

# Al Hamra塔，科威特

Al Hamra Tower, Kuwait City, Kuwait

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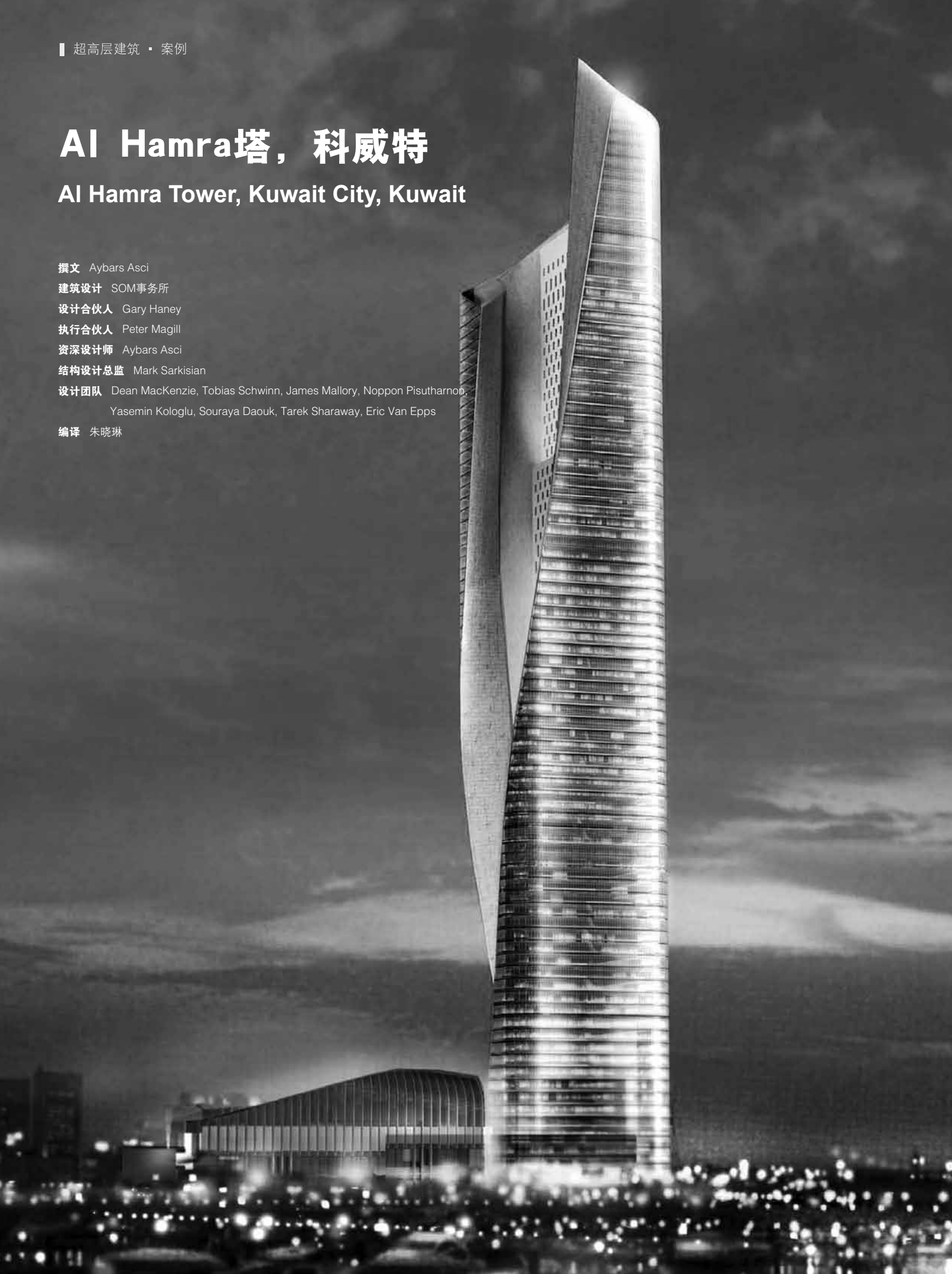
资深设计师 Aybars Asci

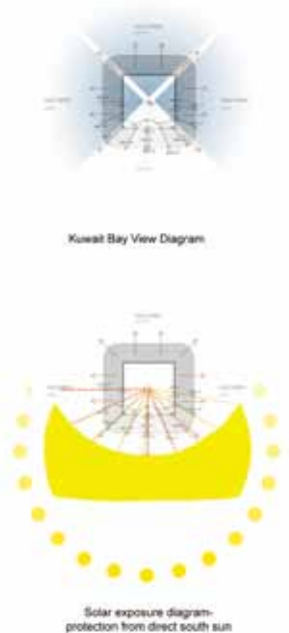
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Al Hamra塔坐落于科威特市，是一座包含有办公空间、健身俱乐部、剧院、美食广场的高端商业中心的商业综合体。建筑高度达到 412m。这座标志性的写字楼将成为科威特市最高的建筑。

Al Hamra塔的建设目前已经接近尾声，办公面积达到18.6万 $m^2$ ，其旁边是一座由当地建筑师设计的面积达3.4万 $m^2$ 的商业裙房。该项目的业主是一位当地开发商和一位总承包商，但建造一座超高层建筑却并不是他们的初衷。事实上，在项目之初他们已经开始动工建造一座由当地建筑师设计的50层高的塔楼和一座4层的裙房，而科威特当局却突然变更城市规划，允许基地内建造更高的建筑物。科威特希望能参与到该地区狂热的建筑热潮中，希望建造更高、更引人注目的建筑物。当 SOM 参与到项目中时，基地已经全部开掘，四层高的裙房已经在建。业主们希望保持裙房不变，并委托 SOM 在基地北部尖角处边长约60m的方形地带内设计一座新的塔楼。

