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SPECIAL FEATURE
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Development Insights

What's the dirt on contaminated and greenfield sites?

PETER CAULFIELD
CORRESPONDENT

The Developing a Contaminated/Greenfield Site session on Feb. 13 is a two-speaker session, that, say the presenters, will be of interest to property owners, developers and the architects and development managers who are working with such sites.

Speakers Kevin Wong and Jamie Slogan, both with Keystone Environmental in Burnaby, B.C. say their one-hour presentation will proceed in two parts.

Part One will be an overview of contaminated site development. Wong and Slogan will discuss the challenges of developing an environmentally hazardous site, including how to deal with the associated regulations and requirements, as well as the solutions that are available.

Part Two will deal with the ins and outs of developing a greenfield site. The presenters will discuss such topics that are relevant to greenfield development as setbacks from water courses, environmental impact assessments, species at risk and habitat assessment.

Wong is the department head of Keystone's contaminated sites team. He has over 12 years of experience and provides senior-level expertise and project management for the performance of detailed site investigations, remediation planning and design, human health and ecological risk assessments and acquisition due diligence assessment.

He also helps clients negotiate with local and provincial regulators and approving agencies.

Wong has been involved in such investigative and remediation projects as field supervision (for example, underground storage tank removals, remedial excavations and the installation of barrier wall remediation systems); the



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In this rendering is the Roberts Bank Terminal 2 which is the largest marine and estuarine environmental assessment and offsetting program undertaken in Canada.

collection and selection of soil and groundwater samples for laboratory analysis; and the interpretation of data and analytical results.

"A developer who hasn't previously developed a contaminated site will probably have little or no knowledge of what needs to be done to remediate it in order to satisfy provincial regulations," said Wong. "Encountering unexpected contamination can lead to delays which can last from one to six months, depending on the stage of the development"

Slogan manages a small group of biologists at Keystone who provide solutions to a wide variety of environmental problems. He has 17 years of experience and training as a senior marine, fisheries and vegetation ecologist, including 12 years as an environmental consultant.

In addition to Vancouver, Slogan has worked throughout B.C., Yukon, the Northwest Territories, Nunavut, Alberta, Saskatchewan and Manitoba.

He has led environmental assessments and habitat restoration projects for government, port, mining, transportation and infrastructure development projects.

For the past 10 years Slogan has been designing small and large-scale offsetting projects, including Roberts Bank Terminal 2, the largest marine and estuarine environmental assessment and offsetting program undertaken in Canada. His work included the first use of an ecosystem model to account for potential changes in productivity to an estuary as part of an environmental assessment.

"When developing a greenfield site, a developer can encounter federal, provincial and municipal environmental regulations," said Slogan. "The main ones are the federal Fisheries Act, the provincial Water Sustainability Act and the provincial Riparian Areas Regulations."

On top of that, he says, individual municipalities may have their own versions of

these regulations.

"Dealing with these regulations can be very complex," said Slogan. "There can be plenty of uncertainty, with intensive consultation required to increase certainty and to acquire the necessary permits."

Wong and Slogan's employer, Keystone, has positioned itself as a strong advocate for the development industry.

"Utilizing our environmental regulatory expertise and our knowledge and working relationships with senior B.C. [Ministry of Environment and Climate Change] managers and directors, we will challenge the regulatory position and work towards the best interest of our clients."

Keystone has worked with the development industry for over 30 years.

"During the property acquisition stage, we are routinely involved in conducting Phase I/Stage I preliminary site investigations, and, where warranted Phase II/Stage II site investigations.

"Our Phase I investigations are prepared... to reduce potential exposure to liability associated with contaminated sites, [and] to assist in obtaining mortgage and project financing. Where contamination is present, our preliminary investigations are designed to enable assessment of potential clean-up costs."

Keystone has also helped clients negotiate with vendors on liability and cost-sharing agreements on site remediation programs.

The company says its work complements other aspects of the development approval process.

As a member of the development project team, it coordinates the environmental with the overall development approvals process so that critical project elements are not delayed.



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How are things stepping up with BC Energy Step Code?

PETER CAULFIELD
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The demand for green building products and technologies in British Columbia received a boost in April 2017 when the BC Energy Step Code came into force.

The Step Code is part of the BC Building Code, and is intended to make new construction in the province net-zero energy ready by 2032.

A new study detailing the size of the market for green building products, and the corresponding opportunities for product developers, will be made public at the Buildex session called Economic Development Impacts of the BC Energy Step Code on Feb. 13.

The presenters are Paul Shorthouse, director of the

Delphi Group, and Juvarya Veltkamp, manager of green economy initiatives at the Vancouver Economic Commission (VEC).

