

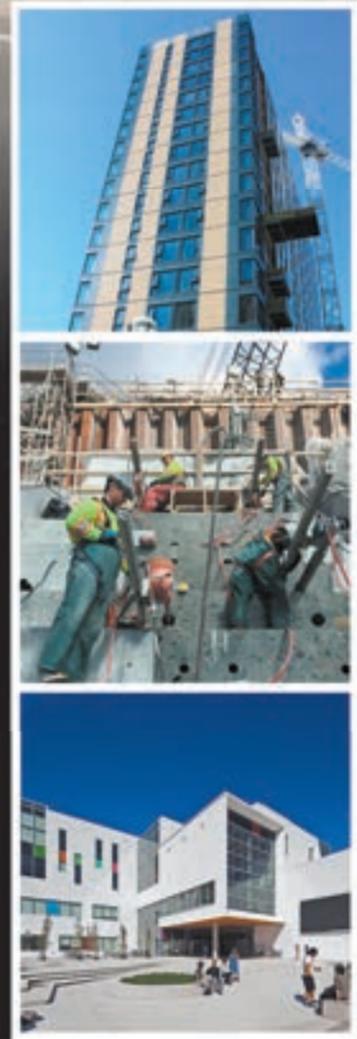


October 22, 2018

VRCA Awards of Excellence 2018

Journal of Commerce

by ConstructConnect®



VRCA award submissions highlight industry trends

WARREN FREY
DIGITAL MEDIA EDITOR

If you want to see the latest trends in construction, judge them.

Retired construction executive Bob Proctor is one of the judges for this year's Vancouver Regional Construction Association (VRCA) Awards of Excellence and has a bird's eye view of not only the best projects in the province but also the trends driving the way things are built.

One of the key trends driving construction at present is technology, Proctor said, particularly personal technology on jobsites.

"More contractors are installing computer terminals and using tablets on jobsites for drawing reference, real time access to change orders, and so forth. We are seeing an increased use of drones for progress updates and marketing as well," Proctor said.

He also pointed to wood construction to create new and innovative forms such as the Brock Commons student housing facility, one of the tallest mass timber structures in the world, exterior cladding and in interiors, dropped ceilings using cross limited timber.

"In general, green construction practices continue to grow. From recycling and reducing the amount of packaging materials onsite

to ever improving HVAC systems and controls, we see tremendous increases in sustainable construction practices," Proctor added.

In addition to innovation, he said, human factors are continuing to affect the industry.

"In the relatively short time I have been on the committee, I have seen a marked increase in the number of women in positions of responsibility in our presentations," Proctor noted.

But while there are positive changes to the industry, there are also demographic concerns that haven't abated.

"Finding enough labour is an increasing problem and our buoyant market and aging labour pool make this a continuing problematic trend," he said.

Proctor also praised the nominees and other VRCA members for their dedication to both their craft and the industry.

"A trend that has not changed is our members' ability to meet challenges put before them. From seemingly unrealistic deadlines, to lack of available labour, our members and their staff always find a way to meet owners' expectations," he said.

The VRCA Gold Winners will be announced at the 2018 Awards of Excellence Gala tonight (Oct. 23).



PHOTOS COURTESY OF VRCA

This year's submissions for the VRCA Awards of Excellence were all strong examples of the changing face of the construction industry. From innovative material use to introducing new technology to construction processes, this year's nominees were definite examples of the latest trends impacting the industry, stated various award judges.

VRCA Awards of Excellence Silver winners

The Vancouver Regional Construction Association's (VRCA) 30th Annual Awards of Excellence culminate in tonight's gala (Oct. 23), when the Gold winners are announced. The Gold winners are picked from the below list of Silver Award winners, who were recently recognized by the VRCA at a reception in downtown Vancouver.

GENERAL CONTRACTORS — TENANT IMPROVEMENT

- Canadian Turner Construction Company: Metro Vancouver Headquarters
- ETRO Construction Limited: Parq Vancouver
- ICE Development Ltd.: BCLS Park Royal Shopping Centre
- Ledcor Construction Limited: Bass Pro Shops Outdoor World – Tsawwassen

UP TO \$15 MILLION

- Jacob Bros. Construction Inc.: Jacob Bros. Construction Office & Maintenance Facility
- Peter Kiewit Sons ULC: Powell Spillgate Rehabilitation Installation
- Vancouver Pile Driving Ltd.: Viterra Pacific Terminal Ship Loading System Upgrade

\$15 MILLION TO \$50 MILLION

- Graham Construction and Engineering LP: Metrotown Station and Exchange Upgrade
- Graham Infrastructure LP: Burrard Bridge Rehabilitation
- Smith Bros. & Wilson (B.C.) Ltd.: Surrey Biofuel Facility
- Smith Bros. & Wilson (B.C.) Ltd.: West Vancouver Public Service & Municipal Hall Building
- Urban One Construction Management Inc.: UBC Brock Commons Phase 1 Student Residence

OVER \$50 MILLION

- EllisDon Corporation: Emily Carr University of Art + Design
- FRPD-BEL Gateway Joint Venture: Fairview Container Terminal – Phase 2 North Expansion
- ITC Construction Group: 3 Civic Plaza
- Ledcor Construction Limited: BC Children's and BC Women's Redevelopment Project Phase 2

MECHANICAL CONTRACTORS — UP TO \$3 MILLION

- Black & McDonald: Metrotown Station and Exchange Upgrade
- Gisborne Industrial Construction Ltd.: BC Hydro Wahleach Powerhouse Fire Protection System
- PMB Joint Venture: Parq Vancouver

\$3 MILLION TO \$9 MILLION

- Division 15 Mechanical Ltd.: West Vancouver Public Service & Municipal Hall Building
- Sentrax Mechanical: Ellsworth
- Trotter & Morton Building Technologies Inc.: UBC Brock Commons Phase 1 Student Residence

