

# STEEL DESIGN

FORGING A LEGACY OF STEEL

Issue Two, Volume 55

Fall 2022

## Building Peak Performance Canada Summer Games



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Building peak performance | Solving the Canadian housing crisis with Steligen<sup>®</sup>  
Home away from home | Par for the course | Big build on the prairie



ArcelorMittal  
DOFASCO | HAMILTON

# STEEL DESIGN

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## About ArcelorMittal

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With a strong presence in North America, Europe, South America and South Africa, and an emerging presence in China, ArcelorMittal delivers a large scale of products, solutions and services to customers with the same quality focus in all regions. ArcelorMittal is the leader in steel technology, both in the breadth and depth of our product portfolio, and in our ability to supply a range of grades throughout the world. ArcelorMittal is a supplier of choice for all markets, a testament of our commitment to working collaboratively with our customers to engineer advanced steel grades to meet their needs.

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In the city of Hamilton, ArcelorMittal Dofasco lands are situated upon the traditional territories of the Erie, Neutral, Huron-Wendat, Haudenosaunee and Mississaugas. This land is covered by the Dish With One Spoon Wampum Belt Covenant, which was an agreement between the Haudenosaunee and Anishinaabek to share and care for the resources around the Great Lakes. We further acknowledge that this land is covered by the Between the Lakes Purchase, 1792, between the Crown and the Mississaugas of the Credit First Nation. Today, this area is still the home to many Indigenous peoples and we are grateful to work and live on this land.





# Building peak performance

## Canada Summer Games Sports Centre creates a legacy for Niagara Region

**Story:** Julia Preston  
**Photography:** Steve Enns,  
Christopher Séguin, Raimondo &  
Associates Architects Inc.

In August, 5,000 athletes, coaches and support staff journeyed to Niagara for the Canada Summer Games. For the young athletes, it was the opportunity they had been working towards for much of their lives. A chance to test themselves against the best in their sport, to experience the challenge of a multi-sport competition, and prepare for future events, including the Olympics.

As athletes gathered to compete, the 13 host communities of the Niagara region came together as well. More than 4,500 residents volunteered at the games and thousands of spectators filled the stands. Continuing this sense of unity and bringing people together over the long term is a legacy of the game.

Canada Games was founded in 1967 as part of the country's centennial celebrations. They are Canada's largest multi-sport event and one of the only multi-sport competitions in the world that features events for able-bodied athletes as well as athletes with physical and intellectual disabilities.

In preparation for this national competition, existing athletic centres across the Niagara region were improved and new builds were constructed. These augmentations have elevated the calibre and availability of sports facilities, not only for Canada Games athletes but also for Niagara residents of all ages and abilities for years to come.



Since the first Games in 1967, close to 100,000 athletes have participated. The Games have become an important support for Canada's sport development system and produce a lasting impact through community pride, national unity and the infrastructure they leave behind.

A standout facility from this year's games is the Walker Sports and Abilities Centre. This centre is at the heart of the Canada Games Park, a hub for the competition.

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## **"Sport tends to be something that unites people... This facility really epitomizes that."**

– Christopher Séguin, Niagara 2022 Canada Summer Games

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"When I walk through [the building] I just see potential," says Christopher Séguin, manager, media & communications for Niagara 2022 Canada Summer Games. "The potential that this will create for the community to have a healthy and active lifestyle... [and to] help some young athletes not just aspire to fulfill their dreams, but actually achieve them."

The Centre is 208,000 square feet and houses two NHL-sized arenas, a sport performance centre, a 200-metre indoor track, a multipurpose fieldhouse with four gymnasiums, sport offices, and the Brock-Niagara Health & Well-Being Centre.

The Walker Sports and Abilities Centre was the site of many triumphs during the Games. However, this summer was just the start of its impact. Its long-term legacy for the community is where it will make the biggest difference.

In addition to being a venue for athletic achievements, the building also represents a significant construction achievement.

"This job... wasn't a typical box building," says Paul Power, preconstruction and sales manager with Canam. "It was a lot of slopes, valleys, curved trusses and [custom fabrication]."

Canam worked with fabricator C & A Steel (1983) Ltd. to supply joists, deck, trusses and structural steel—approximately 1,150 tonnes of steel.

Among those 1,150 tonnes are highly complex joist girders and a challenging steel deck.

The joist girders were fabricated in a wide variety of shapes. Eleven cantilever trusses included several angled (non-standard) members. A curved hollow structural section (HSS) had to be installed in parallel for the twelve balcony trusses, following a particular curve radius for the elevated indoor track, where many athletes warmed up this summer, preparing to excel in their competitions.

The steel deck required special design, detailing and fabrication due to a wide variety of shear forces for the deck fasteners, different roof pitches and a sloped green roof system with shear brackets passing through the deck.







## The steel framework forms a visually striking building with large overhangs and a roof that ripples like origami.

Canam worked with the structural steel fabricator, engineer and other trades to ensure that everything aligned perfectly. "You're fabbing each truss separately and when it gets to the field it all fits together... We focus on certain connections to make sure everything lines up," explains Power. Many joists included secondary pieces that had to be framed in.

To ensure that the building performs at the highest level—and enables athletes to do the same—special consideration was given to the quality of the steel. Much of the steel deck was Galvalume™. The Galvalume™ deck is manufactured and designed to withstand moisture and tarnishing longer than a light zinc coat. A special zinc primer for rust inhibition was also used on the trusses and joists in other high humidity areas.

