NVR</th>
<th>Detergent</th>
<th>Polymer</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline, med-carbon, and high-carbon</td>
<td>1.70</td>
<td>1.70</td>
<td>3.65</td>
<td></td>
</tr>
<tr>
<td>Med-air</td>
<td>4.51</td>
<td>4.79</td>
<td>5.48</td>
<td></td>
</tr>
<tr>
<td>High-air</td>
<td>6.06</td>
<td>5.64</td>
<td>7.30</td>
<td></td>
</tr>
</tbody>
</table>

Table 3. Dosages of Water Reducers Used

<table>
<thead>
<tr>
<th>Mixes</th>
<th>Type</th>
<th>Dosage (oz./cy)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline (Low-carbon, low-air)</td>
<td>Low-range</td>
<td>33.8</td>
</tr>
<tr>
<td>Medium-air</td>
<td>Low-range</td>
<td>25.4</td>
</tr>
<tr>
<td>High-air</td>
<td>Low-range</td>
<td>25.4</td>
</tr>
<tr>
<td>Medium-carbon</td>
<td>Mid-range</td>
<td>25.7</td>
</tr>
<tr>
<td>High-carbon</td>
<td>Mid-range</td>
<td>27.6</td>
</tr>
</tbody>
</table>
higher concentrations of carbon. These we refer to as “medium-carbon” and “high-carbon” mixes, depending on the LOI of the fly ash used. The air entrainer dosages were kept the same as in the respective baseline mixes. The water reducer was changed to a mid-range product in the medium-carbon and high-carbon mixes to maintain slump. However, the water reducer type and dosage were constant across all three AEAs. Details of all three fly ashes are in Table 4. The plasticizer dosages used are in Table 3.

All mixes were tested for air volume after eight minutes of mixing according to ASTM C192 (“Standard Practice for Making and Curing Concrete Test Specimens in the Laboratory”). All mixes were tested for 28-day strength according to ASTM C39 (“Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens”). Strength testing of each mix included taking and testing three specimens. To test the impact of agitation, each baseline mix was run in the mixer for 82 minutes beyond the initial eight-minute mixing period, for a total of 90 minutes of mixing time. They were tested for air volume every 15 minutes.

Results

Results of the strength testing are summarized in Figure 1. Full numerical results are in Appendix A. Exact comparisons among different AEAs are impossible because the actual volume of entrained air often differed from what was targeted due to the limits to controlling air volume with the surfactant AEAs. However, fitting lines to the available points suggests that the strength of concrete made with a polymer AEA is generally about 1000psi (70 kg/sq.cm) higher than that of concrete made with the surfactant entrainers.

Figure 1. Results of strength testing

![Strength vs. air volume graph]

Discussion

The researchers have several theories for the greater strength of concrete using a polymer air entrainer:

1. Loss of entrapped air. Under this theory, entrapped air in the mix is

Table 4. Properties of Fly Ash Used

<table>
<thead>
<tr>
<th>Designation</th>
<th>LOI</th>
<th>Fineness</th>
<th>Foam Index</th>
</tr>
</thead>
<tbody>
<tr>
<td>Baseline (Low-carbon)</td>
<td>0.26</td>
<td>18.8</td>
<td>4</td>
</tr>
<tr>
<td>Medium-carbon</td>
<td>0.9</td>
<td>27.6</td>
<td>8</td>
</tr>
<tr>
<td>High-carbon</td>
<td>2.7</td>
<td>25.7</td>
<td>24</td>
</tr>
</tbody>
</table>

![Air volume vs. carbon content graph]

In contrast, the air obtained with the polymer air entrainer fell by less than 5 percent.

Figure 2. Results of carbon sensitivity testing

Agitation test results are in Figure 3. Full numerical test results are in Appendix C. Air volume fell sharply and steadily with mixing time for the concrete using a synthetic detergent AEA. It fell more gradually, but still consistently, for the concrete using a vinsol resin AEA. With concrete using the polymer-based air entrainer, it fell by a small amount during the early stages of mixing, but then was almost perfectly stable over the remaining 90 minutes of mixing time.

