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May/June 2018
Vol. 31, No. 3
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***CRB* EDITORIAL DEADLINES**

September/October 2018—July 2, 2018
Theme: *Seismic Solutions*

November/December 2018—September 4, 2018
Theme: *2018 ICRI Project Awards*

January/February 2019—November 1, 2018
Theme: *Cracks and Joints*

March/April 2019—January 2, 2019
Theme: *Resiliency: Above and Beyond Concrete Restoration*

INTERNATIONAL CONCRETE REPAIR INSTITUTE

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FEATURES

DEPARTMENTS

NOTE FROM THE EDITOR

The ICRI Spring Convention is now history and the 2018 Construction Season is in full swing across the country. As the pace of your projects picks up and more construction personnel are in the field on a daily basis, it is time to focus on job-site safety.

The theme of this issue is *Health and Safety in Concrete Repair.* The issue contains articles focusing on safety in the concrete repair industry. Articles discuss behavior based safety plans, the OSHA crystalline silica rules, preventing falls by using temporary anchor points and hand-held waterblasting equipment safety awareness.

I hope you all have a successful and safe construction Season!

Jerry Phenney
Editor, CRB
MAPEI Corporation

UPCOMING DATES & INFORMATION

CERTIFICATION CLASS
Concrete Slab Moisture Testing Certification Program
- June 21-22—Pompano Beach, FL

2018 ICRI FALL CONVENTION
November 7-9, 2018
Theme: *Resiliency—Above and Beyond Concrete Restoration*
Omaha Marriott Downtown at the Capitol District, Omaha, Nebraska

PRESIDENT'S MESSAGE

What a Wonderful World

If Ralph Jones has a theme song, it has to be "What a Wonderful World" by Louis Armstrong. The last verse and chorus go like this.

I hear babies crying, I watch them grow
They'll learn much more, than I'll never know
And I think to myself what a wonderful world
Yes I think to myself what a wonderful world


CONLEY JONES

I am certain you are thinking what does this have to do with ICRI? Well, the song lyrics bring to mind how important the future generations are to the concrete repair industry worldwide. They are a young, intelligent and well-educated generation that has already changed the way we work and process information. Their impact on our industry will continue to increase. It also reminds me that my duty as an "Old Guy" (I have been told I am one of those) is to pass whatever knowledge I may have on to the generations that follow, starting with introducing you to Louis Armstrong, a great jazz trumpet player.

The theme of my article also allows me to do two things. First, it gives me a reason to place my grandson's photo in the *Concrete Repair Bulletin*. Second, it allows me to broadcast to the membership of ICRI the formation of one of our newest task groups, whose goal is to attract young professionals to ICRI.

ICRI Secretary Elena Kessi has volunteered to lead the effort to form and develop the task group. She already has a few volunteers to assist her and together they quickly structured an outline that led to their first face-to-face meeting at the Spring convention in San Francisco. The meeting resulted in great ideas and action items. The ideas go beyond attracting younger members to ICRI. Their first initiative is to create and foster a mentorship program for young professionals in the concrete repair industry. The intent is to formally pair younger ICRI members with more experienced members. The goal is for the experienced members to share their knowledge with the younger members—assisting them in advancing their careers and increasing their involvement in ICRI.

This national effort will be important and reach greater importance as local chapters participate by encouraging interaction between the mentors and the younger members. So chapters, be ready to respond when a member of the task group contacts you. If you are a younger member, or someone who would be interested in being a mentor, please contact Elena Kessi. She wants to hear from you.

Who knows, maybe the mentors can learn something as well.

I am also excited to announce a second task group that has recently formed—Women in ICRI. This group is led by Past Presidents Monica Rourke and Katherine Blatz. Both are proven leaders in our industry and organization.

The group also had its first face-to-face meeting at the Spring convention. Twenty-one dynamic women and I attended the meeting. One was from Panama and there were two students from California State University, Chico. The group has also received interest and support from women in Canada and Mexico.

The attendees provided input and began to formulate the goals and action items the Women in ICRI task force could initiate. They are discussing ideas that would support not only women in our organization, but men as well.

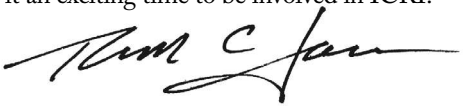
This task group will also look forward to the support of ICRI chapters. Please reach out to Monica and/or Katherine if you are interested in joining or supporting this task group.

As you can see, ICRI is vibrant and active. These two task groups, both formed in the last six months, are moving forward to achieve something important for the organization and the industry as a whole.

These are just two of the many initiatives that are currently active in ICRI—all for the betterment of the concrete repair industry.

One thing that I have heard over and over about ICRI is that it is so open and welcoming. I urge each of you to become involved in ICRI and contribute to the betterment of the concrete repair industry.

Isn't it an exciting time to be involved in ICRI?



Ralph C. Jones, PE
2018 ICRI President
Photo compliments of Conley Jones

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TACTALK

FRED GOODWIN

Perhaps this is not so much a TAC talk as discussion of my own opinions. I want to focus on the importance of concrete repair in this article and address some issues of growing concern. Much of this article is quoted from authors who make relevant statements much better than I can paraphrase.

ICRI had its origins at a World of Concrete seminar in February 1988. The International Association of Concrete Repair Specialists was formed at an organizational meeting in Naperville, Illinois, on May 21, 1988. In 1993, the name was changed to the International Concrete Repair Institute. ICRI is now celebrating its 30th year of existence. The original mission statement was "To improve the quality of concrete restoration, repair and protection, through education of, and communication among, the members and those who use their services." ICRI continues to fulfill this purpose and strives to grow the awareness of the concrete repair industry, but challenges remain.

> *"Dollar for dollar, historic preservation is one of the highest job-generating economic development options available."*

Our concrete repair industry is frequently obscured by new construction. Our last article addressed the state of our structures, and this article will concentrate on the economics of concrete repair. Concrete repair occurs on existing structures, but a significant amount of repair occurs on new construction that is not captured by the repair industry as can be readily observed on most construction projects where something is always being corrected or fixed.

The legal profession classifies construction defects into two types: patent defects and latent defects. Patent defects are visible to the naked eye and are frequently corrected during the final phases of construction. Examples of patent defects would be things like a leaking pipe or early age crack. Latent defects are not visible and may take years to appear. Examples of latent defects could be such things as additional water added during concrete placement, inadequate cover, or inadequate curing of the concrete. The concrete looks the same when these situations occur, but they lead to premature deterioration of the concrete and frequently are not caught during inspection and after construction of the structure.

Our concrete repair industry deals mostly with the correction of latent construction defects, compounded by deterioration through neglect of maintenance; harsh service conditions of the concrete; and damage caused by impact, fire, or other rapidly occurring events. These are called the 3 Ds of the causes of concrete repair: Design and construction errors, Deterioration, and Damage.

Structures survive because of quality of construction combined with maintenance to preserve utility or historic importance. Poorly built or designed structures can deteriorate rapidly and usually are replaced or repaired to increase the structure's service life. ACI 365.1R[1] describes three types of service life: Technical, Functional, and Economic.

"Technical service life is the time in service until a defined unacceptable state is reached, such as spalling of concrete, unacceptable safety level, or failure of elements. Examples of technical end of service life include: a) structural safety is unacceptable due to material degradation or exceeding the design load-carrying capacity; b) severe material degradation, such as extensive corrosion of steel reinforcement; and c) excessive deflection under service load due to decreased stiffness.

"Functional service life is the time in service until the structure no longer fulfills the functional requirements or becomes obsolete due to change in functional requirements. Examples include: a) need for increased clearance, higher axle and wheel loads, or road widening; b) aesthetics become unacceptable—for example, excessive corrosion staining; and c) Functional capacity of the structure is no longer sufficient—for example, a football stadium with insufficient seating capacity.

"Economic service life is the time in service until replacement of the structure or part of it is more economical than keeping it in service. Examples include: a) maintenance requirements exceed available resource limits; and b) replacement to improve economic opportunities—example, replacing an existing parking garage with a larger one due to increased demand."

A very interesting publication loaded with statistics for our industry is *The Economics of Historic Preservation: A Community Leader's Guide* by D. Rypkema of the National Trust for Historic Preservation.[2] Although published in 2005, much of the information remains relevant today for our repair industry.[3] The 20 percent historic tax credit has survived the most significant rewrite of the tax code in more than 30 years. Congress has confirmed once again that incentivizing the rehabilitation of our historic buildings makes good economic sense. The federal Historic Tax Credit (HTC) was created in 1978 as an incentive to catalyze economic development through the restoration and reuse of America's historic buildings. Since its inception, the HTC has been a widely used redevelopment tool, helping revitalize cities, towns and rural communities all across the country, and to date, has rehabilitated more than 42,000 buildings. Some quotes from Rypkema's book include:

"Dollar for dollar, historic preservation is one of the highest job-generating economic development options available. Historic preservation is extremely labor intensive. As a rough rule of thumb, half of new construction expenditures go for labor and half for materials. In a typical historic rehabilitation project, between 60 and 70 percent of the total cost goes toward labor. This has a very practical effect on the local economy. Labor… is nearly always hired locally. And those individuals, in turn, spend their wages locally…Materials for new construction, on the other hand, often have to be purchased elsewhere, thus making a more limited impact on the local economy. Historic preservation goods and services now may account for as much as …1% of the entire Gross National Product (GNP). Direct local purchases from both retailers and wholesalers is greater…for a rehabilitation project than for a new construction project." Concrete repair uses local labor and generally keeps the revenue in the local area.

"In many large cities around the United States, historic preservation has been central to an overall economic development strategy. A few years ago, economic development professionals around the country were asked to name cities with the most successful economic development efforts. Of the 20 cities most often cited, 15 were among the cities with the greatest amount of historic rehabilitation activity in the country...cities that have had the least success in attracting and maintaining investment and jobs…also have dismal records in historic preservation." Where do you go on vacation and what do you see? Likely historic areas are some of the attractions.

"Federal historic preservation tax credits have stimulated nearly US$120 billion in private investment to rehabilitate commercial historic properties across the nation. More than 91,000 places have been listed on the National Register of Historic Places, including many rural districts and older neighborhoods, representing more than 1.8 million contributing historic resources. More than 2,500 National Historic Landmarks commemorate the nation's most significant events and achievements."[4] The revisions to the federal tax code have maintained (at least for now) the economic incentives for continued restoration of existing historic structures.

The difficult news for the construction and especially the repair industry is summarized in the report from McKinsey[5]: "In the United States since 1945, productivity in manufacturing, retail, and agriculture has grown by as much as 1,500 percent; productivity in construction has barely increased at all...The construction sector is one of the largest in the world economy, with about US$10 trillion spent on construction-related goods and services every year…Globally, construction sector labor-productivity growth averaged 1 percent a year over the past two decades, compared with 2.8 percent for the total world economy and 3.6 percent for manufacturing…Construction matters: Construction-related spending accounts for 13 percent of global GDP…Productivity in the US construction industry more than doubled in the 20 years following the end of World War II, reflecting productivity increases in the overall economy, huge investment in the interstate highway system, and housing in new suburbs, for instance. After this, however, the sector's productivity appeared to decline for 40 years as the focus shifted from infrastructure projects toward more residential building, and repair and renovation work, which involves more complex practices.

There is a strong relationship between productivity and the ratio of repair and maintenance to new construction… US productivity data show that, as the proportion of repair and maintenance construction has increased, there has been a corresponding fall

in productivity…Repair and renovation work takes place in a constrained environment. Construction companies are forced to work on tight, often occupied sites where it is difficult to anticipate what complications they may uncover, and where it is hard to work at scale and with a high degree of standardization…For civil works, repairing roads or utilities requires stopping normal traffic and the use of major traffic systems, and is therefore carefully controlled. In developed economies, the share of renovations has increased from 35 to 60 percent, increasing operational constraints.

The construction sector has long been more regulated than other sectors, and this is becoming even more the case. The amount of regulation alone is not necessarily the problem—and of course it is important for construction to have a robust regulatory framework so that consistently safe structures are built. Rather, the confusing and arduous bureaucratic processes through which regulation is administered cause delays and compromise coordination among owners, construction firms, and regulators. One of the most problematic symptoms of the complex regulation and bureaucracy that we have discussed is the prevalence of informality and the potential for corruption that is reinforced by the numerous approvals, inspections, and permits required, many of which come with hefty fees. At every step, there is an opportunity for bribery or payoffs, and the sheer number of procedural gates makes concealment that much easier. These and other factors contribute to construction being the source of the second-highest number of bribery cases globally (only extraction industries have more)… Construction is a highly fragmented industry. This not only prevents players from attaining the size they need to achieve scale benefits leading to higher productivity, but also means that coordination among different players, each with their own vested interests, is difficult, and this can make it harder to deliver a project on time and on budget…The top four firms in the US construction sector control just 6 percent of the market, compared with 14 percent in retail and 42 percent in petrochemical refining, to give just two examples. If the next 16 largest firms are also taken into account, the fragmentation is even more pronounced. The top 20 firms account for only 8 percent of the market, compared with 18 percent and 94 percent in retail and petrochemicals, respectively. An industry that is fragmented, is geographically dispersed, and delivers highly customized solutions meeting bespoke requirements also ends up being very opaque. In most countries and sectors, it is nearly impossible to find good benchmarking data on project cost or performance of contractors."

Furthermore, we are losing much of the talent in the construction industry:

"North America is facing a skilled trades talent drought. In 2016, skilled trades positions were the hardest role for companies to fill for the seventh straight year. With nearly 20% of current tradespeople older than 55 and only one new tradesperson entering the workforce for every five who retire, this labor challenge will only worsen over the coming years. A huge brain drain is occurring in the construction industry, and there doesn't appear to be any way to stop it. Baby Boomers, that part of the US population born between 1946 and 1964, are marching into their retirement years and leaving the workforce in droves; and Boomers comprise 40% of the construction workforce. There were 76 million kids born in the US during this period, and as working adults they built, actually and metaphorically, much of the world we inhabit today. To put it bluntly, they know a lot. Since an estimated 54% of construction managers are Boomers a serious wave of institutional knowledge is about to say goodbye to the jobsite. By some estimates, there will be a shortage of 31 million skilled tradespeople by 2020. The domestic workforce generally is seeing a mass departure of Boomers—the group is estimated to be retiring across all US work sectors at a rate of 10,000 a day."[6]

As ICRI continues to fulfill its mission "to provide education, certification, networks, and leadership to improve the quality of repair, restoration, and protection/preservation of concrete and other material systems," we must work together to rehabilitate, renovate, repair, restore, and recognize the challenges we face with regulation, productivity, and skills development in the concrete repair industry.

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Fred Goodwin *is chair of the ICRI Technical Activities Committee.*

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SECRETARIATUPDATE

JEFF BARNES

As we move deeper into the first full year of the existence of the Secretariat, we find ourselves addressing some important and complicated idea submissions—issues such as forming a grievance committee, instituting a women's group, establishing a task group to focus on our global strategy, and creating a task group that will lay the foundation for ICRI to deal with Disaster Preparedness and Relief. We also find ourselves addressing some idea submissions that do not align with the four strategic pillars (which is what is used as the basis for evaluating an idea). We have also seen a change within the Secretariat as professional responsibilities increase due to a robust economic climate, thus forcing one individual to step down.

We, as individuals, deal with important topics on a regular basis; or we read about something that touches us in a way to make us put words into action. When we do that at a personal level, we can see an almost immediate benefit as we feel better about ourselves by doing the right thing, or by moving things forward, regardless of the size of the step. We, as the Secretariat, operate in the same manner—the ideas invigorate us to have healthy discussions and we get energized to move things forward. We definitely see the benefit as groups, task groups and subcommittees are formed to address these important

ideas. The Secretariat is set up to assist ICRI with change and evolution as we grow by being tasked with looking at the big picture and making sure the ideas necessary to advance ICRI do not get lost or delayed in committees.

These changes don't happen overnight, not by a long shot, but they are taking shape. We can hear it in the committee meetings. We hear it while passing people in the halls at conventions, on conference calls and from feedback from members. These changes we are experiencing within the Secretariat are a snapshot of what people experience on any given day, anywhere in the world. As we grow, we remind ourselves that change is good…and necessary.

***Jeffrey Barnes** is an ICRI Secretariat and serves on the ICRI Board of Directors.*

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LEGALINSIGHT

THE "NON-DELEGABLE DUTY OF SAFETY"

BY MATTHEW J. PAVLIDES AND JUSTIN C. ELLER, MILES & STOCKBRIDGE

As a general contractor, architect, engineer or construction manager, you think you are just monitoring the work for completion under the specifications because it isn't your work or you delegated that aspect of the work to a subcontractor or maybe even that subcontractor delegated it to a sub-subcontractor. So why is your lawyer telling you that you may have a problem? Could it be that the "non-delegable duty of safety" created by a statute (such as a building code) or even your own contract language is to blame?

As a general rule, an employer doesn't have a duty to supervise the work of an independent to assure a safe workplace, and consequently, an employer is not liable for the negligence of the independent. Simply put, since you don't control an independent's actions, you should not be liable for the independent. But as with all things legal, there are exceptions. Enter the exception of the "non-delegable duty of safety," which can be created by a statute (such as a building code) or even your own contract language.

Recent appellate decisions provide important examples of the "non-delegable duty of safety." For example, the Maryland Court of Special Appeals recently found that a building code can provide the basis for a duty of safety that leads to liability for injury and that applies far beyond those who did the work.

