

FAÇADE DESIGN IN CHINA BY VS-A

“THERE IS AN OUTSIDE, AN INSIDE AND THAT WHICH LIES IN BETWEEN. THIS SPACE MIGHT ONLY BE A FEW MILLIMETRES OR SEVERAL METERS DEEP. THE STUDY OF THIS SPACE CAN BE DETAILED BY A FEW SENTENCES, CAN BE DEVELOPED IN A BOOK, OR AS A FULL-TIME ENDEAVOUR. THIS IS HOW VS-A DEFINES THEIR WORK”

VS-A FOUNDING PARTNER, ROBERT-JAN VAN SANTEN

After qualifying as an architect in France in 1986 van Santen began his career in Paris with Renzo Piano. It was here that he journeyed into the world of façade technology and developed his passion for the industry. He went on to establish VS-A in Lille, France in 1989 and over the past thirty years has worked with some of the biggest names in architecture. His portfolio includes iconic buildings such as the Casa da Musica in Porto, the London Olympic Aquatic Centre, the Alcide de Gasperi tower in Luxemburg and the Casablanca Finance City Tower in Morocco.

van Santen's interest in Asia was accelerated alongside an increasing frequency of invitations to speak at various regional conferences. During this period Suzy Huang joined the company as Partner and began to play a major role in establishing the Hong Kong office in 2011. He also attributes his success in Asia to Naree Kim, who has worked with VS-A since 2008 and was integral in establishing the Seoul branch in 2014. The practice would then go on to set up an office in Shenzhen in 2018, raising the number of employees in Asia to over 60.

This year the Hong Kong based team was recognised for excellence in the façade engineering category of the CTBUH Awards for their work on Vanke Binhai Cloud Center in Shenzhen. Clearly, van Santen is a man with a great passion for design and this is reflected by his position of Technical Director over Founder or CEO.

DESIGN PHILOSOPHY

With a philosophy built upon the premise of bridging the gap between architectural design and construction, van Santen and his team are testament to the notion that the work of the façade engineer must always start from the “design vision” of the architect.

“It is important for us to understand the particular characteristics of each job,” states van Santen. “We believe that projects are weakened as architectural vision is diluted. With so many chefs in the kitchen this is a very real problem that we are very conscious of. As such we take great care to design in a way that complements the project's underlying logic. We very much use questioning as a design tool, and this method sees to it that the different constraints of a project



Guyin Minsheng Financial Building
國銀民生金融大廈

are gradually integrated into the design vision. In some cases this integration can even become a feature of the final design! So far architects, and even Asian developers, have responded well to our rational and neutral approach."

At the core of VS-A's success is not only a sensitivity towards capturing the essence of the architect's vision, but also a team whose expertise spans all the technical facets of engineering, cost control and adherence to building regulations globally. This allows them to propose and compare multiple solutions for every part of the project.

Asked how he would define VS-A as a company, van Santen prides himself on having attracted a set of individual personalities, each of whom have a unique set of skills, but are collectively able to develop a very diverse set solutions for all types of demands.

"Globally, we consider ourselves as a well-balanced mix of technical and design-oriented consultants. Half of the team has an architectural background, and we are united by a common feeling of fulfilment when we know we have provided the best solution to a client's problem."

The diversity of VS-A's international team has allowed for an organic expansion into other fields. Van Santen says that the firm's design solutions are always tailored to suit a project.

"Naturally we do this because standardized products are often unable to suit the specific requirements of our projects. With this approach, it becomes clear that the intricacies of façade design come with a considerable overlap to product design. Not only in terms of scale, but also in terms of design thinking. Thus VS-A Design and Ublo-windows are companies that were created to autonomously develop such products," he says.

Although the profile of VS-A has provided for opportunity to collaborate with many international architectural firms now located Asia, van Santen maintains that the original reason for coming to Asia was to collaborate with local firms. This goal was quickly fulfilled and can be illustrated by both of projects featured in this article.

GUOYIN MINSHENG

One of VS-A's most challenging projects involved the design of the futuristic, "crystal maze-like" steel and glass podium of the Guoyin Minsheng Financial Building, designed by Zhubo Design, also in Shenzhen.

The project's principal designer presented VS-A with sketches for large cavernous space, open to the public, connecting the project's two towers. The designer's intention was to play with the space's visceral boundaries, incorporating free flowing geometries with transparent and reflective glass panels.

