

Community energy builds

- a community energy system
- an award winning municipal building
- BC's first six-storey wood frame housing project

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Community energy builds community energy system

Quesnel, BC is working to develop a community energy system that will be the first of its kind in North America.

by Anne Phillips



Operating with style

Newmarket, Ontario just opened the doors to its award winning municipal operations centre – a testament to the effective procurement of goods and services for its design and construction.

by *Summit* staff



BACK to WOOD

BC changes its building code to allow wood frame construction thus stimulating the forestry, construction and design industries.

by *Summit* staff



FROM THE EDITOR

editor@summitconnects.com

The articles presented in this online version of *Summit* are a result of my travels over the summer.

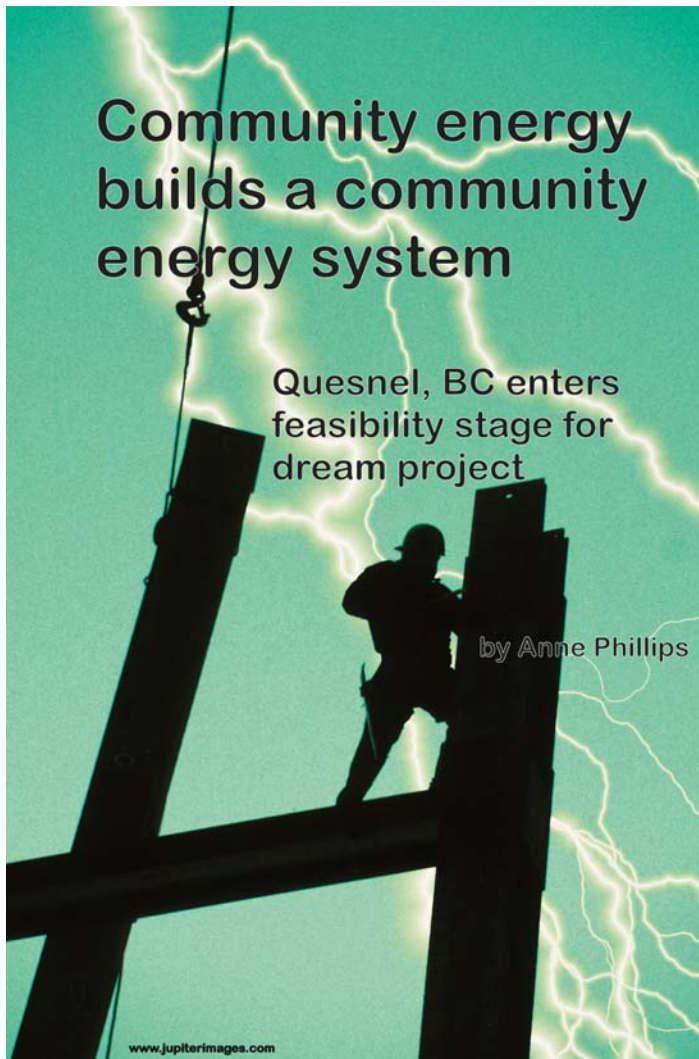
I was privileged to attend a presentation on Quesnel's efforts to build a community energy system. Supported by city staff, the local population and government and many others, the project hopes to bring many benefits to the city.

I had the opportunity to learn about wood construction and the BC forest and construction industries and the changes resulting from the *Wood First Act*, thus the first six-storey wood frame building is underway in Richmond, BC.

I also spent some time in southern Ontario and was impressed by Newmarket's new operations building. Knowing the procurement process involved in finding the right goods and services to create a team that can complete such a building, I congratulate the city staff involved.

I hope you will enjoy all the articles.

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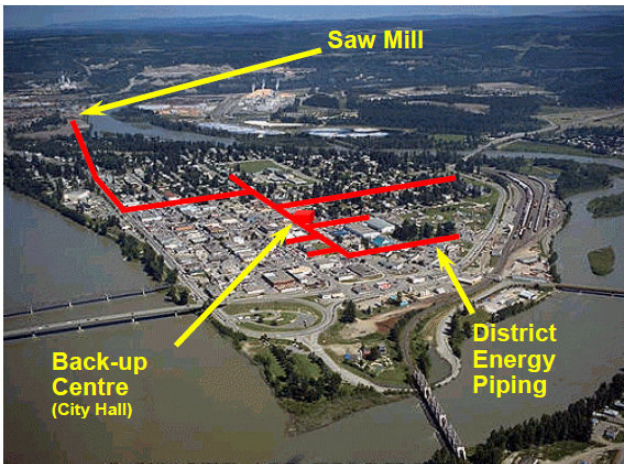


Quesnel, BC is hoping to be home to the first of its kind community energy system in North America. The project has entered the final feasibility stage.