"Because you have moisture in the arena from the ice surface [the Galvalume™ deck] doesn't tarnish as quickly as other decks. It doesn't change colour, so you have that shiny-looking deck," explains Power. In other words, the Walker Sports and Abilities Centre was built for a bright future where athletes of all abilities will have a chance to shine.

The result of the steel framework is a visually striking building with large overhangs and a roof that ripples like origami. Together all of the folds, valleys and projections have a purpose. They help to make the centre 35 percent more efficient and generate 45 percent less greenhouse gas emissions than a standard building in Canada.



The overhangs provide shading to reduce the solar gains and associated cooling load. The partial green roof helps to reduce the heat island of the building by removing heat from the air and lowering the temperature of the roof's surface and the surrounding air. The green roof also helps to minimize stormwater runoff.

This focus on sustainability enhances the Walker Sports and Abilities Centre's long-term impact on the community. A view to the future also drove the building's emphasis on accessibility.

In preparing for the Canada Summer Games and looking ahead to the needs of the region, providing more accessible sports facilities in Niagara to serve the relatively large para-population was a priority.



The Walker Sports and Abilities Centre will support the growth and development of existing para-sport programs in the area for athletes at all levels, including future paralympians. More than 30 percent of Team Canada's athletes and coaches at the Tokyo 2020 Paralympics were Canada Games alumni. Through its design, the Walker Sports and Abilities Centre is fully accessible and emphasizes inclusivity.

Enhancements include the floors of the ice pad, which were constructed at a level so that wheelchair spectators could view the competition and translucent boards for sledge hockey. The multipurpose fieldhouse allows for many parasports and on the indoor running track, handrails assist those with stability or mobility challenges.

"Sport tends to be something that unites people and brings people together," says Séguin. "I think this facility really epitomizes that with the inclusivity... for parasports, able-bodied athletes, for community use, for high-performance use."

Some of the athletes that competed in Niagara this summer will make their way to Paris in 2024 or Italy in 2026 for future Olympics. "We have tangible examples of athletes who... benefited from the infrastructure legacies that were created for [previous Canada Summer Games] who went off to do these amazing things," says Séguin. "There's no doubt that this facility is going to do that for athletes born and raised in Niagara."

A further benefit is how the wider community gains from a top-class athletic centre. The Walker Sports and Abilities Centre will support people in maintaining a healthy and active lifestyle in numerous ways.

The Brock-Niagara Centre for Health & Well-Being, along with the gymnasiums and arenas, will provide an abundance of fitness and educational programs for Niagara residents. As community members take advantage of the facility, they will enhance their well-being and quality of life and Niagara will excel and flourish.

"The whole community in Niagara is going to have some connection to that facility at some point," says Séguin. "They're going to either participate recreationally in it, they might come to see a family member compete at an event in that facility. They're all going to have some kind of connection to it. I think that's the beautiful part that the games generate. To bring this facility to Niagara so that it will benefit people for decades."



### Project Specifications

#### Building Owner:

Niagara Region, City of Thorold, City of St. Catharines, Brock University

#### Architects:

MacLennan Jaunkalns Miller Architects // [mjma.ca](http://mjma.ca)  
Raimondo Associates Architects Inc. // [raimondoarchitects.com](http://raimondoarchitects.com)

#### Engineers:

Blackwell // [blackwell.ca](http://blackwell.ca)

#### Construction Project Manager:

Urban & Environmental Management // [uemconsulting.com](http://uemconsulting.com)

#### General Contractor:

Aquicon Construction Co. Ltd. // [aquicon.com](http://aquicon.com)

#### Steel Erector:

Niagara Rigging & Erecting Company Ltd. // [niagararigging.ca](http://niagararigging.ca)

#### Product Suppliers:

C & A Steel (1983) Ltd. // [casteel1983.com](http://casteel1983.com)  
Canam // [groupecanam.com](http://groupecanam.com)

#### Products:

Standard joists, Non-standard joists, Standard joist girders, Non-standard joist girders, Conventional steel structure, Steel deck



The  
intelligent  
construction  
choice

Steligence®



**Steligence® allows building owners, architects, and engineers a fact based approach to view building construction, for collaboration to build sustainable, more cost-effective buildings.**

# Solving the Canadian housing crisis with Steligence®

Steel offers environmental and financial benefits for high-rise construction

Story: Julia Preston

Cities are economic engines. They have the greatest concentrations of companies, the most job opportunities and the highest salaries. However, housing in major cities is increasingly unaffordable. The high cost of buying or renting a home in Canada's urban centres discourages people from moving to where employment prospects are best. Without people to do the work, our economy suffers.

To ensure our economy continues to expand, there is an urgent need to build more housing and to make it more affordable.

But what is the solution? One possible answer is steel. Steel can be used to build multi-storey residential buildings quickly, economically and sustainably, as a recent Steligence® case study from ArcelorMittal Dofasco shows.

The study evaluated a hypothetical 22-storey residential building within the Greater Toronto and Hamilton area. Here, as in other centres in Canada, demand for housing outstrips supply and cost exceeds many people's budgets.



## People have been priced out of Canada's cities, and this negatively impacts our economy.

The average home price in many urban areas – single-family, semi-detached or condo – is more than \$1 million. Even if prices drop, with interest rates rising, buying a house remains out of reach for many people. This high cost of home ownership also impacts rental housing. People have been priced out of Canada's cities, and this negatively impacts our economy.

