Keeping in Touch with Alumni Winter 2017

U OF A ENGINEER

the BUILDER

Tegan Martin-Drysdale is taking infill seriously

A fire in the sky

Leading an urban planning revolution

Doubling down on C.D. Howe Scholarships

Supporting steel structure engineering

ALWAYS MOVING FORWARD

Fall on campus is a full and busy time and, as the snow flies, I'm now reflecting on the past autumn here at the Faculty of Engineering. In addition to the energy and excitement of new and returning students, we welcomed many of you back to campus during Alumni Weekend. Together, we renewed old friendships and marvelled at the achievements of today's students and researchers. Their enthusiasm is infectious and seemingly unlimited.

It's our mission to support those students, instructors, and researchers, and we're taking big steps forward in that respect.

Internally, Valérie Bélisle has joined the Faculty of Engineering as the assistant dean of advancement. She holds a bachelor's degree in industrial engineering from École Polytechnique Montréal. Joining the faculty as strategic advisors are Eddy Isaacs, the former CEO of Alberta Innovates – Energy and Environment Solutions, and Brad Anderson, former director of both the Construction Owners of Alberta Association and the Alberta Chamber of Resources.

Eddy and Brad are sharing their decades of executive-level networks and experience in establishing research chairs and partnerships between industry, researchers and students. Valérie is leading our advancement and alumni relations team. Together, they are connecting with alumni such as you, and supporters from industry, who are interested in ensuring our students, researchers and educators have the resources they need to reach their full potential and help solve some of today's most pressing challenges.

Together, our dream is to give our students the experiences we wish someone had given us, taking an outstanding educational experience and making it even better, and to help our researchers make discoveries they could not make elsewhere. The story of this support will be written in the advancements and innovations made by the next generations of engineers.

We're thankful to all of you for your support, in all forms, throughout the years. With your help, we are always moving forward.

J. Fraser Forbes PhD, PEng
Dean of Engineering

Vision To be one of the largest and most accomplished engineering teaching and research centres, a leader in North America.

Mission To prepare top-quality engineering professionals, to conduct world-leading research and to celebrate the first-class reputation and outstanding accomplishments of alumni.

Values Dedication, integrity, professionalism and excellence in teaching, research and service to the global economy and community.

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FACULTY OF ENGINEERING

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FEATURES

DEPARTMENTS

ON THE COVER Tegan Martin-Drysdale (Civil '02) is taking on infill development—including restoration of the historic Alberta Block building on Edmonton's Jasper Avenue. Photo: Demetri Giannitsios.

Reconnecting with my most effective teacher

I was sad to read in the last issue of Dean Emeritus George Govier's passing. But it was nice to read about one of my favourite professors, Robert Ritter, in the same article (The Dean's Dean: Robert Ritter recalls the spirit of his mentor and friend, George Govier, *U of A Engineer*, Spring 2016).

I graduated from the U of A in 1961, and professor Ritter taught me for three classes: the first term of Unit Operations out of the book by G.G. Brown et al., Process Control and the senior class in public speaking. In my opinion, Ritter and Don Robinson were my most effective teachers.

In the first class, Ritter taught me I could never grasp the method of coming up with the proper dimensionless numbers. Finally a former classmate from graduate school at Berkeley explained how he could rationalize dimensional analysis from the basic differential equation and boundary conditions. So, nearly 20 years later, I was able to come to peace with the concept.

I really found Ritter's reflections about Dean Govier interesting. He was the dean when I was an undergraduate. After graduation, I stayed on with the encouragement of the department chair, Don Robinson, for a master's degree. When I started the graduate program in the fall of 1961, my first office was Dean Govier's former office. I think it was larger than my apartment!

After finishing my MSc, I went to Berkeley for a PhD. I ended up doing a project on freeze-drying with Jud King and Charles Wilke. I finished in the spring of 1966, and that was a great time to be looking for a job. I narrowed my choices down to the U of A or the new department at the University of California, Santa Barbara. It was really a tough decision. On the personal level, my family were all in Alberta but my wife loved Southern California. On the professional side, the U of A had a well-developed program but UCSB presented real opportunities, since we didn't even have a graduate program in chemical engineering when I started.

I was the first person hired by the new chairman, John E. (Jack) Myers at Santa Barbara. He also graduated from the U of A, in 1945, and he also had stories to tell me about Dean Govier. He had worked at Govier's house as did Ritter, as described in his reflections.

After Jack finished his BSc, his first job was with the Alberta Oil and Gas Conservation Board, and he worked with Govier there also. Jack and Don Robinson both worked with Don Katz at the University of Michigan for their PhDs on the same heat-transfer project. Jack was in the same U of A class with Don Quon (one of our professors) and they were good friends. (Don was a good-natured fellow who may have laughed harder at his own jokes than we students did.) He visited us in Santa Barbara a couple of times.

I just wanted to let you know that I appreciated reading professor Ritter's reflections about Dean Govier. It also brought back memories of my time in his classes. He was a tough but effective teacher and I am thankful for that.

Orville C. Sandall (Chemical '61, MSC '63)
Santa Barbara, Calif.

Low carbon, high expectations

A new multidisciplinary institute will explore new energy technologies

Provost and Vice-President (Academic) Steve Dew speaks during a funding announcement supporting new low-carbon energy research.

The University of Alberta is launching a new institute aimed at reducing the environmental footprint of fossil fuels and developing new low-carbon energy systems, thanks to a $75-million federal grant. An additional $82.5 million in infrastructure funding, of which more than $22 million is destined for the Faculty of Engineering, will help put leading-edge research on the fast track.

The federal funding programs were announced in September.

The new Future Energy Systems Research Institute (FESRI) will bring together researchers across many disciplines to improve energy systems related to unconventional hydrocarbon resources—tailings ponds, greenhouse emissions, water use, land reclamation and safe, efficient energy transportation.

Larry Kostiuk, former chair of the Department of Mechanical Engineering, has been appointed as director of the institute.

FESRI will build on U of A strengths in advanced materials, smart electrical grids and bioprocessing to help move Canada toward a low-carbon energy economy. The multidisciplinary institute will examine energy demands, sources and processes through a broad range of perspectives—social, economic, legal, scientific and technological. The Faculty of Engineering will play a key role, according to Ying Tsui, the faculty's associate dean (research).

"The Faculty of Engineering has been a powerhouse of energy systems development, and we bring major technological know-how to the table," Tsui said following an announcement of the funding.

"And working together with other faculties on campus like ALES (Agricultural, Life and Environmental Sciences), Science, the School of Business and more, knits us all closer together as we work to find new energy solutions."

Global partnerships such as the Helmholtz-Alberta Institute and collaborations with China's Tsinghua University and RWTH Aachen University in Germany will help bring in new ideas, he added.

The $75-million federal investment is part of the Canada First Excellence Research Fund to strategically invest in areas where post-secondary research institutions have a competitive advantage and can become global leaders.

Days after the announcement, the University of Alberta received $82.5 million in infrastructure funding from the federal and provincial governments to improve the scale, quality and sustainability of 10 research and innovation facilities.

In the Faculty of Engineering, that means completion of renovations to the Chemical and Materials Engineering Building and the creation of new labs in the Electrical and Computer Engineering Research Facility (ECERF) to research smart grid technologies and accommodate biomedical engineering research. It will also lead to the hiring of 30 engineering professors.

The investment is supported by the federal government's Post-Secondary Institutions Strategic Investment Fund and the Government of Alberta to develop technology commercialization spaces. This combined contribution, along with an injection of $48 million from the private sector and the U of A, will support more than $130.8 million of renovation and construction projects over the next two years.

Electrical engineering professor Ryan Li says the funding will have a profound impact. His research focuses on developing new smart grid technologies to enable the century-old electrical infrastructure to work in an environment it wasn't designed for, integrating electrical energy from renewable sources like solar and wind power.

Li is part of a group of about 10 Faculty of Engineering researchers exploring smart grid technologies—it is one of the largest research groups of its kind in North America.

"This enables us to set up the best smart grid research facility in the world—right here at the U of A," he said.

For the U of A, the funding supports capital projects and renewal that will help maintain and improve current campus infrastructure, benefiting students and ensuring the province plays a key role in diversifying Canada's economy and creating a more sustainable future.

For example, enhancing ECERF will put Alberta at the forefront of research in electrical power generation and transmission, while renewing labs at Campus Saint-Jean will triple the number of student spaces for increasingly needed bilingual health professionals.

ENGG NEWS

Traffic app makes streets safer

A new mobile app jointly developed by the City of Edmonton and the University of Alberta is helping make city streets safer.

Recognizing that most drivers now carry a smartphone, the city and the Centre for Smart Transportation worked together to create the SmartTravel traffic safety app.

Available free through the iTunes app store or Android app centres, SmartTravel literally speaks up about safety, providing drivers with voice alerts that increase awareness and safety. For instance, when approaching a school zone, motorists will hear the voice of a girl advising them to slow down.

Other message types use adult male and female voices to advise motorists of changes in speed limit and alert them when they are entering high-risk collision locations. The voice variation helps hold the attention of the driver.

The SmartTravel app runs in the background and complies with Alberta's distracted driving legislation. When not driving, users can browse the app and review maps of high-collision locations, school zones and speed limits, as well as review traffic safety-related information sent through SmartTravel's push notifications system.

Users are also invited to participate, anonymously, in a data collection project that gathers information such as speed and rates of acceleration in order to conduct statistical analysis of driving patterns in Edmonton. The data, which cannot be connected to individual drivers, helps traffic safety planners understand driving habits, enhance the effectiveness of the app and, potentially, improve other infrastructure features such as signage.

Push information includes alerts of real-time traffic disruptions and reminders of seasonal events (such as school season start, adverse weather, etc.).

The app was also showcased earlier this year at the International Conference on Urban Traffic Safety, where it won recognition for innovative technology.

On the ball

in engineering and soccer

Shamit Shome kicked off his professional soccer career with a bang: the 19-year-old played 26 games out of 32 in his inaugural North American Soccer League season, marking an impressive debut with FC Edmonton.

Oh—and on top of that, he's in his second year of electrical engineering.

For Shome, juggling engineering courses with a professional career in soccer is like kicking a ball around with his friends—easy and exciting.

The two careers are equally important to Shome. With six courses per term during the school year, he practises five or six times a week and plays regular games with the team. To keep his eye on the ball, Shome has developed excellent time-management skills.

"I make sure I set time for each thing. So once I have practice, I focus on the practice. When the practice is out of the way, then I transition to the school aspect: I get all my homework done, study, go to classes," he says.

He's clearly handling the load well. He was just nominated by Canada Soccer for the Under-20 Player of the Year.

"We've done nothing but sing Shamit's praises all season long and rightly so, because of his attitude and his willingness to listen and learn and his humble approach to the way he goes about things," FC Edmonton coach Colin Miller says of Shome's performance.

Staying focused on the ultimate goal and working hard is what contributed to Shome's success on the field and won him the reputation of a disciplined, quality footballer.

"I believe in doing the right thing on and off the field and being consistent," says Shome.

FC Edmonton had one of its best seasons in the past five years, making it to the playoffs and ranking third in the North American Soccer League.

"We did very well this season. Not only did we surpass our expectations, but the expectations of the entire league," he says.

With so much success in his debut year as a professional soccer player, Shome's objective is to become an even better midfielder.

"I created chances this year. Next season, I want to score goals and get assists."

ECE students get backstage pass at NASA for comet crash

Engineering students invited to NASA's Jet Propulsion Lab in September were among the first people to see images taken by the Rosetta spacecraft as it made a planned crash on Comet 67P/Churyumov-Gerasimenko.

