6
SUSTAINABLE DESIGN AND CONSTRUCTION STANDARD FOR REGIONAL FACILITIES

The Finance and Administration Committee recommends:

1. receipt of the presentation by Tracey Forrest, Manager, Corporate Energy Services and Subhash Bhatia, Sustainable Building Engineer; and

2. adoption of the recommendations contained in the following report, February 7, 2006, from the Commissioner of Corporate Services:

1. RECOMMENDATIONS

It is recommended that:

1. The Region approve a minimum sustainable design and construction standard of LEED™ Silver for new Regional facilities over 500 m² (5382 ft²) gross floor area. A higher level of certification than minimum standard can be considered on an individual business case assessment basis.

2. The Region approve implementation of sustainable design principles for retrofit and renovation projects on an individual business case assessment basis.

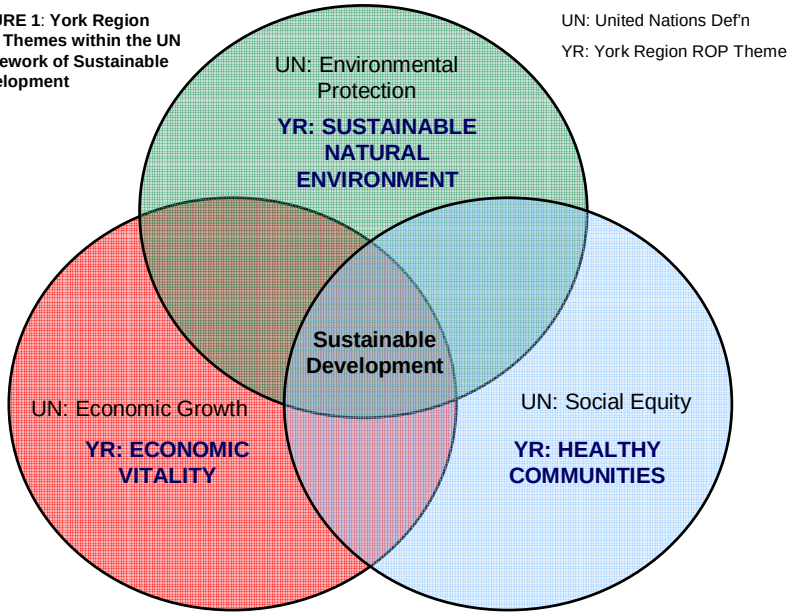
2. PURPOSE

The purpose of this report is to ensure that Regional owned facilities are designed, developed, and operated to demonstrate leadership in sustainability for the benefit of the environment and residents of the Region.

3. BACKGROUND

On October 27, 2005 Regional Council endorsed the proposed work plan for a Sustainable Development Initiative for York Region. The objective of the high level work plan is to move the Corporation forward to a more sustainable Region. The fundamental objective of this initiative is to strive for "triple-bottom line sustainability". That is, to simultaneously integrate the values of sustainable natural environment, healthy communities and economic vitality into all aspects of Regional policy, operations and decision-making. These values are the three elements of sustainable development as defined by the United Nations and are the three themes in the *Regional Official Plan* as demonstrated in Figure 1.

FIGURE 1: **York Region ROP Themes within the UN framework of Sustainable Development**



The Region's *Sustainable Buildings Program* is one of the effective means within the Corporation to operationalize the triple-bottom line by integrating building materials and methods that promote sustainable natural environment, economic vitality and healthy communities through the design, construction and operation of the built environment. Sustainable buildings or green development provide for the needs of the present without detracting from the ability to fulfill the needs of the future.

Sustainable buildings use key resources like energy, water, materials, and land much more efficiently than buildings that are simply built to code. They also create a healthier work, learning and living environment, with more natural light and cleaner air, and contribute to improved health, comfort, and productivity of the occupants. Sustainable buildings are cost effective, saving taxpayer dollars by reducing operations and maintenance costs as well as by lowering utility bills.

3.1 Purpose of Minimum Sustainable Standard

By adopting a minimum sustainable standard for new Regional facilities, the Region will:

- Provide a positive example of initiative and commitment to the environment.
- Support the *York Region Sustainable Development Initiative* by employing sustainable development principles and by raising awareness about its importance and benefit across the Region.
- Develop new facilities identified in the *York Region Strategic Accommodation Plan* in a sustainable manner.