![Air volume vs. mixing time graph]
quickly driven out by the polymer bubbles. This eliminates a set of unevenly sized and spaced voids that can create weak spots.

2. Reduced interference with hydration. The conventional AEA’s attraction to cement may inhibit the reaction between cement and water that is key to strength gain. With minimal attraction to cement, the polymer should not have this effect.

3. More optimal dispersion. The polymer’s mechanism of dispersion by mutual repulsion may space the air bubbles more evenly than the dispersion by attraction to cement and water of traditional AEAs. This should result in less air clustering and its associated weak points.

4. More consistent bubble size. Polymer AEAs produce more consistently sized air bubbles. This should reduce the chances of weak spots from oversized bubbles.

Although some of these theories are based partly on empirical observations, the truth and relative importance of any one of them must still be considered matters of conjecture.

Results of the carbon tests are consistent with the chemistry of the different entrainers. The air volume of the mixes using traditional AEAs drops as carbon content rises because an increasing number of the available AEA molecules become attached to carbon particles instead of forming air bubbles. In contrast, the polymer-based air is believed to interact little, if at all, with the carbon.

The agitation tests tend to verify the greater resistance to mechanical action of the polymer AEA. Air content of the concrete containing the polymer AEA dropped a relatively small amount at the outset of mixing and went virtually unchanged.
thereafter. One theory to explain this pattern is that the early, limited air loss is actually a departure of entrapped air from the mix, which is driven out by the presence of the polymer bubbles.

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References


Appendix A. Numerical Results of Strength Testing

<table>
<thead>
<tr>
<th>Foam Index</th>
<th>Miracon Synthetic Vinsol</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>3740psi 12.5% 3210psi 12.4% 3743psi 11.5%</td>
</tr>
<tr>
<td>8</td>
<td>4673psi 9.5% 3685psi 9.5% 5190psi 9.0%</td>
</tr>
<tr>
<td>24</td>
<td>6880psi 6.8% 7180psi 5.5% 6870psi 5.5%</td>
</tr>
</tbody>
</table>

Appendix B. Numerical Results of Carbon Sensitivity Testing

| Foam Index | Carbon content (%) Polymer air content (%) Synthetic air content (%) Vinsol air content (%) |
|------------|----------------------------------|----------------------------------|----------------------------------|
| 4          | 0.26 6.8 5.5 5.5 |
| 8          | 0.9 6.2 4.0 3.75 |
| 24         | 2.7 6.5 2.5 2.0 |

Appendix C. Numerical Results of Mixing Time Testing

| Time (minutes) | Polymer air content (%) Synthetic air content (%) Vinsol air content (%) |
|----------------|----------------------------------|----------------------------------|
| 15             | 7.2 6.5 7.2 |
| 30             | 6.2 5.0 7.0 |
| 45             | 6.2 5.0 7.0 |
| 60             | 6.2 4.5 6.5 |
| 75             | 6.2 4.5 6.2 |
| 90             | 6.0 4.2 6.0 |

| Time | Miracon air retained (%) Synthetic air retained (%) Vinsol air retained (%) |
|------|----------------------------------|----------------------------------|
| 15   | 100.0 100.0 100.0 |
| 30   | 86.1 76.9 97.2 |
| 45   | 86.1 76.9 97.2 |
| 60   | 86.1 69.2 90.3 |
| 75   | 86.1 69.2 86.1 |
| 90   | 83.3 64.6 83.3 |
Succession Planning for the Ready Mixed Concrete Industry: It’s Your Responsibility

By Chad Hustedde, Cemex
Jeff King, Cemex
Chris Mathias, Cemex
Tom Roloson, Lafarge
Todd Shenk, Crider & Shockey
Chris Sheffield, Cemex

In 2006, this group of authors was drawn together as a team participating in the National Ready Mixed Concrete Association’s “Developing Industry Leaders” program. Challenged to research a topic that had never been explored on a national level by our industry, the group developed a presentation that was presented to the NRMCA Board of Directors in San Diego at the NRMCA 2007 Annual Convention. The following is a summary of the group’s findings. The Actual PowerPoint presentation is available through NRMCA.

