

COMMITTEE OF THE WHOLE – DECEMBER 3, 2007

SUSTAINABILITY AND STATUS UPDATE OF THE NEW CITY HALL

Recommendation

The Commissioner of Community Services, in consultation with the City Manager recommends:

That this report be received for information.

Economic Impact

As previously budgeted.

Communications Plan

Work with Corporate Communications to develop a communications strategy for the new City Hall.

Purpose

Provide Council with a progress update on the new City Hall.

Background – Analysis and Options

At the Committee of the Whole meeting of September 24, 2007, Report No. 40, Item No. 20, Council directed “that staff provide a report on the sustainability components of the new City Hall, including energy use and other environmental aspects of the new building.

Design for a sustainable society has become the major issue for the 21st century, as buildings have a major impact on our environment. The embodied energy inherent in the construction of buildings such as the new Vaughan Civic Centre is substantial, and by planning and undertaking certain practices in the development of such a building, we can reduce its impact on the environment.

Cities must show leadership in designing buildings that are developed with sustainability as a major criteria in their design process. Sustainable design strategies need to be deeply embedded into the architecture to create an effective fusion and integration of systems, technologies and architectural expression and provide an urban presence. Applying sustainable practices on a limited scale will have minimal positive effects on the environment; however, if all new buildings make an effort to reduce their consumption of energy during construction and throughout their operational life cycle, there will be a noticeable positive effect on the environment.

The new Civic Centre is the largest building undertaken by the City, and is therefore the ideal project to demonstrate Council's commitment to lead and promote environmental sustainability in Vaughan.

One way to measure the extent and success of a buildings sustainability is through the LEED certification process. The general principles of the LEED initiative is driven by the ultimate goal of minimizing the impact of human artifice on the environment through careful selection and procurement of site, building materials and products. However, the responsible management of energy consumption has the further benefit of creating healthy buildings which invariably have a positive impact on the building inhabitants and visitors.

LEED Rating System

The Leadership in Energy and Environmental Design (LEED) Green Building Rating System is the nationally accepted benchmark for the design, construction and operation of high-performance green buildings. LEED provides building owners and operators with the tools they need to have an immediate and measurable impact on their buildings' performance.

LEED Project Certification

LEED Certification provides independent, third party verification that a building project is environmentally responsible, profitable and a healthy place to live and work.

There are four levels of certification:

1. LEED Certified
2. Silver
3. Gold
4. Platinum

The original design competition for the Vaughan Civic Centre required that the building be LEED Silver certified, and Council further demonstrate their commitment to lead and promote environmental sustainability in Vaughan by changing the LEED status to "Gold Certification."

The LEED process for certification focuses on six areas of design:

1. Sustainable Sites
2. Water Efficiency
3. Energy and Atmosphere
4. Materials and Resources
5. Indoor Environment Quality
6. Innovation and Design Process

APPROACH TO ACHIEVING LEED GOLD STATUS WITH THE VAUGHAN CIVIC PROJECT:

1. Sustainable Sites

The design of the new City Hall incorporates the following sustainable features for a Leeds Gold Certification:

- The project design incorporates measures to control erosion in order to reduce negative impacts on water and air quality through the prevention of loss of soil during construction by stormwater runoff and/or wind erosion. These measures include protection of topsoil stockpiling for reuse, prevention of sedimentation of storm sewer or receiving streams and the prevention of polluting the air with dust and particulate matter.
- The existing hydrocarbon contaminated soils have been remediated on the site as required by Provincial Contaminated Sites Program.
- One of the goals is to reduce pollution by the following means:
 - (a) the site is located adjacent to a commuter rail line and bus routes;
 - (b) the project conforms to the requirements to provide for secure bicycle storage, with convenient changing/shower facilities within the building for 5% or more of regular building occupants.
- The Project implements a stormwater management plan that prevents the post-development 1.5 year, 24 hour peak discharge rate and quantity from exceeding the pre-development 1.5 year, 24 hour peak discharge rate and quantity.

- The design incorporates a combination of “green” (vegetated) roof and high albedo (reflective) roof membranes which collectively provide an effective 75% coverage that would not be provided by a stand alone reflective roof.