Tucked into the confluence of the Fraser and Quesnel Rivers in the interior of British Columbia, is a small but charming city called Quesnel, which is home to more than 10,000 people. Quesnel is also hoping to be home to what it claims will be the first of its kind community energy system in North America – a project that has been a dream of the city’s economic development corporation and is now entering its final feasibility stage.

The Quesnel Community Energy System (QCES) is a biomass system that will use waste heat and left-over residues from West Fraser

Timber Co. Ltd’s Quesnel sawmill to generate both heat and electricity. No trees or other forest biomass will be harvested solely to power the QCES. What makes this system unique is that although all the technologies proposed in the QCES are currently operational today (many in Europe), these existing installations either provide district heating only, power only, or are purpose-built, while the QCES takes advantage of existing systems and infrastructure to generate both heat and power. It is proposed that QCES purchase excess heat from West Fraser, and BC Hydro purchase the electricity generated under an Electricity Purchase Agreement.



Quesnel, BC sits at the confluence of the Fraser and Quesnel Rivers in the heart of the province. This photo, courtesy of the City of Quesnel depicts the scale of the community energy project.

The project is a result of visionary leadership on the part of Quesnel’s Economic Development Corporation. This group created the partnerships necessary to the project’s success working with Terasen Gas, West Fraser and BC Hydro, local government and provincial and federal government organizations. According to Quesnel Mayor Mary Sjostrom, the project has the potential to be a significant economic generator for the community in addition to supporting the city’s commitment to green energy. Quesnel is committed to being carbon-neutral by 2012.

The initial capital cost of the QCES is estimated at \$14 million, jointly funded by the City of Quesnel and Terasen Gas. The City of Quesnel, through its Economic Development Corporation, secured grant funding of \$4.13 million through BC’s Innovative Clean Energy Fund, with Terasen Gas funding the balance and acting as a major technical advisor. The federal government through Western Economic Diversification Canada provided \$150,000 of seed capital for research and development studies, the FCM Green Municipal Fund provided \$54,000 towards initial feasibility research and BC Hydro provided \$40,000 towards subsequent feasibility research. The BC Bioenergy Network have also been supportive in moving the project forward by contributing a \$200,000 forgivable loan to

help complete detailed engineering studies and business, legal, and financial frameworks that will finalize the project’s economic viability.

The community-based energy solution allows for the incorporation of new or alternative technologies – in this case, recovered heat and sawmill residuals. The QCES will be designed to achieve more than 90 percent energy efficiency. It would modify the existing biomass energy system at West Fraser’s Quesnel sawmill to generate 5.5 megawatts (MW) of heat to numerous industrial, municipal, commercial or multi-family residential buildings in Quesnel. It will also produce up to 1.7 MW of electricity, which is proposed for purchase by BC Hydro (through an Electricity Purchase Agreement) for re-sale, allowing it to provide its customers with access to a clean source of power.


About 40 per cent of all energy utilized through the project will be from recovery of waste heat; an estimated 9,000 tonnes of wood waste from milling operations will be burned to increase power and heat production.

