



A NEW GREEN ERA OF LUXURY

THE WORLD'S LARGEST GREEN
HOTEL OPENS IN LAS VEGAS.

BY BOBBY BOOTH, AIA

*The Palazzo Resort Hotel Casino, at eight million square feet, is the largest green building certified by the U.S. Green Building Council.
Courtesy of The Palazzo Resort Hotel Casino.*

THE PALAZZO LAS VEGAS RESORT

LOCATION: LAS VEGAS STRIP

SIZE: 8 MILLION SQUARE FEET, 50 STORIES

CERTIFICATION: LEED SILVER

OPENED: 2008

WEBSITE: WWW.PALAZZOLASVEGAS.COM

PROJECT TEAM

DESIGN ARCHITECT: HKS HILL GLAZIER STUDIOS

ARCHITECT-OF-RECORD: JAMES R. RIMELSPACH
ARCHITECT, LTD.

LEED ADVISORS: ERNST & YOUNG LLP

INTERIOR DESIGN: WILSON & ASSOCIATES

LANDSCAPE ARCHITECT: LIFESCAPES
INTERNATIONAL

MEP AND STRUCTURAL ENGINEERS:

RG VANDERWEIL ENGINEERS, MSA
ENGINEERING CONSULTANTS AND WALTER P.
MOORE & ASSOCIATES

GENERAL CONTRACTOR: TAYLOR
INTERNATIONAL CORPORATION

SUSTAINABLE PRODUCTS

AWNINGS: LAS VEGAS AWNINGS

CARPETING: DURKAN, A BRAND OF
THE MOHAWK GROUP

CONCRETE: FILL, DENSITY, COMPRESSIVE -
ELASTIZELL CORP. OF AMERICA

CONCRETE: NEVADA READY MIX

FAUCETS: MOEN

GLASS: PACIFIC WESTLINE

GLAZED ALUMINUM WINDOWS: ENVEL
DESIGN CORP.

GYPBOARD: ATLANTIS ARCHITECTURAL

IRRIGATION: RAINBIRD

LIGHTING: GE

LOUVERS: LAS VEGAS AWNINGS

PAINT: TREMCO

RECYCLED STEEL: NUCOR-YAMATO, CLAYMONT,
ARCELOR, OREGON STEEL MILLS

ROOF MEMBRANE: SURE-WELD BY CARLISLE
SYNTEC INC.

SEALANTS: PROTECTIVE FLOOR & DECKS
COATINGS - DEX-O-TEX & TREMCO SEALANTS

STEEL: NUCOR-YAMETO STEEL CO, CLAYMONT
STEEL - PLATES & ARCELOR

COMMERCIAL - SECTIONS

TOILETS: TOTO

The Palazzo took its commitment to the planet to the next level. The eight million-square-foot The Palazzo Resort Hotel Casino*, which opened on the Las Vegas Strip (next to the Venetian) in January 2008, was certified by the U.S. Green Building Council (USGBC) as the largest green building in the world. The USGBC presented developer Las Vegas Sands Corp. with a Silver Leadership in Energy and Environmental Design (LEED) certificate at an award ceremony.

"The Palazzo is the first major LEED project opened on the Las Vegas Strip," said Richard Johnston, AIA, principal project manager with HKS Hill Glazier Studio — designer of the hotel. "The second largest project is four times smaller than The Palazzo. The USGBC and the state of Nevada continue to develop innovative incentives encouraging business owners along the Strip to design, build and think green."

According to Nicholas Rumanes, vice president with Las Vegas Sands Corp., owner of The Palazzo, sustainability sells. "Corporations will choose a sustainably designed hotel over one that is not, we've found. People like to know they are conducting business in an environmentally friendly environment."

GREENER GUEST STAYS

In Las Vegas, air conditioning is a necessity but also a big consumer of energy. To beat the heat, some of the biggest environmental innovations at The Palazzo are inside each one of the resort's 3,000-plus guest suites.