2. Water Efficiency

- The goal is to reduce potable water use and maximize water efficiency to reduce the burden on municipal water and waste systems.
- The Project utilizes high-efficiency irrigation technology through the use captured rain and recycled below grade water through the dewatering system to reduce potable water consumption for irrigation by 50% over conventional means. There will be no potable water used to irrigate the site or the building roofs.
- The Project employs strategies that in aggregate use 30% less potable water than the water use baseline calculated for the building through the use of high-efficiency fixtures.

3. Energy & Atmosphere

- The design reduces the energy consumption to comply with Natural Resources Canada’s Commercial Building Incentive Program (CBIP) requirement for a 25% reduction relative to the consumption of the reference building designed to the Model National Energy Code for Buildings 1997.
- The Project has specified zero use of CFC-based refrigerants in the HVAC&R systems and zero use of halons in fire suppression equipment, to reduce ozone depletion.
- The Project is targeting a reduction in design energy cost compared to the energy cost of the (MNECB OR ASHRAE/IESNA 90.1-1999) standard reference building by 29%.
- The Project has specified continuous metering equipment to provide for the ongoing accountability and optimization of building energy and water consumption performance over time.
- A Measurement and Verification Plan that incorporates the monitoring information from the above end-uses is being developed for building monitoring.
- The City is investigating providing at least 50% of the building’s electricity from renewable sources by engaging in at least a two-year renewable energy contract. Renewable sources are those that meet the Environment Canada Environmental Choice programs’ EcoLogo requirements for green power supplies.

4. Materials & Resources

- The Project incorporates an easily accessible area that serves the entire building and is dedicated to the separation, collection and storage of materials for recycling including (at a minimum) paper, corrugated cardboard, glass, plastics and metals. The design facilitates horizontal movement on each floor to one vertical movement location (north service elevator) which provides an efficient way to collect and manage waste and recycling materials. As part of the building operations management, there are procedures being developed that include the following:
 - (a) identify to local waste handlers and buyers for glass, plastic, office paper, newspaper, cardboard and organic wastes.

(b) instruct/educate occupants and cleaners on building recycling procedures.

- Following occupancy, a three-stream waste collection program will be implemented. General workstation, office, meeting rooms and lobbies will have separate containers for general waste and recyclable materials.
- Organic waste will be collected in the cafeteria, and one “green bin” will be located within each Department area equipped with kitchenette facilities. All materials will be collected at the end of the day, and taken to the main collection room for appropriate separation.
- Based on the waste management program developed during the design phase, a vertical movement of waste and recyclables will be primarily via the north service elevator and managed at the dedicated collection room at the loading dock area. The Project team evaluated the benefits of incorporating conveying chutes throughout the building to facilitate recycling operations. However because of the horizontal plan layout of the building and lack of vertical connection to one common collection space, chutes were not implemented.
- Measures are in place for the General Contractor to divert construction, demolition and land clearing debris from landfill disposal including the redirection of reusable materials to appropriate sites. These measures will contribute to redirecting recyclable recovered resources back to the manufacturing process. The General Contractor has developed and is implementing a waste management plan, quantifying material diversion goals including the recycling and/or salvaging at least 75% of construction, demolition and land clearing waste.
- The Project has targeted 15% recycled content materials and identify material suppliers that can achieve this goal. During construction, the General Contractor has put in place measures to ensure that the specified recycled content materials are installed and quantify the total percentage of recycled content materials installed.
- The Project has targeted regionally sourced materials and has identified materials and material suppliers that can achieve the goal of reducing the environmental impacts resulting from transportation. During construction the General Contractor has put in place measures to ensure that the specified regional materials are installed and quantify the total percentage of local materials installed.
- To encourage environmentally responsible forest management, the building uses minimum of 50% of wood-based materials and products, certified in accordance with the Forest Stewardship Council’s Principles and Criteria, for wood building components.

