

THE Advisor

Bringing Buildings To Life Since 1966™

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a  publication

Solar Trees Take Root in Vegas | Exotic Meets Extraordinary | Lighting Systems In The Spotlight

WELCOME



Dear JBA Clients, Fellow Colleagues and Industry Associates,

We hope this issue of The Advisor finds you well as we move into the New Year. As JBA advises our clients around the world through our innovation and desire for a more sustainable global future, we are successfully influencing our clients to adopt more sustainable outcomes with every project we work on. From thought leadership on designing facilities that harmoniously exist in the natural environment, to industry partnerships, to sharing our knowledge across our market sectors, to the development of innovative uses for our BIM expertise, we are playing our part.

By now you are probably wondering why this matters to us. Well, our drive towards more sustainable outcomes touches everything we do. As we operate in the built environment lifecycle, we have a major opportunity and responsibility to influence the future direction of the global sustainability agenda and promote more sustainable outcomes. This can help grow our business. Differentiating our services through sustainability will help us to win work in existing markets and capitalize on new business opportunities in the multi-billion dollar green economy of the future.

How are we doing this? Specifically our teams in each of our offices around the globe are providing thought leadership on innovative sustainability designs to help reduce energy cost, carbon emissions and improve the air quality on projects while partnering with a range of organizations to help influence the development of standards and practices in our sector. And last, when our projects are built, we are sharing our successes and raising awareness of our sustainability capabilities and expertise with our stakeholders through our marketing materials, project offerings, presentations and white papers to industry and customer perception surveys.

Winston Churchill famously said "With great power comes great responsibility." At JBA we're deeply thankful for the powerful opportunities we get on every project to advise our clients towards responsible sustainable built environments that contribute to a better future for all of us. Thanks for joining us for this Quarter's issue of The Advisor.

Respectfully –

Jim Gist
JBA Consulting Engineers

Jim Gist, an innovative, inspired and forward-thinking executive, joined JBA in 2011 as Chief Sales and Marketing Officer. Jim is responsible for integrating JBA's innovations, sustainability message and exemplary client service philosophy throughout the company worldwide. Jim can be reached at jgist@jbace.com

COVER PHOTO: JEFF GREEN

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THE Advisor

EDITOR **Jim Gist**
DESIGN **JBA Marketing**
Arthouse Design Studio

CORPORATE HEADQUARTERS

JBA Consulting Engineering
5155 W. Patrick Lane
Las Vegas, NV 89118
702.362.9200

www.jbace.com

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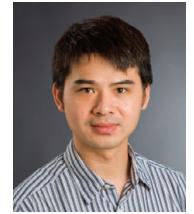
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PHOTO: JAY ABRAMSON

New city hall saves Las Vegas 50% on energy bills

JBA ENGINEERS THE SOLAR POWER AND OTHER GREEN SYSTEMS FOR THIS NEW LANDMARK

Here's a project where green design has proven its worth.

The new Las Vegas City Hall, in process for a LEED Gold certification, is using less than 50% of the energy of the city's old facilities—and potentially saving the city more than \$500,000 per year, according to utility bills compiled thus far by the city.

But that's only part of the story. "One of the biggest successes of this building is its open design. The smiles on the faces of our employees tell me how much they enjoy working here," says City of Las Vegas Project Manager, Michael Vlaovich.

The old building, designed in the 1970s, was anything but an energy hog. Yet it was built at a time when sustainability was nearly never a consideration. The methods deployed made for a closed, very limited facility with relatively few windows heavily tinted to keep out the heat and save on cooling costs.

The new state-of-the-art seven story building, featuring a striking design by Elkus Manfredi Architects and engineered by JBA's Trusted Advisors™, is an entirely different story. "To be able to achieve these kinds of energy savings with a building this bright and open seems like a contradiction, but it's not," Vlaovich adds. "It's a testimony to the technology that's been employed."

Solar 'Trees'

The design of the new City Hall, according to Vlaovich, fits into former mayor Oscar Goodman's vision of Las Vegas as the solar capital of the nation. The city, which averages 292 days of sunshine each year, is ideally suited for this type of power. To take advantage of it, the designers incorporated revolutionary *solar trees*, tall steel structures standing prominently in the main plaza, each featuring a photovoltaic (PV) array on top. The trees are an extremely interesting design element that maximizes the building's sustainability. Additional PV arrays are deployed on the roof, and together they offset about 10% of the electric power used by the building.

