

# THE STATE OF THE CONCRETE REPAIR INDUSTRY— 25 YEARS IN THE MAKING

**T**he theme for this issue of the *Concrete Repair Bulletin* is “The Future of Concrete Repair and New Technologies,” and ICRI is also in the midst of celebrating a milestone—its 25th anniversary. We thought that one of the best ways to discuss the future of the industry was to hear from some of ICRI’s founding members. After all, these folks have been a driving force since they helped create the association back in 1988. We encouraged them to talk about how things have changed in the past 25 years and where they see things heading in the next 25 years. Here are some of their comments, insights, and reflections.

**You have been a part of ICRI and the repair industry now for at least 25 years. How have things changed for you and your business in the past 25 years?**

**TERPENING:** ICRI has organized and brought together engineers, contractors, and manufacturers in such a way that they have improved and consolidated the entire industry. My business has improved by these sectors working together.

**ROYER:** The industry has matured greatly in the last 25 years, and I believe that ICRI has been a significant factor in the process. Before ICRI, the restoration business comprised many emerging restoration companies and a few dominate players in the market. A similar scenario applied to restoration engineers and manufacturers of repair materials. ICRI provided a framework and forum for the exchange of information. It also capitalized on an opportunity to help standardize the industry in terms of procedures and quality. The emerging companies brought fresh ideas and an eagerness to learn all aspects of the business. The established firms had the expertise and processes and were willing to share their knowledge in various settings provided by ICRI (or IACRS as it was originally named). This exchange of ideas has raised the level of expertise and professionalism in the industry.

**REEDY:** For most professionals in the repair industry, whether from the side of material supply, contracting, or specification development and management, over the last 25 years we have experienced and benefited from a much more level playing field. This has served our members well when differentiating us from our competition. ICRI’s long-range vision and commitment to education and the development of our many technical guidelines have played a tremendous role in the success of that 25-year transition. Just look at project specifications, contract documents, and product data sheets today versus the days prior to our founding meeting in Naperville, IL. We see, at increasing frequency, more and more references to ICRI Technical Guidelines regarding surface preparation, material



IACRS booth, 1988,  
Houston, TX



## INTERVIEWEES:



**ROBERT L. TERPENING**  
Consulting Structural  
Engineer,  
Fairburn, GA



**STEVEN ROYER**  
Chief Operating Officer,  
Concrete Protection &  
Restoration, Inc.,  
Baltimore, MD



**GEORGE REEDY**  
Director of Sales,  
Miracote Division of  
Crossfield Products Corp.,  
Forest Hill, MD

selection, evaluating surface adhesion, and other critical facets of the repair process.

**MORROW:** The whole concrete repair industry changed in 1988 with the inception of IACRS/ICRI. Prior to 1988, there was no voice for our industry. Contractors were the first to become active, followed by the engineering/consulting people and, finally, the manufacturers came on board. This resulted in a unique organization made up of three equally important groups working together to improve the concrete repair industry.

**MORRISSEY:** The concrete repair industry has become organized exactly like the founding group in Naperville saw it. What were ideas became concepts then guidelines, which are now universally recognized as the current standards for our industry.

**MCDONALD:** In the early 1980s, the primary mission the U.S. Army Corps of Engineers (Civil Works) began shifting from new construction toward repair and rehabilitation of existing structures. Initially, materials and methods used in repair and rehabilitation of concrete structures were typically those used in new construction, sometimes with less-than-desirable results. Consequently, guidance developed by ICRI was a significant benefit to me and the Corps of Engineers during this transition.

**FALLIS:** Things have changed in a number of ways over the last 25 years. One of the key things is that the deterioration of concrete due to the corrosion of the reinforcing steel has become a much larger and prevalent issue. And with this, many technologies have been developed and come into the market (a few these being more cathodic protection, galvanic anodes, galvanized and fiberglass reinforcing, new protective coatings, and techniques for the repair of this concrete). And ICRI has been the leader in developing, educating, and promoting these methods and standards of concrete repair.