Air conditioning controls in guest suites automatically reduce cooling when guests are not present and reset to the desired temperature upon return.

"This technology, which has been used in Europe and Asia for decades, is becoming a part of many hospitality owners' energy plans in the United States," said Katherine Hammack, LEED AP, senior manager with Ernst & Young LLP — LEED advisors hired by Las Vegas Sands Corp.

Also, a master light switch is located next to each door, allowing guests to turn off all of the suite lights in just one movement. If no one is in the area, occupancy sensors in the employee areas shut off lights.

FIXTURE INNOVATIONS

Innovations were also a part of the resort's lighting. "We used combined lighting technology to provide unique and energy-efficient options at The Palazzo," said Hammack.



Air conditioning controls in guest suites automatically reduce cooling when guests are not present and reset to the desired temperature upon return. Courtesy of The Palazzo Resort Hotel Casino.

PROJECT SUMMARY

CONSERVATION HAS RESULTED IN OVER 16.4 MILLION POUNDS OF CO₂ FROM ENTERING OUR ATMOSPHERE. ANNUAL SAVINGS

ELECTRICITY: 10.1 MILLION KILOWATT HOURS

WATER: 41 MILLION GALLONS

GAS: 19,000 THERMS

DETAILED SUSTAINABLE HIGHLIGHTS

1. MINIMUM ENERGY PERFORMANCE:

- ENERGY-EFFICIENT LIGHTING AND AIR CONDITIONING: 10,100 MWH OF ELECTRICITY ENOUGH TO POWER MORE THAN 700 HOMES ANNUALLY
- LIGHTING POWER DEMAND REDUCED BY 2/3 IN THE GUEST ROOM TOWER OF 3,066 SUITES.
- GUEST ROOM MASTER CONTROL SWITCHES ALLOWS GUESTS TO TURN OFF ALL LIGHTS WHEN THEY LEAVE THEIR SUITE
- SOLAR POOL HEATING: ANNUAL SAVINGS OF 340,000 THERMS OF NATURAL GAS ENOUGH NATURAL GAS TO POWER A CITY BUS FOR MORE THAN ONE MILLION MILES (1.02 MILLION MILES)
- SOLAR PHOTOVOLTAIC 100KW PLANT ON THE EMPLOYEE PARKING GARAGE ROOF

2. CONSTRUCTION WASTE MANAGEMENT:

- LANDFILL DEPOSITS REDUCED BY 72 PERCENT
- 42,000 TONS DIVERTED BY RECYCLING EFFORTS

3. WATER EFFICIENT LANDSCAPING

- NO CITY WATER USED IN LANDSCAPING
- USES WATER FROM UNDERGROUND GARAGE SEEPAGE
- ANNUAL SAVINGS OF TWO MILLION GALLONS OF WATER

4. WATER USE REDUCTION

- LOW WATER USE FAUCETS AND TOILETS 37 PERCENT REDUCTION ANNUAL SAVINGS OF 21.9 MILLION GALLONS OF WATER
 - INCREASED CYCLES OF CONCENTRATION IN COOLING TOWER ANNUAL SAVINGS OF 9.4 MILLION GALLONS OF WATER
-



Air quality sensors in densely occupied areas ensure that enough outside air is brought into every conditioned area of The Palazzo. Photo by Blake Marvin/HKS, Inc.

“For example, we worked with GE to identify the technology that provided the best overall results through an understanding of the utility function of the space, the intended ambience of the lighting and the fixtures of choice.”

The result is attractive lighting that uses less energy and less wattage. Hallway light fixtures originally lamped with two 40-watt lamps now feature two 9-watt lamps with the exact same light output. Guest rooms with four 60-watt incandescent lamps are now revamped to house four 15-watt compact florescent lamps. All told, the reengineered lighting throughout the resort saves 10,100 MWh of electricity annually — enough to power more than 700 homes.