- Implement and support the recommendations tabled in the *Corporate Clean Air Task Force Progress Report and 2006 Work Plan.*
- Support environmentally responsible (Green) procurement and waste reduction as outlined in the *Governments Incorporating Procurement Policies to Eliminate Refuse (G.I.P.P.E.R.) Statement of Principle.*
- Achieve compliance ahead of schedule to Climate Change Action Plan requirement for new commercial / institutional buildings to exceed the Model National Energy Code for Buildings (MNECB) by 25 percent by 2010.
- Reduce contribution to landfill sites by encouraging the reuse and recycling of construction, renovation, demolition and other solid waste materials.
- Promote development and restoration of sites in urban areas by encouraging implementation of the Region's Centres & Corridors strategy, utilizing existing infrastructure and protecting green fields.
- Encourage increased ridership of existing public transportation system through site selection and thereby reducing greenhouse gas emission and improving air quality.
- Reduce operating costs through improved energy and water efficiency.
- Promote a safe, healthy and productive workplace for the Region's employees and visitors.

4. ANALYSIS AND OPTIONS

The following sections outline the LEED™ (Leadership in Energy and Environmental Design) building rating system with respect to status, applicability, cost and implementation.

4.1 LEED™ Building Rating System

Standards to measure and rate the environmental impact and sustainability of building activities have been created by a number of national and international agencies. LEED™ is the most recognized and accepted rating system in Canada. It is a voluntary, consensus-based, market-driven building rating system. It evaluates environmental performance from a "whole building" perspective over a building's life-cycle, providing a definitive standard for what constitutes a "green building". It was developed by the U.S. Green Building Council (USGBC) in the mid 90's and has been licensed to CaGBC, a national not-for-profit corporation, for implementation in Canada. The Canadian version of LEED™ provides a comprehensive list of guidelines to improve the environmental and energy performance of buildings using proven principles, technology and materials that are aligned with Canadian standards and conditions.

USGBC has developed standards to cater to some specific project applications. These standards are being reviewed by CaGBC for their adoption. By the time Canadian versions of these standards becomes available, projects with such specific applications can be registered with USGBC for LEED™ certification.

- Existing Building Operations (LEED™ – EB)
- Commercial Interiors Project (LEED™ – CI)
- Core and Shell Projects (LEED™ – CS)
- Homes (LEED™ – H)

LEED™ Canada for new construction and major renovations contains prerequisites and credits in five categories: Sustainable Sites, Water Efficiency, Energy and Atmosphere, Material and Resources and Indoor Environmental Quality. An additional category, Innovation and Design Process, addresses expertise in green design and construction, as well as design measures not covered under the above categories. Points are earned by fulfilling the requirements laid out in each credit. The total number of points awarded in all credits and categories determines an overall rating of Platinum, Gold, Silver or Certified for a project. The project ratings are certified by CaGBC, following an independent review and audit of documentation submitted by the design and construction team.

A total of 70 points are available within four categories of certification:

- LEED™ Platinum - 52 to 70 points
- LEED™ Gold - 39 to 51 points
- LEED™ Silver - 33 to 38 points
- LEED™ Certified - 26 to 32 points

Refer to Attachment 1 for a detailed LEED™ Canada project checklist.

4.1.1 The National Experience

A number of public sector entities have adopted a minimum standard for their facilities.

- Region of Waterloo has adopted LEED™ Silver as a minimum design and construction standard for all new Regional facilities.
- City of Kingston has adopted project based LEED™ assessment for all large municipal buildings and retrofit projects.
- City of Ottawa has adopted the Green Building Policy which stipulates: *All newly constructed buildings with a footprint greater than 500m² must be designed, delivered and certified by the Canada Green Building Council (CaGBC) as being LEED™ Canada "Certified" at minimum.*
- City of Calgary has adopted LEED™ Silver as minimum sustainable design and construction standard for all new buildings and major renovations.
- City of Vancouver has adopted LEED™ Gold for all new civic buildings greater than 500m². The city also mandated specific energy points in the LEED™ rating system to ensure a 30 percent reduction in energy consumption.
- Public Works and Government Services Canada has adopted LEED™ Gold as a minimum standard for all new office buildings.