The development of special engineered repair materials design for specific applications and application technique is another huge development over the last 25 years. We have seen the development of materials that are less permeable, wet-



*ICRI founding members in attendance at the ICRI 2013 Spring Convention. From left to right: James E. McDonald, Ken Lozen, George Reedy, Marty Sobelman, Jay Paul, Bob Swan, Kal Hindo, Garth Fallis, Patrick J. Morrissey, Jim Warner, Peter Craig, Chuck Pfahl, Robert L. Terpening, Frank Verano, Bert Kriekemans, Peter Emmons, and Jack A. Morrow*



*Inaugural meeting of the International Association of Concrete Repair Specialists (IACRS), May 21, 1988, Naperville, IL*

sprayable, trowelable overhead, and many other specialized materials.

**SOBELMAN:** The industry and my business have changed dramatically in 25 years. As I see it, materials, manpower, and equipment have all been positively impacted. Manufacturers of repair materials have responded to a demand for products that meet certain performance criteria including shrinkage, permeability, set times, and workability. The published material technical data has improved and product comparisons can be more easily achieved. Repair mortars with better shrinkage compensation have reduced cracking and corrosion mitigation admixtures and sacrificial anodes have



**JACK A. MORROW**  
*President,  
Jamor Engineering, Ltd.,  
Calgary, AB, Canada*



**PATRICK J. MORRISSEY**  
*President,  
ConSpec Associates, Inc.,  
East Haven, CT*



**JAMES E. MCDONALD**  
*Consulting Engineer,  
McDonald Consulting,  
Clinton, MS*

increased repair longevity. Training has improved both through industry-sponsored seminars and within companies. At the end of the day, it comes down to the man with the trowel. ICRI has many tools that have assisted us in training our field personnel. The companies in our industry have embraced training because we understand the benefits: better quality and increased profitability. Finally, it is clear to me that advances in all types of equipment have improved our productivity and the quality of our work—from preparation equipment that works more efficiently and improves substrate profiles to mixers and pumps that are better suited for repair materials. We have seen a response by the equipment manufacturers to the needs of the repair industry.

**CRAIG:** Over the past 25 years, I have watched the repair industry evolve from what was primarily a response-orientated business to an industry that has worked together to answer many of the scientific questions regarding cause and effect. New products and technologies have been developed from the knowledge gained and shared by repair professionals at all levels. These innovations have helped consultants like me to provide better and more lasting solutions to some of concrete's most challenging repair problems.

**ICRI members continue to be at the forefront of new and emerging technologies. What one thing can you point to from the past 25 years that has had the greatest impact on the industry? What new technologies, either recent or emerging, are you most excited about?**

**TERPENING:** The ICRI Technical Guidelines were developed to explain the proper way to do repairs and to present the best practices for the evaluation of structural systems. I enjoyed being on the Post-Tensioning Guideline Committee and have learned so much from all the U.S. and Canadian committee members.

**ROYER:** I would say that the evaluation and investigation aspects of the business have advanced



*Committee meeting, ICRI 2003 Fall Convention*

the most. Ground-penetrating radar (GPR) or surface-penetrating radar, along with X-ray technology that has been adapted to the analysis of structural concrete and other nondestructive testing methods, have greatly enhanced the ability to design the repairs of deteriorated concrete structures. These instruments are also helpful when it comes to modifying existing concrete structures, especially if they are “post-tensioned.” Infrared thermography is another technology that has increased the effectiveness of analyzing building façades for leakage and deficiencies.

Corrosion inhibitors, either integral or applied, have become more widely used and passive cathodic protection such as sacrificial anodes are being incorporated into repairs. The effectiveness of these products seems to be positive, but time will tell us how effective they are. Active cathodic protection systems, which have a long track record in marine and underground environments, have also been installed in parking structures and buildings on a limited basis. I believe that there are more opportunities in these areas to develop more long-lasting repairs to concrete structures.

**MORROW:** The development of guidelines, certification programs, and the production of the surface profile chips have made ICRI a leader in our industry. Prior to ICRI, the American Concrete Institute and the Post-Tensioning Institute did include some repair programs but their main focus was new construction and the development of design codes. With ICRI's focus only on repair, the association rapidly became the “go-to” organization for the repair industry.