The entire project is made of flat, single and double curved glass panels. A project of this scope and ambition is totally dependent on what local glass manufacturers can supply. Fortunately, what glass manufacturers in China can do is totally unique.

ACHIEVING THE EXTRAORDINARY

Designing Guoyin Minsheng's podium the first major challenge was the project's geometry. But the construction details also had to incorporate the architects' request to include horizontal lines throughout to ensure that the podium would be as striking as possible.

Therefore it was immediately apparent that the glass would not be point-fixed and, to deal with the tolerances of the glass, a clamp system had to be developed instead of using a linear frame. This was necessary to streamline the installation. The secondary structure is made of horizontal transoms that are offset from the main structure, solving a 3D problem with a 2D solution. The clamps were designed so that the same clamp can be used to fix any glass, with any inclination.

The captivating fluid planes of the podium at Guoyin Minsheng Financial Building are the perfect example of VS-A's design philosophy centred on bridging the gap between architectural design and construction.

BINHAI CLOUD CITY

VANKE, the developer of Binhai Cloud City, Shenzhen, approached VS-A to enter into collaboration with 5th Architects for the design of this 160m tower, home to one of the Group's regional headquarters.



Guoyin Minsheng Financial Building
國銀民生金融大廈

When speaking of this signature project van Santen's enthusiasm is obvious. "This was one of our first projects in Shenzhen and we are proud that our façade engineering was awarded by the CTBUH. But this award is one to share with all of the project's stakeholders whose positive support for the original architectural vision ultimately ensured the tower's successful delivery."

The building's curtain wall was designed with unique concave-convex units. The resulting geometric "zig-zag", the tower's defining architectural feature, was driven by directing the internal view across two opposing axis of the urban environment and was the inspiration behind adopting stone panels to emphasize the stoic angle of the building.

Externally this approach to the design of the building envelope has created a facade that graduates from totally opaque to entirely glazed, whilst, whilst the smaller window/wall ratio required the use of more transparent glass to achieve the desired levels of daylight penetration with minimal colour distortion to ensure the creation of a pleasant and comfortable interior atmosphere.

When approaching the building the façade progressively reveals subtleties like the curved perforated aluminium strip that hides the operable windows (10% of the façade area). The perforation pattern itself was specifically developed to allow the exterior lighting to be totally concealed.

ENGINEERING THE FUTURE

Robert-Jan van Santen says that finding the perfect architectural expression in the design for office tower façades doesn't reply on always making grandiose statements but even simpler geometries can create a significant amount of attention.

He says even design or building constraints can create opportunities within design proposals with one example coming from the requirement in China that glass must always be supported or secured by mechanical fixings, on at least two sides. Innovation is in many ways the life force of façade engineering.

VS-A continues to expand its specialist offerings to include developing technologies. Whether a project is large or small, local or global, what is clear is that ultimately, at the heart of VS-A is a mission to merge the architectural and technical elements of a project by taking pride in the development of customised solutions, often requiring the taming of complex geometries, so as to transform creative visions into a technical realities.

VS-A 中国外墙的设计美学

「一外一内，亦可内外兼备。这个空间可能只有几毫米或几米深。对于空间的研究，我们可以用几句话来描述，可以写成一本书，也可以深入研究。VS-A 就是这样定义着他们的工作。」

VS-A 的联合创始人 Robert-Jan van Santen 说。

1986 年，Robert-Jan van Santen 获得法国建筑师资格之后，便与 Renzo Piano 在巴黎展开了职业生涯，亦是他首次接触外墙工程技术之时，对此行业的热情由此而起。1989 年，他在法国里尔创立 VS-A，在过去的 30 年，他与建筑界的著名企业紧密合作，成就不少令人瞩目的履历：包括葡萄牙波多音乐厅、伦敦奥运会水上运动中心、大成金融中心及摩洛哥卡萨布兰卡摩天大楼中心等标志性建筑。

当他获邀出席不同地方的会议发表演讲时，他对工作的热情、好奇心及对亚洲的兴趣表露无遗，在这段期间，Suzy Huang 加盟公司成为合伙人之一，并在 2011 年在港创立办公室，一起大展拳脚。他亦将自己在亚洲的成功归功于建筑师 Naree Kim，他于 2008 年起便与 VS-A 合作，在 2014 年一同在首尔设立办公室。至 2018 年，VS-A 在深圳正式成立，在亚洲的员工人数已经超过 60 人。

