



APEX OF DESIGN

With a new wave of high-rise buildings on the horizon,
what can architects learn from London's icon, **the Shard?**

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*“ARCHITECTS SPEND AN ENTIRE
LIFE WITH THIS UNREASONABLE
IDEA THAT YOU CAN FIGHT
AGAINST GRAVITY”*

RENZO PIANO

Partner and Founder,
Renzo Piano Building Workshop



INTRODUCTION

WHY THE SHARD MATTERS

Every major global capital features one stand-out high-rise icon – and in London, that building is undoubtedly The Shard.

Completed in 2012, the building reaches up 310m to pierce the clouds. Yet its true significance lies not just in the scale of the physical achievement, but in how it has paved the way for a new wave of ambitious high rise projects all over the world.

The skyscraper is enjoying a major renaissance – and for good reasons. As the availability of inner-city development space becomes ever more scarce, and urban populations keep rising, the demand for tall building is only going up.

It's no wonder that 2019 has been dubbed 'Year of the Tall Building' by New London Architecture, with countless monumental projects underway across the globe, from Madrid's Caleido (181m) and Moscow's MIBC Plot 1 (405m), to China's Suzhou IFS (452m) and South Korea's Busan Lotte (510m).

For the architects tasked with bringing these visions to life, the demand for a new wave of skyscrapers brings with it a hoard of technical challenges. Next-generation design solutions will be needed to create sustainable additions to the skylines of the world's biggest cities. And that means building on the lessons learned from the most recent generation of high-rise icons such as The Shard.

"It will change with the weather," says Piano of his design vision.¹ "I always thought this tower will be a sensor of the city, reflecting the mood."



DESIGNING THE SHARD

FROM LUNCHTIME SKETCH TO GLOBAL ICON

When client and architect first met to discuss the project that would become The Shard, things got off to an inauspicious start. Irvine Sellar, the developer and joint owner of the development site, had invited Renzo Piano to lunch at a Berlin restaurant to describe his dream of creating a ‘vertical city’, featuring retail units, a hotel, offices and apartments – alongside restaurants and a viewing gallery for the public. “You know, I hate tall buildings,” Piano remarked.² “They are arrogant, aggressive, like fortresses.”

Over the course of the meal, however, Piano began to come round to the idea. “The most important thing that attracted us was this idea of mixing use, and the fact that it was sitting in a vital place of interchange,” he says.³ “It provided an excellent occasion to show that you could provide life in a city without increasing the traffic – by using public transportation.”

Piano was soon excited about creating a groundbreaking addition to London’s skyline, in a highly sustainable location, with a design inspired by its historic London setting next to the River Thames. He remembers thinking: “I see it as like a giant sail emerging from the river, and so the shape of The Shard was conceived.”⁴ The architect turned over the restaurant menu and began sketching an outline of a building. Sellar was captivated. “As he sketched, I said, you’ve got it,” he recalled. “You’ve now got my vision.”⁵



COMMERCIAL AND AESTHETIC DESIGN

REACHING FOR THE SKY

Nearly 20 years on from that pivotal meeting, The Shard is now recognised around the world as an iconic feature of the London skyline. Less well known is how a highly specific set of site characteristics, commercial objectives, and political circumstances informed Piano's architectural approach - and changed the way we now think about tall buildings.