In May 2017, the Maryland Court of Special Appeals affirmed a general contractor's liability for just under $1,000,000 based on the "non-delegable duty of safety." In this case, the general contractor hired a trim subcontractor to install a safety guardrail in front of a sliding glass door. The safety guardrail was required by code to protect occupants if the sliding glass door was opened where the above-ground deck option had not been selected by the owner at the time of initial construction. When a guest was injured after opening the sliding glass door and falling through the safety guardrail, the guest sued the owner, general contractor and subcontractor. The subcontractor, which had incorrectly installed the guardrail, went bankrupt, so by the time the trial rolled around, only the general contractor remained. The general contractor's defense was that it didn't do the work and that it fully delegated the responsibility to the subcontractor to perform the work in a safe and proper manner. The court rejected the general contractor's argument. The court found that there was a statutory duty established by the building code, which included site safety, that could not be delegated by the general contractor to the subcontractor, and thus, the general contractor could be held liable.

A recent decision from the Illinois Supreme Court provides an example of a party's own contract language creating a "non-delegable duty of safety" that could lead to liability for injury and that could apply far beyond those who you would anticipate.

Specifically, in April 2017, the Illinois Supreme Court found that a design-builder could be held liable where a sub-subcontractor's worker fell due to a ladder that was too short for the work he was performing. While the design-builder argued that it had delegated compliance with safety to the subcontractor by operation of contract and that the subcontractor then re-delegated it to the sub-subcontractor by a flow-down contract provision, the court rejected this argument. The court held that the design-builder's own contractual language created a duty of care that included maintaining a safe site, and this duty could not be delegated and remained with the design-builder. Of particular interest was the court's reference to standard, if not boilerplate, language that the design-builder would control the means and methods on the project, which the court used to reach the conclusion that the design-builder could be held liable.

In addition to the examples above, the Occupational Safety and Health Act also can create a "duty of safety" that is broader in scope than one might expect. When there are multiple employers working on a particular project or site, the Occupational Safety and Health Administration (OSHA) takes the position that it can cite employers for safety violations under a number of different theories pursuant to the agency's multi-employer citation policy. For example, a "controlling employer" is one with general supervisory authority over a worksite, including the power to correct safety violations or require others to do so. Control may be established by contract or, in the absence of express contractual provisions, the exercise of control in practice. A controlling employer that fails to exercise reasonable care to prevent and detect violations on the worksite may be cited for such violations by OSHA, even if the employer's own employees are not exposed to the alleged hazards. Depending on the circumstances, other employers on the project or worksite may be cited as a "creating employer" (an employer that causes a hazardous condition), "exposing employer" (an employer whose employees are exposed to a hazardous condition created by another employer), or "correcting employer" (an employer who is responsible for correcting a hazard but fails to exercise reasonable care in preventing and discovering violations and thus fails to meet its obligations to correct the hazard).

So how do you avoid these problems where you don't control the work, don't control the means and methods, aren't supervising the work, or are just there to see if the work meets the specifications?

Watch out for contract language where you really don't intend "to be responsible for," "to supervise," "to control means and methods," "to implement and/or monitor," "to possess a right to control," or "to possess a right to direct." Know when you are actually controlling the work or even have the possibility of exercising the right to control others related to the work, and treat each situation differently. If you contend you are a construction manager, engineer or design professional and do not possess the right to control, make sure your contract reads that way and expressly states this, perhaps even emphasizing it using italics, bold and/or underlining. If you do possess the right to control or are possibly exposed by statute, building code or contract language and likely have a "non-delegable duty of safety," then obtain an appropriate indemnity agreement and make sure to obtain sufficient insurance from the independent party, including being added as an additional insured. There is likely no worse feeling than finding out that your own boilerplate contract language is being used against you. ■

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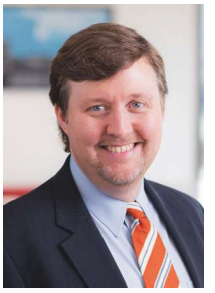

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A full-service business law firm, Miles & Stockbridge also has a Labor, Employment, Benefits & Immigration practice that works with employers on OSHA matters. To learn more about the firm, visit www.milesstockbridge.com.

Clearing the Air: Are You Ready?

BY PETE HAVERON

The new OSHA 1926.1153[1] standard for the construction industry went into effect on September 23, 2017, and has a significant impact on the concrete repair industry and how contractors perform surface preparation on concrete substrates. On December 22, 2017, the United States (US) Court of Appeals for the District of Columbia Circuit rejected all American Industry's many challenges to the new silica dust standard. It is important that all involved in the concrete repair and coating industry understand what is required to meet the new standard.

The Occupational Safety and Health Administration (OSHA) in 1926.1153 estimates that the new rule will save over 600 lives and prevent 900 new cases of silicosis each year, once its effects are fully realized. The final rule is projected to provide net benefits of about US $7.7 Billion, annually.

About 2.3 million workers are exposed to respirable crystalline silica in their workplaces, including 2 million construction workers who drill, cut, crush or grind silica-containing materials such as concrete and stone, and 300,000 workers in general industry operations such as brick manufacturing, foundries, and hydraulic fracturing, also known as fracking.

Those who do not comply with the new standard will be subject to a maximum fine of US $12,650 for a serious or other than serious violation; US $12,650 per day past abatement date for a failure-to-abate violation; and US $126,749 for a repeated or willful violation.

Crystalline Silica and Permissible Exposure Limits

Crystalline silica is a common mineral found in many naturally occurring and man-made materials used at construction sites. Materials like sand, concrete, brick, block, stone and mortar contain crystalline silica. Armorphous silica, such as silica gel, is not crystalline silica.

Respirable crystalline silica—very small particles typically at least 100 times smaller than ordinary sand found on beaches or playgrounds—is generated by high energy operations like cutting, sawing, grinding, drilling and crushing stone, rock, concrete, brick, block and mortar, or when abrasive blasting.

Before 2016, the OSHA Permissible Exposure Limit (PEL) Standard 1974[2] for crystalline silica Permissible Exposure Limit (PEL) was limited to 250 micrograms per cubic meter of air over an average of eight hours (typical work shift). The new standard reduces that exposure to 50 micrograms per cubic meter of air over the same time period, a reduction of 5 times what it used to be.

Implementation of New Standard

The first step for an employer is to determine if the standard applies to his work. If the work process is covered by the standard, an employer has two options for limiting employee's exposure to respirable crystalline silica:

1. Specified exposure control methods 1926.1153(c)1 Table[3], or
2. Alternate exposure control methods

Employers who choose the specified exposure option must fully and properly implement protections for the task or equipment listed on Table 1 of the standard. Employers who fully and properly implement the controls in Table 1 do not have to assess employee's silica exposure levels (No Air Monitoring).

Employers who follow alternative exposure control methods must:

1. Determine the levels of respirable crystalline silica that employees are exposed to (Air Testing).
2. Limit employee exposure to a PEL of 50 micrograms per cubic meter of air as an 8-hour time weighted average (TWA).
3. Use engineering and work practice controls, to the extent feasible, to limit employee exposures to the PEL, and supplement controls with respiratory protection when necessary.
4. Keep records of employee exposure to respirable crystalline silica.

All employers are required at all times to provide the following:

1. Provide respiratory protection when required.
   A. APF 10 Respiratory Protection.
   B. APF is an estimate of how much protection a respirator provides. A protection factor of 10 means no more than one-tenth of the contaminants to which the worker is exposed leaks into the mask. APF 100 means only one percent leakage.

2. Restrict housekeeping practices that expose employees to respirable crystalline silica where feasible alternatives are available.
   A. Example: Vacuum instead of sweeping.

3. Establish and implement a written exposure control plan, including designating a competent person.
   A. Employers must list all tasks that employees perform that could expose them to respirable crystalline silica dust.
   B. Describe the equipment used and factors that affect exposures, such as types of silica-containing materials handled in those tasks (concrete), weather conditions (wind or humidity), soil types (clay versus rock), and if tasks are done outdoors versus indoors or in enclosed locations.
   C. The plan must include a description of engineering controls, work practices, and respiratory protection used to limit employee exposure to respirable crystalline silica for each task.
   D. For each task that an employee performs, employers must describe types of controls used, like a dust collector with manufacturer's recommended air flow and a filter with 99 percent efficiency, effective work practices, as in checking that water nozzles are not plugged, and if required, appropriate respiratory protection, like a respirator APF of 10.
   E. Describe signs that dust control are not working effectively, such as increase in visible dust or no water being delivered to the saw blade.
   F. Employers must allow the written exposure control plan to be viewed or copied by each employee covered by the standard, their designated representative, and representatives from OSHA and National Institute for Occupational Safety and Health (NIOSH), upon request.
   G. If OSHA inspects a workplace, the OSHA Compliance Safety and Health Officer will ask to see employer's written exposure plan.
   H. A yearly review is required to evaluate the effectiveness of the written exposure plan.
   I. The employer must designate a competent person to frequently and regularly inspect job sites, materials and equipment to implement the written exposure control plan. A competent person is someone who:
      - Can identify existing and foreseeable respirable crystalline silica hazards;
      - Is authorized to promptly eliminate or minimize silica hazards; and
      - Has the knowledge and ability to implement the written exposure control plan.

Graphic courtesy of OSHA

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Table 1—Specified Exposure Control Methods When Working With Materials Containing Crystalline Silica

Equipment/Task	Engineering and Work Practice Control Methods	Required Respiratory Protection and Minimum Assigned Protection Factor (APF)	
		≤4 hours/shift	>4 hours/shift
(i) Stationary masonry saws	Use saw equipped with integrated water delivery system that continuously feeds water to the blade Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions	None	None
(ii) Handheld power saws (any blade diameter)	Use saw equipped with integrated water delivery system that continuously feeds water to the blade Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions:		
	• When used outdoors	None	APF 10
	• When used indoors or in an enclosed area	APF 10	APF 10
(iii) Handheld power saws for cutting fiber-cement board (with blade diameter of 8 inches or less)	For tasks performed outdoors only: • Use saw equipped with commercially available dust collection system • Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions • Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency	None	None
(iv) Walk-behind saws	Use saw equipped with integrated water delivery system that continuously feeds water to the blade Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions:		
	• When used outdoors	None	None
	• When used indoors or in an enclosed area	APF 10	APF 10
(v) Drivable saws	For tasks performed outdoors only: • Use saw equipped with integrated water delivery system that continuously feeds water to the blade • Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions	None	None
(vi) Rig-mounted core saws or drills	Use tool equipped with integrated water delivery system that supplies water to cutting surface Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions	None	None
(vii) Handheld and stand-mounted drills (including impact and rotary hammer drills)	Use drill equipped with commercially available shroud or cowling with dust collection system Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism Use a HEPA-filtered vacuum when cleaning holes	None	None
(viii) Dowel drilling rigs for concrete	For tasks performed outdoors only: • Use shroud around drill bit with a dust collection system. Dust collector must have a filter with 99% or greater efficiency and a filter-cleaning mechanism	APF 10	APF 10
(ix) Vehicle-mounted drilling rigs for rock and concrete	Use dust collection system with close capture hood or shroud around drill bit with a low-flow water spray to wet the dust at the discharge point from the dust collector	None	None
	OR		
	Operate from within an enclosed cab and use water for dust suppression on drill bit	None	None
(x) Jackhammers and handheld powered chipping tools	Use tool with water delivery system that supplies a continuous stream or spray of water at the point of impact:		
	• When used outdoors	None	APF 10
	• When used indoors or in an enclosed area	APF 10	APF 10
	OR		
	Use tool equipped with commercially available shroud and dust collection system Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions Dust collector must provide the air flow recommended by the tool manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism:		
	• When used outdoors	None	APF 10
	• When used indoors or in an enclosed area	APF 10	APF 10
(xi) Handheld grinders for mortar removal (i.e., tuckpointing)	Use grinder equipped with commercially available shroud and dust collection system Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions Dust collector must provide 25 cubic feet per minute (cfm) or greater of airflow per inch of wheel diameter and have a filter with 99% or greater efficiency and a cyclonic pre-separator or filter-cleaning mechanism	APF 10	APF 25

Table 1—Specified Exposure Control Methods When Working With Materials Containing Crystalline Silica *(continued from page 18)*

Equipment/Task	Engineering and Work Practice Control Methods	Required Respiratory Protection and Minimum Assigned Protection Factor (APF)	
		≤4 hours/shift	>4 hours/shift
(xii) Handheld grinders for uses other than mortar removal	For tasks performed outdoors only: • Use grinder equipped with integrated water delivery system that continuously feeds water to the grinding surface • Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions	None	None
	OR		
	Use grinder equipped with commercially available shroud and dust collection system Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions Dust collector must provide 25 cubic feet per minute (cfm) or greater of airflow per inch of wheel diameter and have a filter with 99% or greater efficiency and a cyclonic pre-separator or filter-cleaning mechanism:		
	• When used outdoors	None	None
	• When used indoors or in an enclosed area	None	APF 10
(xiii) Walk-behind milling machines and floor grinders	Use machine equipped with integrated water delivery system that continuously feeds water to the cutting surface Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions	None	None
	OR		
	Use machine equipped with dust collection system recommended by the manufacturer Operate and maintain tool in accordance with manufacturer's instructions to minimize dust emissions Dust collector must provide the air flow recommended by the manufacturer, or greater, and have a filter with 99% or greater efficiency and a filter-cleaning mechanism When used indoors or in an enclosed area, use a HEPA-filtered vacuum to remove loose dust in between passes	None	None
(xiv) Small drivable milling machines (less than half-lane)	Use a machine equipped with supplemental water sprays designed to suppress dust. Water must be combined with a surfactant Operate and maintain machine to minimize dust emissions	None	None
(xv) Large drivable milling machines (half-lane and larger)	For cuts of any depth on asphalt only: Use machine equipped with exhaust ventilation on drum enclosure and supplemental water sprays designed to suppress dust Operate and maintain machine to minimize dust emissions	None	None
	For cuts of four inches in depth or less on any substrate: • Use machine equipped with exhaust ventilation on drum enclosure and supplemental water sprays designed to suppress dust • Operate and maintain machine to minimize dust emissions	None	None
	OR		
	Use a machine equipped with supplemental water spray designed to suppress dust. Water must be combined with a surfactant Operate and maintain machine to minimize dust emissions	None	None
(xvi) Crushing machines	Use equipment designed to deliver water spray or mist for dust suppression at crusher and other points where dust is generated (e.g., hoppers, conveyers, sieves/sizing or vibrating components, and discharge points) Operate and maintain machine in accordance with manufacturer's instructions to minimize dust emissions Use a ventilated booth that provides fresh, climate-controlled air to the operator, or a remote control station	None	None
(xvii) Heavy equipment and utility vehicles used to abrade or fracture silica-containing materials (e.g., hoe-ramming, rock ripping) or used during demolition activities involving silica-containing materials	Operate equipment from within an enclosed cab	None	None
	When employees outside of the cab are engaged in the task, apply water and/or dust suppressants as necessary to minimize dust emissions	None	None
(xviii) Heavy equipment and utility vehicles for tasks such as grading and excavating but not including: Demolishing, abrading, or fracturing silica-containing materials	Apply water and/or dust suppressants as necessary to minimize dust emissions	None	None
	OR		
	When the equipment operator is the only employee engaged in the task, operate equipment from within an enclosed cab	None	None

1926.1153(c)(1) Table 1 (courtesy of United States Department of Labor, OSHA)
For each employee engaged in a task identified on Table 1, the employer shall fully and properly implement the engineering controls, work practices, and respiratory protection specified for the task on Table 1, unless the employer assesses and limits the exposure of the employee to respirable crystalline silica in accordance with paragraph (d) of the standard (the Exposure assessment): (d) Where the most recent exposure monitoring indicates that the employee exposures are above the PEL, the employer shall repeat such monitoring within three months of the most recent monitoring.

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The employer can designate any of his or her employees to be a competent person if the employee is qualified, including the employee who does the work on the job. For example, employees who go to jobsites alone can be designated a competent person if they know how to properly implement controls on the tools they use, can recognize if the controls are not working, and correct the non-working controls.

The standard does not require specific training for a competent person. The employer is responsible for determining what training is necessary to provide the knowledge and ability for his or her competent person to implement the written exposure control plan.

4. As required under OSHA Respiratory Protection Standards (1926.103[4] and 1910.134[5]), employers must perform medical evaluations and fit tests for all employees wearing respirators. In addition, the Respirable Crystalline Silica Standard (1926.1153) requires employers to develop a medical surveillance program for all employees required to wear a respirator for 30 days or more per year. Medical surveillance program requirements include:
   A. Employers must offer baseline medical examinations within 30 days of initial assignment that requires the employee to wear a respirator, unless the employee has received a medical examination that meets the requirements within the last three years.
   B. Examinations must be performed by a physician or other licensed health care professional.
   C. Employers are required to provide their employees with medical examinations every three years from the employee's last examination that met the requirements of the silica standard.
   D. When unexpected circumstances result in employees being required to wear respirators more frequently than first expected, employers must make medical surveillance available as soon as it becomes apparent that the employee will be required by the silica standard to wear a respirator for 30 or more days per year.
   E. Employers must provide the health care professional with a copy of the 1926.1153 standard; the employee's former, current and anticipated duties; the employee's former, current and anticipated exposure levels; PPE information (type used, when, and duration of use); and any employment-related medical examinations in the employer's control.
5. Communicate hazards and train employees.
   A. Employers must train and inform employees covered by the silica standard about respirable crystalline silica hazards and the methods the employer uses to limit their exposures to those hazards. Employers must cover the cost of training and must pay employees for the time spent in training.

