

Honolulu Municipal Building & Honolulu Police Department Headquarters ESPC



Rebuild Hawaii Quarterly Meeting
May 23, 2006

Energy Conservation Measures

- ECM 1 – HMB Lighting Retrofit
- ECM 2 – HMB Central Air Conditioning Plant Upgrade/Retrofit
- ECM 3 – HMB Rooftop Photovoltaic System (Not Implemented)
- ECM 4 – HPD-HQ Lighting
- ECM 5 – HPD-HQ HVAC System Modernization

Under Consideration:

- PC Power Management Program
- HECO's Commercial/Industrial Direct Load Control (CIDLC) Program

ECM 1 – HMB Lighting Retrofit



Typical Floor Before Retrofit

- “Super T8” lamps and ballasts (~7,800 fixtures)
- De-lamp fixtures from 2-lamps to 1-lamp with custom reflectors
- Tandem/quad wiring of ballasts

- Occupancy sensors in selected offices and areas
- New fluorescent fixtures in elevator lobbies
- Dimmable fluorescent lighting in selected conference rooms



Same Floor After Retrofit

ECM 2 – HMB Central Air Conditioning Plant Upgrade/Retrofit



Existing 325-Ton Centrifugal Chiller (One of Two)



Existing 90-Ton Air-cooled Chiller (Night Time & Emergency)

- New high-efficiency chillers with VFDs
- New induced draft cooling tower



Existing Forced Draft Cooling Tower

ECM 2 – HMB Central Air Conditioning Plant Upgrade/Retrofit (Cont.)

- Series to parallel flow conversion of chilled water piping system
- New VFDs on chilled water pumps
- Modernization of building's two main air handler units
- Replace 286 constant volume boxes with new digital controlled VAV boxes in office space
- New web-based energy management and control system
- Re-commission computer room HVAC system
- Upgrade mechanical room to ASHRAE refrigeration standards

ECM 4 – HPD-HQ Lighting



HPD Squad Room

Install occupancy sensors in selected offices and areas



ECM 5 – HPD-HQ HVAC System Modernization



Two (2) Existing 500-ton Centrifugal Chillers

- Retrofit supply air fans with VFDs and CO₂ sensors
- Install new VAV controllers
- Replace air handler valves and actuators
- Install new VAV in Traffic Division office
- Install new DDC controller in central dispatch center
- New web-based energy management and control system
- Convert one 500-ton chiller to VFD operation
- Replaced failed VFDs of air handlers and chilled water pumps

Energy Savings

	kWh	kW	Cost
HMB Baseline (11/04 to 10/05)	7,786,975	1,511	\$1,085,016
HMB Savings	2,236,133	617	\$ 354,766
Reduction	29%	41%	33%
	kWh	kW	Cost
HPD Baseline (11/04 to 10/05)	8,878,513	1,309	\$1,177,308
HPD Savings	1,925,546	233	\$ 256,632
Reduction	22%	18%	22%

Construction Cost: \$7,038,086
 Estimated HECO Rebate: \$ 175,000
 Net Cost: \$6,863,086

Cost Savings: \$ 611,398

Payback: 11.2 Years

Completion of Construction – December 2006

Project Keys

- Preliminary Energy Assessment by HECO
Provided scope of work and budget estimates
- City personnel familiarity of ESPC process
Used lessons learned from Honolulu Hale Project
- Experienced project team
Worked on Honolulu Hale and other City projects

Project Team

Contractors:



Heide & Cook



Consultants: Randolph H. Murayama & Associates, Inc.
Ronald N.S. Ho & Associates, Inc.

Questions: Allyn Lee
Department of Design & Construction
City & County of Honolulu
523-4106