OVER \$9 MILLION

- Fred Welsh Ltd.: BC Children's and BC Women's Redevelopment Project Phase 2
- PMB Joint Venture: Parq Vancouver
- Sentrax Mechanical: 3 Civic Plaza

TRADE CONTRACTORS — UP TO \$1 MILLION (CHAIRMAN'S TRADE AWARD)

- Centimark Ltd.: Bass Pro Shops Outdoor World – Tsawwassen
- Horizon Landscape Construction Inc.: South Surrey Operations Yard
- Seagate Structures Ltd.: UBC Brock Commons Phase 1 Student Residence

\$1 MILLION TO \$3 MILLION (PRESIDENT'S TRADE AWARD)

- Columbia Glazing Systems Inc.: Five Ten Seymour
- Keith Panel Systems (KPS): The Polygon Gallery
- Rufus Enterprises Ltd.: Bass Pro Shops Outdoor World – Tsawwassen

\$3 MILLION TO \$7 MILLION (FOUNDER'S TRADE AWARD)

- Glastech Glazing Contractors Ltd.: Parq Vancouver
- Phoenix Glass Inc.: 1245 Harwood
- West Coast Cutting & Coring Group Ltd.: Ruskin Dam and Powerhouse Upgrade Project

OVER \$7 MILLION (DIRECTOR'S TRADE AWARD)

- Ebenisterie Beaubois: Parq Vancouver
- Starline Windows: 3 Civic Plaza
- West Coast Cutting & Coring Group Ltd.: Ruskin Dam and Powerhouse Upgrade Project

ELECTRICAL CONTRACTORS — UP TO \$2 MILLION

- Houle Electric Limited: Victoria International Airport – HBS Recapitalization Project
- Status Electrical Corporation: Fraser Valley Cancer – ACU & Chemo Expansion Phase 1
- Western Pacific Enterprises: Deltaport Rail Maintenance Building

\$2 MILLION TO \$5 MILLION

- Houle Electric Limited: Fairview Container Terminal – Phase 2 North Expansion
- Western Pacific Enterprises: Campbell River Water Treatment Building
- Western Pacific Enterprises: Johnson Street Bridge

OVER \$5 MILLION

- Allteck Line Contractors Inc.: Shinish-Pennask 34.5kV
- Houle Electric Limited: Emily Carr University of Art + Design
- Houle Electric Limited: Parq Vancouver

MANUFACTURERS AND SUPPLIERS

- Amico Accessories Inc.: BC Children's and BC Women's Redevelopment Project Phase 2
- Engineered Assemblies: Langara College Science and Technology Building
- Holmes & Brakel: Emily Carr University of Art + Design



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VRCA 2018 Award of Excellence Winners



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Fairview terminal north expansion an award winner beyond the work site

GRANT CAMERON
CORRESPONDENT

A massive construction and expansion project completed at the Fairview Container Terminal in Prince Rupert, B.C., is in the spotlight and three companies that worked on the ambitious venture have won silver Vancouver Regional Construction Association (VRCA) 2018 Awards of Excellence.

Maksim Mihic, general manager of DP World (Canada) Inc. which operates the terminal, said he's pleased the project is being recognized and that the companies are receiving accolades because they overcame substantial obstacles to ensure the venture was completed on time and also on budget.

"It is great news to be recognized," said Mihic. "The project itself has positioned Fairview terminal as the second largest container facility in Canada."

The project, officially called the Fairview Container Terminal Phase 2 North Expansion, was completed last fall and raised capacity to 1.35 million TEUs (twenty-foot equivalent units) from 750,000. Expansion work at the terminal began in 2015 and was completed over a two-year construction period. It included the development of a new berth expansion, upgrades to the existing caisson wharf, new mooring dolphin, new empty container stacking yard, and new container storage yards.

The footprint was also increased to 32 hectares, or 320,000 square metres, with the reclamation of 4.5 hectares, or 45,000 square metres, of land. The capacity was increased to support importers and exporters that favour Prince Rupert for its position to Asian and North American markets.

Two of the companies that worked on the project as a joint venture, Fraser River Pile & Dredge Inc. and BEL Contracting, won silver in the over \$50 million category of the VRCA awards for their performance and Houle Elec-



DP WORLD (CANADA) INC.

The corporate social responsibility aspects of the terminal expansion included employing local and First Nations workers and reusing crushed rock from blasting for backfill.

tric Ltd. won silver in the electrical contractors \$2 to \$5 million category.

Mihic said DP World has long-standing relationships with each of the three companies that worked on the Fairview Container Terminal project and they deserve awards for the work they did.

"We have successfully completed expansion projects with this team in the past. They are all premier companies in their category — and not surprisingly, they delivered a quality product this time too."

Mihic said the project started slowly and, initially, was behind, but the FRPD-BEL Gateway joint venture in particular developed a plan to put the project back on track so it was on time and on budget.

Piling on the project was particularly challenging due to the fact upper layers of rock were apt to crumble which, in turn, made drilling

difficult because holes would collapse. However, the team adapted.

"As is typical with any project of this scale, piling was particularly challenging due to some unforeseen geotechnical issues," said Mihic. "The team quickly identified the issues and solutions, so it did not affect delivery."

Judges of the awards noted in their remarks that building on a working dock comes with its own set of challenges, including the simple fact that construction trucks can't just come and go as they please.

"Not only did the project team manage these challenges, but they also found ways to contribute to their corporate social responsibility from employing local and First Nations workers (40 per cent of site manhours) to reusing crushed rock from blasting for backfill," the judges said in their remarks.

Sarah Clark, president and CEO at FRPD,

said the project site was very constrained because operations had to continue while construction work was underway in fenced-off areas at the terminal.

"They had to give up some of their operating space and we had very strict handover dates of when they could take over because all the time we were there we were restricting their TEU capacity."

Ground conditions made drilling and piling difficult because the upper layers of rock weren't structurally sound and would crumble and shift, she said.