Have you ever thought about what would happen to your company or organization, if you as a leader, CEO or owner were not there in person to see things through? Are you willing to just take a chance that things will be alright, or do you have a plan? Do you have a vision, and does everyone in the organization know the direction you are heading? Unfortunately, historically many ready mixed concrete businesses have had no such “vision.” We never know what tomorrow will bring. What we do know is that change is inevitable, and those leaders who plan for it, those
leaders who have a vision, are the true leaders who leave a lasting legacy to their companies and to our industry.

Having a clear vision and path for your company and employees is the responsibility and expectation of all true leaders of our industry. The majority of ready mixed concrete employees who become dissatisfied with their jobs do so as a result of a lack of responsibility, lack of appreciation and lack of opportunities for advancement, rather than for compensation reasons. Succession planning is an investment in the future of your business and the future of the employees who grow as a result of carrying out a well-developed plan.

If succession planning is such a good thing and a wonderful tool for your company, why don’t more companies and organizations do it? Quite frankly, the topic of “what happens when I’m gone” is something few people want to think about. However, it is no different than estate planning for your family and the need to ensure their well-being if you are not around. True leaders of our industry see their responsibility and act accordingly.

Succession planning forces leaders to recognize those employees who have the capability to grow into positions of greater responsibility and creates an environment where employees feel they have opportunities for advancement. It reduces the likelihood of losing skilled personnel and ensures the ability of the company to perform in the future while also creating peace of mind for investors, family members and employees.

The first step to succession planning is recruitment. Your baby-boomer leaders of today will be leaving shortly. The challenge will be getting the right people in the right jobs. It is essential to target your market of potential employees and establish minimum qualifications for all positions with your ready mixed concrete company. Be sure not to waste time on candidates who don’t meet these qualifications. Career fairs, online job postings, military recruiting, CIM program candidates and community colleges are all great ways to raise the bar in recruiting for leaders of tomorrow. Look for those who are career-minded, self-motivated, have good organizational skills, are creative and possess a “get the job done” attitude. The ready mixed concrete business, with its unique and fast-paced environment, needs to be completely understood by prospective leaders.

The next step in succession planning is having a business that will foster employee retention by ensuring proper compensation, advancement opportunities and a wide variety of cross-training. It’s important that leaders install a recognition program that rewards outstanding performance, implement management trainee programs and use the “personal touch” to create a relationship with not only employees, but employee family members as well.

Company structure also plays into succession planning. It is a lot less complicated for a small company to design a succession plan than it is for a large company or corporation with multiple regional locations and widely varying business objectives throughout the organization. But the fact remains that large or small, regional or national, a succession plan for a ready mixed concrete business is achievable and essential to the well-being of the company. The key is developing organizational charts that clearly define the path that employees follow and also helps them understand their function within the organization.

One possible career path, for example, could be developed for a person graduating with a degree in business or a related field. The degreed employee might be fast-tracked to management and would go through a thorough training program lasting several months, with a length of time that could vary depending on company demographics. His career path could continue with a period of time in the customer service/dispatch department followed by a duty status as a field quality control representative. The degreed employee could act as quasi service rep, giving him contact with customers, plant personnel, drivers and virtually all aspects of concrete production. Continuing on within the organization, the employee would fill a full quality control representative position with responsibilities for testing in the field, submittals and troubleshooting. A sales position may be next. If successful in sales for several years, the employee would have the experience and the ability to roll into a sales manager position.

Another possible career path may be more suited for an engineering or construction management program degree. And still another career path would be for an individual with no college degree who typically starts as an hourly employee. If the individual shows he is a high-potential employee, he can move from his current position into the training program. This will give him exposure to all aspects of the business. After the training program, the employee can go into a plant superintendent role, after which he can go into a maintenance coordinator position. This would be working directly with the mechanics on parts ordering, maintenance schedules, etc. After this, the employee could move into a fleet manager position, responsible for all or part of the mobile equipment in a given region.