The building featured in the case study is a typical structure found in many cities. At just over 441,000 square feet, it includes two levels of underground parking and 288 residential units ranging from one to three bedrooms. High-rises like this can help to address the housing crisis: a high density building that limits urban sprawl, is designed for central areas where people want to live, and can accommodate nearly 300 individuals or families.

The study compared two unique building scenarios: a steel-based design versus concrete. Only the structural elements were significantly altered. The appearance, size, floors and number of units remained the same.

By looking at the two structures side by side, "we can demonstrate the pros and cons of both designs and compare them apples to apples," says Slobodan Kukic, director of Business Development for Canam-Buildings-Hambro, which served as the structural engineer for the steel building.



The study evaluated construction time, cost to build the high-rises and environmental impact. The steel-based design was found to take less time, reduce cost and provide a significantly lower environmental impact.

For the construction schedule, the steel building was completed five weeks (25 working days) prior to the concrete. This result was primarily due to faster floor construction time. For levels three to six, the steel building required seven days per floor. The schedule sped up as the building rose. By level 19, construction time was down to three days per floor. In contrast, the cast-in-place concrete required eight days per floor for levels 3 through 13 and five days per floor for levels 14 through 22.

"The steel structure consists of columns, beams and floor joists [with] a concrete topping on those joists," explains Kukic. "We can erect multiple floors, say 10-15 storeys, and then come back and pour these floors. That gives an advantage to the general contractor in terms of speed and other trades following up."

### Design scenarios

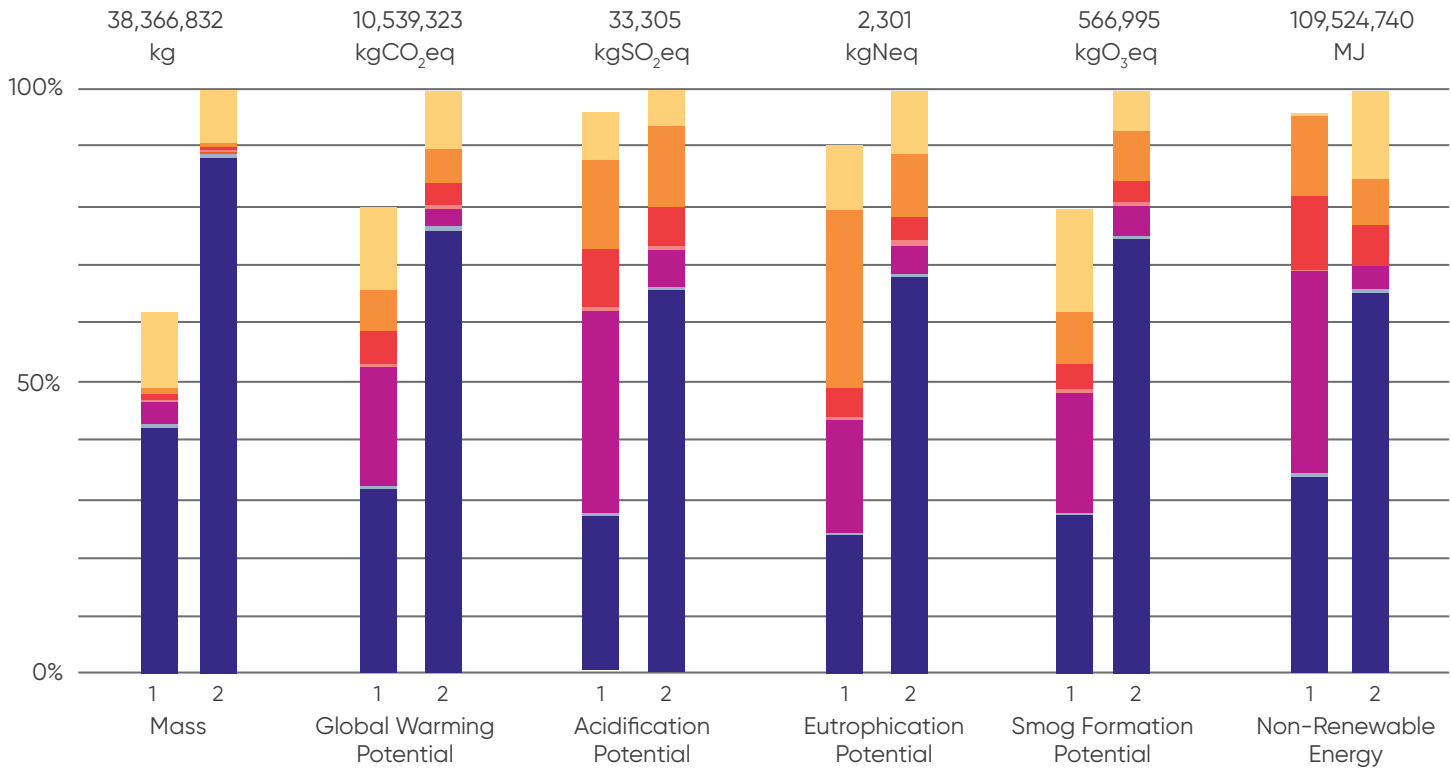
	Steel	Concrete
Foundation & Underground Parking	Cast-in-place (CIP) concrete columns, slabs	
Floors (all levels)	Composite Steel Joist System	CIP concrete slabs
Columns	AM HiStar® 460 sections	CIP concrete
Beams	Wide flange sections	CIP concrete
Interior Walls	Light steel framing	
Core, Shear, Load Bearing Walls	HSS chevron bracing, structural steel	CIP concrete
Exterior	Insulated steel stud wall, metal panel, window wall glazing	
Roof	Steel Deck	CIP concrete



Tally® Life Cycle Analysis

Divisions

- 03 - Concrete
- 04 - Masonry
- 05 - Metals
- 06 - Wood/Plastics/Composites
- 07 - Thermal and Moisture Protection
- 08 - Openings and Glazing
- 09 - Finishes



Design Options: Option 1 - Steel    Option 2 - Concrete

Working with steel also limits the number of trades on site until the super structure is complete, minimizing the coordination required.

