

UNDER ONE ROOF

Green builders want to cut energy use.

Heritage advocates want to save old buildings.

And both camps are concerned about the future.

BY JAMES CLAVE WITH PHOTOGRAPHY BY MARINA DODIS





Heritage buildings are not only physical things but *emotional* assets, reminders that craftsmanship used to matter before perfectly-tuned supply chains began creating everything we touch with soulless uniformity.

Architects Russell Acton and Mark Ostry (OPPOSITE, from left) were tasked with greening the Vancouver Salt Company Building (PREVIOUS PAGES AND BELOW, circa 1933). Amid the city's old-meets-new skyline, its renovation showcases two types of conservation under one roof.



I AM BATTLING VERTIGO four storeys above the weathered fir-plank floor of the Vancouver Salt Company Building as I follow architect Russell Acton up a somewhat terrifying construction scaffold in my borrowed rubber workboots. We're ascending a set of aluminum stairs — they feel more like ladders — through a spiderweb of Douglas fir timbers that have supported this former industrial plant for almost eight decades. “Look to your right,” Acton calls down. I turn and spy a short section of dilapidated track and a miniature rust-pocked hopper car tucked into the rafters.

In the 1930s, when this building was a salt refinery, workers augered raw salt out of scows anchored in nearby False Creek and used this track to send the mineral along the ceiling to a variety of brine-processing vats on the shop floor below. “We'll be leaving that there,” Acton says of the hopper car, “after seismically stabilizing it, of course.”

Good idea, methinks. Vancouver lies in an earthquake zone, and in a few months, the cavernous space below will be a recreational lounge for athletes competing at the 2010 Winter Olympics. I doubt that any German snowboarders would want a tonne of plunging vintage iron interrupting their friendly après-half-pipe Wii match.

Eventually, Acton and I reach the top and step onto a temporary platform set up inside the glass-encased clerestory — a long, narrow structure, like the cupola on a caboose, that runs the length of the building's roof. We've climbed up here so that he can show me, first-hand, something that, in my mind, is a bit of a puzzle.

You see, this happens to be a very green construction project, and green building is something I know a little bit about. A couple of years back, I built a small-footprint studio/office and guest house in the front yard of my home on a small island just outside Vancouver. Its many green features include spray-foam insulation, Energy Star fibreglass windows, passive solar design and reclaimed lumber. I call it my Eco-Shed.

This 1,200-square-metre “shed” is not only significantly larger but also considerably more “eco.” Like all large civic buildings now built or rebuilt by the City of Vancouver, the Salt Building will meet a stringent LEED Gold Standard. The rating stands for Leadership in Energy and Environmental Design, and the Canada Green Building Council awards it to projects that meet a broad range of responsible practices and technologies. For example, a LEED Gold building will typically be sealed tight against the elements and swaddled in extra insulation. It will often include efficient heating, cooling and ventilation equipment, low-flow plumbing fixtures, and so on.

The head-scratcher for me isn't that this old salt plant can do all those things and meet such a high standard of environmental performance. It's that it can do so without swapping out the 20 or so original single-glazed windows up here in the roof.

“We've pulled them all out, had them rebuilt and put them back in,” says Acton, gesturing to the divided panes. He also points out a series of cedar ventilation louvres — picture a set of horizontal wooden-slat blinds — that will remain open, albeit sealed from behind with glass.

Hence the puzzle. In winter, the building's heat will rise and gather in this small space where Acton and I are standing. And from there, according to conventional environmental wisdom, it will truck straight through these thin windows and vanish forever.

Or not. “Windows are one of the first things to get replaced in the name of energy conservation,” says Natalie Bull, executive director of the Heritage Canada Foundation. To her, that's a huge mistake. Conservation advocates have tested properly weatherstripped and restored single-pane windows like those in the Salt Building, says Bull, and have concluded that they perform about as well as contemporary double-glazed units, which are the stock and trade of any home-energy retrofit.

To diehard greens who groove over insulation ratings the way others share hockey stats, this is pure crazy talk. But what's better: an energy-efficient window made with unsustainable vinyl or non-recyclable fibreglass, or a single-pane window that essentially heats the outdoors?



The question cuts to the heart of a fragile alliance that is emerging across Canada, a nascent partnership between heritage conservation groups and the sustainable-building community. In recent years, as urban planners have worked to increasingly focus growth in our cities inward and upward in an effort to arrest sprawl, the two camps — once plainly at odds with each other — have found themselves getting together around the same table.