You must have a vision of your organization and a purpose that is desirable to continue long after your time. It should be the responsibility of a leader to ensure the upper echelons of management are committed to the concept of succession planning, and the plan needs to be integrated into the day-to-day practices of your ready mixed concrete organization. True leaders promote an environment that builds the intellectual capital of your organization. Nearly all great leaders of our industry have used collaborative leadership techniques. They never stop being a mentor, they constantly rely on training to improve employee productivity, and they never stop evaluating the process.

As leaders, we may never achieve all the attributes of the greatest leaders. However, we should strive to build those leadership qualities within us that foster a positive experience for our employees. We should have a passion and purpose in what we do and a strong desire to achieve goals. We should exhibit hope and optimism along with the following five “C” characteristics: competence, constancy, caring, candor and congruity. A great leader will create an environment of learning, thinking and talking about ways to improve the organization while also creating a clear path for succession in all aspects of your ready mixed concrete business.
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For the optimal career path, NRMCA now also offers the Certified Concrete Professional (CCP) career track, leading to the top professional designation in the industry. The CCP designation gives ready mixed concrete industry employees the fundamental technical, operational, sales and managerial information needed to prepare for and enhance careers in the industry.

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Developing Industry Leaders Rise to the Challenge

The Next Generation Assures the Industry’s Strong Future

By Eileen Dickson, Senior Director of Education, NRMCA

The most effective way to retain what we learn has always been by doing. And that is especially true for adults, who experience on-the-job training daily just in the act of executing their tasks. Yet some on-the-job training requires higher level thinking far beyond this industry daily rock-and-roll. Therefore, with the wisdom it brings to the table, the National Ready Mixed Concrete Association’s Executive Committee began sponsoring an annual learning opportunity three years ago for the next generation, called the Developing Industry Leaders program. The program’s structure encourages participants to pull all the skill and knowledge they have into a new, challenging venue, thereby expanding participants’ horizons.

Every fall, NRMCA’s Executive Committee asks current industry senior management to nominate their best employees to participate in a six-month long work-study program. Once nominees are selected, the group-at-large头脑storms about critical industry challenges that warrant examination. Individually, participants select one of those challenges. Those with the same topic form a working team. For a half of a year, with guidance from NRMCA staff and access to industry information, the DIL group meets via conference call or in person, analyzing their topic in depth. In fall 2006, 22 nominees broke into five groups.

The DIL group is always a diverse lot. They are from all over the country. Some are from small, successful and progressive single proprietorships, some from medium companies with very strong businesses in specific geographic areas and some are from large, vertically integrated multinational powerhouses. Because of the participants’ variety of experience, and with a six-month long opportunity share insights, they not only gain a deeper understanding about the business at-large, but they also gain a deeper understanding about a critical issue in a non-competitive setting amongst peers.

The DIL program’s culmination is at NRMCA’s Annual Convention where each group presents its findings and recommendations at the Board of Directors’ spring meeting. It is not difficult to see that they grew in a relatively short period because their insights can be so on target that they have influenced NRMCA’s long-term strategic plan. Thereafter, DIL members are encouraged to participate in NRMCA committee work to help carry out their recommendations as well as become a NRMCA Shadow Board of Director.

In recognition of the 2006-2007 Developing Industry Leaders, their names, topic and key findings follow.

Group 1: Driver Recruitment and Retention
- Darryl Keiser, New Holland Concrete
- Brad McMahon, Transit Mix Concrete
- David Semones, Lafarge North America
- Matt Smith, Smith’s Ready Mix
- Leif Yderstad, Lafarge North America
- Tom Zais, Texas Industries

The wages and benefits offered by most R/M companies are relatively competitive with other trucking organizations. Most trucking companies fail, however, in fundamental personnel management practices. Driver retention can most significantly benefit from the implementation of sound personnel management practices and the establishment of clear lines of communication with each employee. Several Best Management Practices were identified through the course of research and continued identification of programs should be encouraged to differentiate the R/M industry from other trucking segments. Recommendations include developing company monthly newsletters, conducting an annual employee satisfaction survey, conducting a national mixer driver survey and ongoing employee training.