"We had to adapt to that. The layers were not very cohesive and solid. That means they could collapse in when you start to drill"

The work also had to be done in tight areas and trucks had to travel through town so the drivers had to be extra careful, noted Clark.

BEL Contracting was in charge of all the upland work at the project and rock was blasted from a hill behind the terminal. The crushed rock was used to fill in a portion of the shore to be able to expand the facility. Trucks were used and a conveyor was built over a railway line to move the rock into position. Teamwork was key to successfully managing the project.

"Co-operation, to me, was one of the most outstanding between the subcontractors and our joint venture partner," said Clark. "Everybody was working for the project. They weren't working for their own company. They were working for the good of the project. Sometimes you don't see that co-operation."

Judges noted that Houle Electric Ltd. faced a unique set of challenges working in a container terminal that's in Canada's wettest city. The company did substation upgrades, installed new electrical systems, and did infrastructure upgrades for four new container cranes and upgrades to existing cranes infrastructure, installed a new high mast-lighting system and radiation portal systems.

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Groundbreaking Brock Commons blazes new construction trail

JEAN SORENSEN
CORRESPONDENT

The University of B.C.'s Brock Commons Phase 1 student residence, now the world's second tallest wood building, is reshaping traditional construction through fabrication and winning awards for its' construction crew.

Three B.C. construction companies have received Vancouver Regional Construction Association Silver Awards: Urban One Builders Construction Management (general contractor — \$15-\$50 million), Seagate Structures Ltd. (Chairman's Trade Award for trade contractor up to \$1 million), and Trotter & Morton Building Technologies Inc. (mechanical contractors — \$3-\$9 million).

"The wood structure came together in nine weeks," said Urban's senior project manager Karla Fraser, as that work included 16 wood storeys plus envelop and concrete floor topping. Throughout the build, prefabrication components, just-in-time delivery, and crews employed on carefully sequenced work cycles sped the building's rise.

Construction could have moved even faster as a building cycle was removed. "We were going too fast — they sent us home early for a long weekend in July. How crazy is that?" said Ralph Austin, owner of Seagate, a company known for of mass timber and cross-laminated timber wood (CLT) construction. Seagate installed the CLT floor plates, the glulam beams and floor columns. Seagate worked closely with Urban One, Structurlam, and structural engineer Fast + Epp to ensure that the installation process rang smoothly and Structurlam ensured that all panels were pre-cut to the trade specifications.

Trotter & Morton Building Technologies' David Stefanchuk, senior project manager, said the speed with which the building was being assembled was the real challenge as



COURTESY OF URBAN ONE BUILDERS CONSTRUCTION MANAGEMENT

UBC's Brock Commons Phase 1 student residence building was completed in record time as construction crews and trades used modelling and then prefabricated as much as possible off-site. Components such as the wood floors, columns, beams, windows and the mechanical room were prefabricated, delivered to the site and installed, thereby reducing manpower and congestion onsite.

mechanical crews had to keep up. Prefabrication became the solution. "We completely modeled everything. We did the prefab off site and assembly on site, including the mechanical room and roughed-in materials were also prefabricated. We do prefab but not to this extent," he said. It became a process of crews placing the components as other prefab components were installed. The mechanical room components were installed and the room completed in half or less time than would normally take to install a built in-place room.

Stefanchuk sees it as the emerging trend. "We are moving towards more prefab," he said, adding the technology has also evolved to the extent that modeling is more viable. "Modeling takes down the labor costs and the labour is the number one unknown on a project."

When Fraser, with site senior project superintendent Bill Leininger, first approached the task of building the tall wood structure, there were immediate challenges. "No one had done a project like this and we were wondering how it would work," she said. It was to be the world's tallest wood hybrid building rising 53 metres in height with 18 storeys. (Norway's 18-storey, 80-metre structure Mjosa Tower has now taken the title and completes in early 2019).

The proposed student residential building would house 400 students, plus provide amenity areas. The foundation, ground floor, and second storey slab plus elevators and stairs are concrete while CLT floor panels supported on glulam beams with parallel strand lumber were used as columns. The building exterior used prefabricated steel studs framing panels holding wood-fibre laminate siding.

Fraser credits modelling and animation with taking

a proposed project and transforming it into a virtual reality allowing the whole construction team to visualize the process.

"We used CadMakers — they did the virtual modelling and the animations," she said. Each building trade was able to view how their role contributed to the project, what needed to be done, and how it needed to be staged in relation to the other trades.

"That was a big turning point, everyone

could see how it could come together," Fraser said.

If one trade rushed ahead or fell behind, it would throw off the building cycle. "It became very clear that if anyone trade failed all of the team would fail. As a result we had a great collaborative working environment," she said, adding that the degree was collaboration ranging from the engineers through to the trades was greater than seen on the normal construction project.

Centura Building Systems supplied, engineered and installed pre-manufactured sections of the panel for the building envelope. Lafarge Canada and Equus Surfaces installed the 40 mm acoustic topping on the same day as the mass timber installation. Whitewater Concrete and LMS Reinforcing Steel Group achieved an impressive two floors of concrete every five to seven days.

Seagate's Austin said the Brock Commons structure was "pretty easy" once the preplanning was done. But, the building does show how the whole concept of construction is evolving today and change is being fuelled by both new labour-saving software programs but a changing labour pool, both in terms of skills and management.

Prefabrication places employees in a controlled environment rather than in the elements. As well, Austin said, the old-breed of site superintendents who arrived at 5 a.m. and stayed on site doing hands-on trouble-shooting is fading into retirement. He said the new breed of construction management is not run by the job, arrives at 7 a.m. and leaves at 3:30 p.m., is computer savvy and are comfortable using software modeling programs to resolve conflicts.

"They don't have the seasoning or the experience (of the older superintendents), but you know — they get it — and resolve problems before they happen," he said.



FILE PHOTO

Brock Commons has provided the business case for building in northern B.C. where rapid assembly of the building's structural elements and exterior panels meant trade crews were inside when the big chills hit.



