CRH TIMES

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Shipping Season!

Message from Marie Glenn

Marie Glenn
Vice-President
Cement Sales & Marketing

Now that we are finally starting to dry up from a soggy spring 2019, we are pleased to bring you this latest edition of the CRH Times. Despite a challenging start to the construction season, a lot has been going on in the background at CRH Canada; from welcoming new colleagues (*see Welcome to Tobias Lutz, pg. 2*) and building relationships with counterparts across Canada and the US as part of CRH Canada's new North American cement platform, to celebrating epic milestones and relationships (*see Merkley Supply Ltd Celebrates 60 Years and CRH Canada Ogden Point Quarry 60th Anniversary Open House, pg. 13-14*).

As our transformation into the fourth largest cement producer in North America continues, we bring you a snapshot of some of the many benefits we are already enjoying. As a broader and larger organization, we can have an even greater voice to ensure that views on cement and concrete are holistic and evidence-based, driving responsible industry leadership (*see What is the GCCA? pg. 4*). Our commitment to sustainable development and providing solutions that support resiliency and reduce impact is shared throughout our organization (*see CRH 2018 Sustainable Development Report, pg. 3*). We also have an influence closer to home and in our own backyards, by planning facilities and spaces to not only respect but also enhance the natural environment (*see Habitat Restoration at CRH Canada's Mississauga Cement Plant, pg. 12*).

In an important April 2019 study, *Emission Omissions: Carbon accounting gaps in the built environment*, the International Institute for Sustainable Development (IISD) released its findings about considering resilience and longevity in the choice of building materials. Read our summary of the study as advocacy for the positive impact that cement and concrete can have on the built environment (*see IISD Study Examines Assumptions Behind Building Material Choices for a Sustainably Built Environment, pg. 6*).

And of course, no CRH Times would be complete without our gallery of events and places the CRH Canada Team has been over the past few months – who knows, you might just find yourself featured!

Happy reading!

Marie Glenn
Vice-President
Cement Sales & Marketing

Welcome to CRH Canada Tobias Lutz

It is our pleasure at CRH Canada Group Inc. to welcome Tobias Lutz to our Western Canadian cement team.

Tobias assumes the Terminal Supervisor role in Selkirk, Manitoba. Tobias's undeniable commitment to safety and past experience in the cement industry makes him a great fit at the Selkirk Terminal.

We look forward to working with Tobias and wish him the best. Welcome aboard, Tobias!

CRH 2018 Sustainable Development Report

Sustainability is more important now than ever. The world's population is on the rise and is expected to reach 9.8 billion by 2050. This upsurge in population and urbanization, coupled with increasing pressures on resources such as water, and the threat of climate change, is why sustainable development is fundamental to our performance and will play an important role in helping us achieve our ambition to become a leading global industrial company.

Stakeholder interest in sustainability is at an all-time high, particularly as it pertains to climate change, sustainable sourcing, use of natural resources and inclusion and diversity. Over the past two years, global socially responsible investments are reported to have grown by 34 percent to $30.7 trillion, with Europe remaining the biggest region for sustainable investors.

Our customers are pursuing more sustainable solutions, with an increasing demand for products that enhance the sustainability of structures. Today, there are more than 90,000 commercial projects participating in Leadership in Energy and Environmental Design (LEED), with 2.2 million square feet of building receiving LEED-certification every day.

As the expectation that companies conduct their business in an ethical and transparent manner increases, the need for sustainable business practices has never been greater. At CRH Canada we recognize that, through innovative solutions and collaboration, we can meet the challenges of an increasingly uncertain and complex world. CRH is ranked among sector leaders by leading environmental, social and governance (ESG) rating agencies and we are a constituent member of indices including the FTSE4Good Index and the Dow Jones Sustainability Index.

Our Sustainability Report provides an overview of our economic, environmental and social activities. In our report, we highlight how we are effecting change through improved performance and progression towards our sustainability targets. The graphic here provides a snapshot of the many areas in which CRH's global efforts are making an impact. For the full report, visit us at www.crh.com/sustainability.

Our highlights

Operating with integrity

38%
female representation on our Board of Directors

Creating solutions for our customers

32m
tonnes of alternative raw materials re-used in our products

Protecting the environment

23%
reduction in our specific cement CO_2 emissions compared to 1990 levels

Embedding a culture of safety

94%
of our locations were accident-free in 2018

Developing and empowering our people

2.7m
hours of training across the Group

Collaborating and engaging for sustainability

Over
1,300
stakeholder engagement events held

The New Global Cement and Concrete Association

Albert Manifold
GCCA President
CRH plc

Formed in January 2018, the Global Cement and Concrete Association (GCCA) was created to help ensure that the sentiment and representation of cement and concrete as building materials and as an industry are holistic and supported by fair, broad and accurate evidence.