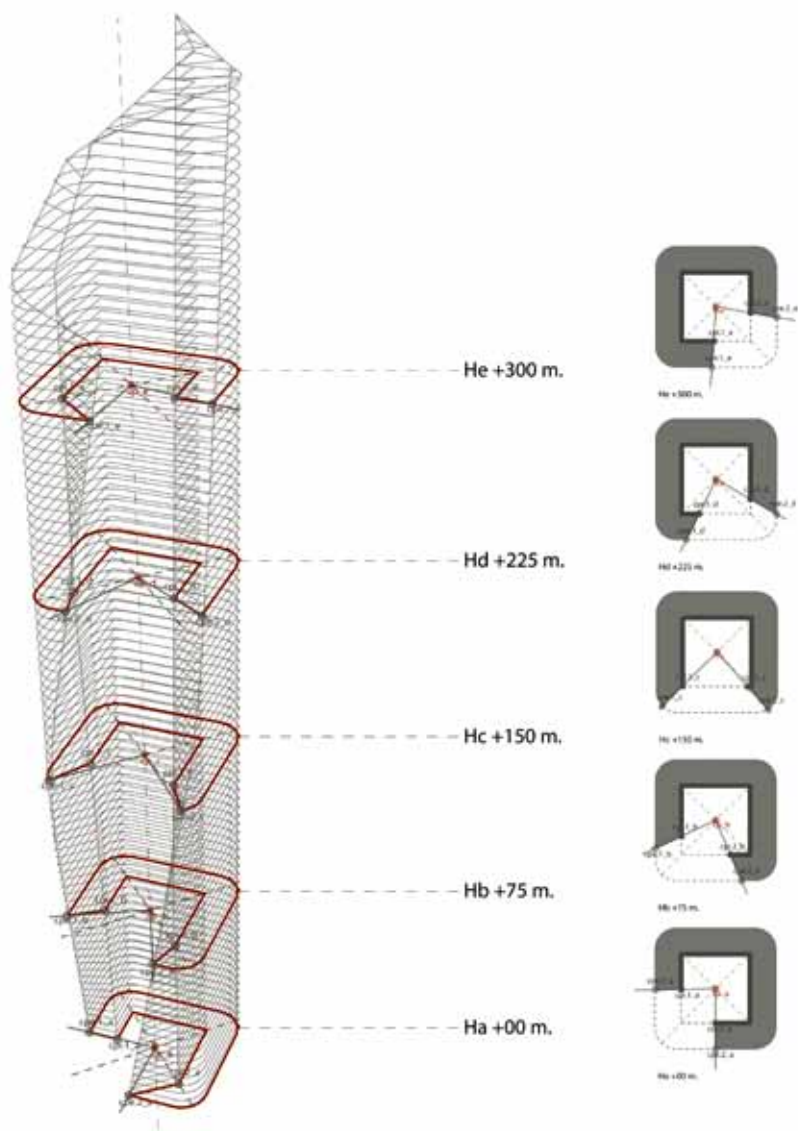
Al Hamra塔地处科威特半岛中心的黄金地段。沿着海岸线感受城市全景，超高层塔楼的形象强烈地凸出于城市的天际线。业主们期许着一个能很好地利用基地优势的标志性建筑，一个科威特的城市地标。他们同时也要求这是一座高效的办公

Al Hamra Tower, at 412 meters, is the tallest structure in Kuwait. It is nearing completion and scheduled to be complete in early 2011. The tower has 186,000 SM gross area of office adjacent to a 34,000 SM retail podium designed by a local architect.

Building a super tall tower was not the initial plan of the owners, a joint venture of a local developer and a general contractor. They had started the construction of a 50 storey tower with a 4 storey podium designed by a local architect, when Kuwait authorities changed the zoning to allow for a much taller structure on the site. Kuwait wanted to catch up with the building boom happening elsewhere in the region, and wanted to build taller and more prominent structures. When SOM was brought into the project, the site was fully excavated and the construction on the 4 storey podium was on its way. The owners wanted to keep the podium as it was designed and commissioned SOM to design a new tower at the northern tip of the site measuring 60 meters square.

The site of Al Hamra is located at the center of Kuwait peninsula, on a very prominent location. The tower has a strong presence in the skyline, which can be experienced panoramically from along the corniche. The owners envisioned an iconic structure that will take advantage of the site's prominence, and be a landmark for Kuwait. They also required an efficient office building that has a constant 12 meter deep lease span, facing towards the water.

During the planning process, the lease span was tested along the entire 60 meter square perimeter of the site, and was found out that the 25% of the floor plate needed to be taken out to meet the area requirements. The desire to maximize the views towards the water suggested that this removal should correspond to the southern edge of the square, facing the city. In parallel, the design team ran solar and wind analysis to test the performance



