The Technology Issue

With feature stories on robotic construction and utilization of AI to help masons avoid injury - we would also like to pay tribute to industry leader Paul Seibel, who was recently inducted into the GVCA Hall of Fame and is this year's recipient of the CCA's Community Leader Award.
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For the Greater Good

Nothing on a construction site happens in isolation. The expression “no person is an island” applies perfectly to the work that we all do every day.

Collaboration is something I believe in passionately. As a business owner, I believe that every member of my team should have the expertise and authority to review someone else’s work for accuracy and completeness. As an electrical contractor, I believe that a project team is strongest when generals, architects, engineers and key trades work together early on to design and execute to the best of all our abilities. As the chairman of the GVCA, I believe there are always opportunities for owners and buyers to discuss ideas with contractors before they become full-blown problems.

When we all pull in the same direction, our effort is maximized. Let’s set aside any old-fashioned ideas of “us versus them” and start working together for the greater good.

Adaptive Thinking

What’s your competitive advantage? Is it a product? A process? A key member of your staff?

Sorry to burst your bubble, but it’s none of those things. Your competitive advantage is your ability to adapt your organization and your people in the face of change. And if it isn’t, it should be.

I know many of you are probably thinking right now that everything is just fine the way it is. You’re probably thinking that your company has survived all these years by doing the same things it always has in the same ways it always has. That’s fine, but let’s be clear for a moment: that mindset will propel you no further than the middle of the pack.

Change is everywhere, and if you’re not adapting your business to react to new trends and ideas, you’re falling behind. Right now, some of your competitors are reading this message. Change is everywhere, and if you’re not adapting your business to react to new trends and ideas, you’re falling behind. Right now, some of your competitors are reading this message. They’re thinking about new ways they can retain key workers, new systems they can implement to be more efficient, and new products they can innovate to serve clients even better than before. In other words, they’re getting smarter, faster and better than you. What are you doing to keep up?

Over the next few months, change—and how it can impact your business—will become the central issue we discuss in GVCA’s monthly e-newsletter. Watch out for a series of inspired and insightful articles like adaptive thinking. If you’re not on our mailing list, make that all-important first change.

Send me a quick note at mgeorge@gvca.org and we’ll get you signed up right away.
Mount Forest, ON
Value: $15 million

Project details
North Wellington Health Care anticipates requesting stipulated-price contract bids in the spring for work pertaining to a one-storey emergency room (ER) addition/renovation and a two-storey ambulatory care addition/renovation of the existing Louise Marshall Hospital building in Mount Forest, and a new medical education addition/renovation to the Palmerston and District Hospital.

The initial phase of work will involve the development of the new ambulatory care addition and new staff parking to provide decanting space that will be required during the emergency department expansion and renovation of the ground floor (the hub) near the existing main entrance. Internal renovations will be initiated to relocate day surgery to its new location. Renovations to the existing interior spaces for oncology and pharmacy will follow.

The ER phasing will be structured to maintain existing operations while new expansion is built to the south. The existing ambulance drop off will remain in use during this time. The ambulatory care clinics adjacent to the emergency department, along with main entrance and a portion of the hub area, will be included in the scope of this phase in order to have a substantial portion of the main entrance and new waiting areas complete.

Following completion of the emergency department addition, access through the new main entrance will resume and renovations to the existing emergency department will commence, including the removal of the existing ambulance canopy. The final phase of construction will include the completion of the hub areas with the realignment of the main east-west corridor and displacement of offices, and support space. With the building expansion complete, any remaining site work will be completed including final parking lot construction and related landscape elements.

Approximate area of project: 23,000 square feet
Anticipated date of bidding: spring 2018
Payroll can be one of the biggest headaches your company faces and certainly the last place to look for innovation, but one company is looking to change that.

TSheets is a time-tracking software that’s easy to use and keeps things organized and efficient. It offers streamlined, real-time tracking and updates for scheduling and time entry. The first client we ever moved to TSheets paid their team by the hour and needed to schedule service calls for their repair teams. When I presented the features to the business owner, he said it was exactly what he needed. TSheets provided a virtual training session for his employees and got them up and running on their smartphones quickly. After a small investment of time to learn and build a new process, the lives of all involved were made much easier.

**BENEFITS to your team**

The mobile app allows your team to clock-in and out with the touch of a button on their cell phones. They can switch jobs, take a break or submit their timesheets for the day. But don’t worry, TSheets is also available to use on desktop computers or laptops. There is even a dial-in option.

Scheduling allows your team to see where they need to be for the day and real-time schedule updates mean your employees are always in the know. In today’s world, having your employees’ real-time schedules on their phones is something that will set you apart. No more printed pieces of paper on the office wall.

Your employees can see how much vacation and paid time off they have available and request time off right in TSheets. Managers will be able to quickly and easily verify and approve any requests.