Conclusion

This article is a condensed discussion of how the new OSHA 1926.1135 standard will affect your jobsite and employees' ability to do surface preparation. Remember that these new standards are in place to protect our employees and others that are on the jobsite or close by.

For more information on the new silica standards, contact your nearest OSHA office, visit www.osha.gov, or call 1-800-321-OSHA (6742). You can also look to trade associations, unions, equipment manufacturers and dealers for help in getting your silica program up and running.

If you need help to develop a written exposure control plan, CPWR—The Center for Construction Research and Training has a tool to help employers develop their plan and is available at www.silica-safe.org. ■

References

1. OSHA 29 CFR 1926.1153, Respirable Crystalline Silica, Part 1926, United States Department of Labor, Occupational Safety and Health Administration, Washington, DC 20210.

2. OSHA PEL Standard 1974, Permissible Exposure Limits, United States Department of Labor, Occupational Safety and Health Administration, Washington, DC 20210.

3. OSHA 29 CFR 1926.1153(c)(1) Table 1, *Specified Exposure Control Methods When Working with Materials Containing Crystalline Silica*, Part 1926, United States Department of Labor, Occupational Safety and Health Administration, Washington, DC 20210.

4. OSHA 29 CFR 1926.103 Respiratory Protection Standard, 1998, United States Department of Labor, Occupational Safety and Health Administration, Washington, DC 20210.

5. OSHA 29 CFR 1910.134 Respiratory Protection Standard, 1998, United States Department of Labor, Occupational Safety and Health Administration, Washington, DC 20210.

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INTERNATIONAL CONCRETE REPAIR INSTITUTE

WOMEN in ICRI

ICRI announces the formation of a dynamic forum for its female constituents and members to:

- network;
- advance knowledge;
- address barriers that may be controversial regarding growth and participation in policy making and industrial leadership; and most important,
- recognize the challenges and successes of women who share a place within the concrete repair industry.

First Meeting of *Women in ICRI* Held

The first meeting of *Women in ICRI* was held April 13, 2018 during the ICRI Spring Convention in San Francisco and it was truly enthusiastic and inspiring.

Because having planned meetings at the ICRI Fall and Spring Conventions will not allow all of our members and colleagues to participate, it is important to build our *Women in ICRI* network at the local chapter level, University/College level, internationally and through media exposure.

Meeting Summary

The meeting started with introductions and brief descriptions of what attendees wanted to gain from being part of this women's group. Items discussed were:

- equality in the work place, on the jobsite and within the pay scale were discussed.
- "appropriate language" and perceptions of women in our industry, not only in the office or jobsite, but in the academic environment, social media genre and as owners and entrepreneurs.

The immediate focus of the group will be sharing ideas, networking, providing support for the creation of open conversation when responding to negative behavior, words and/or body language. It was agreed that *Women in ICRI* would also become a reliable and friendly resource for job searches, resume review and design, marketing of new ideas, references for deals on clothing and safety gear for women, checklists and tips for promoting our businesses and career growth.

Women in ICRI looks forward to having guest speakers, professional facilitators who will run career related workshops, participating in community and industry outreach programs, and interact with other women groups within the engineering and restoration communities.

Men will be invited to join our group to share their views about how things have changed for them with more women entering the field of concrete repair and possibly participate in some role-playing.

Most importantly, *Women in ICRI* needs to be a safe place where women in our industry can find a trusted group of colleagues who can supply support, advice, information, friendship and fun.

A brief survey will soon be initiated helping *Women in ICRI* organize a social media and webinar plan.

Interested women, students, wives and partners of ICRI members, educators, owners and government employees are encouraged share their ideas and contact information. Men are also encouraged to share their insight and support. Please email Katherine Blatz, katherine.blatz@basf.com, or Monica Rourke, mrourke@mapei.com

Thank you for your interest, enthusiasm and partnership.

"We empower one another by supporting and helping one another."

If you are interested in in the development of this group, contact:
Katherine Blatz, Katherine.blatz@basf.com | Monica Rourke, Mrourke@mapei.com | Gigi Jaber-Sutton, gigij@icri.org

Behavior-Based Safety: Making the Case for a Focus on Habits

BY RYLAN PAGE

Fig. 1: Sign showing required safety controls at the Nipigon River Bridge Project in Ontario, Canada

As safety professionals, we are tasked with ensuring our company activities conform to regulations. It's up to us to help supervisors achieve all the requirements for job site safety. This usually means implementing solutions according to the *hierarchy of controls*. As the name suggests, there is a preferred order to deploying safety solutions, with engineering controls coming first, followed by administrative controls, and then by personal protective equipment (PPE)—the last line of defense.

Using these controls at work means putting guards on tools and points of contact; developing risk assessments, hazard controls and procedures for performing all tasks safely; and providing all the appropriate PPE as well as training on its use and selection (Fig. 1). The hierarchy of controls means that we can ensure that our crews are pulling post-tensioned cables safely in confined spaces, that they are applying cathodic protection to cooling towers 400 ft (122 m) in the air safely, and that they are using top-of-the-line safety controls to administer structural strengthening underneath bridge decks over water.

The industry does well when performing very dangerous work as safely as possible—especially given the hazardous potential of construction work. Unfortunately, even our best is not good enough. According to the US Bureau of Labor Statistics, the construction industry still leads all industries with the total amount of fatal workplace injuries each year.[1] It's not a good race to be winning. Even though we do a lot to keep our work-

force safe, we need to ask ourselves how we could do better, and one considerable answer is to focus on changing attitudes toward safety.

Safety Is Not Only a "Work Thing"

Statistics from the National Safety Council show that almost 90% of unintentional injuries happen off the job—and only 3% of deaths caused by unintentional injury happen at work.[2] In fact, more people are hurt or killed while driving as all workplace incidents combined (Fig. 2).

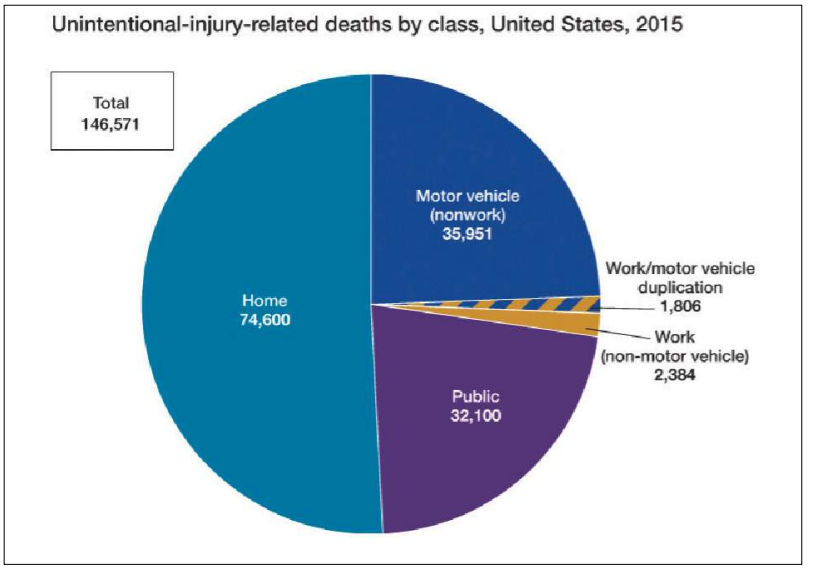

Fig. 2: Unintentional-injury-related death statistics (image courtesy of the National Safety Council)

Why is there such a large discrepancy between safety at work and safety at home? One piece of the puzzle is the fact that there is no enforcement at home. We don't have supervisors breathing down our necks to "tie-off" and "secure the ladder" when we clean the gutters or to "wear protective footwear" when we mow the lawn. People are far more likely to take shortcuts off the job because safety is not a 24/7 concern to them. It's only a "work thing."

Even at work, rules and engineering solutions do not achieve the desired results. Incidents happen every day, even though supervisors remind workers to be compliant and watch them as closely as possible.

We know that there aren't any functional defects with safety controls, but users of the controls are still getting hurt. This means we need to take a closer look at the users—the workers. One of the reasons that employees take safety shortcuts is because they don't see the need to follow every rule and regulation to the letter. It's up to us to make safety something they believe in, and not just something they have to do.

For these reasons, in addition to safety basics like hazard controls, it is also important to focus on behavior. If we can help people get committed to safety and develop better habits at home and on the road, they will be much more likely to be safe at work.

This is where leaders, managers and safety professionals can help by adding a few simple pieces to the company safety program and its language. Using systems that are easy to integrate with existing programs are advised, rather than introducing additional control solutions—new initiatives are easier to implement when they don't involve tons of additional paperwork!

I am Safe Enough, but Is My Family?

Experience tells us that simple and proven behavior-based programs will provide streamlined additions to hazard assessment and control. For example, the SafeStart process adds just a few simple concepts to a safety program; states of mind lead to errors which lead to increased risk. These additions include teaching workers about common errors that lead to incidents at work, at home and on the road, and provides them with error reduction techniques to help them avoid these errors wherever they are. It's not a total overhaul but it can have a huge impact on getting workers to truly believe in safety.

One of the crucial outcomes is that workers are convinced that 24/7 safety is important. To do that, spend a lot of time thinking and talking about what's most important to workers. Good behavior-based solutions focus on workers' motivations—and for almost everyone, the biggest priority is the safety of their loved ones. So we make sure that our safety programs provide workers with the right behavioral tools and the safety language that helps them look out for their families.

For example, it's not possible to give your children PPE whenever they play. But developing a common language and making them aware of situations in which they are more likely to be harmed is going to help keep them safe. Telling children to "be careful" doesn't work. But making them realize that rushing might cause them to miss something dangerous (such as an approaching car) will make it much easier to tell your kids to "slow down" and have them understand why.

That is how simple a behavior-based component can be. Most people think that they are safe enough as it is, but give them the tools to help them keep their family safer, and you might see a change in their own behaviors.

Behavior-Based Safety Benefits

Adding behavior-based safety components and continuously supporting them can be a part of significantly reduced recordable injury rates. This is great news for the industry and encourages companies to keep working hard to ensure the continuing safety of workers. Taking a 24/7 safety approach really works. But if we want to keep improving our workers' engagement in safety, focusing on injury rates is not the way forward. That's because the injury rate is a lagging indicator that shows the

Fig. 3: Workers catch up and share stories during stretch and flex sessions at the Antelope Valley Station in North Dakota

Fig. 4: Toolbox session helps share safety messages and continuous learning of behavior-based safety programs in front of the Legislative Building in Edmonton, AB

results of our commitment but doesn't measure engagement. And that's what we should concentrate on to make our next leap forward in safety.

One of the best ways to measure engagement is with leading indicators such as near-hit reporting. Near-hit reporting by frontline staff increases when focusing on behavior-based safety programs and educating workers on the errors contributing to potential mistakes. Near-hits are important to share during daily safety huddles, morning stretch and flex periods (Fig. 3), and weekly toolbox training sessions (Fig. 4).

Importantly, these discussions should also include mistakes made at home and descriptions of how workers are going to commit to being safer all day, not just for themselves or their company, but for their family. This helps reinforce the fact that safety is an around-the-clock issue. Safety is not just a "work thing," it's an attitude and a habit that should be shared with our families.

Communication as a Safety Tool

The use of near-hit reporting closely relates to the fact that good behavior-based programs stress the importance of using stories to always keep the importance of safety fresh. Stories help to identify unsafe acts and behaviors. The way stories are told needs to encourage people to work on habits, remind them about the most common errors before starting work, or support them in using their error reduction techniques when performing hazardous tasks.

Sharing stories makes future incidents less likely to happen, creates a sense of community, and encourages people to look out for each other. When leaders start to share their own stories of how they nearly got hurt at work or at home, they actively participate in the building of a stronger safety culture, showing

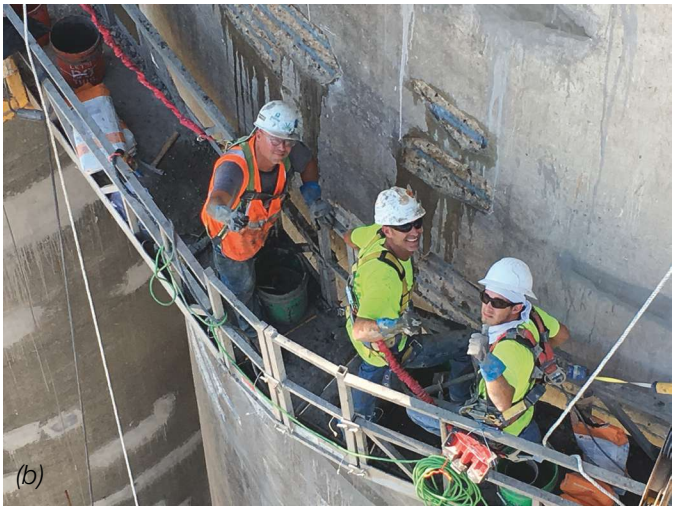

Fig. 5a & b: Workers are encouraged to work together and watch out for one another, building strong culture and teamwork even on the most dangerous projects

their commitment to changes in behavior, starting with themselves.

Stories play a big part in communication. Behavior-based programs also strive to provide the workers with a common safety language because they are likely to become more engaged and discuss safety if they have a language to address it. After a while, using a common safety language and looking out for the safety of others becomes part of the workplace culture. When workers look out for one another, rather than having to look over their shoulder for a supervisor or safety cop, it builds team resolve (Fig. 5).

We can spend a lot of time and money implementing every control imaginable when it comes to preventing incidents on construction sites, and we should certainly strive to do that. But, as the statistics show, engineering controls are not everything, and they certainly aren't doing enough. Introducing a behavioral component can result in a marked improvement in safety and morale and help increase compliance by getting workers to believe in safety. With some small additions, you can help change workers' attitude and shift their perspective of safety from "a work thing" to a 24/7 habit. ■

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Rylan Page *is the Corporate Safety Manager for Vector Construction and supports the company's safety programs in North America and Europe. Rylan received a Diploma in Civil Engineering Technology and is a Gold Seal Certified Project Manager with the Canadian Construction Association. Rylan has obtained a Canadian Registered Safety Professional with the Board of Canadian Registered Safety Professionals, and Certified Health and Safety Consultant status with the Canadian Society of Safety Engineers. He has 15 years of experience managing operations in the construction industry and has been directing the Vector Safety Program for the last 5 years. Rylan is a member of the Canadian Society of Safety Engineers, The American Society of Safety Engineers, the Canadian Construction Association, and the National Safety Council.*

Hand-Held Water Blasting Equipment Safety Awareness

BY SAM DICKSON

Fig. 1: Medical treatment of skin penetration from a low-pressure water jet

Throughout the concrete repair industry there is widespread use of hand-held water blasting equipment (hand lance). The hazards of this equipment are very real and often misunderstood and underestimated. Be it a 3,000 psi (21 MPa) low-pressure water cleaning unit (pressure washer) used to clean a prepared surface prior to a repair material placement or a 40,000 psi (276 MPa) hand lance system used for concrete surface preparation or coating removal, this equipment can be dangerous.

The 2,500-4,000 psi (17-28 MPa) gasoline-powered pressure washer is a common tool routinely used on commercial jobsites. Even consumers can purchase a small pressure washer for home use at the local hardware store. Many pressure washer users are unaware of potential hazards associated with the waterjet produced by these machines. Even the "low" powered units can be extremely hazardous.

The lowest powered pressure washer available on the Web is a 110v electric pressure washer with a rated output of 1,350 psi (9 MPa) @1.45 gal/min or GPM (5.5 liters/min or LPM). Even the waterjet from this "light duty" pressure washer has the ability to pierce the skin. Herein lies the real danger associated with operating any pressure washer. A short blast from the water jet that pierces the skin will inject water into the body. Even if the water is potable, it contains microorganisms capable of infecting the body. In addition, the waterjet will carry any dirt that may be on the skin (along with bits of clothing and other debris) into the body. This can be a nasty injury that sidelines you for an extended period of time.

From homeowners cleaning their decks, casual users at the coin-operated car wash, to a worker on a commercial jobsite, pressure washers are commonly used power tools. Do we always properly protect ourselves from the hazards when we use these tools? These hand lances use pressurized water jets. They can be hazardous to work around regardless of their pressure. The danger only increases as we move up through the range of water cleaning and water jetting hand lances from low-pressure water cleaning "pressure washers" (typically less than 5,000 psi [34MPa]) to high-pressure water cleaning (5,000–10,000 psi [34-70 MPa]), to high-pressure water jetting (10,000–25,000 psi [70-170 MPa]) to ultra-high-pressure water jetting (25,000 psi [170 MPa] and greater). Hand lance systems that operate at pressures in the range of 40,000 psi (276 MPa) are readily available.

Hand-Held Water Blasting Equipment Hazards

Hazards of pressurized hand-held water blasting equipment include:

1. The water jet can easily penetrate the human body, causing severe tissue damage, injecting microorganisms and debris into the body. A quick blast to the foot with a "0 degree nozzle" from low-pressure cleaning equipment may seem like a benign injury; after all, it is just a small red dot when in fact, several ounces of water along with debris may have penetrated deep into the skin and soft tissue of the foot. These injuries are serious, even life threatening, and require professional medical attention. First aid cream and a band aid will only lead to trouble. This injury will require opening the wound and going deep enough to allow the removal of debris and damaged tissue from the wound. The wound will require suturing, along with a regimen of powerful antibiotics. Recovery time can be significant.