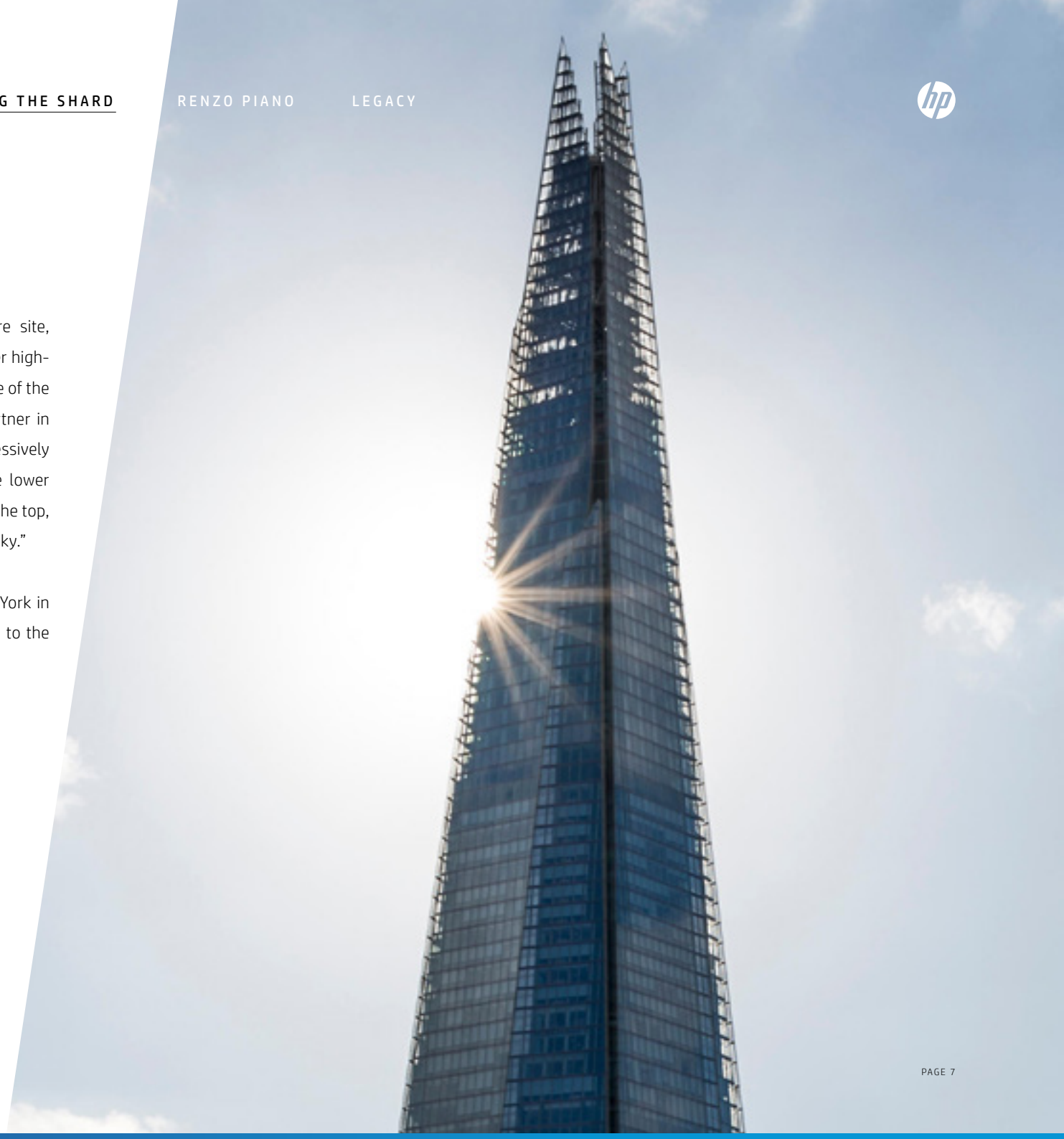
The project could easily never have happened. Sellar initially had no intention of developing the site, which he acquired in 1998 when it was occupied by the 25-storey Southwark Towers. But a white paper published the following year, which outlined the UK government's support for tall buildings above public transport hubs,⁶ planted a seed in Sellar's mind. That quickly grew into an ambitious plan for a vertical city, designed to take advantage of the site's location directly above and adjacent to the London Bridge transport interchange.





Piano saw that Sellar's vision of a tower atop a one-acre site, incorporating a broad mix of uses, would lend itself to a super high-rise design which elegantly tapered towards the top as the size of the required floorplates became smaller, Joost Moolhuijzen, partner in charge at Renzo Piano Building Workshop, explains: "Progressively changing from functions requiring large floor plates at the lower levels towards functions requiring small floor plates towards the top, would allow the tower to have a light presence in the London sky."

Piano's design made sense, Sellar told a conference in New York in 2015.⁷ "For [Piano] it was a colourful inclusive building, open to the public through restaurants, hotel and viewing galleries."



SOLUTIONS BEHIND THE SHARD

KEEPING COOL

An innovative triple-glazed facade features blinds fitted between panes of glass automatically respond to changes in light, helping to maintain an optimum internal temperature.

DIVERSIFYING USES

The different sized floor plates were used to cater for office, hotel and residential uses while separate points of entry and a total of 44 lifts were installed to serve office workers, hotel guests, diners, and residents.