“We may make odd bedfellows, but we have common goals,” says Diane Switzer, executive director of the Vancouver Heritage Foundation. “We are both trying to conserve for the future.”

TO PUT IT SIMPLY, the green camp is working to transform our buildings to consume less energy and water, to produce less waste and fewer carbon emissions and, in general, to become healthier, more inclusive, productive and comfortable places. Unfortunately, when architects take stock of an old building — perhaps one with Gothic gargoyles on the parapets or a soaring ironwork-framed atrium or a set of polished granite banisters — sometimes they can make structures more sustainable *and* preserve historical features while remaining within their budgets, and sometimes they can't.

The compromises that occasionally result can fail to please either side. “There have been many crimes committed against heritage architecture in the name of environmental sustainability,” says Bull. While she admires the work done at Winnipeg's Red River College, for example, others in her field are not as positive. When it was opened in 2003, the school's Princess Street Campus incorporated the facades of five historic buildings in the city's famous Exchange District, with new floors of green building tucked behind. But the result looked a little too “movie set” for some. The original

The Vancouver Salt Company Building was once part of False Creek's busy industrial waterfront. With many of its original elements preserved (BELOW), it will serve as a lounge for athletes competing in the 2010 Winter Olympics. The mixed-use housing tower rising above the former Woodward's store (OPPOSITE) will also bring new life to a site that's part of the city's rich history.



MAP: STEVEN FICK/CANADIAN GEOGRAPHIC

buildings were effectively gone, replaced with a veneer as authentic as faux wood-grain furniture.

American architect Carl Elefante coined the mantra for many so-called sustainable heritage advocates a few years back, when he stated that “the greenest building is the one that's already built.” Elefante and his peers point out that many early-20th-century buildings were designed with sustainable features such as prism glass and operable windows and transoms — features that welcomed natural light and fresh air into buildings before the age of air conditioning and extensive electrification.

Many early-20th-century structures also offer excellent “thermal mass,” the innate and desirable ability of dense materials, like stone, to absorb and retain heat. While the windows in old buildings tend to be single-glazed, there were generally fewer of them. Moreover, heritage advocates argue that the practice of adapting and reusing older buildings is inherently more responsible than building new ones — not to mention the many social and cultural benefits that come with preserving our collective past.

The green-versus-heritage debate is both complex and political, says Martin Nielsen, design principal with Busby

Perkins+Will, an architectural firm renowned for its innovative green designs. “There is a lot of emotion,” he says, “attached to older buildings.”

No kidding. There's no way to plug shared memories into a spreadsheet. We can't attach hard numbers to the lessons of history, to the tangible and reassuring feel of carved stone or hand-forged cast iron. But there are ways to objectively take stock of an existing building's impacts and benefits.

That's what the University of British Columbia did in 2003 when it launched UBC Renew, a project designed to save money by rehabilitating an initial collection of 11 aging campus buildings. The school retained Nielsen's firm to take a close look at the Buchanan Building Block D — a classroom complex that went up in 1960 and has served tens of thousands of students. The 5,090-square-metre building resembles a set of long, low rectangles linked together in a West Coast-modern motif. Forty years into its life, however, the place was verging on decrepit. It leaked heat and didn't meet current standards for fire, earthquakes and accessibility.

To support the case for rehabilitation over demolition, Busby Perkins+Will turned to Athena, a sophisticated software package developed by a non-profit institute in

Merrickville, Ont. The program — one of only a handful of its kind in the world — analyzes the environmental impacts of a given structure across its full life cycle to a degree that can easily overwhelm casual greens who might idly wonder whether they should perhaps fly a little less or ride their bikes a little more.

In effect, Athena transported the reno team back to the Diefenbaker era, when concrete first flowed into Buchanan's foundation forms. It essentially tallied the diesel fuel burned by the locomotive that pulled the iron ore to the foundry, the natural gas and water the factory used to make the steel and the exhaust from the trucks that carried the completed girders to the job site and the cranes that lowered them into place. And it did the same thing with the concrete, lumber, drywall, tile, glass and everything else on site. The result: a portrait of the Buchanan's "embodied energy," the sum total of the material and pollution that it took to build it.