It is important to note that the injury in Figure 1 is from a low-pressure water jet. Contact with human tissue by high-pressure water jetting equipment can result in complete destruction of tissue. Following this injury, there may be nothing to repair.

2. Flying debris and other material that has been blasted from the surface can be propelled at high velocity by the water jet, and is capable of causing serious damage to personnel and property. A water jet can travel at speeds up to 3,000 f/s (914 m/s) and can propel a stone through the window of a building or the windshield of a car. Flying debris is something we would all rather avoid, and we definitely want to avoid bodily injury such as debris in the eye or a laceration caused by flying debris.

3. The loud noise from the engines driving the pumps or the water jet is a continuous droning noise at an elevated decibel level which will require the use of hearing protection. In addition, the sound caused by the water jet passing through the substrate (such as a blow-through during concrete removal using hydrodemolition or during caulk removal when the water jet blows through an open joint) can be very loud, similar to that of gunfire. A hearing conservation program should be employed.

4. Musculoskeletal injuries can occur from repetitive motion, working in an awkward position, or in confined space, and from the thrust/reaction force of the water jet. Using the light duty 2,000 psi (14 MPA), 2 GPM (7.6 LPM) pressure washer at the car wash for 15 minutes may not cause your hand to cramp or give you a sore back, but operating a 4,000 psi (28 MPa), 4 GPM (15 LPM) unit for 5 hours of trigger-on time out of an 8-hour shift can leave one tired and sore at the end of the day. When we step up the power to a 10,000 psi (69 MPa), 20,000 psi (138 MPa) or 40,000 psi (276 MPa) system, we increase reaction force, further increasing the fatigue level. Consider rotating employees while operating a hand lance to alleviate fatigue.

5. A hand-held water jet system utilized on a work site or a pressure washer used in your backyard while cleaning the siding on your house can cause slip, trip, and fall hazards. Hoses, debris, wet conditions, and access equipment required to reach your work area (ladders, man-lifts and scaffolds) can all lead to a potentially hazardous work area.

6. Last, if the equipment is not an electric motor driven unit, then we have the potential hazard of carbon monoxide gas from an engine driven pump. A jobsite where there is not adequate ventilation can lead to trouble. When employees are exposed to conditions where carbon monoxide is present, air monitoring equipment should be used. Electric driven pumps must have the proper electrical supply, extension cords, and Ground Fault Interrupter (GFIs) installed to ensure against electrical shock.

Administrative and Engineered Controls

After we have assessed the job and determined that hand-held water blasting equipment is the best tool to perform the work, then we need to consider ways to protect ourselves and the public from the hazards, starting with Administrative and Engineered controls. Employ policies and procedures for shielding, perimeter control, ventilation, use of PPE and specific equipment requirements. Establish a perimeter around the work area to keep everyone away from the hazard, including proper warning signage, and only allow those directly involved with the work in the work area (Fig. 2). Use shielding around the perimeter to protect adjacent areas from flying debris. Shielding should be sturdy enough to block any flying debris propelled by the water jet. Shielding can be used as a part of the hand lance (Fig. 3). Three mil (0.003 in) plastic may not be sufficient. Cleaning algae from home siding with a light duty pressure washer requires less shielding than a concrete scarification project

Fig. 2: Warning signage and caution tape to designate the work area

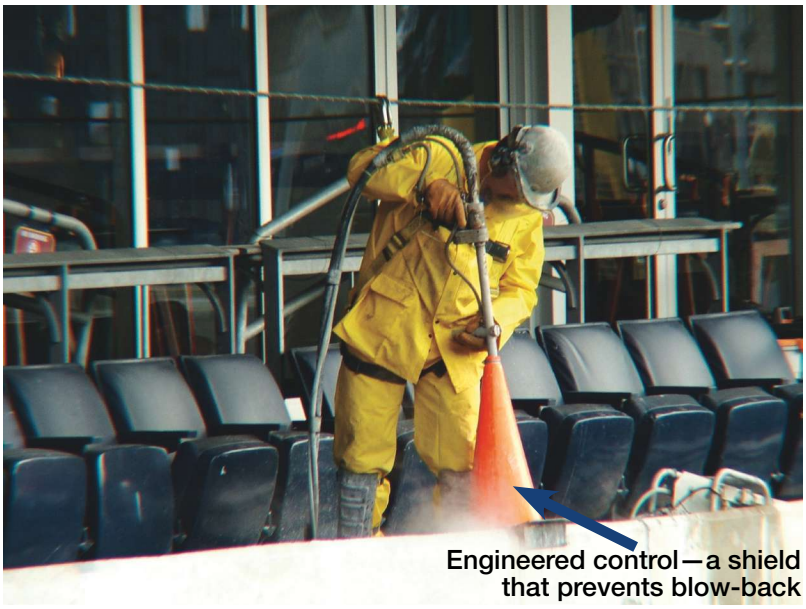

Fig. 3: Engineered control to protect operator

using an ultra-high pressure water jetting hand lance. Ensure there is adequate ventilation to move fresh air through the work area to keep carbon monoxide levels low and water vapor or steam moving out of the work area.

A minimum hand lance length should be considered that makes it difficult for the operator to point the hand lance at their own body (Fig. 4). Typically, a hand lance with a 48 in (122 cm) barrel will make it difficult for the average size person to direct the water jet at their body. The foot has the greatest potential to be struck by the water jet and the hand lance length should be sufficient to ensure the operator cannot direct it in a way that would allow the water jet to strike their foot. All hand lances should be equipped with safety trigger locks which prevent the operator from inadvertently pulling the trigger when performing other tasks.

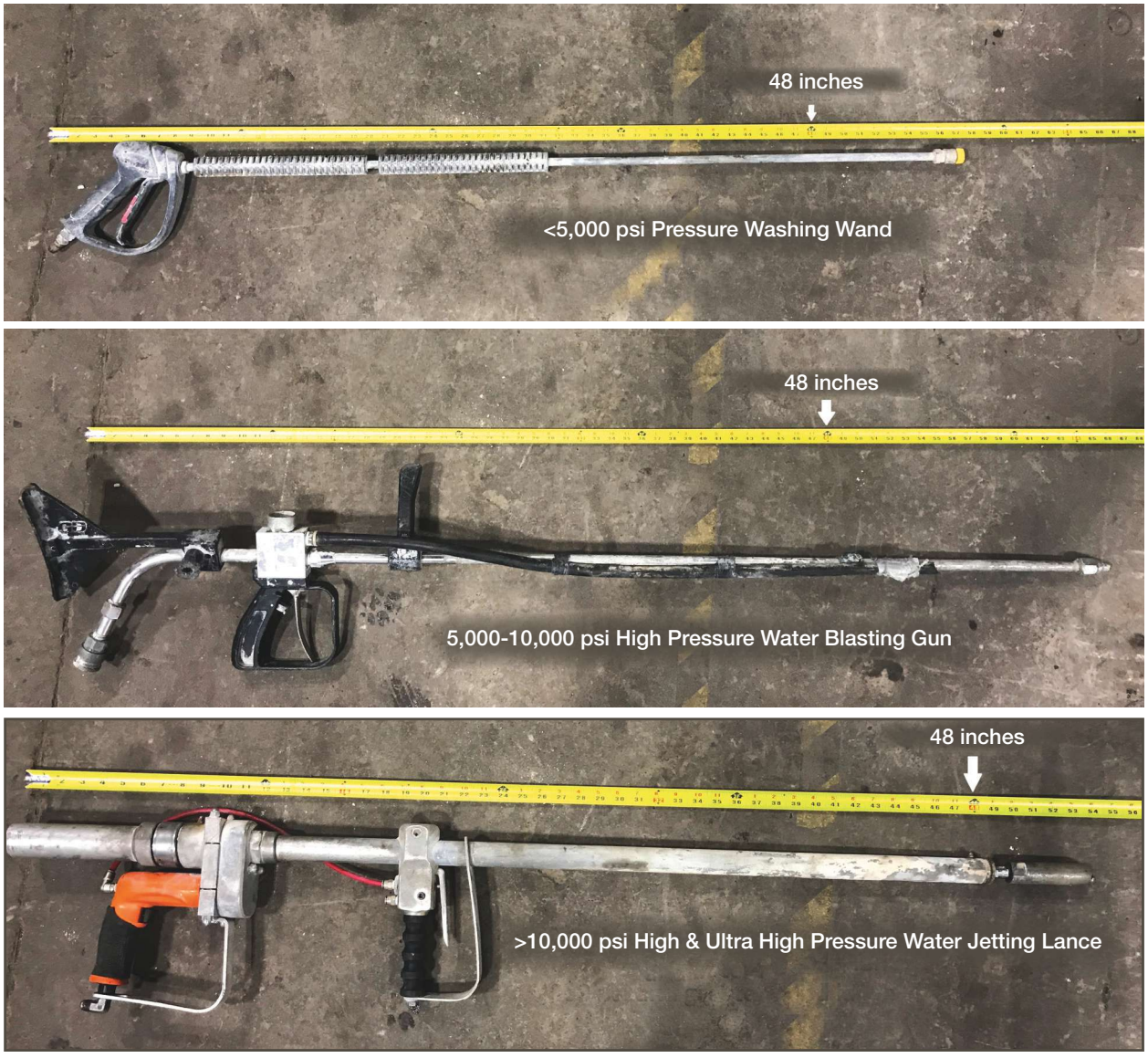

Fig. 4: Hand lances with long barrels to minimize the potential for operator injury

Personal Protection Equipment (PPE) Considerations

All pressure washing, cleaning and surface preparation activities, regardless of the pressure and flow rate, should consider minimum PPE requirements (Fig. 5):

- Safety toe boots with metatarsal protection;
- Shin guards with armored ankle protection;
- Hard hat, safety glasses or goggles, and face shield;
- Leather gloves;
- Hearing protection;
- Reflective clothing; and
- Waterproof clothing.

When pressures exceed 5,000 psi (34.5 MPa), there should be pre-activity planning and documentation, including the potential for additional PPE such as body armor (Fig. 6).

Hand-Held Water Cleaning and Water Jetting Equipment

Equipment must be maintained in order to ensure safe operation. Pressurized water blasting equipment must be inspected prior to operation; any defective components, such as corroded fittings or hoses where the outer protective jacket has been compromised and the inner steel wire reinforcement is showing, should be taken out of service immediately. Ensure safety triggers function properly and are equipped with a trigger lock. An over-pressurization safety device (pressure relief, rupture disk, unloader valve) must always be used. These are typically located on the pump or on the discharge (high pressure) side of the pump's plumbing and are designed to prevent over-pressurizing the system. Ensure all components of the system are rated for the correct working pressure including hoses, hand lances, and all plumbing fittings. Note that some low powered equipment may use regular pipe threads, and common black steel fittings from the local hardware store may not be rated for the pressures of the equipment. Never modify equipment or use components with an incorrect pressure rating.

General considerations for safe equipment use and operation include:

- Always inspect equipment before, during and after use;
- Never attempt to tighten fittings while a system is pressurized;
- Use lockout/tag-out procedures and ensure system has had the pressure relieved before servicing;
- Ensure hose restraints (whip checks) are used at all connections;
- Always have your body positioned, stabilized, and ready for the thrust from the water jet that will occur when you pull the trigger;
- Do not point hand lance at anyone.

Fig. 5: Typical PPE for hand lance operation

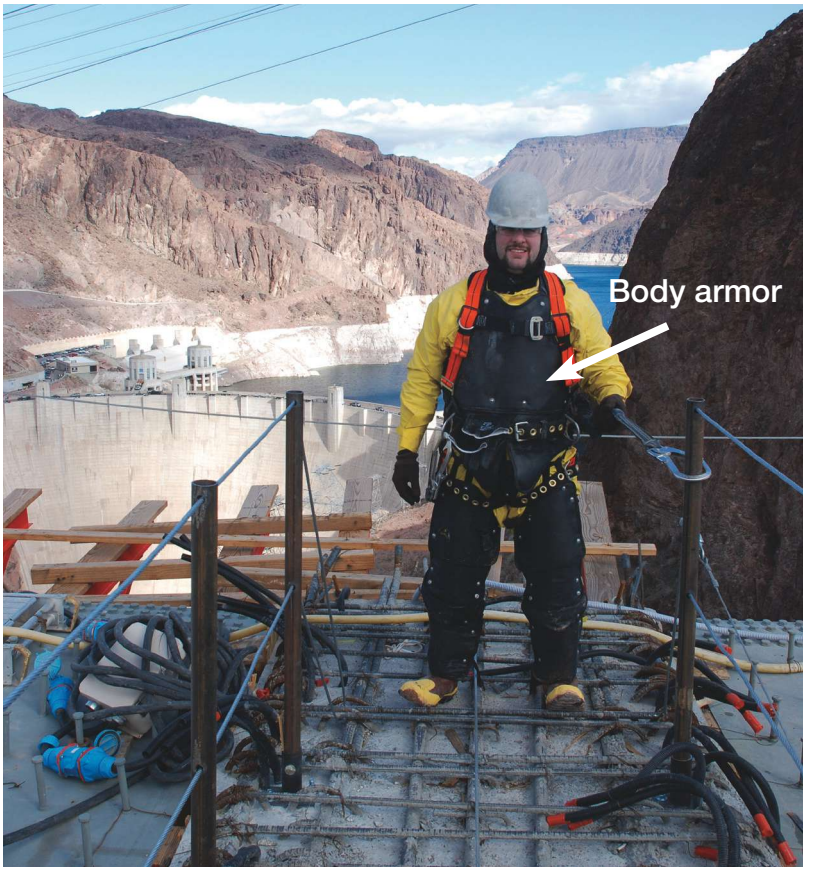

Fig. 6: Body armor used in conjunction with a hand lance

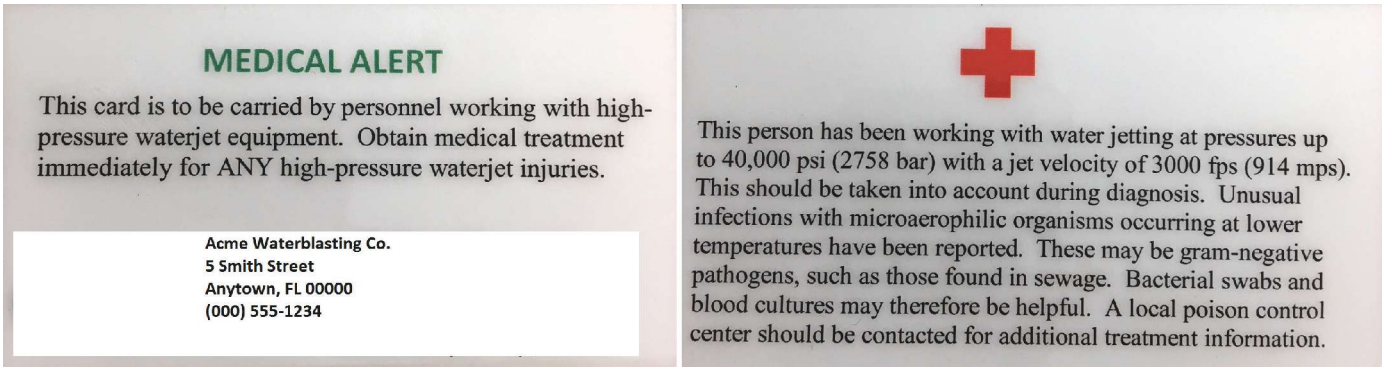

Fig. 7: Medical Alert card example

- Do not point the hand lance at anything not intended to be pressure washed/water jetted;
- Do not place any part of your body (legs, arms, hands, fingers, feet or toes) into the water jet stream;
- Do not clean dirt or debris from your clothes or boots with a pressure washer;
- Provide fire extinguisher by all gas and diesel engines; and
- Administer specific operational training prior to anyone operating the equipment.

Conclusion

Hand-held water blasting equipment is an extremely useful tool that many of us encounter on a regular basis. Take the time to closely examine your safety protocol and keep everyone **safe**. All who use, or are around, pressurized water blasting equipment should carry a Medical Alert Card (Fig. 7) that informs medical personnel of the unique injury a water jet can produce. A waterjet injury can be very serious and requires professional medical treatment. This injury is similar to a gunshot wound and should be treated as such. They can result in severe internal tissue, blood vessel, and organ damage. The wound may require X-ray and/or surgical intervention. Unusual infections can occur and the water source should be considered in deciding on antibiotic therapy. Aggressive irrigation and debridement is needed to ensure the wound is sufficiently cleaned. First and foremost, take all precautions to avoid a waterjet injury as it is extremely serious and potentially life threatening. ■

Sam Dickson *is the Operations Manager at Rampart Hydro Services and a graduate of Pennsylvania State University. He has been with Rampart for 8 years. Sam has been active with ICRI as a Pittsburgh Chapter Board Member and is on the Committee 120 Environmental Health and Safety as well as Committee 310 Surface Preparation. Sam is also an ICRI Tier 1 Concrete Surface Repair Technician.*

CONCRETE REPAIRCALENDAR

JUNE 21-22, 2018
ICRI Concrete Slab Moisture Testing Certification
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Website: **www.icri.org**

NOVEMBER 7-9, 2018
2018 ICRI Fall Convention
Omaha Marriott Downtown at the Capitol District
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Theme: *Resiliency—Above and Beyond Concrete Restoration*
Website: **www.icri.org**

JANUARY 21-25, 2019
World of Concrete
Las Vegas Convention Center
Las Vegas, Nevada
Website: **www.worldofconcrete.com**

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Events can be emailed to editor@icri.org. Content for the September/October 2018 issue is due by July 1, 2018 and content for the November/December 2018 issue is due by September 4, 2018.