**RALPH JOECKEL LEAD THE
DESIGN OF THE ORIGINAL
LAS VEGAS CITY HALL,
WHICH WAS CONSIDERED
STATE-OF-THE-ART AT
THE TIME IT WAS BUILT
IN THE EARLY 70'S.**



The solar trees are only the tip of the sustainable iceberg, as JBA's engineers designed in high-efficiency pumps with variable frequency drives, condensing boilers and chillers, waterside economizers, the use of LED task lighting, fluorescent light fixtures with premium efficient ballasts, high-efficiency glass in all the windows, occupancy sensors to turn off unneeded lighting, Energy Star components in the audiovisual and other systems, and the extensive use of 'daylight harvesting' – photo sensors to adjust artificial lighting as sunlight levels change.

"One of the best decisions we made was to install an enormous evaporative cooling unit that pre-chills hot outside air before it reaches our air conditioning system," Vlaovich says. When it's

110 degrees outside, cooling is a big issue. This system uses a series of fans and water pumps to utilize evaporation to cool the air before it gets to the high energy-use equipment.

The JBA team designed the solar power, electrical distribution and HVAC systems, as well as the plumbing, telecommunications, data, security, surveillance, fire protection and many of the audiovisual systems for the building.

An important innovation is a building automation system (BAS), also specified by JBA. The BAS uses sophisticated systems from Johnson Controls to track the performance of the building on a component level plus electric, gas and water usage. "The city has an 'energy czar'

"Our original objective was to save \$400,000 per year on energy," Vlaovich explains. "Based on usage data compiled thus far, we anticipate approximately \$500,000 in electrical energy savings and \$20,000 or more on gas."



PHOTO: JEFF GREEN

who looks for ways to improve the efficiency of all our buildings and systems,” Vlaovich says. He will be using the automation system to pinpoint areas where further improvements might be made, working with JBA and its partners to continually maximize the system’s performance.”

Equally interesting and useful is the BAS energy dashboard. The dashboard is a large-screen flat panel monitor in the lobby that displays details of the building’s energy use and savings. The monitor can easily be seen by everyone. Energy dashboards qualify for education points under the LEED ratings, since studies have shown that they help raise conservation awareness among building users.

Trusted Advisors Going Above and Beyond

JBA project managers Clint Gordon and Dave Magdefrau describe the design process for the new City Hall as straightforward, though more exacting than most.

“The LEED Gold requirements impact everything we do, from the building envelope to insulation, glass, water usage, lighting design, air handling, even the reflectivity of roofing and paving systems,” Magdefrau explains.

The city also has a goal of using the new building and its major systems for a minimum of 50 years. “That goes hand in hand with the LEED requirements,” Gordon says. “In other words, the higher quality systems we specified will also tend to be more durable, assuming that the city maintains them properly.” While JBA always follows the industry’s best practices, the durability and efficiency requirements pushed the engineering to the next level. “In a LEED Gold building, we have to start looking at innovative designs, although obviously there’s a cost associated with them, so we must weigh the cost against the gains. For example, we had to do 14% better than the ASHRAE Standard 90.1 to get the LEED credit, although we wanted to be at least 21% better for our targeted threshold, and we ended up at 22.6%.”

“There’s a lot of redundancy built into the systems as well,” Magdefrau adds. “The building has parallel generators and UPS to serve critical loads such as the data center. The diesel generators also back up about one third of the central plant and all emergency systems, including power for the elevators, smoke management and life safety.”

Vlaovich says JBA has been very responsive throughout the project. For example, when the evaporative pre-cooling system became operational the building experienced a humidity gain. “It was just an improper setting, but JBA’s Ed Butera got involved, even though he was on vacation, to make sure it was taken care of quickly.”

In the end, JBA’s innovative designs helped the new City Hall exceed its sustainability goals by about 30%. “Our original objective was to save

\$400,000 per year on energy,” Vlaovich explains. “Based on usage data compiled thus far, we anticipate approximately \$500,000 in electrical energy savings and \$20,000 or more on gas.”

These savings — totaling about 50% of the energy the city had used in its old offices — will eliminate more than 2,400 metric tons of greenhouse gases each year.

Best of all, these savings are from a building that’s refreshingly open, bright and pleasant to work in.

It’s a win-win. ☐



PHOTO: JEFF GREEN



NICK MORIARTY, PE

Manager of Fire Protection

"Man of Fire"

Las Vegas, NV

Q

What is the foam substance I see in your marketing materials?

A

Over the course of the past several months, you've probably seen the picture of that "foam stuff", whether you saw it in the front lobby of the Las Vegas office or in some marketing material. You may have asked yourself, what the heck is that and what does it have to do with fire protection? Well hopefully this gives you a little insight as to what it is and why it's used in fire protection.