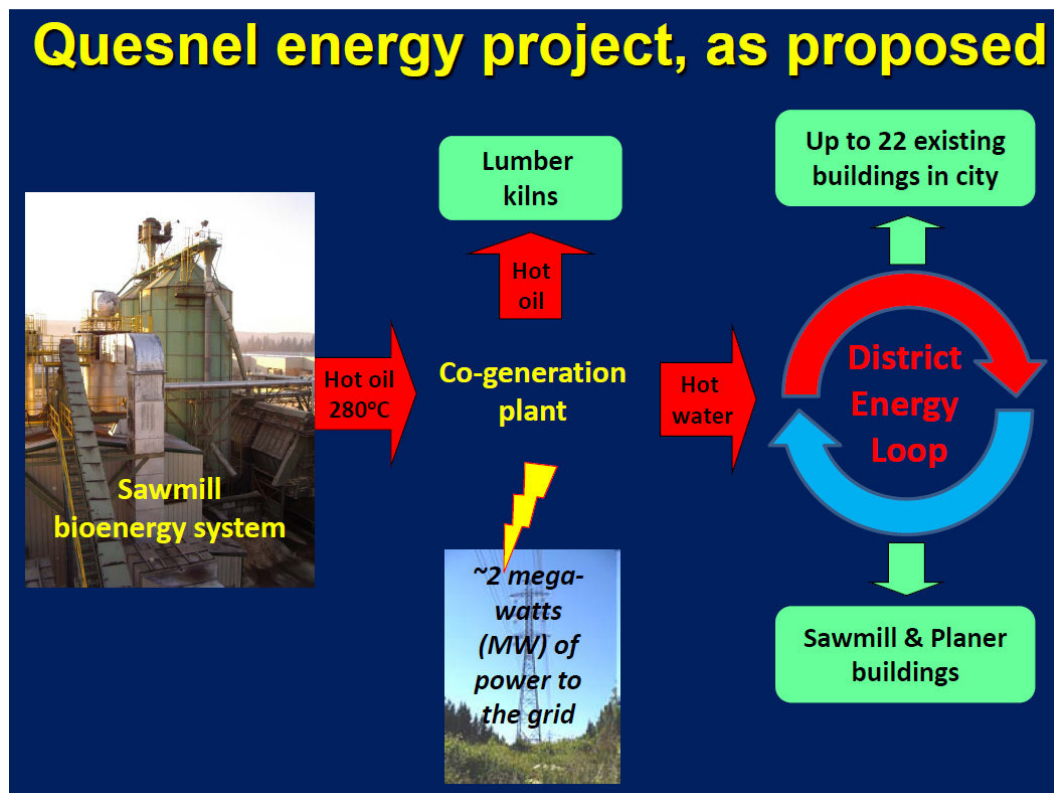
According to plans, if the project proceeds, there will be numerous additional local economic, social and environmental benefits for all involved, including:

- providing a new non-property tax based revenue source for the city;
- a revenue stream for West Fraser provided in exchange for utilization of its infrastructure and for operational and maintenance services;
- creating jobs during the construction of the QCES and once the system is operational;

The community-based energy solution allows for the incorporation of new or alternative technologies

- providing the capacity to serve the majority of large commercial and public sector heat users in Quesnel with a stable, carbon-neutral source of heating;
- retaining wealth in the local economy through retained energy payments from the buildings the QCES will serve;
- diversifying Quesnel’s economic portfolio – the district heating infrastructure can be expanded to provide carbon-neutral heat to new customers, such as food processors;
- meeting BC’s greenhouse gas reduction targets for publicly owned buildings at a reasonable cost; and
- providing an opportunity for BC Hydro, Terasen Gas and West Fraser to gain experience with organic Rankine cycle turbine technology.

In July 2010, in cooperation with West Fraser and BC Hydro, the City of Quesnel and Terasen Gas signed a letter of intent (LOI) to conduct the final feasibility work on the new renewable energy system in Quesnel. Detailed engineering work has begun to finalize analysis of the economic viability of the QCES and the required business, financial, and legal frameworks will also be completed. Ausenco Sandwell has been hired to do the final feasibility work, in cooperation with FVB Energy. This phase of the project should be concluded by late 2010. Approval from the BC Utilities Commission is required to proceed with the project and if obtained, the project is anticipated to be operational in 2012. 





In early September 2010 the Town of Newmarket, Ontario, a town of 80,000 people approximately 45 km north of Toronto, celebrated the opening of its new Operations Centre. The award winning building is located on what was formerly a brownfield in an industrial park. The visually appealing building now serves as a substantial and welcoming landmark at one of the main entry points to the town. The town, working with its designers and contractors and supported by some funding from the Federation of Canadian Municipalities (FCM) Green Municipal Fund, has created not only what is a beautiful building but one that is functional and environmentally friendly.

In late 2008 the Town of Newmarket, Ontario, released a tender for the construction of the Newmarket Operations Centre. According to the tender documents, the new operations centre consisted of a main building of approximately 70,000 sq. ft. (7,000 sq metres) for administrative offices; meeting and training spaces; an emergency command centre; vehicle storage; workshops; vehicle maintenance and repair; interior and exterior vehicle wash bays that included a salt and sand storage facility; greenhouse; and vehicle fuelling station. The new centre would consolidate three existing municipal departments: Public Works, Parks and Facilities. Occupancy date was to be mid-2010.