4.1.2 LEED™ Projects in the Region

There are numerous projects in the Region pursuing LEED™ certification:

- Joint Vaughan Fire Station 79 & York Region EMS Paramedic Response Station targets LEED™ Silver and construction completion by December 2006.
- Kortright Centre for Conservation – Living City Centre in Vaughan targets LEED™ Platinum and construction completion by 2007.
- Toronto and Region Conservation Authority (TRCA) Environmental Regeneration Services in Vaughan targets LEED™ Gold and construction in summer of 2006.
- Renaissance of Richmond Hill (Developer – Tridel), a seven storey condominium project targets LEED™ Certification and construction completion by May 2007.
- Markham Centre School for Athletics targets LEED™ Silver and construction completion by September 2007.
- The Vaughan Civic Centre and Power Stream headquarters are also targeting LEED™ certification though they are not registered with CaGBC at the present time.

The private sector interest towards LEED™ implementation is gaining momentum as interest in corporate environmental stewardship builds. Some high rise projects in the Greater Toronto Area from developers like Tridel, MintoUrban and Shane Bhaghai are also pursuing LEED™ Canada certification.

4.2 Applicability and Cost Analysis

4.2.1 Building Size & Application

A review of the Region's owned and leased facilities revealed that around 60% of the existing Regional buildings exceed a gross floor area of 500m². Considering the existing buildings to be a fair representation of the Region's future construction program, the minimum sustainable design requirement of a gross floor area over 500m² will be applicable to the majority of new Regional buildings.

This proposed initiative applies only to the general Regional portfolio and not the Housing York Inc. (HYI) facilities. Any policy impacting the HYI portfolio must be approved by the HYI Board of Directors.

The staff is investigating the minimum sustainable standard applicable for new HYI facilities. The design of a low rise rental apartment building in Newmarket will be reviewed to analyze minimum sustainable standard suitable for HYI facilities. A separate council report will be tabled later this year to address the design and construction standard for HYI facilities. The Process facilities such as water and wastewater pumping and treatment plants are not included since a LEED™ standard has not yet been developed for such specific application.

4.2.2 Cost Analysis

Sustainable buildings inevitably carry a higher initial cost premium for design and construction. There is no, as of yet, statistically definitive answer to the incremental cost associated with LEED™ buildings. The incremental cost depends entirely on the project type, intent, familiarity of the design team with LEED™, level of performance being sought as well as the stage at which (and how thoroughly) LEED™ is integrated into the design and construction process.

Buildings can be designed and constructed to achieve different levels of certification. The costs associated with utilizing sustainable principles are different from building to building. The familiarity and experience of the design and construction team can also have a significant impact to incremental cost premiums. However, based on a current review of the latest available cost studies, staff estimate incremental cost associated with various certification levels as follows:

LEED™ Platinum 7.5 – 10.5%
LEED™ Gold 3.5 – 5.5%
LEED™ Silver 2.5 – 3.5%

To provide an example of the cost implication on a typical building project, we can consider a new office facility of 10,000 m² (107,600 ft²) gross floor area, which is comparable in size to the new Central Services Centre. A typical incremental budget allowance of 3.5% would be applied to this facility for LEED™ Silver certification. If we assume a conservative energy target of 25 to 30% better than the Model National Energy Code for Buildings (MNECB), the facility would achieve an estimated energy savings of $45,300 to $66,700 per annum with a payback period of approximately 10 years (source for energy savings: National Resources Canada for similar size office facilities eligible for Commercial Building Incentive Program during 2004 and 2005).

Once all the benefits associated with a sustainable building are accounted for and analyzed using the Life Cycle Cost (LCC) method, the present value of the savings will greatly outweigh the incremental costs. LCC is an economic evaluation technique to determine the total cost of owning and operating a facility over a building life cycle (20-50 years). The estimated benefits related to water conservation, productivity gains, better indoor environment, reduced environmental impact and lower infrastructure requirements depend on individual project and can be quantified upon project completion.

Sustainable buildings significantly lower operating and maintenance costs. The financial benefits resulting from lower energy and water consumption could be realized year after year. In an environment where energy prices will continue to rise in the foreseeable future, energy reduction initiatives will play an important role in mitigating the operating costs of Regional facilities.

A number of studies have indicated a strong link between a better indoor environment associated with sustainable building and increased worker productivity. The magnitude of productivity gain is not clearly established as it relates to specific project conditions. However, a small productivity gain over the building life would be sufficient to compensate for any extra costs associated with the design and construction of sustainable buildings.

To offset the incremental cost, there are incentives available for sustainable, energy efficient projects. The Commercial Building Incentive Program (CBIP) offers two times the annual energy savings for buildings that demonstrate 25% better energy efficiency than MNECB, up to a maximum of a one-time grant of $60,000. LEED™ Canada stipulates design and construction of new buildings 25% better than MNECB as minimum standard. Therefore, new Regional facilities designed and constructed as per the LEED™ Canada rating system will be eligible for funding assistance under the CBIP program.