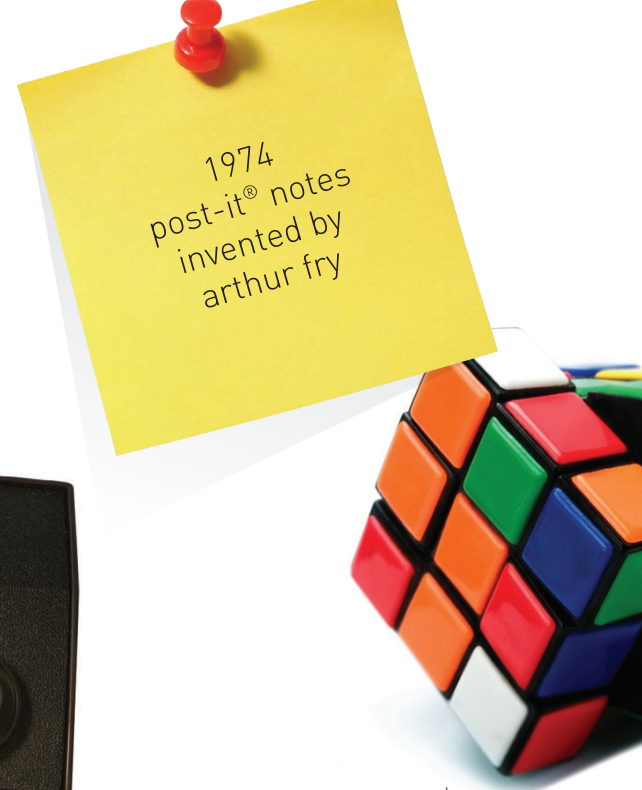
The foam is a fire suppression system specifically designed for high challenge fires that cannot be extinguished with water, such as, in an aircraft hangar (above right) and flammable liquid fires. There are different expansion rates for the foam based on the specific application. The picture shows high expansion foam (expansion ratio over 200:1) but there is also low expansion foam (expansion rate less than 20:1) and medium expansion foam (expansion ratio of 20:1 to 200:1). Low expansion foam would be used for fairly quick application on a large area. Some hangars will use low expansion foams if the aircraft being protected are smaller in nature. Protection of commercial airliners would call for the high expansion foam to be used. Military hangars specifically use low-expansion foam introduced from floor level. Hangars that contain larger jets will utilize high-expansion foam introduced higher in the space in order to get to a potential fire more quickly.

Foam is produced by combining water with a foam concentrate liquid that is discharged from foam generators within the space. The picture shows the high expansion foam being discharged from generators at the ceiling of the hangar. There are also different types of foam; synthetic foams and protein based foams. Synthetic foams are water based and will provide for a better flow and faster extinguishment. Protein foams contain biodegradable materials, spread slowly and provide a more heat-resistant foam to prevent a fire from re-igniting. Fire suppression foam will cool the fire and cover the fuel, thereby preventing the oxygen from reaching the fuel. If you talk to any fire protection engineer they'll tell you about the fire triangle: heat, fuel, oxygen. You need all three of these components in order to have a sustainable fire. Without even one, you have no fire. ☐

INNOVATIONS & MILESTONES



pong developed
by atari



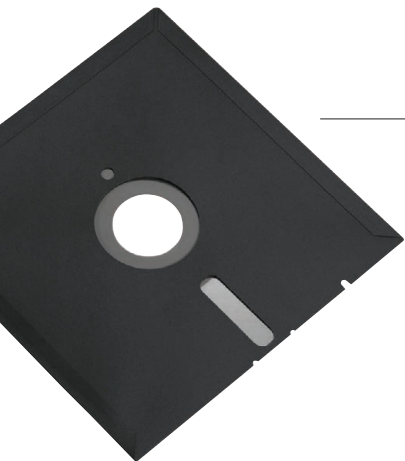
1974
post-it® notes
invented by
arthur fry



rubik's cube created
by erno rubik

70

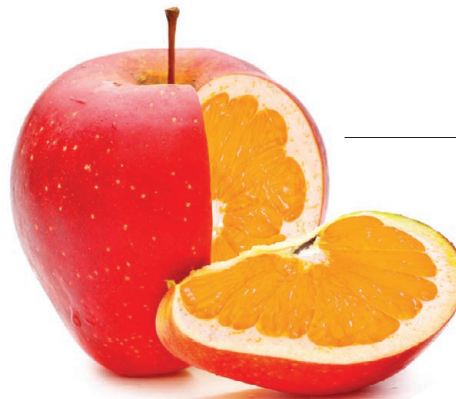
jba consults
on the new
city hall in
las vegas



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large floppy disk
introduced by ibm
interesting note:
a typical autocad file
is over 20mb
and would take
nearly 60 disks!