Group 2: Employee Hiring, Training, and Retention: Succession Planning in the Ready Mixed Concrete Industry
- Chad Hustedde, Cemex
- Jeff King, Cemex
- Chris Mathias, Cemex
- Tom Roloson, Lafarge
- Chris Sheffield, Cemex
- Todd Shenk, Crider and Shockey

Many senior managers simply do not want to recognize that when they retire, if the business is to continue to thrive, they must assure a strong management team is in place to follow. Current senior management must have that organization vision. A way to start is to implement leadership qualities from the top down which will foster the environment necessary to grow future leaders and promote collaborative leadership. To assure the right people are in place, current management must establish and promote by assessing staff based on predetermined core competencies. Leadership should actively look for probable successors and not be afraid to mentor their choices. And all the while, train, train, train. And once the plan
The National Ready Mixed Concrete Association has seen a slight increase in interest from home buyers about Insulated Concrete Form home construction in the past two years. With escalating construction costs and “Acts of God” concerns, NRMCA would like to show home buyers the many advantages of an ICF home. In 2003 ICF made up 3.2 percent of the new housing market. Since that time interest in ICF has held steady or slightly increased. The overall vision of our public relations effort is that by the summer of 2009, realize an increase of ICF construction of at least 5 percent of the homebuilding market. We feel that 5 percent growth over a two-year period is achievable considering today’s construction market. In order to help reach that goal, the responsibility falls to both NRMCA staff and members. Therefore another way to help increase the ICF home buyer market is to improve the NRMCA members and their contractors’ awareness and attitude toward the product.

Group 4:
Concrete Promotion – How to Enter the Pervious Market
• Barbara Nelson, Titan America
• Jenna Burnworth, NRMCA

There has been a lot of interest recently in pervious concrete, but for it to become a large growth market past challenges must be overcome, including poor placement, delivery obstacles and improper stormwater design. By working with target markets, including zoning boards, government regulators, stormwater management, with codes and compliances standards, civil engineers and architects, the industry will grow. Current training efforts to certify finishers and educate specifiers promise a robust future.

Group 5:
Building Industry Wide Business Acumen – NRMCA’s STEPs Program
• Andy Blake, Lehigh Cement
• Jeff Bradford, Cemex
• Brian Curtis, Maschmeyer Concrete
• James Day, Cemex
• John Peoples, BASF Admixtures

Last year, NRMCA’s Board of Directors approved a new program called STEPs. It is an organizational process of NRMCA education opportunities that encourages the industry to train its staff in specific professional development tracks, with the goal of raising the competency level of employees against a national standard. When a person completes the process, they will have earned a nationally recognized umbrella certification called, the Certified Concrete Professional, or CCPf. In order to hit a target number of 7500 certified by 2012, NRMCA will have to continue to survey participants and their supervisors, find multiple means for material delivery, ask members to help identify target program participants and advertise in industry publications so knowledge of courses and schedules expands.
Balancing work and family has received a lot of attention over the years. There are several reasons for this. First, today’s workforce is increasingly diverse and demanding. Second, the workforce is shrinking. There are not enough skilled workers to fill all the jobs.

In this country skilled workers have options. It is important not to force workers to choose between work and family. Each year thousands of good people leave good jobs to take other positions that are more family friendly. This situation has fueled the dramatic rise of home-based and female-owned businesses.

A one-size-fits-all approach no longer works. Employers must either accommodate the needs of their people or be faced with constant turnover and unhappy employees.

The cost of turnover is much more expensive than people realize. In the United States it costs between $7,000 and $17,000 to replace an hourly employee, upward to $40,000 to replace a manager and even more to replace an executive. In spite of the staggering cost, the majority of businesses do not have a formal retention program.

What makes one person happy can be the very thing that displeases another. That is why organizations must pay specific attention to the various needs each person may have and expect.

By creating a Flexible Work Arrangement (FWA), companies can keep good employees and not force them to sacrifice the diverse needs of their family life. An FWA will help them benefit personally and professionally, and the result will be people who are more loyal, committed and productive.