5. Indoor Environmental Quality

- The Project design incorporates permanent carbon dioxide (CO₂) monitoring system that provides feedback on space ventilation performance in a form that affords operational adjustments.
- The Project design conforms to the ASHRAE 129-1997 requirements for mechanically ventilated buildings, design ventilation systems and naturally ventilated spaces, to support the safety, comfort and well being of occupants.
- The Project team is in the process of addressing Air Quality (IAQ) for the construction and pre-occupancy phases of the building by developing and implementing an Indoor Air Quality (IAQ) Management Plan for the pre-occupancy phase.

- The VOC content of adhesives, sealants and sealant primers used must be less than the VOC content limits of the State of California's South Coast Air Quality Management District (SCAQMD) Rule #1168, October 2003. Products specified for this Project will meet these requirements.
- The design uses reduced quantities of indoor air contaminants that are odorous, potentially irritating and/or harmful to the comfort and well-being of installers and occupants. Carpet systems will meet or exceed the requirements of the Carpet and Rug Institute's Green Label Indoor Air Quality Test Program.
- The Project employs permanent entryway systems (grilles, grates, etc.) to capture dirt, particulates, etc. from entering the building at all high volume entryways to minimize exposure of building occupants to potentially hazardous particulates, biological contaminants and chemical pollutants that adversely impact air and water quality.
- The Project provides areas for copying/printing rooms with segregated partitions with separate outside exhaust at a rate of at least 9.2 cubic meters per hour per square meter.
- The Project provides at least an average of one operable window and one lighting control zone per 18.5 m² of floor area for all regularly occupied areas within 5 meters (15 feet) of the perimeter wall to provide a high level of thermal, ventilation and lighting system control by individual occupants or specific groups. The project uses addressable controls, and thermostats for individual human comfort, in lieu of large area zoning.
- The building provides a connection for the occupants between indoor spaces and the outdoors through the introduction of daylight and views into 90% of the occupied areas of the building.

6. Innovation & Design Process

- The Project incorporates a concrete mix which achieves a higher reflectivity than normal concrete and therefore reduces lighting requirements.
- The City operations department is in the process of developing a building cleaning and maintenance program which will conform to green principles.
- An education program from both building users and visitors is being developed which will explain the green features of the building as well as instruct building occupants on how the building functions and how they may actively interact with certain aspects of the building sustainable operations.
- The consumption of water is targeted to exceed a 40% reduction over and above the 30% targeted. If this is achieved and additional credit will be attained.
- The Project has a designated LEED accredited professional on the Project team which achieves and additional credit.

Project Update

Background:

The construction of the new Vaughan Civic Centre is now well under way. Designed by the internationally recognized firm KPMB Architects, the building proposal was selected through a two stage competition process. Detailed design development and working drawings were

completed with tenders called in 2006. Tenders were received in the fall and Maystar General Contracting Ltd. was the low bidder, and council awarded the contract in December, 2006.

Progress

Construction began in early 2007, with site mobilization, site preparation, and hoarding installation of trailers underway. All site preparation was completed and in place during the early spring.

Excavation and dewatering was carried out during the spring and early summer, with shoring completed and dewatering operational. Rough site grading was also completed as well as the safety berm and fence along GO Railway line. At this time, planting with topsoil to be completed at a later stage.

During the summer months concrete work at the foundation and basement level was underway with 90% completion by October. Below grade waterproofing is ongoing and is approximately 90% complete. Mechanical and electrical trades are actively working on site, installing rough-ins, coordinating with other trades and reviewing shop drawings and submittals. Forming and placement of the ground floor slab underway and the superstructure will begin to rise above grade in January.

Two (north and south) construction cranes were installed on site in July and August respectively. Construction sequencing is from north to south, and therefore the north wing is progressing first, with basement slabs poured for the north wing and 50% of the parking area. All building foundation walls are in place, south end basement slabs and underslab drainage and foundation waterproofing is 70% complete.

Grade level construction has begun at the north wing ground floor and the Civic Square level 100 ground floor and slab is 50% complete. Early January should see the commencement of above grade construction.