72



73

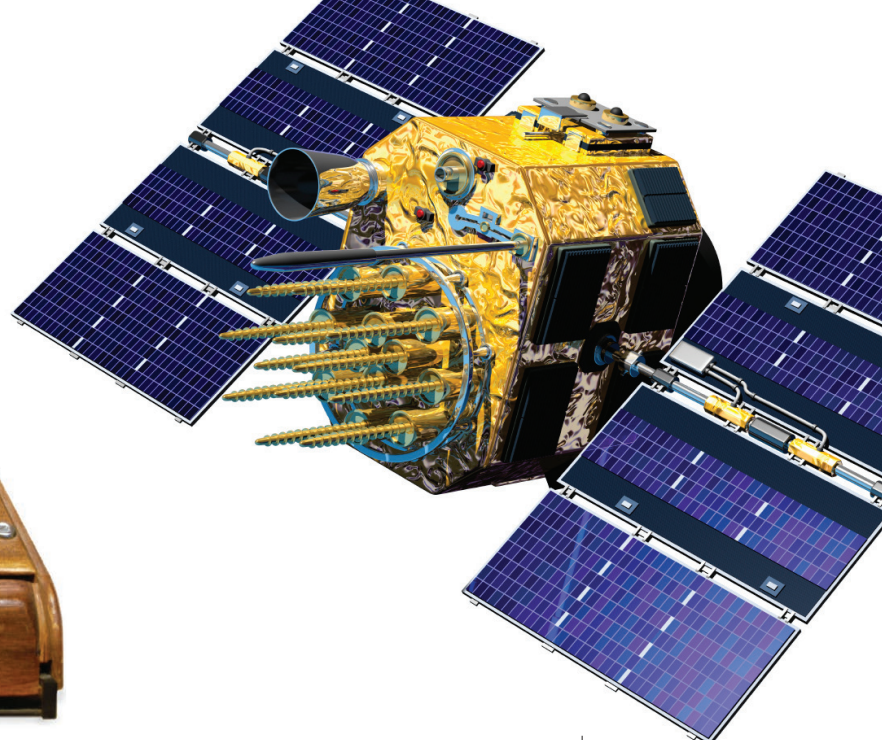
genetic modification
introduced

cell phone
technology
introduced

74

jba advisors
begin consulting
circus circus on
strategic growth





jba CONSULTING ENGINEERS
Mechanical and Electrical Engineers

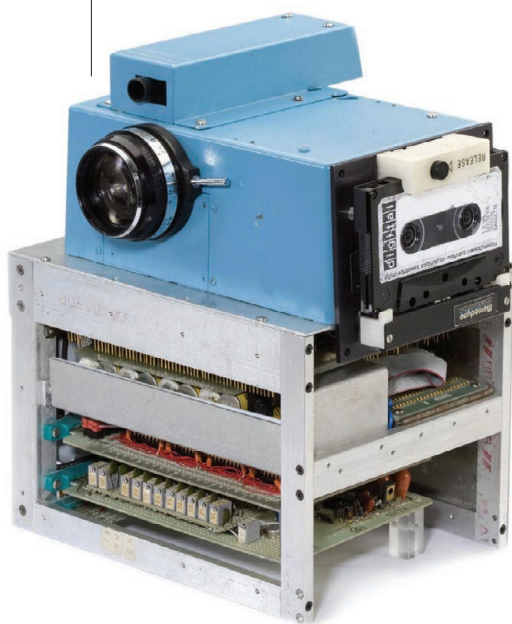
apple one invented by
steve wozniak and steve jobs.
today jba's advisors utilize ipads and
iphones to maximize their work day.

jba debuts
a new logo

gps technology
is first launched

75

steven sasson
develops the first
digital camera



76

optical digital audio
disc first developed

first whole-body
mri scanner by
dr. raymond damadian
is completed



77



78

sony walkman
launched in tokyo



79

Engineering the Exotic

JBA HELPS LONDON-BASED HAKKASAN SIMULTANEOUSLY
OPEN CLUBS IN LAS VEGAS, SAN FRANCISCO AND BEVERLY HILLS



PHOTO: VICTOR ROMERO

Designing an Ultra Restaurant and Ultra Club is Not an Easy Task

"The Hakkasan Group is literally ripping the corner off the MGM Grand in Las Vegas and rebuilding it with extra floors and a larger footprint," explains Robert Platt, Vice President of Project Operations for JBA Consulting Engineers. "We're actually working underneath and around the six-story lion sculpture on Las Vegas Boulevard, because that's the way the building is expanding."