The construction budget for the Newmarket Operations Centre was set at approximately \$22.4 million. An earlier RFP process resulted in a list of pre-qualified general contractors who were eligible to bid on the project, including:

1. Bondfield Construction Company Limited
2. Melloul Blamey Construction
3. Maple Reinders Constructors Limited
4. First Gulf Construction
5. The Atlas Corporation
6. Aquicon Construction
7. McKay-Cocker Construction Limited
8. Buttcon Limited
9. Bird Construction Company
10. Jasper Construction
11. Graham Construction and Engineering

Bird Construction was selected as the general contractor for the project. Rounthwaite Dick & Hadley Architects Inc. from Toronto, a consulting firm specializing in corporate and institutional architecture, acted as the architects/project manager, and Halsall Associates Limited was the structural designer. Telco Steel Works Ltd. was the steel detailer; the mechanical/electrical contractor was Jain Associates Ltd. and the landscaping was done by NAK Design Group Inc.

According to Andrew Solda, project associate with Halsall Associates Limited, “there were several structural steel engineering challenges required to help the architect achieve his vision for the new civic building.” Two independent structures, an office building and a maintenance facility built on two elevations were to be connected by an expansion joint so that they appeared to be one building. In order to allow both joined buildings to move independently and yet conceal the structural bracing Halsall had to engineer steel moment frames in two directions, which according to Solda means “that certain corner columns are bending in both directions.”

Other elements of the building posing engineering challenges included: a column-free atrium with a green roof that showcases a staircase to upper and lower offices; the maintenance building’s steel bi-fold garage doors that fold in the middle and fold up (typically seen on aircraft garages); and a steel track and girder system to support the track for the crane hoist and running track of a 10-ton vehicle maintenance crane. Overall the structural design and fabrication is more like that found in a complex multi-storey structure and the engineering achieved the architectural and functional features envisioned by the architectural team.

The resulting building and grounds are a testament to the work done by the designers and contractors who were selected by the town and its purchasing department. It is unusual for municipal operations centres to attract the

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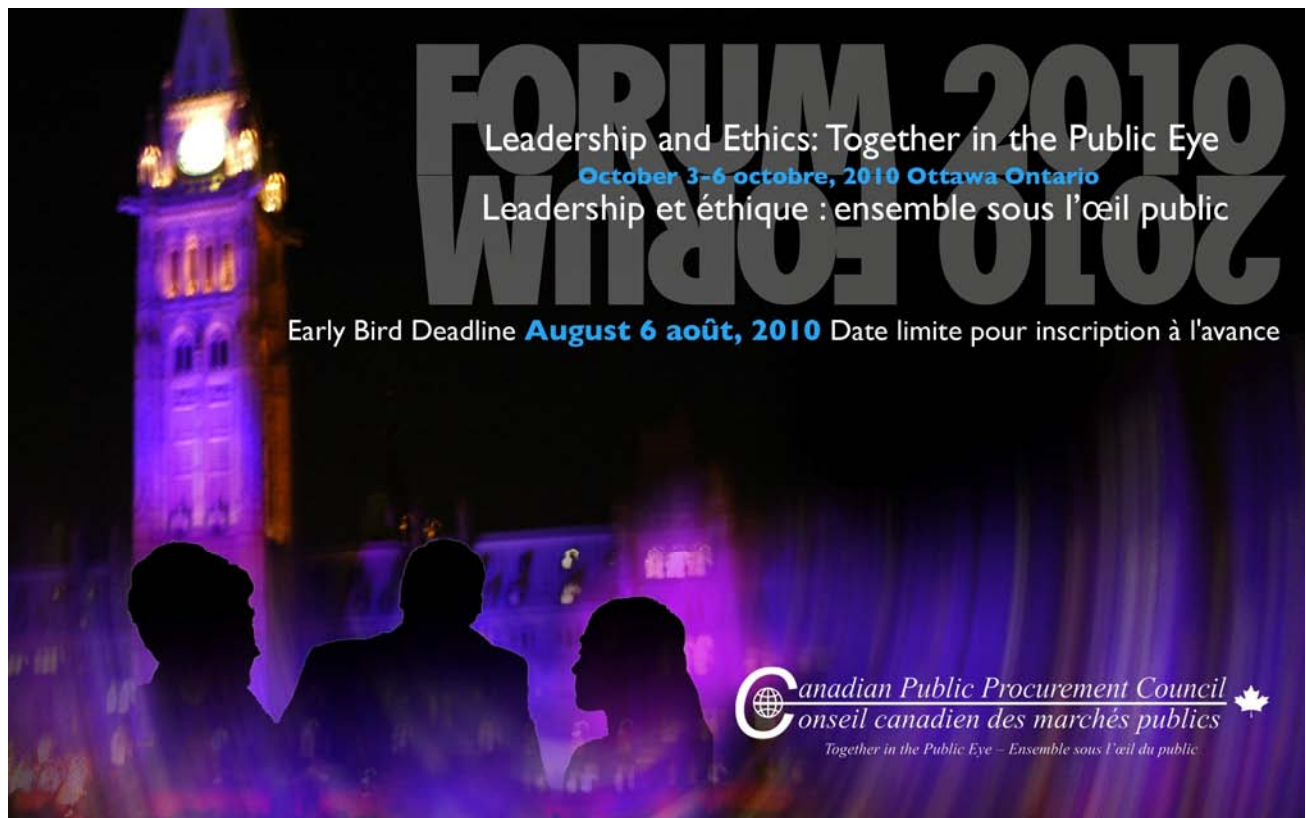
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attention of designers, or even the general public; however, this one did, winning an Award of Excellence from *Canadian Architect* magazine in 2009. The site's one-story change in grade was incorporated into the design of the building to create a distinct separation between the office and public area on the upper level and the works building and yard below. The impressive atrium is the main entry point to the building and as such it serves as a subtle reminder of the importance of the building to the operations of the municipality.


