



The Rise of Modern Construction

Construction used to be a long and laborious process, with painstaking detail provided by master craftsmen on-site, and piece-by-piece. Timber cranes and scaffolding, with complex systems of pulleys to lift large loads, complemented steep ramps that hauled materials to the upper floors and roof-level.

Our proliferation of skyscrapers and monumental landmarks could only have come to life with the help of modern elevators and cranes. Heavy equipment and power tools have helped decrease our dependence on manual labour, and prefabricated components offer a degree of quality and consistently unachievable by hand. Most of all, digital modelling to visualise and virtually test every potential scenario has been the real game-changer, streamlining processes that maximise efficiency while leaving far less to chance.

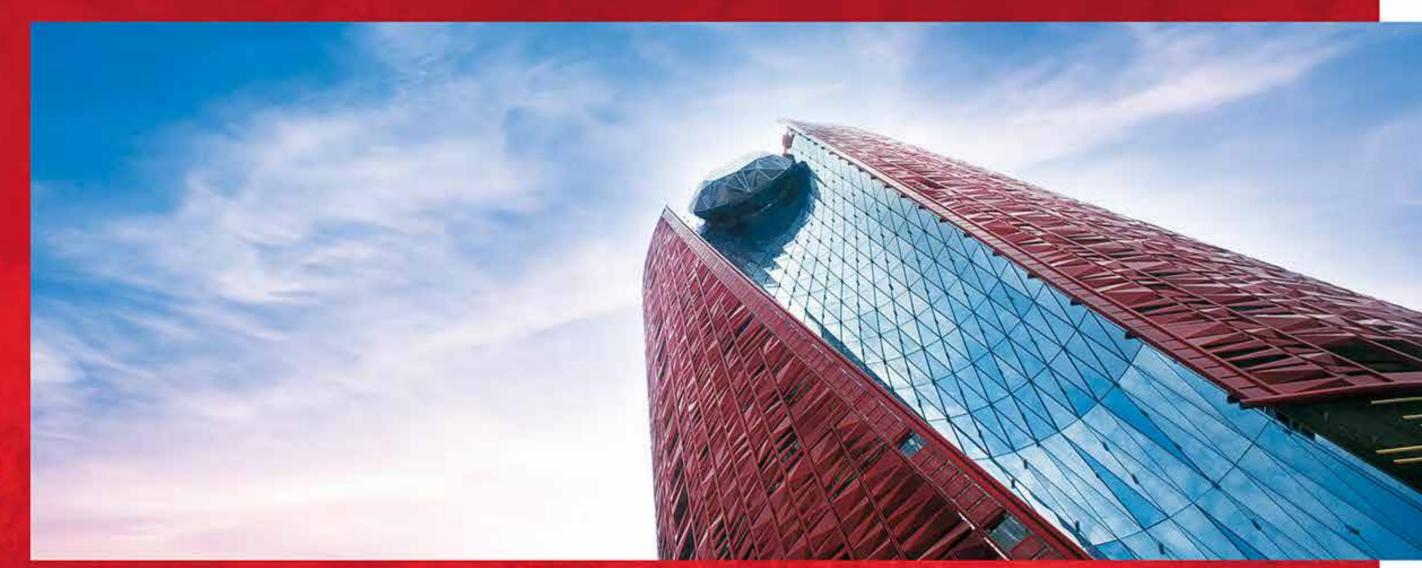










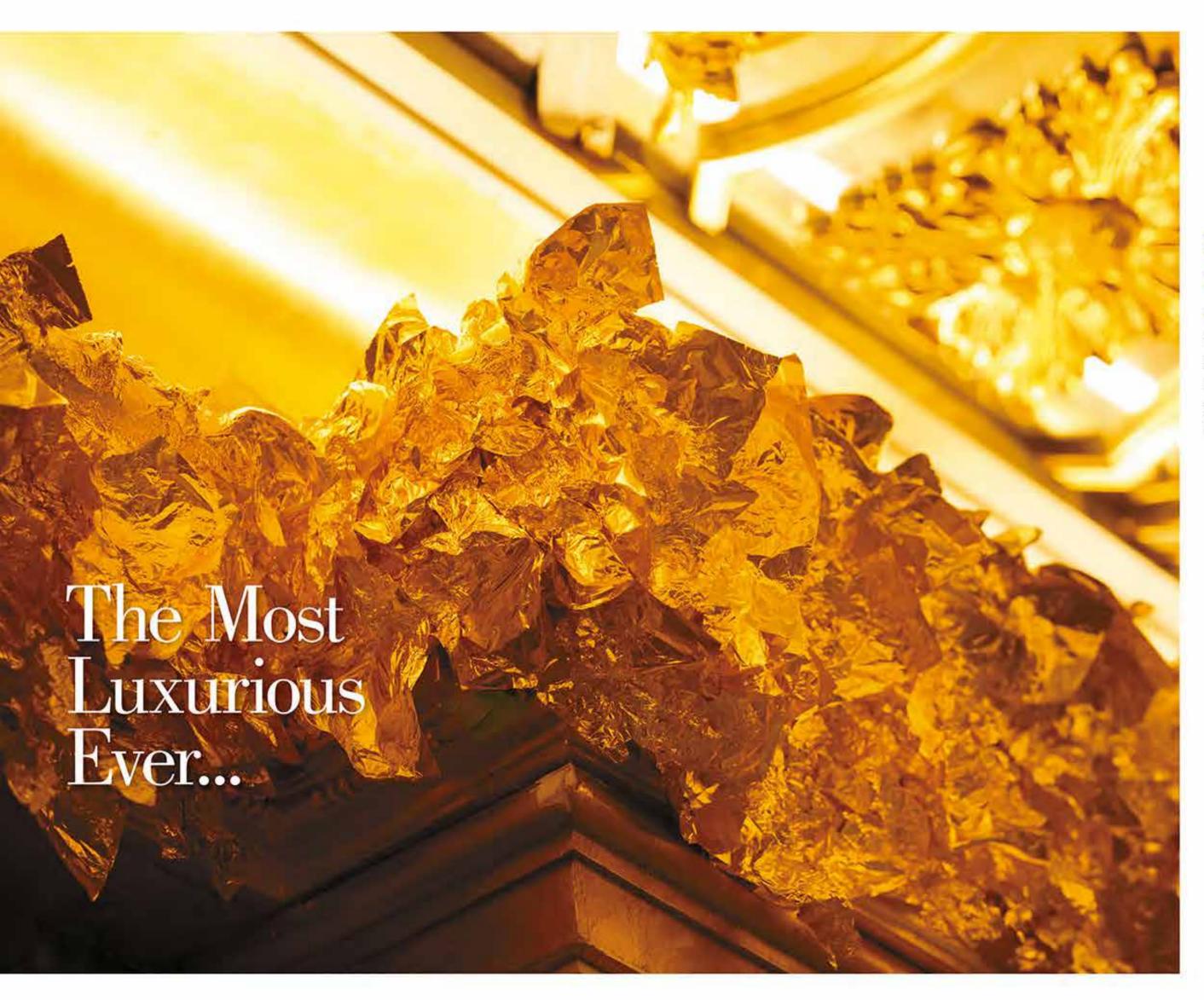


Redefining Modern Magnificence

Throughout its creation,
THE 13 not only raised the bar
on high-end hospitality, but also
set new records in design and
construction for its numerous
one-of-a-kind features.