About a dozen students from the Department of Electrical and Computer Engineering were invited to watch the mission finale at JPL by Artur Chmielewski, a mechanical engineer and NASA's project manager of the Rosetta mission.

Chmielewski invited students to JPL to see Rosetta complete its 12-year mission after he delivered a presentation about the Rosetta mission on campus.

"It was an opportunity you just couldn't refuse," says Carson Dick, an engineering physics student who made the trip. "It felt like the closing of a very important project, and we got to be there in person as they were wrapping it up."

Many of the students were in elementary school when Rosetta was launched on March 2, 2004. Ten years later, after travelling 6.5 billion km, Rosetta made its rendezvous with the comet. Rosetta's robotic probe, Philae, landed hard on the comet's surface. Limited data was collected by Philae and the next step of the mission was to take close-up images of the comet—which required crashing Rosetta onto the surface.

The mission was run jointly between NASA and the European Space Agency, and the students were among about 50 VIPs in an auditorium at JPL, connecting via Skype with Chmielewski, who was in Germany, where final manoeuvres were handled.

Second-year electrical engineering student Jack Zhao said the trip made the idea of one day being involved in space missions "more tangible."

Allen Elbana, who graduated with a degree in electrical engineering in April, said students are grateful to electrical engineering professor Abdul Elezzabi, who encouraged them to reach out to Chmielewski in the first place, and who consistently asks students to think big.

"He spurs interest in big projects like this and people in the program feel like they can achieve those things," says Elbana. "That's his mentality and he shares that with students."

Charities win as Dean gets dunked

Dean Fraser Forbes raised the stakes at the ESS Engineering Carnival's dunk tank fundraiser. After egging on students, faculty and staff to dig for donations, Forbes was dunked—several times. Also taking turns on the platform were members of the ESS executive and other students, Associate Dean Jason Carey, Student Services Manager Raymond Matthias, and Student Recruitment Officer Connor Harper. In all, the ESS raised $500, it will donate to a charity to be determined by a student vote early in 2017.

First-year student has long-term plans and the scholarships to power them

Ben Hallworth found out pretty early in life that he could help others using his prodigious talents.

He assembled his first circuit board at the age of four and spent his summers at the U of A's DiscoverE engineering camps. Hallworth, while attending Edmonton's Strathcona High School, used his knowledge in computer programming to develop an app called Physics Toolbox, which helps students perform unit conversions and find solutions to most physics problems taught in the curriculum. That app is now being used by more than 500 students and teachers in several countries.

And while education tools are a virtuous endeavour, Hallworth, who was named a University of Alberta 2016 Schulich Leader Scholarship winner, took his career lead way back in 2010 from Hugh Herr, an engineer, biophysicist and world-class rock climber who also happens to be a double amputee. It was shortly after a horrific rock-climbing accident that Herr began to apply biophysics to improve the interface between prostheses and the human body and lead his team at MIT to the forefront of biomedical engineering.

"My vision is to go even further and utilize physics and engineering, inspired by the fusion of art and science already present in nature, to augment human performance through the implementation of neural-integrated prostheses," wrote Hallworth in his Schulich scholarship application.

Hallworth knows a little about overcoming adversity himself. A routine checkup last year revealed that he required spinal surgery, and that a prolonged recovery was an obstacle standing in the way of his goal of being Strathcona's top student.

Undeterred, he organized an online study group with dozens of peers similarly keen to delve deeper into the course material. After hundreds of hours leading peer-to-peer online collaboration, he not only achieved the highest academic average, but also saw many others in his online group achieve academic honours as well.

"This experience showed me the value of teamwork and the power of tenacity in the face of adversity," said the first-year engineering student, adding he has learned that leaders cannot succeed alone. "It is essential that a team collaborates towards a common goal."

Hallworth and science student Sheldon Cannon are the two U of A students among 50 students across Canada to receive four-year scholarships of $60,000 to $80,000, depending on their chosen profession.

Past Perfect

Engineering alumni return to the place it all began to renew old friendships

Every year, Alumni Weekend draws our family of engineering alumni together. Graduates travel from across the country and around the world to meet with old friends and discover what's going on at their alma mater.

Like any family reunion, the weekend's filled with shared memories, renewed friendships and bittersweet good-byes.

Alumni Weekend is where we tell our stories. It's where our history is shared, where today's students and professors can inspire—and feel inspired.

U of A Engineer captured some memorable moments from Alumni Weekend 2016. Thanks to all of you for attending—we can't wait to see you again!

Photos by Demetri Giannitsios

Alumni Weekend 2016

Connecting industry and research

Eddy Isaacs and Brad Anderson bring their expertise and connections to the Faculty of Engineering

The Faculty of Engineering is doubling down on its ability to connect researchers to industry and government partners, to co-ordinate large interdisciplinary research initiatives, and to transfer new knowledge and technologies to the market.

Eddy Isaacs, the former CEO of Alberta Innovates – Energy and Environment Solutions, and Brad Anderson, former director of both the Construction Owners of Alberta Association and the Alberta Chamber of Resources, have joined the Faculty of Engineering as strategic advisers to the dean. The two are bringing decades of executive-level experience and connections in establishing research chairs and partnerships to researchers in the faculty.

Eddy Isaacs

In his capacities with the ACR and the COAA, Anderson was connecting university researchers with industry and government partners. The organizations helped establish research chairs in the faculties of science and engineering at the U of A, the University of Calgary and in the U.S.

"We did it because we were getting good results from these research partnerships," Anderson says. "I've seen some great results when industry and universities connect needs and research goals."

Isaacs is one of Canada's energy industry visionaries. He has spent his career promoting innovation in energy and the environment across the country and forging partnerships among industry, governments and academia. In 2014 he received the ASTech Foundation award for outstanding contributions to Alberta's science and technology community.

He is a former co-chair of the Energy Technology Working Group of the Canadian Council of Energy Ministers and is regularly called upon to provide expert opinion and insight into Alberta's energy and environment future.

Isaacs served as CEO of Alberta Innovates – Energy and Environment Solutions, the province's top agency in energy and environmental technology innovation advocating for environmentally responsible energy, sustainable water management and renewable energy and emerging technologies in Alberta since its inception in 2010. He retired from the position earlier this year. During his tenure, he expanded collaboration and reinforced partnership with the government and industry, and worked toward positioning Alberta at the forefront of innovation in the energy and environmental sectors.

In 1969 he obtained his bachelor of science degree in chemistry from McGill University, and in 1974 graduated from the University of Alberta with a PhD in chemistry, focusing on organometallic chemistry.

Brad Anderson

With more than 80 publications and six patents in the energy field, Isaacs is a valuable resource for Faculty of Engineering researchers, particularly those working in energy and the environment.

He sees the recent awards of $75 million in funding for future energy systems research at the U of A, and $82.5 million for new infrastructure, as enormous opportunities for the U of A to help position the province as a leader in energy and climate change.

Over the years he has had countless interactions with academia, and in his new role with the Faculty of Engineering, he's hoping to help build connections where they will be most beneficial.

"My approach right now is to be asking people, 'How can I help you?' If I can be helpful to one or two people maybe others will follow."

Anderson, who earned his geology degree at the U of A, adds that Dean of Engineering Fraser Forbes is "a connector" and knows that many engineering researchers already have positive research connections with external partners. But with his background and history of connecting interested parties, Anderson stands poised to help create relationships that might not otherwise be made.

"I want to have an open-door policy here. I certainly know enough folks that I can connect a few dots so that we can—where appropriate—work with people off campus when we're working on things they find relevant."

Rare double win

Lightning strikes twice as both C.D. Howe recipients are from the U of A

Natasha Pye and Brendan Calef have been awarded both of the prestigious C.D. Howe awards.

Only two engineering students in Canada win the C.D. Howe National Engineering Scholarship, which is awarded annually. How hard is it to win this prize? It's next to impossible—the scholarship goes to the best of the best. Every engineering dean across the country nominates one male and one female student. That list is reviewed by a committee of national college and university representatives, who then select the recipients.

This year both winners are from the U of A Faculty of Engineering.

In her first year of engineering, Natasha Pye was already chalking up great achievements. She earned a perfect 4.0 grade point average while taking on leadership roles in student-led initiatives and clubs. She's one of the leaders of the U of A EcoCar team, which won the North American title at the Shell Eco marathon in Detroit and competed on the world stage in London, England in July.

The other recipient is Brendan Calef, an electrical engineering student who's also a key member of the U of A Golden Bears Track Team. And he scored a perfect grade point average of 4.0 with nine A+ grades. He's on track to be designated an Academic All-Canadian student athlete.

"My first reaction was, 'No way!' It's a Canada-wide competition. To get the award is a huge honour, I'm happy about it," says Calef.

Calef spent his summer working on a research project with mechanical engineering professor Martin Barczyk, programming and coding for a computer vision project on drone vehicles used in photography. His main research interests revolve around mechatronics and robotics.

He's also taking part in student team projects as a member of the Autonomous Robotic Vehicle Project, an interdisciplinary engineering team that competes annually at an international robotic submarine competition in the U.S. He worked on the programming side of things with ARVP, and is hoping to work with other student clubs and initiatives in the years to come.

He's obviously just as committed to athletics. His athletic career started in junior high school, where he competed in middle distance and cross-country running, and butterfly and freestyle swimming.

How fast is he? Very. His best time for the 800-metre event is 1:50.11. To put this into perspective, the gold medalist in the men's 800-metre final at the 2016 Olympics was 1:42.15. Calef intends to close that gap.

