

DATE: January 21, 1998

**SUBJECT: PARK BOARD ENERGY MANAGEMENT COORDINATOR**

**RECOMMENDATION:**

**THAT the Board approve the continuation of the Park Board Energy Management Coordinator position as regular full time and that the position be funded from savings to Park Board utility budgets.**

**POLICY**

The Global Budget arrangement with City Council allows the Board to establish staff positions at its discretion if funds are in place.

**BACKGROUND**

Since 1987 the Energy Conservation Office at City Hall in the Building Management Branch of the Corporate Services Group has carried out a variety of energy conservation measures within various Park Board facilities. Because of these conservation measures, the projected energy cost avoidances to the Park Board now total \$244,000 each year.

A Park Board employee was assigned as a Temporary Energy Project Coordinator in 1991 to work under the direction of the City Energy Manager to coordinate the completion of facility energy audits, to liaise with Engineering Consultants, contractors and Park Board staff, to review specification documents, and to complete administrative tasks associated with project work. Funding to cover project costs for consulting and construction, and for the Temporary Energy Project Coordinator position, was arranged through a loan from the Property Endowment Fund, and subsidized by the B.C. Hydro Power Smart Program. The total capital expenditure of \$1.37 million, borrowed for conservation projects, was ultimately paid back from savings to Park Board utilities accounts.

**DISCUSSION**

Energy Conservation Program

The Energy Conservation Office explores, and carries out, where feasible, a variety of conservation strategies and amendments to operational practices that result in utility cost avoidances and

raise awareness of conservation issues. These strategies are described in Appendix .

## The Role of the Park Board Energy Project Coordinator

While the Park Board Energy Project Coordinator shares office space with, and takes technical direction from, the City Energy Manager, he is directly responsible to the Manager of Building Services & Maintenance in the Environment and Operations Division of the Park Board.

The incumbent is responsible for the management and administration of the energy accounting program for Park Board facilities, and for the development of the water consumption accounting program. He is also required to perform some functions formerly the responsibility of consulting engineers. These responsibilities include:

- completion of facility audits of Park Board facilities,
- identification of viable energy conserving strategies,
- completion of computer-aided lighting designs to IES standards as needed,
- defining the scope of system / equipment upgrades with the City's Manager, Energy Conservation,
- preparation of project documents defining scope of work, product specifications and tender requirements as needed,
- performance of project management administrative functions, to include: proof of insurance, WCB standing, City of Vancouver business license, and appropriate trades licensing,
- supervision of construction, commissioning and project sign-off.

The success of each project in providing utility cost avoidances is determined by a process of monitoring and verification over time.

## Energy Coordinators Work Plan

Audits of the principal recreational facilities are to be completed as the preliminary step in determining the conservation strategies to be implemented. It is projected that a total of five audits of major facilities can be completed in each calendar year beginning in 1998. Consulting Engineers will be commissioned to audit those major facilities that incorporate multiple services, such as swimming pools with ice arenas, due to the complex nature of their operations. These facilities include Killarney C.C., Riley Park C.C. and the West End C.C.

Based on the 1996 Budget allocations for utilities consumed within Park Board facilities, 36.2% of the electrical costs, 26.5% of the Natural Gas, and 25.9% of the water charges are attributable to the smaller out buildings, including field houses, marinas, golf courses and beach houses. The potential for savings in these areas is perceived to be significant as few conservation measures have been completed in these structures to date. Therefore, along with the major facilities, audits will be conducted on a number of these smaller sites each year to identify potential utility cost savings.

## Budget Considerations

The goal of the Energy Conservation Office is to realize utility and energy cost

avoidances in Park Board facilities totaling an additional 15% or \$390,000 within five years. These additional cost avoidances would be achieved through system modifications and operational changes that are estimated to cost approximately two million dollars. This funding would be borrowed from the Property Endowment Fund. The resultant utility cost avoidances would be used to repay the capital costs of the projects with a simple payback of five years.

Current budget allocations for electrical, natural gas and water utilities within Park Board facilities total approximately \$2.6 million annually. It is accepted within the industry that savings of 2% can be realized, without any capital expenditures, through due diligence of energy management monitoring. These activities include an energy and water accounting, project design review, specification development and auditing of facility equipment and operational practices. Two percent savings of the total annual utility budget is calculated to be \$52,000, a value that would come very close to covering the salary costs of the administrative position currently held by the Energy Project Coordinator.

Conversely, it is also recognized within the industry that without energy monitoring and due diligence, energy consumption and utility costs rise. Therefore, it is assumed that, in the absence of a reasonable alternative, non-continuance of the present Energy Project Coordinator's position would compromise the past advances achieved in energy conservation, and will result in increased electrical and natural gas expenditures.