建筑，具有连续的12m进深的室内空间，并且面朝大海。

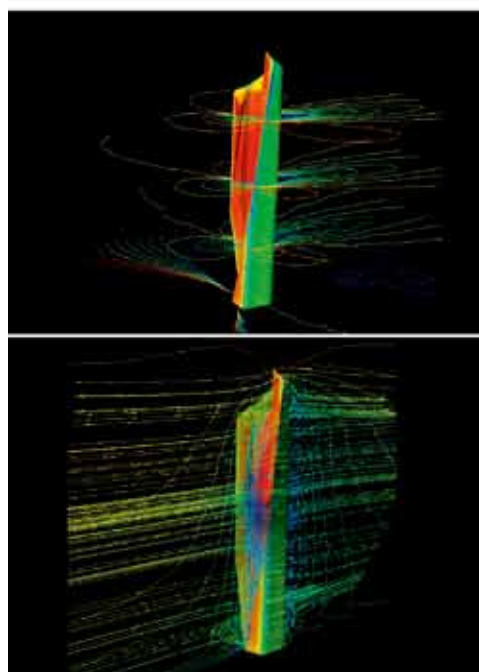
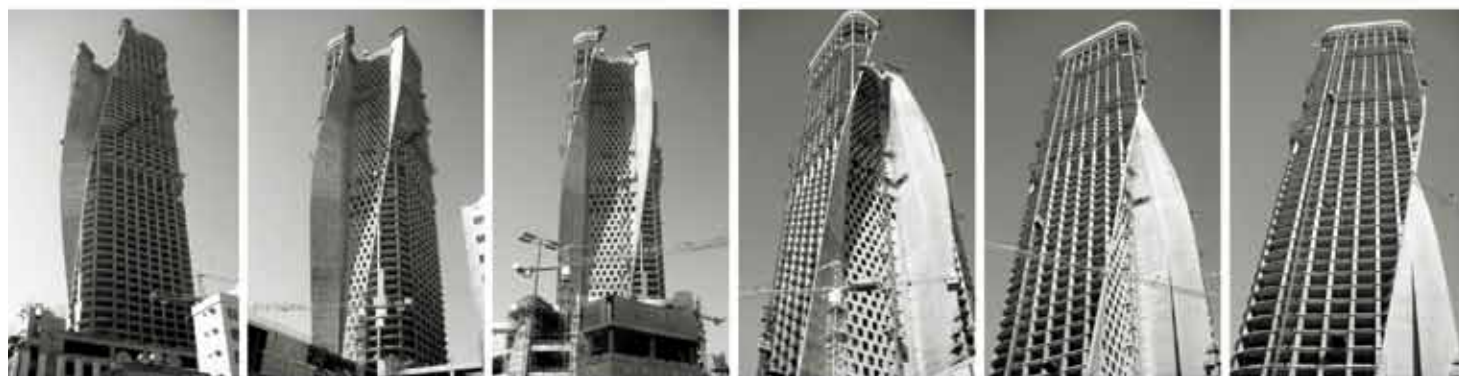
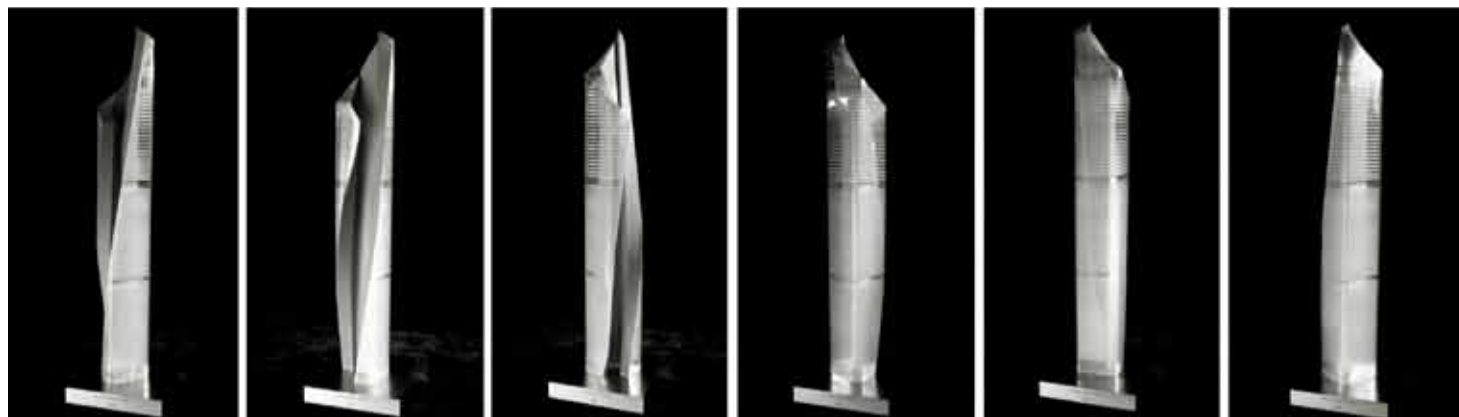
在规划阶段，设计师沿边长为60m的广场边界对建筑跨度进行了试验，结果表明：需要减少约25%的楼板以满足面积需要。由朝向水面的景观最大化的要求又可推导出：建筑减小的部分应与广场的南边有所呼应，朝向城市。同时，设计团队分别进行了太阳能和风环境分析以评测不同删减方案下的建筑性能。太阳能分析的结果表明建筑应切掉西南转角，而风环境的研究结果显示折线的切割方式比直线更能有效地缓和风速。因此，建筑的最终形式是在底层平面西南角切除楼板四分之一的面积，并渐变至顶层平面的东南角，这是由分析过程推倒而来的最优化设计。

Al Hamra 塔在科威特的城市天际线中增添了一个动感的形象，仿佛在挤压和扭曲着它周围的空间，而非只是一个造型。显著的视觉动势来自于其内部螺旋上升的中空设计，犹如漩涡的中心。塔的诗意则来自于它给予人们的在坚固的实体与消隐的空间之间不断切换的视觉效果。

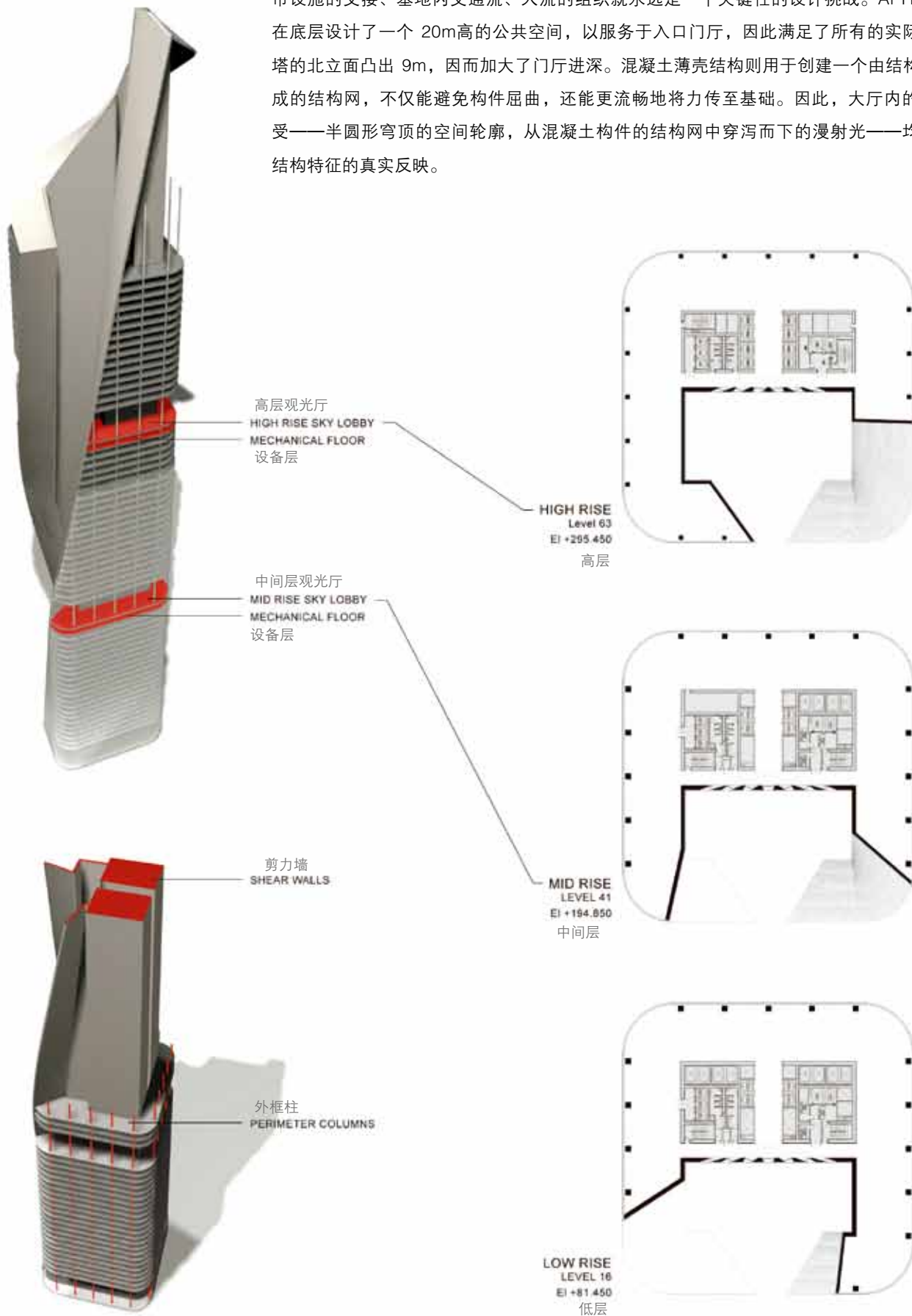
of different cut-out options. The solar analysis results favored the South West corner cut, meanwhile the wind studies showed an uneven cut being better over a straight cut in confusing the wind. The resultant form that removes one quarter of the floor plate starting from the South West Corner at the base towards one quarter of the floor plate removed at South West corner at the top is an optimal solution driven from this analytical process.