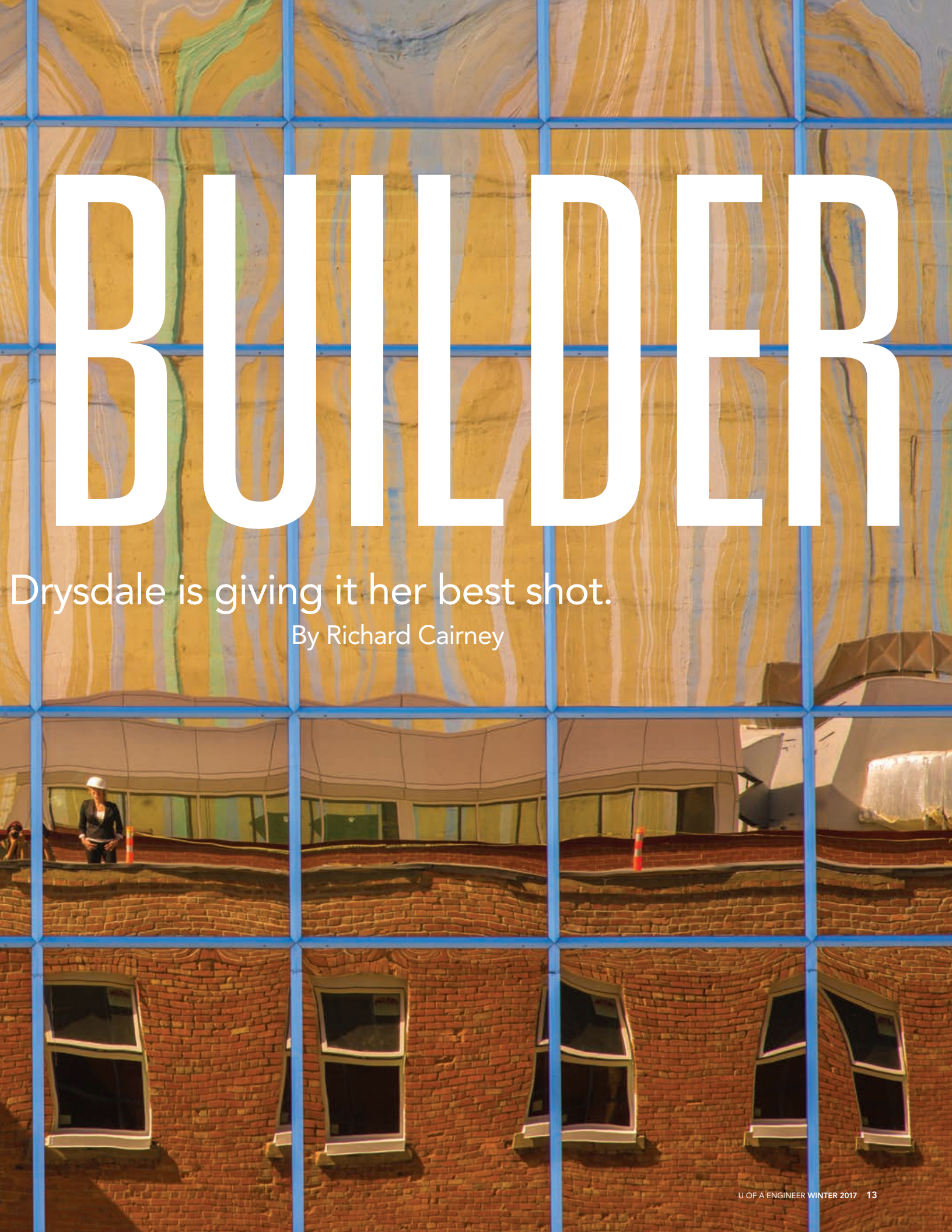
"I'd like to be able to make a national team and compete for Canada at the University games or the U23 games. After I graduate, I'd like to try to go for the Olympics. But, at the end of the day, engineering is my main future. I want to continue running, but there's going to be a point in time where I'll stop training at such a high level."

Calef says efficient time management and good company are key to achieving success, academic and athletic.

"The biggest thing, I guess, is to stay on top of things as they come to you rather than trying to get things done just in time for the deadline," he says. "The group of friends that I have in school is a very smart group of kids. Studying with people who are academically successful makes you more academically successful."

THE

It ain't easy being sustainable, but Tegan Martin-



BUILDER

Drysdale is giving it her best shot.

By Richard Cairney

"There's inherent value in historic arch

The story, the history, the fabric of our cities can be found in our buildings. "If these walls could talk" is not merely an old saying. Rooms and doorways and staircases speak of our past and, in doing so, establish our identity and help guide our future. Whether it's a downtown business centre or a residential neighbourhood, the character of a place dwells in the structures in which we live and work. Edmonton's character is hard to read because it's a young city in a young province where economic cycles cause periods of rapid growth. Sterile towers of glass and steel now stand where stone-clad buildings housed independent merchants. Old stories are torn down and replaced with new stories and a changed identity.

There are thankfully some who believe that renewal doesn't require a wrecking ball, that our cities can refresh themselves from within. Tegan Martin-Drysdale (Civil '02) is one of those people. When she established RedBrick Real Estate Services in 2012 and began considering opportunities for the company, one contender was the Alberta Block building on Jasper Avenue at 105 Street in downtown Edmonton. Alberta Block served as the home of CKUA radio for nearly 60 years, and the 100-year-old landmark was sitting dark and empty. There was something irresistible about the six-storey brick building.

"I toured it in 2012 and thought about purchasing it, but then I thought it was too big to be my first project. But I kept driving past it, thinking, 'I can't let this go. There's something drawing me to this.' And that's when I really started to push. There's inherent value in historic architecture and the story of a building."

Selling others on the project was another matter. "The building sat on the market for two years—and there was a reason for that," she says. "Inside, there was this maze of rooms that made it hard for people to see what it could become. From my experience, I can visualize a space and I imagined it all opened up. The toughest thing was to create a vision people could buy into and see for themselves."

At one point, just as Martin-Drysdale was about to write the whole idea off, people starting saying yes. Pieces began falling into place and the project was a go.

"I had to pinch myself—I still pinch myself—I love the building."

The restoration is emblematic of what it's going to take for Martin-Drysdale's young company to succeed. She describes another project, a new infill apartment building near Commonwealth Stadium,

Photos: Demetri Giannitsios

Tegan Martin-Drysdale (Civil '02) shows off one of two "skinny" infill homes she had built in her own neighbourhood. Previous page: Martin-Drysdale on the roof of Alberta Block, as seen in the reflection of the Energy Square building.

nitecture and the story of a building."

—TEGAN MARTIN-DRYSDALE

as "a testament to taking a risk as an entrepreneur and failing and getting back up and going at it again." Construction on the 34-unit building stalled for a year after a key contractor went out of business. Today, with new financing and plans, construction is nearly complete.

"I had to buckle up and ride it out and see what was going to happen. If I wasn't as passionate about what I am doing in this industry, I would have just quit. I'm hopeful that a year from now the story ends with a completed, quality building that's a good addition to the neighbourhood."

Infill and finding developments that fit with communities are issues dear to Martin-Drysdale, a strong advocate of rejuvenating established neighbourhoods.

After graduation, she landed her dream job, working with Read Jones Christoffersen as an Engineer in Training. She worked her way up the ranks to become a team leader overseeing the construction of Jamieson Place, a striking, 42-storey office tower in Calgary. Wanting to get closer to the action in building, she joined ProCura Real Estate Services in Edmonton to have a role in how a building, its occupants and neighbours work together. In 2012, she opened RedBrick Real Estate Services, a boutique infill development company that's finding its niche in new and retrofitted residential and commercial buildings.

Through RedBrick, Martin-Drysdale's goal is to keep older communities sustainable, diverse and vibrant, and to help address seemingly unchecked urban sprawl by building quality, affordable housing that will rejuvenate older neighbourhoods. Martin-Drysdale is a former member of the city's Sustainable Communities Task Force, established to address growth and community stability. Through meetings with developers, school boards and service and utility providers, she came to understand the complex issues that go into city building and neighbourhood life cycles. A community's population peaks in its first 10 years as young families move in and grow. Schools and amenities fill most needs conveniently. Slowly, over decades, things change.

"After you hit that peak, these neighbourhoods are in decline for the next 30 or 40 years," Martin-Drysdale says. "And in these mature neighbourhoods you end up with empty schools, while on the periphery of the city, schools are overcrowded and have portables. It's a cycle and it's not a sustainable way to build communities."

The solution—keeping younger families moving into established areas—is easier said than done. RedBrick has completed two narrow-lot homes ("skinnies") in Riverdale, her own neighbourhood, just off the downtown core. And while residents of well-established neighbourhoods want to see young families in their communities, the words "infill housing" set off alarms. Martin-Drysdale is working to promote the notion of "quiet densification," in which infill homes are built on skinny lots and three or four housing units fill an area once occupied by one family. Using homes designed with rejuvenation in mind, she's promoting communities that adapt to the life cycle of families living in them. A young couple might buy a three-level infill home and use one level as a rental suite. As their family grows, they can take over the entire building; when their children move away, the couple can rent out part of the house again, or take in their aging parents. One day, as seniors themselves, that couple could be living on the ground level, with their adult children occupying the upper floors.

This view of development addresses a cultural issue, in that a neighbourhood always has a diverse population, comprising young families and seniors in the same area. The idea that we ship off our seniors to live in seniors housing seems odd to Martin-Drysdale, because it robs a neighbourhood of its most vital assets—people.

"Diverse housing equals diverse communities, which creates healthy communities. We need housing that meets the needs of a diverse population," she says. "I don't believe that communities of one social or economic demographic are healthy communities. They aren't an accurate reflection of society."

Equally frustrating, she says, is the fact that young people often can't afford to buy homes in the neighbourhoods they grew up in. Martin-Drysdale worries that when it comes to buying a home, everyone knows the price but few people know the value.

"I want to start educating buyers to think differently about what is valuable besides square footage. Value is about quality. Are you willing to pay more to be closer to public transit? Are you willing to pay more per square foot but have a better layout? A 1,600-square-foot home can feel a lot bigger when more thought goes into the design."

The other side of the coin is maintaining quality of life in established, mature and core neighbourhoods—making sure that the schools stay there, yes, but also that restaurants, grocery stores and other services thrive.

Politically and socially, Martin-Drysdale says Edmonton is "on the cusp" of change. On the plus side, the city's annual growth report indicates that while populations in mature neighbourhoods (developed before 1970) were declining from 2001 to 2011, that trend has begun to reverse. Earlier this year, the city expanded its approval of skinny lots across all residential zones, cutting the land cost of infill homes in half.

"I think the change in spring helped with land prices," she says, adding that there are still too many restrictions against

Martin-Drysdale's goal is to keep older communities sustainable, diverse and vibrant, and to help address seemingly unchecked urban sprawl...

Restoring a building as old as the Alberta Block meant conducting research on the properties of 100-year-old brick and finding trades people with the know-how to rehabilitate aged infrastructure.

secondary rental suites or garage suites that would enable real demographic change in older neighbourhoods.

While waiting for zoning bylaws to catch up to what's occurring in the marketplace—some homeowners are renting secondary suites in areas where it's prohibited—Martin-Drysdale is continuing to build buildings and help the city grow inward.

Reflecting on the Alberta Block project, she points to a lack of know-how as one complicating factor in preserving old buildings.

"What we have lost in our industry is the knowledge of and the craftsmanship that it takes to do the repairs," she says. RedBrick "dove into the science" of the building's envelope, sending bricks to testing labs in Ontario to discover their properties and characteristics.

"We pushed the limits of the R value of the building because we were willing to put research and money into it. It's a headache, but the inherent value is that everybody loves the building. People have a very strong emotional response to the building that they wouldn't have if we'd have torn it down. It's hard to quantify, but you can't put a dollar sign on that history."

The Alberta Block building is now fully operational. The main floor is home to the Needle Vinyl Tavern—a new restaurant and live music venue—appropriate given the building's connection to music. The upper floors are office space, and Martin-Drysdale has opened a co-workspace on the second floor for small startup companies. The Edmonton Digital Arts College has made its new home on the fourth floor. Alberta Block is a key development in a re-energized stretch of Jasper Avenue.

She admits that infill is an ongoing learning process—but the rewards are well worth the effort.

"It's hard. It's hard to be an entrepreneur and be innovative when you add the complexity of infill on top of that, with tight sites and no laydown areas, and communities that might not want your project. But I am still doing this today, and I have other new projects, and things are looking quite positive."

Steel Resolve

Strong connections make for a solid structure. That's the idea behind a new research centre and professorship.

Structural engineering professor Robert Driver (right) has been appointed as the inaugural director of the Canadian Institute of Steel Construction Centre for Steel Structures Education and Research and as the Supreme Steel Professor in Structural Engineering Education and Innovation.

Alberta is home to a major steel fabrication technology cluster that is arguably the largest and most advanced in the country, and the University of Alberta plays an important role in the field. The university is recognized as a world leader in steel structures research and education. The connections between the university and the steel and structural design sector have been strengthened with the establishment of a new teaching and research centre and a professorship in steel structures education and research.

Two major Faculty of Engineering initiatives were announced this fall: the establishment of the Canadian Institute of Steel Construction Centre for Steel Structures Education and Research, and the Supreme Steel Professorship in Structural Engineering Education and Innovation.