Encapsulated in a tower spanning 23 floors, the resort offers 200 villas measuring between 2,000 and 30,000 sq. ft. The building's façade utilises an innovative three-layer curtain wall, crowned by faceted glass Diamond, while its atrium features one of the world's largest outdoor green walls, a vertical garden of nearly two million plants.

Inside, thirteen giant angel sculptures, nine of which hand-finished with gold foil, valiantly watch over visitors. 29 elevators lead to each villa's private elevator lobby, ensuring maximum guest privacy. At the very top, above the Royal Villa, lies the resort's state-of-the-art Sky Pool. From floor to ceiling, every one of THE 13's immaculate features could only be made possible with impeccable materials and supreme craftsmanship.



Striving to be
the Most Luxurious Hotel
ever built,
many of the features
contained within THE 13
broke new ground
as the first of its kind
in Macau or Asia.



A Roaring Success in Project Delivery



As the proverbial Tailor of Luxury, Paul Y.
Engineering unleashed tremendous innovation
and building prowess to meticulously craft
and construct this glorious masterpiece.

In the end, Paul Y. Engineering succeeded in not just meeting the project's goals, but also exceeding the standard of quality and sublime brilliance THE 13 demanded. The relatively short schedule of 38 months, paired with limited space for storage and logistics, required all of this esteemed Hong Kong design and construction firm's creativity and foresight to surpass every challenge.



Luxury with a Modern Touch

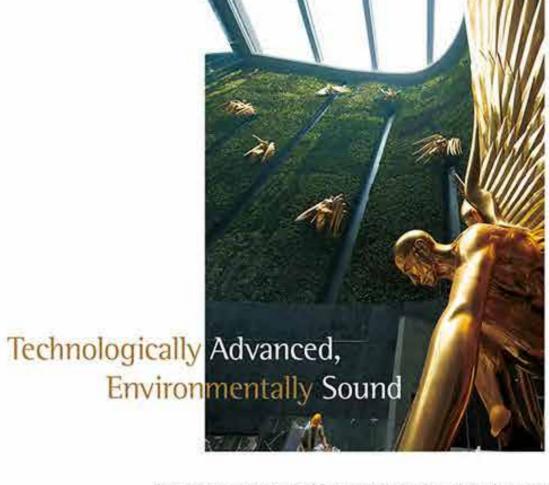


Throughout the project, Paul Y. Engineering harnessed cutting-edge construction techniques and seamless execution and coordination, underscored by its long experience in the field. Utilising a top-down approach to conserve time, the firm created 1:1 mock-ups and prefabricated many of THE 13's more complex features to streamline the construction process. Wherever possible, computer-aided technologies were employed to further enhance building efficiency. Industry-leading MEP technologies, on-site installation techniques, logistic support and excellent time management were also applied to ensure all stringent building requirements were met and the project was completed smoothly. The result is a truly modern classic, set to become one of Macau's iconic new landmarks.









Throughout planning, builders worked closely with landscape consultants to select ideal shade-loving plants. Consideration had to be given to the plant's individual nature, and the amount and duration of sunlight at each location and direction. The ultimate layout arising from this meticulous planning presents the best visual effect, while ensuring the health of each plant. A built-in sprinkler system automates irrigation throughout the wall, minimising manual labour. Advanced, automated building maintenance units (BMUs) will help groom and prune plants throughout their life cycles, keeping them in tip top shape.

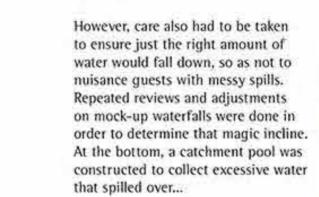




Creating the Perfect Splash...



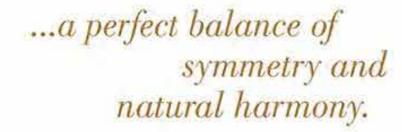
Six painstakingly designed waterfalls are embedded into the green wall. Each has water running down, with a splash effect at the bottom. Mimicking nature's perfection required a system advanced enough to maintain a non-stop flow of water, while also ensuring there was a sufficient incline to create realistic splash effects.















Angelic Guardians...

Befitting THE 13,

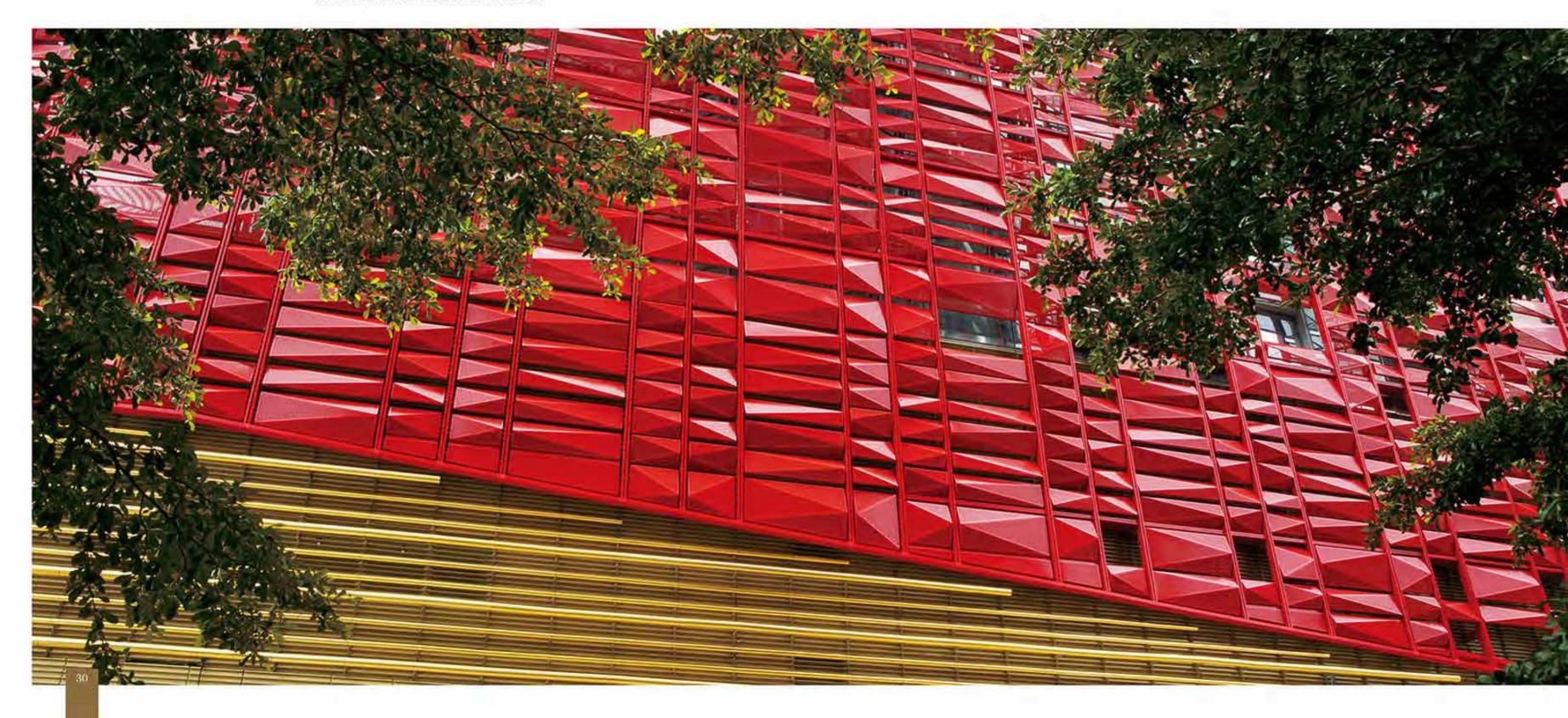
thirteen angels herald the divine splendour located within.