When viewed in Kuwait skyline, Al Hamra gives the impression of a movement, twisting the space around it, rather than itself. The remarkable visual dynamism, as an epicenter of a vortex, is generated by the spiraling central void. The poetry of this tower is generated by how it shifts the visual experience from what is there, as the concrete presence, to what is missing, as an enigmatic absence.

How a super tall building meets the ground -where there are peak structural demands, the connection of building services to the urban infrastructure, the low of traffic and the low of people coming into the site - is always a critical design challenge. Al Hamra resolves all the pragmatic demands at the ground floor into a 20 meter tall public space that serves as the entrance lobby. The north face of the tower peels out 9 meters to increase the depth of the lobby. A concrete lamella structure is used to create a web of structural members to avoid buckling and to luently bring the forces down to the foundations. The experiential qualities of the lobby – the barrel vault outline of the space; the illtering light coming through the web of concrete members - are the relection of the tectonics of the structure.



一座超高层建筑应如何与大地相接？只要有建设超高建筑的需求，建筑配套设施与城市设施的交接、基地内交通流、人流的组织就永远是一个关键性的设计挑战。Al Hamra塔在底层设计了一个 20m高的公共空间，以服务于入口门厅，因此满足了所有的实际需求。塔的北立面凸出 9m，因而加大了门厅进深。混凝土薄壳结构则用于创建一个由结构构件组成的结构网，不仅能避免构件屈曲，还能更流畅地将力传至基础。因此，大厅内的空间感受——半圆形穹顶的空间轮廓，从混凝土构件的结构网中穿泻而下的漫射光——均是建筑结构特征的真实反映。