An FWA offers options to employees who do not want or need a standard work schedule. A properly prepared FWA allows
greater flexibility in balancing roles of work and home. It also can help prevent valuable employees from quitting and taking a less suitable position somewhere else. Most of the time, an FWA involves fewer work hours and possibly a proportional reduction of pay and benefits.

A survey by Flexible Resources Inc. of more than 500 women seeking flexible work arrangements found 64 percent of them had either quit or were planning to quit due to the lack of work hour flexibility. What was alarming was that 59 percent of these women never asked their employers to modify their work schedules because they assumed they would be denied or lose stature. Younger women are more assertive in seeking flexible work arrangements: 72 percent of women between the age of 25 and 35 were willing to request an FWA compared to only 30 percent of the women aged 36 to 45.

Among those who requested a Flexible Work Arrangement and were told no, here are the top reasons why:

• We can’t give it to you and not the others (52 percent)
• You will not be available to others (48 percent)
• We have never done it before (24 percent)
• You won’t be as productive as when you work full time (8 percent)
• Your job is not conducive to flexible hours (5 percent)
• There is too much work to do (5 percent)
• It wouldn’t fit into a team atmosphere (5 percent)

But FWAs have drawbacks. People feel physical presence equals more opportunity for promotions and advancement. Men are particularly vulnerable to the stigma “if you are not at work full-time, you are not competitive.”

Several years ago Working Mother magazine recognized the innovative work/life programs provided by the Bank of America. Its Child Care Plus program pays eligible workers an additional amount of money each week per child for employees earning less than $30,000 a year. After learning turnover for participants was about half that of the peer group not participating, Bank of America expanded the program to include workers with family incomes of $60,000 and began to allow workers two paid hours a week to work in their children’s schools. Finally, they added money for college. Bank of America gives $2,000 a year for employees enrolled in undergraduate classes and $4,000 for graduate study. As a result, they were able to reduce turnover by 50 percent.

Greg Smith is a nationally recognized speaker, author and business performance consultant. He has written numerous books, including his latest, Here Today, Here Tomorrow: Transforming Your Workforce from High Turnover to High Retention. Smith has been featured on television programs such as Bloomberg News, PBS television, and in publications including Business Week, USA Today, Kiplinger’s, President and CEO, and the Christian Science Monitor. He is the president and “Captain of the Ship” of a management-consulting firm, Chart Your Course International, in Atlanta. Phone him at 770-860-9464. More articles are available at www.chartcourse.com.
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John and I started out together as new sales reps for ABC Concrete. We’ve been close friends for over 10 years. Several years ago I left ABC to become the sales manager at CBA Company. When John became sales manager at ABC last year, we decided to have breakfast every Wednesday. It gives us a chance to talk about business, construction activity, and other items, of, let’s say, mutual concern. Is there any antitrust risk in this activity?

There’s always a risk of antitrust when you meet with friends and associates who are employed by competitors and discussing business activities. That doesn’t mean that you can’t continue to meet with your friends socially. What it does mean is that you should always be aware of the principal antitrust concerns involved in discussions with your competitors, and avoid discussions of confidential and competitively useful information. This includes, for example, pricing issues, including any discussion of discounting practices, marketing strategies, or treatment of individual customers or suppliers. Talking about general business conditions and overall construction activity shouldn’t present antitrust concerns.

Please note: The column contained here should in no way be considered a substitute for competent legal counsel. It is only meant as a guide to help employers know when it is necessary to consult an attorney on issues pertaining to labor-management relations and other workplace issues.

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- Low stack temperatures, highly energy efficient (energy is used to heat water, not outside air!)
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Ludell Manufacturing Company has been helping companies heat up their energy savings and maximize their profits since 1948. Whether you need a water heater, storage tank, pumping system or complete water heating system, please call...

Ludell Manufacturing Company or your local Representative. We can save you money!

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800/558-0800  414/476-9934  Fax: 414/476-9864
gthorn@ludellmfg.com  Website: www.elliscorp.com

Attention Concrete Ready Mix Producers!

Are you tired of...

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➢ Replacing Boiler Heat Exchanger Coils?
➢ Waiting for Hot Water?
➢ Acid Cleaning Boiler Tubes?
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➢ Water Heating Equipment Corrosion?