Preventing Falls from Heights through Temporary Anchorage Points

BY KEVIN GRANT

Fig. 1: Each employee is tied off to vertical ropes with rope grabs through the suspended scaffold rigging assembly

The construction industry is responsible for more fatal injuries than any other industry and falls are the leading cause of all construction worker deaths, according to the Bureau of Labor Statistics.[1] This statistic should not be as high as it is, because the Occupational Safety and Health Administration (OSHA) requires fall protection to be utilized for all employees working at heights of 6 ft (1.8 m) or greater.[2] So, what can be done to prevent falls in the construction industry? Employees are required to implement fall protection systems, but it is up to employers to make sure that employees have the necessary training and equipment required. When heights are involved, it is critical that fall protection systems are planned before any work has begun. Employees should also familiarize themselves with all potential fall hazards on their jobsite. Employers must train their employees on how to use their fall protection equipment and the hazards that are involved.

When it comes to fall protection systems, there is not a one-size-fits-all method for jobs, but utilizing either permanent or temporary fall protection systems are critical to making sure that each employee goes home safely at the end of each day.

When working from heights of 6 ft (1.8 m) or greater, the best practice to protect workers from falls is to eliminate or minimize the fall hazard itself. When permanent fall protection systems are not already embedded into the structure, a temporary fall protection system can be implemented instead to eliminate a fall hazard (Fig. 1). Installing a temporary fall protection system should include an anchor point, connectors, lanyards or a self-retracting lifeline, and a body harness (Fig. 2). To ensure a temporary fall protection system is installed correctly, the design of a temporary fall protection system should be created by the construction company's engineers and/or safety personnel.

Anchor points are a great form of temporary fall protection as they are designed to attach to concrete decking or concrete columns, making it easy to apply at any jobsite. There are multiple methods available for installing anchor points on a jobsite, allowing the engineer and/or safety personnel to choose what will work best for a particular situation. Some anchors can be embedded into the concrete before it dries, creating cost-effective temporary anchor points. Other anchors can be installed by drilling or bolting into the concrete structure. Both methods of installing anchor points provide effective measures to implement a temporary fall protection system in order to eliminate the chance of a fall.

So what qualifies as a safe anchorage point? When selecting an appropriate anchor point for a fall protection system, it is best to adhere to what OSHA defines as a safe anchorage point. OSHA defines a safe anchorage point in Section 1926.502 Appendix C as, "anchorages to which personal fall protection equipment is attached shall be capable of supporting at least 5,000 lbs (2268 kg) per employee attached, or shall be designed, installed, and used as a part of a complete personal fall protection system which maintains a safety factor of at least two, under the supervision of a qualified person."[3] When engineering anchor points, the anchorage must be capable of supporting twice the maximum intended impact load.

A common issue on the jobsite is that, in order to save time and try to fool onsite safety personnel, employees often try to create an illusion of being tied off. Employees should never be tied off to light fixtures, conduits, HVAC equipment, ductwork, rusted roof davits, or any anchor that does not support at least 5,000 lbs (2268 kg) in any direction. Suitably designed and installed anchors and support locations must always include a secure connecting point or a terminating component of a fall protection system which is capable of safely supporting the impact forces applied by a fall protection system or anchorage system. Temporary anchor systems can be removed when the job is completed or when that particular task is finished, leaving no evidence that the system was ever present.

Fatal occupational injuries can be prevented through a combination of proper safety training and adhering to the rules and regulations set forth by OSHA. Employers need to have a strong commitment to creating a safe working environment through a comprehensive safety program. Prevention of falls in the construction industry can sometimes be overlooked, but in actuality, they are one of the most important aspects to focus on in a job. Many employers and employees think about what it takes to get the job done and not what it takes to get the job done with every employee finishing the day safely. Going home at the end of the day seems to be taken for granted by employees, but it is up to the employer to ensure that employees do not take their safety lightly by training employees regularly in hazard recognition and how to work safely. Employers must always begin by considering what the worker exposure hazards are before any project is started. This will allow all workers to begin on a safe path to success on the job site, especially when heights are a factor. ■

Fig. 2: Employees are tied off on 10 ft (3 m) retractable lanyards attached to a temporary horizontal cable lifeline (fall hazards are eliminated, without any freefall)

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2. OSHA 29 CFR 1926 Construction Industry Regulations and Standards, United States Department of Labor, Occupational Safety and Health Administration, Washington, DC, 2013.

3. Ibid.

Kevin Grant *is the Safety Director for Concrete Protection & Restoration, Inc. He has over eight years of experience working as a Safety Director in the construction industry. Kevin holds a degree in Mechanical Engineering from the University of Maryland and is currently obtaining a second degree in Environmental Health and Safety Management. Prior to joining the team at CPR in October 2017, he worked as safety director at multiple mechanical construction companies throughout his years in the industry.*

In addition to Kevin's work experience, he also holds multiple certifications. He is certified in Fall Protection Safety, Confined Spaces, Excavation, Cranes, Silica, Blood-borne Pathogens, OSHA 511, OSHA 510, OSHA 30, OSHA 10, First Aid/CPR, Lockout/Tagout, Respiratory Protection, Occupational Exposure to Noise, JHA/JSA, Powder Actuated Tool Trainer, Legionella Awareness, Powered Industrial Trucks & Heavy Equipment, Electrical Safety, and is a certified OSHA 500 trainer.


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INDUSTRYNEWS

WORLD OF CONCRETE HITS 9-YEAR HIGH

World of Concrete's 43rd edition in January was the largest World of Concrete in 9 years. This event for the concrete & masonry industries drew 58,222 registered professionals and featured more than 1,567 companies (including 302 brand new companies) exhibiting across more than 747,411 net square feet of exhibit space.

Jackie James, Group Director, World of Concrete, said, "This has been an incredible year—the success of World of Concrete 2018 helps solidify WOC as the only annual event for concrete & masonry professionals. Having our largest event in 9 years proves that the construction sector is going strong worldwide. Participants, both domestic and international, experienced the very best the industry has to offer in terms of suppliers, products, services and education, and we look forward to an even larger event at WOC 2019."

World of Concrete 2019 will be held January 22-25 (Seminars 21-25), at the Las Vegas Convention Center.

JAN HOLT, CHANEY'S CHIEF CUSTOMER OFFICER, NAMED ONE OF MARYLAND'S TOP 100 WOMEN BY *THE DAILY RECORD*

Chaney Enterprises, a ready-mix concrete, aggregates, custom blends, and related construction supplies provider, announced that Chief Customer Officer Jan Holt was named to *The Daily Record's* listing of Maryland's Top 100 Women.

The Daily Record's Maryland's Top 100 Women recognizes outstanding achievements by women demonstrated through professional accomplishments, community leadership, and mentoring. Nearly 425 women were nominated this year and honorees were chosen by a panel of business professionals and previous Maryland's Top 100 Women honorees from throughout the state.

Holt has been with Chaney for almost 10 years. Prior to joining Chaney, she served as chief marketing officer for The Brick Companies and marketing manager for Outback Steakhouse. Holt was the first female president of the Maryland Ready Mix Concrete Association (MRMCA) in 2015, and currently serves as a board member. She devotes time to the Chaney Foundation, and is a member of the Maryland General Assembly's 21st Century School Facilities Commission. Holt currently mentors students of Southern High School by working with them on career pathing. With her help, students graduate high school knowing what they plan to accomplish in their lives and their careers. Holt's work with Anne Arundel County Schools and these skills are now included in the school system's curriculum.

"Maryland's Top 100 Women create change and break barriers in their professional worlds but also make a difference at home and in their communities," said Suzanne Fischer-Huettner, publisher of *The Daily Record*. "We applaud our honorees for their passion, their commitment to excellence and for the work they do to bring communities together. The impact these women make across our state demonstrates why they are truly Maryland's Top 100 Women. The Daily Record is honored to recognize them."

For more information on Chaney Enterprses visit www.chaneyenterprises.com. For more information on *The Daily Record* visit TheDailyRecord.com.

SIMPSON STRONG-TIE SUPPORTS STEM EDUCATION WITH HABITAT FOR HUMANITY PLAYHOUSE BUILD AT LOCAL MIDDLE SCHOOL

Simpson Strong-Tie, the industry leader in engineered structural connectors, fasteners, anchors and building solutions, is sponsoring a STEM (Science, Technology, Engineering and Math) playhouse build with Habitat for Humanity East Bay/Silicon Valley.

The STEM playhouse program was created by the local Habitat affiliate to enhance, supplement and support existing classroom learning around Science, Technology, Engineering and Math while encouraging creativity, critical thinking, collaboration and communication. Students in grades 6-8 follow specific curriculum leading to application of their STEM learning with the building of playhouses. Funding from the program supports Habitat's mission and the completed playhouses will be donated to children of military families. This is the second consecutive year Simpson Strong-Tie has supported the program, donating $25,000 and providing volunteers to help with the build.

"Simpson Strong-Tie has been a strong champion of Habitat's work for many years, and we're happy to have them partner with us on this educational initiative," said Habitat for Humanity East Bay/Silicon Valley President and CEO Janice Jensen.

Simpson Strong-Tie has supported Habitat for Humanity for more than two decades and has been a national sponsor since 2007, donating more than $5 million in cash and products, including the structural framing hardware (connectors and fasteners) and reinforced shear walls used in new home construction. The company also supports Habitat for Humanity's annual Jimmy and Rosalynn Carter Work Project and Habitat Strong, a program for building more resilient homes.

INTERESTED IN SEEING YOUR NEWS IN THIS COLUMN?

Email your indusrty news to editor@icri.org. Content for the September/October 2018 issue is due by July 2, 2018, and content for the November/December 2018 issue is due by September 4, 2018.

In Need of Repair

ICRI Fills the Need for Training in the Concrete Repair Industry

The single largest opportunity for people entering the construction trade is in concrete repair, rehabilitation, and restoration.

More concrete is used than all other construction materials combined—12 billion tons placed annually. It is the second most common man-made material in the world, second only to potable water. However, the volume of *existing* concrete is at least 30 times the volume of new concrete—at least 360 billion tons of existing concrete worldwide.

Despite its durability, concrete structures require maintenance and repair.

The ASCE Report Card estimates $4.6 trillion needs to be spent over the next 10 years to return our infrastructure to a "C" rating—$14,241 per American citizen.

Concrete repairs are not performing satisfactorily.

The US Corps of Engineers Study REMR CS2 states, "A little more than 50% of the repairs performed on Corps structures are performing satisfactorily, which is an unacceptable rate. Failures are attributable to design or evaluation errors, material performance, and installation or construction errors. The Corps' experience is not unusual."

The Corps' findings were confirmed by CONREPNET—an examination of 215 case histories where about 50% of repairs were deemed successful. Of those repairs it was found that 20% deteriorated within 5 years, 70% within 10 years, and 90% deteriorated in 25 years.

We NEED trained concrete repair professionals.

An informal poll conducted at the 2017 International Concrete Repair Institute Fall Convention reported over 95% of contractor members polled indicated a need for new workers to go immediately to work in the concrete repair and restoration field.

Due to the number of concrete structures that are in need of repair, restoration, and maintenance—*and* the lack of satisfactory performance of repairs previously performed—the need for field workers who are trained in concrete repair methods and standards has never been greater.

Educational content exists.

ICRI had its origins at a World of Concrete seminar in February 1988, during which attendees voiced their frustration about the lack of standards and guidelines for concrete repair. They also expressed their concern over the proliferation of unqualified contractors entering the industry. These contractors were not properly trained in concrete repair and were underbidding without proper knowledge of surface preparation, equipment, materials, techniques, etc.

Since then, ICRI has created and updated technical guidelines, publications, and certification programs to educate concrete repair professionals on all aspects of concrete repair.

INTERNATIONAL CONCRETE REPAIR INSTITUTE

ASSOCIATIONNEWS

CONNECTICUT CONCRETE PROMOTION COUNCIL ASSISTS CONCRETE CARES WITH DONATIONS FOR CHILDREN

Mike Murray of Arkansas-based Concrete Cares put out the call for donations for his charity organization Concrete Cares. The Connecticut Concrete Promotion Council heard the call and helped out... with some assistance from the Friends of the Cheshire (Connecticut) Library.

Murray's non-profit organization is dedicated to fighting cancer and specifically aiding children afflicted with the dreadful disease. Mike's organization broadcast a request over social media that they needed DVDs of popular children's movies to distribute to children in hospitals. Enter the Cheshire Public Library and the Friends of the Cheshire Library. Tom and Debbie Morck, directors of the annual library book sale, were the resource that volunteer (and Connecticut Concrete Promotion Council's Executive Director) Dominic Di Cenzo approached for DVD donations. Tom Morck commented, "During every book sale, we always get donations of used DVDs and the library also rotates older titles out of stock. When Dom called us, we very quickly organized the first shipment of more than 60 children's DVDs from the materials we had on hand. Dom's organization, the Connecticut Concrete Promotion Council took it from there—boxing up the DVDs and shipping them to Mike in Arkansas for his Concrete Cares organization."

Di Cenzo said, "The Connecticut Concrete Promotion Council is challenging other Ready Mix Concrete Associations around the country to join in donating any 'gently used' children's movies for the Concrete Cares cause. There is probably no family in the concrete community that has not been affected by cancer in one way or another. Ready Mix Associations should reach out to their membership and libraries in their communities as a resource for donations and send them to Concrete Cares." As Mike Murray says, "We can beat cancer one yard at a time."

For more information on Concrete Cares, visit https://www.concretecares.com.

For more information on the Friends of the Cheshire Library, visit https://www.cheshirelibrary.com/friends-of-the-library/.

For more information on the Connecticut Concrete Promotion Council, visit www.ctconstruction.org.

AMERICAN CONCRETE PUMPING ASSOCIATION ANNOUNCES AWARD WINNERS

The American Concrete Pumping Association (ACPA) is pleased to announce the recipients of the 2017 ACPA Awards:

2017 ACPA Safe Operator of the Year – Sheldon Gier, Kokosing Construction Company, Fredericksburg, Ohio. On the jobsite at Kokosing Construction Company, Sheldon Gier is known as a mentor and leader who is capable, confident, and committed to emphasize the company mission of working and living with safety on the mind. Gier has held certification as an ACPA concrete pump operator for more than 12 years of his 30-year construction career. He recently reached the achievement of working 10,000 man-hours accident-free and has had no damage to date to any equipment or accidents involving Kokosing equipment.

2017 ACPA Hall of Fame Award – Gabriel Ojeda, Fritz-Pak Corporation, Dallas, Texas, Gabriel Ojeda, President and CEO of Fritz-Pak Corporation, was born in Mexico City and raised and educated in Mexico. In 1984, Ojeda began working for Fritz Industries in Dallas and began managing the international promotion of Fritz Industries' newly patented product, Slick-Pak, in 1994. In 1998, an opportunity arose for Ojeda to buy the Admixture Division of Fritz Industries, and he and his wife Jane formed Fritz-Pak Corporation. As Fritz-Pak grew, Ojeda continued his involvement in the ACPA by working on committees and serving on the Board as a Manufacturing Member since 2006. Ojeda is the first recipient of the newly formed ACPA Hall of Fame Award.

2017 ACPA Lifetime Achievement – Bill Germany, Tri-Way Concrete Pumping, Dallas-Fort Worth, Texas. Bill Germany's long history in the concrete pumping industry began in 1976 when he formed Bill's Pumping Service. In 1977, Germany merged his pumping company with Tri-Way Concrete Pumping, the company his father founded in 1968. Through integrity and hard work, Germany helped build a business that became known for exceptional service and equipment for construction projects in Dallas-Fort Worth and beyond. Germany has remained committed to advancing the concrete pumping industry as an active member of the ACPA and its board of directors.

The ACPA Awards promote merit and achievement in the concrete pumping industry and recognize individuals who have made exemplary contributions to ACPA. Award winners embody the core values of advancing the concrete pumping industry and commitment to ACPA.

For more information about the ACPA, visit www.concretepumpers.com.

AMERICAN CONCRETE PUMPING ASSOCIATION ANNOUNCES ELECTIONS RESULTS

The American Concrete Pumping Association (ACPA) is pleased to announce the election of its new Executive Board, held January 24, 2018, in Las Vegas at the ACPA Annual Meeting and Awards Presentation. Elected to serve a one-year term, the newly selected Executive Board includes:

Executive Board
President: Gary Brown–R. L. McCoy Inc., Indianapolis, Indiana
Vice President: Wayne Bylsma–Cherokee Pumping Inc., Hampton, Georgia
Secretary: Eric Duiker –Cancrete Equipment, Mississauga, Ontario, Canada
Treasurer: Tony Inglese–CPE America LLC, Smyrna, Georgia
Past President: Beth Langhauser, Midwest Placing, Rock Island, Illinois

Also at the January 24 meeting, the ACPA announced results of recent elections for the following board positions:

Pump Directors
Wayne Bylsma–Cherokee Pumping Inc., Hampton, Georgia
Todd Morgan–Ramcrete Inc., Hamilton, Ohio
Nathan Germany–Tri-Way Concrete Pumping Inc., Roanoke, Texas
Doug Marquis–Conco Pumping and Belting Inc., Fontana, California

Regional Directors:
Region 2: Gary Brown–R.L. McCoy Inc. Indianapolis, Indiana
Region 4: Doug Doggett–Concrete & Materials Placement LLC, Charlotte, North Carolina Region 6: Chris Pernicano–San Diego Concrete Pumping Inc., Santee, California

Distributor Directors:
Tony Inglese–CPE America LLC, Metter, Georgia

Manufacturer Directors:
Bob Hamilton, Construction Forms Inc., Port Washington, Wisconsin
Peter Mendel–Putzmeister America Inc., Sturtevant, Wisconsin
Gabriel Ojeda–Fritz-Pak Corporation, Mesquite, Texas

For more information about the ACPA, visit www.concretepumpers.com.