"On the one hand, we are helping to create a truly over-the-top experience for club patrons," Platt adds. "Yet at the same time we need to pay attention to all the mundane details of construction, for example making sure that the utilities that come through our space for the MGM Grand remain operational throughout the project."

Hakkasan is an international restaurant and nightclub known for its very fine Cantonese cuisine and extraordinary ultra lounge environments. JBA's Trusted Advisors™ are deploying all of their expertise to help Hakkasan with the colossal task of opening not one, but three high-profile facilities in the first quarter of 2013.

Redefining the Ultra Restaurant and Ultra Club

Two of the new Hakkasan properties, in San Francisco and Beverly Hills, will include 10,000 to 12,000 SF of restaurant seating, a bar, extraordinarily fine materials and finishes, and world class sound and video systems. "They will serve exotic versions of Cantonese cuisine until midnight, then transform into high-end ultra lounges the rest of the night," explains Vic Sibilla, Director, Operations, JBA Orange County, CA. "Each will be, first and foremost, a great place to meet and relax

with friends.” This concept is similar to other Hakkasan Properties like NYC Miami and other locations around the World.

The first two floors of the Las Vegas property will duplicate this experience, but then Hakkasan adds a dedicated ultra lounge and a club on the third floor and an ultra club on the fourth and fifth.

“The Las Vegas location provides a progression of guest experiences,” Platt explains. “You can come into the restaurant for dinner and then slowly wind your way up to top of the building as the night goes on. You go from a dinner experience to an easy nightclub, then move up to a club providing a high energy atmosphere, including a dance floor, special effects, immersive video and audio from the top DJs in the world.”

There’s a total of 70,000 square feet of guest space in the Las Vegas club and an additional 2,000 devoted to the central plant. “It’s an especially large and finely appointed club, even by Las Vegas standards,” Platt adds.

Engineering the Ultra Experience

For the Las Vegas and Beverly Hills properties, JBA designed and engineered the mechanical, plumbing, electrical, telecommunications, data center, security, surveillance and access control systems as well as a full acoustical design. For San Francisco, JBA also designed and engineered the life safety systems and handled code consulting for the general contractor.

In a high-end property like Hakkasan the comfort and enjoyment of the guests is paramount. Acoustics, mechanical systems and audiovisual must be of the highest quality and extremely reliable. That adds complexity, yet there isn’t any room for a design flaw.

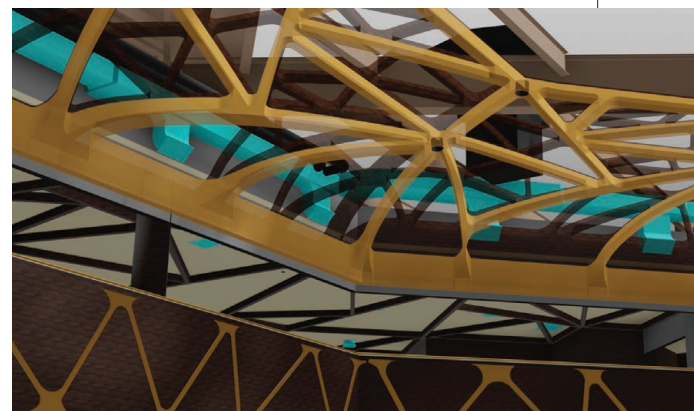
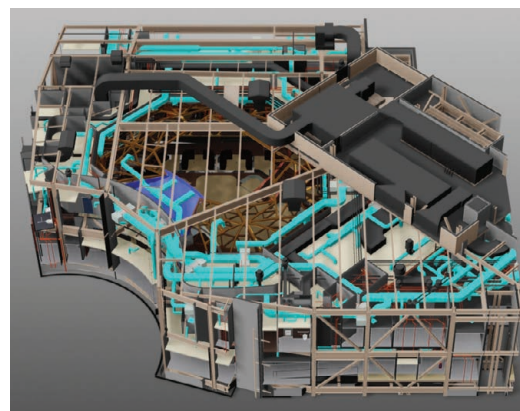
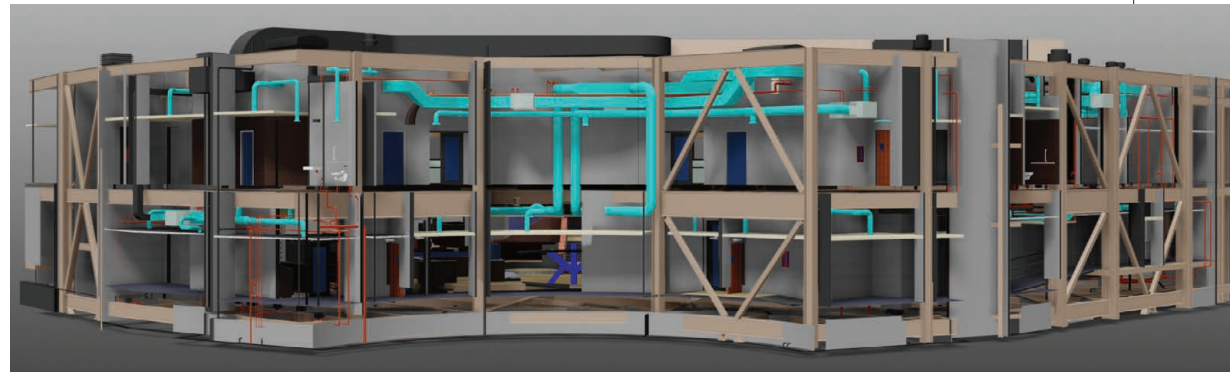
While JBA has worked on any number of high-caliber properties, the Hakkasan project was especially challenging because all three locations were designed simultaneously with a timeframe that was unusually tight. They are also geographically dispersed, and many of the key players, including the interior designer, lighting designer, AV consultant and food service designer are based out of Europe.