The minimum sustainable standard will contribute towards lower demand for large-scale infrastructure such as waste transfer facilities, water supply and treatment infrastructure and their related development and operational costs. It will also contribute towards reduction in transportation development and maintenance and increased economic performance of transit systems.

4.2.3 Minimum Certification Level

Considering the market maturity and incremental costs, staff recommend that all new Regional buildings over 500m² gross floor area be built to a minimum LEED™ Silver rating. Section 4.2.2 lists some factors which affect the cost of developing a LEED™ project. It is likely that the incremental costs will decrease with market maturity and experience of the design and construction team. It will be possible to achieve higher certification levels for the same cost premium once the market has developed familiarity and experience in sustainable design and construction practices.

4.3 Implementation

The key process difference between green and conventional buildings is the concept of integration. The Integrated Design Process uses a multi-disciplinary team of building professionals who work together from pre-design through post-occupancy phases to optimize the building's environmental sustainability, performance while minimizing cost. Using an integrated approach, buildings are developed in an iterative manner promoting input and communication from all building disciplines beginning at the earliest phase of design. Refer to Attachment 2 - Key Elements of Integrated Design and Construction Process.

For successful implementation of LEED™ design, it is critical that the design team act, think and function in a fully integrated manner. In order for this to occur a LEED™ accredited professional should sit on the design team and follow an integrated design

process from the onset of the project. The integrated design and construction process will ensure that:

- The integrated design approach is applied from project inception.
- Request for Proposal for design team includes minimum LEED™ requirements.
- The selected sustainable design strategies are integrated design solutions.
- The construction documents, building construction and commissioning includes sustainable requirements.
- The buildings are maintained and operated as designed to ensure continuous energy savings over building life cycle.
- The client departments support the delivery of LEED™ by ensuring additional project funding.

4.3.1 Performance Based Procurement

In order to encourage design and construction teams to meet and exceed minimum sustainable requirements, a performance based procurement model would be needed. The performance procurement model should provide incentives to exceed the minimum requirements and penalize non-compliance to the sustainable requirements. The Region is currently evaluating proposals to hire a consultant for the development of a monitoring process for contractor(s) performance.

4.4 Relationship to Vision 2026

Given the concept and holistic nature of the Region's Sustainable Development Initiative, the intent of this staff report is consistent with all goal areas and objectives of Vision 2026. More specifically, Vision 2026 identifies quality communities and enhanced environment that are environmentally sensitive and healthy as one of its principle goals. As a key player in community development, the Region has the opportunity to show environmental stewardship and leadership by ensuring that its own facilities are built and managed in a responsible and sustainable manner.

5. FINANCIAL IMPLICATIONS

There is a general consensus among building professionals regarding the economic, environmental and social benefits of LEED™ certified buildings. As stated in Section 4.2.2, there is no definitive answer to the incremental cost question as it depends on the project type, intent, familiarity of the design team, market maturity, certification level and the stage at which LEED™ is integrated into the design.

These factors should be evaluated on a life cycle cost basis to determine the incremental cost for each project. Based on the information available from cost studies, implementation of a minimum LEED™ Silver standard for new Regional buildings greater than 500m² gross floor area would require a typical incremental budget allowance of 3.5%.

The increased capital cost will be partially offset by funding from federal and provincial agencies (for example National Resource Canada CBIP grant). In return for the incremental cost, the buildings will be more energy efficient; have reduced environmental impact, better indoor environment and lower operating and maintenance costs.

6. LOCAL MUNICIPAL IMPACT

The adoption of a minimum standard for the Regional facilities will benefit all local municipalities by contributing towards lower demand for large-scale infrastructure, better Regional air quality and a reduction in greenhouse gas emissions.

7. CONCLUSION

Sustainable buildings provide better building performance, energy and water savings, enhanced indoor air quality and productive indoor environments. The sustainable building design requires a holistic approach from strategic planning to final design to a functioning building. By choosing to design and construct our own buildings to meet at a minimum the LEED™ Silver standard, the Region will demonstrate leadership to the community, enhance credibility, and build capacity and experience that can be shared.

The Senior Management Group has reviewed this report.

(The attachments referred to in this clause were included in the agenda for the April 6, 2006 Committee meeting.)