



## case study

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product

**CITY MULTI / Mr. Slim**

market

**Multi-family Residential**

location

**Honolulu, Hawaii**





## Paradise Required Unique Solution

Project Name  
**909 Kapiolani**

Location  
**Honolulu, Hawaii**

Completion Date  
**September 2007**

### The Team

Developer  
**POSEC Hawaii, Inc.,  
Honolulu, Hawaii**

Architect  
**The Durrant Group, Inc.,  
Dubuque, Iowa**

General Contractor  
**Hawaiian Dredging  
Construction Company, Inc.,  
Honolulu, Hawaii**

HVAC Contractor  
**Critchfield Pacific, Inc.,  
Honolulu, Hawaii**

HVAC Distributor  
**AC Warehouse, Inc.,  
Honolulu, Hawaii**

909 Kapiolani, a 36-story, residential glass tower completed in September 2007, is located in the Kaka'ako commercial/retail district of Honolulu, Hawaii. It offers stunning views of Diamond Head and the beaches of Waikiki. POSEC Hawaii, Inc., Honolulu, a wholly owned subsidiary of Seoul-based POSCO Engineering and Construction, was the project developer.

The elevator lobby, upscale shops and private access entry of 909 Kapiolani are located on the street level. Homeowner parking occupies the first five floors. A recreational deck, swimming pool and landscaped plaza start the living levels. Floors six through 33 house the living areas called "The Residences" where each floor has four one-bedroom, one-bath units and four two-bedroom, two-bath units. "The Penthouses" reside on floors 34 and 35, each consisting of three two-bedroom units with two baths; one two-bedroom unit with two and a half baths; and one three-bedroom unit with two and a half baths. Finally, the 36<sup>th</sup> floor hosts two rooftop "Terrace Penthouses" consisting of one two-bedroom unit with two and a half baths and a wrap-around, 1,700-square-foot lanai; and one three-bedroom unit with two and a half baths and a 1,427-square-foot lanai. Each one of these 227

condominiums has its own lanai, ranging in size from 42 to 1,700 square feet.

### **One of the First Mr. Slim® System High-rise Installs in U.S.**

While the skylines of many European and Asian cities are graced with high-rises sporting Mr. Slim systems, none of the members of the 909 Kapiolani HVAC team know of a residential high-rise in the U.S. specified almost entirely with Mr. Slim split-ductless systems. Gary Imamura, president, AC Warehouse, Inc., Honolulu, said, "It's pretty common to have split-ductless systems in a hotel; in fact I know of three Mr. Slim systems installed in hotels around Waikiki – the Waikiki Joy, the Equus (formerly Hawaiian Polo) and the Wyland Hotel Lofts. But I don't know of one residential high-rise like 909 Kapiolani."

Ron Swenson, sales manager, Critchfield Pacific, Inc., Honolulu, agreed with Imamura on the historic precedent of 909 Kapiolani. Swenson received a call from Hawaiian Dredging Construction Company, Inc., Honolulu, in spring 2005 to bid on the HVAC system design. With the help of Bobby Hahn, Pacific Systems Group, Torrance, Calif., a manufacturer's representative for Mitsubishi Electric HVAC Advanced

Products Division, Suwanee, Ga., Swenson submitted the winning bid for the HVAC contract, beating two of Mitsubishi Electric HVAC's closest competitors.

"Mr. Slim split-ductless systems are all about comfort and convenience—ideal attributes for residential living, regardless of the number of floors," said Swenson. "For 909 Kapiolani, the combination of Mr. Slim on the first 33 floors and the CITY MULTI® Variable Refrigerant Flow Zoning (VRFZ) system for the penthouses on the top three floors worked perfectly. These systems were very easy for my crew to install because there are very few parts. Before the first families moved in last fall, we fired up all 227 systems and they started without a hitch—extremely rare in this business."