今年，这支扎根香港的团队打造的深圳万科滨海置地大厦，荣获了世界高层建筑与都市人居学会 (CTBUH) 的外墙工程杰出奖。显然，Robert-Jan 是一个对设计充满热忱的人，从他担任起公司的技术总监一职中得到充分体现。

设计理念

Robert-Jan 及团队善用建筑设计与外墙建筑之间的差距，证明了外墙工程师的工作与建筑师的设计理念环环相扣，甚至以设计为导向，VS-A 的成功不单因擅于贴近建筑师的原创理念，而且团队运用其专业知识准确拿捏技术、成本控制及遵守国际技术要求。

对于 VS-A 的设计理念的过程，他说每一个项目也不尽相同，因此了解项目的特点最为重要，设计工作包括了解不同持份者的愿景及优先事项、技术上的限制、以及如何影响设计的最终面貌，甚至将限制变成特点。随后团队便能明白设计师及发展商的要求，并开始构思设计。

当 Robert-Jan 被问及对 VS-A 的看法时，他以公司拥有独特个性及技能的团队，及擅于满足各种市场需求的灵活性为荣。

「我们视自己为全球技术与设计导向并行的顾问公司，逾半团队成员具有建筑背景，当我们为客户问题提供解决方案时，我们更能设身处地感受。」

VS-A 的团队多样性容许公司扩展至其他领域。Robert-Jan 说，公司的设计解决方案能为项目而度身而设。

他说：「我们这样做，是因为标准化通常无法满足一些特定要求。如透过客制化，外观设计的复杂性与产品设计会有明显及大范围的互补，这不仅反映在规模上，还有在设计思想之上。因此，VS-A Design 和 Ublowindows 就是为此类产品而成立的公司。」

尽管 VS-A 的往绩有利公司与亚洲许多国际建筑商寻找合作机会，但 Robert-Jan 仍毋忘初衷，接下来介绍的两个项目，反映其目标即将实现。

国民生生金融大厦

VS-A 最具挑战性的项目之一是由深圳筑博设计负责设计的国民生生金融大厦，大厦具有未来风格呈「水晶迷宫」型的钢铁及玻璃大堂。

项目首席设计师向 VS-A 展示一个巨大呈洞穴状空间的草图，空间可向公众开放并连接大厦两座塔楼。设计师为了善用空间的内在边界，将随意流动的几何形状与透明反光玻璃面板相互结合。