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Bass Pro Shops Outdoor World – Tsawwassen reels in awards

PETER CAULFIELD
CORRESPONDENT

Three contractors have won 2018 Silver Awards of Excellence from the Vancouver Regional Construction Association (VRCA) for their part in the Bass Pro Shops Outdoor World — Tsawwassen project.

The winners are Ledcor Construction Limited, in the General Contractors — Tenant Improvement category; CentiMark Ltd. (Trade Contractors — Up to \$1 Million [Chairman's Trade Award]); and Rufus Enterprises Ltd.

(Trade Contractors — \$1-\$3 million [President's Trade Award]).

Bass Pro Shops Outdoor World is a 148,000-square foot sports and outdoor store in the Tsawwassen Mills shopping mall in Delta, a Vancouver suburb.

The store offers gear for such activities as fishing, hunting, camping, boating, hiking and backpacking.

An anchor tenant of the huge mall, the store is prominently located near the heavily-travelled Highway 17, which connects the Tsawwassen BC Ferries terminal with the rest of the Lower Mainland.

Ledcor Construction Limited provided general contracting services for the project, which took place over nine months (February-October) in 2016.

"This was one of the largest tenant improvement projects at the Tsawwassen Mall," said Ian Summers, Ledcor's manager of the special projects group during construction.

Much of Ledcor's work involved coordinating the different trades and materials supplied by the owner.

"Most of the finishes, including the art work, faux painting, lighting, animal artifacts and building materials were provided by the owner," said Summers. "The Ledcor team coordinated the deliveries and stored

the materials, and scheduled the activities of the different artists and trades working on-site."

Handling the logistics of the massive amounts of materials supplied by the owner was a challenge.

"Ledcor had 15 storage containers located on site to store all the materials," said Summers. "We had to keep track of what was in each container and be able to access the materials when construction required."

One month before the store was to open, Ledcor had an unpleasant surprise.

"The sanitation lines were broken — no water was flowing," said Summers. "The Ledcor team, during final merchandizing of the

store, had to break open the concrete slab, and remove seven feet of fill to replace the broken pipes. Fortunately, work was completed without any delay to the store opening."

One of the many eye-catching features of the store is its steel stud framed and drywall arched barrel ceiling. The ceiling is 250 feet long, 40 feet wide, 36 feet off the ground, and painted to look like the sky.

The custom concrete flooring, created by CentiMark Ltd., is also unusual.

Polished and tinted with dyes of different colours, the multi-coloured finish helps distinguish the different areas of the store from one another.

CentiMark used a variety of colours: Saddle Brown, Terra Cotta, Midnight Black, Turquoise and Patriot Blue.

The project, which took place between April and September 2016, was challenging, says CentiMark project manager TJ Weidema.

"The concrete had been exposed to the elements, traffic and chemicals, all of which affected the polishing and dyeing process," said Weidema. "Different colour dyes had to blend seamlessly."

As the floors are polished, each colour is sprayed on separately. The resulting colour job looks like a rock surface in the retail store and water in the restaurant.

Matching CentiMark's proposal with the customer's expectation was challenging, says Weidema.

"You never know what picture the customer has in his mind," he said.

Rufus Enterprises provided the custom steel stud and drywall.

The main barrel ceiling with bulleted ends is believed to be the largest ceiling of its kind in North America.

The project also included two matching wave ceilings over the bowling alley and bar area.

"What helped us get the project was that, because I've been in the business for years, I knew exactly what was needed and how to do it," said Rufus's owner Greg Rodgerson.

The most challenging part of the part of the project was the tight scheduling, he says.

"I had to be on-site full-time to make sure the job was done right," he said.

Rufus's part of the project was completed ahead of time, "and everything was done as it needed to be done."

"I was really happy to have had the opportunity to have worked on the project," said Rodgerson. "It has some very impressive finishing."



COURTESY OF VRCA

The logistics required to co-ordinate all the different trades, artists and materials onsite as the Bass Pro Shops Outdoor World — Tsawwassen took shape was an award-winning effort, said judges.

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Westcoast's core values on display at Ruskin Dam project

PETER KENTER
CORRESPONDENT

Westcoast Cutting and Coring Ltd. likes its concrete projects big and complex. Its crews are as comfortable working on underwater drilling on a Russian oil rig in the Sea of Okhotsk as they are completing major infrastructure projects at home. Working on the \$800-million upgrade of BC Hydro's Ruskin Dam Spillway was right up the company's alley.

The dam measures 110 metres long and 59 metres tall and is located in Mission, B.C. It was built in the 1930s, long before the development of modern seismic building standards. Westcoast's main mission: cut and remove existing piers, the bridge deck and sections of the spillway. Other tasks included: working on the old powerhouse; cutting out old generators, intakes, gate slots and draft tubes; and carving out steps on the spillway for new pier forms.

In all, the Ruskin Dam project included the removal of 20 million pounds of concrete, both above and below water and coring 5,000 holes to depths of up to 12 metres. The work supported not only a seismic upgrade of the facility, but an overall renewal, including installation of updated equipment.

"It was huge concrete cutting job," says founding partner Brian Wnuk who started the company in 1976. "Certainly it's the biggest job of its kind in British Columbia and perhaps Canada as well. It was also challenging. For example, some of the concrete contained huge chunks of aggregate, including boulders up to 10 inches in diameter."

The project began in 2012, but Westcoast was awarded its contract by general contractors Flatiron/Dragados Joint Venture & Voith Hydro in January 2015. Crews of up to 30 people worked six-day weeks in alternating shifts for almost three years to complete Westcoast's work.

The contractor worked to cut and carve the largest and heaviest concrete blocks that could be moved by the 275-ton crane already located on a barge at the dam. The crane was limited to loads of 50,000 lbs.



SUBMITTED PHOTO

The \$800-million upgrade of BC Hydro's Ruskin Dam Spillway was a large and complex project for all involved. The dam measures 110 metres long and 59 metres tall. Over 20 million pounds of concrete were removed during the upgrade.