Members of Canada's and Alberta's industry are working together to establish an integrated hub focused on the long-term development, growth and sustainability of the steel industry, creating a national industrial steel centre, and a professorship in structural engineering education and innovation at the U of A Faculty of Engineering.

The Canadian Institute for Steel Construction (CISC), Collins Steel, Supreme Steel, Waiward Steel, DIALOG, TSE Steel, and Price Steel are supporting the centre, which will provide education and research leadership and address key issues facing the industry.

Supreme Steel is also supporting a new endowed professorship at the centre. Robert Driver, a professor in the Department of Civil and Environmental Engineering, has been appointed inaugural director of the centre and holds the new Supreme Steel Professorship.

Speaking at a special event to announce the new centre and professorship, Driver said the steel centre in many ways "is like creating an opportunities fund for students."

"We need to imagine where structural engineering design will be 10 or 20 years from now so the people who will be at the peak of their careers are prepared. We need to think of what the industry will be like 20 years from now," he says. "This is really about people."

In fact, Driver observes that relationships between the industry and the Faculty of Engineering date back at least 50 years.

One of those early relationships was forged in the late 1970s when John Leder, the founder of Supreme Steel, approached

Department of Civil Engineering Chair Roger Cheng, professor Robert Driver, John and Sally Leder, Collins Steel president Jason Collins, CISC chairman Laurier Trudeau and Dean Fraser Forbes celebrate the creation of a steel research centre and professorship.

Dean Emeritus Peter Adam, looking for help with an industrial problem.

Leder quoted from a speech he delivered on campus 25 years ago on behalf of the CISC, in which he counted 20 research projects the CISC and the university partnered on during the previous 20 years, and graduate scholarships supported by steel fabricators.

"Fast forward another 25 years and here we are today, continuing that relationship," Leder said. "It is a lasting beacon to the steel industry."

Dean of Engineering Fraser Forbes noted that the Faculty of Engineering has an exceptional record in building relationships with industry that benefit teaching and research and solve big problems. For example, the Faculty of Engineering has 15 NSERC Industrial Research chairs—more than any other entire university in Canada.

"How did we get here? Not by being a bunch of smart people hiding in a university," Forbes said. "It has been a community effort. Industry isn't afraid to work with us and we're not afraid to work with industry."

Speaking on behalf of industry partners, Jason Collins, president of Collins Steel, said his company became involved because it values collaborative work, pursues excellence and believes in stewardship.

"The steel centre is a big step in advancing competency," he said. "This is like a new beginning because we're investing in the industry at a foundational level. We get to sit at the table with our partners and shape what we're going to do."

CISC chairman Laurier Trudeau s aid support for the steel centre makes perfect sense for the entire industry, which has for decades focused on engineering and research, finding better ways of doing things.

"We have flourished because of our relationship with academia," he said. "Our industry and this centre are a great combination. We get it. This centre has all the right ingredients: design, innovation, passion and people—it's going to be a success."

Investing in tomorrow

John Leder doesn't recall the exact details of the problem his steel fabrication company was facing. But he does remember picking up the phone and calling then-dean of engineering Peter Adam, looking for someone who could help the steel fabrication company resolve the problem. Placing the call seemed natural, Leder says, because the culture of the industry was such that it was active in higher education, establishing scholarships for graduate structural engineering students and partnering with the university on research projects.

"We were struggling with a technical issue of some sort—I can't rightly remember what it was—but we knew that the university was the brain trust of the engineering community," says Leder, who founded Supreme Steel (now the Supreme Group) in 1972. "The relationship we had in the late '70s and early '80s with Pete Adams was a relationship between the Canadian Institute for Steel Construction and I think that is what brought the fabricators closer to the university."

Regardless of its origins, the relationship has been long and fruitful with the steel fabrication industry bringing engineering challenges to the Faculty of Engineering's steel structures group. The researchers and students benefit by working on real-world problems and the industry as a whole benefits when the researchers develop innovative solutions.

"There have been advancements," says Leder. "When the university does research it may initially affect the engineering community but it flows down into the fabrication industry."

With that history and its results in mind, Leder, through his family's foundation, is establishing the Supreme Steel Professorship in Structural Engineering Education and Innovation. Robert Driver, a professor in the Department of Civil and Environmental Engineering, will hold the professorship and has been appointed as inaugural director of the new Canadian Institute of Steel Construction Centre for Steel Structures Education and Research.

Establishment of the centre and the professorship is, he says, a formalization of long-standing connections between the university and the industry.

Leder says it's important that his industry commit itself to continuous improvement, and that investing in research and education are incredibly effective ways to keep the industry moving forward.

"If we don't invest in academia, what will happen over the long term is that steel will become the 'old way' of doing things. We have to be cognizant that our industry is evolving. Change happens and innovative solutions are found," he says.

Richard Cairney

Supreme Steel founder John Leder says the steel fabrication industry has benefited from an enduring relationship with the Faculty of Engineering. Supreme Steel, Leder and his family's charitable foundation have established the Supreme Steel Professorship in Structural Engineering Education and Innovation.

Leder understands that changes may be slow and incremental but he has witnessed incredible advances over the years, from the development of atmospheric steel that doesn't require painting, to the advances made through materials engineering.

"The laws of physics won't change, and some people will say steel is steel, but we've seen the development of different grades and strengths of steel and now, for the same pound of steel, you have more strength."

Innovation also comes in how steel is used. Leder notes that Supreme will be using steel plate shear walls that take over the bracing element in a building.

"We're working with a technology in the U.S. right now and planning on using steel plates to form the core of a building—this will be the first one in North America where there's a steel core and steel is the first element and concrete gets poured in later. It makes a big difference."

Through it all, he says, education is the real key. He likens the new research centre and the professorship he has endowed to stock market investments: the payback will not come quickly but over time will be significant.

"We're taking a long-term view of things. What you invest in today will not necessarily give you a return today but over the long term I believe it will. Education is the thing that is going to add value to our society," he says. "That's why as the Leder Charitable Foundation and the Supreme Group we felt hey—let's invest in the university of tomorrow."

Support for Syncrude evacuees

Providing company staff with working space brought back a sense of normalcy

The University of Alberta and Alberta's oil sands industry have a long history of discovery and application of new knowledge and technologies. The hot-water technology developed by engineering professor Karl Clark in the 1920s led to the processes used to separate oil from sand today. Clark's was the first of countless innovations developed through partnerships between the industry and academics.

So when wildfires forced the evacuation of Fort McMurray last May, the Faculty of Engineering reached out to industry to offer help. That assistance took the form of providing office space for about 150 displaced Syncrude employees, who spent more than a month working in offices in the Engineering Teaching and Learning Complex.

As the Syncrude staff prepared to return to Fort McMurray in June, the faculty and staff held a mixer where industry professionals could meet with professors and graduate students to discuss research and industry needs.

"A lot of our staff visit the Faculty of Engineering fairly regularly," said Peter Read (Mining '86), Syncrude's vice-president of strategic planning. "For example, our advanced control team members are here frequently meeting with professor Biao Huang (NSERC Senior Industrial Research Chair in Control of Oil Sands Processes) and on the mining side, we have a high percentage of our employees who earned their degrees at the U of A."

Another strong tie between Syncrude and the Faculty of Engineering is the co-op program. Engineering students in the co-op program often accept paid positions with Syncrude, and this spring those hired students remained on the company's payroll throughout the evacuation.

"We made the decision as a company to maintain their employment," said Read. "We chose not to treat them differently than any other employee. They continued working, but doing very different things until we got back to work on site."

While conversations at the mixer focused on work and the enormous tasks Syncrude had ahead, there was also a strong social atmosphere during the discussions and heartfelt offers of support.

Read, who has served on the faculty's Mining Industry Advisory Committee since 1990, said the Syncrude staff was given everything it needed on campus.

"What we got from the U of A was above and beyond anything we imagined. Every time we inquired about something, the answer was 'Yes.' And that will not be forgotten."

Being able to work together with colleagues made each individual far more productive, he added, and it helped bring a sense of normalcy to the lives of the technical professionals and engineers who were working in the ETLC building.

If there is a silver lining to the crisis, it is that it has brought teams of people closer together, he said.

"A lot of these teams usually work in different buildings and have different focuses. One good thing that has happened is we now have people from different parts of the company meeting each other and working together. There will be long-term benefits of having these people work together, even for a short time."

"Being able to come into work every day and be productive brought back a sense of normalcy," said Mark Wyllie (Mining '87), area leader, Long Range Planning. "We get so much more done working together than if we were all working on our laptops at hotels or a friend or family member's house."

Wyllie served as co-ordinator of the Syncrude staff during their stay in the ETLC office space. He was "amazed" at how accommodating the Faculty of Engineering was, finding enough desks and chairs to squeeze three or four people into offices. Five Syncrude employees sat at tables inside the office space once occupied by the dean of engineering.

The logistics were complex, but every request was met, he said.

"We do a lot of hiring of new graduates from the U of A and they know their way around here. Some of them were using the big screens to do their work in the mining design lab where they were doing school assignments a few years ago."

Home away from home: Syncrude's Long Range Planning area leader Mark Wyllie (Mining '87) greets visitors in the reception area of the Engineering Teaching and Learning Complex where Syncrude staff set up temporary work spaces.

Wyllie says there were personal benefits to working on campus as well that helped people cope with the crisis.

"This has given us an opening to tell our stories—just getting out of the city during the evacuation was a major event for all of us—and we've been able to talk about what happened and it helps us try and move on."

At the mixer, both Read and Dean of Engineering Fraser Forbes commented on the support and collaboration being a testament to the strength of the relationship between the university and Syncrude and thanked everyone who made it happen.

"The U of A was there for us as we faced the biggest challenge in our company's history," Read said. "That generosity made a real difference for many people in a time of significant adversity. Thank you, all."

Greg Christenson takes the long view on residential development. "We have to think in 60-year cycles," he says, so that neighbourhoods and "urban villages" support demographically diverse populations.

Jason Franson

IT TAKES A LEADER TO BUILD A VILLAGE

Greg Christenson is supporting a sustainable way of building sustainable communities

By Richard Cairney

“I want to see our industry move from doing transactional work to doing transformative work.”

—Greg Christenson

When Greg Christenson (Civil ’79) talks about homebuilding, he’s really addressing the creation of sustainable communities and neighbourhoods—planning the ways that buildings, services and gathering places serve the families making it their home, knitting people together in a community that thrives and endures over generations. He’s the kind of guy who wonders why towns and cities sprouted up where they did, and what kept them going.

“I’m more interested in the whole spectrum of development, from the raw land all the way to densification, to building a community, to creating something more than buildings,” says Christenson.

Through his charitable foundation and a gift in his estate, he is establishing an endowed professorship in the Faculty of Engineering dedicated to research and education in sustainable and healthy community development.

“The idea is to advance the science of urban villages and do feasibility studies in brown- and greenfield markets,” says Christenson, president of Christenson Developments and a member of the city’s social and affordable housing advisory groups.

The professorship will investigate the use of renewable energy, new materials and innovative construction practices along with quality-of-life issues like helping neighbourhoods rejuvenate themselves by accommodating a diverse population.

“Community building plays on a number of levels, and as engineers we sometimes think too much about bricks and mortar,” Christenson says. “We can go through numbers like cost and what people are willing to pay for certain features. You also need to think of how happy the people who are living in a community are going to be—having nearby services like grocery stores and schools and health care are important too, and we can quantify that.

“I want to see our industry move from doing transactional work to doing transformative work.”