Eight smaller, semi-gloss gold angels mount the green wall, while a single large, matte gold angel stands guard over the atrium. A final four angels coloured in the hotel's signature red watch the mass gaming hall, for a touch of heavenly fortune. Each angel was meticulously crafted to capture their purity, intelligence and beauty, while harking back to the plethora of angels in classical art.



A Marvel Innovation

THE 5 boasts three layers of curtain wall systems – an innovative structure that is the first-of-its-kind in Macau.



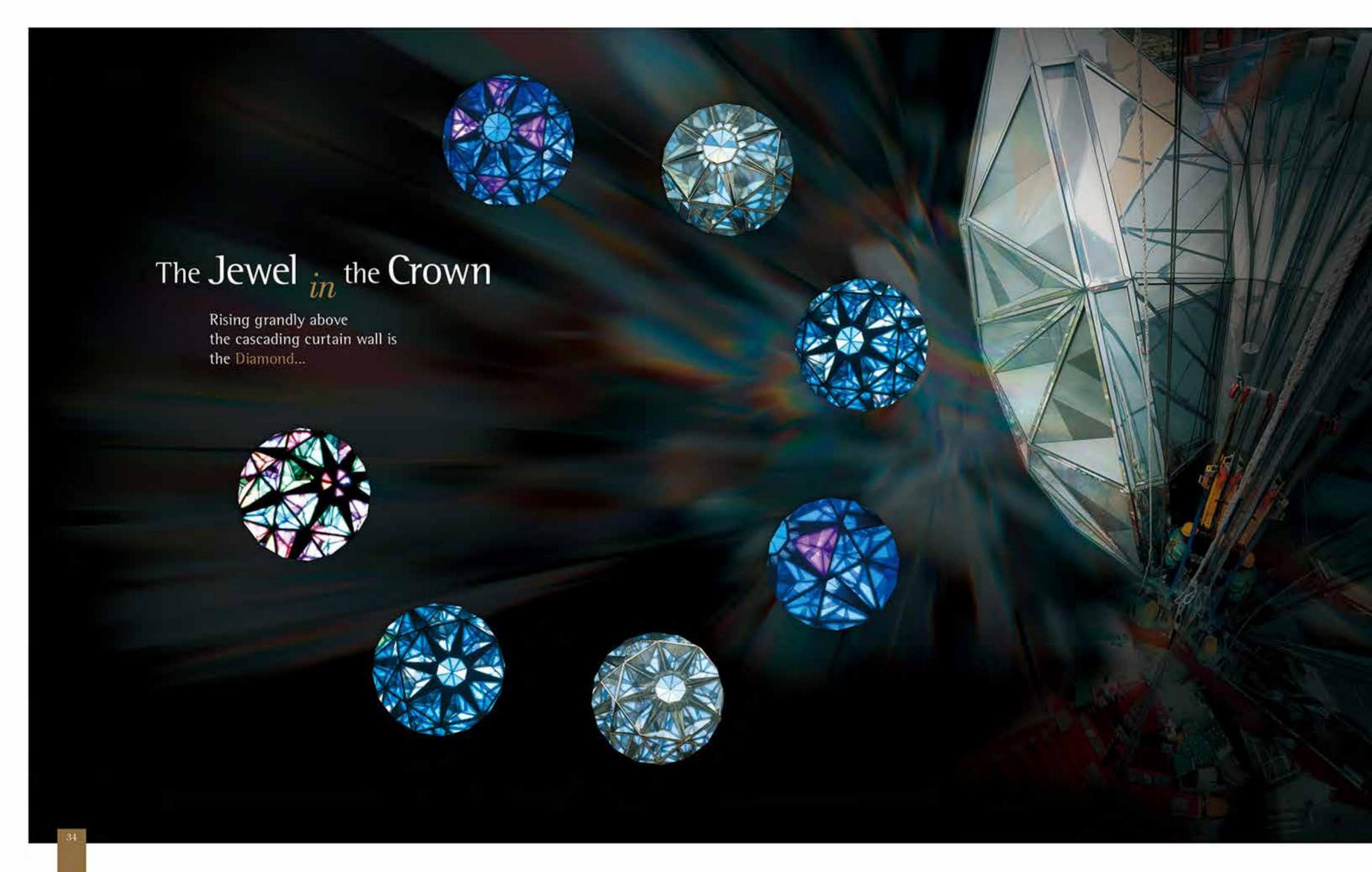


Combining practicality and bespoke aesthetics, a portion of the walls are "cut away" on the building's façade to reveal the beautiful layers within. The innermost curtain wall forms the main building envelope and completely wraps around it. This is covered by an aluminium panel featuring a BMU system for service installation and a catwalk for lighting effects. The outermost wall envelops the building and is made up of red perforated aluminium panels in faceted profile, a practical barrier against the environment as well as a striking statement of style.

Crafting Layer by Layer

Triple the walls required triple the effort to construct compared to a traditional curtain system. This unique feature was without precedent, which meant its builders had no previous reference to fall back on. Utilising the full breadth of its professional planning and construction expertise, Paul Y. Engineering managed to complete this unique structure in the face of a tight schedule.

The building's outermost shell, which shelters it from the sun and helps conserve energy, posed another unexpected challenge – finding the perfect red to colour it with. Ultimately, any colour chosen would have to align with THE 13's branding, which uses the same red for its interior décor and Rolls-Royce fleet. Once again, Paul Y. Engineering prevailed. Multiple tests were made to assess the effect of sunlight and artificial lighting on different shades before the perfect red was found.







13 meters in diameter and comprising over

130 LED panels and 73 glass panels.

Symbolising the rarest of gems,

the Diamond marks THE 13

as the utmost brand in luxury accommodation.