"In most cases, we had to use wire saws," says business partner Dario Babic. "Nothing else could cut concrete blocks the size we were cutting. Wire saws can cut to any dimension that you can loop a wire around."

The project environment presented a significant challenge. Much of the work was completed on the 60-degree slope of the dam wall with workers performing their tasks on specialized work platforms while using harnesses and fall arrest equipment. At times, work was suspended during cold weather, due to black ice coating the concrete work surface.

The dam remained operational at all times, so by necessity a significant portion of concrete was cut underwater. Salmon living in the dam reservoir were protected by a three-tier slurry containment system and other environmental protections. Some project highlights:

- Three of four free-standing piers were cut into 48 pieces, each weighing approximately 35,000 pounds. One larger pier was poured against a rock face. With no access to the rear face, crews cut it into 58 pieces using a grid pattern of 12-metre-deep intersecting core holes to allow sections to be cut by wire saw.

- Reducing the dam's seven existing gates to five required new construction. Using a combination of wall sawing and wire sawing, the contractor cut a series of massive steps into the dam slope to allow the installation of new steel form work.

- On the reservoir side of the dam, the contractor used underwater wall sawing techniques to cut slots for a coffer dam. Each slot took seven days to complete with a crew working in 12-hour shifts.

- Work on the dam's powerhouse was completed alongside the other aspects of the project. It included restoring the heritage façade of the powerhouse building, cutting a steel pipe nine metres in diameter, dissecting a stator into six pieces, and creating openings measuring 1.5 metres by 7.5 metres between the three levels of the powerhouse to aid in the cooling of the new dam generators.

"The work was completed ahead of schedule and within budget," says Babic.

"Our workers were particularly proud of all they had achieved under challenging conditions — and the more challenging it is, the better we like it."



SUBMITTED PHOTO

Much of the work on the Ruskin Dam upgrade project was completed on the 60-degree slope of the dam wall.

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Ledcor's efficiency kept TACC construction on track and on budget

PETER KENTER
CORRESPONDENT

“When children need hospital care, they should be in a place that feels like home, where they can play, exercise their imagination, and be surrounded by family to help them heal. This new centre means better care for thousands of patients and their families from every part of B.C. who access the building.”

— *British Columbia Premier John Horgan*

Construction of the Teck Acute Care Centre (TACC) at the B.C. Children's and B.C. Women's hospitals campus replaced aging infrastructure and provided 640,000 square feet of much-needed space to its clients. But

with its focus on comfortable space for family members, natural light, wood accents and access to outdoor green spaces, the project was always meant to feel like home.

The project was completed by CWH Design-Build GP, a joint venture between Balfour Beatty Construction and Ledcor Construction Limited, for a contract value of \$340 million.

It was completed for Affinity Partnerships, a joint venture between Balfour Beatty and Ledcor, acting as a private partner to the Provincial Health Services Authority.

As a P3, Design, Build, Finance and Operate contract, the project was completed on time and on budget.

The only additional compensation of

about \$4.5 million was associated with owner-requested changes for building and foundation enhancements and for hazardous material abatement.

An average of 550 workers were employed on the site, peaking at 950 workers over the 38-month construction period.

The new facility provides:

- A pediatric intensive care unit with a focus on single-patient rooms;
- A neonatal intensive care unit providing 76 bassinets in 70 single-patient rooms;
- A high-risk labour and delivery suite with single-patient rooms;
- A hematology/oncology department for integrated patient and outpatient services;
- Two floors of medical/surgical inpatient units;
- Medical imaging and procedures suites with the capability of ultrasound, magnetic resonance imaging and computerized tomography;
- An emergency department with single-patient treatment rooms and dedicated space to address the needs of children with mental health issues; and
- Integrated clinical space to accommodate training.

TACC is also designed as a “post-disaster facility”, featuring redundant electric generators, onsite medical gas storage, potable and grey water storage and redundant data infrastructure.

Environmental features of TACC, which is targeting LEED Gold, include thermally efficient walls, energy-saving mechanical systems, use of heat-recovery chillers, an optimized façade and glazing system, and a high-performance lighting strategy.

Virtual reality was used extensively for design development in clinical spaces. It not only helped the building team and stakeholders to envision the space once equipment was

installed, but also helped to ensure that each piece of equipment could be supported.

3D modeling was also used during the design and construction process. The builder also provided full-scale mock-ups for unique room spaces, allowing for open communication and design improvements suggested by clinical staff.

Building near an operating hospital required special considerations to ensure the safety of patients, families and clinical staff. These included:

- Full-time traffic and pedestrian control around the perimeter of the site;
- Maintaining unimpeded ambulance and helicopter service on campus;
- Infection prevention and control measures implemented through all construction activities; and
- Vibration monitoring throughout the existing facility to ensure construction activities didn't disrupt patient care.

Another challenge of the project involved phasing the design development packages ahead of construction needs, so that construction areas were ready to receive procured equipment with enough time to complete commissioning and training before service commenced.

“The schedule was fast track whereby the Design and Construction of the project was in parallel which meant that the team had to be large, diverse and nimble at the same time and with all its skills and experience this was achieved without delay and disruption and allowed the Hospital to be completed and opened on schedule to deliver care to the young people of British Columbia,” writes Pat Duggan, general manager at Affinity in a public letter to Ledcor.

“The B.C. Children's and B.C. Women's Hospital would not have been a success without your team being part of project.”



BC CHILDREN'S AND BC WOMEN'S HOSPITAL REDEVELOPMENT PROJECT

A major challenge in the building of the Teck Acute Care Centre involved phasing the design development packages ahead of its construction needs.

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The art of meeting Emily Carr University's creative needs

JEAN SORENSEN
CORRESPONDENT

Artists create with all kinds of material so when EllisDon received the nod to do the P3 design-build contract for the \$122.6-million new Emily Carr University of Art + Design it was an exercise in finding ways to meet a wide open range of creative needs.