The belief in the importance of community and service to community runs in the Christenson family. His parents, Lloyd and Joyce, were active members of the Lutheran Church. Lloyd served on the board of the Camrose Lutheran College (now the U of A’s Augustana Campus, in Camrose, Alta.), and Joyce served the church at the national level on various boards and committees. The family’s history is tied to rural development and community building in central Alberta.

In the 1940s, Lloyd helped his father build homes in the Camrose area and later helped with construction of the old Bethany Nursing home in Camrose. Lloyd also helped the Lutheran College move its iconic headquarters, Founder’s Hall, to its current site, presiding over the vibrant Augustana quad. Family ties to the area were so strong that Lloyd and Joyce wanted their son to attend the Camrose Lutheran College. Greg had other plans.

“Growing up in southwest Edmonton, the U of A casts a long shadow,” he says. As a youth, he and his neighbourhood friends spent plenty of time on the U of A campus, attending Golden Bears football and hockey games. After high school, it was expected of many of his peers that they’d attend the U of A “regardless of your grades.”

Building communities runs in the Christenson family. Greg’s father helped build then relocate Founder’s Hall, at the U of A Augustana Campus in Camrose, Alta.

Grades became an issue for Greg, who jokes that he was a member of four graduating classes. At one point he was put on "dean's vacation" for a year. Perhaps the challenge for Greg was that he'd skipped a grade in elementary school, being advanced from Grade 4 to 6. He felt, as a university student, that things were happening too quickly.

"I didn't want to be a teenage engineer," he says. "Imagine that you've just turned 20 and you've graduated and now what—you're a professional engineer? I don't think so."

But graduate he did, at the age of 24, adding to his university education by studying his father's books on leadership—by the likes of Dale Carnegie and Norman Vincent Peale. He began coaching lacrosse teams at the Enoch First Nation just west of the city to put his leadership skills to the test. Professionally, he was helping his father with his building company, which specialized in apartment buildings. The trouble was that like so many of his classmates, he had emerged from the relative security of university studies into the waiting jaws of a devastating global economic meltdown.

The inflation rate in 1979 was 9.3 per cent. It jumped to 12.5 per cent in 1981 and 10.9 in 1982. Five-year fixed mortgage rates sat above 15 per cent for two years from 1980 to 1982, spiking to more than 21 per cent in 1981. The national unemployment rate, steady at 7.5 and 7.6 per cent from 1979 to 1981, blew up into double digits, peaking at 12 per cent in 1983 (and didn't return to 7.6 until 1999).

Everything stopped.

"I was a young man building large projects beyond my experience," Christenson recalls. "We were a one-dimensional company building apartments. Dad built the company up and I carried it for a while, but we went from about 200 employees to one—Brenda Mackin. She still works here."

Christenson turned to property management, running buildings that had been foreclosed upon, then aligning his company with investors who bought the properties and retaining them as clients. At the same time, members of the building community closed ranks. Operators like Reza Nasseri (Electrical '70), founder of the Landmark Group of Companies, and Radhe Gupta, who established Rohit Communities, ran their one-office companies from Christenson's building.

"For a while, I didn't even have an office or a phone," Christenson says. "When I got phone calls, I'd take them in whatever office was available."

From this petri dish emerged a community of entrepreneurs working in a symbiotic way, supporting one another's projects and, in time, charitable causes.

"Our industry is collective and we all got started in the depths of a depression," he says.

In 1989, Christenson formed a partnership with Peter Dirksen, and together they began to delve into shifting demographics, working with non-profit agencies to build new "active adult" housing for the aging baby boom generation. Today, Christenson Developments doesn't simply construct buildings—it manages communities.

"Part of this comes from Dad's affinity for not-for-profits," he explains of the company's ongoing work with the Lions Village of Greater Edmonton Society. "We don't just turn over the keys and walk away. We're partners. We stay in that micro-community, and the buildings are focal points and gathering places for the community."

From working on seniors housing with non-profit groups like Lions Villages in the past, Christenson has now become involved in wellness and community care models, working with Lyn Krutzfeldt of Advantage Assist Group, and with Dr. Karen Lee, a noted public health design advocate.

The Christenson professorship will be a part of the Nasseri School of Building Science and Engineering, established in 2015 to support research into more environmentally friendly construction practices.

Dean of Engineering Fraser Forbes noted that Christenson's gift is, by its nature, sustainable.

"Endowed gifts such as this ensure that teaching and research programs continue in perpetuity," says Forbes. "The Christenson Professorship will establish a legacy of advancing the engineering and science of community building, giving generations of engineers the tools they need to improve the ways our communities and cities work."

Reza Nasseri, an Edmonton-based homebuilder and namesake of the Nasseri School of Building Science and Engineering, says the professorship is an important part of the school's ethos.

"It's a perfect fit," Nasseri says. "What Greg is doing is going to be a big component behind the Nasseri school."

Christenson says the school is just one of the assets of the U of A and the city that make it the best place to advance sustainable and healthy community building practices. Equally important, he adds, is that Edmonton's homebuilders are also colleagues who have grown together and are working together to improve quality, overall affordability and sustainability. Alberta cities, he notes, have land where urban villages could be put to the test. In Edmonton, that includes areas such as Blatchford Field and potentially the Northlands Park area and the U of A's own South Campus lands. Cities are encouraging inward growth aimed at rejuvenating mature neighbourhoods with housing and services that appeal to young families and seniors alike, and the professorship can help advance research supporting this style of growth and community building.

"We've got all the ingredients in place in Edmonton," he says. "And members of the building community here—we truly aspire to build communities."

"It's a perfect fit. What Greg is doing is going to be a big component behind the Nasseri school."

—Reza Nasseri

A fire in the sky

David Vonesch is hitting his stride with one of Western Canada's hottest solar energy firms

By Malcolm Azania

Demetri Giannitsios.

In Greek mythology, reaching for the sun was a big no-no. Bellerophon flew Pegasus to Mount Olympus, but Zeus attacked his ride with a gadfly and the lad fell to his death. Phaeton tried to drive Apollo's sun chariot, but like many a young man steering a hotrod, he crashed and burned. And soaring Icarus plummeted to a Mediterranean grave when his waxen wings melted.

But David Vonesch (Mechanical '06), the chief operating officer at Calgary's pack-leading SkyFire Energy, has harnessed the sun for the betterment of his country, and there's nothing but clear skies ahead. That's what's enabled his team to drive the single biggest solar photovoltaic project in western Canadian history.

For Vonesch, studying mechanical engineering offered more than technical competence for his desired career path. "The biggest thing I took out of my degree," he says, "was the idea that if you put your mind to anything, you could learn anything." That wisdom arose not only from class projects, but the transition from small-town Alberta to the culture of Edmonton and the U of A. "You become instantly exposed to so many different options in life, so many different career choices, so many different people from different places, and that exposure opens up doors."

Personal awakenings are one thing, but moving from a non-business education and zero entrepreneurial experience to co-leading SkyFire Energy was not just a consciousness

of the motivation in my career choice." The organization let him work on local campus projects, including local promotion of the United Nations' eight Millennium Development Goals and joining discussion groups focused on renewable energy.

So, did his altruism arise solely from his work with the charity? Or was the culture of the U of A, or his cultural and religious background, the key driver?

"I don't think I could pin it on one," he says. "It's a combination of all those things. Growing up on a farm in rural Alberta, you're very connected to the environment. You also become naturally mechanically inclined in some ways in terms of working with your hands, dealing with technical challenges on a day-to-day basis." He also spent seven summers planting trees in northern Alberta, which he says reinforced his connection to Mother Nature.

Moving to Calgary was perfect timing, says Vonesch. "I feel very fortunate to have met my partners (David Kelly and Tim Schulhauser) when I did. It was such a tiny little niche industry. To meet and begin to work with Dave and Tim at that time was an extraordinary opportunity." While

change—it required acquiring and practising specific skills. For Vonesch, third- and fourth-year academic projects were "obviously hugely important." As he explains, "Working in a team atmosphere towards a single goal was certainly valuable in supporting the real-world application of what I started at SkyFire. The technical foundation of a mechanical engineering degree was fairly broad, looking at structural, mechanical and electrical elements. That really ties altogether with what I'm doing today."

Yet it was ethics—not only mechanics—that launched Vonesch onto his eventual solar vector. At the U of A he got involved with Engineers Without Borders, which he says "supports the idea of contributing to the greater good . . . (and) formed part

SkyFire Energy Inc.

David Vonesch and SkyFire Energy installed the solar panels on the new U of A Physical Activity Centre (top left). Larger projects include the Kimberley SunMine (above), constructed near Kimberley, B.C., and the huge 2-MW station at the Green Acres Hutterite Colony in southern Alberta (next page)—the largest solar installation in the West.

"Growing up on a farm in rural Alberta, you're very connected to the environment. You also become naturally mechanically inclined."
– David Vonesch

David Dodge, GreenEnergyFutures.ca

the Calgary renewable sector is still small, Alberta's solar supply gives it plenty of space to grow. SkyFire "is the largest solar-power company in Alberta by a pretty wide measure, and we're 19 employees—still a small business, but lots of growth potential."

Indeed, the business case for renewable energy is stronger than ever. When Vonesch began in the industry nine years ago, most of its customers were driven purely by ecological concerns, but not today. "You have to take that longer outlook, but the economics do work if you're able to do that. The distributed nature of renewable energy, solar in particular, is very appealing to many people: the idea of owning their own power generation. That has broad support across the political spectrum."

SkyFire has grown tremendously since Vonesch began with Kelly and Schulhauser. He also saw that the province's greatest renewable energy bug was actually its best feature. Under decades of Progressive Conservative rule, the government offered minimal leadership, subsidies or incentives to companies seeking to develop the sector. The result has been renewable energy enterprises so efficient, run by people who are so dedicated, that they need little-to-no government support.

"We haven't been tied to government policy," he says. "That's enabled us to grow our business in a much more stable environment. Incentives and government policy can change and shift over time. In our experience, that can be extremely challenging. We're dealing with real-world market conditions." Since the cost of solar engineering is continually though incrementally falling, the world has caught up with the industry, as with new construction projects including photovoltaic power as essential elements.

In 2011, SkyFire took a giant leap from its previous peak project of a 43-kW system. At Okanagan College's Penticton campus, it built a 260-kW photovoltaic roof installation, at the time the biggest in the West. Now the campus's Centre of Excellence in Sustainable Building Technologies and Renewable Energy Conservation draws nearly all its electricity from its PV and solar water heating system and uniquely flexible PV modules with low tilt (10 degrees) to catch maximum sun.

Then in 2015, SkyFire leapt again—installing B.C.'s largest solar PV system, the Kimberley SunMine: 96 solar trackers and 4,000 260-watt solar modules to create a whopping 1.05-million-watt system.

But no other SkyFire project can match its work with the Green Acres Hutterite community.

The 8,000-ha colony invested $4.8 million to place 7,686 solar modules that will be 50 to 60 per cent more productive than an identical solar project built in less sunny Germany, the global solar-power leader. It will pay for itself in 15 years—less if electricity prices rise. And at a productive capacity of two million watts, it's the biggest solar PV project in Western Canada.

No amount of prodding can make Vonesch brag, but he concedes, "They've been highly successful projects."

As he explains, "It really fits in with (the Hutterite) lifestyle: for one, the idea of generating your own electricity fits in really well with growing your own food and harvesting the sun. They have the belief that they're going to be there for another several hundred years. So making a 25-year investment in a solar project is perfectly reasonable."