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DRUM MIXERS

BMH SYSTEMS

BMH Systems
71 Du Tremblay
Boucherville, QC J4B 7L6
Phone: (450) 449-4770
Fax: (450) 449-4898
E-mail: bmh@bmhsystems.com
Web: www.bmhsystems.com
BMH Systems is expert in the design and manufacturing of Central Mix Plants and Concrete Mixers. The company is focused on providing tailor-made solutions to meet the specific needs of each customer. Always aiming for our customers to be the best of their league, we put an emphasis on the excellent quality and consistency of your concrete. BMH’s RollMaster® reversing drum mixer is the most profitable type of mixer for the ready-mix industry. It provides you with an edge over your competition by offering supreme consistency, very low operating costs and superior durability. RollMaster® is guaranteed for 3 years or 500,000yd³.

ENVIRONMENTAL

Enviro-Port

Enviro-Port, Inc.
10953 Dunbarton Road
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Gratetot, WI 53541
Phone: (608) 922-6264
Fax: (608) 922-3370
E-mail: enviropt@nhtc.net
Web: www.enviro-port.com
Enviro-Port offers 100% ready-mix reclamation for the Ready-Mix and Precast producers. Enviro-Port will help manage your plant’s process and storm water. New is our add-on system for producers that have existing reclaimers and/or pit systems that desire 100% reclamation with gray water rebatching. Visit our website at: www.enviro-port.com.

EXECUTIVE SEARCH

ConcreteCareers.com

Concretecareers.com
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Bremen, GA 30110-0900
Phone: (770) 537-3237
Fax: (770) 537-1488
Toll Free: 877-5 WIN-WIN
E-mail: gene.vineyard@ConcreteCareers.com
Web: www.ConcreteCareers.com
Since 1976, ConcreteCareers.com has been a PERSONNEL resource EXCLUSIVELY for the concrete industry. CC.c conducts contingency and retainer search’s to identify Middle, Upper, & Executive level personnel for Concrete related companies. We identify and qualify all levels of personnel. We have placed President’s, CEO’s, Plant Managers, General Managers, Engineering Managers, Corporate Quality Assurance Director’s, Sales Manager’s, Dispatch Directors, and many more positions. CC.c are members of most Concrete Associations including NRMCA, NPCA NCMA, PCI, ACI, NCPA & ASCE. All inquiries are confidential. Please call, Toll Free 877-5 WIN WIN (877-594-6946) or visit our web site at www.ConcreteCareers.com.

MIXERS

BMH SYSTEMS

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PERSONNEL

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REVERSING DRUM MIXER

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STAFFING

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28- New 2007 Peterbilt 335, Cummins ISC 330 HP, 9LL Hendrickson suspension 5.25 ratio, 238 in wheel base, 22.5 tires aluminum/steel wheels, fully locking rear, new Terex 10.5 yd paver style mixers. Standard features include: 150 gal, 120 psi aluminum watertanks, brinell skin & fins & flight, under 12’ hopper height, air chute bake and air flip hopper, slump meter, tow loop, work lights, electronic controls. Pre 07 emissions.

20- new Freightliner M2-106V, C9 Cat 350 HP, 9LL, Tuff Trac suspension, 5.38 ratio, fully locking rear end, with new Terex, 10.5 yd paver style mixer. Standard features include: 150 gal, 120 psi aluminum watertanks, brinell skin & fins & flight, under 12’ hopper height, air chute bake and air flip hopper, slump meter, tow loop, work lights, electronic controls. Pre 07 emissions.

16- 2007 Freightliner M2-112 Cat C13 335 HP with 1550 ft lbs torque, Allison automatic, Hendrickson Haulmax suspension, 5.39 ratio, fully locking rear with new 10.5 Terex power style mixer. Standard features include: 150 gal, 120 psi aluminum watertanks, brinell skin & fins & flight, under 12’ hopper height, air chute bake and air flip hopper, slump meter, tow loop, work lights, electronic controls. Pre 07 emissions.

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