



City of Richmond

Report to Committee

To: General Purposes Committee
From: Jim V. Young, P. Eng.
Senior Manager, Project Development

Date: January 28, 2015
File: 10-6125-07-01/2015-
Vol 01

Re: Minoru Complex Energy Saving and Sustainable Initiatives Update

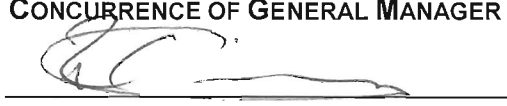
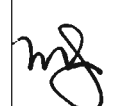
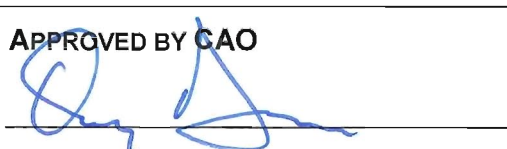
Staff Recommendation

That the staff report titled, Minoru Complex Energy Saving and Sustainable Initiatives Update, dated January 28, 2015, from the Senior Manager, Project Development, be received for information.

Jim V. Young

Jim V. Young, P. Eng.
Senior Manager, Project Development
(604-247-4610)

Att.

REPORT CONCURRENCE		
ROUTED TO: Recreation Services	CONCURRENCE <input checked="" type="checkbox"/>	CONCURRENCE OF GENERAL MANAGER 
REVIEWED BY STAFF REPORT / AGENDA REVIEW SUBCOMMITTEE	INITIALS: 	APPROVED BY CAO 

Staff Report

Origin

On November 12, 2013, Council made the following resolution:

The following Major Capital Facilities Program Phase 1 projects be endorsed and included in the City's 2014 budget process for Council consideration and described in the staff report titled, "Major Capital Facilities Program Phase 1," dated May 31, 2013 from the Director, Engineering:

- a. *A co-located Aquatics and Older Adults' Centre at Minoru 2 Field in Minoru Park (as shown in Attachments 2 & 3) and described in the staff report titled, "Minoru Older Adults and Aquatic Centre Site Selection," dated October 30, 2013 from the General Manager, Community Services and the General Manager, Engineering & Public Works.*

Council subsequently approved the following items related to the project:

- a. Capital budget (December 9, 2013);
- b. Award of Architectural and Engineering Services (March 10, 2014);
- c. Public Engagement Plan – including establishment of stakeholder and Building Advisory Committees (March 10, 2014);
- d. Guiding principles and program and space allocation (July 28, 2014); and
- e. Minoru Complex Floor Plan and Preliminary Form/Character (October 10, 2014).

Work has been ongoing in terms of all elements of the project since Council's approvals were received.

The purpose of this report is to update Council on the Minoru Complex energy conservation and greenhouse gas emissions reduction strategies, and on the current estimated Leadership in Energy and Environmental Design (LEED®) rating that this project is designed to achieve.

Background

Council's commitment to corporate energy conservation, efficient resource use and reduced GHG emissions, are key components that drive the City's sustainable business and operational practices. This continual commitment led to the recent update of the Sustainable "High Performance" Building Policy – City Owned Facilities (#2307) in February 2014, with strong energy conservation and sustainability performance targets for new and existing facilities. The update was brought forward so that it would coincide with initiation of the Major Capital Facilities Program, and includes the following key measures:

- Target of LEED® Gold certification for new construction, with the goal of 10 LEED® points achieved from the Optimize Energy Performance criteria (equals 24% better than current building code for energy performance), along with emphasis on implementing measures that reduce water use, maintenance and operational costs, greenhouse gas emissions, and optimize indoor environmental quality.

- Target no net increase in corporate building energy use and related greenhouse gas emissions, as compared to 2012 levels by:
 - Aiming to not increase energy demand or GHG emissions when constructing replacement infrastructure; and/or
 - Striving to offset increased energy demand and GHG emissions through reductions at other civic facilities.
- Ensure effective stakeholder engagement is carried out through an integrated design process that utilizes a collaborative design approach, involving consultants, staff and user group representatives, to set a well-defined vision and performance objectives for the project.

Analysis

Energy Efficiency and Sustainability Considerations

Given the high energy demand of aquatic facilities, the design focus has been to maximize energy efficient operation, heat recovery, and GHG emissions reduction. This is being accomplished by engaging in a high degree of collaboration with a multi-disciplinary team to inform the design development process.