So what is the future for Alberta solar? By 2014, Ontario had installed 2,171 MW of solar with 939 MW under construction. At the end of 2015, Alberta didn't even have eight MW. How long will it be until renewable energy production vaults from being a niche service to being the standard?

"We've already seen it in many jurisdictions," says Vonesch. In the U.S. last year, there was more solar generating capacity installed than natural gas, and it was second only to wind, he says. "The cost of solar has been brought down tremendously by other markets such as Germany, the U.S., China, Japan, etc., where they've developed this technology for a mass production level where costs decrease significantly." He says Ontario has procured generation at 14 to 18 cents per kilowatt hour. "It seems high when you look at your bill, but the market price for solar in Alberta in 2013 in our deregulated market was 15 cents per kilowatt hour, and Alberta has a 20 per cent better solar resource than Ontario."

Vonesch says government regulations and mandates aren't the key, because market-driven solutions are better. But he says there's one exception—a carbon levy on coal and natural gas, which generate electricity in Alberta: "Monetizing the environmental impacts of those generators certainly would help in levelling the playing field."

Making a difference

Ken Sury Memorial Prize in Chemical Engineering Design honours an engineer of creative intellect and inspires students

We will not tip-toe around the fact that the term "capstone design project" provokes varying degrees of trepidation among students in the final year of their engineering education. Among alumni, they bring back memories of struggle and success, hours of iterative design engineering and, ultimately, feelings of accomplishment.

The reward for excellence in these projects, which demand students draw on everything they've been taught in their engineering education, goes beyond good grades: sometimes a capstone project is a path to a career; and sometimes a student team's work has a lasting impact.

Last fall, for example, a Department of Chemical and Materials Engineering capstone team successfully designed a fractionation pilot plant for SBI BioEnergy. The Edmonton company, which signed on as an industrial client with the capstone course, is building a biorefinery that will be turning canola oil and animal fats into a renewable fuel that can replace or be blended with diesel fuel. With a few tweaks, the company is going to be using the design created by the student team.

This is the kind of project that would have captured the fertile imagination of Ken Sury, an engineer whose curiosity and deep understanding of scientific fundamentals led him to a versatile, creative career.

In 1981 Ken joined Imperial Oil in Calgary, where he found his professional home and his work family. He remained with Imperial for 35 years, working in coal mining, heavy oil and oil sands research. His last position was as senior technical advisor to Imperial's Kearl oil sands project and he was a key part of its many technical achievements as well as its commercial success. Ken believed that engineering innovation was driven by team work. As one of five "Artists of invention" profiled in Imperial Oil's magazine *The Review* in 2010, he said that inventing is more often than not a team effort: "Every time we hit a snag, I gather the troops and say, 'Let's talk about it,' " he said. Ken had almost 20 oil sands-related patents to his name and was Imperial's undisputed expert in all technologies related to mined oil sands processing. His work on Paraffinic Froth Treatment was recognized by ExxonMobil in 2013, when he shared in the Process Innovator of the Year award.

In the spring of 2015 Ken was diagnosed with Hodgkin's Lymphoma. He faced the disease with his usual courage and resilience but did not survive.

To honour Ken's memory his wife, Chitra, has established the Ken Sury Memorial Prize in Chemical Engineering Design, for Department of Chemical and Materials Engineering students completing their capstone projects. The projects demand creative thinking, sensible design, and a thorough understanding of a client's needs—just the sort of task Ken thrived on as an engineer and mentor.

Marnie Jamieson, an industrial professor in chemical process design and a member of the team that teaches the chemical engineering capstone course, says capstone projects in all disciplines are "innovation incubators" that help in the transition from student to Engineer-In-Training. Design engineering is a creative process requiring ideas and inputs from many stakeholders and sources. The legacy of this gift, she adds, will be in the form of engineering innovation and collaboration. "Like Ken Sury, we ask students, "Can we do it better, faster, sooner? What prevents us from doing it better?" she says.

"What I've learned from teaching and mentoring students working on design projects for eight years now is that they work best when they know that the work they're doing is meaningful and can make a difference," she says. "They're collaborating and looking for innovative solutions. And that raises the profile of their work. An award recognizing collaboration and innovation can inspire students, attract project sponsors and even potential investors."

Supporting students in the capstone projects matches Ken's interests to a tee, says Chitra.

"This fits so well with everything Ken stood for," she says. "Although he worked in the oil sands, his interest was, broadly speaking, science and technology. He was interested in innovation. And there's a very strong team-building and mentorship angle

A new capstone award is being presented to chemical engineering students, in the name of the late Ken Sury.

to the design course, which is what Ken was all about."

At work and in his private life, she recalls, Ken had a nurturing quality to his character. It's hard to think of an engineer who doesn't secretly hope their offspring will follow them into the profession, but Chitra and their daughter Deepa fondly remember that Ken provided total and unequivocal support to Deepa when she chose a career as an artist. He might have felt that there is as much science and math and creativity and beauty in engineering as there is in music and was one of his daughter's biggest fans.

Ken and Chitra both grew up in India. Ken earned his degree in chemistry from Madras University and an engineering degree from the prestigious Indian Institute of Science in Bangalore. Chitra studied economics, earning her master's degree at the Delhi School of Economics and going on to complete a PhD at the University of Rochester, New York.

Ken immigrated to Canada, as his two elder brothers had done. After a short stint at the Iron Ore Company of Canada, he completed a master's degree in minerals processing at Penn State University. It was in Pennsylvania that the two met, thorough mutual friends.

Ken moved to Canada in 1981 and in 1985 Chitra joined him, as his wife. While Ken worked at Imperial, Chitra was an assistant professor of economics at the U of A.

It wasn't long after arriving in Canada that the coal industry experienced a sharp downturn and Ken had to adapt to oil sands engineering—a leap that led to one of his most significant inventions, in low-energy extraction technology.

Ken took every change, positive or negative, in stride. This resilience was a quality that Chitra always admired.

"He wasn't brought down by the downswings," she recalls. "He sort of said "OK, this is the way it is—what do we do now?" It was the same with the successes. He really didn't dwell on it or give it too much importance. By the time the award or recognition came around he was already onto the next thing."

Ultimately, the family hopes the award gives students the motivation to work a little harder, to take risks, and to excel in their capstone projects, and that it will help young students find their own engineering paths, as Ken found his.

"I'm hoping it will draw more people into the program who hadn't thought of it," says Chitra. "They might look into it and see the value—that this could help students who are deciding what to specialize in or even younger students deciding to go into engineering or not."

How a gift of life insurance works

A person can purchase a new life insurance policy, making the University of Alberta the owner and beneficiary, and support the Faculty of Engineering.

EXAMPLE - John Smith, age 40, would like to contribute $100,000 to the Faculty of Engineering to enhance the Student Life Enrichment Fund, but has no substantial capital assets other than the equity in his home and his RRSP. He purchases a life insurance policy with a face value of $100,000 (death benefit), naming the University of Alberta as owner, and pays premiums of $1,800 per year for 10 years, after which the policy is expected to be paid-up. (Note: exact number of years and premium amount will depend upon unique circumstances including insurance company rates. Please seek independent professional advice.)

STEP 1

Total premiums paid over 10 years	$18,000
Total amount of charitable tax receipts over 10 years	$18,000
Total tax credit over 10 years (combined charitable tax credit is 50%)	$9,000

STEP 2

Total premiums paid	$18,000
Total tax credit (combined charitable tax credit is 50%)	$9,000
After-tax cost of policy ($18,000-$9,000)	$9,000

STEP 3

The amount of the death benefit the Faculty of Engineering Student Life Enrichment Fund receives is $100,000. John Smith will provide a future gift of $100,000 for a net outlay of $9,000. A gift of insurance allowed John to help students pursue a world class education and reach their potential, achieve his philanthropic goals by making a larger gift than otherwise possible and create a lasting legacy.

OTHER LIFE INSURANCE OPTIONS

There are a number of additional opportunities in the use of life insurance as a giving vehicle. Options include:

- **Naming the University of Alberta** as the beneficiary only of a life insurance policy—the charitable tax receipt will be issued for the death benefit only, not for any premiums paid.
- **Transfer ownership of a paid up policy**—this option entitles a donor to an immediate tax receipt for the fair market value of the policy.
- **Wealth replacement life insurance**—this option can be used to offset taxation of capital gains or to compensate for a donation of property.

For more information about life insurance or any other planned giving vehicle, please call Bryce Meldrum (780) 492-8969, or bryce.meldrum@ualberta.ca.

Capstone connection

Donovan Nielsen has always preferred working in close-knit groups. His support for capstone projects will reward strong student teams

By Richard Cairney

David Kotsibie

Close your eyes and picture a solitary engineer working at a desk, alone in a 3,500-square-foot office area. If you're one of that engineer's clients, what's your impression? The engineer in this case, Donovan Nielsen (Mechanical '02), had just relocated his headquarters and was the sole employee of his new engineering firm. For the previous three months, the head office was infused with the warm, familiar scent of dryer lint and fabric softener, located as it was in the basement laundry room of his home. After moving to his sprawling new downtown Calgary location, Nielsen recalls, clients were impressed.

"People would come in and visit me, working alone in this big office, and it actually inspired confidence that I was thinking ahead, that I was planning for the future," he says.

The move is emblematic of Nielsen's approach to his engineering education and his career: you need to be able to adapt when you see an opportunity.

Nielsen couldn't really see the pattern he was setting at the time, but looking at the decisions he made about his education and the opportunities that presented themselves at university and professionally, a clear pattern of discovering new interests and adjusting his path had been set. An interest in architecture led to an interest in civil engineering, which led him to mechanical engineering, which led him to the oil and gas industry—which was actually the last place he ever wanted or expected to be.

After completing his first year of the engineering program at Red Deer College, Nielsen's grades were high enough that he could pick from any of the engineering disciplines when he transferred to the main campus in Edmonton.

"I found out that I had other options that I hadn't considered. Cars and the auto industry were always interests of mine, so I chose mechanical engineering."

With every turn in his plans came renewed energy and commitment, and immediately following graduation Nielsen and his then-fiancée Joanne (Education '02) began life—with gusto.

"I had lined up a job in Calgary as a followup to one of my co-op terms and I think I started working there the day after graduation. We bought a house and we were off to life.

"We both have farm backgrounds and we both have families who had to work hard to earn everything they've got. We were in our 20s and we were grinders. It's just what we expected. At the age of 25, we owned an acreage and we were busy maintaining a yard and doing renovations and all those things."

That first job after graduation was focused on developing fuel cell technology, but Nielsen was out of work when research funding ran out. From there, he joined Bower Damberger Rolseth Engineering Ltd., a smaller engineering firm working in the oil and gas sector. Five years later, having taken on project management duties for some of the company's bigger projects, BDR was bought out. Nielsen says he "wasn't interested in climbing the corporate ladder" and began considering his employment options. But he wouldn't leave clients or the company in a lurch. He stayed on to complete his projects.

Favouring smaller companies with a strong team ethic over large, less personal settings, Nielsen went only as far as the basement laundry room to start building his own company. It wasn't long before his reputation drew colleagues and clients.

"When I left Bower Damberger Rolseth, employees and clients followed me eventually. Just because I was quitting my job didn't mean I wasn't a loyal person—there's no perfect time to leave, you just time it to have the least impact on your former employer."

Before long, he was joined by former colleague Scott Pattinson (their company name, Scovan, is a merging of the names Scott and Donovan). "Scott was a process engineer who was widely recognized in the market, and he had other options but trusted me and wanted to partner with me." Nielsen and Pattinson are president and vice-president, respectively, of Calgary-based Scovan.