STATEWIDE CONCRETE DESIGN AWARD WINNERS

Wisconsin Ready Mixed Concrete Association recognizes excellence in concrete design.

The Wisconsin Ready Mixed Concrete Association has recognized the winners for the 36th Annual Concrete Design Awards. The awards are a part of a prestigious program showcasing best uses of ready-mixed concrete in Wisconsin and Michigan's Upper Peninsula (UP). The Wisconsin Ready Mixed Concrete Association (WRMCA), Acuity, ACCU-Mix Concrete, Euclid Chemical, GRT-Mapei, Oshkosh Corporation, Riv/Crete Ready Mix, Sika Corporation, and ACI Wisconsin cosponsored the annual award program, now in its 36th year. Award winners were determined by a distinguished panel of Wisconsin/UP educators and construction professionals.

The award program recognizes excellence in the ready-mixed concrete industry in the following categories: Agricultural, Commercial, Concrete Overlay, Decorative, Education, Healthcare, and Public, ICF, Industrial, Facility, Municipal Infrastructure, Other, Parking Lot, Tilt-Up and regional projects.

The Concrete Design Award Ceremony took place on Friday, March 16 at the Osthoff Resort in Elkhart Lake.

This year's award-winning projects exemplify innovative design in concrete for a diverse range of projects in Wisconsin and Michigan's Upper Peninsula.

For the 36th Annual Concrete Design Awards, projects showcased represented winners that included owners, architects, engineers, contractors and ready mixed producers.

For more information, please contact Cherish Schwenn at cschwenn@wrmca.com or at 608.250.6304.

The Wisconsin Ready Mixed Concrete Association is a statewide trade association consisting of ready-mixed concrete producer and associate members throughout the state and Michigan's Upper Peninsula. Its mission is to advance the ready-mix industry through legislative action, promotion, and education.

CONNECTICUT CONCRETE PROMOTION COUNCIL'S BUILD WITH STRENGTH CAMPAIGN FOCUSES ON INSULATED CONCRETE FORMS (ICFs) IN CONSTRUCTION

America is burning. Construction practices utilizing wood frame construction in low- to mid-rise buildings are fueling fires in multi-story buildings nationwide. The National Ready Mixed Concrete Association's (NRMCA) Build With Strength campaign is educating architects, engineers and specifiers on alternative design methods—specifically the utilization of insulated concrete forms (ICFs) in the construction of low- to mid-rise residential and commercial buildings.

Connecticut Concrete Promotion Council Executive Director Dominic Di Cenzo said, "The Connecticut Ready Mixed Concrete Association (CRMCA) is part of a nationwide Build with Strength campaign to educate construction specifiers and those involved with the design and engineering of multi-story and commercial office buildings on the use of insulated concrete forms (ICFs). ICFs offer considerable energy cost savings, reduce building sound transmission and provide storm and fire resistance. These ICF properties, when combined with concrete, produce a building that far surpasses a wood frame building as far as longevity, durability and environmental friendliness."

Ric Suzio, of Suzio-York Hill Concrete, and Committee Chairman of the CRMCA's Build With Strength committee, commented on the Build with Strength ICF campaign, "We are finding that housing authorities, fire marshals and building officials are more receptive to the concept of utilizing ICFs in their building designs. In particular, ICFs offer increased thermal resistance, fire resistance and durability. Safety buildings such as firehouses and police stations or disaster refuge buildings are ideal for ICF construction-providing a secure, fire and storm resistant construction. ICFs, when utilized in a system with ready mixed concrete, are becoming a basic building technique for multi-story residential, municipal and commercial buildings due to their strength, energy efficiency and ease of construction."

About the NRMCA's Build With Strength Campaign

Build with Strength is a coalition of architects, builders, engineers, community organizations, emergency services personnel and policymakers supported by the National Ready Mixed Concrete Association (NRMCA). Their mission is to educate the building and design communities and policymakers on the benefits of ready mixed concrete, and encourage its use as the building material of choice for low- to mid-rise structures. No other material can replicate concrete's advantages in terms of strength, durability, safety, ease of use, and long-term value. For more information visit, http://buildwithstrength.com

DAVID A. LANGE ELECTED PRESIDENT OF AMERICAN CONCRETE INSTITUTE

President, vice president, and board members elected

The American Concrete Institute (ACI) introduced its 2018-2019 president, vice president, and four board members during The Concrete Convention and Exposition in Salt Lake City, UT.

David A. Lange

David A. Lange, FAC, has been elected to serve as president of the Institute for 2018-2019, Jeffrey W. Coleman has been elected ACI vice president for a two-year term, and Randall W. Poston is now the Institute's senior vice president, which is also a two-year term. Additionally, four members have been elected to serve on the ACI Board of Directors, each for three-year terms: Heather J. Brown, Mark A. Cheek, Michael J. Paul, and Michelle L. Wilson. For more information visit www.concrete.org.

AMERICAN CONCRETE INSTITUTE ANNOUNCES JOINT ACI-ASCC COMMITTEE 310, DECORATIVE CONCRETE

The American Concrete Institute and American Society of Concrete Contractors are pleased to announce that ACI Committee 310, Decorative Concrete, has become a joint ACI-ASCC committee. The mission of the joint committee is to develop and report information on the application of artistic finishes of cast-in-place concrete, avoid duplication of effort, and speed document development. Joint participation also offers greater prospect of funds for research and experimentation, and a wider acceptance of results.

"As the leading authority and resource worldwide for the concrete industry, ACI is pleased to expand our partnership with the American Society of Concrete Contractors to develop resources of importance to the industry," stated Ronald G. Burg, P.E., Executive Vice President, American Concrete Institute. "By working together, our organizations are better positioned to provide additional resources to serve the needs of the decorative concrete industry."

ASCC's Decorative Concrete Council is a professional organization dedicated to focusing on the issues, trends and work of the decorative concrete industry, and to

meeting the needs of the contractors who pursue this specialty market. The council is celebrating its 20th anniversary this year.

"The ability to collaborate with the American Concrete Institute on publications and educational programming relative to decorative concrete is a fantastic opportunity for ASCC and the Decorative Concrete Council," stated Beverly Garnant, Executive Director, ASCC. "We are pleased to be able to expand our capabilities with this alliance."

Two new ACI certification programs will be launched before Summer 2018: the Decorative Concrete Flatwork Finisher and the Decorative Concrete Flatwork Technician. Both certifications require the completion of a written exam, and current certifications as a Concrete Flatwork Technician. ASCC will be offering the certification exams at their Annual Conference in Charlotte, NC, USA, September 20-23, 2018.

Stealth Sculpture, Atlanta, GA. Decorative Concrete category 2nd place winner of a 2016 ACI Excellence in Concrete Construction Award, and an ASCC Decorative Concrete Awards winner.

INTERESTED IN SEEING YOUR NEWS IN THIS COLUMN?

Email your association news to editor@icri.org. Content for the September/October 2018 issue is due by July 2, 2018, and content for the November/December 2018 issue is due by September 4, 2018.

Submit your 2018
Outstanding Shotcrete Project to ASA

Prepare your 2018 Award entries now!

DEADLINE: OCTOBER 1, 2018

Brag about your Outstanding Shotcrete Project on the application and you may be able to brag about your Project as one of this year's Award Winners!

www.shotcrete.org/ASAOutstandingProjects

american shotcrete association | asa

PEOPLE ON THE MOVE

MATHSON JOINS PROSOCO AS ACCOUNT MANAGER


Alley Mathson

PROSOCO has hired **Alley Mathson** as its new strategic account manager. Mathson will work directly with decision makers from national firms to provide technical product support on projects, including product demonstrations and trainings for current and new customers.

Mathson joins PROSOCO with a wide range of professional skills and experience. Most recently, she spent five years as the technical sales manager for CETCO's below-grade, green roof and plaza deck waterproofing systems.

She will travel extensively but be based out of Flower Mound, Texas.

"We are very excited to have an individual like Alley on board with us," said Brian Koenings, head of strategic partnerships for PROSOCO. "She's a highly skilled communicator with experience in construction materials and specifications. She can make an impact for our customers immediately. She'll bring focus to multi-location, national accounts and make sure all of their needs are met in order to achieve mutual success on projects."

Contact Alley Mathson at alley.mathson@prosoco.com.

INTERESTED IN SEEING YOUR PEOPLE IN THIS COLUMN?

Email your People on the Move announcements to editor@icri.org. Content for the September/October 2018 issue is due by July 2, 2018 and content for the November/December 2018 issue is due by September 4, 2018.

CHAPTER MEETINGS & EVENTS

BALTIMORE-WASHINGTON
May 3, 2018
2ND QUARTER DINNER MEETING
Location: TBD

CAROLINAS
May 17 & 18, 2018
CHAPTER MEGA DEMO
Raleigh, NC

CHICAGO
June 7, 2018
CHAPTER GOLF OUTING
23rd Golf Outing & Scholarship Fundraiser
White Pines Golf Course
Bensenville, IL

July 20, 2018
CHAPTER SOCIAL OUTING
Chicago Dogs Baseball Game
Impact Field
Rosemont, IL

DELAWARE VALLEY
May 22, 2018
CHAPTER DINNER MEETING
Topic: FRP
Philadelphia Marriott West
Philadelphia, PA

DELAWARE VALLEY
June 21, 2018
CHAPTER SUMMER SOCIAL
Clay Shoot
Lehigh Valley Sporting Clays
Coplay, PA

FLORIDA FIRST COAST
May 17, 2018
CHAPTER TECHNICAL MEETING
Topic: ACI 562 Building Code
University of North Florida
Jacksonville, FL

FLORIDA WEST COAST
June 6, 2018
CHAPTER SOCIAL EVENT
Ricks on the River
Tampa, FL

GEORGIA
May 7, 2018
CHAPTER GOLF TOURNAMENT
Student Scholarship Golf Tournament
Legacy on Lanier Golf Club
Buford, GA

GULF SOUTH
May 10, 2018
CHAPTER SPRING SOCIAL
Offices of JJ Morley Enterprises, Inc.
Birmingham, AL

CHAPTER MEETINGS & EVENTS

METRO NEW YORK
May 24, 2018
CHAPTER TECHNICAL MEETING
Club 101 Manhattan
New York, NY

June 7, 2018
CHAPTER FISHING TRIP
Guy Lombardo Avenue
Freeport, NY

MICHIGAN
June 7, 2018
CHAPTER SOCIAL EVENT
Shooting Clays
Detroit Gun Club
Commerce, MI

MINNESOTA
May 22, 2018
CHAPTER SPRING TECHNICAL SESSION
Topic: Electrochemical Treatments to Historical Structures
West End Office Park
St. Louis Park, MN

July 24, 2018
CHAPTER GOLF TOURNAMENT
Edinburgh USA
Brooklyn Park, MN

FOR UP-TO-DATE CHAPTER ACTIVITIES AND FULL DETAILS ON THOSE LISTED HERE, VISIT WWW.ICRI.ORG.

NEW ENGLAND
May 8, 2018
CHAPTER TECHNICAL MEETING
Topic: Concrete Pumping Technology
Granite Links
Quincy, MA

June 12, 2018
CHAPTER ANNUAL GOLG OUTING
Shaker Hills Country Club
Harvard, MA

NORTH TEXAS
June 15, 2018
CHAPTER SOCIAL EVENT
Sporting Clay Event
Dallas Gun Club
Dallas, TX

QUEBEC PROVINCE
May 2, 2018
BREAKFAST SEMINAR
Topic: Non-destructive Evaluation
Quebec City, QC

May 17, 2018
CHAPTER SOCIAL EVENT
Networking Happy Hour
Pub St. Ambrose
Montreal, QC

June 13, 2018
CHAPTER SOCIAL OUTING
Montreal Impact Soccer Game
Saputo Stadium
Montreal, QC

ROCKY MOUNTAIN
May 17, 2018
CHAPTER PROGRAM MEETING
Location: TBD

SOUTH CENTRAL TEXAS
May 17, 2018
CHAPTER MEMBERSHIP LUNCHEON
NXNW Restaurant & Brewery
Austin, TX

SOUTHERN CALIFORNIA
May 17, 2018
CHAPTER LUNCHEON
National Safety Week Seminar
Simpson Strong-Tie Offices
Riverside, CA

TORONTO
May 8, 2018
CHAPTER SOCIAL OUTING
Blue Jays vs. Mariners Viewing Party
Sightlines in the Rogers Center
Toronto, ON

June 8, 2018
CHAPTER TECHNICAL MEETING
Restoration of Coignet Building
Cluny Bistro
Toronto, ON

VIRGINIA
May 17, 2018
CHAPTER SPRING SYMPOSIUM
Topic: Municipal and Military Airports
Colonial Heritage Golf Club
Williamsburg, VA

INTERNATIONAL CONCRETE REPAIR INSTITUTE

Are you a potential mentor?
Share your ideas on how your experience can benefit young professionals

Are you a potential mentee?
Share what you would like to learn from a mentor and where you feel you could benefit

ICRI is developing a Mentorship Program geared toward young professionals within ICRI to help build leadership skills and guide career growth. The program will involve activities and interactions at the National and Local Chapter level.

Get involved and help drive it forward.

Contact Elena Kessi, elena@aquafin.net, to get involved.

CHICAGO HOSTS REPAIR AWARDS PROGRAM

The Erie Café hosted the ICRI Chicago Chapter February Dinner Meeting where the Chapter had the chance to shed some light on two outstanding Chicagoland concrete repair projects performed in 2017. The ICRI Concrete Repair Project Award of Merit was presented to Walker Consultants, Inc. and Golf Construction for the Chicago Medical Center Parking Structure B repair project. Diego Romero (Walker Consultants) and Virgil Ramirez (Golf Construction) discussed the extensive deterioration of the U of C concrete parking structure, the different types of concrete repairs used to restore the parking garage, and the coordination of the repair areas with the needs of the University of Chicago Medical Campus. Due to the extent of concrete deck deterioration, concrete repairs (including full depth flange repairs for the entire span length of the double tees) were performed throughout the garage. New cable vehicular guards were installed inboard of the existing guards due to concrete edge constraints. The sheer volume of concrete and vehicular guard repairs, and the complexities of coordination with the university, are what made this project exceptional.

The ICRI Outstanding Concrete Repair Project Award was presented to LS Contracting Group, Inc. for the Carter H. Harrison Crib/William E. Denver Crib repair project. John Decker and Steve Chiquet from LS Contracting Group discussed the uniqueness of the Lake Michigan water crib repair project and the logistics which needed to be resolved to perform the concrete repair work with time, weather and geographic constraints. Because the project is located approximately two miles out into the middle of Lake Michigan, daily access to and from the site for personnel was made by boat, while materials, concrete trucks and a crane were transported to the site by barge. Due to the time it took the get to the water crib by barge, Prairie Materials and BASF worked together to provide a concrete mix which could be made dormant for a specified amount of time to allow the transportation of the concrete from the batch plant to the site without curing before placement. The concrete promenade slabs, stairs and crib entrance were poured in one day with the special concrete mix. The logistics of access and installation as well as the use of special admixtures to solve the geographical problems encountered by being located in the middle of Lake Michigan made this an exceptional project and the winner for 2017. Everyone enjoyed the food and presentations, and learned that preparation and coordination of projects is just as important as the execution of proper repairs.

A nice crowd gathered at the Erie Café for the ICRI Chicago Chapter Project Awards

John Decker and Steve Chiquet from LS Contracting Group present on the Outstanding Concrete Repair Project

Preparing to present on the Chicago Chapter Award of Merit

FLORIDA FIRST COAST HOSTS POST-TENSIONING DISCUSSION

On March 15, 2018, Florida First Coast ICRI Chapter hosted its March Chapter meeting at the University of North Florida in Jacksonville, Florida. A total of 37 members and guests were in attendance to hear Carla Ramo, PE with Tendon Systems, Inc., present on Post Tensioning and Post Tensioning repairs. Ms. Ramo discussed the basic design of post tensioning, its advantages and benefits, as well as typical applications. The second part of her presentation focused on typical damage associated with post tensioning and various repair strategies. Many of the attendees joined in the lively discussions that were brought up and everyone appreciated the conversations.

Attendees at the March meeting for the Florida First Coast Chapter enjoyed a presentation on post tensioning as well as a lively discussion

DELAWARE VALLEY TAKES A RISK ON CONTRACTS

Although yet another Nor'easter caused a rescheduling of the original event, there was still a strong turnout for ICRI Delaware Valley's dinner meeting presentation held at the Embassy Suites Philadelphia Airport on Tuesday, March 27. Following a happy hour social, the group was treated to dinner and a technical presentation on construction contract risks and issues. The presenter was Jason Spang from the local office of the law firm Pepper Hamilton, LLP. Jason's presentation gave attendees a view of how to address the primary risks to owners, consultants, contractors, subs and suppliers on projects. The presentation focused on utilizing widely used contract provisions and how they affect the risks to various project participants. Actual project examples of the good, bad and the ugly from an ICRI perspective (as well as from other perspectives) were presented.

