

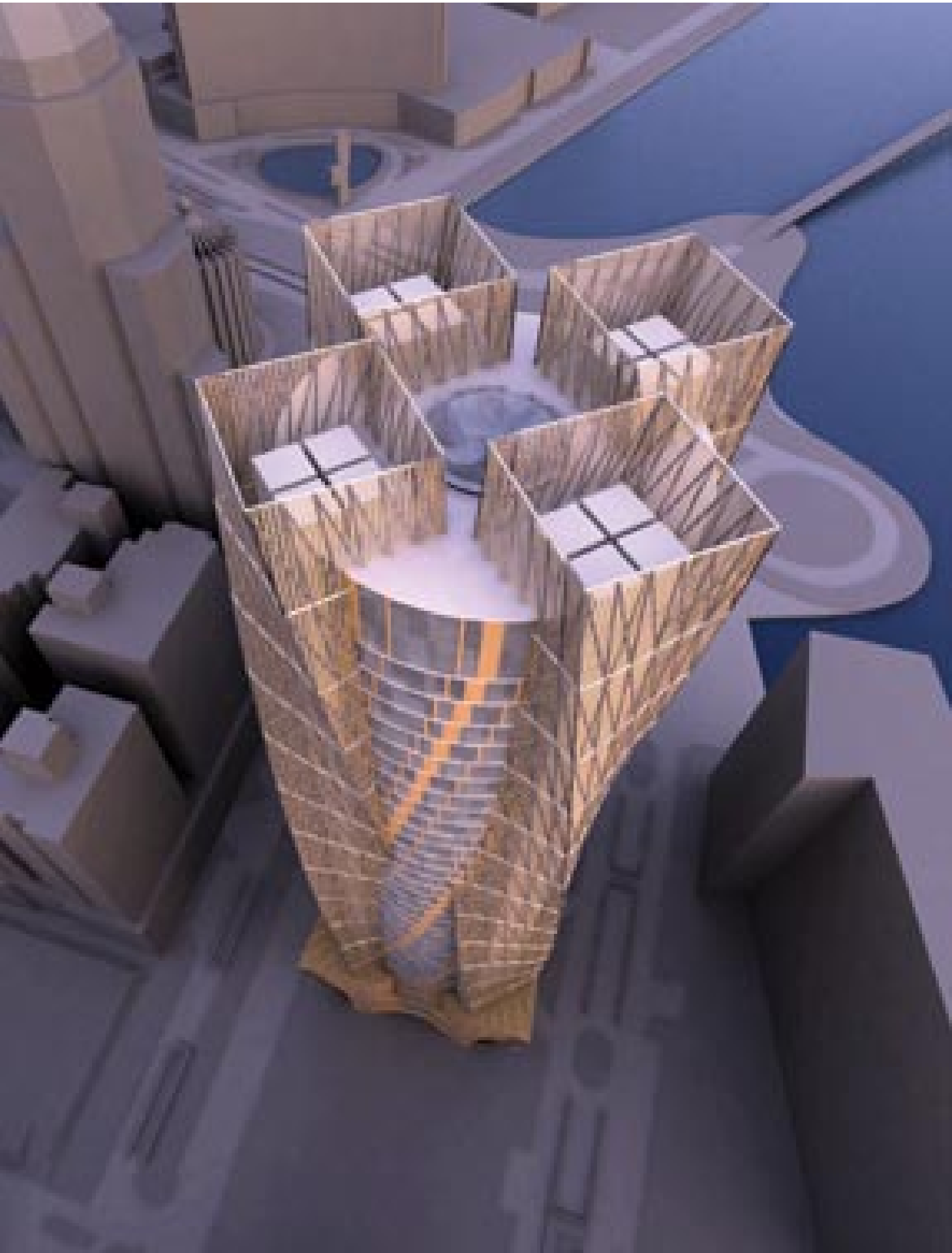
The award-winning Jade Entertainment Complex in Macau boasts innovative green design features including an environmentally friendly ventilation system at its core.