When fully lit, the glittering jewel in THE 13's crown complements the unique façade of the hotel and its advanced lighting system, making it an instantly recognisable icon on Coloane's cityscape.

Built to outshine and outclass







Unveiling

the Perfect Gem

THE 13's splendid signature feature required significant coordination among different development teams, from E&M to merchandising and construction. Low-iron glass and steel were used to shape the ultra-white diamond-like facets. Over 100 individual computer programs were designed for the LED lights, which are able to play a variety of glittering effects in different colours. To save on construction time, a 1:1 mock-up was built for testing actual effects prior to installation. Finally, an air-conditioning system was specially built behind the Diamond. When fully lit, interior temperatures could soar as high as 80°C. Proper cooling ensured the beauty of this feature would stay unmarred by time - just like the real gem.



Unparalleled Privacy

's 200 exquisitely furnished suites are only open by invitation, lending an unprecedented level of prestige and exclusiveness to its guests.

This incredible aura of privacy is aided by 16 elevators operating round-the-clock. Guests are guaranteed their own exclusive elevator for each journey from the car park to their suite, and generally do not need to share elevators with other guests throughout the building.

It is a rare feature even within the ultra-luxe hospitality bracket to have such an extremely low room to elevator ratio, which requires great skill by the builder to enact. Planning for the high number of elevator shafts within the constraints of a compact hotel was a challenge that Paul Y. Engineering relished. The result was a system that enabled the highest level of security and convenience for the lucky few allowed into this luxurious sanctum.



An Immense Welcome

As the pinnacle of luxury par excellence, the Royal Villa at the top of THE 13 stands without precedent. It boasts an exclusive oversized elevator to transport guests and their entire party from the car park to the villa's private lobby. So massive is this elevator that many believe it was meant to lift cars – huge enough to house an entire retinue of staff. Contained within are sofas, towels and fine wines, the ultimate in hospitable welcomes.

Such a flashy first impression befits THE 13's most honoured guests. In the span of a minuteslong journey, the elevator is meant to introduce guests to the most incredible hotel they have ever experienced. Naturally, an elevator this special also required special techniques to build. The extralarge intended load and sheer size of the shaft were meticulously put into place with great success by Paul Y. Engineering.







Gilded Indulgence

Gold, the colour of "divine light", has remained a symbol of luxury throughout the ages.

THE 13 employed over 1.2 million pieces of gold foil to create its resplendent interior detailing. This can be prominently seen on the mica panels beside the main escalators.





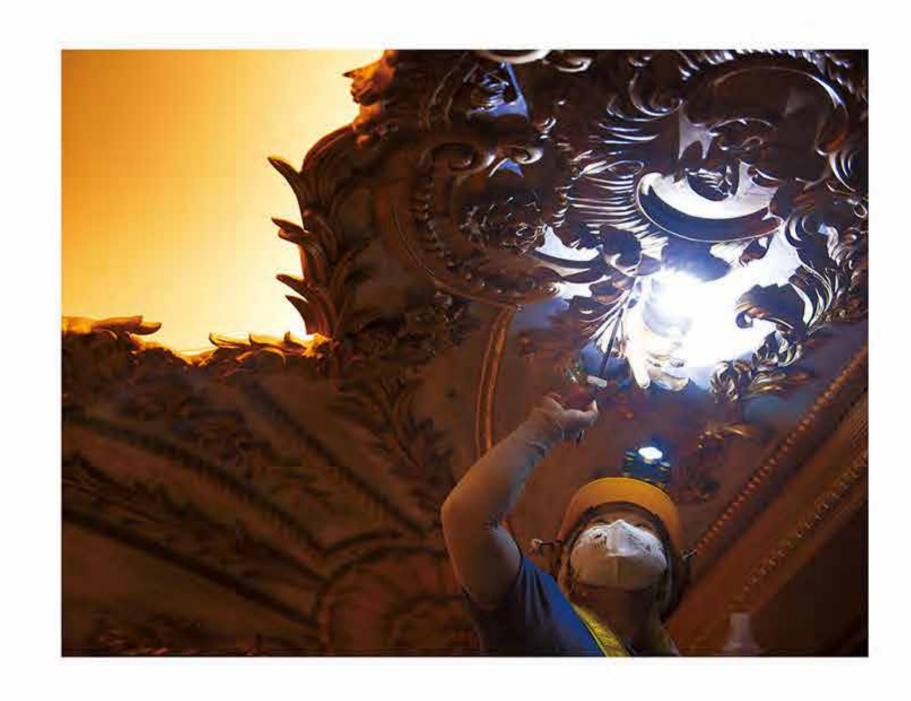


A New Level of Golden Interiors

THE 13's luminous interiors are the result of meticulous gilt work by experienced master craftsmen.

Before any gold leaf could touch the moulding, however, excellent project management and coordination was required to create the dry, clean, dust-free environment required for perfection. A purpose-built humidity control system was constructed explicitly for gilding and maintaining the lustre of gold finishing.

The mica panels, with their central visibility in the hotel's mezzanine, demanded skilled craftsmen of the right calibre to gild. A strict tendering process winnowed out a single factory out of four that met the qualifications. Six additional months were spent on testing different methodologies of fabrication, from roasting to blowing, to attain the most magnificent sheen.









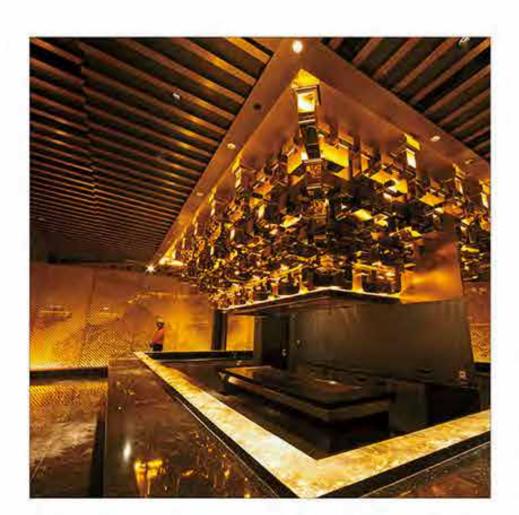


An authentic sheen of luxury...





Artisanal Interiors with Modern Skill



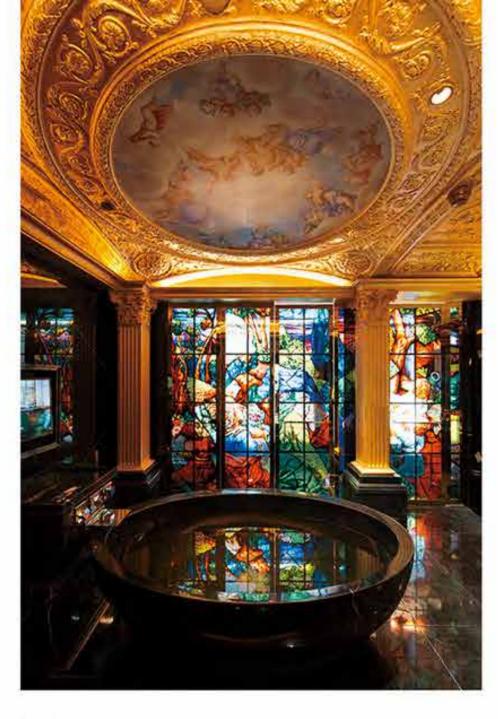
Numerous precious materials create textures and contrasts that are exclusive to the hotel, including eel skin leather in its retail shops, called the "silk of the ocean" for its beauty and smoothness, which has an elegant, horizontal pinstripe-like pattern. The hotel's Japanese restaurant uses real kimono cloth that was specially sourced from Kyoto, with a delicate, silken texture in vivid colours and traditional Japanese patterns.