The shorter timeline means lower costs on equipment rentals, trades, financing and insurance. It also means that the people who are desperate for a place to live can move in a month sooner.

Overall, the concrete-based design cost \$73.7 million to construct. The steel design was \$400,000 less.

On the environmental side, the study team completed a full life cycle analysis using the Tally® add-on for Revit for both design scenarios from cradle to grave for the entire building.

This analysis combined the bill of materials and North American environmental product declarations from GaBi life cycle inventory. It evaluated global warming (embodied carbon), acidification, eutrophication, smog formation and non-renewable energy for the estimated 60-year lifespan of each structure.

The life cycle analysis showed the steel-based building had lower environmental impact across all five indicators. In each design scenario, concrete was the largest material contributor across the five environmental impact areas.

The most significant improvement was Global Warming Potential (GWP). The steel design was 20 percent lower compared to concrete. To further highlight the impact, this is equivalent to taking 422 vehicles off the road each year.

Despite steel's many benefits, concrete has long been the go-to choice for constructing multi-storey buildings. With so many advantages, why is steel not used more widely?

Kukic sees this as a national bias. "If you look at... cities like New York or Boston, you will not find a concrete building... Why can they build all those high-rises... out of steel but we cannot do 22 storeys in Toronto? It's really the habits... in those markets versus in Canada."

He adds that advancements in steel now make it an alternative for many aspects of building construction.



ArcelorMittal manufactures structural and cold formed steel grades with innovative member design. The steel building in the case study used columns of ArcelorMittal HISTAR® 460 structural sections. This innovative high strength low alloy design contributed to a lighter structure (36 percent less than the concrete building) and reduced material cost over lesser strength grades.

Other steel used in the high-rise included a composite steel joist system for floors, wide flange sections for beams, light steel framing on interior walls, insulated steel stud walls with metal panels for the exterior and a steel deck roof. For core, shear and load bearing walls, Canam specified chevron bracing using hollow structural sections and structural steel.

"The entire structure is designed in a way to be supported by structural steel. Even the... lateral restraint system of the building is steel braces rather than traditionally used concrete cores or elevator shafts," says Kukic.

Because high-rises like this rely on steel bracing for lateral strength, it's crucial that structural engineers are involved in the early stages of design.

Braces may be 15-20 feet long. By working directly with the architect, the engineer is able to ensure that the steel does not affect the building's design and remains economical.

"The consulting industry is so used to concrete. They know where to position concrete elements," says Kukic. "With steel... the architecture has to be designed around the system. You cannot design [a building] for concrete and then try to fit it to steel. It's like putting the square peg in the round hole. Early involvement is crucial."

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## "We proved that steel is performing better than concrete."

— Slobodan Kukic, Canam-Buildings-Hambro

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Kukic hopes that this study demonstrates the viability of steel in high-rise construction and encourages architects, developers and builders to consider other options beyond the default.

"We proved that steel is performing better than concrete," he states. "When everybody's on board and understands the process and the system, things go smoothly and the end result is really evident."

With more housing options in our big cities, more people will move in, work, shop and live. This in turn will boost our economy, which is good for all of us, no matter where we live.



### Case Study Team

#### Design:

mcCallumSather // [mccallumsather.com](http://mccallumsather.com)

#### Structural Engineering:

WSP (concrete) // [wsp.com](http://wsp.com)

Canam (steel) // [canam-construction.com](http://canam-construction.com)

#### Mechanical Engineering:

mcCallumSather // [mccallumsather.com](http://mccallumsather.com)

#### Electrical Engineering:

Seguin Engineering // [sei-ee.com](http://sei-ee.com)

#### Cost Consulting:

Altus Group // [altusgroup.com](http://altusgroup.com)

#### Schedule Consulting:

MPa Consulting



# Home away from home

Steel clad residence at UNBSJ is built with longevity and legacy in mind

Story: Julia Preston

Photography: Barrett Jackson Photography

Nearly sixty years ago, the University of New Brunswick looked beyond its base in Fredericton and established a second campus in Saint John. For decades the Saint John site was modest. It developed a reputation as a centre for marine biology and as a commuter school for local students.

Twenty years ago, the university began to expand its operations along the Bay of Fundy. One of the primary goals was to become a campus of choice for students—including drawing applications from outside the city, outside the province, the Maritimes and the country.

Today, the University of New Brunswick Saint John campus (UNBSJ) has a population of approximately 2,200 students and offers programs in all disciplines across arts, business and science. As the campus has grown, so has the demand for services. The Barry and Flora Beckett Residence, the latest development in the evolution of UNBSJ, has been designed to meet both current needs and the anticipated future growth of the campus.

