

Southland Industries designed a central plant of 3,900 tons, that would be expandable to 7,800 tons, and 57,000 MBH of heating, expandable to 95,000 MBH.



Winning Hand

The M Resort is a new destination in the Las Vegas region. Once inside, guests play and relax in comfort provided by Southland Industries. **By Ron Rajecki, contributing editor**

What happens in Vegas is supposed to stay in Vegas, but in the case of the new M Resort Spa Casino, the word had to get out, in the form of a **Contracting Business Design/Build Award** for Southland Industries, Las Vegas, NV.

Located at the south end of the Las Vegas Strip in Henderson, NV, "The M" provides a desert oasis far enough away from the hustle and bustle of The Strip to be relaxing, yet close enough to provide all the action for which Las Vegas is famous.

The initial phase of M Resort consists of a 390-room, 12-story hotel tower, approximately 90,000 sq.ft. of gaming space, 40,000 sq.ft. of convention space, a full service spa, a three-acre pool area, eight restaurants, and an 800,000 sq.ft. parking garage. Southland's contract at M Resort included design and construction services for all mechanical, plumbing, and fire protection systems.

M Resort sits on 90 acres of land approved for up to 3,000 hotel rooms, 3,000 condo or time-share units, an additional 70,000 sq.ft. of gaming space, 100,000 sq.ft. of additional convention space, and 1 million sq.ft. of retail. Expansion plans on the drawing board include a second hotel tower and a low-rise, mixed-use, "urban village" complex consisting of a combination of retail, office, and condominium space.

'Fast Track' Required Parallel Design/Construction

As anyone who has ever sat at a blackjack table can tell you, things happen very quickly in Las Vegas. This project was no exception.

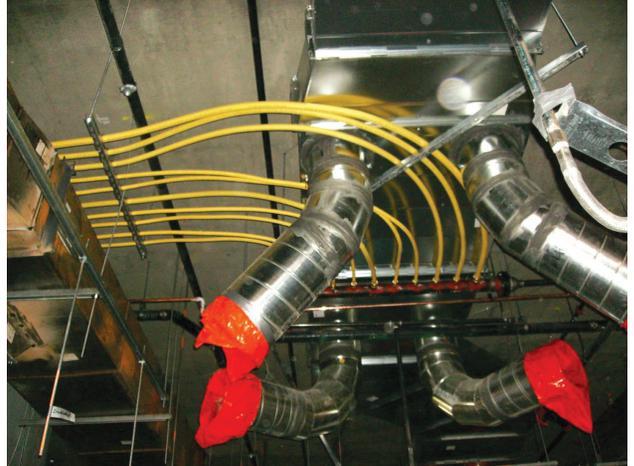
"The M Resort project was a fast-track construction project," says Michael Hallenbeck, Southland's assistant principal engineer. "The design and construction ran parallel to each other and were accomplished in under two years. This was an enormous task for the project team, given the size and scope of the project. The Design/Build process was the ideal delivery method to use, given the challenges associated with the construction schedule," Hallenbeck says.

Southland, *Contracting Business* magazine's 1999 *Commercial Contractor of the Year*, performed the mechanical, fire protection, and plumbing design in-house. Field reviews occurred regularly, and suggestions and concerns were integrated into the design early on. The close collaboration between the field and engineering allowed for a highly constructible and quality engineering design. Southland's engineers remained involved with the job throughout construction, quickly responding to field questions and concerns. The end result was high quality project, delivered on-time and on budget.

"Southland Industries uses a sophisticated planning process that incorporates computer software to three-dimensionally model and coordinate the work to be done by all the various trades," Hallenbeck says. "This allows for the more rigorous use of construction standards and enables a significant reduction of inter-trade collisions in the field. The mechanical and plumbing models are then converted to shop spool drawings and fabricated in Southland's fabrications shop. Before final sign off, the engineering department performs construction surveys and develops quality control punch lists to ensure the final installation meets engineering's design intent. These processes allow for a high quality installation that is efficient and correct."

VAV Accommodates Many Zones

The M Resort contains many types of occupancies and functions, ranging from hotel rooms, dining and kitchen, casino, office, conference center, data processing, spa/fitness, and warehouse. To accommodate these multiple zones, variable air volume (VAV) with re-heat terminal units was chosen as the primary air-handling system to meet the owners' comfort requirements. Zoning of the air handling units (AHUs) was critical to achieving proper occupant comfort. Southland's design called for a total of 24 AHUs grouped by occupancy. Separation of areas containing environmental tobacco smoke from non-smoking zones was taken into consideration in the AHU zoning. Zones that were primarily ventilation driven were supplied with hot water re-heat to prevent overcooling. A total of 430 VAV



Natural gas is distributed at 5 PSI throughout the building. There are 126 appliance hook-ups

boxes were used in the M Resort, to provide zone control.