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*This article was written by Kyle Turriff, Tech Lead at RLB LLP and Amplify LLP. Contact him at 519-822-9933 or visit rlb.ca.*
**BENEFITS for your bookkeeper**

Tsheets integrates with many of the major payroll providers and bookkeeping software including Quickbooks, Sage and Xero, which means less data entry for your bookkeeper and some major efficiency gains in payroll. Owners and managers can approve timesheets on the go with the mobile app and payroll can be started right away. Not only does TSheets integrate with QuickBooks, but TSheets is now in QuickBooks Online and a part of their parent company, Intuit. So the integration works seamlessly.

**BENEFITS to you and your business**

With streamlined time entry and scheduling, your employees will save time by not having to manually track time on each job and will be onto the next project faster, giving you a better handle on productivity and logistics. While features including GPS locaters and business insight reporting are not the main focus of the software, we do get a lot of feedback about different ways of utilizing these features.

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**WHY Tsheets?**

With over 8,000 five star reviews, TSheets is considered the leading time tracking app on the market. Their easy to use mobile app is highly efficient for tracking time and keeping scheduling up to date.

TSheets also won the 2017 Stevie Award for Best Customer Service Department of the Year. With their online training and real time help, you’re guaranteed great service when you need it.

I meet with business owners every day to build solutions for their internal process issues and find ways to make their lives easier. When speaking to clients who need to track employees’ time, I never hesitate to recommend TSheets. Seamless, technologically advanced time tracking and scheduling that also makes payroll processing more efficient is a win for all parts of your company.

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The Ontario government has decided to introduce domestic or sexual violence leave under the Employment Standards Code that would provide an unpaid, job-protected leave of absence when a worker or their child has experienced, or is threatened with, domestic or sexual violence.

The eligible employee would be entitled to take up to 17 unpaid weeks off work per calendar year, comprising 10 days that can be taken a day (or part of a day) at a time for things like medical appointments; and up to 15 weeks (or partial weeks) intermittently for reasons that require more time, such as making moving arrangements.

The employer can deem a partial day of leave to be a full day of leave. The employer can deem a partial week of leave to be a full week of leave.

Employees who have been employed for 13 consecutive weeks with the same employer would be entitled to this leave. The employee would be required to advise the employer that they are taking leave in advance or as soon as possible. The employer may require the employee to provide evidence that is reasonable in the circumstances of the employee’s entitlement.

The domestic or sexual violence leave would be in addition to any entitlement to leave under family medical leave, family caregiver leave and critically ill child care leave, child death leave, crime-related child disappearance leave and personal emergency leave under the ESA.

The proposed leave is not part of the original version of Ontario’s Bill 148, Fair Workplaces and Better Jobs Act. Bill 148 originally proposed to expand the grounds for claiming personal emergency leave to include domestic or sexual violence or the threat of sexual or domestic violence. Amendments to Bill 148 introduce a new stand-alone unpaid leave of absence where an employee or the employee’s child has experienced domestic or sexual violence.
The leave may be taken to:

- Seek medical attention for the employee or child for physical or psychological injury or disability caused by the domestic or sexual violence.
- Obtain services from a victim services organization for the employee or child.
- Obtain psychological or other professional counselling for the employee or child.
- Relocate temporarily or permanently.
- Seek legal or law enforcement assistance, including preparing for, or participating in, a legal proceeding related to the domestic or sexual violence.

This article appeared on HRinfodesk.com and was written by managing editor Yosie Saint-Cyr.
WSIB Coverage for Chronic Mental Stress

On January 1, amendments to the Workplace Safety Insurance Act came into effect to create coverage for work-related chronic mental stress. The changes have prompted some to ask whether we will see a flood of claims for chronic mental stress. As a lay observer on matters of Workplace Safety and Insurance Board (WSIB) coverage, I am inclined to think that these changes will not prompt a flood of claims, at least not yet.

The scope of coverage for work-related chronic mental stress is defined by the WSIB’s new Operational Policy for Chronic Mental Stress. The policy provides that a worker will generally be entitled to benefits for chronic mental stress if an appropriately diagnosed mental stress injury is caused by “a substantial work-related stressor” arising out of and in the course of the worker’s employment. The policy says that the WSIB must be able to identify the particular event or events that gave rise to chronic mental stress:

“In order to consider entitlement for chronic mental stress, the WSIB decision-maker must be able to identify the event(s) which are alleged to have caused the chronic mental stress. This means that the event(s) can be confirmed by the WSIB decision-maker through information or knowledge provided by co-workers, supervisory staff, or others.”

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Furthermore, the policy indicates that chronic mental stress brought on by “routine stress” will succeed only where the claimant’s employment exposes him or her to extreme danger or matters of life or death.

Reading between the lines, the policy is really geared to claims for mental stress sustained by first responders and front-line emergency room staff. No doubt we will see an increase in claims by workers in those professions. However, the policy largely excludes claims for chronic mental stress brought on by routine stress in workers in other professions. As such, the new policy is unlikely to trigger a flood of new claims.