#### **Key Mr. Slim System Benefits Sway Decision**

Swenson described the key Mr. Slim system benefits that determined the contract award for 909 Kapiolani:

The Mitsubishi Electric proprietary INVERTER-driven compressor technology (Variable Frequency Drive) provides exceptional, high-speed cooling (28,600 Btu/h) and dehumidification. It operates very efficiently by minimizing energy

usage. A Mr. Slim system uses only the minimum amount of energy necessary to cool individual zones in each condominium.

Mr. Slim systems keep in check the "discomfort quotient," the term commonly used to describe the high-humidity level of Hawaiian heat. The air-conditioning systems accomplish this phenomenon by reducing the humidity in each zone, providing comfort for each homeowner. Each indoor unit has a dry mode setting, accessible by simply pressing a button on the convenient wireless remote controller.

The Mr. Slim outdoor unit, engineered for 48 dB(A) at cooling, is 20 percent quieter than the sound code required by the City of Honolulu. The outdoor unit fan is designed to deliver air quietly and continuously with only a gentle "whoosh" for constant circulation. Because the outdoor units sit on each lanai, it was extremely important that the next door neighbors not hear the outdoor unit's compressor. This feature was influential in the decision-making process.

Mr. Slim systems require no ductwork. As such, materials and installation costs were kept to a minimum, contributing to the ability

to complete the job easily and ahead of schedule. With Mr. Slim systems, each room in the condominium has individual zone control over comfort and temperature. No matter what the indoor environment or outdoor weather conditions are, users have precise control over the temperature in each room.

#### **CITY MULTI System Selected for the Luxury Penthouses**

"Some people have asked why we didn't specify Mr. Slim systems for all 36 floors," Swenson said. "The answer is really quite simple. For the 12 luxury penthouses on the top three floors we wanted the indoor units to be hidden, out of the homeowner's view. Similarly, we wanted the outdoor units hidden from view as well. This meant putting the outdoor units on the roof, instead of the lanai as we did with the Mr. Slim outdoor units. The simplicity of the CITY MULTI two-pipe system and non-polar, two-wire connection made this task easy.

"All of these requirements led us directly to the CITY MULTI VRFZ Y-Series, which gave us a perfect match for our design concepts. The PUHY-P108TGMU outdoor unit provides a huge 108,000 Btu/h cooling capacity and exceptional zone cooling. It has one of the



For 909 Kapiolani, a 36-story residential high-rise, the project team selected a combination of Mr. Slim and CITY MULTI systems. Ultimately, the installation garnered a \$70,000 energy rebate from the utility company.

smallest footprints in the industry (39 inches by 32 inches), perfect for the Kapiolani rooftop. The INVERTER-driven compressor technology delivers a smart, quiet and reliable operation and intelligently air-conditions up to 32 zones. Finally, by incorporating T-branches and headers, the Y-Series provides the ultimate in piping design flexibility. My crews found this system incredibly easy to install,” said Swenson.

**\$70,000 Energy Rebate from Hawaii Electric Company, Inc.**

Six months after the first family moved in, Young Jun Choi, controller, POSEC Hawaii, Inc., declared the 227 units of 909 Kapiolani 80 percent sold out. “We are very happy with the success of our Mitsubishi Electric HVAC systems here,” said Choi. “These energy-saving units have

saved us a lot of money and made possible an enormous, surprise rebate award from our electric company.”

Because of the highly efficient Mr. Slim INVERTER-driven, multi-zone technology on the first 33 floors, the building owners received a significant, one-time energy rebate award of \$70,000 from Hawaii Electric Company, Inc. The fact that Mr. Slim systems use environmentally friendly R410A refrigerant also contributed to this award.



**CITY MULTI Equipment Installed:**

- (4) PUHY-P108TGMU Y-Series (R410A) Outdoor Units
- (4) PDFY-P24NMU-E Ceiling-concealed Indoor Units
- (8) PDFY-P48NMU-E Ceiling-concealed Indoor Units
- (12) PAR-21MAA Deluxe MA Remote Controllers

**Mr. Slim Equipment Installed:**

- (215) MXZ3A30NA (R410A) Outdoor Units
- (322) MSH09TW Wall-mounted Indoor Units
- (215) MSH12TN Wall-mounted Indoor Units
- (537) Wireless Remote Controllers