The team then instructed Athena to simulate other scenarios, including tearing the place down, recycling some materials and erecting a new building from scratch. Its conclusion? A brand-new facility would consume a significant amount of material and resources in construction and would save only about five percent of energy in operation as opposed to a renovated building.

"In the end, it was still worth keeping," says Nielsen, noting that the reno saved the school about \$10.4 million. "All the right pieces came together."

Everyone wins, right? Well, maybe. The software modelled a new Buchanan building that looked very much like the old one, but with a slightly improved "envelope" — the walls, windows, insulation and other pieces of the structural skin that separate indoor from outdoor. In this respect, it projected a very average building, the minimum standard in terms of energy performance. Many greens would contend that a 40-year-old design, even one with modern windows, sets a poor benchmark.

Then there's the gorgeous 1923 Chemistry Centre, another UBC Renew project. One of only two Gothic-style buildings on campus, it features a granite facade, copper downspouts, marble staircases, leaded windows and detailed brickwork corridors. Its recent renovation scored top honours in the British Columbia Heritage Awards earlier this year.

"At the end of the day, we saved a beautiful old historic building and managed to meet a LEED Silver target," says Gregory Henriquez of Henriquez Partners Architects, the project's design firm. From a materials and resources point of view, the stats are impressive: the Chemistry Centre reno diverted 323 tonnes of solid waste from landfills, kept 1,155 tonnes of carbon dioxide out of the atmosphere and saved more than five million litres of water.

But to Henriquez, this victory is bittersweet. "We could not afford to do the envelope upgrade, which would cost probably more than a whole new building," he says. That's



because the exterior walls were built with stacked granite blocks that were not physically tied into the structure; any attempt to insulate on the inside would trap the moisture that passes through the gaps between the stones. "We couldn't afford to insulate the building, because the envelope leaks so badly. In terms of the health of the inhabitants, it has all the operable windows, a breathing wall, and so on. But from a sustainability point of view — at least from the way most people frame it these days — it's a pig."

THAT BLUNT ASSESSMENT speaks volumes about the conundrum that underlies discussions about what we save, what we keep and why. Because our deepening understanding of the planetary mess into which we have gotten ourselves is forcing us to make difficult choices and trade-offs.

Here's why. In 2006, an influential Santa Fe, New Mexico-based architect named Edward Mazria stood up at the annual convention of The American Institute of Architects to challenge his peers with a plan he called Architecture 2030. His group had analyzed federal government data to understand the role that buildings play in the global-climate emergency — the extent to which they are part of the problem and the role they might play in solving it.

Mazria's findings were alarming. His research revealed that existing buildings, heritage and otherwise, consume nearly *half* — 48 percent — of all the energy used in the United States. Meanwhile, just 8.6 percent of America's



The century-old Woodward's complex (LEFT and BELOW) is undergoing one of the most innovative redevelopments in Canada. The project, helmed by architect Gregory Henriquez (OPPOSITE), is an ambitious social experiment, bringing together urban professionals, young families, homeless people and students. Some historic elements have been preserved and there are some green strategies at play, but Henriquez is more concerned with bringing "body heat" back to the city's troubled Downtown Eastside.

'In our practice, we talk about cultural sustainability, which deals with things like inclusivity, accessibility and getting beyond the fundamental problems of greed and materialism that need to be addressed in order to confront climate change.'



OPPOSITE PAGE, BOTTOM: CITY OF VANCOUVER ARCHIVES/CVA 99-4848/STUART THOMSON

total energy goes into the manufacture of new building materials plus renovation and new construction. (We can assume these ratios are similar in Canada.)

In other words, the fossil fuels we burn to heat, cool and power our existing buildings far exceed those we burn to

build and renovate them, even when you count the energy locked up inside the new materials. And while there are other environmental impacts associated with new construction, such as the landfilling of demolition waste, to Mazria and many others, the footprint trumps them all.

"It comes down to this," says Ruben Anderson, a principal at futureproof, a Vancouver-based ecological-design consultancy. "The atmosphere doesn't care how pretty or old or sentimental our buildings are. We must cut atmospheric CO₂ below current levels, or our children will likely see the end of our civilization. We are heading into a world of deep uncertainty and great bleakness — and I should worry about the wainscoting?"

Mark Ostry, a partner with Vancouver's Acton Ostry Architects who worked with Russell Acton on the Salt Company Building, dismisses this as doomsaying. "I can't believe we can't have some balance, some good spiritual qualities in our lives — one of which is to have some heritage buildings around. It is not about saving the wainscoting."