"You had a building where pretty well every room had a specific purpose — there was even a puppet room," said EllisDon project manager Gary Watt.

These included a wood shop, carving rooms, 400-seat lecture hall and theatre, metal working room, ceramics area, kiln rooms, outdoor arts plaza with a high-tech screen for showing animation and film, plus a \$4 million motion capture studio with 40 cameras, natural light painting rooms, a library, and more.

"The mechanical and electrical design had to suit all the equipment and provide extraction for any exhaust," said Watt.

The construction of B.C.'s leading art university has earned EllisDon a Vancouver Regional Construction Association Silver Award of Excellence (general contractor over \$50 million). Two other companies within the university's construction team also received silvers: Holmes & Brakel (manufacturers and suppliers) and Houle Electric (contract over \$5 million).

Watt said that because it was a design-build project there had to be a cooperative attitude between the client, construction crew, and the design team. "Emily Carr (staff) had ideas of what they wanted and often it was a challenge, but at the end of the day it worked out pretty well," Watt said.

The structure is large, comprising a 26,700-square-metre (290,000 sf) of space. It has a composite look, with coloured glass denoting the colours used in Carr's painting, and was designed by the joint effort of Diamond Schmitt and Chernoff Thompson architects. Diamond's senior associate architect Anna Maria Llanos said the building's interior is broken into quadrants to help many full-time and part-time students and the public way-find.

Scheduling was a constant challenge for the trades on site as the design was still evolving as construction progressed. The site had more than 100 electricians and another 100 mechanical staff working on the structure at one time and careful phasing of the work and scheduling was required so that "everyone was not tripping over one another," he said.

A big feature of the building is the use of natural light with three of the four floors featuring an atrium which cuts north-south through the core of the building.

"With the open atrium we introduced what we think is the first horizontal fire shutters



EMILY CARR UNIVERSITY

The striking design of B.C.'s new Emily Carr University has a composite look with coloured glass denoting the colours used in Carr's paintings.

installation in Western Canada," said Watt, adding the metal shutters close over the atrium open space between the floors and shut out fire and smoke from that level. Natural light is also a feature of the library and a concern for art students wanting to optimize colours in their art work.

The project was started in August 2015 and finished two years later on time. "You couldn't delay it as students were signed up (for the next year)," he said. The new campus took enrolment from 800 at the smaller Granville Island campus to 2,000 students as well as continuing study students.

"It was one of the tightest schedules I have ever worked on," he said, crediting superintendents Denis Hoffart and Eric Noort and a good office and field team for the success of the project.

Houle Electric project manager Al Macham agrees that staying on schedule was the challenging aspect of the project, especially as the design was evolving. "It was a moving target," he said.

Houle had to ensure that productivity was kept high. "We used prefab — a lot of prefab built off site," he said. As well, because each room was different, the company used moving material bins that could be pre-stocked with the components in the morning prior to the day's start and then shifted to an area. Crews did not have to travel back and forth retrieving supplies. "We were quite heavily into organization," he said. "You are not wasting time looking for things — that is the kicker."

Macham said the focus was on design assist and giving Emily Carr staff and students the facility that they required. "There was a lot

of pre-work and pre-designing to make sure it was what they needed."

Lighting in the various rooms is flexible to facilitate the different demands of students using the room. "There are miles of track lighting with adjustable heads," he said. While the project has its deadline constraints and challenges, it didn't toss anything at Houle's staff they had no encountered before. The main difference was the very high-end lighting controls that were installed. "The amount that we installed was quite different," he said.

Holmes & Brakel provided the on-site assembly of new furniture for classrooms, offices, shops, and specialty spaces. "We supplied the soft seating, lounge and public space seating, desk and workstations, office chairs,

board room table for the main boardroom and student and cafeteria seating," said Holmes & Brakel's John Gleeson.

There were several challenges, Gleeson said. The vendor selection process, beginning with the request for proposals, was different in that the firm was not asked to quote on a basket of goods. "It was really about pricing out specific recommendations and once the contract was given, those recommendations became more specific," he said. The process was one of supporting the general contractor who was consulting with the client's needs. "One of the unique processes was supplying furniture through the construction partner EllisDon," he said.

The major challenge, though, was again a tight timeline. Furniture is the last placed into the building when all other trades complete and Holmes & Brakel had to perform within that time slot. "When the rubber hit the road, the project timeline was extremely challenging," he said, especially since the client's needs evolved and the firm attempted to help meet those

needs. "It was really value-engineering," he said, as the firm had to work on a fixed budget, and worked with the university to determine the best fit of furniture for the budget spent.

At the end of the project, Gleeson said he was pleased with the furniture, most of it Canadian manufactured, that went into the building. "We toured the building a year afterwards with the VRCA (judges) team," he said. The furniture, chosen for its ruggedness as well as looks, had stood up well to the demands of creative students.

When Gleeson looks back at the contract and the work performed, it was about helping the client and contractor get the best furnishings for the best price. "It was really value-engineering," he said.



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EMILY CARR UNIVERSITY

An atrium cuts through the centre of the new Emily Carr University bringing natural light into the building. The atrium floors are broken up by the installation of horizontal fire shutters.

Parq Vancouver rises to construction challenges and delivers

PETER CAULFIELD
CORRESPONDENT

How stakeholders involved in the building of Parq Vancouver adapted and rose to its construction challenges made the project a multiple VRCA Silver Award winner.

Five contractors won six Vancouver Regional Construction Association (VRCA) Silver Award winners for their Parq Vancouver work, they are ETRO Construction Limited, in the General Contractors — Tenant Improvement category; Glastech Glazing Contractors Ltd. (Trade Contractors — \$3-\$7 million [Founder's Trade Award]); Ebenisterie Beau-bois (Trade Contractors — Over \$7 million [Director's Trade Award]); PMB Joint Venture (Mechanical Contractors — Up to \$3 million; Mechanical Contractors — Over \$9 million); and Houle Electric Limited (Electrical Contractors — Over \$5 million).