"We were very much in a situation where we had long wait lists for residences. We were 100 percent occupied," says Kevin Simpson, director of Facilities Management and Campus Development for the Saint John Campus. The new residence added 105 beds and in doing so, helped the university to create a "residence culture" for students.









**"It's our aspiration to grow.  
With growth comes more  
residence buildings... for people  
to really feel the university."**

– Kevin Simpson, UNBSJ



The university experience is about much more than academic programs. Roommates, clubs, extra-curricular activities and life beyond lecture halls often have the biggest impact on students. Each university's unique culture attracts like-minded people and provides a foundation for their development.

The Beckett Residence helps UNBSJ "welcome students... who will not only be enriched themselves but contribute to the richness of the campus in return," said Barry Becket, a UNB alumnus, long-time professor, registrar emeritus, and a key figure in establishing the Saint John campus.

The Beckett Residence sits on a quad with the Dunn and Mackay residences. The building is 38,000 square feet and six storeys high. It connects to the other residences via an 83-foot steel pedway.

UNBSJ is known for its tunnels that allow students to "leave their room in their sock feet and/or their slippers and... get to class," explains Simpson. In constructing the new residence, the university wanted to maintain that level of accessibility. The pedway between the Beckett and Mackay residences enables students to easily get from building to building and connects them to the rest of the campus.

The pedway was constructed of insulated metal panels (IMPs) manufactured by Kingspan. The prefinished panels are composed of a steel outer skin over a ridged stone-fibre mineral insulation core. IMPs are known for their superior thermal properties, design flexibility and fast installation time. On the exterior the panels are coated in a siliconized modified polyester resin, which will not weather, chalk or fade.

From the pedway to the residence itself, complementing the existing buildings was an important consideration. The Dunn and Mackay residences are clad with shingled exteriors in various shades of grey. "We wanted to make sure that the building fit really well with the other two residence buildings. But we also wanted to bring some type of life to the building in regards to colour," explains Simpson.

That led the design team to select accents of red and black, the university's official colours. Just like the sweatshirts students wear to class, the on-brand colour palette is a further opportunity to celebrate the UNBSJ spirit.

The majority of the building employs Agway Metal's 7/8" corrugated cladding in a light grey that echoes that of the other residences. Black horizontal panels (HF-6) are used along the bottom of the building to ground the structure. The designers also used black to delineate the entrance to the building. Here the HF-6 stretches the full height of the building and is paired with an adjacent wall covered in shiny red aluminum panels.

The HF-6 profile, part of Agway's hidden fastener system, provides a 12" wide panel with a 6" return. The cladding delivers ultra sleek lines and a very clean, modern profile, a nod to the university's focus on the future.





"One of the biggest aspects for us when we were constructing the building... was finding materials that would have longevity but at the same time very low maintenance requirements," says Simpson. That led to the selection of steel cladding from Agway Metals and insulated metal panels from Kingspan.

## The modern aesthetic of the steel cladding matches the university's focus on the future.

UNBSJ's ambitions are long-term. Focusing on durable, sustainable construction ensures that the residence supports the university's goals for future expansion.

At the same time, the university is growing thoughtfully, developing its own distinct post-secondary identity centred on collaboration and connection.

This sense of collaboration is woven into many programs at UNBSJ. Students embrace this cross academic culture throughout their education and build connections through their residence experience. When the new Beckett Residence opened, Petra Hauf, UNB vice-president Saint John, said, "We are committed to making this campus a more inclusive and comfortable place to live and study and this new residence is one way for this to happen."

"The collaborative approach... really speaks volumes to what UNBSJ is and does on a regular basis," says Simpson. "It's our aspiration to grow. With growth comes more residence buildings and things [that allow] people to really feel the university, feel the culture that you're trying to establish and create."

### Project Specifications

#### Architect:

D. M. White Architecture Inc. // dmwhite.ca

#### Construction Manager:

Maxim Construction Inc. // maximconstruction.ca

#### Engineers:

CBCL (civil) cbcl.ca

MCW (mechanical) // mcw.com

Tek Consultants (electrical) // tekcon.ca

Lawrence RA Engineering (structural) // lawrenceengineering.ca

#### Cladding Installer:

O'Brien Roofing // 506-634-0049

#### Product Suppliers:

Agway Metals Inc. // agwaymetals.com

Kingspan // kingspan.com

#### Product Specs:

HF-6 Black (QC 28262), 7/8" Corrugated Regent Grey (QC 28730), AR-38 Black

Kingspan Insulated Panels, Weather XL – Siliconized Modified Polyester, Driftwood

# Par for the course

Reflecting the elegance and legacy of the golf club experience through steel

Story: Julia Preston

Photography: Mark Luciani  
& Perlane Construction

National Golf Club



A round of golf is about much more than playing the course. It's connecting with friends, family or business associates. The beauty of the landscape and time spent outdoors. The challenge of beating your personal best. The enjoyment of amenities and a post-game meal in the clubhouse.

For many, golf isn't just a game, but rather an experience.

And the National Golf Club of Canada in Woodbridge, Ontario has been providing an exceptional experience since it opened in 1975. It was developed with one focus: to be the country's best. For nearly 50 years, it has been consistently rated as a top course in Canada.

But, just as maintaining a single-digit handicap requires training and practice, to remain the best requires evolution and transformation.