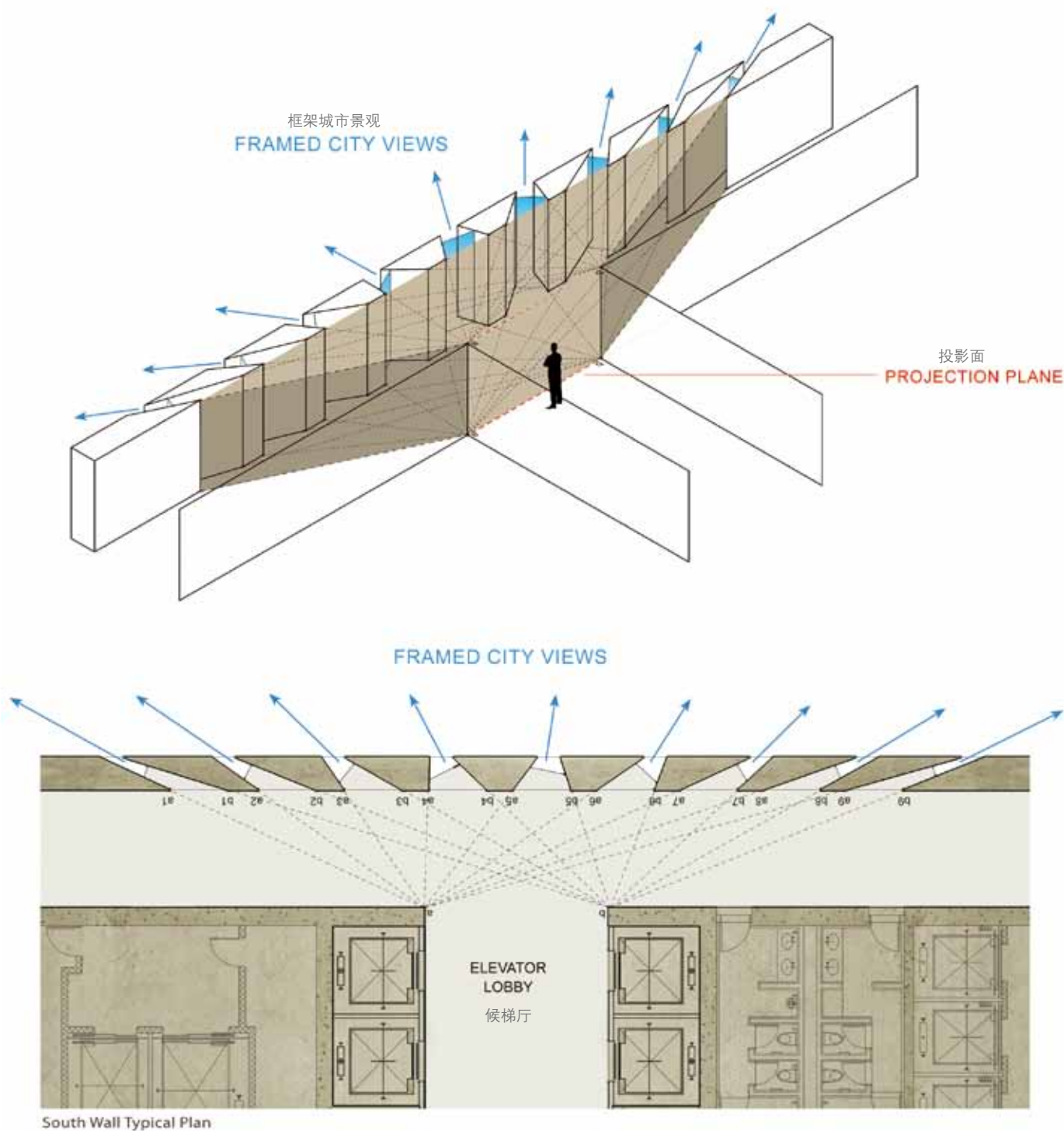


## 雕塑化的几何体

为了最大化面向海湾的景观视角，并最小化办公楼层的日照得热，建筑南部四分之一的楼板面积被删减，并且随着塔楼高度的变化由西至东转移。这种设计的结果便是建筑南部由扭转墙面形成了雅致的结构带以及宝石般的、具有标志性的整体造型。

## 句法

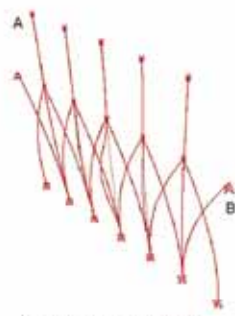
建筑应用了清晰的材料句法，意在强化双重目标，即最大化景观与日照得热的最小化：建筑南面光亮的外层玻璃被移除以展现出一个整体化的、具有石材感的内部空间。



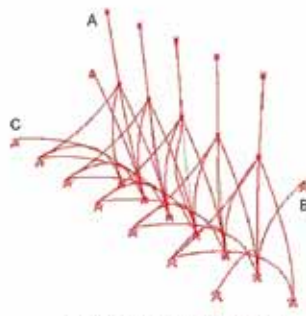




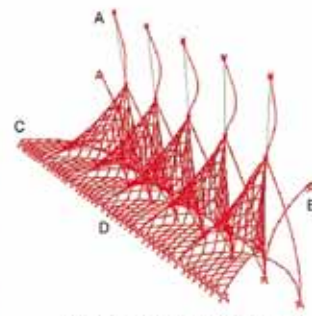
Model 1 - "A" Elements  
Column Demand: 56,000KN  
Buckling Load (Capacity): 25,000KN



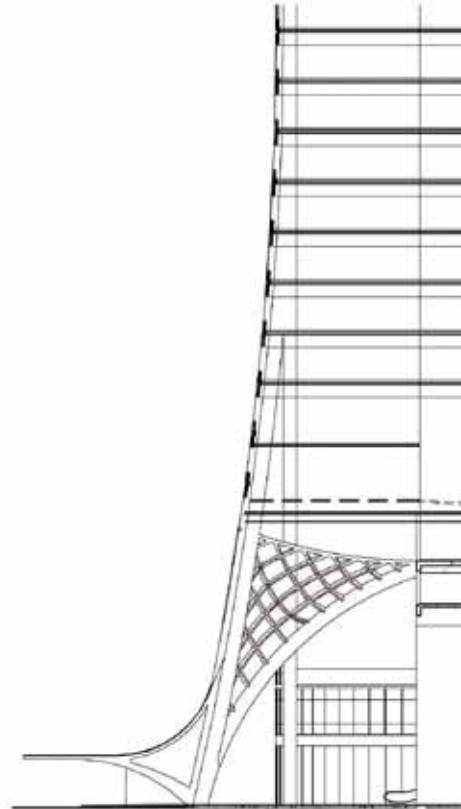
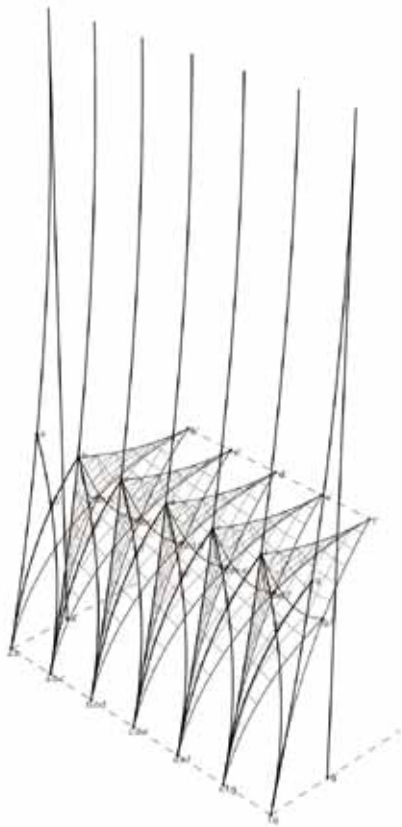
Model 2 - "A" & "B" Elements  
Column Demand: 56,000KN  
Buckling Load (Capacity): 46,500KN