The City Energy Manager also proposes to utilize the services of the Energy Project Coordinator on occasion to aid in the completion of energy conservation project work within City facilities. Compensation to the Park Board would be arranged for these services.

The estimated cost of this proposal for 1998 is \$53,400 including fringe benefits, to be covered by utilities account savings.

## **JUSTIFICATION**

Continuation of the energy management program is not feasible without a full time position assigned to Park Board projects. The Manager, Energy Conservation, City Building Management Branch cannot handle Park Board facilities and City facilities along with his other duties.

Until completion of the BC Hydro Power Smart program projects, this position was funded by a subsidy from BC Hydro and funds borrowed from the P.E.F. The BC Hydro subsidy is no longer available and funding the salary from the P.E.F. is repaid from the Park Board utility budgets.

Continuation of energy conservation strategies through the work of the position will result in continuing energy savings sufficient to fund the position.

## **APPENDIX**

### **UTILITY COST AVOIDANCE STRATEGIES**

#### 1. An ongoing energy accounting and monitoring program.

The Park Board Energy Project Coordinator tracks the monthly electrical and natural gas charges for Park Board facilities. The program is under frequent review and has now expanded to monitor thirty-three facilities. Energy Consumption Summary reports are forwarded quarterly to management and to the facility staff of major facilities. These reports include details of the monthly consumption and power demand values, billing structure, the energy costs per square metre, and the power factor. This monitoring exercise ensures that the Park Board obtains the most favorable electrical and gas rates available. The monitoring of electricity and natural gas billing also aids in the identification of system anomalies and permits detection of low power factor so that remedial action can be initiated and penalty charges avoided. These reports increase the awareness of Operations and other staff of the effects their operating procedures have on utilities consumption.

#### 2. An ongoing water consumption accounting

The Energy Conservation Office has begun development of a Park Board water consumption monitoring program. The bimonthly water consumption of various facilities is tracked, and quarterly reports are issued to management and facility staff, identifying the average daily potable water rate of consumption and the associated costs. Water rates have increased 23% in two years, and are expected to increase further. In addition, the GVRD has initiated a charge for secondary water treatment based on a flow rate. Water conservation, therefore, presents an opportunity to reduce costs.

#### 3. Engineering strategies

##### a) Mechanical system upgrades

The Energy Project Coordinator seeks out opportunities to achieve improved efficiencies through modifications to, or replacement of, existing mechanical systems. Adjustments may include system balancing by industry professionals. Systems to be considered include: principal heating equipment, air handling units, exhaust air, refrigeration and pumping systems.

##### b) EMCS installations

The Energy Conservation Office pursues the installation of new, or expansion of, existing computerized building management systems. Wherever feasible, in-house staff are utilized, thereby eliminating charge-out costs for contractors while increasing the understanding and technical expertise of Park Board Operations staff.

#### c) Electrical equipment modifications

The Energy Conservation Office investigates the benefits of various electrical system upgrades, including high-efficiency motor replacements, motor downsizing, switching control upgrades and lighting improvements.

#### d) A water management program

The water management program includes the completion of fixture inventories, water flow rate metering and the installation, where appropriate, of flow restriction devices and implementation of strategies for water loss avoidance.

#### e) Soft conservation strategies

The Energy Conservation Office seeks out and carries out, where appropriate, soft conservation strategies. This may include the installation of low-emissivity ceilings in ice arenas and swimming and whirlpool covers.

#### f) Pre-construction design and specification review

The Energy Conservation Office provides technical support to other divisions (Planning, Operations, Recreation) on various engineering issues. To date these have included: light level projections and remedial recommendations, lighting product selection and DDC controls applications.

### 4. Educational activities

The Energy Conservation Office attempts to source and make facility operators aware of training opportunities on topics related to the conservation of utilities.

Training has also been custom-designed where a need exists. For example, a curriculum was developed and an instructor sourced to provide on-site hands-on training in combustion theory and the use of a flue gas analyzer. Awareness and understanding are further promoted through the distribution of pertinent periodicals and technical papers related to energy conservation issues.

### 5. Users pay strategies

The Energy Conservation Office recommends to Park Board management utility cost recovery where deemed appropriate and feasible from tenants and user groups. In some cases, this is achieved through sub metering.

### 6. Rebates and incentives

As with the recently completed Power Smart Program, the Energy Conservation Office will continue to source incentives from outside agencies and utilities, including BC Gas, BC Hydro, the federal and provincial governments, and from private industry.

#### 7. Legislated changes and requirements related to energy conservation

The Energy Project Coordinator will continue to monitor for legislated changes at the federal, provincial and municipal levels on energy issues, and to advise the various Park Board Divisions (Planning, Purchasing, Operations, etc.) of those that impact the selection of materials and products for new and retrofit construction in Park Board facilities.

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