Efficiencies weren't just achieved on light fixtures — plumbing fixtures were also part of the green package. Interior plumbing fixtures use 37 percent less water than conventional buildings — including water-efficient showerheads, high-efficiency toilets and low-flow lavatory faucet aerators.

FRESH AIR

Air quality sensors in densely occupied areas ensure that enough outside air is brought into every conditioned area of The Palazzo. All of these areas host outside air ventilation rates greater than current code requirements to improve indoor air quality and guest comfort.

Johnston said, “A typical approach in Las Vegas resorts is installing sill vents in guest room windows. These vents provide makeup air to the room but also allow dust, noise and unconditioned air into the room.

“Las Vegas Sands management made the decision to require the circulation of 50 cubic feet per minute of fresh air into each guest room and preconditioned/filtered air in public areas, allowing less outside air pollutants to enter the space,” he continued. “This creates fresh, breathable air for everyone.”

And, air conditioning refrigerants are specifically selected to reduce ozone depletion and support early compliance of the Montreal Protocol.

THOUGHTFUL TRANSPORTATION

The Palazzo provides alternative modes of transportation to the resort in a number of ways. The hotel is located within a half-mile of the Las Vegas Monorail Station and within a quarter-mile of two bus stops on the Strip.

For those who prefer biking it, The Palazzo has provided secure bicycle racks for both guests and employees. The resort also rewards those who carpool or drive fuel-efficient



A master light switch is located next to each door, allowing guest to turn off all of the suite lights in just one movement. Courtesy of The Palazzo Resort Hotel Casino.

vehicles by providing preferred parking — with 5 percent of the total parking spaces reserved for car and vanpools.

More than 95 percent of the resort's parking spaces are located underground — significantly reducing the heat island effect.

"The Palazzo is also currently looking into teaming with hybrid-based car rental agencies," said Rumanes.

EARTH-SENSITIVE LANDSCAPE

More than 40 percent of the building's footprint at the Palazzo is open to the outdoors with extensive pools, a fountain, terrace and planted areas to enjoy.

Artificial turf, drip irrigation and moisture sensors are located in planted areas, resulting in a 75-plus percent reduction in irrigation needs. "More than 30,000 gallons of water a day is pumped from the underground parking garage," said Hammack. "This seepage is filtered and used for landscape irrigation or returned to the city's stormwater system."

Swimming pools are warmed with solar pool heating systems. In the summer, the excess solar energy not needed for the

pools is directed to the hotel's hot water system. And, the hotel's public area air-conditioning systems use an innovative cooling technology that saves more than 10 million gallons of water per year.

SUSTAINABLE CONSTRUCTION

Not all of the hotel's environmentally friendly innovations can be seen by guests.

In building the mostly concrete and steel resort, the steel used averaged more than 95 percent recycled content while the concrete contained 26 percent recycled content — including fly ash from coal-burning power plants. And, every effort was made to procure materials from within a 500-mile radius of the construction site to minimize the negative environmental effects of transporting materials.

According to Johnston, the team's goal was to reduce construction-site waste. "During construction, more than 70 percent of waste materials were recycled, diverting nearly 42,000 tons from the landfill.

"While designing and building the resort, we used only the best air quality environmental products with low emissions of

VOCs — including paints, coatings, adhesives and sealants," he said. "The resort's carpet meets the testing and product requirements of the Carpet and Rug Institute's Green Label Plus program — a first on a project of its size in the industry."

"Green design is just good business," said Rumanes. "In addition to saving in energy costs annually, we have greatly decreased our utility consumption, conserved water resources and are pulling less from our local electrical grid.

"And, we harnessed Nevada's most abundant resource — the sun," he continued. "That's significant. We're proud to lead the way and encourage others to think sustainable when designing their next building." ■

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*All aspects of the Palazzo Resort are LEED certified. A casino was not included in the LEED project boundary; the casino floor area is less than 2 percent of the rest of the project area.



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