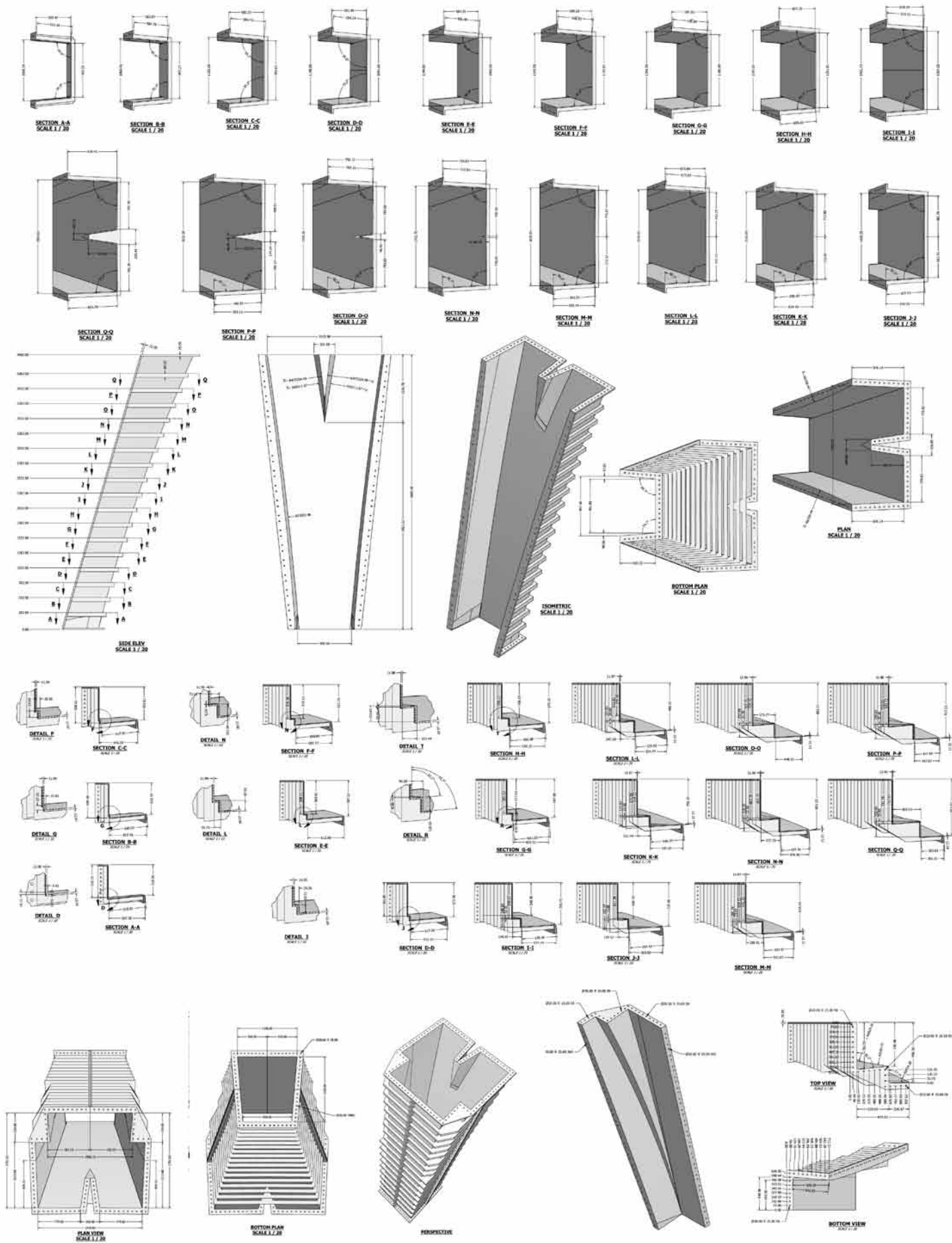


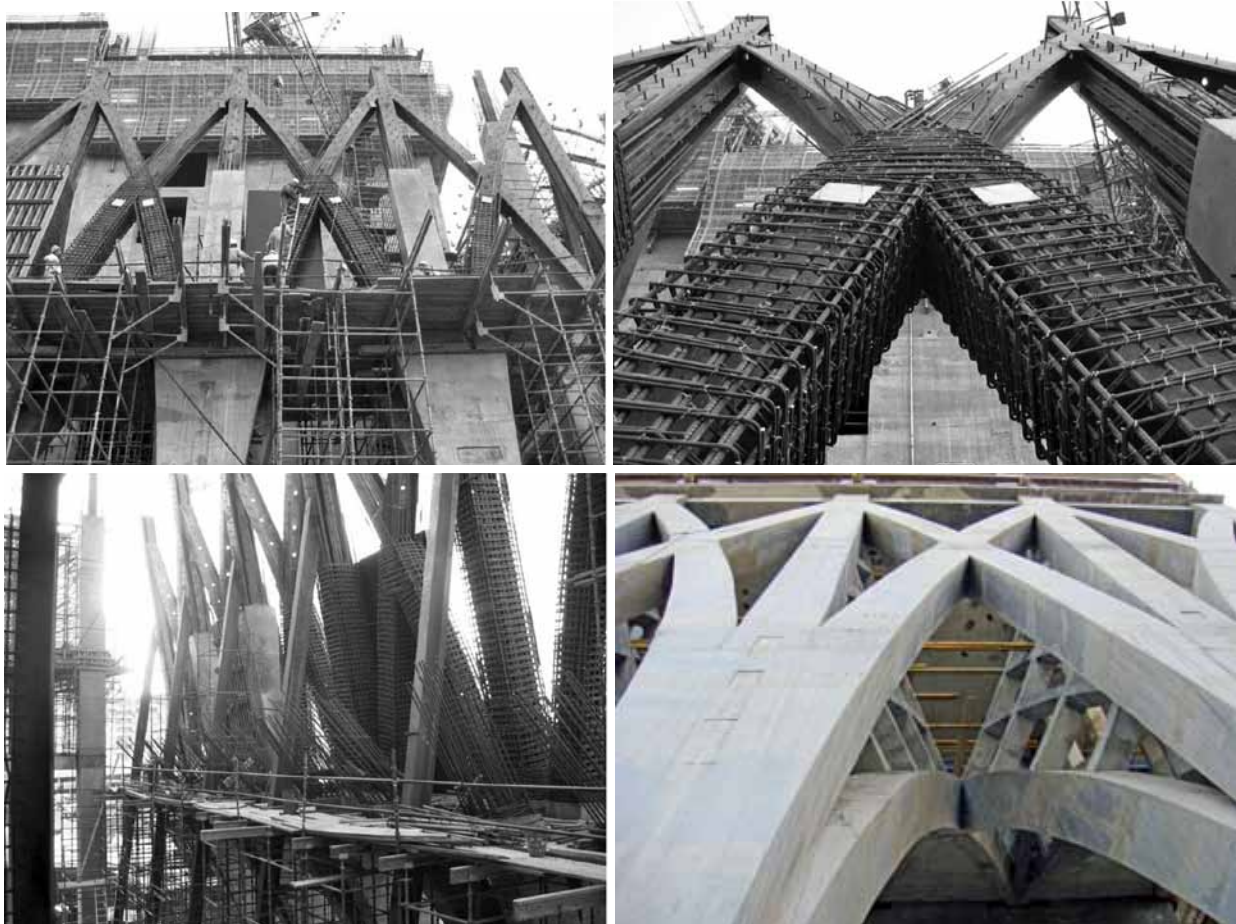
Model 3 - "A", "B" & "C" Elements  
Column Demand: 56,000KN  
Buckling Load (Capacity): 49,500KN