“The original proposal had the first of JBA’s seven design packages to be completed in just 25 days,” says Platt. “We met all of our deadlines over a compressed design schedule of about six months.” The Hakkasan project obviously required a large engineering firm, and with over 140 employees worldwide, JBA fit that bill.

“Still, firms with a lot of horsepower often fail to perform well on a job like this,” Platt explains. “JBA has been unusually successful breaking down the barriers between disciplines and offices, and we’ve done well leveraging our expertise no matter where individuals may happen to be located.”

For the Hakkasan projects, JBA put together a core team of ten engineers, mostly in Las Vegas and Orange County, but including people from other offices and additional engineers

The Beverly Hills and San Francisco restaurants, though smaller than Las Vegas, had their own challenges. San Francisco is located in an historical structure whose facade could not be altered. “In Beverly Hills, we couldn’t even expand up onto the roof, since the building has an outdoor terrace open to the public,” Sibilla says. “We had to build a mezzanine within the footprint of the building to add enough square footage to accommodate the mechanical, plumbing, electrical systems and infrastructure.”



TOP: left front elevation section ; BOTTOM LEFT: top front elevation; BOTTOM RIGHT: interior nightclub

who worked on specific phases of the project. Together they spent over 5,000 man-hours, most of it during the spring of 2012. The firm has been engineering mega-casino, resort and nightclub projects since the 1980s.

BIM (or Building Information Modeling) plays a key role in the Las Vegas project, allowing architects, engineers and contractors to collaborate on scale renderings of the building and all of its components. “It’s an active and intelligent model where information resides within the software and documentation,” Platt explains. “Among other things, it allows us to detect clashes between the systems that make up the structure, the architecture and the electrical/mechanical and fix them before they cause construction delays.” JBA was a pioneer in the use of BIM, and a JBA subsidiary, INVIEW Labs, creates and publishes BIM objects and related content for equipment manufacturers.

The Beverly Hills property was also challenging in that it shares walls with an office building on one side and the executive offices of MGM Studios on the other. “Because we couldn’t impact our neighbors with our nightclub,” Sibilla adds, “controlling noise and vibration was a major priority.”

Platt says that the Hakkasan Group has been very happy with JBA’s designs and with the construction process so far. “We have already begun work on additional projects for this client.” ▣

5 STEPS TO MALL LIGHTING

by Jain and Scott Hatton, Architects, Oculus Light Studio

Once you've seen one shopping center, you've seen a mall. Puns aside, what makes them all not look the same, and how do you create a definite nighttime and indoor identity to the shopping center that you are designing? These 5 key lighting strategies have proven to be successful.