SOFTENING THE STRUCTURE

Low-iron glass was used as glazing to achieve a crystalline finish that would help it blend into its surroundings. The facades also stop at varying levels just short of the peak to achieve Piano's desire to see the tower 'disappearing into the sky'.

INTERGRATING WITH THE CITY

Public viewing galleries offer never before seen views of London, while the project included a new concourse at London Bridge station, new links with the London Underground, a revamped bus station and the creation a new public piazza.



ENERGY-EFFICIENT DESIGN

SUSTAINABLE SOLUTIONS

Piano's instinctive aversion to tall buildings was overcome by his sense that a super high-rise structure was the best way to achieve sustainability on the highly constrained Southwark Towers site. "There is a nostalgic, almost romantic idea that it is more ecological to make a small building. Forget it. This is the worst way to consume land," he says. "This is the reason that cities grow. It is more socially correct to intensify the city and free up space on the ground."⁸

However, measurable sustainability would only be achieved if Piano could reconcile his 'shard of glass' design with energy efficiency challenges to ensure the building would not be subject to excessive heating and cooling as the sun shone through 56,000 sq m of glazed surfaces – a surface area equivalent to eight football pitches.

Piano's solution was to opt for a 'double-skin' facade, with Venetian blinds installed between layers of glazing, responding automatically to changes in light levels. The building's fractured design, with individual facades not quite meeting at the edges or at the summit, provides natural ventilation to internal winter gardens on the office levels. Once again, the building's mix of uses worked to its advantage. "We have extra production of heat from the offices that we can reuse in the residential part," Piano explained.⁹ "This is un-poetic but it is very intelligent."

An innovative form of low-iron white glass was chosen for the facade, avoiding the green tint characteristic of many glazed buildings, causing the surface of The Shard to subtly respond to changes in the sky. "Depending on the day, the light and the position of the sun, the building will look different," says Piano.¹⁰ "It will not look like a massive glass meteorite - choom! - as many towers do. It's going to be more vibrant and changing."

DESIGNING FOR APPROVAL

INQUIRING MINDS

The Shard's striking design was more than just a bold aesthetic proposal – it was a commercial imperative. Almost as soon as the project was conceived, Sellar said: “It became clear to my team that we needed a compelling outstanding design to secure planning permission and funding.” Recruiting an architect of Piano's stature was essential. “His appointment was critical to creating a first class design and helping us to attain planning consent.”¹¹

Not everyone agreed on The Shard's design merits. Simon Thurley, Chief Executive of English Heritage, said the tower “would put a spike through the heart of historic London”.¹² The controversy around the scheme led the UK government to hold a public inquiry to decide whether the project should go ahead.

Piano describes the process as “tiring, irritating at times, but necessary; a project

like this needs public support”.¹³ In November 2003, the then deputy prime minister, John Prescott, gave the project the green light. “The proposed tower is of the highest architectural quality,” he wrote. “Had this not been the case, the secretary of state might have reached a different decision.”¹⁴ Sellar's bet on his architect had paid off. “If it wasn't through Renzo,” he says, “I don't think we would have got planning consent.”¹⁵

COLLABORATIVE DESIGN

CROSS-SECTOR COLLABORATION

Construction of The Shard began in November 2009. At the project's peak almost 1,500 people were employed, ranging from structural engineers to glaziers, electricians to security staff, crane operators to lift installers. Over the course of three years, the team installed 54,000 sq m of concrete, equivalent to 22 Olympic-sized swimming pools, 11,000 sheets of glazing, 200 miles of wiring and 38 miles of pipework.

The project required an extraordinary amount of cross-disciplinary collaboration. Claudio Boccasile, a director at Rebus Engineering Services, which was involved in the redevelopment of London Bridge Station, says: "They did everything in perfect coordination. All the disciplines involved, step by step, day by day, all together."

Renzo Piano Building Workshop worked particularly closely with engineer WSP to ensure completion of the project before the 2012 Olympics, while staying true to the design.

"The stereotype is very much that the engineer is worried about numbers, and the architect is worried about colour, and all the builder cares about is getting it done quickly," says John Parker, senior technical director at WSP.¹⁶

"On The Shard it wasn't like that. The architect did listen to our concerns about structure, and we listened to him about his concerns about aesthetics."