In addition to Shorthouse and Veltkamp, four local manufacturers of green building products will be taking part in the presentation.

The study that is the subject of the presentation quantifies the size of the market for high performance building products, as well as industry investments, economic development and job creation potential in B.C.

The six panelists will discuss the particulars of the B.C. green supply chain, and make recommendations on how to stimulate local production and innovation in the green building product industry.

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Field Intelligence

Engineer deals the straight dope on marijuana production facilities

PETER CAULFIELD
CORRESPONDENT

Marijuana (cannabis) for medical and recreational purposes is legal in Canada now.

The annual demand for the formerly evil weed is estimated to be as high as hundreds of thousands of kilograms, which, when sold, could produce billions of dollars in honest and upstanding revenue.

Under the 2018 Cannabis Act, only producers who are licensed by Health Canada are allowed to grow the product. As of October 2018, when recreational marijuana became legal in Canada, there were approximately 120 such licensed producers in the country, some large and some small.

Although cannabis production in Canada is dominated by a few large companies, and is likely to stay that way, industry watchers say there is room in the market for small- and medium-size “craft” producers, enterprises that are nimble enough to respond quickly to changes in consumer taste and preference.

For anyone who is interested in getting into the budding business, James Furlong of MCW Hemisphere Limited has some words of advice from the engineering side about designing and building a marijuana production facility.

Furlong is hosting a session at Buildex called A Prescription for Success: Engineering Insights for Medical Marijuana Production Facilities, in the afternoon of Wednesday, Feb. 13.

Furlong, a partner at MCW, mechanical

and electrical consulting engineers, has been involved in the design of cannabis production facilities across Canada for several years.

He says that while all marijuana production facilities have features in common, each one is in fact different. That means that owners and their design teams need to think carefully about the mechanical and electrical designs that suits their operation best.

“Many of the people who want to get into manufacturing-scale production are new to construction, because they come to the business from the growing side,” said Furlong. “Often we need to educate the owners who

are not yet up to speed in building and operating a production facility. We show them that, most of the time, it’s like designing a greenhouse in the middle of a bank.”

Not only owners, but also developers of cannabis production facilities, architects, contractors and code authorities will find his presentation of interest, Furlong says.

“There are a number of questions that I typically get asked when I make the presentation,” he said. “One is ‘How much will it cost to build and operate?’ Many aspiring producers are surprised when I tell them that cannabis production facilities are more

expensive to build in Canada than in the U.S.”

Other questions that come up deal with building code interpretation, such as whether cannabis production facilities are considered farm buildings.

“Some owners will ask us if a greenhouse is good enough, or if they should build a fully enclosed building,” said Furlong. “Greenhouses can be faster to build, but they’re not necessarily less expensive. Most production facilities are made of metal or freezer panel, to ensure a stable thermal environment.”

Furlong says most growers start with a facility that’s between 30,000 and 75,000 square feet in area, with plans to expand from there in the future. “From design to completion takes about 18 months,” he said. “Local permits can take time to obtain. Then there are Health Canada approvals, which take about 16 weeks after an applicant has submitted a test crop to the government.”

Furlong says many Canadian production facilities are built in small, rural areas.

“The land is cheaper than in cities and many small municipalities are supportive because production facilities add to the tax base and provide local employment,” he said.

Wherever they’re located, cannabis production facilities are high-humidity environments and consume large amounts of energy and water.

“Because some utilities impose limitations on how much water and energy can be consumed, it’s important to design a facility that is mechanically and electrically efficient,” Furlong said. “Operating costs can be a killer.”



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Growing marijuana in a government approved production facility, like the one pictured above, comes with many electrical, mechanical and engineering design considerations.

Dutch sustainable treats at Buildex Vancouver session

PETER CAULFIELD
CORRESPONDENT

How North American builders can use and benefit from innovative European products and services will be explored at a Buildex session presented by Dirk van der Ven, chief innovation and sustainability officer of World of Walas, a Dutch company.

World of Walas (Walas) is a multinational group of companies that specializes in sustainable urban development projects and access to European innovation. The session takes place Feb. 13 and it is called From the European Union to North America.

Walas’ services include concept and design, development and construction, project management, property management and access to innovations.

“Our models address economic, financial, environmental and social sustainability. Our approaches to gradual development and financial modeling require significantly less upfront investment and offer comparable returns within 10 years.”

For example, when a 500,000-square foot complex of office buildings became vacant in the Dutch city of Heerlen, Walas created Carbon6 to revitalize the site.