Model 4 - "A", "B", "C" & "D" Elements  
Column Demand: 56,000KN  
Buckling Load (Capacity): 189,000KN







## 雕塑化的南立面

当人们在楼层中行走，由一系列小窗洞形成的整体感极强的南立面给人以强烈的空间体验。这些窗洞朝向电梯厅，形成了望向城市风景与远处沙漠的观景框。当沿着天桥感受建筑时，墙面渐渐变得更“实”，唯有丝丝缝隙为室内引入阳光。

## 薄壳门厅结构

由于门厅在底层对外开放，建筑采用薄壳结构以整合塔楼柱网并与核心筒连接，以避免结构失稳。一个由整体结构构件覆盖形成的尺度宏大的公共空间应运而生。

## 混凝土划分

复杂的结构系统设计是由实际模型而来的。为形式而设计的精确划分促成了从设计图纸到建造的平稳过渡。

## 石材划分

斜翼墙的几何特征由一系列双曲抛物面组成。这种表面的确定经过了多边化的过程，以方便平板石材的铺制。在这种非常复杂的表面上脚本程序令94%的石材板完全一样。从这种高度数字化的过程中显现出来的连接样式体现了建筑在不同高度上的特征转换。

## SCULPTED GEOMETRY

With the aim of maximizing Gulf views and minimizing solar heat gain on the office floors, a quarter of each floor plate is chiseled out of the south face, shifting from west to east over the height of the tower. The result of this operation reveals a rich, monolithic stone at the south wall framed by the graceful, twisting ribbons of torqued walls and defines the iconic form of the tower.

## SYNTAX

The tower employs a clear material syntax that reinforces the twin goals of maximizing view while protecting from solar protection: a crisp outer glass skin is carved away at the south to reveal a monolithic stone interior.

## SCULPTED SOUTH WALL

The monolithic south wall is sculpted by a series of small openings that is experienced as one circulates around the floor. These openings are directed towards the elevator lobbies to allow framed views of the city and the desert beyond. When perceived along the sky bridge, the wall changes to a more solid nature only allowing light to come through its cracks.

## LAMELLA LOBBY STRUCTURE

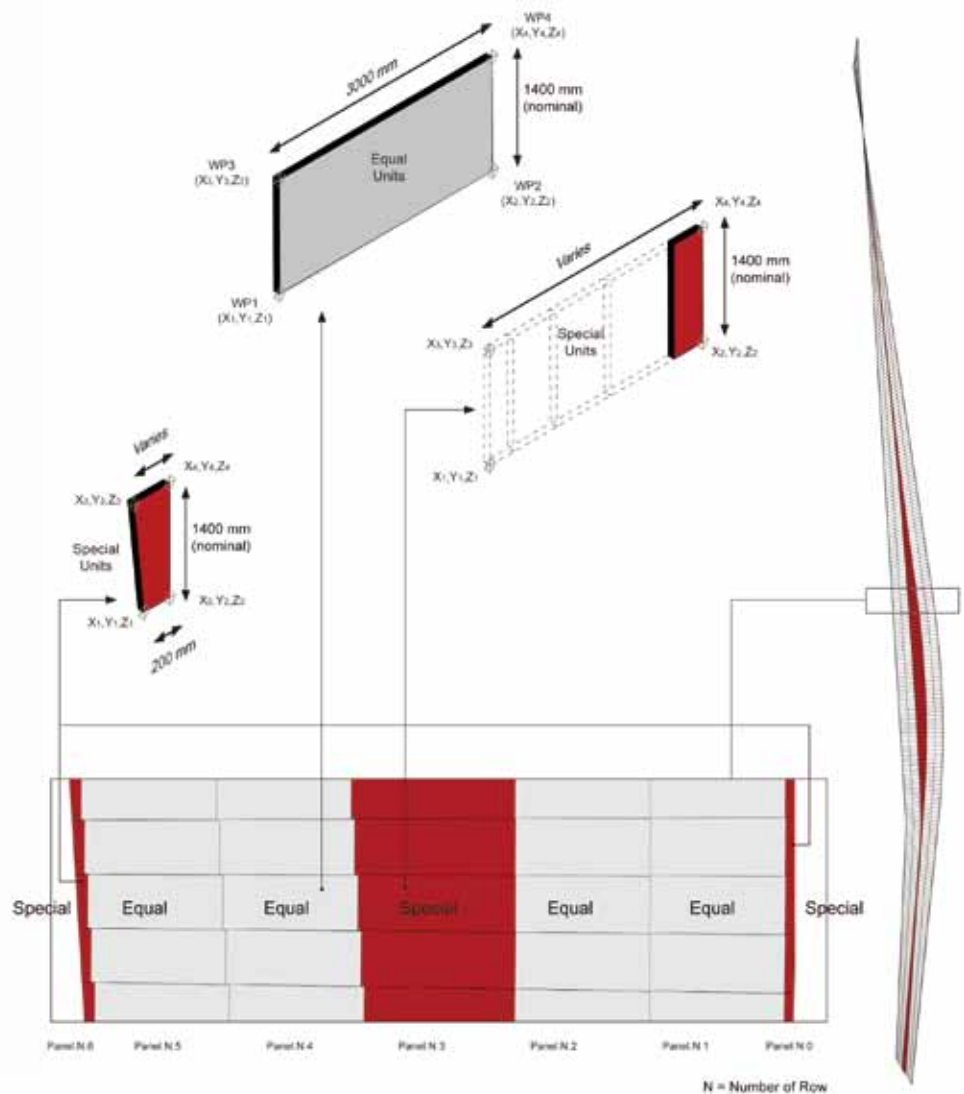
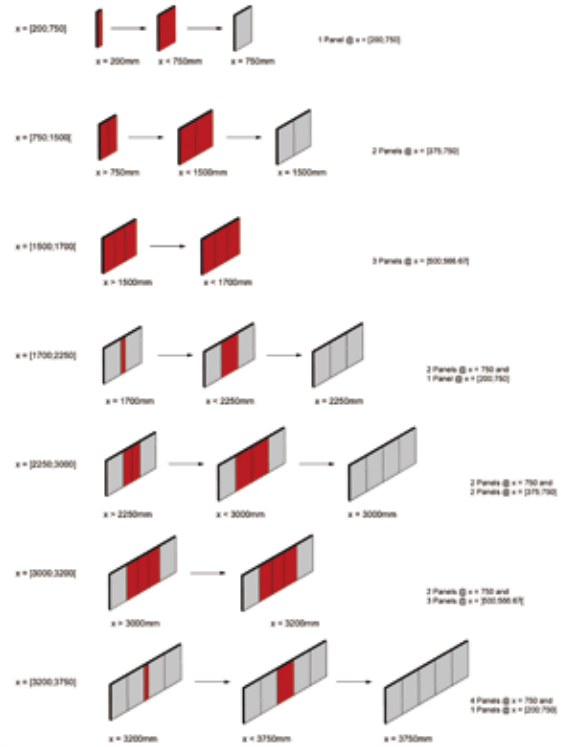
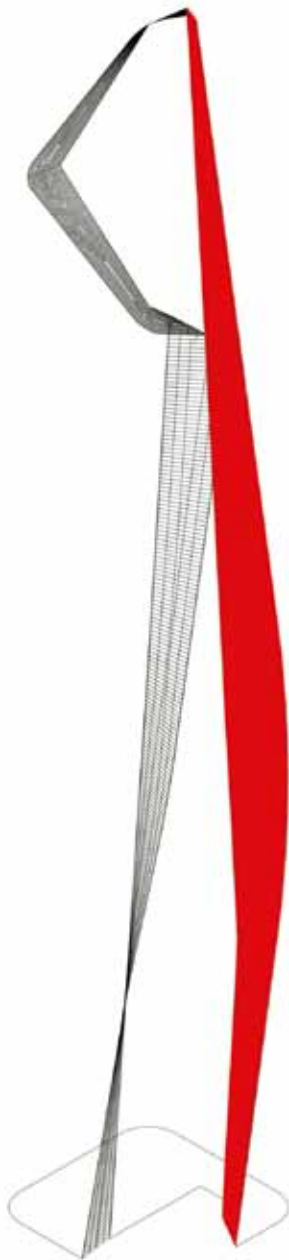
As the lobby opens up at the ground floor a lamella structure is employed to brace the tower columns together and then to the core walls to avoid buckling of members. This creates a grand public space framed above with entirely structural members.