1. View from Far to Near

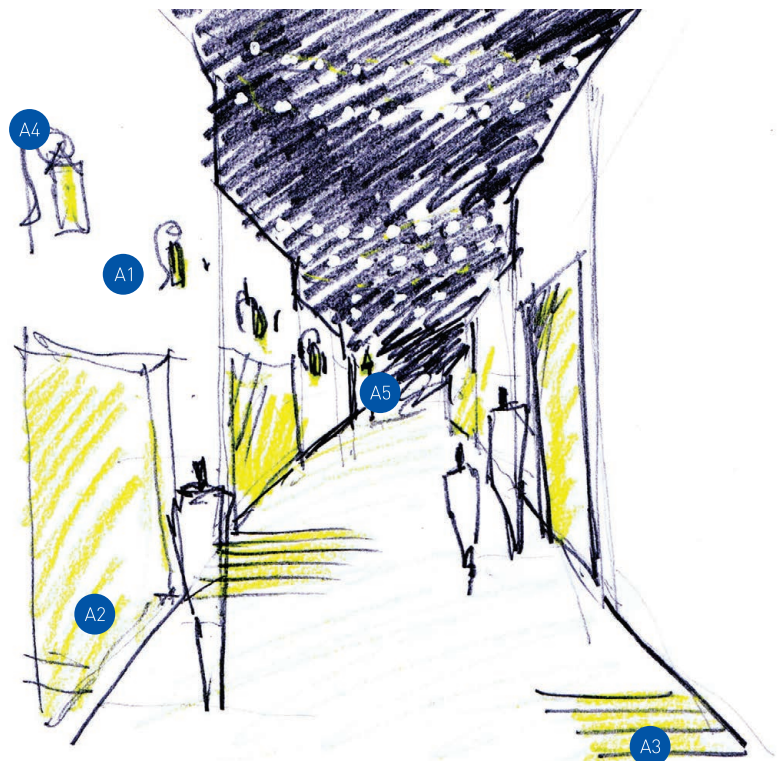
From far to near, make sure that the project speaks the same language. Many times, especially in Asia, shopping malls are multi-storied structures with perhaps a tower or two with the mall in the podium. When looking from far away you may only see the top of the project. From close, you may see the first few floors and walking next to it, you may only see under the canopy. Make sure that the lighting message is consistent.



2. Create a Storyline

Like in a movie, storylines help create a consistent look and feel to the space. Many times the story is part of the architectural and interior concept. Examples of actual storylines include following Ibn-Battuta's travels across Asia, taking clues from being on a catwalk in Hollywood; taking inspiration from nature preserves and the ways various cultures have interpreted market places throughout history. In each case, the lighting was different and supportive of the storyline. Lighting design complements and adds to the scheme. Visual luminaires like pendants and sconces create the look and feel, while hidden and recessed luminaires light surfaces and provide lighting for safety.

-  **A1** *Rhythm and Repetition*
-  **A2** *Light From Openings at Pedestrian Level*
-  **A3** *Filtered Light / Uneven Light Levels*
-  **A4** *Glowing Lanterns / Lighting Hardware*
-  **A5** *Elements of Surprise and Discovery*



3. Light Surfaces, Not Just Measure Lux and Footcandles

When we see light, our eyes don't measure it in lux and footcandles. In fact, studies have shown that there is very little correlation between what the light level (light falling on a surface) is to what the perceived light level is in a space. A white space with very little light may feel bright, whereas a room with black walls, ceilings and floors will feel dark even with bright, office-like light levels. Calculating lighting levels in each and every space is not required once bare minimum code required levels are met. What is needed is to make sure that surfaces are illuminated. When we see across a space, we do not see the floor, we see vertical surfaces, we see ceilings, we see the surfaces that face us—let's light them.



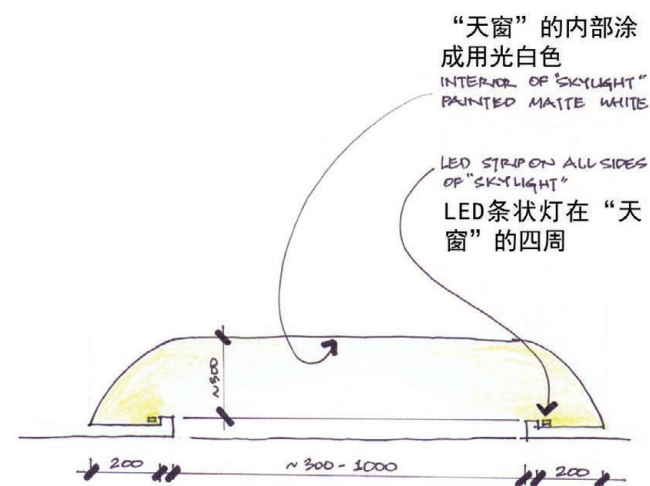
4. Create Interest

Work with the design team to identify focal areas in the mall. How do you lead people from one side to the other? Especially to the top of a multi level mall? How does the food court support a comfortable space for relaxing and eating? In a skating rink, how is the ceiling illuminated? Is there a role for color and pattern projections? How are the architectural surfaces highlighted? Is there a pattern or texture on them? Can we graze it to bring out the texture? Can they be back lighted to glow? Can we integrate lighting into the columns, ceilings and floor? Lighting helps with wayfinding, and leading patrons through the mall.