Today, they're leading a team that has been making a name for efficient and innovative work and has an affinity for developing and embracing new technologies. One of its most recent projects was Pengrowth Energy's Lindbergh Steam-Assisted Gravity Drainage (SAG-D) facility in east-central Alberta. The site has been producing above its 12,500-barrels-per-day goal. Scovan has since been awarded the second phase of the project, which could see production hit 30,000 bbl/d.

Reflecting on his past and the way his career has developed, Nielsen recognizes a small irony.

"When I was a co-op student, I refused to get any jobs in the oil and gas sector because I didn't think there was an opportunity to innovate and do interesting work," he says. "The truth is that there's probably more opportunity for that kind of work in this industry than in any other in Alberta. Sometimes you don't know what you don't know until you're exposed to it."

He describes Scovan as a medium-sized firm loaded with experience and talent and a solid record with large projects.

"In over six years now, we've got 350 projects worth $1 billion under our belt. We're probably the only private firm currently in existence that has done a full SAG-D development. We've done gas plant projects and a lot of pipeline work."

Working on a fixed-fee or lump-sum basis gives the firm flexibility and gives it more leeway during economic downturns. The current oil slump has had an impact on staff numbers, which dropped to 50 from 80, but Nielsen and Pattinson believe in building a team that will stay together.

"We've had very little turnover. Our emphasis has been on not ramping up real hard, but just trying to be loyal," he says. "We have had very few contractors, and encourage people to be staff with us, instead of working on contract. To me it's about growing a team that will be together for years to come, not just for one project."

Growing and working together in teams is an endeavour Nielsen values highly. Recently, he and Joanne have chosen to give back to the U of A, supporting engineering students in their capstone projects and U School, a program that brings at-risk youths to U of A for a week of exploration and discovery.

Scovan Engineering took root in a basement laundry room office in Donovan Nielson's home. Now located in the heart of downtown Calgary, the firm has built up a solid reputation for teamwork and results in complex projects. Nielson and his wife Joanne have recently provided support for U of A students and projects including Mechanical Engineering capstone projects and USchool, an initiative that brings disadvantaged youths to campus to explore their education options.

"With Joanne, the connection to educating students and helping underprivileged kids—that's a perfect fit," he says.

For Nielsen, providing funding to help students with their capstone projects was important. The capstone team he was part of was charged with designing an energy system for an artists' retreat in South America. These final-year projects, he says, are where students are able to put all of their engineering tools to work in a project that mimics the professional workplace.

"The capstone project is about providing solutions to problems and thinking outside the box and working as a team," he says. "These are things that are applicable to the things we do at Scovan."

SAVE THE DATE FOR THESE U OF A ALUMNI EVENTS

JAN 24

FORECASTING ALBERTA'S ENERGY SECTOR

Calgary Lecture Series - Forecasting Alberta's Energy Sector with Alberta School of Business professor Emilson Silva (333 5 Ave SW, Calgary, AB T2P 3B6)

JAN 26

HOW WE BUILT A MULTI-MILLION DOLLAR HIGH TECH COMPANY

Cheriton Distinguished Lecture Series presents Hemi Thacker (Computer '86): How We Built a Multi-Million Dollar High Tech Company. 8Th Floor, Donadeo Innovation Centre for Engineering 4:30 – 6 p.m. RSVP to lectures.rsvp@ualberta.ca

FEB 5

FORT MCMURRAY FAMILY TUBING AND DINNER

Fort McMurray - Annual Family Tubing and Dinner event. Free degree replacements offered to residents this year. Contact jmjenkin@ualberta.ca

MARCH 15

SMART MATERIALS FOR FOOD SAFETY

Calgary Lecture Series - Smart Materials for Food Safety with engineering professor Dominic Sauvageau (333 5 Ave SW, Calgary, AB T2P 3B6). Contact Joanna Chan at Joanna.chan@ualberta.ca

MARCH 19

SYMPHONY SUNDAYS FOR KIDS

Calgary - Symphony Sundays for Kids: Symphonic Sorcery: The Music of Harry Potter. Contact Joanna Chan at Joanna.chan@ualberta.ca

Staying in touch just got easier

Want to be informed about what's going on in the Faculty of Engineering? Want to hear about other alumni, students and professors?

Become a fan of the U of A's Facebook page—you'll get news, photos and videos about the Faculty, students and alumni sent directly to your own Facebook account.

Join us online at:
www.facebook.com/UofAEngineering.

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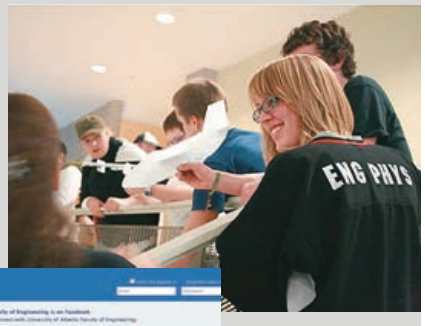

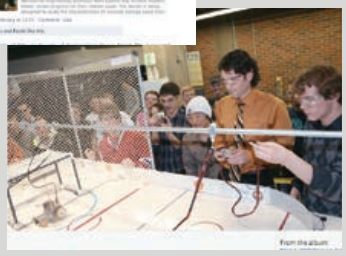

IN MEMORIAM

The Faculty of Engineering sincerely regrets the passing of the following alumni and friends.

Allbright, **Ronald Philip**, Civil '56, In July 2016

Badun, **Walter Robert**, Electrical '52, In April 2016

Bahniuk, **Thomas William**, Civil '59, In May 2016

Brower, **Mervin Wendell**, Eng Physics '62, In February 2016

Charyk, **Joseph Vincent**, Eng Physics '42, LLD (Hon) '64, In September 2016

Chen, **Vincent Kwan-Ho**, Electrical '87, In August 2016

Cheriton, **E. Muriel**, Electrical '46, In November 2016

Colbourne, **John R.**, Professor Emeritus, In June 2016

Culliton, **John Gabriel**, Civil '64, In May 2016

Curtis, **William Edward**, Civil '50, MSc '55, In May 2016

Egglestone, **Allen Eugene**, Chemical '50, In April 2016

Gillis, **Robert James**, Civil '73, In April 2016

Gillmore, **Ingram Burhoe**, Electrical '51, In July 2016

Graburn, **Larry**, Civil '64, In October 2016

Holman, **John L. (Len)**, Civil '53, In September 2016

Houlgate, **John Edwin**, Chemical '46, In March 2016

Housman, **James Richard**, Petroleum '91, In October 2016

Howe, **Rae Clifford**, Civil '58, In October 2016

Istvanffy, **Stephen Macmillan**, Chemical '49, In May 2016

Johns, **Malcolm Leighton**, Chemical '63, In May 2016

Johnson, **Wayne Lawyer**, Chemical '70, In August 2016

Kotyshyn, **Orest**, Mining '53, BEd '57, In April 2016

Kovacs, **John Stephen**, Mechanical '66, In October 2016

MacKay, **E. Virginia (Webb)**, Civil '48, In November 2016

May, **Donald Ira**, Electrical '57, In June 2016

McNeill, **George Alexander**, Electrical '52, In August 2016

Movold, **Roger Brian**, Electrical '71, In August 2016

Mutter, **Roy James**, Mining '57, In September 2016

Neiman, **Owen Emil**, Mechanical '77, MSc '79, In June 2016

Ng, **Heng-Joo**, MSc '71, PhD '75, In September 2016

Olsen, **Grant Eric**, Chemical '58, In April 2016

Peacock, **William Boyd**, Civil '57, In November 2016

Reidford, **Wayne Norman**, Chemical '79, In May 2016

Sande, **William Nicholas**, Chemical '48, In June 2016

Sandercock, **John Albert W. W.**, Chemical '59, MSc '62, In May 2016

Scotland, **William Alexander**, Chemical '50, In May 2016

Thomson, **Stanley**, MSc '55, PhD '62, In October 2016

Tottrup, **Peter**, Petroleum '85, MBA '86, In July 2016

Tuck, **N. G. Maxwell**, Chemical '44, MSc '45, In June 2016

Underhill, **Robert William**, Electrical '50, In October 2016

Werenka, **Walter**, Civil '53, In June 2016

Wiskel, **Stanley Joseph**, Mining '56, MSc '59, In April 2016

Zahary, **George**, Mining '55, In September 2016

The Faculty of Engineering was recently made aware of the passing of the following alumni more than a year ago:

Creedon, **John Philip**, Petroleum '86, In October 2005

Minchin, **Brian Daniel H.**, Chemical '67, In 2008

Taylor, **Thomas Alastair Ian Clark**, Electrical '36, In October 2005

Thomassen, **Kai**, Chemical '51, In July 2012

ADEEB, SAMER PEng

Has won Wolfram Research's Wolfram Innovator Award in recognition of his work employing Mathematica in his teaching. Adeeb is a structural engineering professor in the Department of Civil and Environmental Engineering. His research, in part, focuses on internal pressure in failure strain of pipelines.

CAMARTA, NEIL PEng

(Chemical '75)

Has been named one of Canada's Top Energy Innovators (2016) by *Alberta Oil* magazine. The CEO of Calgary's Field Upgrading is spearheading the development of new, skid-mounted technology to refine marine diesel, which burns cleaner than marine fuel and meets new regulations. Plans are to have the Fort Saskatchewan-based process operational by 2019,with a target to ship 10,000 bpd to market.

CHEN, JIE PEng

Has been appointed an IEEE Fellow and has been inducted as a Fellow of the Canadian Academy of Engineering. A professor in the Department of Electrical and Computer Engineering, Chen is a highly regarded researcher who also makes teaching, and mentoring youth, a priority. The IEEE directors gave Chen the citation in recognition of his contributions to low-power and biomedical ultrasound circuits and devices. He is a world-leading expert in biomedical devices. He has supervised 68 graduate students and helped found two companies.

CHENG, ROGER PEng

Has been inducted as a Fellow of the Canadian Academy of Engineering. The designation is one of the highest honours bestowed on Canadian engineers. Nominees are elected by their peers in the CAE based on their achievements and career-long service to the engineering profession. Cheng is the C.W. Carry Chair in Steel Structures and has served as chair of the Department of Civil and Environmental Engineering since 2002. He is the author of more than 90 refereed journal publications and more than 150 refereed conference publications.

DANESHMAND, MOJGAN PEng

Has been awarded the prestigious 2016 IEEE Antenna and Propagation Society Lot Shafai Mid-Career Distinguished Achievement Award. This award recognizes the technical accomplishments and potential an outstanding woman of mid-career status in the field of antennas and propagation, inter-nationally. She is a professor in the Department of Electrical and Computer Engineering and holds the Canada Research Chair in Radio Frequency Microsystems for Communication and Sensing.

DONADEO, LORENZO PEng

(Mechanical, '81)

Has been named CEO of the Year by *Alberta Oil* magazine. Donadeo is CEO of Vermillion Energy, the company he co-founded in 1994. The magazine credits the CEO's years of experience and calm disposition for navigating Vermillion and overcoming challenges presented by a global nosedive in oil price by reducing spending and acquiring exploration blocks in Croatia and Germany.

FRANCHUK, CAMERON PEng

(Civil '00, MSc '02)

Has been named to the Top 40 Under 40 list in Edmonton's *Avenue* magazine. Franchuk is a structural engineer and associate at DIALOG in Edmonton, and an instructor in the Department of Civil and Environmental Engineering. He also volunteers with the Canadian Institute for Steel Construction and the Consulting Engineers of Alberta's Young Professionals' Group.