The real question, I think, is not whether the policy is too broad, but whether it is too narrow to withstand a charter challenge. Section 15 of the Canadian Charter of Rights and Freedoms prohibits legislation from discriminating upon various grounds, including mental and physical disabilities. The Ontario government extended WSIB coverage to include claims for chronic mental stress in response to a 2014 decision of the Workplace Safety and Insurance Tribunal which concluded that the blanket prohibition on compensation for mental stress that had existed until that time violated the section 15 of the charter. If a blanket policy of excluding claims for work-related mental stress violates the charter, it strikes me that a policy that excludes claims for work-related stress suffered by a worker other than a first responder or front-line hospital staff may be equally difficult to defend. The new policy may not survive a charter challenge. We may yet see a flood of mental health claims.

“In some cases, therefore, consistent exposure to a high level of routine stress over time may qualify as a substantial work-related stressor.

Jobs with a high degree of routine stress would typically have one or both of the following characteristics:

• responsibility over matters involving life and death, or
• routine work in extremely dangerous circumstances.”

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For his commitments to the GVCA and his dedication to the betterment of our construction community, Paul Seibel has been named the recipient of two major distinctions: induction into GVCA’s Hall of Fame, and the Canadian Construction Association’s annual Community Leader Award.

A dedicated leader
Paul’s career in construction began in 1975 when he earned his diploma in Civil Engineering Technology. He cut his teeth in the trades with a general contracting company that ran a miscellaneous metals fabrication shop and built pre-engineered buildings. But that wasn’t to last. Paul wanted skin in the game. He invested in the company in 1988 and bought up the remaining shares in the business in 2000. The company would later become ACL Steel.

Across our region, ACL Steel is a trade of choice. And why not? The company is known for its ability to execute on just about any scale of job, and has been decorated with a series of awards for its work.

Paul himself is a passionate believer in the power of education. In his view, a better educated industry is more professional and values ethics over all. Paul holds Gold Seal certification in project management and estimating, and ACL Steel has held ISO certification since 2009. In the same year, ACL Steel implemented a Certified Quality Assurance Program under the Canadian Institute of Steel Construction. Paul was also GVCA’s first member to sign up for

GVCA past chair Paul Seibel has been named the 2017 recipient of the Canadian Construction Association’s Community Leader Award, and inducted into GVCA’s Hall of Fame.

What can you say about the accomplishments of former GVCA chair Paul Seibel? Over his career of more than 40 years, he’s seen and done an impressive range of things. He’s bought and developed a well respected business in ACL Steel. He’s given back countless hours to the betterment of our local construction industry. He’s won awards, and above all, he’s never once waivered from grounding every decision he takes in integrity and ethics, even when the alternative appears faster and easier.
the Construction Industry Ethics course when it was introduced, and directs his employees (and indeed, all GVCA members) to follow suit.

When he’s not thinking about professional conduct, Paul is focused on business development and the health and safety of his workers. ACL Steel has been a member of the GVCA Safety Group since 2011, registered for COR certification in 2017, and received a WHMIS – CSAO Health & Safety Award.

Unsurprisingly, such commitments to ACL Steel employees has paid off in the form of loyalty and retention. Turnover at ACL Steel is extremely low, and Paul operates an open-door policy to encourage as much free-flowing conversation among team members as possible. Everyone knows that they can come to Paul with any issue and he will help them solve it, or supply the resources they need to solve it themselves.

“I cannot think of a finer or more deserving person for the CCA Community Leader Award.”

A passionate advocate
As if all this weren’t enough, Paul has dedicated himself to the betterment of our industry by volunteering and leading on the boards and committees of various special groups. These include GVCA, the Council of Ontario Construction Associations, the Canadian Construction Association, the Canadian Institute of Steel Construction, Steel Plus, Conestoga College—and more.

A super member
In GVCA terms, Paul is a “super member.” He’s someone who is loyal to GVCA and its vision, and he encourages others to join the association and contribute actively. Small wonder, then, that GVCA president Martha George said this about Paul in her letter of nomination for the CCA Community Leader Award:

“I cannot think of a finer or more deserving person for the CCA Community Leader Award. Paul has a quiet leadership. He listens, he learns, he has the capacity to turn vision into reality. He is also that rare person who has true wisdom. He understands complex issues and that there is not always a right answer, but he knows there is an ethical answer and he chooses that path. His devotion to our community is one that comes from his heart and not because he sees it as a way to get ahead. He just wants to be better and he’s happy to help others fulfill their aspirations. I deeply admire Paul and I am grateful that he is part of the GVCA.

Congratulations on two honours well deserved, Paul—and thank you for your contributions to our industry. ■
SAFETY

Taking Action on Workplace Stress

Some stress can be motivational, but constant feelings of pressure, worry, or tension at work can have a profound effect on our physical and mental health, and the performance of organizations.

Psychosocial hazards

- Workplace factors that have the potential to cause psychological or physical harm if not adequately eliminated or controlled
  - Organization of work: production pressures, lack of role clarity, poor change management, insufficient staffing
  - Management: poor communication and leadership, work-life imbalance, inattention to worker needs and addressing unacceptable behavior
  - Job design: work demands, little to no worker control, lack of resources

Outside factors

- Financial, family, health, community can also impact workers

Mental health problems and illnesses are estimated to account for nearly half of long-term disability claims in Canada.