Paul Y. Engineering engaged a professional merchandising team to source top-end materials for THE 13's interior fit-out and decorations. As much of the bespoke materials needed to be prefabricated off-site as possible, then assembled on-site to achieve the best results. Many of the exotic and highly coveted items used in the décor have more common use in high end fashion. Thus, using the same materials for a building's interior demanded above-normal skill and craftsmanship. THE 13 utilises a team of experienced artisans to perform this task.

Behind the scenes, it was up to Paul Y.
Engineering's engineers to install a museumquality climate control system. This was an
absolute necessity to ensure the temperature
and humidity stayed at the perfect level in order
to maintain the lavish materials.





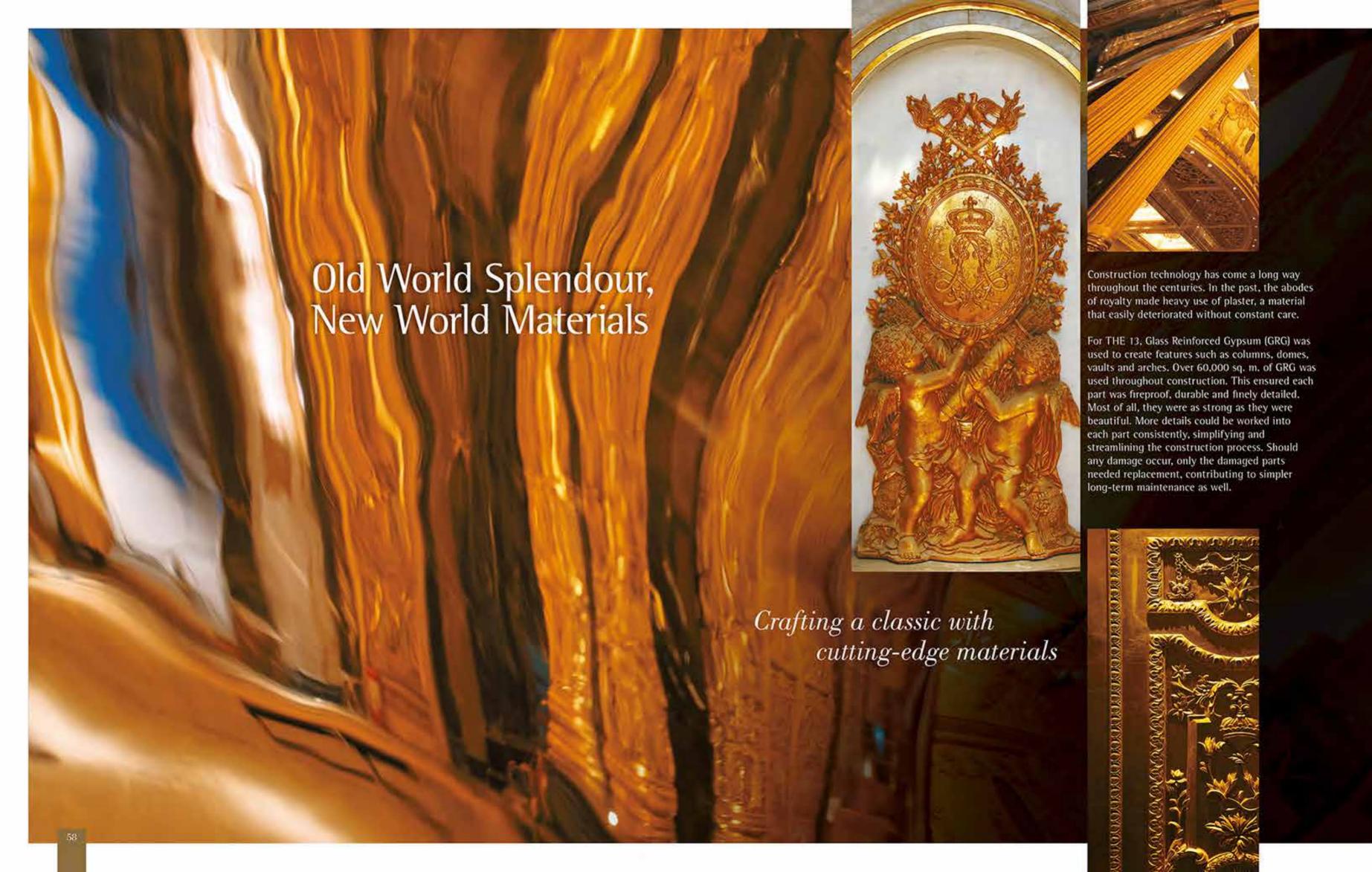


Bespoke Luxury in Every Detail

Creating the ultimate Jacuzzi required Paul Y. Engineering to exert tremendous planning, designing and E&M work.











Improving on Classic

THE 13 is a modern mirror of classic luxury, utilising contemporary technology to improve on what came before.

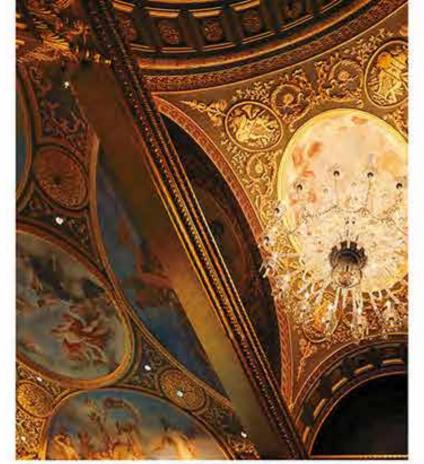
From start to finish, THE 13's interiors had to be a true reflection of royal extravagance, and as the tailor of luxury, Paul Y. Engineering left no stone unturned to ensure this was so.

While technological marvels like modular, prefabricated Glass Reinforced Gypsum (GRG) pieces ensured consistent craftsmanship, the massive amount of artwork, crafted details and sculptures within THE 13 nonetheless had to be finished by hand. GRG relief sculptures on the walls were paired with precious marble tiling, and individual painted murals with crafted gold leaf borders fill the high, vaulted ceilings. High resolution paintings hang on the walls of the ballroom and Royal Villa. Even the smallest fixtures – screws – had to be specially sourced so that they had uniform motifs and matched the decorations perfectly.