Walas owns and operates the sprawling complex, which has been re-purposed for arts and culture, start-up companies and social enterprises. A total of 1,200 people are employed at Carbon6, which is on its way to becoming carbon-neutral.

The complex is home to the largest creative cluster in the Netherlands, which houses the region’s largest pop music school and artist studios for painting, glassworks and digital media.

Van der Ven’s Buildex presentation will take place at the event’s European Innovations Pavilion, which highlights the

latest trends in sustainable and smart development in cities across Europe.

Visitors will be able to meet and network with European companies that are part of the Walas trade mission to Buildex.

One of the companies at the pavilion is the Royal Wijma Company, a producer of African hardwood. <https://www.wijma.com/en>

Wijma has been in the hardwood trade for over 120 years. They were the first forest managers in West Africa to obtain Forest Stewardship Certification on its concessions in 2005.

Dopik has over 35 years of experience in heating with renewable energy and 25 years of experience in wood shredding.

With 4,500 heating system and 1,000 wood chipper installations, Dopik is one of the largest companies in Germany in its field.

Some of their new, efficient and innovative products are battery storage systems and absorption refrigeration technology.

DUTCH VR is a virtual reality (VR) and augmented reality (AR) studio not far from Amsterdam.

VR and AR make it easier to control the design and appearance of future built environments. They can help builders, architects and clients see the impact of their design choices before even a single brick is put in place.

The CarbonBlue urban solar project reduces energy costs and reliance on the energy grid, and facilitates the transition to cleaner energy sources.

CarbonBlue mounted panels on an elevated structure that covers a large parking lot.

The panels do triple-duty. They provide filtered light during the day, capture rain water and clean up air and water.

In addition, they create jobs and provide a green retreat for the community.

Farm2Future explores integrated solutions to the food security challenges faced by residents of modern cities.

The company develops agri-systems that can produce food on smaller and alternative areas, and protect crops with less environmental impact.

Farm2Future’s solutions include stand-alone, closed systems for food production, integrated pest management and innovative bio-materials.

Priva makes hardware and software for process management and climate control in non-residential buildings, in horticulture and in industry. <https://www.priva.com/ca>

Founded in a small Dutch town in 1959, Priva has grown to become a global company with sites and training centres on every continent. With its certified partner network, Priva is represented in more than 100 countries.

In addition to W35 — From the European Union to North America, the European Innovations Pavilion will be the site of a number of other presentations.

They include W14 — The Case for Leading with Results in Sustainability, which takes place on Feb. 13.

Presented by Gerben van Straaten, CEO and founder of the World of Walas, his talk will cite some best practices from Europe which show how to achieve sustainable results, progress and value at the same time.

W50 — Multimedia In the Urban Environment (also on Feb. 13) will demonstrate how multimedia can bring creativity to storytelling and add value to a company’s business objectives. The presenter is Dane ten Berge, international business development manager, Blast Digital Signage.



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Quality Assurance

Rigorous standards keep B.C. roofs tight and buildings dry

PETER CAULFIELD
CORRESPONDENT

How robust building standards and the latest technological know-how have combined to help B.C. roofs keep buildings dry and safe will be discussed in the Buildex session called Making the Invisible Visible for Roofs: Quality Assurance, Risk Mitigation and Innovation in Roof Construction.

Like most aspects of construction, potential roofing problems are best dealt with well before they present themselves, say the Feb. 14 session presenters Judy Slutsky and Jason Teetaert.

That's because deficiencies in waterproofing can be difficult to detect until leaks, and sometimes even structural problems, start to appear. Fortunately, say the presenters, there are ways for building owners, operators and

scientists to predict future damage and limit liability.

Being able to see what was once invisible in a building's walls, roof and foundation has enabled the construction industry to develop safer, healthier and more sustainable buildings.

Their presentation will, say Slutsky and Teetaert, give visitors a better understanding of how innovative structural monitoring technologies and B.C. roofing standards work together to provide quality assurance, risk mitigation and innovation support to the roof construction industry.

The one-hour session will have two parts. Part One will be delivered by Slutsky, who is director of business development of the Roofing Contractors Association of BC (RCACBC). As the representative of the B.C. roofing industry standard, she will discuss studies of roofing

projects in the province.

Attendees will be able to compare the performance of commercial roofs under the RoofStar Guarantee program with those that are not.

"The association has the most robust roofing standards in Canada," said Slutsky. "Claims under the RoofStar Guarantee program are minimal."

A RoofStar primer:

The RoofStar guarantee is the most comprehensive roofing and waterproofing guarantee in British Columbia.

Available exclusively through RCACBC roofing contractor members, the RoofStar guarantee assures building owners that quality materials will be installed to specific standards by professional roofing contractors.