## DRAWING CONCRETE

The design for this complex structural system was developed through parametric modeling. Precise drawings generated for the form work allowed a smooth transition from documentation to construction.

## DRAWING STONE

The lare walls are rationalized as series of hyperbolic paraboloids. This surface deinition is polygonized to enable a population using lat stone panels. The scripting routines allowed for 94% of stone panels to be identical on this highly complex surface. The jointing pattern emerging from this highly mathematical process epitomized the transformation of the tower over its height.





#### 项目情况

竞赛时间: 2011

基地面积: 10 000m<sup>2</sup>

建筑面积: 195 000m<sup>2</sup>

建筑高度: 412m

建筑层数: 74

获奖情况: 2010 • Cityscape奖 • 已建成的商业/综合类建筑

2008 • 芝加哥Athenaeum • 美国建筑奖

2008 • 芝加哥Athenaeum • 国际建筑奖

2008 • MIPIM/Architectural Review • MIPIM未来项目奖: 所有建筑

2008 • MIPIM/Architectural Review • MIPIM 未来项目奖: 高层建筑

2007 • 迈阿密建筑双年展 • 未建成项目铜奖



#### 作者简介

AYBARS ASCI, AIA, LEED®

Aybars Asci毕业于哥伦比亚大学, 获硕士学位, 现任职于SOM, 其带领的设计团队为SOM公司赢得了殊荣, 体现出将建筑设计与算法完美结合的设计理念。他擅长标志性的超高层建筑设计, 其担纲的项目Al Hamra塔获得了多项国际大奖。

Aybars Asci在SOM工作期间, 曾参与了世界各地设计的复杂机构和商业项目的设计, 包括美国人口普查局总部、纽约证券交易所、纽约第五大道住宅楼、利雅德Al Rajhi银行总部、科威特Al Hamra塔、迪拜Al Sharq酒店大楼、多哈卡塔尔石油公司总部、伦敦Wood Wharf和墨西哥Anida住宅楼。Aybars Asci在2007~2008年担任SOM伦敦办公室的设计总监, 目前在SOM纽约办公室工作。

AYBARS ASCI, AIA, LEED ®

Aybars Asci leads an award winning design group at SOM, embodying a design philosophy that combines conceptual clarity with analytical processes such as the use of algorithmic tools and building performance modeling. He specializes in the development of iconic super tall towers. The projects he led have been widely published in international architectural magazines as well as publications like Economist and Fast Company. Science Discovery Channel recently featured an episode on Al Hamra Firdous Tower, the tallest structure in Kuwait. Mr. Asci has given various lectures in academic institutions, including Architectural Association, MIT and Tsinghua University.

During his tenure at SOM, Mr. Asci has worked in designing complex institutional and commercial projects around the world, including, the United States Census Bureau Headquarters, the New York Stock Exchange, 400 Fifth Avenue Residential Tower in New York, Al Rajhi Bank Headquarters in Riyadh, Al Hamra Firdous Tower in Kuwait, Al Sharq Tower in Dubai, Qatar Petroleum Headquarters in Doha, Wood Wharf Towers in London and Anida Residential Tower in Mexico City. Mr. Asci was a design director of SOM's London office during 2007~2008. He is currently located in the firm's New York office. He holds a Master's Degree from Columbia University.