Energy conservation and GHG emissions reduction strategies for this project have been implemented as part of a full building environmental strategy that also considers site development, water consumption, energy demand and efficiency, building operational costs, material selections, social sustainability, indoor environmental quality, and adaptation to climate change.

Several energy efficient systems have been incorporated into the design to pursue LEED® Gold certification for new construction, reduce operational cost and Optimize Energy Performance. Highlights being incorporated into the design are as follows.

- A low temperature water loop and integrated heat recovery system to maximize the waste heat that is recaptured and shared between spaces.
- An external building envelope that minimizes heat loss from internal spaces.
- Photovoltaic (PV) panels that convert solar energy to electrical energy, which will displace some of the purchased electrical energy of the facility.
- Low flow fixtures throughout the building, reducing the site's water demand.
- A shower water waste heat capture systems, to pre-heat some of the domestic hot water supply.
- High efficiency light emitting diode (LED) lighting.
- State of the art building automation and control systems, which will allow for optimized scheduling and detailed energy use monitoring.
- A rainwater capture system for non-potable water use on site, reducing landscape water demand and storm water run-off.

Although the new Minoru Complex facility (110,000 ft²) is approximately twice as large as the current Minoru Aquatic Centre and Older Adult's Centre combined (55,000 ft²), these energy efficiency measures are estimated to enable the new facility to replace the other facilities without increasing corporate energy use. The following achievements are also anticipated to be met.

- As compared to the existing Minoru Aquatic Centre and the Older Adult's Centre, the proposed design and mechanical system for the new Minoru Complex is anticipated to reduce associated GHG emissions by 70% – this is equivalent to a reduction of approximately 600 tonnes of CO₂e or a reduction of 180 Richmond cars from the City roads.
- The proposed energy efficiency and waste recovery measures at Minoru Complex will allow the City to meet one of the main goals of the Sustainable High Performance Building Policy – 6.0 “aiming to not increase energy demand or GHG emissions when constructing replacement infrastructure.”
- In comparison to the building code reference building, the new Minoru Complex will have approximately 50% less annual energy demand and 80% less GHG emissions than a typically constructed facility.

The design team also reviewed the possibility of incorporating renewable energy sources besides solar PV into the facility design including geo-exchange heating, solar thermal hot water heating, and heat recovery from the Minoru Ice Arena. It was found that presently none of these renewable energy alternatives were suitable and/or cost effective to be integrated into the Minoru Complex energy system. As design development progresses, staff will continue to review opportunities including grants or other external funding in a continued effort to incorporate renewable energy into the project design.

The Minoru Complex is currently in the design development phase – as design development progresses there are likely to be adjustments to the energy/sustainability initiatives as described herein.

Current Estimated LEED® Certification Level

Achieving LEED® Gold certification for the Minoru Complex has been a goal from the project outset, with emphasis on optimizing building energy use.

LEED® Gold is the second highest certification level and signifies a strong commitment to achieving a sustainable design and building. Through multiple sustainable measures such as indicated below, the Minoru Complex is anticipated to achieve LEED® Gold certification with a total score of 63 to 66 points (minimum for LEED® Gold is 60pts).

- Optimized energy use through a reduction in glazing ratio and improved external wall construction.
- Maximizing heat recovery and energy transfer within the building to reduce overall energy use.
- Using low flow water fixtures throughout the building.

Due to the significant emphasis placed on conserving energy use throughout the building and mechanical design phases of this project, the building is expected to achieve seven points in the Optimize Energy Performance criteria. This is approximately 18% better than the referenced building code making this iconic facility one of the most energy efficient buildings in the region.

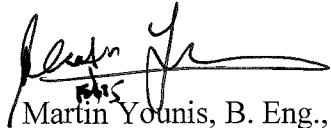
As design development for the Minoru Complex progresses, the design team will continue to seek energy conservation opportunities and incorporate additional enhancements where possible to achieve the High Performance Building Policy goal of ten energy points in the Optimize Energy Performance criteria.

Financial Impact

None.

Conclusion

The Minoru Complex has been designed to satisfy and fulfill the needs of a growing community for future generations, which includes the construction of a highly efficient and sustainable building. The new Minoru Complex reduces the City's corporate carbon footprint and minimizes conventional energy costs increases, while increasing recreational capacity. The construction of the Minoru Complex is expected to be a model for inclusive stakeholder engagement and integrated design approach that leads to an extremely high quality, efficient and iconic facility.



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