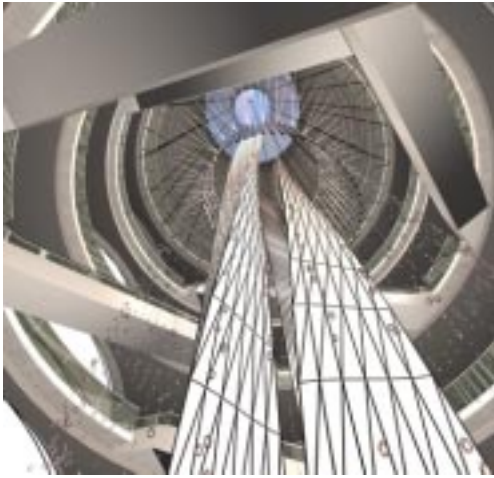
Jade Entertainment Complex

Located in the heart of Downtown Macau, the Jade Entertainment Complex sits in a densely developed urban fabric where the recent pace of development has pushed up land values exponentially. The small site is a 50 m x 50 m square above ground, with extended borders below grade. The developer's multi-use program calls for entertainment venues, casino gaming, parking, restaurants, hotel, condominium and adjoining amenities. With the size and relative mix of each component intimately tied to the economic viability of the project, the first challenge was to aggregate the multiple program elements effectively on the site.

The solution to program aggregation follows closely with the relative value and size of floor space to height within the building section. The spatial requirements of the gaming floor necessitated its location underground, where the borders of the site extend beyond the build-to line above. The rest of the program is stacked based on its relative value in height. As relative value decreases as one moves up from the ground and down from the top, the public revenue generating spaces take precedence at the top and bottom, while the parking is located in the middle at the least valuable point. Condominiums are located high in the building to take advantage of a higher investment grade, with hotel and amenities stacked below.





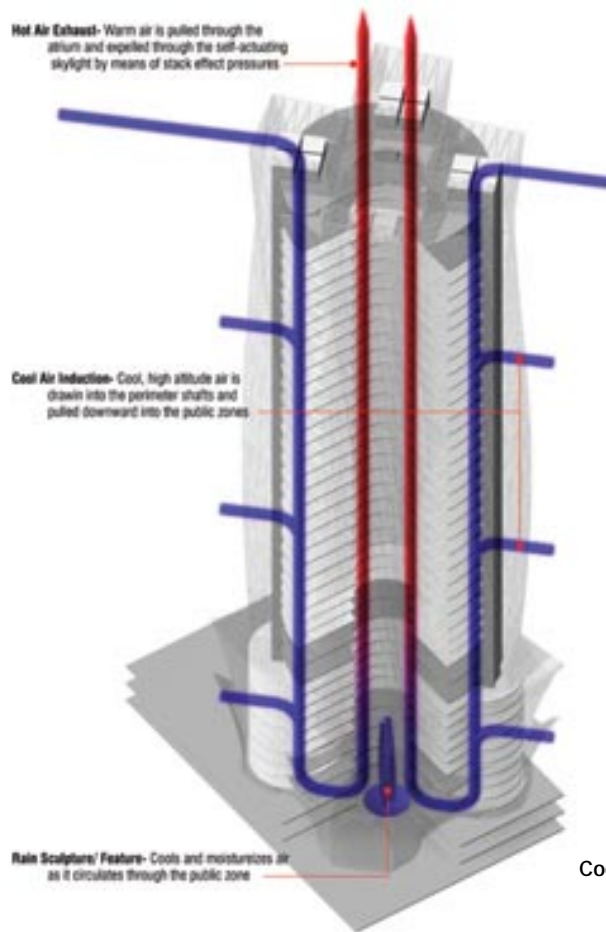


The plan is derived from the structural requirements of the tower. In a typically organized gridded tower with a central core, as the building height increases and the floor area remains constant, the slenderness ratio approaches an unacceptable limit. By pushing the cores to the perimeter, a more stable '4-corner' configuration is created, effectively reducing the bending moment along the height of the tower. The introduction of a central atrium shaft works to cheat the slenderness ratio further to a mere 1:5. By increasing the perimeter and footprint without increasing the floor-area ratio, the hollow tube structural scheme gains a significant advantage with a minimal cost premium.