Use a framework such as the National Standard of Canada for Psychological Health and Safety in the Workplace

- Outlines a systematic approach to develop and sustain a psychologically healthy and safe workplace
- Focuses on psychological harm prevention and mental health promotion
- Intended for organizations and business groups
- Voluntary standard – not legislated nor a regulation

aka THE STANDARD

1. Get senior leadership on board, involve key stakeholders, and identify a champion to help advance activities
2. Develop a policy statement and identify gaps around psychological health and safety
3. Analyze results and pick the key issues
4. Implement controls to reduce the risk of psychological harm
5. Evaluate and decide whether to continue the current course of action or explore new initiatives
In today’s fast-paced, multi-tasking society, workers can face enormous demands and stress on a daily basis. Over time, this constant pressure, worry and tension can affect both our mental and physical health. These problems, in turn, affect work performance and behaviour. In more severe cases, work may no longer be possible.

Created by the Canadian Centre for Occupational Health and Safety, this infographic outlines some of the workplace factors that have the potential to cause psychological and physical harm, and what employers can do to address and prevent workplace stress, and develop a healthy organizational culture.
Learning to play golf isn’t easy, which is why novice golfers are encouraged to take professional lessons to learn the intricacies of an effective swing. With golf, it seems, there are countless ways to do it wrong, and only a few ways to do it right.

Yet even with professional instruction, most golfers will tell you it takes years of regular practice to achieve an easy golf swing that is efficient and doesn’t place undue stress on the body. The much-lauded “10,000 hours of practice rule to become an expert” made popular by writer Malcolm Gladwell seems to apply across all spectrums of life—from sport to music to work. The more you practice your craft, the smoother your motions and the more efficient you become. It’s as though, with practice, your body intuitively knows how to move better, faster and safer.

This is exactly what Carl Haas, professor of civil and environmental engineering at the University of Waterloo, has discovered in his team’s research on movement in bricklaying. Using mo-
tion tracking suits, along with artificial intelligence (AI), Haas and his colleagues have learned that the subtle but significant differences between a rookie bricklayer and an expert mason is like watching a novice golfer go up against Sergio Garcia, a highly ranked 37-year-old golf professional.

“We’ve discovered through the use of AI software and motion sensor suits that the master masons’ movements and postures are different than the ergonomics of what we are teaching students,” says Haas.

While the lessons new bricklayers receive from the instructors, who themselves are master masons, are ergonomically sound and are designed to promote safety in a physically demanding trade, Haas’s research discovered that the master bricklayer subtly, and perhaps unknowingly, adapts his or her body movements to work smoother, faster and safer.

“There is a huge opportunity to use AI-powered motion suits when teaching new bricklayers how to move safely and quickly,” says Haas. He adds that masonry workers have the highest rates of overexertion. Their work involves many tasks which are risk factors for work-related musculoskeletal disorders (WMSDs). Less-experienced bricklayers also report more WMSD injuries, in addition to being less productive compared to master masons. Indeed, it was when a family member got injured on the job as a bricklayer that Haas was first inspired to investigate how masons could do their physically taxing job more safely.
Physical wisdom of a master

Haas, who leads the research with Ehab Abdel-Rahman, a systems-design engineering professor also at the University of Waterloo, found that expert bricklayers use previously unidentified techniques to limit loads on their joints. This acquired “physical wisdom” which is so subtle that it can’t be easily seen to a casual observer, can now be minutely analyzed and catalogued, allowing it be taught to a new generation of bricklayers.

Using advanced AI software to analyze the immense volume of data acquired by the $1,000-motion suits was the key to understanding how experts (bricklayers with 15 to 20 years’ experience) stacked up against apprentice bricklayers who had three or fewer years of training, said Haas.

Their first study, performed at the Conestoga College’s School of Trades and Apprenticeship, Brick and Stone Mason program, compared 21 masons divided into four groups based their years of experience. Participants were asked to build a five-course concrete block wall while wearing the motion tracking suits. The data showed the expert masons were able to do significantly more work while putting less stress on their bodies, said Haas. These highly experienced masons intuitively held loads closer to their bodies while using fewer and more ergonomically safe poses that allowed for faster, injury-free work. The data revealed that these experts had the tendency to swing rather than lift blocks, and they bent their backs less.

The study, published in Automation in Construction, revealed that the third-year apprentices were trying to keep pace with the experts. Although these students were significantly faster than their first- and second-year counterparts, they were still using comparatively inefficient, less-safe postures. This
was a revelation for the research team. Even using the best practices in ergonomically correct teaching, mimicking the elegant smoothness of an expert bricklayer was impossible because it appears the lessons fail to capture what the experts were truly doing on the job.

Translating knowledge into functional learning
For Haas and his team, the next stage of the research is to translate this new knowledge into functional learning so that the apprentices can learn the dominant postures of the experts earlier in their training and avoid unnecessary wear and tear on their bodies. Haas says the low cost of the motion-sensor training suits is making it possible to use them as viable training tools.