PUBLIC PERCEPTIONS

DIVIDING OPINION

A month before The Shard opened to the public in 2013, the world was watching. The New York Times summed up the public mood: “Londoners have a love-hate relationship with The Shard, Western Europe’s tallest building, which opens to the public next month. Some of us love it, and lots of us hate it.”¹⁷

True enough, the project had its detractors, including architecture critic Owen Hatherley who denounced the building as a “dystopian presence”.¹⁸ Others, such as Piano’s former collaborator Richard Rogers, saw an architectural marvel. “The Shard is the most beautiful addition to the London skyline,” he said. “Even when the sky is dark it captures the light around it and stands like a blade cutting through the clouds.”¹⁹

Many more saw elements of both sides. US architecture historian Charles Jencks claimed The Shard failed to live up to its name and reputation, writing that “The ‘shards’ are neither the potsherds of the name, nor the slivers of ice, stone and glass

of the main metaphor. Instead, they are large, flat, industrial window-walls that taper”.¹⁹

However, he went on to praise The Shard’s “positive visual metaphors” and function as a navigation point for Londoners, adding he could “like the building for its non-precious detailing, the way its remorseless windows disappear into nothingness”.

The critic Edwin Heathcote, writing in the Architects’ Journal, described the building as a “paradox”, noting some failings in the way the building related to the surrounding city, but nonetheless describing it as an “extraordinary presence on the skyline” and “a monument that has changed the shape of London and will continue to exert an influence”.²⁰ The Guardian’s Rowan Moore wrote: “The startling, part-graceful, part-clunky, impressive, slightly nutty Shard is a true monument to the city that made it.”²¹

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EDWIN HEATHCOTE
Architectural critic

RENZO PIANO

THE MAN BEHIND THE VISION

Renzo Piano first made a name for himself in the 1970s. Teaming up with renowned British architect Richard Rogers, he designed the Centre Georges Pompidou in Paris – a building that became famous for boldly inverting its inside onto the exterior.

During a career spanning decades, Piano stamped his vision on a host of other notable projects worldwide including the International Airport in Osaka and Berlin's Potsdamer Platz.²² His work in the US ranges from the New York Times Building to the California Academy of Sciences. Piano's creative passion for architecture is evident throughout all these schemes.

Renzo Piano Building Workshop (RPBW), the practice he founded in 1981, is described as having preoccupation with transparency, beauty and lightness that extends to a striving for 'weightlessness'.²³

Piano was born in 1937 into a family of Genoa-based builders, and went on to win accolades including the Pritzker Architecture Prize and the American Institute of Architects Gold Medal. His impact was summed up perfectly in a Financial Times review of a 2018 exhibition dedicated to his life's work at London's Royal Academy:²⁴

"Piano has consistently created urban landmarks, buildings that define skylines and, no matter how controversial or huge, eventually melt into civic-psychic images."



LEGACY

HOW THE SHARD CONTINUES TO SHAPE DESIGN

Renzo Piano's hope for The Shard was that it could challenge the narrative that high rise towers were representative of negatives such as money and power. Rather, he believed the design to be "quite gentle" – going tall only to "breathe".

No doubt conscious of his creation's tendency to divide opinion, he asked for critics to reserve judgement on The Shard. Speaking in 2012, he said: "You know, the best architecture takes time to be understood. I don't know how The Shard will be thought of. In some ways it's a bit narcissistic to even think about it like that. But I would prefer people to judge it not now. Judge it in 10 years' time."²⁵

It's been seven years since construction was completed and the scheme's impact is starting to become clear. While the design still has its detractors, the building's presence in the city seems to accord with Piano's original vision.

"The slim profile of The Shard works well from all angles, from near and far," says Peter Murray, chairman of New London Architecture. "The façade always seems to be light and clear, perhaps because its angled glazing is reflecting the sky."

The Shard shows that elegant form can follow function – and that to break boundaries, you must dare to be bold. "You have to accept as an architect to be exposed to criticism. Architecture should not rely on full harmony," says Piano.²⁶

This legacy can be seen in a new generation of skyscrapers, such as Landmark 81 in Ho Chi Minh City and Tower One at the Changsha complex in Hong Kong, projects which push the boundaries of what is deemed possible while seeking commercial viability through architectural innovation, a diverse mix of uses, and promises to serve the public good.





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