> "Concrete is more than a material. It's about life."

The GCCA is comprised of 32 member companies (representing 35% of global cement production) and nine affiliate organizations, all with a focus on sustainability. This includes driving responsible industry leadership, striving to improve global social and environmental impact, fostering innovation and collaboration with other industry associations at national and regional levels, including the Cement Association of Canada, and forging partnerships with organizations such as the World Business Council for Sustainable Development.

The GCCA is a CEO-led industry initiative, with a governance structure that reflects the importance member companies place on the organization and its mission. As a founding member of the GCCA, CRH's own global CEO, Albert Manifold is the GCCA's inaugural President and Chair of the Board of Directors, guiding the charge to provide a global voice for the cement and concrete industry.

The group's first annual gathering was held in November 2018, where the GCCA defined its priorities and work program, including:

- Positioning concrete as the sustainable building material of choice;
- Promoting international best practice in the areas of safety, production and the use of cement and concrete in the built environment;
- Fostering innovation in the cement and concrete sectors;
- Making a positive contribution to global sustainable development; and
- Promoting the principles of a circular economy across the value chain.

The GCCA's work program sets the direction for the association towards achieving its sustainability objectives and addressing the full lifecycle of cement and concrete: reducing the impacts of cement production and promoting the unique properties of concrete as a sustainable, durable and resilient building material – a material that will answer the needs of a growing and increasingly urban population that is set to exceed 9 billion people by 2050.

Watch and hear more about the GCCA on their YouTube channel, through LinkedIn or Twitter (@the GCCA) or visit **https://gccassociation.org/** for more information.

Inclusion and Diversity

In 2018, CRH Canada set a challenging ambition: to become a leading global industrial company. To achieve this, we must not only continue to excel at the things we do very well, but also consider what we need to do differently. One of these identified areas to address is Inclusion & Diversity (I&D).

So what does it mean to be inclusive and diverse? Diversity is the who and the what: who's sitting around that table, who's being recruited, who's being promoted, who we're tracking from the traditional characteristics and identities of gender and ethnicity, and sexual orientation and disability—the inherent diversity characteristics that we each bring with us as individuals.

Inclusion, on the other hand, is the how. It is the behaviors that welcome and embrace diversity. Inclusion leads to a work environment in which all individuals are treated fairly and respectfully, have equal access to opportunities and resources, and can contribute fully to the organization's success. Employees in inclusive environments feel appreciated for their unique characteristics and are therefore comfortable sharing their ideas and other aspects of their true and authentic selves.

To address I&D internally, a taskforce was set up last year to develop an initial I&D roadmap. From this came a key recommendation; the creation of a support structure to drive the I&D agenda forward. This included the establishment of a global governance council and the appointment of a Chief Inclusion & Diversity Officer at CRH.

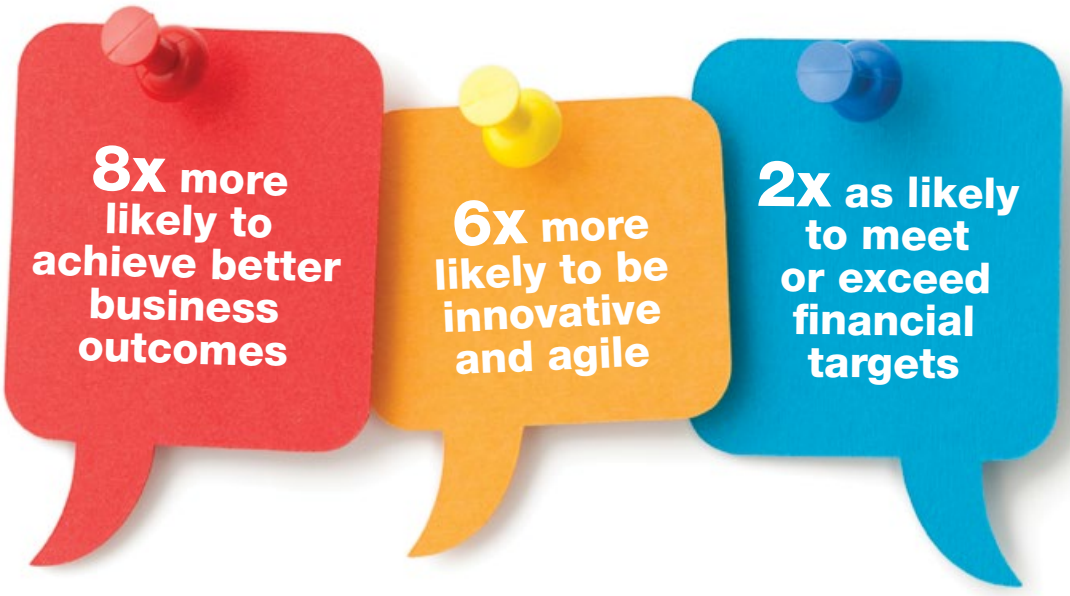
A Global Inclusion & Diversity Council has been formally established, consisting of 16 representatives from across our organization globally. The Council, which will meet on a quarterly basis, will oversee the delivery of our I&D roadmap in the coming years.