“The first [motion sensor] suit was a $80,000-unit we borrowed, now we can get them from China for $1,000 each, and a California company has come up with a way to make them for $500,” says Haas. “But it really is the practical use of AI that allows us to figure out the complex data the suits generate.”

The value of using high technology on what has been historically a low-tech trade will result in better trained masons who have fewer work-related musculoskeletal injuries while being more productive. In an industry where the average age is 39 years, and attracting new workers to a physically demanding job is paramount, using advanced technology to make learning easier and safer has enormous potential for success, says Haas. He predicts that within five years, motion-sensor suits coupled with artificial intelligence to interpret the complex data will be readily available as essential training tools for human bricklayers.

Improving how bricklayers learn the trade is just part of the puzzle of working safer and more productively. Haas and his team are exploring other research challenges including improving masonry work systems such as better scaffolding, layout and the use of exoskeletons on the job. The goal is to use advanced technology to help make a low-tech trade safer and allow masons to extend careers without suffering undue wear and tear on their bodies.

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In Ontario alone, BuildForce Canada reports that companies will need to hire more than 100,000 workers in the next 10 years to keep up with demands created by retiring workers and the needs of several mega projects that are either planned or underway. Add to this the fact that construction productivity has actually declined nearly 20 percent since 1964, which is shocking when compared to productivity rates in other, non-agricultural industries, which increased by more than 150 percent over the same period. Such challenges are alarming.

As the World Economic Forum recently noted in its report on the future of construction, “virtually all other businesses rely on the construction industry to provide and maintain their accommodation, plants and infrastructure, and construction is a determinant of where and how almost everyone lives, works and plays.”

Going forward with modular
Yet there may be light at the end of the tunnel in the form of one innovation that’s been around for years, but which is generally underused and certainly under-appreciated. Modular construction has been a hallmark of the residential construction sector for more than 100 years, but it’s not been until recently that its application has gained a toe-hold in the non-residential sector.

According to the Modular Building Institute, a group whose mission it is to expand the use of offsite construction, “modular construction is a process in which a building is constructed off-site, under controlled plant conditions, using the same materials and designing to the same codes and standards as conventionally built facilities, but in about half the time. Buildings are produced in ‘modules’ that when put together on site, reflect the identical design intent and specifications of the most sophisticated site-built facility – without compromise.”

That’s not all. Compared to traditional building models, modular is more flexible, safer and produces better engineered products.

The time is now
Experts suggest that modular may at last be about to have its day in the sun. Global sectoral output is expected to rise by 6 percent by 2022, and some countries are already making modular the focal point of their residential-

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**It’s greener.**
Factory-controlled processes allow for less waste, fewer site variables, and better quality buildings.

**It’s faster.**
Modular construction happens alongside site work, which allows projects to be completed in half the time of traditional construction.

**It’s smarter.**
Modular buildings are built with the same materials and to the same codes and specifications as traditional construction.

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**Can Modular Solve Construction’s Challenges?**
Modular is generally agreed to be the way forward for swift, safe and quality construction practices. So why is it so slow to be adopted.
development plans. In Sweden, for example, about 84 percent of detached homes use pre-fabricated timber. (In the United States, that figure is closer to 5 percent.) Japanese builders constructed more than 9 million pre-fabricated homes across the country between 1962 and 2004. Today, one in four new Japanese homes is pre-fab.

The trend is even gaining ground in the developing world. The Nigerian government is considering modular housing as a way of alleviating its national shortage of close to 20 million homes.

Closer to home, examples of non-residential modular construction are fewer and further between. It’s true that aspects of modular construction, most notably tilt-up concrete construction—where concrete wall panels are cast on-site and tilted into place—has been used on many non-residential projects, stricter applications of off-site manufacturing are far less common.

One of the higher-profile Canadian modular projects that was completed last year was the ALT Hotel in St. John’s, Newfoundland. Built by Marco, which is one of the largest builders in Atlantic Canada, the hotel features five storeys above ground and two below. Marco adopted a unique modular approach whereby the rooms were constructed as individual pods in Poland before being shipped to Newfoundland. Each weighed between 20 and 40 tonnes and was lifted into place using a specially engineered crane.

The unfortunate thing is that, despite examples of modular successes in the shape of the ALT Hotel or the 32-storey Pacific Park building in Brooklyn, New York (which was entirely modularly built), less than 4 percent of construction in North America is modular.

### Why?

**Despite its advantages, modular construction faces an uphill battle for further application—and for credibility.**

According to an expert panel convened by Canadian Construction Innovation, there are five major factors limiting its application.