Parq Vancouver bills itself as Western Canada's only urban resort.

Located in downtown Vancouver, the development comprises two luxury hotels, a conference centre, eight restaurants, bars and lounges, hotel ballroom, parkade, retail space and the Edgewater Casino.

ETRO Construction Limited was the general contractor for two tenant improvement projects in Parq Vancouver, the JW Marriott Spa and the Victor Steakhouse.

"Tony Pasqualini, the site superintendent, deserves all the credit," said Dan Chyzowski, ETRO director of construction and project manager on both projects.

The awards committee judges called Parq Vancouver "a challenging project with a fast-tracked timeline. The judges were impressed by how well ETRO adapted to factors beyond their control and delivered impressive, high-end finishes in the spa and Victor Steakhouse."

For example, the start date for building the restaurant was delayed when the interior designer was changed as construction was about to begin.

Despite this, ETRO and its subcontractors accelerated the construction schedule

and met the completion date to open for the Christmas rush.

ETRO practiced value-engineering on the project.

In the steak house, it engaged a third party to do a 3D scan of the restaurant space before starting construction, to determine the flatness of the floor and the location of equipment in the ceiling space.

ETRO took the model and overlaid the reflected ceiling plan to determine where the ceiling conflicted with the equipment.

This allowed it to change the design intent early and avoid delays during construction.

"Working in another contractor's construction site was an intricate experience," said Chyzowski. "It asked ETRO teams to not only navigate logistics challenges creatively, but also to consider the relationship with the other contractor — Ellis Don."



SUBMITTED PHOTO

How project stakeholders responded to the fast-tracked timeline in the construction of the Parq Vancouver earned high praise from VRCA awards judges.

Glastech Glazing Contractors supplied and installed curtain wall, aluminum doors, revolving doors and glass canopy to the podium level of the building.

"The glazing was fairly standard, but the curved feature at the main entrance offered some complexity," said Glastech project manager David Kidman.

The scheduling and sequencing with other trades were sometimes a challenge, he says.

"Since we were on the ground floor, everything for the towers above us had to come through our area of work," Kidman said. "We needed to be flexible with the contractor."

Houle Electric Limited did the base building electrical for the project's interior and exterior.

Houle installed interior and exterior luminaires, the lighting control system throughout the six floors of the podium levels, a fire alarm system that tied into BC Place, high-voltage feeds and distribution, and an underfloor duct raceway system for the gaming areas.

The project had challenges, says Houle project manager/estimator Reuben James.

"In the casino area, underfloor duct was used as the raceway to all of the gaming machines and tables," he said. "The under-floor duct had to line up perfectly with the gaming layout, so making sure this was installed accurately was a challenge."

"Due to the amount of duct, we were able to use our pre-fab shop to help prepare the materials and simplify the installation."

James says the project's large size and its downtown location complicated material handling.

"Houle used various lean construction concepts to minimize time wasted on-site," he said. "By keeping our electricians close to their work area and reducing the amount of time spent ordering material, they were able to focus on the planning and construction of the building."

James says Houle brought some "innovative solutions" into the project, such as lean construction, 3D modelling and pre-fabricated materials.

"Incorporating these techniques into a challenging project helped make it a success," he said.

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Contractors ride Metrotown station and exchange upgrade to VRCA Silver Awards



SUBMITTED PHOTO

At 10,400 square feet, the new Metrotown Station is twice the size of the original which was built in 1986. The station's bus exchange was built in 1989.

PETER CAULFIELD
CORRESPONDENT

Two local contractors have won 2018 Silver Awards of Excellence from the Vancouver Regional Construction Association (VRCA) for their part in the Metrotown Station and Exchange Upgrade project.

The winners are Graham Construction and Engineering LP, in the General Contractors — \$15-\$50 million category, and Black & McDonald Limited (Mechanical Contractors — Up to \$3 million).

TransLink's Metrotown advanced light rapid transit station and exchange are at the centre of the eponymous commercial and residential development in southwestern Burnaby, B.C.

The transit stop is well used. Metrotown is the second-busiest SkyTrain station, with more than 50,000 passenger trips per day. And the bus exchange handles over 25,000 trips per day.

Before the upgrade, it was also, by west coast standards, a little long in the tooth.

The station was built in 1986 and the bus exchange three years after that.

Both facilities were having a hard time handling the constantly growing number of passengers who used them.

At 10,400 square feet, the new Metrotown Station is twice the size of the original.

The three-phase upgrade had several components: A rebuilt east entrance and new centre and west station houses; four new pairs of up and down escalators; three new elevators and new stairs; more space on the platforms to enable the system to expand for future customers; improved station design with better lighting and visibility; an upgraded adjoining bus exchange; and a new bike parkade.

The project took almost four years to complete. Pre-construction began in September 2014; substantial completion took place in March 2018.

"It was the biggest station renovation in TransLink history," said Vladimir Krotkiy, Graham's senior project manager.

In March 2015, Graham began demolition work.

"Careful planning and reinforcement of the existing station structure were done before beginning demolition," said Krotkiy. "That allowed the trains and passengers to have full access to the station throughout the project."

As construction proceeded, the project faced several challenges, says Krotkiy.

"With an average of 50,000 passengers passing through the station every day, we needed a complex pedestrian management solution," he said.

Graham created a temporary entrance to the central station house, and installed temporary stairs for passengers so that its crews and trade partners could work undisturbed.

To accelerate the construction schedule, Graham assembled loop trusses on the ground. They were later installed in four lifts when the transit wasn't operating from 2 a.m. to 5 a.m.

"Each truss weighed 140,000 pounds and was 220 feet in length," said Krotkiy. Said the judges on the awards committee, "Metrotown SkyTrain station is the second-busiest station, so scheduling a significant update while keeping the station open was no small feat."