A marriage of beauty and pragmatism



The painstaking processes of sourcing, sculpting, installing, gilding and conditioning artistic details throughout THE 13 required seamless planning and coordination to pull off. The hotel's ceilings proved particularly challenging. Many modern services we take for granted, such as sprinklers and electrical connections, had to be incorporated alongside the painted murals and elaborate sculptures. Ensuring these basic functions and aesthetic details worked together was itself a wonder of construction.







In addition, the paintings and art pieces featured in the ballroom and Royal Villa had to be specially finished to give them the right antiquated look. Paul Y. Engineering tried numerous coatings and textures to recreate a fresco effect. The results are ingenious modern fixtures that genuinely resemble artefacts from a past age.



Hidden within THE 13's elaborately decorated ballroom is an advanced lighting system capable of showcasing its many grand soirees to come. The biggest challenge Paul Y. Engineering faced was installing the system within the curved, vaulted ceiling, where special arrangements were required to conceal electrical equipment and features. An elevating platform is built into the room, which has the ability to better spotlight objects using a dazzling array of lighting effects.





Many of the fixtures and components were either custom-made for THE 13, or specially sourced. Technology and creativity prevailed, and the end product is a magnificent space designed to host everything from royal banquets to bespoke fashion shows.









Orchestrating THE 13

Modern construction often faces unrelenting schedules from start to linish, and THE 13 was no exception. Paul Y. Engineering undertook both the role of designer and builder, requiring it to simultaneously design, construct, coordinate and manage a high-visibility project. With so much on the line, the firm eked out every ounce of professional expertise to streamline the complicated planning, perfect coordination with subcontractors and enable full logistic support.





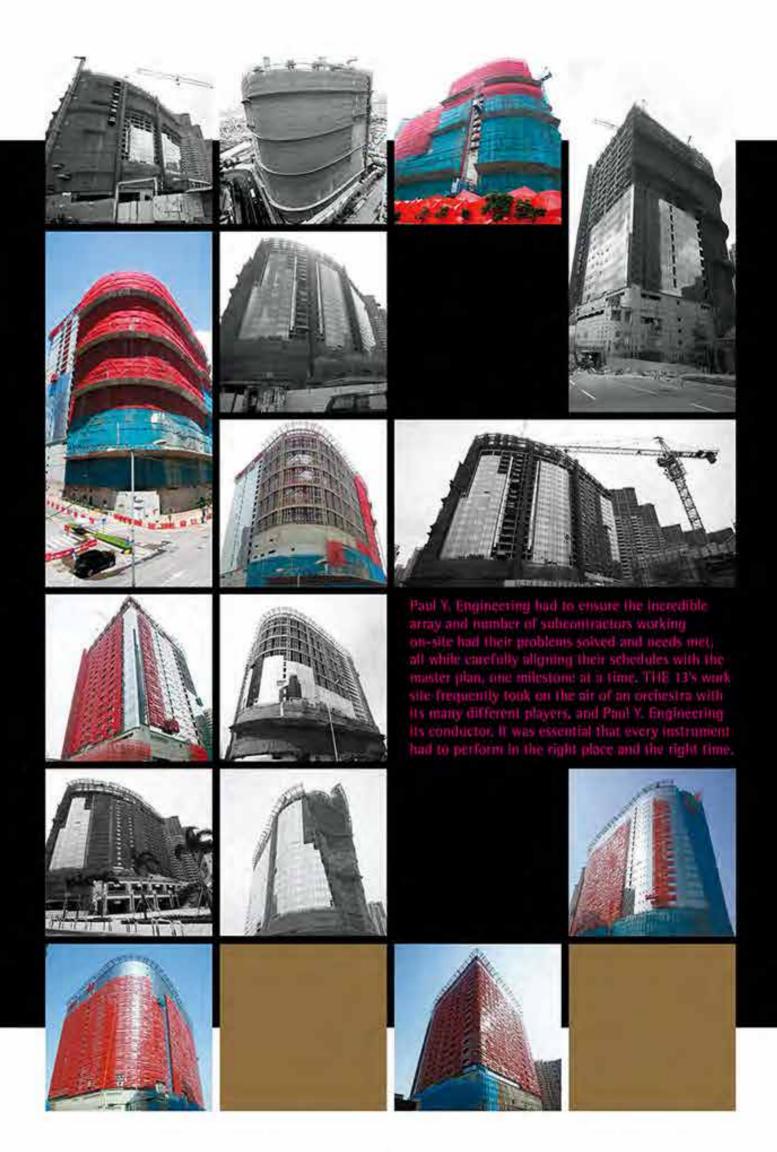














Countering limited space

Apart from time, a lack of construction space proved another complex challenge. To maximise what space the work site had, most of the building materials could not be stored on-site. Instead, prefabricated components were built off-site for later installation. This strategy allowed Paul Y. Engineering to minimise the land it needed to lease for temporary storage.

Nonetheless, like all else about THE 13, perfect timing and coordination still reigned supreme. Limited space for storage on-site required any prefabricated components to be installed within a two-week window, or they would take up precious space meant for other components. Prefabricated parts had to be created off-site and on schedule every time, then transported precisely just before they needed to be installed. Early arrivals would find insufficient space for storage, and late arrivals meant a possible delay for the whole project.







Buying Time _____ with Technique





THE 13 consists of 4 levels of deep basement, and a 23-storey superstructure including 4 storeys of podium. Construction of the basement and superstructure was 14 months from excavation to topping out and completion of all late cast structures. The top-down method was chosen to help fast-track the superstructure, as using conventional building methods would have otherwise required an additional 8 months.











The top-down method allowed construction on the superstructure to commence without completing the basements. Stanchions extended from piles were laid up to Level 4 above ground, before the first slab of the ground floor was cast. Once this was in place, construction of Level 1 commenced. Podium slabs were cast floor by floor upwards to maintain stability. Work would then continue on the superstructure until it was complete. Concurrently, excavation for Basement 1 was done and its floor slab cast. This was repeated until the desired depth of four basement levels was reached.







Super-efficient Construction

While the top-down approach offered significant time-saving benefits, the method was not only more costly, but much more difficult to execute. Here, the genius of Paul Y. Engineering's teams fully came into play.



It took detailed construction, and extensive logistical planning and coordination to build the basement floors and superstructure simultaneously.

Firstly, enough room had to be set aside while the superstructure was being built for excavating and constructing the basement levels. A total of 114,000 cubic meters of soil had to be excavated for 23 meters deep of basement floors. It was an enormous challenge to muck out the excavated material while also continuing work on the superstructure. Technology was once again the builder's saviour. Paul Y. Engineering utilised special facilities including excavators with telescopic arms, and mucking out openings for clear vehicle access in order to meet, and exceed, the demands of this prestigious project.







Speedier, Greener Construction





A large amount of the parts used in THE 13 were crafted off-site for later assembly. Key features: flooring and fittings were pre-installed off-site and simply lifted into position by crane. This modular approach streamlined the construction process, enabling just-in-time manufacturing and delivery.