1. **Negative stigma:** Some believe that modular construction is of lower quality and is intended primarily for temporary, single-storey buildings.
2. **Few success stories:** Few people can name projects where modular construction using concrete, steel, masonry and wood for mid-rise and high-rise building projects was completed.
3. **Standards and regulations:** Building codes, bylaws and operational standards are generally more conducive to conventional construction practices.
4. **Procurement strategies:** Procurement strategies favour conventional construction technologies: A value-based system for procurement may create new opportunities for modular construction, which provides advantages that conventional construction cannot offer.
5. **Project financing:** Progress-based project financing inherently favours conventional construction. Public owners recognize that modular builders will invest significant resources on a product upstream prior to onsite assembly. This poses the need to restructure project financing and streamline cash flow for publicly-funded projects to use modular.

### Innovation, but only when needed

Construction has a long habit of innovating only when innovation is needed. With that in mind, modular's time may have come. Productivity declines, worker shortages and increased scheduling demands may combine to create the perfect storm. If so, modular is well positioned to respond.

Time will tell.
Aiming for **Net Zero**

Walters Group is a key part of the construction team that is helping Mohawk College realize its vision to build the province's first net-zero-energy institutional building.

Images courtesy Walters Group

Mohawk College's The Joyce Centre for Partnership & Innovation will be Ontario’s first net-zero energy institutional building, producing as much or more energy as it consumes when it opens in 2018.

Mohawk College’s The Joyce Centre for Partnership & Innovation will be Ontario’s first net-zero energy institutional building, producing as much or more energy as it consumes when it opens in 2018.

“We applied for a government grant and one of the things that we felt was important was to differentiate ourselves from other applications for that fund,” says Tony Cupido, chief buildings and facilities officer at Mohawk College. “In doing that, we recommended the building be a net-zero energy building.”

In May 2017, the Canada Green Building Council announced its Zero Carbon Buildings Framework that will become the standard for zero carbon buildings in Canada. The Joyce Centre for Partnership & Innovation was selected as one of 16 national pilot programs to help demonstrate the council’s new standard and validation process.

“This project was funded by the Government of Canada’s $20-million grant, which does not happen often because the federal government does not get involved in the post-secondary education sector,” Cupido explained. “The investment is the single largest federal infrastructure funding in our 50-year history. We received a grant for the project and the requirement is to have all the work completed by April 2018. That was a challenge for us, but we are certainly at or near our target.”

**Impressive features**

The Joyce Centre for Partnership & Innovation will feature solar-powered labs, workshops, open study space and a 200-seat lecture theatre. It will have a 500-kWp AC solar panel system that will generate 721,000-kilowatt hours of clean electricity per year, which is enough to power 45 homes per year.

Based on the season, The Joyce Centre for Partnership & Innovation regulates its temperature by transferring heat to or from the ground using a series of 28 geothermal wells. The building will consume energy at a rate of 75 equivalent kilowatt-hours per square metre per year, which is 2.8 times more efficient than the average Canadian secondary school, according to Mohawk College. The Joyce Centre for Partnership & Innovation is a 96,000-square-foot, five-story building.

“No one has worked on a net-zero energy, institutional building of this magnitude and size in Canada to our knowledge,” Cupido stated. “We needed the right team and capacity in place.”

**Walters selected to the project team**

Mohawk College awarded the job of overseeing construction to Ontario-based general contractor EllisDon. The project had an 18-month timeline at the time of selection. EllisDon then awarded Walters Group Inc., an Ontario-based family owned steel construction company, to provide design assist to reduce costs and to provide fast-track construction, fabrication, erection and the delivery of 931 tons of structural steel for the main building and 186 tons of solar panel support steel.

“Mohawk and Walters go way back,” explains Walters project manager Kevin
McElhone. “We worked with the school for many years by providing teaching assistance, providing co-op placements for engineering graduates and hiring their graduates.”

The Joyce Centre for Partnership & Innovation was a unique project for Walters in that it was very preliminary. “They had hardly figured out what it would look like and how it would work before we got to work on it,” McElhone remembers. “We became involved in the design/assist process to help our customer get what they needed as quickly as possible.”

Walters is proud to have worked on The Joyce Centre for Partnership & Innovation because of its long-standing relationship with the college. “Many of the students that graduated from Mohawk helped produce the steel that went into the new building,” McElhone noted. “This is the true meaning of relationship and community. The pride that was expressed by the people who worked on this project was astounding. We held a final steel beam placement ceremony and we had somewhere in the range of 150 to 200 signatures on the beam. It was incredible.”

The most important part of this project for Mohawk College has been ensuring it has a knowledgeable and skilled team working on the building. “As it relates to net-zero buildings, we will see more of these and many more are being planned in Ontario and other locations,” Cupido adds. “If we learned one thing, it was recognizing more than ever that all the major partners on the project have to work closely and be in complete alignment to make sure things get done the way they should. There is not a lot of room for failure here. There’s no going back.”

Walters Group is a family-owned steel construction company that designs, fabricates, and constructs commercial and industrial projects throughout North America. Regardless of the industry, size or complexity, we always bring the same passion and commitment to every project we take on.

Walters Group is proud to have been a part of bringing the vision and structural innovation to Canada’s largest, and Hamilton’s first Net Zero energy institutional building - The Joyce Centre for Partnership & Innovation at Mohawk College.

www.waltersgroupinc.com

Transforming Vision into Reality.