With a \$2 million loan and \$300,000 grant from the FCM's green municipal fund, this facility is one of the first municipal operations centres in

Canada to be built to LEED (Leadership in Energy and Environmental Design) Silver standards. It is designed to meet the Canada Green Building Council's energy efficiency targets. Green strategies used in construction and design include: a green roof; day-lighting and natural ventilation; a geothermal heating and cooling system; solar hot water heating; stormwater collection for irrigation; and provisions for a future wind turbine. Consolidating three existing municipal departments into one well-designed functional space and sharing resources allows Newmarket to realize major operational savings. 



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For years and years, forestry and wood products has been a mainstay industry in the Province of British Columbia. In recent years the industry has been dealt several severe blows: the softwood lumber agreement dispute with the United States; the softening of world market prices; and the Mountain Pine Beetle (MPB) epidemic, which has laid waste to countless hectares of prime forest leaving millions of dead pine in its wake. Then on top of this, the industry was affected by the recent economic downturn and several mills, already struggling under the weight of the MPB and market prices, were forced to close or shut down leaving mill workers searching for other jobs and training opportunities.

Consequently, the BC forestry industry and governments at all levels have been working to develop new uses for wood that would breathe life back into the industry – even if in a different form than before. Resting on the much reduced primary saw log industry, several new businesses are beginning to take shape and are becoming successful such as the pellet industry and bio-fuels. The forest industry is determined to sustain and grow and harvest the forests. When a tree is cut down no part of the wood will go to waste.

The forest industry, the construction industry, architectural and engineering associations and

politicians from forestry affected and dependent communities, using a “wood first” mantra, pressed for changes to the British Columbia building code, which allowed for the construction with wood of only four-storey structures. Last year the province changed the code to allow six-storey structures. The result is an increased demand for wood products, not only opening a new domestic market but helping to stimulate further changes in the industry. Formerly the majority of wood products were shipped to foreign markets; a market closer to home now needs supply meaning changes in the customer base and supply chain. It means the opportunity is there for BC firms to make engineered wood products. The new code also opens the door for additional creative solutions from design firms in their urban planning.