5. Be Pragmatic

The lighting of the mall has to look great on the first day and keep looking the same several years later. Choose lamps that have a long lamp life. Luminaires that are not one of a kind, and hard to replace. Work with the design team to integrate common luminaires in architectural detailing to create special experiences. Think of dust or bugs that may collect over lensed luminaires. Simple is better—anything too fussy will most likely get destroyed quickly. Metal halide lamps work great in Europe and America where there are no power interruptions, but not so well in Asia where power supply is not reliable. LED lamps and luminaires need to be evaluated closely to make sure they are the right color, tested properly, and are available from a reliable source. And in mall which may have a large open atrium be sure the lighting is not designed to be in places where maintenance would necessitate a call to Spiderman.



These key lighting strategies will help guide a designer through the collaboration process with the project team. They will help the designer create lighting designs uniquely suited to the character of the project. A mall that provides unique experiences and feels comfortable will allow patrons to visit often and stay for longer. That combined with a pragmatic approach lends direct support to the mall's overall business goal of having successful retailers. □



PHOTO: JEFF GREEN

SLEEPING THROUGH THE PARTY

JBA'S DESIGN ALLOWS ULTRA-LOUNGE AND HOTEL TO CO-EXIST PEACEFULLY

by Don Kreski

Imagine a night out dancing with the rich and famous at a five-star ultra-club. Now imagine the same night, but you're trying to sleep in a room just below the dance floor.

Would that be a problem? No! Thanks to an acoustical design by JBA's Trusted Advisors™, no matter what room you book in the Al Maabar Abdoun Resort in Amman, Jordan, you can dance for half the night then sleep like a baby for the rest.

"Our biggest challenge in this project was acoustically isolating the nightclub on the hotel's top floor from the sleeping rooms just below," says Michael Schwob, Senior Acoustical Engineer for JBA Consulting Engineers.

Schwob's solution was to build floating floors in the nightclub to isolate the sounds of the music and dancing. "Low frequencies in particular can propagate into a building's structure as vibration," he explains. "Once you allow that to happen, it's extremely difficult to deal with, so our strategy was to prevent those sounds from getting into the structure at all."

Below the nightclub's kitchen, Schwob and his team designed a concrete matt resting on rubber

isolators which, in turn, rest on the concrete slab of the guest room ceilings." This type of floating structure is best suited to heavy equipment such as refrigerators and ice machines."

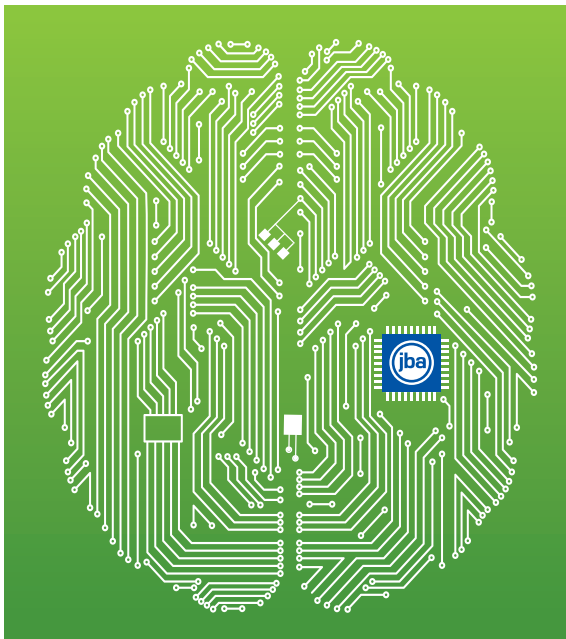
For the rest of the nightclub level, the team floated the concrete floors above the guest room ceilings using steel springs." Springs are much better at isolating louder sounds, such as music and the low frequency vibrations from dancing."

While isolating the noise from the nightclub was JBA's biggest acoustic challenge, the team still had to deal with all of the normal issues and opportunities of a building of this caliber. The hotel in the Al Maabar Abdoun Resort includes 270 luxury guest rooms, 2,800 square meters of

meeting space, four restaurants, a cafe, pool, spa, fitness center and the nightclub. There are also two more 16-story residential towers with 80 luxury condominiums plus a lobby, pool, fitness center and lounge. "In addition to keeping unwanted sound out of these structures, we had to make sure that music and vocals generated within the clubs and meeting spaces sounded its very best," Schwob says.

JBA Trusted Advisors™ also designed the security, audiovisual, information technology, surveillance, telecommunications and access control systems for the resort. It's one more successful project for JBA, which has been engineering world-class buildings for almost 50 years. ☐





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Irvine, CA 92618
P+ 1.949.419.3030

SHANGHAI

Unit 2602D, 26 F,
333 Asendas Plaza
Tianyaoqiao Road,
Shanghai, China
200030
P+ 86.21.2215.7793