整幢建筑由平面、单曲面及双曲面玻璃制成，这项目取决于当地玻璃供应商的可供的玻璃种类，而幸运地内地制造商所生产的玻璃均独一无二。



Binhai Cloud City
深圳万科滨海置地大厦

CTBUH FAÇADE
ENGINEERING
AWARD 2019

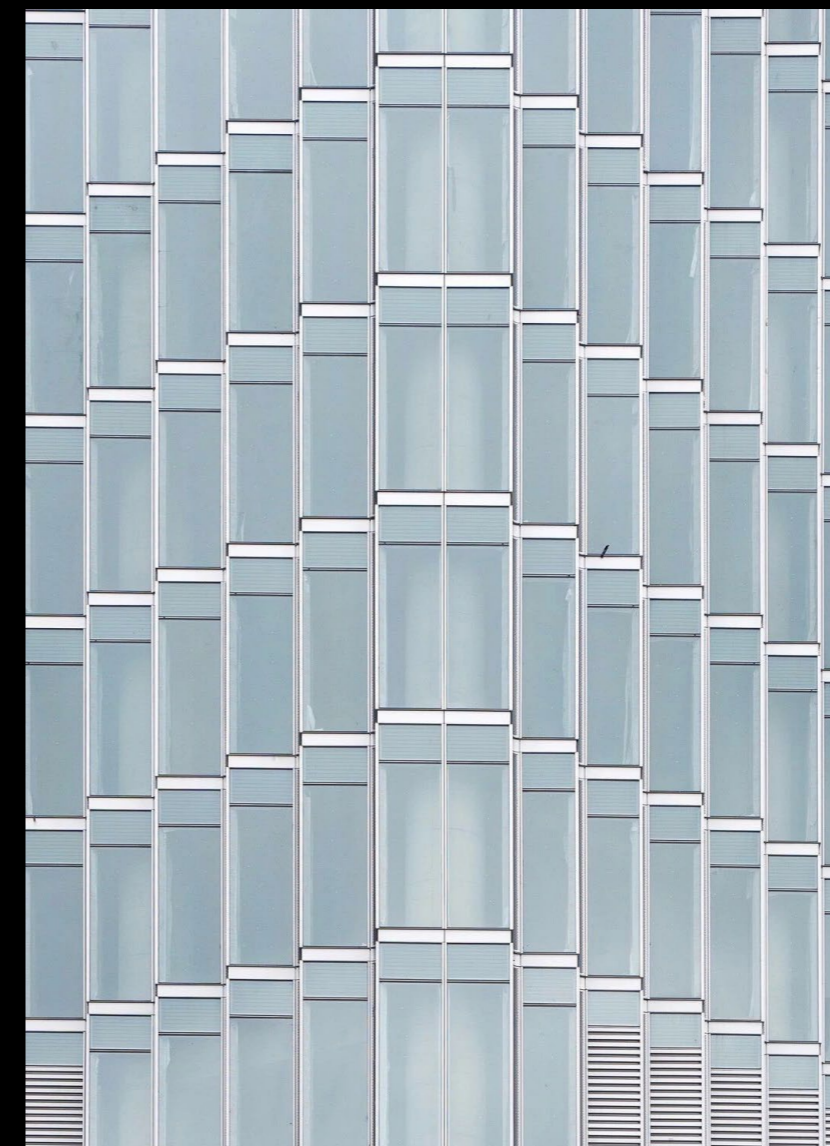


Wind load testing of sample façade

实现超都凡建筑

几何设计是发展商的首个主要挑战，大堂的建筑细节必须符合建筑师对使用水平线的要求，使建筑更引人注目。

然而，因玻璃不会定点固定，为了解决玻璃的公差及简化安装程序，团队须开发一种夹具系统，而非使用传统工具。次结构则由主要结构偏移的横梁而成，这可利用 2D 解决方法解决 3D 问题，夹具本身的设计可用作夹起倾斜玻璃。国民生生金融大厦大堂的流动平面设计引人入胜，是 VS-A 设计理念的完美典范，完美地补足建筑设计与现实之间的差距。



深圳万科滨海置地大厦

高 160 米的深圳万科滨海置地大厦是万科集团的地区总部之一，万科集团直接邀请 VS-A 与 5th Architects 合作，建筑的锯齿形外墙将面向都市环境内部视觉分为两轴；从外观上看，此设计创造了看来完全坚固而且具有玻璃外观的建筑物，建筑使用大石板来突显建筑物的直角，而较小的窗/墙面积比需要更多的透明玻璃才达到所需的采光系数。使用的玻璃可减少颜色失真，从而营造出舒适的室内氛围。

幕墙设计有独特的凹凸位，当行人靠近建筑物时，外墙逐渐展现一些细微之处，例如弯曲的多孔铝制涂条，隐藏可动窗户（占外墙面积 10%），穿孔图形本身经过特别设计，可以完全隐藏外部照明。

Robert-Jan 说：「这是我们在深圳的第一个项目，已获取了世界高层建筑与都市人居学会外墙工程杰出奖，为此我总感自豪。」他补充道：「殊荣由一同努力实践项目的人分享，他们由始至终皆积极地支持最初的建筑构想。」

设计未来

Robert-Jan 说，在办公大楼中实践完美的立面设计不代表可使人眼前一亮，更简单的几何图形也可以引起众人的目光。

他补充，即使设计或建筑会有不少限制，但团队亦可在设计方案中创造机会，就如上述的深圳建筑例子，团队尽力满足发展商利用机械固定装置将玻璃固定在两侧的要求，创新可在各方各面中展现，这亦是立面工程的生命力。

VS-A 团队凭借专业知识，扩展业务至开发技术，不论是大型还是小型项目、本地还是全球项目，VS-A 透过定制设计，将建筑及技术元素融为一体，配以团队引以为傲的结构和技术专业，利用复杂的几何图形，将具创造力的愿景带来现实。