Project Challenges:

There have been three areas that have presented challenges to progress on the project, and they are as follows:

1. During the dewatering process it was discovered that the water flow was greater than that initially identified in the Hydrogeological Report. Consequently there were design modifications made to the under slab weeping system to accommodate the increase flow requirements.
2. Greater quantity of soils contaminated with organic, debris and hydrocarbons were encountered than anticipated in the geotechnical report and environmental assessment. A total of 66 boreholes were drilled across the site. A large quantity of debris were found during excavation that was not located at any of the bore holes. Most of the hydrocarbon contaminated soil was discovered under the old Annex Building which housed the old York Region and the City's truck bays. It was suspected the hydrocarbon originated from an old buried oil tank inside the building.
3. Labour strikes lasted approximately 20 days.

Measures have been undertaken by the project Team to manage these challenges and keep the project moving towards a successful and timely completion.

Risk Management:

The City has engaged a professional Scheduling management consultants (Pearson Associates) and Cost Management Consultants (Helyer Associates) to assist the project team in successful project delivery and risk management. The Scheduling Consultant is working with the project team, contractor and architect to develop a management process to overcome any potential delays related to the project challenges listed and to keep the project on track for timely completion. Each phase of the project is put through a detailed analysis of critical path items, potential obstacles and delivery dates to ensure that the project can be completed within the schedule, and project sequencing has been given a thorough review.

The Cost Management Consultant has been retained to review constructability and analyze contractor's requests for information. This ongoing security is in place as a second check to ensure that the City of Vaughan receives excellent value.

Relationship to Vaughan Vision 2007

Vaughan Vision 2020 - Pursue Excellence in Service Delivery.

This report is consistent with the priorities previously set by Council and the necessary resources have been allocated and approved.

Regional Implications

Not applicable.

Conclusion

The Vaughan Civic Centre overall masterplan is a synthesis of urban planning principles and solar principles which have jointly produced the layout and positioning of the various buildings constituting the Vaughan Civic Centre. The collection of buildings form an overall Civic Campus of low-rise buildings which frame a zone of public spaces while positioning the buildings in ways to optimize solar exposure to both the public spaces and the buildings themselves.

The Project design facilitates natural ventilation both through the building Atria which facilitate air movement as well as at individual operable windows in offices and at workstations. The atria serve as the lungs of the building providing flexible, light-filled loft working spaces. The maximization of passive systems is fundamental to make a building that delivers a healthy work environment. Individual control of air supply at workstations and offices is provided which allows for individual fine tuning of environmental conditions. Effective day lighting and views to the exterior have been provided to over 95% of occupied areas through the use of floor to ceiling glazing at the building perimeter as well as the innovative use of atria and light monitors which bisect the work loft areas allowing light to penetrate into the centre of the building. The combination of fresh air, views and natural light have proven to have significant impact on employee well being and satisfaction with the work environment. Annual energy demand and costs have been modeled to reduce consumption.

At the exterior solar shading is located at critical south and west elevations. Building materials including local limestone and terracotta have been specified for the Project. The utilization of green roofs along with the use of a combination of a rainwater and ground water fed cistern for irrigation purposes facilitates the maintenance of the green roofs and surface landscaping at low cost should significant periods of drought occur.

The current LEED program for the Vaughan Civic Centre remains an opportunity for the City of Vaughan to become a sustainable leader, meeting the environmental challenges of the 21st century through a delicate balance of the user and the needs of the planet. The future phases of

the Civic Centre will build on the initiatives established during the Phase 1 work to further establish the value of Council Vision to lead and promote environmental sustainability within the City of Vaughan.

Attachments

1. KPMB Architects Letter, November 26, 2007

Report prepared by:

Marlon Kallideen, Commissioner of Community Services, Ext. 8501

Respectfully submitted,

Marlon Kallideen
Commissioner of Community Services

KPMB Architects Recent Work**KPMB**

Kuwabara Payne McKenna Blumberg Architects (KPMB) was founded in Toronto in 1987. Since then the studio has grown to a staff of 90+ and has consistently focused on creating architecture that contributes to the sustainability and cultural vitality of contemporary urban life. The firms' commitment to architectural excellence is demonstrated with over 100 design awards, including two American Institute of Architects (AIA) Honor Awards and nine Governor General's Awards for Architecture – Canada's highest honor for architecture. The firm is also the recipient of the Royal Architectural Institute of Canada's Firm of the Year Award (2006).