CRH appointed Soma Mohanty Garg in the new role of Chief Inclusion & Diversity Officer (CIDO), effective April 1, 2019. The CIDO will be part of CRH's Global HR Leadership Team and will also play a leadership role on the I&D Council.

In her new role, Soma will draw on global best practice to ensure a world class I&D standard for CRH. She will support our leaders in the articulation of how I&D links to better business results, and will also work closely with our HR and Talent Management teams to develop recruitment strategies to attract the best and most diverse talent.

Embracing I&D across our organization will make CRH Canada stronger, more innovative, more creative and more competitive, which in turn will help us deliver a superior performance for our customers. By working with people from different backgrounds and with different experiences and working styles, we learn and get another view. Diverse views make for better decisions, and thus drive a high-performance culture. Ultimately, we understand that this is not only a business-critical journey, but it is also the right thing to do for our people and our communities.

Inclusive Organizations are:



IISD Study Examines Assumptions Behind Building Material Choices for a Sustainably Built Environment

In April 2019, the International Institute for Sustainable Development (IISD), an independent environmental think tank whose mission is to promote human development and environmental sustainability, published a study called *Emission Omissions: Carbon accounting gaps in the built environment.*

The study examined the effectiveness and accuracy of existing Life Cycle Assessments (LCAs) in providing proper guidance for decarbonizing the built environment, including building material selection. Amongst other findings, a key recommendation is that while building material choice can have an impact of greenhouse gas emissions, the efficiency and longevity of buildings should take priority with policy-makers looking to decarbonize the building sector.

The *Emission Omissions* study was sponsored by the Cement Association of Canada and conducted by IISD. The study was overseen by an independent research advisory committee of academics, ENGOs and sustainable building professionals.

In *Emission Omissions*, IISD closely examined existing LCAs that evaluated environmental impacts of concrete, wood and steel as building material choices. The study found that while LCAs are indeed a good approach for evaluating environmental impacts in the built environment, existing LCAs produce widely variable results and can contain uncertainties that significantly impact the estimated embodied emissions of building materials.

Roughly 90% of carbon emissions from forest harvesting and wood product manufacturing are biogenic in origins and are not officially counted

In the case of wood, many LCAs were found to underestimate biogenic carbon emissions. In some cases when taking biogenic carbon into account, wood could have higher embodied emissions when compared to concrete. These sources of biogenic carbon include lower forest regeneration rates, loss of soil carbon storage and conversion of natural forest.

By the time long-lived wood products arrive at the construction site, as much as 70-80% of the carbon initially stored in the living tree may be lost or emitted.

Most importantly, however, is that the study finds the greenhouse gas impacts of building material choice are negligible in long-service-life and energy-efficient structures. The focus for policy-makers therefore should be in maximizing lifespan, durability and energy efficiency of structures while providing decarbonization incentives across all material sectors.

