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Bacco Mechanical Installs Mitsubishi Electric City-Multi at Palmdale, Calif., Embassy Suites

By Peter Landau, Editor,
Indoor Comfort New

The Embassy Suites Palmdale hotel, at seven stories and 156 rooms, is the tallest building in Antelope Valley, Calif. The 80,000-square-foot hotel had originally been planned with chillers and water-sourced heat pumps. The price for that set-up was prohibitive and the design was finally commissioned with Mitsubishi Electric HVAC City-Multi.

"The standard system that had been proposed was 30-year-old technology, which not only would have cost more, but would have been noisier and a lot less energy efficient," said Bob McGowan, general manager of the Lancaster, Calif.-based commercial heating, ventilation and air conditioning (HVAC) firm Bacco Mechanical, Inc. (BMI), and installing contractor on the job.

BMI was licensed in 1978 and runs 14 installation trucks and employs a crew of between 14 and 28, excluding office staff. It has recently opened a 4,000-square-foot sheet metal shop, with three full-time employees dedicated to manning the plasma machine and making duct, saving 45 percent on its fabrication costs.

The Embassy Suites Palmdale was BMI's first job with City-Multi equipment, which supplies refrigerant to a branch circuit (BC) controller that circuits the refrigerant to up to 13 individual rooms. Within the BC controller there are two different heat exchangers that provide simultaneous heating and cooling off of one refrigerant cycle, multiplying efficiency level, spreading the heating and cooling between floors before it returns to the roof.

The manufacturer's representative for Mitsubishi Electric was Bobby Hahn, of the Torrance, Calif.-based Pacific Systems Group. US Airconditioning Distributors (USACD) supplied the equipment out of its Lancaster branch, managed by Mark Ogden.

"We work together as a team," Ogden said. "We provide the equipment, but also answer the questions about equipment to meet their tight deadlines." USACD Lancaster expanded its warehouse by 5,000 square feet to accommodate the extra business from BMI.

"When Bacco got the Embassy Suites Palmdale project, Bob had to be certified in the City-Multi line, taking a three-day training class provided by Mitsubishi Electric in Irvine," said Jan Lankin, USACD Antelope Valley territory manager. "No contractor can buy or install this product without certification through the manufacturer's training course because of its advanced technology."

"The electronics on the City-Multi are a hundred times more complicated than on a standard HVAC system," said Jim McGowan, Bob McGowan's brother and a vice-president at BMI.

The City-Multi units heat and cool the entire hotel except for the lobby, which uses 12 York gas-electric package units and 10 split systems for a total of 22 zones. There are three Mitsubishi ductless units for the elevator room and two equipment areas. For the guest floors, there are 12 14-ton condensers on the roof, rated at 168,000 BTU, with two condensers responsible for each floor.

The project started in April 2008. It was slated for 14

months, but took longer due to problems outside of HVAC. The hotel opened in Jan. 2010.

"The biggest difficulty for us on this project was the post-tension slab for each floor, where they had to run cabling through it," said Bob McGowan. "None of that was drawn out in the engineers' plans because they changed from one system to another in the beginning stages. A lot of it was done on a design-build theory to get the job moving. We did a good job, but it created a lot of headaches."

Mitsubishi supplied the thermostats and controls. Other equipment used included Aeon make up air units, which supply fresh conditioned air. "The equipment is guaranteed for 25 years, running 24 hours a day, seven days a week," said Jeff McGowan, Bob McGowan's son and a vice-president at BMI. "That's what's heating the corridors and all of the common areas in the tower section. It also feeds fresh air into the return air system."

According to Bob McGowan, one of the most remarkable aspects of the Embassy Suites Palmdale installation was the startup. Once the building had power, the startup was accomplished in only four days. "We had slated it for three or four weeks," Bob McGowan said. "We ended up working around the clock for four days. To do 156 startups and have only minimal problems was amazing, especially never having worked on this system, which is electronically very complicated."

Another benefit to using the Mitsubishi Electric City-Multi system is how quiet it runs. "It's the design," said Bob McGowan. "Utilizing variable frequency drives, the compressor doesn't have to run at full power. It can run all the way down to 10 percent. The slower it goes the less noise and more efficient it is."

The system uses direct digital controls (DDC), which requires a laptop for any diagnostics reading. On the installation side, quality is crucial for the system to work. "BMI prides itself on high-quality installation," Bob McGowan said.

What helps in keeping the installation costs down is that Mitsubishi Electric City-Multi is the only two-pipe, simultaneous heating and cooling system currently on the market. Competitors' equipment require three or four pipes, doubling or tripling the amount of copper piping used in an installation and increasing the financial commitment.

"For the owner, the true savings is going to be over the next decade in reduced utility costs," said Bob



L-R: Jim McGowan, BMI; Mark Ogden and Jan Lankin, USACD; Jeff and Bob McGowan, BMI.



Mitsubishi Electric HVAC City-Multi units mounted to the rooftop of the Palmdale, Calif., Embassy Suites hotel.

McGowan. The City-Multi variable refrigerant flow (VRF) technology energy costs are 33 percent, 16 percent and 20 percent better when compared to a packaged thermal heat pump, water source heat pump and four-pipe system, respectively, depending on the weather conditions at the installation site. "And it's a life-long savings."

BMI is working on another City-Multi installation through an Embassy Suites hotel in Ontario, Calif. The only difference is that the new facility is eight stories high, one more floor than the Embassy Suites Palmdale. It is scheduled for completion in Aug. 2010.

Mitsubishi Electric City-Multi has been in use for decades in Europe, some units working for a quarter century without service. "With the efficiency of the equipment, meaning it's not being over taxed, as long as the system is kept clean and there are no refrigerant leaks it just keeps on running," Bob McGowan said.