Ostry has a point. Heritage buildings are not only physical things — great bundles of energy — but *emotional* assets. They're reminders that craftsmanship used to matter



Vancouver Heritage Foundation executive director Diane Switzer believes green builders and heritage advocates should be friends, not foes.

retrofits, but we also have to figure out how to build better. Many of our new buildings are further from net zero than most existing buildings.”

Armstrong, who also serves on the board of the Toronto chapter of the Canada Green Building Council, cites the many condo towers that have sprouted across the country in recent decades. While they do focus population growth in urban centres, they typically offer occupants sweeping views through floor-to-ceiling windows. These so-called curtain walls make buildings more appealing to live in but do little to keep warmth where it belongs.

“I think we have to be careful about razing heritage buildings in the interest of energy savings when there are bigger fish to fry in 20- or 30-year-old buildings,” says Armstrong. “Maybe the building across the street from that heritage building is run poorly, has an old system and is leaking air like crazy, so there may be bigger gains to be made there.”

In fact, great strides might be found in the nation’s residential housing stock — but also challenges. In September 2008, the Now House Project threw this into focus. After winning a Canada Mortgage and Housing Corporation contest, a design studio called Work Worth Doing launched a back-to-the-studs near-zero retrofit of a 60-year-old home in Toronto’s East York neighbourhood. Workers sprayed the little home’s walls with foam insula-

before branding and focus groups and target markets and Twitter, before perfectly tuned supply chains began creating everything we touch and see with soulless uniformity.

But Anderson is right too. All of those warm fuzzy feelings are going to evaporate in a heartbeat against the backdrop of a crisis that is already killing an estimated 300,000 people a year and displacing some 20 million more. Many scientists now privately admit that we have already locked ourselves into a grim spiral of famine, disease and desertification — but that doesn’t mean we shouldn’t try to stop it.

Architecture 2030, the most ambitious and respected program of its kind, calls for all major renovations or new buildings to consume half as much energy in operation as the regional average. Over the coming years, Mazria proposes ratcheting up that reduction until all new buildings and renovations reach “net zero,” the point at which they require no fossil-fuel energy to operate.

“NET ZERO IS DEFINITELY OUR END-GAME,” confirms Scott Armstrong, manager of sustainable design services and heritage restoration projects for international engineering firm Halcrow Yolles. “We are going to get there partly through

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tion, installed solar panels on the roof, added heat-recovery ventilation to the basement — the works. The tab ran to \$85,000, but the architect and many others worked for free. With those costs included, the price would have easily soared north of \$100,000.

Tens of thousands of these modest post-Second World War houses ring our cities, but the people who live in them do not generally have access to the kind of capital required to bring them close to net zero, even if it means saving money over the long haul. And the task can be made trickier if doing so requires meeting the expectations of heritage review boards, as the Now House team discovered during a follow-up project in the St. Mary’s Heritage Conservation District, in Kitchener, Ont.

The reno crew wanted to swap out a warped front door that did not close and seal properly, but the local heritage office said no, because doing so would change the appearance of the home. Ultimately, the reno team replaced the



The University of British Columbia Chemistry Centre, completed in 1923, was given a heritage award-winning retrofit as part of the larger UBC Renew project. Because the building was renovated, not demolished and rebuilt, 323 tonnes of solid waste were diverted from landfills and 1,155 tonnes of CO₂ were kept out of the atmosphere. The building attained LEED Silver status, but questions linger as to whether the reno was green enough.

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glass in the door with a sealed pane and added insulation to the actual door. Then the conversation shifted to the large single-pane window on the front of the house.

“We wanted to change it, but the heritage office wanted us to leave it alone or repair it,” says Lorraine Gauthier, Now House’s president. After much back and forth, the house in Kitchener received a new Energy Star-rated window that looked just like the old one, and while the heritage board initially wanted it to be made of wood, it eventually accepted vinyl.

The technology to retrofit heritage homes exists, but one must write big cheques for things like heat-recovery ventilation, triple-glazed windows and high-efficiency furnaces. Green retrofits are all the rage these days, but many homeowners still put their money where my wife and I did back in 2003, after we bought a fixer-upper in Ed Mazria’s hometown of Santa Fe, New Mexico. The old house had single-pane windows, scant insulation and a wheezing, *circa*-1959 forced-air furnace, but instead of upgrading all these things, we went in hock on a sparkling new kitchen.