LUO, JINGLI PEng

Has been inducted as a Fellow of the Canadian Academy of Engineering. An internationally known scholar, her outstanding achievements in research on fuel cells and corrosion control are widely acknowledged. She pioneered several non-conventional fuel cells that co-generate electricity and value-added products. The designation is one of the highest honours bestowed on Canadian engineers. Nominees are elected by their peers in the CAE based on their achievements and career-long service to the engineering profession. She is a professor in the Department of Chemical and Materials Engineering and holds the Canada Research Chair in Alternative Fuel Cells.

MASLIYAH, JACOB PEng

(DSc [Hon.] '13)

Has been appointed a member of the Alberta Order of Excellence. A professor emeritus in the Department of Chemical and Materials Engineering, Masliyah is an internationally respected oil sands researcher. He joined the faculty as an associate professor in 1977 and is credited with making key advances in the science of extracting bitumen from the oil sands. He was awarded the U of A's first NSERC industrial research chair and authored more than 350 peer-reviewed papers and two books on surface science.

MATHEWSON, KORY

(Electrical '10)

Has been named to the Top 40 Under 40 list in Edmonton's *Avenue* magazine. Mathewson has performed internationally as a member of Edmonton's Rapid Fire Theatre—and he also uses his creativity in researching artificial intelligence. He is working toward his PhD in reinforcement learning and artificial intelligence at the U of A's Bionic Limbs for Improved Natural Control (BLINC) Lab.

PAWLICK, KAIRI PEng

(Civil '05)

Has been named to the Top 40 Under 40 list in Edmonton's *Avenue* magazine. A senior associate and community development engineer with Stantec in Edmonton, Pawlick mentors first-year engineering students through APEGA and co-chairs the city's NextGen organization, which gives young Edmontonians a voice in civic planning and discourse.

SCANLON, ANDREW PEng

(PhD Civil '72)

Has been named a Fellow of the Canadian Society for Civil Engineering. The former Golden Bears soccer captain has worked as a structural engineer for Duthie Newby and Associates and for Reid Crowther, and served as an engineering professor at Pennsylvania State University for nearly 30 years. The appointment is bestowed in recognition of civil engineering excellence and contributions to the advancement of the profession. Scanlon's son Mark, a project manager with Arrow Engineering in Edmonton, received the Canadian Society for Civil Engineering's Young Professional Achievement Award at the same awards ceremony.

SEDGWICK, ANDREA PEng

(Mining '94, MEng '96)

Has been appointed as the Ledcor Applied Research Chair in Oil Sands Sustainability at the Northern Alberta Institute for Technology's Centre for Oil Sands Sustainability. A renowned expert on the science of oil sands tailings, Sedgwick has more than 20 years of experience in oil sands mining, extraction, tailings and water management and is a former research and development mining manager at Total E & P Canada.

Send your news to **engineer.alum@ualberta.ca**

Remembering John Colbourne

Former U of A mechanical engineering professor John Colbourne, whose portfolio of engineering work includes contributions to the iconic Sydney Opera House, has died.

John passed away June 9 in St. Albert, Alta., after an 11-month battle with colon cancer.

He was born in Leamington Spa, England, and studied at Rugby School (where four of his grandchildren are current or former students). He began his engineering education at Cambridge University and earned his PhD at Stanford. He started his career with the British engineering firm Arup, where he worked on the structural design of the Sydney Opera House.

In 1967 he immigrated to Canada, taking up a position at the University of Alberta, where he was a mechanical engineering professor until his retirement in 1995. He presented research papers at many international conferences, and in 1987 published his major academic work, "The Geometry of Involute Gears."

After retirement, John and his wife Lucienne travelled widely, particularly to Arizona, where they had a home, and enjoyed playing golf and tennis. John continued to conduct research in gear design and was actively involved in a gear venture, Genesis Partners, until a month before his death.

John is survived by his wife of 31 years, Lucienne; his sister, Caroline (Geoff) Seaton; his son, Charles (Caroline) Colbourne and their children: Georgie, Nick, Peter and Isabelle; daughter, Tanya (Themos) Tsikas and their children: Taisie, George, Sofia, and Olya; son, Jack (Sarah) Colbourne and their daughter, Ellie; and his first spouse, Jennifer, mother of his three children.

the CORE

We last spoke with Jillian Dressel (Civil '96, MEng '97) in the Fall 2010 edition of *U of A Engineer*, profiling her career, the establishment of Meade Construction and her nomination as Silicon Valley's CFO of the year in 2009.

Six years later, Meade has changed its name and strengthened its character.

It has been recognized as a Top Workplace and in 2015 recorded a perfect record in safety with no reported accidents or injuries.

We caught up with Dressel, who was part of the Pandas volleyball team that rewrote the Canadian Interuniversity Sport record books during the 1990s, to ask about leadership and how her education laid the foundations of a rewarding career.

You formed Meade Construction out of a group that had been working together at DPR Construction. Are members of the Meade team still working together?

Absolutely. In fact our cohesiveness is one of our key attributes as a company. As original co-founders of Meade, we aimed to provide something different to our clients in the way of partnering, team expertise and collaboration. Although we were a group of equal partners, we couldn't decide on a name that epitomized what we were about. Ultimately we chose the name the Meade Group after one of our more well-known members. This actually put a lot of added pressure on our partner, confused clients and it did not showcase our secret weapon of being a group of talented professionals. In 2009 when the recession suddenly hit, though we weathered the major part of it, we did make some staff reductions and tightened up our operations. The remaining group began referring to itself as the "core group." At one memorable meeting, when we were unsure how long the recession would continue, this remaining group almost offered to reduce salaries if needed to keep this core group together. I remember being absolutely amazed at how tight our group had become, and we soon rebranded to a very symbolic and meaningful "the Core Group." Several of the original founders have since retired, but what keeps us all together has not.

How do you build a company to become a recognized Top Workplace?

There are many things that go into being a Top Workplace, but the biggest factor is having the right people, whether they are employees, subcontractors, clients, architects, bankers, accountants or vendors. We only work with people who we enjoy working with. We have an amazing group of talented and passionate builders who really love what they do. This cannot be faked. We have been told over and over by clients that they can feel how much we care. In addition to only hiring folks that fit into our culture, we let them know how much they are appreciated. This is done in a variety of ways. One way is that almost half of our company are shareholders, including principals, young engineers, project managers and superintendents. Although we are not an ESOP (employee stock ownership plan), there are many similarities. We embrace the idea of shared ownership and we are not only figuratively invested in keeping our clients happy but literally as well. This is very meaningful to me on many levels. Another thing we did was providing unlimited paid time off. With the use of technology, it is easier to answer emails and phone calls and respond to client demands at all hours of the day. This invades our private life and thus makes it more difficult to have downtime. To me we needed to restore balance, and that required more flexibility in the time we take off. We trust our people to self-monitor and ensure we are getting our work done, keeping the client happy and co-ordinating with our teammates. On top of that, we ensure people have many positive outlets and have bocce courts, a workout room, running and biking trails nearby, basketball courts, barbecues, amusement park outings, holiday parties, internal fitness competitions, etc. One last way to show our appreciation is paying our people well. Our compensation package is over the top and we

think that though pay is not the main thing, it is an important piece and we want to pay our people extremely well for all that they provide.

Can you describe your leadership style and philosophy?

Deep down I have an unrelenting drive to succeed in all that I do. I am also extremely competitive and really hate to lose. I approach business this same way and by sheer force of will, hard work and determination I fully expect that every one of our projects is going to be a success and done to the best of our ability. I think my leadership style is best summed up as one where I lead by example. I roll up my sleeves, get to work, do the job well and expect that everyone else will do the same. Ultimately the goal is to keep our clients happy. This means delivering, hitting deadlines, providing a great product, going the extra mile, answering that call in the middle of the night, doing it all with a smile, etc. If our client is happy, everything else falls into place.

Another important part of who I am is that I really care, maybe sometimes too much. It really matters that our clients are happy and want us back. Like a parent, I also feel a deep sense of responsibility for all of the people that work at the Core Group, and their personal and professional success is important too. In that vein, one of my best days was learning that a young project manager was buying her first home in the difficult Bay Area housing market. That same day, one of our project engineers showed me his engagement ring and talked about his upcoming proposal to his girlfriend. When we started this company 13 years ago, I never imagined how what we built would help provide so many people with a bright future and help them achieve their life goals. As my daughters would say, that is "super cool."

The Core Group has a great client list and, reviewing the website, does terrific work. Briefly, can you describe your role there?

I wear many hats in the company and one of the things that separates us from many other similar firms is that our principals are actively involved in day-to-day operations and on projects. I head up the preconstruction/estimating department, I am the CFO and I am also the project executive/point of contact for many clients, being an active part of project meetings and construction. We often hear how nice it is for our clients to have access to the company stakeholders and we wouldn't have it any other way. I am also involved in business development but we don't do this traditionally with marketing, cold calls or anything like that. Our best form of BD is serving our existing clients, architects, clients, etc. If everyone is happy and everyone succeeds on the project, this sort of momentum reaps referrals as our clients become raving fans.

One striking feature of the Core Group is its safety record, which was spotless in 2015. How do you entrench a safety of culture?

You've probably noticed the culture of deep connections with our internal team and subcontractor team. It may sound corny, but we really do care and feel more like a family than a business. The last thing we want is for anyone in our family to be hurt in any way. People and their well-being are not just a priority but something we strongly value, and we all look out for each other. That said, to be successful in safety it takes effort, and we have invested in top-notch people, training, etc., not to mention ensuring we have an industry-leading program with all the necessary resources and expertise on hand. We cannot

be successful on projects if people are getting hurt, and just like ensuring our projects are delivered on time, on budget and high quality, they also need to be run safely. Safety is not an afterthought or a burden but simply something that is integrated into what we do and is treated as another essential part of what we deliver.

You completed your MEng under the supervision of Simaan AbouRizk. Any golden rules, or lessons that you still specifically draw on?

What I remember about Dr. AbouRizk is that he was very bright, driven and collaborative. Many professors maintain an arm's-length distance from students and I found that he was far more involved, interactive and was more of a peer/mentor than a supervisor. For me, this approach brought out the best in students and in many ways I see our business model of rolling up our sleeves, working closely with our clients and serving as their industry expert/mentor on all things construction emulates this approach.

What did a graduate degree give you or enable you to do that you couldn't have done otherwise?

I feel like the U of A, particularly the graduate program, provided me the opportunity to "learn how to learn." With the pace of business being what it is, particularly in the Silicon Valley where new business models or technologies are being developed daily, the pace of change can be demanding. Being able to assess, analyze and understand market trends and quickly respond and meet our clients' ever-changing needs is invaluable. If you can't keep up in this market you can find yourself quickly left behind. Similarly, one cannot just jump blindly and embrace change simply for the sake of change. It requires reason, a willingness to experiment and test strategies and extreme discipline while everything is speeding ahead. It also inevitably requires the willingness to change and push ourselves into radically different paths.

Looking back, some of the biggest impacts and benefits of my time at the U of A were less on the technical aspects and application of the course and knowledge of my studies and more on what I call the "soft skills." Whether it was learning how to juggle the rigours of collegiate sports and academics, learning how to solve problems, learning how to deal with people, learning how to communicate or learning how to deal with stress/conflict, these lessons have served me throughout my career and life, and the U of A provided me with the opportunity to develop, enhance and apply these skills.

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