## INTERVIEWEES:



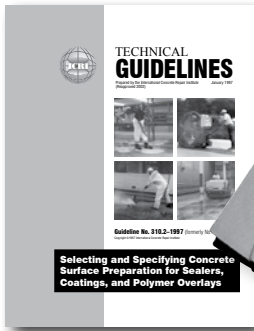
**GARTH FALLIS**  
*Vice President,  
Construction Technologies,  
Vector Corrosion Technologies,  
Winnipeg, MB, Canada*



**MARTY SOBELMAN**  
*President,  
Atlas Restoration, LLC,  
Buffalo Grove, IL*



**PETER CRAIG**  
*President,  
Concrete Constructives,  
Greene, ME*



ICRI Technical Guideline No. 310.2-1997, "Selecting and Specifying Concrete Surface Preparation for Sealers, Coatings, and Polymer Overlays" and concrete surface profile (CSP) chips

**MORRISSEY:** I must say that carbon fiber, whether epoxy-based or cement-based, has and will have the most impact on our industry, both for concrete and masonry.

**MCDONALD:** A general recognition of the need for a systematic repair process to achieve durable repairs has been a major ICRI contribution to the repair industry. Instead of simply repairing the obvious deficiency, there must be an evaluation to determine the cause and extent of the problem. If at this point, repair appears feasible, then a strategy must be developed including objective criteria, materials, and methods. Use of this approach should continue to reduce the rate of premature repair failures.

**FALLIS:** The greatest impact on the industry is the development of technologies related to dealing with damage and future damage caused by the corrosion of steel in concrete. One exciting technology that has developed, and is still developing, is the use of fiber-reinforced polymers to strengthen concrete structures. This technology has allowed structures that previously may not have been able to be used without extensive modifications to be used in applications where they are carrying more load than they were originally designed to handle. Another technology is the development of new protective coating systems that can resist some of the most aggressive chemicals while still being easy to work with and not have the same environmental concerns.

**SOBELMAN:** I see improved project plans and specifications as having had the greatest impact so far. In my opinion, plans and specs are the contractor's road map. This improvement has had a significant impact on the growth in our industry. A proper design, when executed correctly, will produce a long-lasting repair. From the condition survey, with significant advances in nondestructive testing (NDT) and improvements in destructive testing and petrography, the design professional can better evaluate the cause of the failure and create the proper specification for the project. The sharing of information regarding materials and product performance at ICRI and other industry conferences

has dramatically impacted the quality of repair plans and specifications. The ICRI guidelines for surface preparation, masonry, material selection, and others are frequently found in specifications.

**CRAIG:** It is very hard to point to just one thing. Certainly the ICRI concrete surface profile chip set has made a major contribution. Another important development has been our understanding of corrosion in concrete and how repair processes affect and are affected by the corrosion process. And personally, as far as new technologies go, I am most excited about the new generation of rapid-drying concrete mixtures that hold the promise of putting an end to moisture-related flooring and coating problems once and for all.

**During the recent economic downturn, the repair market was not as deeply impacted as other aspects of construction. How do you see the economy affecting this industry going forward?**

**TERPENING:** The last 5 years has been the worst economic downturn in my 50 years in the construction business. My hope is that we have turned the corner and are back on the road to recovery.

**ROYER:** Four years ago, one of our customers that develops and leases office space said that he didn't expect the "leasing market" to rebound for at least 3 years. This proved to be correct. New construction has begun to rebound. However, I believe that building owners are just beginning to look at maintenance and non-emergency repairs again. This, along with the slow recovery, has not produced as large of a demand for our services that we had hoped for. Things are definitely better but there is still room for improvement. Hopefully a sustained improvement will prevent a "back-to-back" boom and bust.

**REEDY:** A weak economy will continue restraining future growth and expansion, but it can't slow down the deterioration process. I believe most ICRI members have a strong and loyal customer base and are more equipped to survive downturns in a stagnant repair market. When the economy does eventually turn in a more positive direction, our membership will be in a better position to reap the benefits of a stronger market.

**MORROW:** Traditionally, we see an increase in repair work when the economy slows down. When times are good, owners tend to build new infrastructure but when the economy slows, they look for ways to extend the useful life of the structures by repairing them. We do the same thing in our personal lives. When things are good we want to buy a new car but when the economy tanks, we buy a new set of tires and hope for the best.

**MORRISSEY:** While some restoration may be delayed or postponed, the infrastructure is served

better by a “stabilize or restore in-place” rather than a “rip out and replace” mentality from both an economic and infrastructure perspective. Basically, it is a better use of our funding and our built environment.