The flexibility of individual modules ensured that if any revisions were required, the affected parts could be efficiently removed and replaced. It also saved on storage space for excess materials. Finally, less building un-site and vehicle movement offered a significant reduction in THE 13's carbon footprint during construction. Faster building overall was simply smarter and more sustainable for the planet.















Streamlining with miniatures

The extensive use of modular parts was not iimited to the final features seen on THE 13, but also includes it virtual building blocks—muck-ups. A temporary muck-up centre customised for this project was erected in Hong Kong's Kwu Tung to test for quality and effect. Almost all the design elements for the hotel were first built as mock-ups. Most features were evaluated as 1:1 models prior to manufacturing.







This presents an unusually high ratio of muck-ups for any one project, and underscores Paul Y. Engineering's commitment to constructing a perfect building.

Key features like the iconic Green Wall required several rounds of review and revision, involving many parties and the client, to achieve the best effect. The mock-ups enabled the builder to test for every scenario that could affect construction, another vital tool in streamlining the building process.

Expertise behind the façade



Overcoming MEP challenges









Again, limited construction space required meticulous planning and tremendous Mechanical, Electrical and Plumbing (MEP) expertise to install all the modern conveniences a truly luxurious hotel needs. Extensive use of computer-aided engineering including Combined Services Drawing (CSD) and the Building Information Model (BIM) helped simplify the planning and reviewing process, while also shortening construction time.

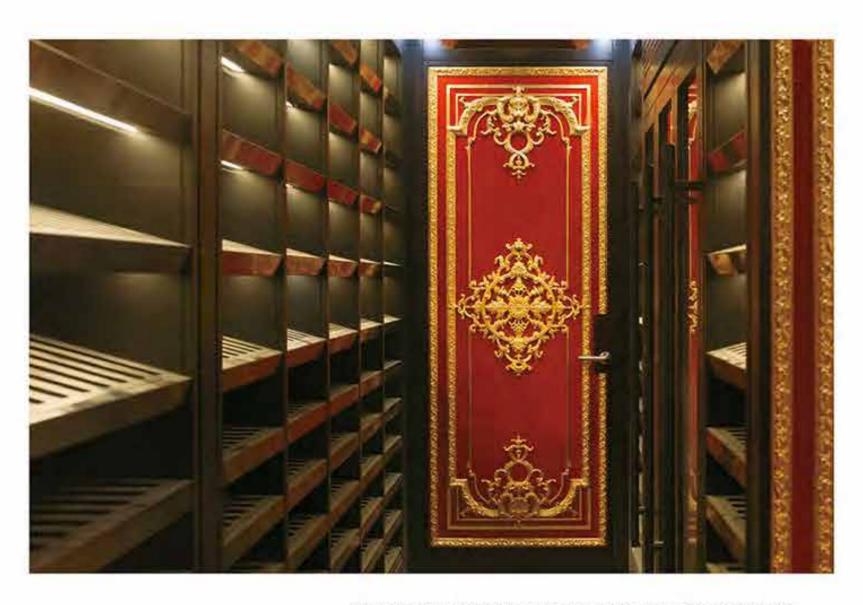
Tailor, Tailleur, Terzi...







International Tailor of Style



As an ultra-luxe destination built to entertain many of the world's most flamboyant guests, THE 13 had to exude a level of prestige on par with its brand. Paul Y. Engineering, the Tailor of Luxury, was tasked to create a hotel with a global eye for grandeur.

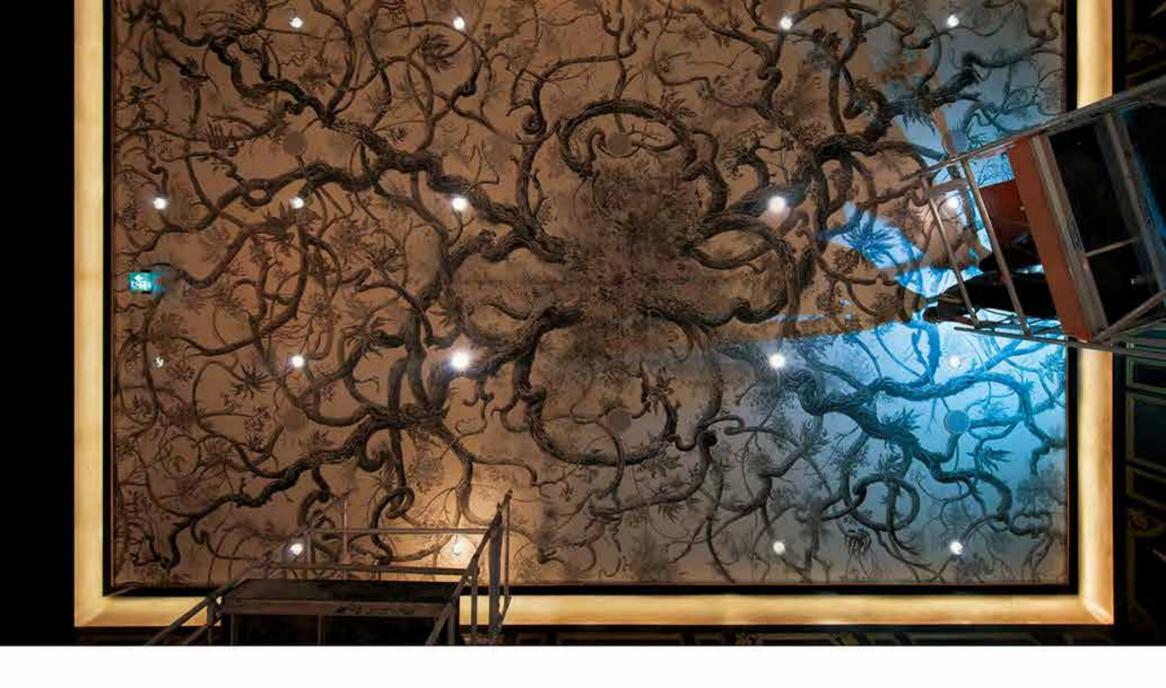
A professional team was formed to source top-quality décor and design elements from around the world. Many of the finest items were imported directly from their original countries as whole pieces, to guarantee local materials and craftsmanship. Ultimately, THE 13 showcases the most potent symbols of luxury recognisable to its savvy jetsetters.

The grand wine cellar from Turkey, the exquisite detailing on the fireplace from Belgium and the artisanal quality of real kimono silk from Japan – all of these represent a world of opulence in just a single building.

The Print of Mastery

To bring the ambience of real French chic into THE 13's French restaurant – L' Ambroise at 3/F, renowned French artist François Houtin was invited to create pieces on-site, which will be integrated into the decor of the upscale restaurant.

François Houtin began as a landscape architect by trade, practising in Paris from 1971. His later trained in etching, and developed a prodigious collection of densely detailed, imaginary gardens in print and encre de chine, for which he has won major prizes, most recently the Grand Prix de Gravure de la Fondation Taylor (Prix Baudry) (2010).





