In 2008, The National Golf Club rebuilt its clubhouse. The goals were two-fold: a timeless design that would provide the latest modern amenities. Not a small feat. But a challenge the National rose to. In fact, they didn't just make par. They sunk a hole in one. Today, the National describes its clubhouse using words like luxury, elegance, classy—apt adjectives for the best private golf club in Canada.

For people who are serious about golf, the sport is a fixture in their lives. As members of a club, they have committed and are invested in ensuring the club meets their needs and fulfills their expectations whether they play a round or simply meet up with people at the clubhouse. It is part of their work, family, entertainment, fitness and social life. Avid golfers may even choose to live in a particular area based on the local course.





A lifestyle built around golf is exactly the vision of the Cobble Beach Golf Club in Kemble, Ontario near Owen Sound. Here, the experience of golf is the foundation for an entire community. The club is the centrepiece of a new four-season master-planned development on the shores of Georgian Bay.

Cobble Beach is characterized by a respect for the natural environment, an intentional focus on cultivating community, a commitment to high quality, and, perhaps in contrast to some other golf clubs, a move away from pretentiousness. The clubhouse is a tangible representation of these qualities, with its grand yet welcoming architecture.

For both Cobble Beach and the National Golf Club, steel is an important material that helps support the guest experience.

At Cobble Beach steel roofing creates an elegant, high-end aesthetic for the large clubhouse. Located beside Georgian Bay, the Nantucket-style building is surrounded by stunning vistas and the rugged Canadian Shield. The clubhouse embraces the beauty of the area and enables people to connect with nature through golf.

But the waterfront setting had taxed the clubhouse. Over the years, the facility had been subjected to the harsh weather that characterizes this area. Traditional asphalt shingles could not stand up to the strong winds from the Bay, and the clubhouse had been reroofed multiple times.

"Almost immediately after our previous asphalt roof was installed, we decided it would be the last," says Cory Hagger, general manager of Resort Operations.

When it came time to reroof, the Cobble Beach team elected to install a steel roof from Vicwest. To align with the elegant aesthetic of the clubhouse, they chose the company's True Nature North Ridge Slate metal tiles. The durable steel roof also supports the community's environmental ethos. The metal should last up to 50 years, and at the end of its life, it can be recycled, making it a sustainable choice.

True Nature is designed to replicate the look of slate, a premium roofing option appropriate for the high-end resort. Vicwest cast, modelled and stamped the tiles based on real slate and each tile is painted with a unique, multi-hued colour palette. Edge-sculpting and multi-width imprints lessen the manufactured look and create a more natural appearance.

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**"Such a stunning facility needed a roof that looked as impressive."**

– Andy Kamrath, AM Group of Companies

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"Such a stunning facility needed a roof that looked as impressive," says Andy Kamrath, vice-president of AM Group of Companies, which handled the roof installation. "True Nature metal tiles work as a complete and integrated roofing system, which meant our team could cover the gables, dormers, hips, valleys, and wall transitions seamlessly."



The Cobble Beach clubhouse features bold lines, steep pitches (predominantly 10/12 and 11/12) and complex geometry. At 13,500 square feet, the project included 500 feet of valley, 500 feet of gable trim, 1,300 feet of drip edge and 700 feet of hip and ridge.

The full suite of accessories provided by Vicwest ensured that every detail was addressed and created a flawless, polished finish. AM Roofing's meticulous installation also ensured a high-quality result.

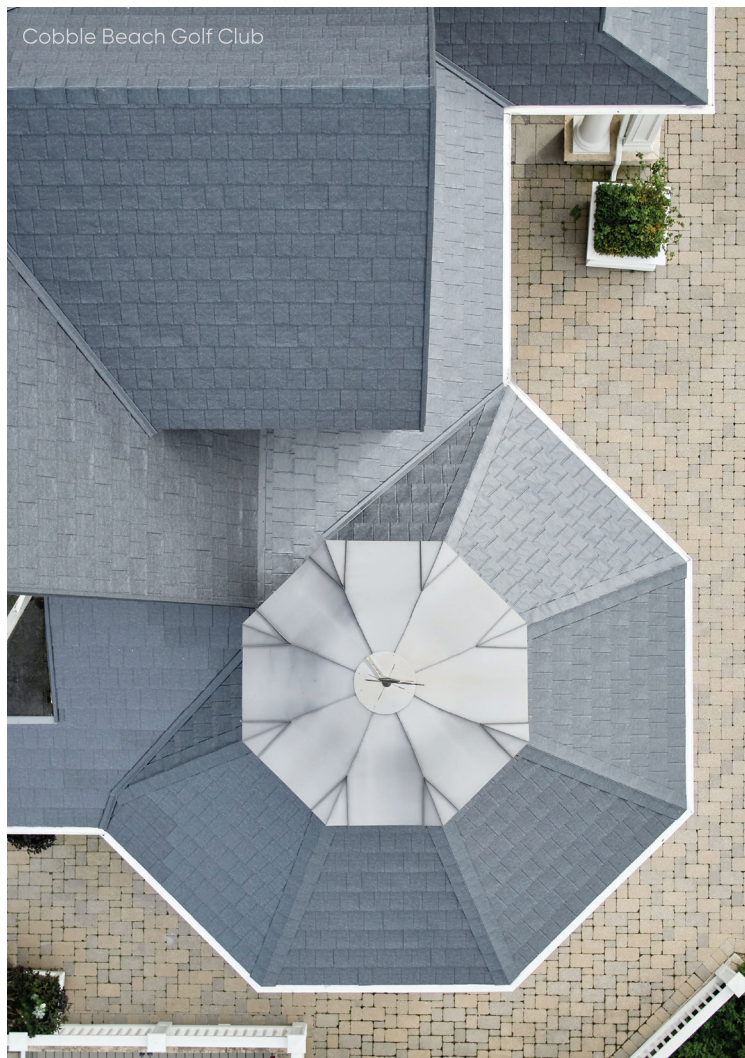
When installing a steel roof, many contractors strap over the existing roof and then install the steel cladding. AM Roofing prefers to start fresh, so their first step for the installation was tearing off the existing asphalt shingles.