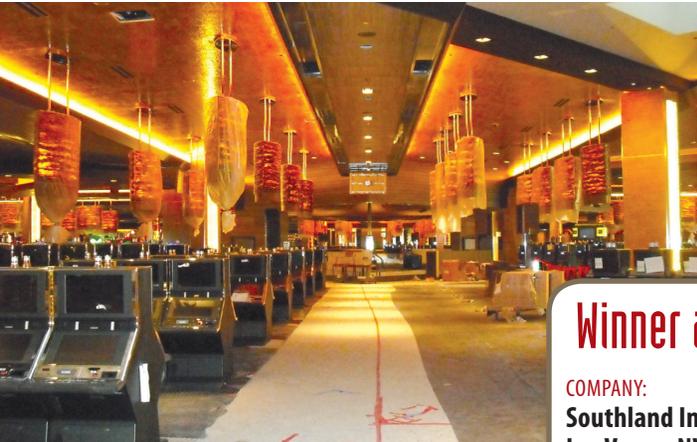
Ceiling diffusers and linear slot diffusers were carefully chosen in each zone to provide the correct throw and noise criteria. Many of the restaurant dining rooms feature high ceilings and glass curtain walls. Southland installed multiple VAV zones and linear slot diffusers at the glass curtain wall to maintain temperature control at the perimeter of the dining areas where the cooling/heating load was high, while not overcooling the interior dining areas.

Individual fan coil units were installed in hotel rooms,

Ceiling diffusers and linear slot diffusers were carefully chosen in each zone to provide the correct throw and noise criteria.



On the mezzanine deck, all tower piping is transferred to a vertical stack on this floor.



Ready to roll the dice. The 90,000 sq. ft. gaming area interior features 1,900 slot machines and 64 gaming tables.



The central plant includes three 1,300 ton Trane centrifugal chillers, variable speed chillers, and variable primary piping.

with thermostats to provide individual comfort control for each room.

The day spa was fitted with a dedicated hot water return loop, for quick delivery of hot water to the manicure and pedicure sinks. This was an owner requirement that enhanced patron comfort and reduced water consumption.

"The resort's direct digital control system coordinates the control and monitoring of all the buildings' mechanical systems," Hallenbeck says. "All mechanical equipment and major plumbing equipment was integrated into the control system. This allowed for the building operator to monitor and change zone set-points remotely from the building control room."

The M Resort features multiple energy efficient design features. The heart of the chilled water plant is highly efficient centrifugal chillers with variable primary pumping. A plate-and-frame heat exchanger, sized for the building tower and fan-coil load, combines with oversized cooling towers to provide free cooling dur-

ing the winter season.

All AHUs are equipped with 100% outside air economizers to provide free cooling during low temperature periods. All AHUs also incorporate variable speed drives and premium efficiency motors.

"Achieving acceptable indoor air quality is challenging, given occupancies that permit smoking. The American Society of Heating, Refrigerating, and Air-Conditioning Engineers (ASHRAE) doesn't provide an acceptable level of environmental tobacco smoke in its ventilation standard," Hallenbeck notes.

"To provide the highest quality ventilation system possible, Southland chose to provide a 100% outside air system for the casino floor. This system provides a significant ventilation benefit over a recirculation system, thus resulting in improved IAQ for the casino floor."

The AHUs that serve the casino floor include energy recovery units to reduce the heating and cooling load at the central plant, and feature demand control ventilation capability to reduce the quantity of outside air during low occupancy periods.

"Along with the size of the project and the fast-track schedule, providing air conditioning for the zones with large quantity of glazing such as the hotel suites, lobbies and restaurants, that was aesthetically pleasing given the high-end architectural finishes posed a challenge for the design team," Hallenbeck says. "Solving these problems required collaboration between the interior designer, mechanical engineer, and the construction team to develop an acceptable solution."

Ary Benoualid, senior vice president of construction for The Marnell Companies, was impressed by Southland's performance on this project. "I don't hesitate in saying that the Southland team is very qualified at all levels and was driven to producing the best possible results for the project," Benoualid says. "There's a significant value in using a Design/Build approach with the mechanical scope on a project the size and complexity of the M Resort, and Southland executed that approach exceptionally. We look forward to the next opportunity to partner with a first-class Design/Build

team like Southland Industries."

Southland's ability to pull together all the teams involved, and create a comfortable, energy efficient system for The M Resort is a winning hand in anyone's book, and one story that should not remain in Vegas. 

Winner at a Glance:

COMPANY:

**Southland Industries,
Las Vegas, NV**

PROJECT NAME/LOCATION:

M Resort, Henderson, NV

TOTAL COST:

\$45,754,791

KEY CUSTOMER CONTACT:

Tony Marnell, CEO, Marnell-Corrao

THE PROJECT TEAM:

Contract Executive: Dan Coppinger

Operations Manager: Phil Phillips

Construction Manager: Mark Williams

Assistant Principal Engineer: Michael Hallenbeck

PRODUCT KEYS TO SUCCESS:

- 12 Trane variable speed drives
- Armstrong plate/frame heat exchanger
- 17 Armstrong vertical centrifugal pumps
- 3 Marley cooling towers
- 5 Bell & Gossett vertical bladder expansion tanks
- 2 Bell & Gossett centrifugal air separators
- 6 Greenheck roof centrifugal fans
- 2 Griswold cooling tower basin filtration systems
- 10 Hydromatic sump pumps
- 19 Loren Cook roof centrifugal fans
- 23 Loren Cook kitchen exhaust fans
- 4 Unilux gas hot water boilers
- 2 Wingert chemical feeders
- 7 Trane horizontal fan coil units
- 3 Trane chillers
- 24 Trane rooftop air handling units
- 20 York fan coil units