Though the region faced another of many Nor'easters, attendance was strong for this recent Delaware Valley Chapter meeting

Presenter Jason Spang gave an enthralling presentation on contract risk

FLORIDA WEST COAST SPONSORS AT A SPECIAL OLYMPICS RUN

The race took place March 24, 2018 in New Port Richey, Florida

Chapter Treasurer Joe Trocano participated in the charity race with his son

The Florida West Coast Chapter was a proud "Bronze Level" sponsor for the Pasco County Special Olympics 5K Run held at the end of March

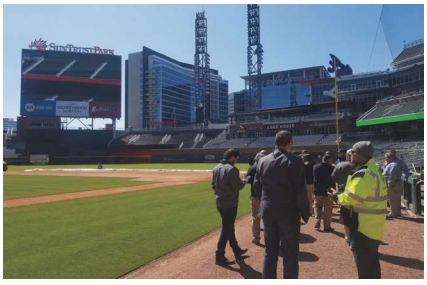
For the latest ICRI Chapter information visit www.icri.org

GEORGIA HOSTS FEBRUARY LUNCH AND A MARCH STADIUM TOUR

On Thursday, February 18, the Georgia Chapter of ICRI hosted its first chapter luncheon of 2018 at the Maggiano's in Perimeter Mall. A total of 41 attendees were part of our February luncheon meeting. Penetron Specialty Products sponsored the February meeting. The presenter was Lawrence Keenan, the vice president and director of engineering with Hoffman Architects Inc. He is both a registered architect and a licensed structural engineer. He has specialized in dealing with parking garages, facades, and plazas with Hoffman Architects for 20 years.

The presentation focused specifically on the analysis of fatigue failure of precast double-tee connections due to high cycle vehicular loading. We learned that while double-tee connections are structural, many consider their repair to be routine maintenance. The governing codes are vague in regard to the appropriate loads and design procedures for these connections. This lack of clarity has led many firms to utilize "industry standard" details that are undersized for fatigue loading. High cycle fatigue is an issue as it causes materials to weaken over time and ultimately result in failure.

On March 22, 2018, the Georgia Chapter of ICRI took a tour of the Atlanta Braves SunTrust Park and Battery hosted by the Atlanta Braves Ballpark Tours group in Atlanta. A total of 25 attendees were part of the tour, where we got to see what the ballparks press box and exclusive club sections and suites looked like. The group ended the tour walking onto the field and taking photos while standing in the Braves Dugout. After the tour, we all had a great lunch the Terrapin Taproom – Fox Brothers BBQ, where we had a great pulled pork or brisket sandwich with some downhome Mac N' Cheese! This was a great opportunity to take a look at the new ballpark and talk with our members about our upcoming events, including our golf tournament on May 7, 2018 and a future National Convention in Georgia!



Everyone enjoyed the opportunity to see the park from a player's perspective

In March, the Chapter got a tour of the Atlanta Braves SunTrust Park

The Chapter heard from a licensed structural engineer on the importance of analysis for fatigue failure

HOUSTON HOSTS PROGRAM ON DISTRESSED CONCRETE

On February 15, 2018, the Houston Chapter welcomed Al Bustamante of Walker Restoration, who gave his presentation, "Distressed Concrete: Structural, Durability, Aesthetic or Nothing." Mr. Bustamante discussed how proper assessment of distressed concrete structures is the key to determine if repairs are required, and the types and extent of these repairs. The goal of his presentation was to provide an understanding of the importance of forensic investigations, the general non-destructive evaluation (NDE) approach, have an instruction of NDE methods, understanding the limitation of NDE methods, and perform demonstrations of some NDE methods. He covered these topics by presenting case studies to illustrate the approach to assess concrete structures.

METRO NEW YORK ON ARCHITECTURAL CONCRETE

On February 22, the Metro New York chapter hosted a technical event with speaker Amedeo Cilli of Architectural Concrete Excellence. More than 60 attendees gathered at Club 101 in Manhattan, NY, including twelve NJIT students, for dinner and a presentation on concrete repairs using architectural concrete.

2018 CHAPTER NEWS DEADLINES

SEPTEMBER/OCTOBER 2018
July 10, 2018

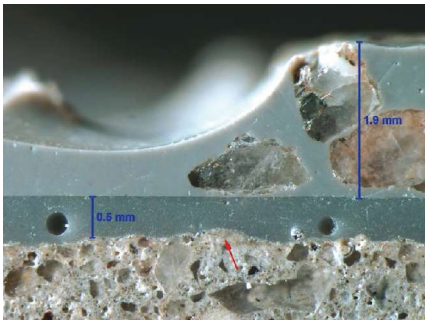
NOVEMBER/DECEMBER 2018
September 10, 2018

Send your Chapter News to Dale Regnier, Chapter Relations Director, at daler@icri.org

GREAT PLAINS HOSTS SEMINAR ON EVALUATION OF CONCRETE SURFACES

On Feb. 15, 2018, the Great Plains Chapter kicked off its 2018 seminar series by hosting 52 members and guests for the technical seminar "Evaluation of Horizontal Concrete Surfaces: Parking Decks, Plazas, and Pedestrian Bridges." The seminar was presented by speakers Jeffrey S. Barnes of CBI Consulting and Gerard Moulzolf of American Engineering Testing. Jeffrey Barnes guided attendees through both the past and current concrete evaluation methods and tools. Mr. Barnes then provided examples of approaches to evaluation through multiple case studies. Gerard Moulzolf provided extensive detail of the petrographic evaluation of concrete. Utilizing numerous microscopic pictures and case studies, Gerard illustrated the petrographic approach for identifying specific concrete composition and potential resulting deficiencies.

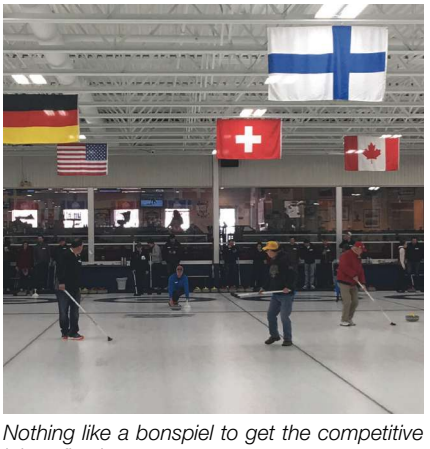
Presenters Gerard Moulzolf (left) and Jeffrey Barnes (right) after their presentation to the ICRI Great Plains Chapter



Examples of petrographic evaluation as presented by Gerard Moulzolf of American Engineering Testing

MINNESOTA HOSTS FUNSPIEL

ICRI Minnesota Chapter held its fifth annual Funspiel Curling event. After watching the Olympics this year, we all thought we were pros and ready to prove it! We were all sadly mistaken **but** had a great time in the process. As proud Minnesotans we embrace our wonderful winters with sports like curling or a good ol' bonspiel (curling tournament). Our fun little twist on this Bonspiel which we call FUNspiel was held at the Four Seasons Curling Club in Blaine, MN, official USA Olympic training facility. The event started with a lunch catered in by Sticks and Stones, followed by a short lesson on terminology, technique and tallying for the new comers and a brief safety update for veterans. We had multiple trainers on the ice coaching the group on strategy, scoring and style. This year's event was **sold out**! We are already looking into continuing the tradition next year.



Nothing like a bonspiel to get the competitive juices flowing

The Four Seasons Curling Club was a great location for the Minnesota Chapter's annual event

With so many people out on the ice, sometimes a little direction is required

MICHIGAN CHAPTER HOSTS DEMO DAY

On Friday, March 2, 2018, sixty-five souls braved snow covered roads and cold temps to attend the Michigan Chapter's Annual Demo Day event. The event was held indoors at J. Dedoes in Wixon, MI. The guests were treated to hands-on demonstrations by W.R. Meadows, Grunwell-Cashero, Evonik, Vector Corrosion, Hilti, and MAPEI. A few guests were even brave enough to attempt some of the techniques that were being demonstrated.

During the event, the guests also had an opportunity to talk to vendors at their display tables and socialize with them over a free lunch, thanks to the support of the demonstrators and table top vendors. Like past events, the guests included a good mix of chapter members, guests and interested concrete repair practitioners. The event concluded with a 50/50 raffle drawing to support our Student Scholarship Program. The raffle was re-named the **Tim Brewer Scholarship Raffle** this year in remembrance of former MI Chapter President Tim Brewer.

Guests enjoying a demonstration including ICRI Surface Profile Chips

Guests learning about Corrosion Control

Michigan Chapter President Andrew Lobbestael learning how to repoint masonry

TORONTO HOSTS TWO SEMINARS

The ICRI Toronto Chapter hosted its Technical Event #3 on October 10, 2017. Guest presenter Peter Emmons gave his talk, "Technical Overview of the Past, Present, and Future of Concrete Repair." Then, the chapter hosted their Technical Event #4 on February 13, 2018. The topic for this technical session was "Corrosion Control in Reinforced Concrete: The Basics and the State-of-the-Art." Corrosion is ubiquitous. It can be unsightly and costly but, particularly in civil infrastructure, it can also be critical and deadly. In this presentation, the basics of corrosion were explained and the specific nature and causes of corrosion of metals embedded in concrete were addressed. Methods of detecting and measuring the corrosion in the field—and their limitations—were also described, followed by a discussion of possible prevention or remediation approaches. The presenter was Dr. Carolyn Hansson, who is a professor in both the Mechanical and Mechatronics Engineering and the Civil and Environmental Engineering Departments at the University of Waterloo.

Attendees gather for the October 10 Technical event for the Toronto Chapter

The ICRI Toronto Chapter welcomed another outstanding crowd to Technical Event #4

Guest speaker Peter Emmons at the October event ←

The February event on Corrosion was presented by Dr. Carolyn Hansson from the University of Waterloo →

QUEBEC PROVINCE HOSTS A VARIETY OF EVENTS

Most recently, the Quebec Province Chapter hosted its annual curling event on February 6, 2018. The friendly curling tournament was held at the Town of Mount Royal Curling Club in Montreal. Over 20 members and guests came out to throw some curling stones and sweep the ice, as well as enjoy appetizers and drinks. It was a great way to get into the Olympic spirit for the games in Pyeongchang! Thank you to all for coming out making it such a fun evening!

The chapter also hosted a Social Mixer on November 23, 2017, at the Boswell pub situated in the beautiful Plateau of Montreal. About 30 people were present including many new people. This casual event is very popular with members and guests who can interact in a friendly environment around a good beer. Thank you to all the participants who have once again made this event a success!

It is with great pleasure that the ICRI Quebec Province Chapter hosted more than 125 guests during the 14th edition of its annual supper conference. It took place this year at the Château Royal in Laval, QC on November 2, 2018. The guest speaker this year was Mr. Dinu Bumbaru, Director of Policy at Heritage Montreal. Mr. Bumbaru shared his experience, highlighting his public speaking skills as well as his phenomenal knowledge of the construction heritage in Montreal and the world! Concrete is an integral part of the history of construction, and Mr. Bumbaru demonstrated it in a dynamic and very interesting way. We thank Mr. Dinu Bumbaru and hope to see everyone again next year!

ICRI Quebec Province Chapter members at their annual supper conference

École de Technologies Supérieures students attending the annual supper conference

ICRI Quebec Province Chapter executives are pictured here with guest speaker Dinu Bumbaru, Heritage Montreal and ICRI national scholarship recipient Perline deVoyer, who is from Quebec

CHAPTER NEWS

CHAPTERS COMMITTEE CHAIR'S LETTER

MICHELLE NOBEL
Chapters Chair

Hello Spring! Speaking from a Florida perspective, it's been really nice weather here and I'm looking forward to all the spring breakers and snowbirds going home! If you've visited or lived in Florida in March, you know what I mean, the traffic is horrible.

The ICRI Spring Convention in San Francisco was a great success. We had 260+ registrants. The exciting news is, we're looking at the potential for a couple of new chapters that could be joining us in the very near future, which is exciting and promising for ICRI.

Now that the chapter awards paperwork has been completed, it's time to look at projects that you'd like to submit to ICRI for the 2018 ICRI Project Awards. The paperwork for this has been streamlined and you can now submit your paperwork online. You can find all the information at www.icri.org. The deadline to submit for the 2018 ICRI Project Awards is June 1, 2018.

The first Roundtable of the year was held in Tampa on February 26 and 27. This was a Region 4 event and members from Virginia, Carolinas, Georgia, Gulf South, Florida First Coast, Central Florida, Florida West Coast, Southwest Florida and Southeast Florida attended. It was a very productive meeting, and we all came away from the meeting finding new ideas for fundraising, member retention and local events within the chapter. We also learned about the inner workings of ICRI and how to engage our members to grow our individual chapters. We emphasized the benefits of ICRI, and all that attended came away with a renewed sense of vigor and excitement that they brought back to all their chapters. Everyone that spoke to me after the meeting said that they had learned a lot and they were glad that they had attended.

The next roundtable will in Region 1, most likely in Philadelphia. I'll keep you posted once I know more. The Philadelphia, Baltimore Washington, Delaware Valley, Metro New York, Connecticut, Pittsburg, New England, Quebec and Toronto chapters will all be invited to attend. Make sure you send two delegates to the roundtable events in your area, so your chapter can benefit from this meetings. I can promise you that you won't regret coming to the Roundtable!

The Fall Convention will be in Omaha Nebraska November 7-9. The theme of the convention is *Resiliency, Above and Beyond Concrete Repair*. Lots of exciting events have been planned so stay tuned! ALL Chapters should be sending a delegate to the convention. This is an opportunity for newer members or even members that haven't been to a convention for a few years, to take advantage of this program. To find out more information on being a delegate, please talk to the current chapter president or visit www.icri.org. Remember, in order to host an ICRI Convention in your area, someone from the chapter needs to do a power point presentation at the Spring Convention. The presentation should be only be a few minutes and it should include why the convention should be in your city and what the local highlights are to attract people to the convention.

Concrete Slab Moisture Testing 2018 was held in Chicago, IL April 24-25. If you're looking to become a qualified concrete surface repair inspector more classe will be scheduled in2018. The mission of the International Concrete Repair Institute is to be the leading resource for education, certification and information to improve the quality of repair, restoration and protection of concrete and other structures. The Concrete Surface Repair Technician (CSRT) certification program is a competency based program that uses the best current practices for online training and evaluation. The Concrete Slab Moisture Testing Technician (CSMTT) certification program's purpose is to help improve the performance of concrete slab moisture testing resulting in more consistent, accurate, and reliable results that will help flooring manufacturers, architects, engineers, and contractors making better decisions as to when a concrete floor is ready for a floor covering installation. There's also ACI 562-16 Repair Code and Guide Training. Improve your knowledge of ACI-562-16 Repair Code and the ACI/ICRI Guide to the Repair Code. The presentations were recorded during a Special Technical Session on the ACI 562 Repair Code and Joint ACI/ICRI Guide to the Repair Code. To find out more information on these programs please visit www.icri.org and go to the Education tab at the top of the page or contact the ICRI Office at (651)-366-6095.

Lastly, I'd like to thank all the 2018 chapter leaders for their support, guidance and dedication to their chapters. Without your leadership, we wouldn't be able to achieve the progress in our chapters that we've achieved. Thank you all for your time and effort in progressing your chapters. As I stated before, there are many new opportunities coming up for our chapters to partner with ICRI through hosting certifications, conventions and roundtables. See you all at the next roundtable!

Sincerely,
Michelle Nobel
2018 Chapters Committee Chair

Did you know that ICRI has 39 chapters, including 2 student chapters, across the US and Canada? Visit www.icri.org to find out more.

NEW PRODUCTS

BOSCH SPEEDXTREME™ SDS-MAX® ROTARY HAMMER BITS OFFER 5X LIFE AND GREAT PRECISION, BENEFITS OF PREMIUM FULL-HEAD CARBIDE

Bosch offers the largest range of full-head carbide bits optimized for heavy-duty rotary and combination hammers

Bosch premium carbide takes concrete drilling to the next level in Bosch SpeedXtreme™ SDS-max® Hammer Bits, the ideal solution for drilling in reinforced concrete thanks to a 100 percent full-head carbide tip. The bits offer 5x life in concrete and are optimized for maximum performance in larger heavy-duty rotary and combination hammers.

Bosch developed the SDS interface and is the only concrete bit manufacturer to make its own carbide. That's the groundwork for delivering the toughest, longest-lasting bit for drilling in reinforced concrete and hard aggregate. Bosch has upgraded the proven long-life technology used in Bulldog™ Xtreme SDS-plus® bits to bring the widest range of 100 percent full-head carbide to the SDS-max interface. NOW 5X Life.

Bosch SpeedXtreme bits are full-head carbide up to 1" diameter, double the size of competitive bits. And Bosch SpeedXtreme bits feature that full-head carbide tip in a four-cutter design, which offers 180-degree cutting diameter and 100 percent power transfer during drilling. In addition, four symmetrical 90-degree side angles create a wider and sharper tip versus competitive bits to aggressively cut through tough material like rebar.

SpeedXtreme bits are manufactured with Bosch's proprietary diffusion-bonding technology, which bonds carbide and steel at a molecular level. It's a precise high-heat, high-pressure solid-state welding process that produces jobsite-proven bits.

A four-flute design for SpeedXtreme bits makes drilling in concrete fast and precise. The four flutes aggressively pull dust away from the work, keeping the bit tip cooler for longer bit life. An active-centering tip is designed for quick, accurate starts and guides the bit through concrete, an important feature when setting anchors or fasteners. A wear mark on the bit helps users deliver the precision hole-diameter tolerance that concrete anchoring demands.