Exposing the underlay and decking allowed AM to ensure that the roof was in good repair and address any issues.

They then laid a high heat ice and water shield over the full slope.

"We always go the extra mile to make sure everything's watertight... before we even install the product," explains Zach Smit, a consultant with AM Group of Companies.

True Nature is engineered to withstand the extreme weather events coming off the Bay and provides year-round protection from wind, rain and snow. Vicwest's Quadra-Loc system locks each tile in place on all four sides. As well, water-shedding channels on each tile divert moisture away from the roof resulting in a watertight covering.





"Once the option to go with True Nature metal roof tiles was presented, we knew it was the right decision... Having a relatively maintenance-free roof allows our team to focus on what we really care about, our members and their club experience," says Hagger.

Now the remarkable clubhouse is a fitting accompaniment to the course, the community and the overall experience of Cobble Beach.

Whether at Cobble Beach or the National Golf Club, the experience begins as soon as people glimpse the course and the clubhouse.

In designing the new clubhouse for the National Golf Club, architect Richard Wengle prioritized the sightlines of the course. "The 17th and 18th holes were vital. The views are spectacular," he explains. "We wanted... to see through [the clubhouse so that]... you see the golf experience."

A forecourt in front of the stately clubhouse sets the stage for this experience and creates a sense of arrival for the prestigious golf club.

The clubhouse references a Tudor revival style with a steep pitched roof punctuated with large gables. The course is located within a residential community, so the building was designed with more of a "residential flair," explains Wengle.

Stepping into the clubhouse, high ceilings, generous rooms and captivating views conjure feelings of elegance and luxury.

Though Wengle took inspiration from residential architecture, at 50,000 square feet, the clubhouse is much larger than even a luxury home. The challenge was to build a clubhouse that felt welcoming, yet was large enough to meet the needs of the members. To scale up the residential look and feel, the building employs lightweight steel framing (LSF).

LSF C-joists from Bailey Metal Products allowed Wengle to achieve the traditional peaked roof look along with the large size needed for the clubhouse. A design that would not have been possible with wood.

Steel standard C-joists come in a variety of depths, flange sizes and steel thicknesses. The big difference with LSF trusses is spacing. In the wood world, trusses run at two feet on centre. In the light gauge world, trusses are set at four feet on centre.

The reconstruction of the clubhouse supports the National's mission to promote the highest standards of the game of golf and reflect the sport's traditions. The clubhouse contains a dining room, lounge, locker rooms, offices and patio, all focused on one thing: to maintain the National's status as a world-class golf course.

"It's one of the top-rated courses in Canada," says Wengle. "They wanted to build a clubhouse up to that level... to go with the calibre of the course itself."

Both the National and Cobble Beach golf clubs recognize that excellent facilities are essential to creating an exceptional golf experience. A visit to the club is about much more than the course or its clubhouse. Every element and how they integrate is carefully considered.

Steel helps tie that experience together, through the structure, appearance and function of the buildings. The durability and aesthetics of steel in these clubhouses reinforces the tradition and longevity of the golf club experience.

### National Golf Club

**Architect:**

Richard Wengle Architect Inc. // 416-787-7575

**Engineers:**

Atkins + Van Groll Inc. // atkinsvangroll.com  
(joined MTE Consultants)

**General Contractor:**

Perlance Construction // perlance.com

**Product Suppliers:**

Bailey Metal Products Ltd. // bmp-group.com

**Product Specs:**

Bailey C-Joists

### Cobble Beach Golf Club

**Architect:**

Richard Wengle Architect Inc. // 416-787-7575

**Roofing Contractor:**

AM Roofing Solutions // amroofing.ca

**Product Suppliers:**

Vicwest // vicwest.com

**Product Specs:**

True Nature North Ridge Slate Mica Gray 18-3030





Indaten® will oxidize and eventually develop a rusty patina.





# Big build on the prairie

## Weathering steel roots new build to its natural setting

Story: Julia Preston

Photography: Dan Banko

At the southern edge of Alberta, the prairie fields stretch as far as the eye can see. Overhead, the sky spans seemingly forever, the vast blue broken only by the occasional wisp of cloud. A river bends and winds through the endless expanse of grass. Far in the distance, you see the sweet grass hills of Montana.

This picturesque spot is a timeless showcase of the province's natural beauty. And for the family who has farmed this land for generations, it's also the setting of their newly constructed modern home and expanded shop.

Appreciating the landscape and ensuring the buildings complement this magnificent scenery was a priority for the homeowners. They engaged Spencer Court, architect at One One Ten Architecture + Urbanism, who shared their vision to embrace the prairie setting.

The shop and adjacent home are the latest additions to this multi-generation family farm. At 35,000 square feet and 28 feet high, the shop is "a farmer's dream come true" says Court. The building will house combines, tractors and other essential farm equipment.