“Canadians see themselves as great environmentalists because we look out the window and see these beautiful landscapes and green trees,” says Gauthier. “But in Europe, they really get it, because they have always had to pay the price for their energy. They grow up understanding conservation.”

Gauthier says that one of the more inspiring outcomes of the Now House Project is that many of the elementary-school kids who tour the place know more about energy efficiency than she does. “The younger generation may well save themselves,” she says. “We are doing a bad job trying to make amends for what we have done.”

She pauses. “It is going to be an interesting future.”

ANOTHER DAY, ANOTHER ARCHITECT, another borrowed pair of workboots. This time, I’m in the thick of the dust and din with Gregory Henriquez, the fellow behind UBC Renew’s Chemistry Centre redo. It’s April, and we’re in the centre atrium of the Woodward’s complex — in the heart of Vancouver’s troubled Downtown Eastside — and at the centre of what is arguably the most innovative mixed-use development in Canada.

Concrete trucks back up with shrill beeping alarms, BobCat excavators scoot past with buckets full of gravel. Cranes swing overhead, lifting bundles of pipe and rebar, and workers hustle around the site like ants. It’s a scene of considerable activity, and a few years ago, it was a zoo of controversy. That’s because for thousands of people who grew up around here in the mid to late 20th century, this block was an urban touchstone, a beacon of nostalgia as recognizable as the giant illuminated steel “W” that once loomed high above the store.

In 1902, Charles Woodward opened a department store on this site. His business grew and expanded down the block over the decades until it became a 55,000-square-metre colossus that sold everything from groceries to vacations, with Christmas window displays that drew crowds from across the region. But by the 1970s, suburban malls were steadily sucking shoppers out of the area, and the neighbourhood fell into steep decline. Woodward’s shut its doors in 1993 and stood empty and abandoned for a decade, a forlorn symbol of the social decay infecting the city’s Downtown Eastside. For a while, squatters and street kids occupied the building.

After a series of false starts, the City of Vancouver selected Henriquez Partners Architects to redevelop the new site in an ambitious social experiment. When it opens this fall, the



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The giant steel "W" no longer presides over the Woodward's complex, but Henriquez argues that preserving the *memories* of a space can be just as valuable as saving a physical structure.

Woodward's complex will bring together urban professionals in hundreds of upscale condos and otherwise homeless people in single-room suites. Young families in below-market housing will mingle with thousands of students who will pass through on their way to classes in the new Simon Fraser University School for the Contemporary Arts. There will be a community-run arts centre and office space for non-profits such as AIDS Vancouver.

There are green strategies at work here, such as downtown density and passive solar shading in lieu of air conditioning, but Woodward's is not even close to net zero. To Henriquez, that isn't the point. "In our practice, we talk about cultural sustainability," he says. "It's a broader movement that deals with things like inclusivity and accessibility and all the things that make a better society, like getting beyond the fundamental problems of greed and materialism that need to be addressed in order for climate change to be addressed."

Realizing this vision meant dynamiting most of what stood on the site; very little of the old structure — a series of ad hoc additions that spanned almost a century — could be salvaged. Henriquez walks me over to the corner of the chaos, where the original building still stands. Mighty Douglas fir timbers support the floors above, shouldering rows of very solid old-growth fir joists. Some heritage advocates may bristle at the thought that this relatively small

building is all that remains of what was once a retail icon, but Henriquez argues that the heritage movement needs to understand what makes a building significant and what does not.

"What are the memories that surround the building?" he asks. "It is about what took place on the site; it is about the memories we have. In some places, it is the actual edifice, the physical design. But the Woodward's building was designed by nobody. It was the Wal-Mart of its day."

"But isn't there something authentic about the old Woodward's space, something intangible in the grain of these old timbers that speaks to people?" I ask. "Aren't people craving this connection?"

"If you believe we can't create anything of meaning that is new, then there is no hope for humanity," he replies. "Because if you look at history and at humanity's attempts to do something good that is of use to the planet, well, we have done a terrible job."

James Glave is the author of Almost Green: How I Built an Eco-Shed, Ditched My SUV, Alienated the In-Laws, and Changed My Life Forever. He lives on Bowen Island, B.C. Photographer Marina Dodis lives in Vancouver.



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