GVCA Journal March/April 2018 25
Nine Startups
Building Robotic Construction Workers for 2018

The construction industry sits at an interesting crossroads. One of the highest-grossing in the world—$10 trillion in 2016—it is also one of the last industries to innovate technologically and one most desperately in need of doing so. Add on the fact that it’s the most dangerous in terms of workplace fatalities—924 cases in 2015, the highest level since 2008—and that it is now facing a shortage of skilled labor, and you have an industry that needs innovation and new thinking in pretty much every aspect.

The answer to almost all of these problems lies, of course, in our future robot overlords. Though the immediate reaction to autonomous equipment in construction is sometimes one of disdain—what about the jobs you’re replacing?—further examination sheds new light on the many benefits. Not to mention the fact that all of these automations need humans in order to operate effectively.

Let’s take a look at eight startups developing cool futuristic toys like exoskeletons, mapping drones, and self-driving earthmovers that will propel the construction industry into the future.

Bionic arms
Ekso Bionics, founded in 2005 in Richmond, CA, has $70 million in funding and possibly the coolest technology of the bunch. A pioneer in the field of robotic exoskeletons, Ekso makes wearable exoskeletons that augment strength, endurance and mobility. Its ZeroG robotic arms reduce the repetitive-stress injuries inherent in construction work. The mounted-arm exoskeleton attaches to tools like rivet busters, grinders and rotary hammers, absorbing the bucking and kicking that occurs regularly with such heavy-duty tools.

Taking stock with drones
You won’t see many construction workers flying around a job site today unless you drop a few hits of Purple Jesus, but all signs point to drones being a staple on construction sites of the future. Since drones are really just flying robots, we decided to include one example from among many that can be found in the drone mapping space.

Silicon Valley-based Kespry was founded in 2013 and has $28.3 million in funding so far to develop their drone technology which they refer to as an “aerial intelligence platform”. Kespry offers a complete solution for surveying, mapping and analyzing large-scale work sites such as quarries, construction material sites and mining operations. Providing hardware, software and cloud services, Kespry offers one simple, automated solution from start to finish.

Site managers create a mission on a supplied iPad, a drone calculates the flight path and flies autonomously, data is transferred and processed wirelessly, and the resulting report is delivered within minutes.

Editor’s note: this article was written by Nanalyze and appears on the company’s website, www.nanalyze.com. We reprint it here with permission.
Raising a building in two days

While this article is about startups, we couldn’t help but include this next company which you can actually buy shares in if you open up a free account with Interactive Brokers. It’s a young up-and-comer called Fastbrick Robotics (ASX:FBR), an Australian company founded in 2015. After taking in $10 million in funding, Fastbrick went public with their robotic bricklaying machine called Hadrian X.

The first step in its eventual “digital construction system”, Hadrian X can construct the walls of an average-sized building in two days. The very-fun-to-watch video of Hadrian in action makes it easy to see why the company is so bullish about its future. What’s more, behemoth Caterpillar has invested $2 million in Fastbrick, and the Kingdom of Saudi Arabia has signed a memorandum of understanding to build a minimum of 50,000 homes by 2022.

Reusable architecture

Last but not least is the vowel-averse company which you can actually buy shares in, called Asmbld, based in San Francisco and founded in 2014 with undisclosed funding. Asmbld is focused on the concept of reusable buildings—disassembling rather than demolishing. The company wants buildings and their parts to become movable products that evolve in cycles, like cars. To achieve this vision, they’re designing new assembly methods using robotics that will, among other things, enable building components to be assembled rather than glued together, allowing for reusability in other buildings and resale in other markets. They’re a bit thrifty with specifics at this point, but a piece they wrote on “robotically reconfigurable interiors” hints at a future where a robot will rearrange your living space on demand.

Robotic carpenters

Maryland startup Blueprint Robotics was founded in 2015 and has taken in an undisclosed amount of funding to create a 200,000-square foot factory full of home-making robots that build prefabricated walls, roofs and floors. Now we haven’t been in the factory or anything, but check out their website for a video that shows some amazing robotics technology. See how precise the robots are able to cut and trim the materials? All you have to do is provide them a CAD file with all the design details and they’ll quote you a price and deliver on it in just a few days.

It all ships on a standard flatbed truck. As of now, they have a team of humans that will assemble all the pieces for you on site. All you need to do is finish the roofing and then paint the walls. That’s where our next startup comes into play.

Earthmoving robots

Built Robotics is almost brand-new (founded in 2016) and is already making a name for itself. The San Francisco-based company has taken in $15 million in funding from Founders Fund and New Enterprise. Started by an ex-Google engineer, Built Robotics took the sensors from self-driving cars and retrofitted them into construction equipment. The result: robot tractors.