"In that particular setting of the landscape you want buildings to feel like they've come out of that place or out of the ground," explains Court. "There's certain vantage points where the shop looks very pure and you don't see the house, and then you come around... and finally the backdrop [to the house] is the shop from the south. All sides of the project have a different relationship [to the land]."

**"In that particular setting of the landscape you want buildings to feel like they've come out of that place or out of the ground."**

— Spencer Court at One One Ten Architecture + Urbanism

To connect the shop to its setting, Court's first choice was Indaten®, ArcelorMittal Dofasco's cold rolled weathering steel. Over time, Indaten® will oxidize, taking on a raw and rusty patina that blends with the natural environment. Like the grains in the field grow from green to gold through the seasons, the steel will transform from grey to orange and finally to a warm rich brown.

This gradual evolution makes the building come alive and further connects it to its location. The transformation of Indaten® is specific to its environment. In order to oxidize, weathering steels must be exposed to alternating cycles of wet and dry weather. In the arid climate of Southern Alberta, oxidation will happen more slowly. The final dark brown patina will be varied, textured and unique, just like the environment of the farm.

"We gravitated to a weathering type of patina so it felt like it's been there longer than it has... [and been] shaped by the climate and the conditions around it," says Court.

Indaten® also helped Court to manage the scale of the large structure.

"As architects we're thinking about human scale. How do we make this hulking mass... relate a bit more to the body?" he says. "Weathering steel seems to relate more to the human qualities of things or natural qualities."

Indaten® gave an opportunity to introduce texture and shadow to the building. Rather than a single monolithic block, panels and layers create subtle visual interest through different stratified lines.

These lines echo the rippled hoodoos that preside over the high grassland prairies of this area. These towering columns of rock have eroded over thousands of years into magnificent natural sculptures.

Writing On Stone Provincial Park, located near the farm, contains a spectacular concentration of hoodoos. The Park, which is also a Unesco World Heritage Site, holds the most significant collection of protected First Nations' petroglyphs (rock carvings) and pictographs (rock paintings) on the Great Plains of North America.

This history, tradition and spirit of the land surrounds the farm and is part of what Court and the owners aimed to honour with their new construction.

At the shop, the base of the building is rooted to the earth with formed concrete veneer. Then, Indaten® was applied in three tiers that stretch 22 feet high. Panels of varying widths were arranged in an irregular pattern and at the very top, fibre cement brings the mass down slightly. The result is an exterior that feels rustic, natural and in harmony with the surrounding environment.

"From a distance all you see is weathering steel," says Court. Up close, the vertical ribbed panels emerge. "Overall it looks kind of random and changing and provides a bit more shadow play. In our region the sun is what activates everything."







Spencer Court, Principal Architect, One One Ten

Court worked with supplier Forma Steel on the weathering steel panels.

The company uses Indaten® as part of its Forma Plank line. Forma Planks are hidden fastener panels that are folded instead of roll formed. Dave Jackson, technical product specialist with Forma, explains that folding is gentler on the metal and also enables Forma to work from blank cut sheets if needed. The company can fold up to 16 gauge and up to 26 feet 10 inches, though the majority of trims and cladding they produce still fall at 10 feet.

Forma offers the planks in a variety of colours and textured finishes as well as Indaten® weathering steel—the only requirement is that the metal be a minimum of 24 gauge.

“The flexibility we have in folding it is that we can change dimensions,” Jackson explains. “We took a standard product which is our Forma Plank and worked with Spencer [Court]... to make modifications to the size of the panel to allow for this random spacing and sizing.”

Forma adjusted the widths of the panels slightly from Court’s original design to ensure they used the full coil with minimal waste.

For installation, Indaten® does not require any special preparation, though One One Ten always goes beyond the standard building paper wraps. On the shop they used a 3D drainage product to ensure adequate ventilation and moisture

“Weathering steel seems to relate more to the human or natural qualities of things. It’s something that would evolve.”

protection behind the panels. They also incorporated foam insulation to improve thermal performance beyond what is seen in most shop buildings. Both the drainage and back ventilation increase the lifespan of the cladding

Jackson emphasizes that along with substrate preparation, ensuring the surface is plumb, level and flush makes cladding installation easier. Forma also recommends stainless steel clips and fasteners when working with weathering steel. The risk of reaction as the steel oxidizes is low, but stainless ensures longevity. The mechanical fasteners also help to secure the panels against Alberta’s harsh winds.

“It could very much be a 50 year cladding especially out in that region where it’s semi arid and quite dry,” says Court.

This long view to the future is perfectly suited to this timeless area. Here the warm browns of Indaten® glow and feel at home in the Alberta sun, a complement to the golden waves of grass and endless fields. The family who farms this acreage has immense respect for the land and its history. Their thoughtful construction of this new shop represents the next chapter for the newest generation on the farm, for those yet to come, and for the land itself.

### Project Specifications

**Architect:**

One One Ten | Architecture + Urbanism // 010110.ca

**Engineers:**

Talbera // talbera.com

**Construction Project Manager:**

Brennon St. Amand (Destination Developments)

**General Contractor:**

Destination Developments // destinationdevelopments.ca

**Cladding Installer:**

Destination Developments and Mauro Contracting  
// 403-382-1382

**Product Suppliers:**

Forma Steel // formasteel.ca

**Product Specs:**

Forma Steel Forma Plank – Custom Variable Width 22ga  
Weathering Steel with Stainless Steel Clips and Fasteners





ArcelorMittal



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