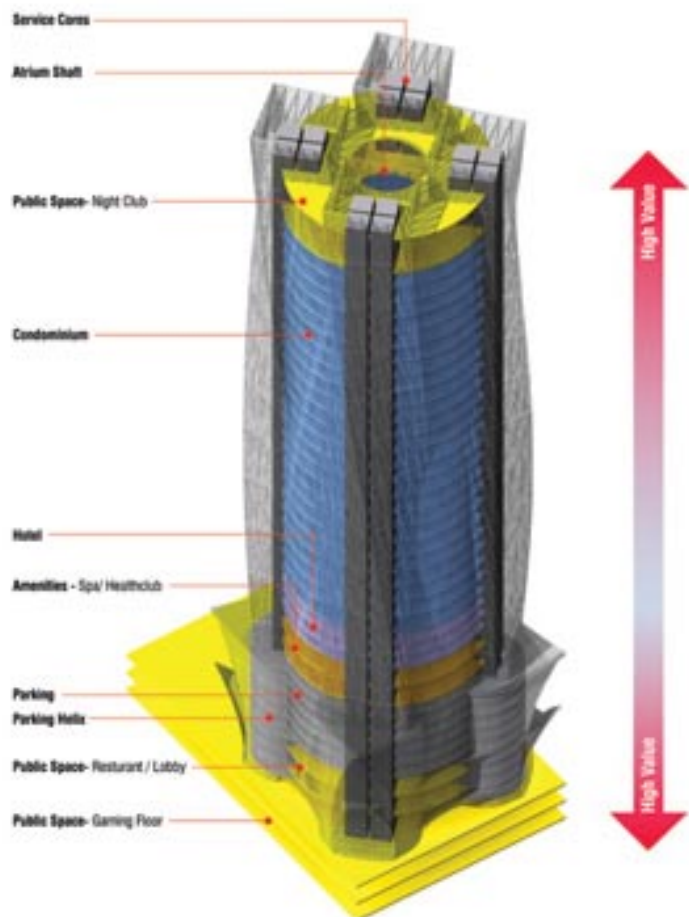
The atrium is the heart of the building. It works on multiple levels beyond the pragmatics of structure. Firstly, it is an architecturally significant spatial experience soaring into the sky. Secondly, it works to tie the public promenade together in a complex spatial matrix. Lastly, it acts as the building's lungs circulating hot and cold air through the public space.

Sustainability

The central atrium and perimeter core configuration allows for a naturally convecting heat and cold cycle by taking advantage of the most abundant resources available to this building; height and pressure differentiation. During the summer months,



Cooling cycle



the cooling cycle involves drawing cool, high altitude air into and down the core shafts where it is circulated and humidified in the public space by the rain fountain/feature located at the bottom of the atrium. This air is then drawn up and out the top of the atrium through the self-actuating skylight using Bernoulli's principle of fluid dynamics. The cycle is reversed for the heating cycle. Air is warmed under the self-actuating skylight, the only location with constant solar exposure in the building. This warmed air is drawn down the atrium into the public space before being pulled back up and exhausted from the core shafts, again through the stack effect. These strategies substantially reduce the mechanical load and power consumption of the project.

By exploiting the unique problems of economy, program, site, structure and environmental control, this project radicalizes normative, parceled building systems and intertwines them into a singular breathing organism. This strategy signifies a shift from the 20th century iconographic tower, into a more significant architecture specific to its unique position and circumstance.

Steelman Partners has received two awards at the American Institute of Architects (AIA) "Excellence in Design" Awards 2007 ceremony held in October 2007. Both the AIA Unbuilt Category Citation Award and the AIA People's Choice Award marks AIA's recognition to Steelman Partners for the firm's design of the unbuilt Jade Entertainment Complex.

architect
Steelman Partners

designer
Paul Steelman, AIA, and Michael Vihn

Steelman Partners



Paul Steelman
President and CEO of Steelman Partners

Founded in 1987, Steelman Partners (formerly Paul Steelman Design Group) has positioned itself as the premier touchstone in the entertainment architecture industry. Steelman Partners is an enclave of the industry's most talented and acclaimed architects, designers, planners and artists. The resulting work is renowned, remarkable and memorable.

80 projects later in 12 countries and 15 states, Paul has completed every type of gaming project including resort, local, European, barge-based, riverboat, pari-mutuel and Native American. Paul has worked for the MGM, Mirage Resorts, Sheraton, Hyatt, Foxwoods, Swiss Casinos, Hard Rock, Grand Casinos, Icahn Enterprises, Caesars Entertainment, Harrah's, Showboat, Silverton, Sun International, and many others. Steelman Partners has also completed many hotels, suites, shopping malls, retail stores, health clubs, theme parks, themed attractions, and restaurants.

In 2001 Paul formed GST (Steelman Gaming Technology) to design and construct the next generation of slot machines which Paul debuted to wide acclaim at the 2001 Gaming Show.

Paul has received several gaming patents on new equipment and accessories. Paul believes in creating entertainment projects for the modern lifestyle.

Steelman Partners is a trendsetter in creating future designs for the entertainment architecture field. The firm grossed more than \$40 million in 2006, making it one of the top ranked architectural firms in the world.

For more information, please visit <http://www.paulsteelman.com/partners/>

Fast Facts

area	80,300 sq m
completion date	2010