Using software designed specifically for construction and earthmoving, Built allows operators to program coordinates, then stand off to the side and let the machines do the rest. The company even specially designed LIDAR (Light Detection and Ranging) and GPS sensors that can withstand the intense vibrations of excavation. Despite (or maybe because of) its youth, Built Robotics has already established itself at the cutting edge of autonomous construction innovation.

Two thousand square feet in one day

Cazza was founded in 2016 (sensing a trend here?) in San Francisco and has $2 million in total funding. Specializing in 3D printing technologies for construction companies, Cazza’s minitanks are 3D printing cranes that can lay just over 2,000 square feet of concrete each day. The Cazza machines are mobile and remotely operated and, once delivered to a worksite and hooked up to a concrete supply, are ready to print within 30 minutes. They can even be programmed beforehand to pause for electrical wiring and plumbing to be installed.

The company recently announced that its machines will build the world’s first 3D-printed skyscraper in the United Arab Emirates.

Paint walls 30x faster

Founded in 2015, Indian startup Endless Robotics has taken in $100,000 to build “intelligent robots to solve dull and dirty problems for construction, maintenance and smart city management.” Long story short, they’ve built a robot called WALT that can paint walls up-to 30 times faster than an average painter at a speed of about 60 square feet per minute. It can handle heights from eight feet to 14 feet, but still needs lots of human supervision. It’s not for sale though, since they plan to use the robot to offer their own painting service. Maybe if they upload a video of their robot painting some walls we can link it to this article and they’ll get loads of leads for new jobs.

The robot-ization of construction is upon us!

A study by McKinsey earlier this year found construction to be one of the most stagnant industries in the world, with productivity growing just 1 percent a year over the past two decades. When its growth rate catches up with that of the total economy—an eventuality analysts feel sure of—an estimated $1.6 trillion will be added to its value. That’s a chunk of potential change hard to ignore and, judging by the number of companies popping up to have a stake in it, the robot-ization of construction has begun in earnest.
Historically technology hasn’t played a huge role when it comes to contractors’ insurance and risk management. That’s what prompted Cowan Insurance Group to develop Build Solutions, a place where contractors can easily access professional advice for their insurance and bonding needs.

Whether you’re just starting up or an established contractor, your company can evolve and scale fast. As the business evolves and grows, your approach to risk management needs to adapt. Build Solutions is a risk-management partner that truly understands the construction industry. It is an online platform that allows contractors to access risk-management solutions backed by Cowan’s knowledgeable, capable and experienced team that specializes in construction.

Here’s a sampling of questions you can address through Build Solutions.

• When it comes to your general insurance program or project insurance, do you need help or recommendations on placing your insurance? Do you want a review of your current program? Would you like some benchmark pricing?
• For bonding, do you need help setting up a new facility? Do you need increased capacity to bond larger projects? Could you benefit from a professional review of your indemnity agreement (including personal guarantees). Do you understand the costing?
• In an industry where projects can be won and lost by the slimmest of margins, it makes it increasingly important to understand your cost associated with providing bonds to an owner.

This advice is not limited to insurance and bonding. That’s why Cowan complements specialized risk management products for your growing business with group benefits, pension, succession planning and wealth management strategies to ensure your business can compete in one of the most competitive fields.

“Build Solutions provides an end-to-end solution to protect what you’ve worked hard to build,” says Kevan Thompson, vice-president construction at Cowan Insurance Group. “As the only partner you’ll need, let us worry about all the risks, you focus on growth.”

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EVENTS CALENDAR

March 12 – 16
CCA Annual Conference – Banff, Alberta
Registration required - http://conference.cca-acc.com/

April 27
Building Excellence Awards Gala
Registration required - https://gvca.org/be-awards-2018/

May 10
WinC Spring Dinner – The Pines, Cambridge
Registration coming soon.

May 30
Leaders in Construction (LinC) – What the Tech Event
Learn about the latest technology that can help your business processes. Registration coming soon.

May
Leaders in Construction (LinC) – Spring Clean-up

Note:
To view a complete list of upcoming events and to register, please visit www.gvca.org/eventscalendar.

EDUCATION CALENDAR

March 19
Approved Working at Heights

March 27
RFP’s Are Replacing Stipulated Sum Bids – Are You Ready To Compete And WIN?

March 23
Construction Best Practices: Creating Successful Employee Engagement

April 3
Construction Industry Ethics (in-class portion)
*Mandatory to receive Gold Seal Certification

April 5
Construction Best Practices: Injured Worker?
Successful WSIB Outcomes For Construction Workplace Injury Claims

April 9
Social Networking For Construction

April 10, 11 & 12
Construction Project Management 201

April 12
COR: Basic Auditing Principal

April 16
COR: Internal Auditor

April 30
COR: Introduction to Hazard Risk Management

April 25 & 26
Standard First Aid with Level C CPR and AEC

May 9
Confined Space Entry & Rescue

Note
All education & training will be held at GVCA -25 Sheldon Drive (unless noted otherwise).

REGISTRATION REQUIRED
for all courses and events. To register, or request additional information please contact admin@gvca.org or call 519-622-4822 X120 or go to: www.gvca.org/eventscalendar.

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