The study is available online at IISD's website: https://www.iisd.org/library/emission-omissions

Introducing CRH's 16 Life Saving Rules

In 2019, CRH Canada introduced 16 Life Saving Rules for all employees to follow. These rules have been developed as the result of real life situations that our employees encounter every day. The rules cover the following topics:

1 Contractor Safety Management

2 Machinery Safety

3 Isolation

4 Electrical Safety

5 Site Transportation Safety

6 Forklift Safety

7 Use of Mobile Phones in the Workplace

8 Hauler Safety

9 Construction Project Safety

10 Road Surfacing/ Repair Operations

11 Lifting Operations

12 Work at Height/ Preventing Injury from Falling Objects

13 Confined Space Work/ Prevention of Contact with Hot Material

14 Lone/Remote Working

15 Drilling and Blasting Safety

16 Preventing Over Pressurization

The Use of Roller Compacted Concrete in the Prairies

Roller Compacted Concrete or RCC, is a special blend of concrete that has essentially the same ingredients as conventional concrete but in different ratios. Unlike conventional concrete, it's a drier mix, stiff enough to be compacted by vibratory rollers. It does not require forms or finishing, nor does it contain dowels or steel reinforcing.

Typically, RCC is blended in high-output continuous mixing pugmills that have the mixing efficiency needed to evenly disperse the relatively small amount of water used. Dump trucks transport the RCC and discharge it into an asphalt paver, which places the material in layers up to 10-inches thick and 42-feet wide. Compaction begins immediately after placement and continues until the pavement meets density requirements.

RCC has been around since the seventies in applications such as logging facilities, intermodal yards, and distribution centers, where surface smoothness and appearance are secondary to high durability, low maintenance, and low initial cost. Since then, RCC has caught on in prairie feedlots which are traditional clay-based pens. In recent years, about 20% of Western Canada's feedlot industry has installed roller compacted concrete in cattle pens with the goals of improving profitability, pen condition and animal welfare and reducing costs associated with pen cleaning and maintenance.

Here are highlights of some of the projects our customers have completed in the recent past:

KASKO FEEDLOT PROJECT - GOLDRIDGE SAND & GRAVEL

Located in Coaldale, Alberta, this project was completed in two phases spanning a total of three weeks. With over 15,000 cubic meters of roller compacted concrete covering roughly 80 acres of farmland, CRH Canada supported Goldridge Sand & Gravel with the supply of cement through our Lethbridge cement terminal. A total of six alleyways were completed (45 feedlot pens) increasing the feedlot capacity to 30,000 heads. Utilizing their state of the art continuous mixing batch plant that consists of a twin shaft mixer that will produce at 500 metric tonnes an hour, Goldridge was able to complete the project in a very tight schedule with no room for error. The RCC was designed for 25 years of hard surface lifespan.

EXTERNAL APRON FOR POTATO STORAGE FACILITY - GOLDRIDGE SAND & GRAVEL

This project consisted of just under 1,000 cubic meters of roller compacted concrete, which included a power trowel finish after the RCC was compacted, densifying the top surface to improve durability and provide a smoother finish. CRH Canada supported Goldridge on this project with the supply of cement through our Lethbridge cement terminal.

CONCRETE FLOOR PAVING PROJECT

Located in Manitoba. Each floor consists of an 8” layer of concrete and placing was completed in less than four hours. Control joints were cut the same day later in the afternoon. In-progress and completed project pictures below.

Concrete pavement used by cattle farmers for their feedlots helps control manure seepage and runoff, making cleaning quick and easy. In addition, there is no need to add extra gravel or shale to the feedlot after removing the manure and all the saturated soil underneath, saving time and money. When paving feedlots, it is not required to power trowel, broom finish, nor to saw cut control joints.

Dear Dave,

There have been many incidents of falling concrete from Toronto's Gardiner Expressway due to corrosion. Seems like standards and regulations are continuously changing to prevent incidents like these that could potentially harm people or destroy vehicles! How do we as concrete producers create concrete that prevents corrosion to meet the standards and regulations that are in place?

Sincerely,

Bob the Batcher

Dear Dave

Who needs Dear Abby when you've got a Dave on your team!

Have a question on your mind?

Send him a note and "Dear Dave", our Senior Manager, Technical Services and Sustainable Development David Bangma, will answer it and publish it here so we can all be better informed.

This is a great question!!

We need to begin by understanding a bit about "Permeability".

Permeability is a measure of how easy it is for water, air and other substances such as chloride ions, the primary culprit of premature corrosion of steel reinforcement, to enter concrete. Concrete contains pores that allow these substances to enter. Larger pores allow easier entry, while smaller pores decrease the rate at which these substances enter the concrete. When chloride ions and oxygen and moisture combine and enter reinforced concrete, disaster can strike!

Evaluating the concrete is necessary prior to pouring for any structure to make sure you are mitigating any durability issues. Contractors may be asked to provide test results on the permeability of proposed concrete mix designs. The rapid chloride permeability test (RCPT) determines chloride permeability by measuring the number of 'coulombs' able to pass through a sample. This is a standard test method for electrical indication of concrete's ability to resist chloride ion penetration. The more permeable the concrete, the higher the coulombs; conversely, the less permeable the concrete, the lower the coulombs.