Recently KPMB has made a series of contributions to Toronto's Cultural Renaissance with five out of the nine projects. The firm is also attracting attention for a number projects that are demonstrating the fusion of aesthetics with sustainable performance. These include:

- 1) **Canada's National Ballet School** (Project Grand Jeté) (executed in joint venture with Goldsmith Borgal & Company Ltd.). Since opening in 2005 this project has gained international recognition for the School with its award winning design – including the AIA Honour Award, the fourth to be bestowed on a Canadian project in 40 years.
- 2) **The Gardiner Museum.** Opened to the public in June 2006, the design renewal has dramatically raised the profile of this modest museum and become a social destination for culture in the city. In 2007 it earned one of 10 highly prestigious Business Week/Architectural Record Awards for demonstrating that design excellence is an effective tool in realizing an organization's business objectives.
- 3) **Young Centre for the Performing Arts (YCPA).** The YCPA is the result of a unique partnership between George Brown College and Soulpepper Theatre Company to form a new paradigm that combines teaching and live performance in one facility. Since opening in January 2006, the Young Centre has significantly anchored the Distillery District as a cultural destination. The YCPA was one of four projects to receive the BW/AR Honour Award.
- 4) **The Royal Conservatory of Music TELUS Performance and Learning Centre** (with Goldsmith Borgal & Company Ltd. Architects for heritage restoration). This project will create a total of 190,000 s. f. of new academic and performance space including a 1,100-seat concert hall, studios and classrooms, a media centre, library and rehearsal hall. The project will define a new cultural precinct for the City in concert with Daniel Libeskind's transformation of the ROM next door, and the expansion of the Gardiner Museum of Ceramic Art by KPMB on Queen's Park.

*A Partnership of
Corporations*
Bruce Kuwabara
Thomas Payne
Marianne McKenna
Shirley Blumberg

Senior Associates
Christopher Couse
Luigi LaRocca

Associates
John Allen
Andrew Dyke
Mitchell Hall
David Jesson
Goran Milosevic
Robert Sims
Judith Taylor

- 6) **Manitoba Hydro:** The new corporate headquarters for Manitoba Hydro will create one of the most energy efficient large-scale buildings in the world and establish a model for cold-climate integrated building design. The project is targeting a 60%+ energy reduction for a 700,000 s.f. building as well as LEED Gold/Platinum. It is also a key participant in the City of Winnipeg's downtown revitalization strategy. In 2006 it received a Canadian Architect Award of Excellence.
- 7) **Vaughan Civic Centre.** Phase 1 is currently under construction. Winner of an invited design competition in 2004 the project has been to date nationally recognized for its innovative and civic concept with the 2004 Canadian Architect Award of Excellence. In 2005 it was one of the first projects to be honoured by the inaugural City of Vaughan Urban Design Award program. The project is targeting a LEED Gold rating.

KPMB continues to collaborate with clients and consultants throughout North America and increasingly in Europe to deliver architectural excellence that promotes the public realm and enhances urban life. Projects underway in Canada include the Canadian Museum of Nature in Ottawa¹ and Le Quartier Concordia for Concordia University in Montreal². Projects in the United States include the Goodman Theatre in Chicago, Sprague Memorial Hall and Hendrie Hall for Yale University, the Arthur Miller Theatre and Walgreen Drama Centre at the University of Michigan, and the New Sugar Building, a mixed-use development in Denver, Colorado. In Europe the firm's work includes the Canadian Embassy in Berlin³, and the Star Alliance Lounge at the Zurich International Airport in Switzerland.

¹ in joint venture with Barry Padolsky Architects and Gagnon, Letellier, Cyr Architectes

² in joint venture with Fichten Soifer Associates, Architectes

³ in joint venture with Gagnon, Letellier, Cyr Architectes and Smith Carter Architects and Engineers Incorporated