The full range of Bosch SpeedXtreme SDS-max Rotary Hammer Bits extends from 3/8" to 1" diameter. The bits will be available starting July 2018.

To learn more visit www.boschtools.com or call 877-BOSCH-99.

EFFECTIVE POSITIVE & NEGATIVE CEMENTITIOUS WATERPROOFING IN NEW CONSTRUCTION & RESTORATION

Waterproof reinforced concrete structures and protect against chemical attack with CEM-KOTE FLEX ST, W. R. MEADOWS' flexible cementitious waterproofing option. CEM-KOTE FLEX ST is a two-component, breathable, fiber-reinforced cementitious coating consisting of a dry and liquid component. Designed for positive and negative waterproofing, CEM-KOTE FLEX ST is effective in both new construction and restoration projects. It can easily be applied by brush or sprayed to suit the application.

Ideal for waterproofing potable water or wastewater treatment facilities, CEM-KOTE FLEX ST offers excellent adhesion and crack-bridging and is an approved ANS/NSF 61 barrier material. This permeable membrane allows substrate moisture to escape. CEM-KOTE FLEX ST is also recommended for use on tunnels.

"Features such as hydrostatic head resistance, flexibility, crack-bridging capabilities, and vapor permeability allow CEM-KOTE FLEX ST to provide waterproofing protection for both positive- and negative-side installations. It has a proven track record for over 30 years around the world," said Russ Snow, building science specialist at W. R. MEADOWS.

Further information about CEM-KOTE FLEX ST can be found at www.wrmeadows.com/cem-kote-flex-st-flexible-cementitious-waterproofing/. Our CEM-KOTE FLEX ST product flyer provides a convenient reference of its important features and benefits that can be requested at wrmeadows.com/literature-request-form.

BOSCH GWS18V-45PSC EC BRUSHLESS 4-1/2 IN. ANGLE GRINDER COMBINES POWER WITH BEST USER EXPERIENCE

On-tool HMI (human/machine interface) screen combines with expanded app capability to provide most complete look at grinder performance and working status

Power, connectivity and a best-in-class user interface combine to make the Bosch GWS18V-45PSC 18V EC Brushless Connected 4-1/2 in. Angle Grinder a must-have product for tough grinding applications. The grinder features a Bosch EC brushless motor that offers maximum efficiency and low maintenance, plus connectivity that delivers next-generation control including mobile-device-based maintenance review and performance notifications.

The Bosch GWS18V-45PSC grinder delivers outstanding performance, including metal cutting. This Bosch-exclusive design provides greater runtime and more power than similar cordless grinders with brushed motors. That means professionals can rely on a cordless grinder that delivers 9,000 no-load rpm, but doesn't forego power in favor of maneuverability.

The grinder's HMI interface provides a large screen that changes color based on grinder operating status: green for operational; yellow identifies an issue with the grinder like kickback; red means the grinder is offline; and blue means the grinder is connected to a mobile device. The corresponding free Bosch Toolbox app can be found at the Apple App Store® or the Google Play® Store.

The grinder's interface works with the Bosch GCY30-4 Bluetooth® connectivity module, which provides next-generation user control from a mobile device. Users can customize the grinder, change the speed of the soft-start function, set the brightness of the LED, plus receive battery charge and safety information.

The grinder's advanced electronics provide features including drop control, which shuts the tool off if dropped, and KickBack Control that shuts down the grinder's motor should the tool become jammed. The grinder also has restart protection to prevent accidental start-up during battery insertion. Soft-start technology reduces start-up torque to ease into cuts.

The grinder features a two-position Vibration Control side handle, which provides greater control than previous generation Bosch cordless grinders. It also makes operation of the grinder less fatiguing for the user. The side handle can switch from left to right for additional control and a slim soft-grip design provides additional user comfort.

To learn more visit www.boschtools.com or call 877-BOSCH-99.

SIMPSON STRONG-TIE INTRODUCES LARGE-DIAMETER STAINLESS-STEEL SCREW ANCHORS FOR CRITICAL WASTEWATER TREATMENT PLANT AND BRIDGE REPAIRS

Simpson Strong-Tie, the industry leader in engineered structural connectors, fasteners, anchors and building solutions, is the first manufacturer to launch large-diameter stainless-steel screw anchors for concrete and masonry. Designed for severely corrosive interior or exterior environments, the new stainless-steel Titen HD® heavy-duty screw anchors (THDSS) deliver an advanced standard of performance for bridge, marine and water treatment plant construction and retrofit applications.

The nation's aging wastewater treatment plant infrastructure is facing a critical turning point, with the American Society of Civil Engineers projecting $206 billion in increased costs to households and businesses if the upgrade and replacement of old treatment plants are not completed by the year 2020. In addition, according to the American Road and Transportation Builders Association's 2018 Deficient Bridge Report, 54,259 US bridges are structurally deficient. In fact, almost 9% of all bridges in the country have at least one key structural element in poor enough condition to need repair, the report finds.

Available since April 2017 in 3/8" and 1/2" diameters, THDSS is now offered in larger 5/8" and 3/4" diameters suitable for heavier civil construction where corrosive elements pose a hazard to standard carbon-steel screw anchors. "There is definitely a need in the market for larger-diameter screw anchors," says Simpson Strong-Tie senior product manager Mike Steiber. "Other wedge anchor or adhesive options often have drawbacks with spacing or difficult installation, so for applications that need stainless-steel anchors, this is a first-of-its-kind solution for the market."

Key features and benefits of the THDSS screw anchor:

- Ideal for exterior applications and corrosive environments
- Made from Type 316 stainless steel
- Installs with an impact wrench or a hand tool
- Now available in 3/8", 1/2", 5/8" and 3/4" diameters

All stainless-steel Titen HD anchors are code listed in IAPMO UES ER-493 (concrete) and ICC-ES ESR-1056 (masonry) for a wide variety of applications and could make a significant impact by improving the structural integrity of bridges via repair and retrofit. For more information, visit strongtie.com.

SIMPSON STRONG-TIE BOOSTS ITS PORTFOLIO OF SCALABLE SOFTWARE SOLUTIONS FOR HOMEBUILDERS WITH ACQUISITION OF LOTSPEC APP SUITE

Popular apps for AutoCAD and Revit enable streamlined 2D | 3D management of plan options

Simpson Strong-Tie, the industry leader in engineered structural connectors, fasteners, anchors and building solutions, has acquired LotSpec, a suite of software applications designed to optimize efficiency and productivity for production homebuilders' needs around construction document and option management solutions. This strategic acquisition, coupled with the 2017 acquisition of CG Visions, will continue to deepen the Simpson Strong-Tie partnership with top builders, architects and engineers throughout the country by offering scalable software solutions via key apps for the industry-standard design platforms Autodesk®

AutoCAD® Architecture and Autodesk® Revit®.

Founded in 2016 by construction IT veteran Jon Albert, LotSpec is focused on the design and development of efficiency tools, practices and workflows for the large-volume homebuilders. The company's core LotSpec application has been recognized as an elegant solution for helping builders manage project options, and is built on a similar code base in both 2D or 3D AutoCAD Architecture and Autodesk's flagship product Revit. This dual functionality allows builders to gain maximum efficiency from their existing 2D drawings, while setting the stage to ease into advanced functionality with Revit and other complementary technology solutions provided by CG Visions.

According to an October 2016 survey conducted by the National Association of Home Builders, awareness and adoption of BIM solutions is increasing among residential construction professionals. In the survey of architects, single-family and multifamily builders, 27% of respondents said they were familiar with BIM, compared to only 17% who reported being familiar with the technology in 2014. Even among those professionals who are BIM-aware, adoption is increasing slowly, demonstrating the need for easily implemented, scalable solutions.

In addition to configuring lot-specific plan sets, the LotSpec app enables production builders to create master plan sets and manage the myriad of options offered to homebuyers, providing a customized project design and build approach that favors variety and flexibility over a static, cookie-cutter style.

With the LotSpec acquisition, Simpson Strong-Tie further broadens its technological service portfolio offering builders a diversity of software choices to fit their individual business needs. For more information, visit strongtie.com.

SIMPSON STRONG-TIE PULLS A DISAPPEARING ACT ON EXPOSED DECK AND TRIM FASTENERS WITH THE DECK-DRIVE™ DCU SCREW PLUG SOLUTION

Simpson Strong-Tie, the industry leader in engineered structural connectors, fasteners, anchors and building solutions, has introduced the Deck-Drive DCU screw plug solution, a complete hidden deck-fastening system comprising the Simpson Strong-Tie premium DCU Composite screw, the DCU screw plug and an Auto-Set Driver™ bit (each sold separately).

Ideal for decking and trim applications using composite or PVC lumber, the DCU screw plug solution offers contractors a simple way to cover exposed fastener heads that's as easy as drive it, plug it, and tap it flush. With the deck plug solution, screw heads are invisible, creating a smooth, professional finish.

"When it comes to decks and trim, visible screw heads have become accepted, but they're seldom desired by either contractors or homeowners," says Simpson Strong-Tie product manager Scott Park. "The Deck-Drive DCU screw plug solution provides a comprehensive and convenient solution to the problem of exposed fasteners and enables builders to easily achieve a strong connection with a clean, professional look."

Made from major composite and PVC board manufacturers' materials in a variety of colors and finishes to match deck and trim boards, DCU screw plugs work well with hand-drive applications, as well as with the Quik Drive® PRO300S auto-feed screw driving system. The Auto-Set Driver bit features a non-abrasive depth stop to automatically countersink screws for inserting the plugs, which are easily secured in place with the gentle tap of a hammer.

Simpson Strong-Tie is packaging the screws and plugs separately to allow building product dealers and distributors to customize their inventory mix from the 39 different composite and PVC lumber colors and finishes currently available. The Deck-Drive DCU screw plug solution includes:

- Deck-Drive DCU screw plugs
- Deck-Drive DCU Composite screws
- Auto-Set Driver bit (for use with drills or impact drivers)
- Quik Drive Auto-Set Driver bit (for use with Quik Drive auto-feed systems)

For more information, visit strongtie.com.

BOSCH GAS18V-02 18V CORDLESS HAND-HELD VACUUM IS LIGHTWEIGHT, CONVENIENT JOBSITE CLEANUP OPTION

Two-stage rotational airflow technology captures both debris and fine particulates

The Bosch GAS18V-02N 18V Cordless Hand-held Vacuum Cleaner provides a lightweight, convenient cleanup solution on any jobsite. With two-stage rotational airflow technology, this easy-to-maneuver vacuum keeps the filter clog-free longer for sustained suction. The filter is washable.

The 18-volt cordless vacuum's two-stage rotational airflow technology features a first stage that captures 90 percent of debris, while the second stage removes finer particles from the airflow to help keep the HEPA filter clog-free longer.

The vacuum weighs only 2.9 Lbs. (tool only, battery not included), but delivers great power and long runtime using the Bosch power system. The powerful motor provides up to 21.2 CFM of airflow and supplies up to seven minutes of runtime per battery amp hour (Ah).

The Bosch cordless hand-held vacuum transforms into a handy upright thanks to extension pipes and a floor nozzle. It comes with five attachments, including a crevice nozzle that allows the vacuum to reach into tight corners for thorough cleaning. There's also a short hose for hard-to-reach areas.

The bagless dust cup on the Bosch GAS18V-02N cordless vacuum is easy to empty and has a transparent shell, so users can check the fill level at any time. It holds up to 61 cubic inches of debris.

The Bosch GAS18V-02N 18V Cordless Hand-held Vacuum Cleaner is 100 percent compatible with all Bosch 18V batteries. Battery and charger are sold separately. The vacuum will be available starting in the summer of 2018.

To learn more about the Bosch GAS18V-02 18V Cordless Hand-held Vacuum Cleaner or to find a local dealer, visit www.boschtools.com or call 877-BOSCH-99.

BOSCH GDX18V-1600 18V ¼" HEX AND ½" SQUARE DRIVE SOCKET-READY IMPACT DRIVER IS A TWO-IN-ONE TOOL FOR JUST ABOUT ANY FASTENING TASK ON THE JOBSITE

High-performance impact driver is designed for ease of use, less fatigue

The Bosch GDX18V-1600 ¼" Hex and ½" Square Drive Socket-Ready Impact Driver offers quick-change hex shank with Power Groove for bits and ½" square drive for sockets – all in one tool. This impact driver supplies plenty of fastener-tightening force while eliminating the hassle of broken socket adapters.

The Bosch GDX18V-1600 two-in-one impact driver switches quickly and seamlessly from a ¼" quick-change hex shank to ½" square drive. This cordless impact driver delivers up to 1,600 In.-Lbs. of max torque. It pairs a powerful cordless motor with the Bosch hammer-and-anvil system, delivering 0-3,600 bpm (blasts per minute) performance and impact endurance to handle the toughest fastening tasks found on the jobsite.

A four-pole carbon-brush motor not only makes the tool powerful, but also delivers greater efficiency in battery usage.

With a weight of only 2.7 lbs. (tool only, not including battery), the Bosch GDX18V-1600 Impact Driver is easy to maneuver, which means less user fatigue. It features a soft slim-grip handle and nonslip housing for added user protection in use. The tool has a head-mounted LED lighting system for illumination in dark areas.

The Bosch GDX18V-1600 Impact Driver includes Bosch-exclusive Electronic Cell Protection (ECP) that protects the battery against overload, overheating and deep discharge for longer life. In addition, Bosch Electronic Motor Protection (EMP) protects the motor against overload with integrated temperature management. To learn more visit www.boschtools.com or call 877-BOSCH-99.

STONE EDGE SURFACES ANNOUNCES THE RELEASE OF JOB ESTIMATOR PRO™, THE CONCRETE OVERLAY INDUSTRY'S FIRST JOB AND LABOR ESTIMATING APP

Stone Edge Surfaces, a division of Turley International Resources, LLC, the owner of concrete manufacturing, mining, packaging, and fulfillment operations in the U.S., New Zealand and Chile, officially announced the release of their new Job Estimator Pro™ APP for the stamped concrete overlay and decorative concrete industry. This new APP quickly and easily creates customized job specific estimates and calculates labor costs and profit margin, so the profitability of the estimate can be immediately verified and adjusted before emailing to the customer. The APP also simplifies material ordering for a Contractor and a Distributor by automatically creating and formatting job specific material quantity lists for the sales and front counter staff to use when placing product orders.

The App automatically creates estimates, calculates material and labor costs and profit margin on horizontal and vertical concrete overlay, customizable concrete veneer, stamped concrete overlay and decorative concrete projects. The APP can archive estimates or format an estimate, drop it into an email, customized it with customer name, disclaimers, and contractor information. It can also format a complete custom material list or a material order, drop them into separate emails for later review or sent to a distributor for order fulfillment. The App can create an email request or automatically open your phone dialer and contact technical assistance at the touch of a button. It can open a vertical or horizontal overlay video photo book to show examples to customers or for ideas. It can open training videos on vertical stamping and carving, horizontal stamping and carving, over wood deck application, crack bridge, and tape down applications. The App can access blog posts on how to price jobs, comparisons to stone veneer, and it can create and place general product orders, order catalogues, supplies and more. Visit the Job Estimator Pro website for more details at www.jobestimatorpro.com.

INTERESTED IN SEEING YOUR NEW PRODUCTS IN THIS COLUMN?

Email your new product information to editor@icri.org. Content for the September/October 2018 issue is due by July 2, 2018 and content for the November/December 2018 issue is due by September 4, 2018.

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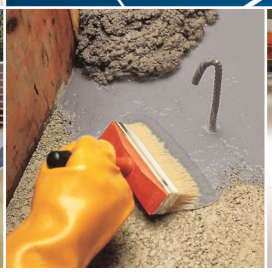

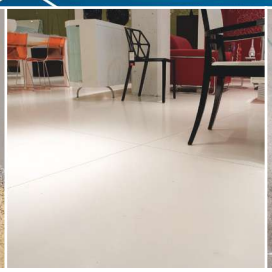

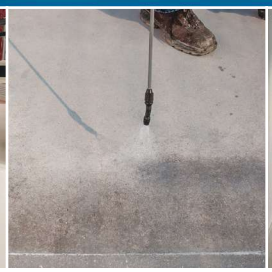

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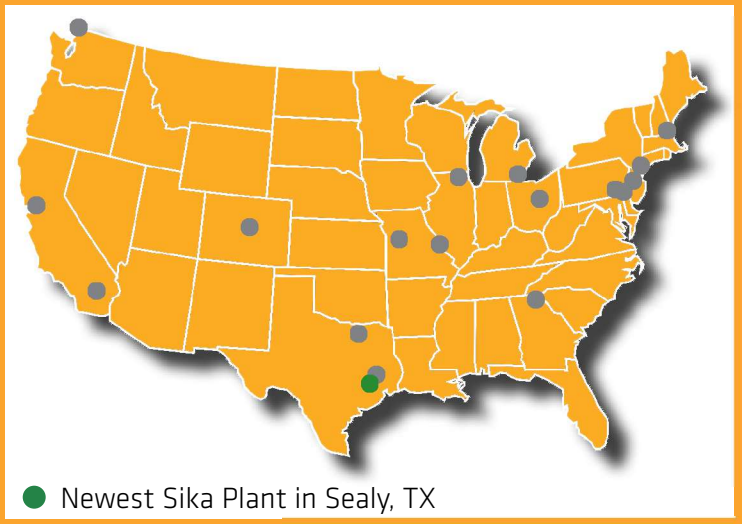

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