What must be done to lower coloumbs readings and decrease the permeability?

Having good practices in place lowers chloride permeability:

- Low water-cement ratio;
- Optimization of binder content by ensuring well graded aggregates;
- The use of supplementary cementitious materials (SCMs) such as Slag and Fly ash - the higher the percentage of slag/fly ash cement in a concrete mixture, the lower the permeability of the concrete. One challenge, however, can be that SCMs can take longer than 28 days to provide full benefit;
- Use of silica fume; this is a superpower when it comes to lowering RCP contents;
- Use of chemical admixtures such as corrosion inhibitors;
- Good consolidation which helps decrease permeability;
- Having lower air content without compromising the specifications;
- Optimal paste content with a well graded sand to stone ratio; and
- Curing, curing, curing!

David Bangma
david.bangma@ca.crh.com

Dr Kristie Ebi, Professor of global health and environmental and occupational health sciences at the University of Washington and Director of CHanGE (The Center for Health and the Global Environment)

CRH Canada, Active with the Canada Green Building Council (CaGBC)

According to Environment and Climate Change Canada's Advisory Council on Climate Action (ACCA) report, the built environment accounts for 12% of current emissions. As part of the largest building material supplier in the world, this is exactly why CRH Canada is active with the Canada Green Building Council (CaGBC).

This organization is dedicated to advancing green building and sustainable community development practices. As the voice of green building in Canada, they work closely with their national and chapter member network to make every building greener. CaGBC established the LEED (Leadership in Energy and Environmental Design) green building system, and recently developed the country's first Zero Carbon Building Standard.

One of the major themes at CaGBC's recent Annual General Meeting (May 2019) was 'deep retrofits' – education and examples about how existing buildings can be updated to become part of climate change mitigation solutions.

On average, green buildings outperform conventional buildings by upwards of 30% in terms of energy efficiency. But to pick up the pace, gains in energy efficiency can't come from new buildings alone. It's estimated that today's buildings will represent 75 percent of the stock in 2030—meaning it's imperative that Canada's existing buildings be retrofitted for energy efficiency if Canada is to meet its targets.

The CaGBC is working with government and industry leadership to develop a strong retrofit economy where the market takes the lead in transforming Canada's built environment to help fight climate change and create new economic opportunities for Canadians – and CRH Canada is committed to being involved to remain part of the solution.

Habitat Restoration at CRH Canada's Mississauga Cement Plant

CRH Canada's Mississauga Cement Plant is working to restore natural habitat. Nature is declining globally at unprecedented rates with over a million species now threatened with extinction, many within our lifetime. Biodiversity restoration and enhancement is at the forefront of CRH Canada's environmental priorities.

As we help communities enhance the resilience of their built environments, we look to our operations and surrounding areas as an opportunity to help restore and enhance the natural ecosystem.

CRH Canada collaborated with Credit Valley Conservation Authority and Environment and Climate Change Canada in a large migratory land bird habitat restoration project in 2015, on its Lakeshore property in Mississauga. 2.2 hectares of land was naturalized for the purpose of providing essential habitat to many bird species during spring and fall migration.

Approximately 76% of the immediate land along the Lake Ontario shoreline has been urbanized with forest cover accounting for only 8% of the land cover. As such, the extent to which migratory bird species can find appropriate resources is very limited. This habitat project will help to address those needs.

In 2017, Credit Valley Conservation and CRH Canada employees planted 1,408 trees and shrubs in the project boundary. 28 native species were planted, with many more native species added when the land was seeded that fall.

Monitoring of the success of the program will be achieved by avian and insect surveys completed at various stages of the project. It is our expectation that as the vegetation matures, CRH Canada will see increased biodiversity within the habitat and that the survival rates of the species that use the habitat for food and breeding grounds will increase.

The commitment to habitat restoration continued in 2018, when CRH Canada employees naturalized 900 square meters of land for pollinators like the monarch butterfly, common eastern bumblebee and many

others. CRH Canada is proud to be involved in such important conservation initiatives and to help some species find new ground for habitat, breeding and resources.

Merkley Supply Ltd. Celebrates 60 Years

Merkley Supply Ltd. celebrated in style at its ever popular annual trade show on March 21, 2019, at the Ottawa Conference and Event Centre. “It was all hands on deck” as Skipper Robert Merkley would put it at this year’s event.