**FALLIS:** I see two areas where the economy will affect our industry going forward. The first is acting on the realization that our infrastructure is essential to our economic development and the investment will be made to do the concrete repairs and protection required to extend the life of these structures (also with this is that more decisions are being made, and will be made, looking at the life-cycle investment in the structures. The second is that due to environmental concerns and economic concerns, we will see structures that would have been demolished and replaced in the past being repaired and upgraded. This will provide more opportunities for those doing concrete repairs.

**SOBELMAN:** The economy is still a concern. The public sector is in trouble with the federal government and many states, cities, and towns are continuing to cut back. Infrastructure spending has decreased, but the private sector has started to slowly rebound in many markets. Fortunately for us there are still companies that recognize that conditions will worsen and cost more in the future and fund projects today and into the future.

### Now that ICRI is 25, where would you like to see the industry going in the next 25 years?

**TERPENING:** The continued working together of our members to improve, enlighten, and promote the concrete repair industry.

**ROYER:** Although great strides have been made, I believe there is still an opportunity in the areas of worker safety and selective demolition techniques/equipment. A noise-reduced, environmentally friendly, safe, and economic demolition device has still not been developed. Hydrodemolition has met some of these criteria, but there is still a lot of room for improvement. A piece of equipment that could fill this need has been discussed and envisioned in many forums, including Vision 2020. An invention

to accomplish this difficult task is likely to be developed in the next 25 years.

The *Concrete Repair Bulletin* (CRB) was first issued in October 1988. It was four pages, printed on an office copier, and the lead article was titled, “Memberships Pass 200 Mark.” The current CRB has come a long way in 25 years and it needs to continually improve because it is the primary benefit for some of our members and it is our best marketing tool.

**REEDY:** The decorative and artistic concrete industry has been growing exponentially for the last 10 or more years. With a predicted 10-year life cycle for most decorative concrete surfaces, that industry anticipates an emerging and booming market for restoration over the next several years and beyond. Contractors, material suppliers, and hardscape specifiers in that industry are at the point where we were 25 years ago. This could be an area for ICRI to expand into.

**MORROW:** I think ICRI must maintain its position as the leader in the concrete repair industry.

**MORRISSEY:** While it will impact our industry, use of nonmetallic reinforcing bar/reinforcement, reversal of carbonization effect on concrete, and other “newer” methods yet to be accepted need to become our new standards. This may put us out of business (kidding), but is necessary if we are to be considered the leaders for tomorrow’s restoration contractors.

**MCDONALD:** I would like to see ICRI continue as a leader in development of technology to improve the quality of concrete restoration, repair, and protection, through education of and communication among the members and those who use their services.

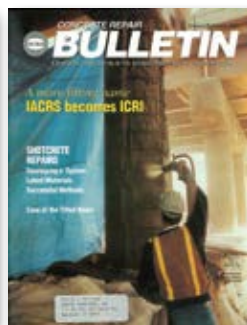
**FALLIS:** Over the next 25 years I would like to see the industry to continue to be leaders in sustainability—through repair versus replace—and see the quality of concrete repair to continue to improve through ICRI’s education and promotion of methods for quality concrete repairs, and through the development of new concrete repair techniques and materials.

**SOBELMAN:** As an organization we can’t create the work, but what we can do is educate property owners and government agencies—sharing our knowledge while training our employees. With quality repairs, the industry will continue to grow. We have accomplished a great deal in the past 25 years toward achieving the ICRI mission: to improve the quality of concrete repair. We should all be proud of the last 25. We are not finished and I can envision an ICRI of 4000 members in 2038. Kelly, call me when we hit it!

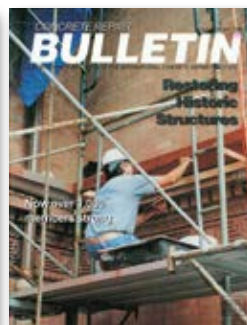
**CRAIG:** I would like to see the repair industry continue on the path that it is currently on developing new and better materials and methods and sharing the knowledge that is gained with those seeking to improve the longevity of new construction processes.



October 1988,  
“Memberships Pass  
200 Mark”



January/February 1993,  
“IACRS becomes ICRI”



January/February 1995,  
“Now over 1,000  
members strong”