The guarantee means that roofing inspections will be undertaken by third-party inspection firms.

RoofStar is backed by both the contractor and the RCACBC Guarantee Corp, which ensures a third-party guarantee.

The guarantee ensures that an RCACBC contractor will always be available to fulfill the terms of the contract.

In addition, RCACBC has a Plus5 Program that offers additional protection to RoofStar Guarantee customers if their guarantee period expires.

Under the Plus5 Program, qualifying building owners can purchase an additional five years of guarantee coverage, with all the normal features of the RoofStar guarantee.

In addition to the coverage, Plus5 customers will receive a credit that will be applied directly to ongoing regular preventive maintenance on the roof during the additional five years.

In Part Two, Teetaert, who is vice-president of business development for SMT Research Ltd. (SMT), will outline the social and economic benefits that innovative structure monitoring technologies bring to roof construction. Teetaert will use case studies of mission-critical buildings (a healthcare facility) and innovative structures (a mass timber building) to illustrate the application of innovative technologies to the structure of different types of buildings, before, during and after construction.

Teetaert will also discuss real-time data analysis and data visualization tools (virtual tour of UBC Tallwood House and the Skilled Trades and Technology Centre at Red River College in Winnipeg) that enable the construction industry to validate designs, materials and methods, so that it can produce more efficient and durable buildings.

SMT partnered with Red River College's (RRC) Building Envelope and Technology Access Centre (BETAC) to monitor the structural health of the Skilled Trades and Technology Centre (STTC) as it was being built on the RRC Notre Dame campus in Winnipeg.

Structural health monitoring helps to ensure that new buildings are energy-efficient, durable and perform as expected.

BETAC and SMT installed a wide network of sensors throughout the building as it was under construction.

A total of seven different building envelope types were instrumented throughout the exterior building envelope, as well as the roof and green roof assemblies.

The effectiveness of the STTC's building envelope, which helps protect its occupants from the extremes of Winnipeg's climate, will continue to be monitored in real time.



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Being able to see what was once invisible in a building's walls, roof and foundation has allowed construction to develop safer, healthier and more sustainable buildings.



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One in every 15 Vancouver residents work in green economy: Veltkamp

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Shorthouse and Veltkamp say presentation attendees will gain a better understanding of the economic impact of the Energy Step Code.

The green building supply chain in B.C. and its ability — or lack thereof — to deliver on the Energy Step Code; and how to address gaps in the supply chain and ensure industry competitiveness.

The province's green economy — Vancouver's, in particular — is already a significant contributor to the economy as a whole.

"One in 15 Vancouver residents works in the green economy," said Veltkamp. "They work in such occupations as designing and constructing green buildings, green building demolition, recycling and materials processing."

Veltkamp says the study looks at six product groups: Fenestration, insulation, heat pumps, heat recovery ventilators, drain water heat recovery systems and domestic hot water systems.

"In B.C. there are many fenestration companies, but not many other kinds of businesses," she said. "We want new companies to start up, and we've identified and quantified the local market for them to take advantage of."

Working with Veltkamp and the VEC, Shorthouse and Delphi led the research behind the report and developed its product demand forecasting model.

"It forecasts demand assuming the current adoption rate for the products, so the forecast will be on the conservative side," said Shorthouse. "We expect demand will increase over time."

The model takes into account five different building types (single family, three types of multi-unit residential and commercial office buildings) and the Energy Step Code steps that

correspond to them.

"The model enables interested people to estimate the demand and market value of high-performance products and equipment — fenestration, insulation, HVAC equipment, etc. — from the present until 2032, based on various Step Code adoption rates and scenarios," said Shorthouse. "It provides a certain amount of certainty on the size of the local market."

Now, about the BC Energy Step Code.

The Code is a voluntary provincial standard that provides a step-by-step approach to achieving more energy-efficient buildings. It goes beyond the requirements of the BC Building Code.

The Step Code establishes a series of measurable, performance-based energy-efficiency requirements for construction that builders can follow and communities can adopt in bylaws and policies. In addition to supporting long-term improvements in energy efficiency in the Building Code, the Step Code is said to make building regulations more consistent across B.C.

A single provincial standard, the Step Code replaces the patchwork of different green building standards enacted by local governments in the past.

The Step Code takes a new, performance-based, rather than the traditional prescriptive, approach. This means that it does not specify how to construct a building. Instead, it identifies an energy-efficiency target that must be met and lets designers and builders figure out how to meet it.

To comply with the Step Code, builders must use energy modeling software and on-site testing to demonstrate that both their design and the finished building meet the Code's requirements.