One of the most innovative applications of wood systems was seen and enjoyed by Canadians who attended Olympic events at the Richmond Oval. Its expansive six-acre free spanning “wood wave” roof, which used BC’s MPB wood, is a precedent setting example advanced wood engineering and prefabrication capabilities. Wood WORKS! BC (Wood WORKS! is a national industry-led initiative of

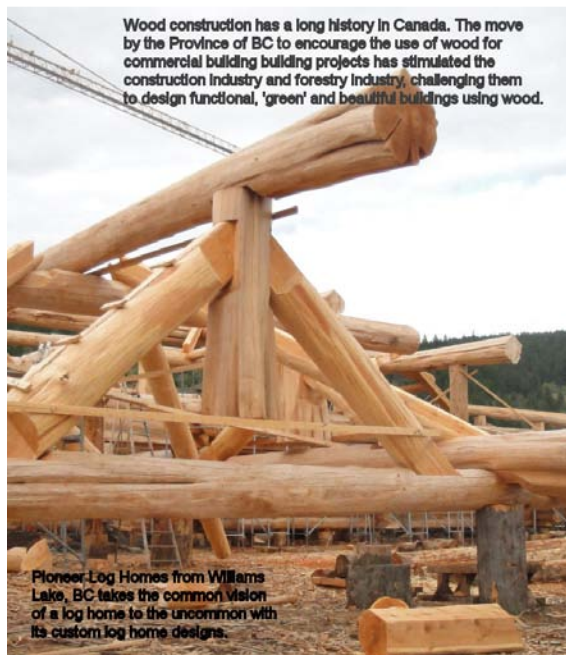
the Canadian Wood Council) provided technical support and wood expertise to building and design professionals. When BC’s new *Wood First Act* passed, Wood WORKS! BC was asked to help municipal governments navigate the “build with wood” requirements for publicly-funded projects.

In April 2010, BC announced the formation of the Wood Enterprise Coalition, which, backed with \$1.75 million in seed funding, was created to help the province achieve its Wood First objectives.

According to the news release, “the Wood Enterprise Coalition is a partnership between WoodWORKS! BC, FPInnovations and the BC Wood Specialties Group. As outlined in the Wood Enterprise Coalition memorandum of understanding, the partners will co-ordinate their efforts to support the value-added forest product sector through promotion, education, training, product development and innovation. ...The coalition’s key work goals to March 2012 include:

- advancing Wood First demonstration and pilot projects;
- increasing public communication around the benefits of using wood;
- developing a Wood First education and training strategy, including support for the planned Wood Innovation and Design Centre in Prince George;
- supporting implementation of Wood First policies and construction; and
- supporting commercialization of new wood products.”


Already there is evidence of change. Richmond, BC is home to the first six-storey wood frame project to receive a building permit in the province. On June 17, 2010 ground was broken on the Remy, a 188-unit condo development project that will supply affordable housing.

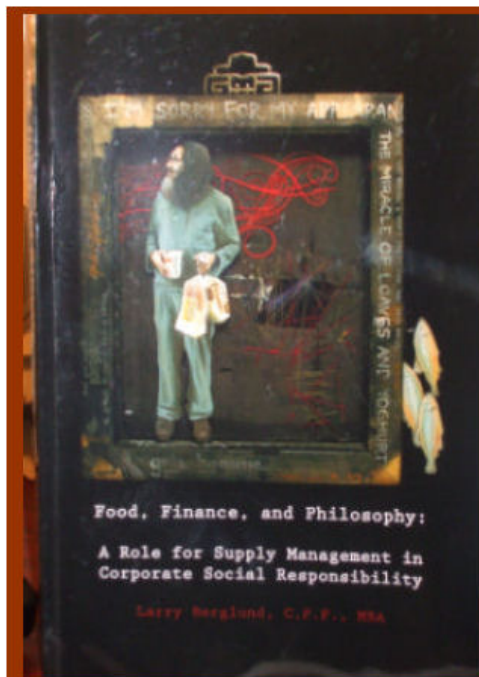


Designed by Patrick Cotter Architect Inc., there will be 33 seniors rental housing (SRH) units supported by contributions from both the federal and provincial governments totaling \$4.75 million. S.U.C.C.E.S.S., a non-profit charitable organization that provides social services to multicultural clientele, will manage and operate the SRH units and also owns and will operate 48 apartments design for low- to moderate-income tenants. The province and the City of Richmond are also contributing a total of \$1.4 million to a daycare with spaces for 50-60 children.

The \$60 million, two-phase, multi-family residential building sits on 2.2 acres of land and will have six storeys on the front and five in the

back and include two levels of parking. The designers are also returning to a practice used 30 years ago by choosing to use wood in the elevator shafts.

According to the developer, Oris Development Corporation, the changes to the building code have led to construction cost savings in the order of 12 percent, roughly \$4.8 million on this project. Work is progressing on the project, despite some concerns raised by the Richmond Fire Department regarding fire safety issues. Both the developer and fire department are working to ensure the building is fire safe. 



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