"Judges were impressed with how they went about fabricating and cladding the complex steel roof structure on the ground on then lifting up and into place in two pieces."

Black & McDonald provided the full mechanical scope for the project, including plumbing, HVAC and fire protection systems.

"There are three entrances to the station," said Black and McDonald senior estimator Trevor Langham. "Because so many people use the facility, we had to do the job by working on the three parts of the station separately, one after the other. We would close off one section, work on it, open it up again, and then

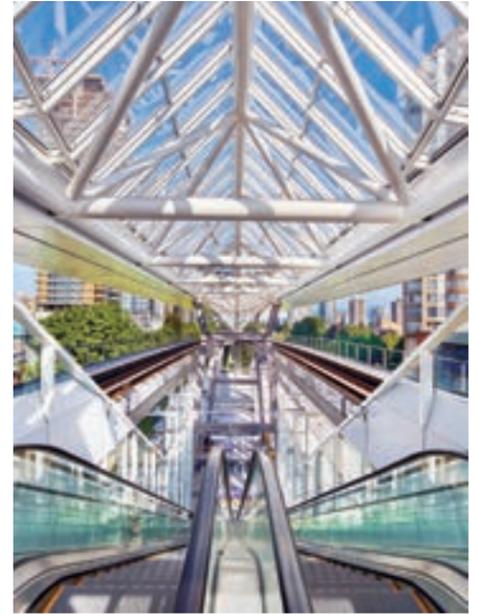
move on to the next one."

Langham says the biggest challenge Black & McDonald faced was doing all the work while keeping the station open for use and not interfering in its operation, and doing it all over a long period of time.

"All of our work was completed in a live automatic train environment, and we did it without disrupting Skytrain operations," he said.

Black & McDonald's work was spread out over three years — from early 2015 until spring 2018.

The judges of the awards committee were impressed that "Black & McDonald re-engineered the entire sprinkler system after it realized the as-built drawings were wrong and the existing system was not up to current code."



SUBMITTED PHOTO

The three-phase upgrade of the Metrotown station and exchange required a complex pedestrian management solution since 50,000 passengers go through it daily.



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Houle's 2018 VRCA Silver Award Winners

West Vancouver Police building's mechanical systems seismically sound

PETER KENTER
CORRESPONDENT

Like so many recent projects in the area, the new West Vancouver Police Services and Municipal Hall facility was built to replace an older facility that might have failed in the face of a major earthquake. Dubbed, the West Vancouver Public Safety & Municipal Hall project, the new construction for the District of West Vancouver will help ensure that first responders can deploy equipment and vehicles while delivering life-saving services to the community following a seismic event.

"We had to organize our deliveries like clockwork. No lay down areas or street deliveries were allowed,"

Rob Campagnaro
Division 15 Mechanical Ltd.

The scope of the project involved adding 57,000 square feet of new space to the municipal facility, including the construction of a full Police Services building, increasing the size of the current city hall, construction of a new parking structure, and seismic upgrades to the existing facility. The project targeted LEED Gold equivalent.

"It was a very high profile project requiring heating, cooling and domestic hot water services in both the newly-built public services hub and existing municipal hall," says James Dixon, a project manager with Division 15 Mechanical Ltd., the contractor which completed mechanical work on the project. "The existing municipal hall facility remained open throughout the construction and we

definitely wanted the city to see our best."

Division 15 completed mechanical work valued at \$3,580,000 as part of a lump sum project. The company worked on a team that included general contractor Smith Bros. & Wilson, architect DIALOG, and mechanical consultant AME Group.

The scope of the mechanical work included:

- heating water, chilled water, domestic water and condenser systems;
- two heat recovery ventilator systems that distribute air throughout the building while recovering heat from exhaust air;
- a complete domestic water distribution system, including high-security fixtures located in basement holding cells;
- complete storm and sanitary systems throughout the building, with connections to existing storm and sanitary services from the adjacent existing municipal building;
- complete fire protection system serving all floors, including water curtains in the common shared atrium area and main entrance; and
- commissioning and demonstration of new equipment and mechanical systems.

Installed control systems included a high-speed, peer-to-peer network of direct digital controllers, a control system server, and a web-based operator interface for the chiller plant systems, heating plant systems, pumping systems, fan coil units, heat recovery ventilators and complete building mechanical controls.

As a post-disaster facility, the project was designed to help emergency personnel to operate independently under emergency conditions. Some of the seismic survival features incorporated into the facility include: a 230-cubic-metre fire water tank to supplement the fire suppression system; sanitary and domestic cold-water storage; and a 4,000-gallon fuel tank and backup generator to support the facility for 72 hours.

The project site was squeezed between the

old city hall building and the road, but also located across the street from a fire hall. Division 15 quickly learned to work under tight constraints.

"We had to organize our deliveries like clockwork," says Rob Campagnaro, senior project manager with Division 15. "No lay down areas or street deliveries were allowed. We talked about deliveries days before they happened to make sure we didn't have multiple deliveries arriving at the same time."

No local parking was available for contractor or employee vehicles. Parking was designated at a school lot located four blocks away and workers were shuttled to the job site.

Although it wasn't specified in the project, Division 15 applied "selective BIM" to the project.

"We were the only trade using it," says Dixon, "And that was for the purposes of our own productivity. The mechanical room was primarily our responsibility. We took the two dimensional drawings and we were able to model the mechanical room to our specifications using 100 per cent BIM without involving other trades or contractors."

Work on the project began in February 2016 and was completed on time in October 2017 to accommodate early occupancy.

"The police department moved in some of their operations earlier than scheduled," says Campagnaro. "Once they began to bring in their equipment, it officially became a secure site. As a result, we were all required to get police background checks to ensure we didn't have any criminal records."



DIVISION 15 MECHANICAL LTD.

Division 15 Mechanical Ltd. used BIM to strengthen its productivity in building the mechanical room at the new West Vancouver Police Services and Municipal Hall.

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