Prioritising Innovation safety

By its nature, building is a dangerous profession. Paul Y. Engineering has a consistent reputation for safe construction standards throughout its projects. The Safety, Health, Environment & Quality (SHEQ) Policy Statement sets out firm compliance guidelines for its construction sites.

THE 13 was a pioneering building in many respects, not only in terms of industry breakthroughs, but also for taking safety standards to a whole new level. A perfectly devised and executed construction plan made safety its first priority. All site workers and supervisors were strictly expected to follow safety rules, and all construction work saw smooth and safe implementation. This resulted in zero fatalities during construction, another triumph worth celebrating.



Harmonious Neighbourhood Ties

Throughout construction, Paul Y. Engineering went above and beyond the board to ensure THE 13 was a conscientious neighbour to its surrounding community. Local building rules were strictly adhered to and tests were conducted off-site to evaluate the effect different building phases could have on the neighbourhood. The most effective and environmentally-friendly option was always chosen and implemented. By utilising a large number of modular pieces in its construction, THE 13 was able to avoid crafting and manufacturing on-site, thereby reducing noise and air pollution in the area around it.

Advancing Workforce Wellbeing







1 8

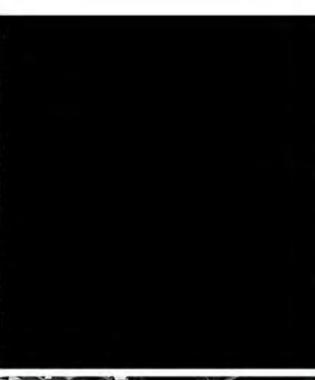










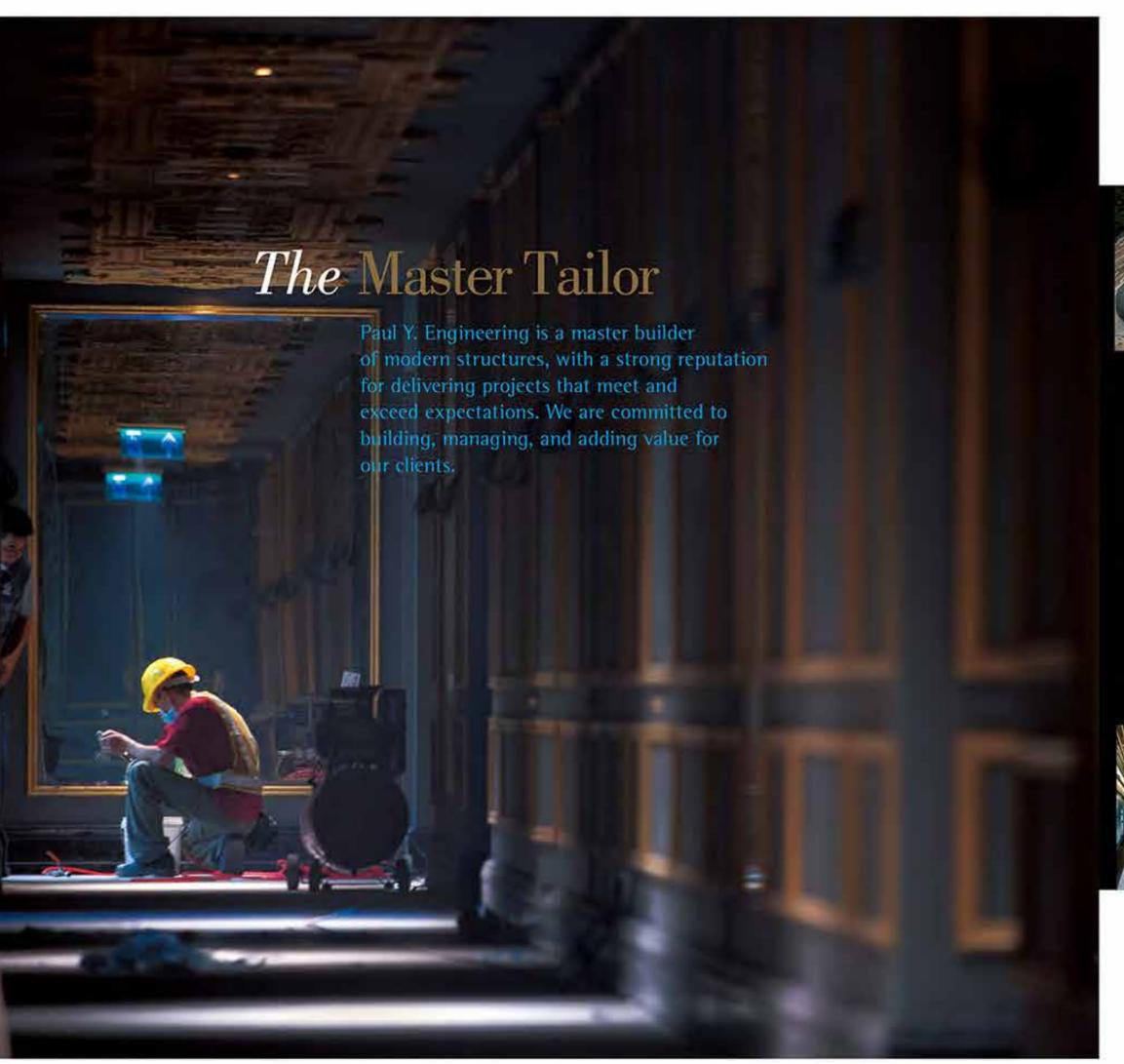




Employees are the most valuable assets of a construction company. Building a contemporary classic was impossible without the concerted efforts of Paul Y. Engineering's staff and workforce.



As such, Paul Y. Engineering takes its employees' wellbeing seriously by ensuring their standards of welfare and benefits were a step ahead of current legal requirements. Every floor was always equipped with a generous supply of water for thirsty builders. At regular lunch meetings, free meals were provided alongside a direct opportunity for workers to voice their opinions about their work.







A Modern Artisan

Paul Y. Engineering Group was founded in 1946 in Shanghai and is presently headquartered in Hong Kong. The firm stands among Hong Kong's largest contractors, with a growing clientele in the region and other parts of the world.

For over 70 years, Paul Y. Engineering has been at the heart of some of the most challenging and impactful construction projects that have shaped the iconic skylines of Hong Kong and many other cities. Our projects include commercial and residential buildings, institutional facilities, highways, airport runways, railways, tunnels, port works, water and sewage treatment facilities etc. We serve our valuable client-base by delivering integrated solutions, from concept to completion and ongoing management, as well as components that best match clients' needs and expectations.

We are strongly committed to improving on our built environment, transferring any cost-savings to our clients. Some of our prominent projects include Hong Kong's MTR underground stations, the Cross Harbour Tunnel and Ting Kau Bridge, Landmark East, Cheung Kong Centre, The Centre, Cyberport in Hong Kong and Studio City in Macau.

Meanwhile, we are deeply committed to our role as a responsible corporate citizen contributing to building harmonious and sustainable communities.









