

## PETROLEUM CORPORATION OF JAMAICA BUILDING

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### ABSTRACT

New standards of energy efficient building design and construction for semi-tropical climates resulted from the combined efforts of Dubin-Bloome Associates, P.C. and Marvin Goodman and Associates.

The Petroleum Corporation of Jamaica (PCJ) authorized Marvin Goodman and Associates to design their headquarters building with Dubin-Bloome Associates retained as the architectural, mechanical, electrical and energy consultants for the PCJ Building.

The objective of the building design team was to select materials and develop systems and plans for a building that would use less than 25,000 Btu/sq. ft./yr. within the established budget and consistent with the owners' program.

The building design deserves recognition by virtue of its innovative use of energy management principles. Virtually no data had been accumulated for Jamaica and other semi-tropical and tropical climates pertaining to energy management and alternate energy use. The design team compiled available information to establish a data base.

A prototype for energy-efficient office buildings in Jamaica and the Caribbean area, the 108,000 sq. ft. office building will serve to:

- o Minimize consumption of non-renewable resources through the reduction of the annual energy requirement for VAV more than 55%, the peak cooling load by more than 35%, the annual lighting by more than 45%, and the peak electrical load by more than 54%, accomplished at no additional capital cost. Actual bids were below base building estimate.
- o Reduce operating costs for energy by more than 43%, as compared to a conventional building. Energy costs for multi-story buildings in Kingston average \$3.00/sq. ft. compared to the projected energy cost of \$1.70/sq. ft. for this energy efficient building.
- o Provide a comfortable, safe and productive working environment. The building design is a stimulating natural environment of sunlight, fresh air and foliage.
- o Be responsive to the site and the Jamaican climate by reducing building water requirements, using multi-directional daylighting from the atrium and light shelves on the exterior to provide the ambient daylighting, and shading the building exterior to reduce heat gain into the building by 53%.
- o Stimulate energy-conscious building design and operation in Jamaica and by example, in Caribbean area.
- o Transfer technology appropriate to Jamaica from the United States and other Nations to encourage energy management in future Jamaican buildings. Technology introduced to the Jamaicans included solar absorption cooling, photovoltaics, efficient central cooling equipment, dessicant dehumidification, cooling storage, photocell control, hot gas heat exchanger for heating domestic and service water from the building air conditioning system, enthalpy and economizer control as parts of a complete energy management system and others.
- o Set a new standard for reduced energy consumption, 23,000 Btu/sq. ft./yr., encouraging the establishment of EPI's for new buildings in semi-tropical climates.