“No better way to celebrate Merkley Supply Ltd.’s 60th anniversary than a trade show,” stated Paul Mutter (Purchasing Manager), who has been all in since he joined the company, some 35 years ago.

More than 1,000 architects, technologists, designers, and contractors flocked to the Event Centre. They took advantage of the opportunity to network with peers and view the latest products and technologies on display from some of the industry’s top exhibitors.

They also had an opportunity to attend many of the offered seminars which counted towards their continuing education credits.

Over the past 28 years, the Merkley trade show has been known as one of the premiere local networking and business building events for the construction industry.

As a special attraction this year, CRH Canada brought back retiree Mr. Gilles Dore to help attend our booth. Many masonry contractors were pleased to see Gilles and remind him of how they made him look so good for so many years. CRH Canada is a leading supplier to Merkley and cherishes our strong, long-standing relationship and bond.

Congratulations to everyone at Merkley Supply Ltd. for their outstanding service in supplying the Ottawa construction industry for the past 60 years.

MERKLEY SUPPLY LTD. | 60 YEARS

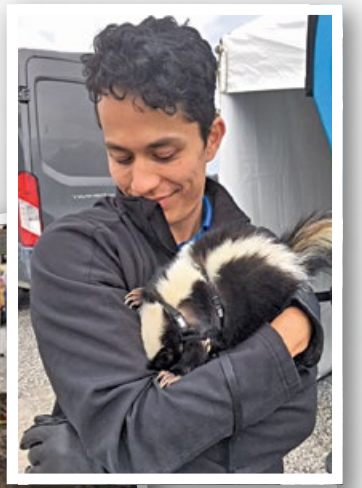
CRH Canada Ogden Point Quarry 60th Anniversary Open House

On Saturday, June 15, 2019, CRH Canada's Ogden Point Quarry opened its doors to the public hosting their 60th Anniversary Open House. Located on the shores of Lake Ontario in Colborne, Ontario, the Quarry was delighted to welcome approximately 750 people over the course of the four hour event.

Visitors to the open house were given the unique opportunity to take guided bus tours of the quarry, learn about the quarrying process through informative displays hosted by knowledgeable staff, and take rides in the large mobile equipment. Earth Rangers were on hand with some of their furry and feathered friends and Colborne Public School Drumline performed to the delight of the crowd.

During the formal presentation, CRH Canada was proud to welcome five of the local organizations with whom they have partnered over the years. Representatives from Colborne Public School, Lower Trent Conservation Authority, Cramahe Public Library, Northumberland YMCA and Community Care Northumberland were delighted and surprised when CRH Canada announced a total donation to the community of $30,000.

CRH Canada would like to thank the employees and retirees of the Ogden Point Quarry for their commitment and talent over the past 60 years – we look forward to the many more years to come!



Toronto Raptors Tribute

Congratulations to the 2019 NBA Champions, Toronto Raptors! The CRH Canada Team was a proud supporter throughout the regular season and during the historic 2018-19 season playoffs.

Photo by Christian Mendoza on Unsplash

Photo Gallery

1- Spring Sales Meeting
2- Earth Day
3- Mavericks Charity Golf Tournament in Calgary
4- Concrete Ontario AGM
5- Dinner with Shouldice Designer Stone
6- OCPA Golf Tournament
7- Farewell Lunch for Dave Zappa
8- Ride to Conquer Cancer
9- Concrete Ontario Camp Ooch Donation
10- Italian Open Golf Tournament

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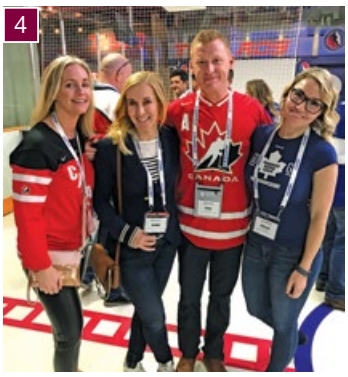

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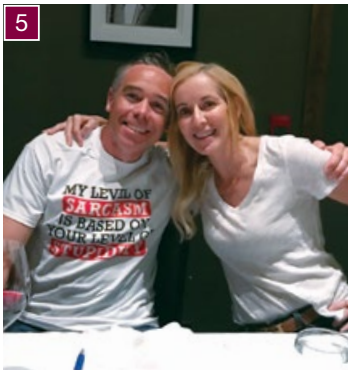

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