

ARCHITECTURE OF EXPO 2010 SHANGHAI CHINA

# 光影世博

主编 郑时龄 摄影 沈忠海



上海科学技术出版社

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# 内容提要 | Brief Description

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中国2010年上海世博会是人类历史上第一次在发展中国家举办的综合性世界博览会，世博会的成功举办对上海城市发展起到极大的推动作用。建筑作为世博园中最主要的组成元素，是举办各种展览和活动的场所，其本身也是耀眼的展品，由此国内外的摄影师们为之拍摄了无数优秀佳作。

沈忠海先生作为专业的建筑摄影师，其作品不仅仅记录下了世博建筑的魅力，更是从建筑的角度诠释了世博场馆的光影变化。中国科学院院士、同济大学建筑与城市规划学院教授郑时龄先生担任主编，更使本书超越了摄影本身的高度，使其成为一本极具专业价值和收藏价值的大型画册。

本书共收录了沈忠海先生248幅世博建筑摄影作品，涵盖了上海世博会A、B、C、D、E区所有场馆建筑，大量满版照片和近30万字的中英文介绍，详尽地诠释了各场馆的建筑特色和设计理念，它不仅是广大摄影爱好者值得一看的画册，也是专业建筑师和一般读者典藏世博建筑的极佳图册。

2010 Expo Shanghai represents the first comprehensive World Expo held in developing countries in human history, whose success pushes Shanghai's urban development ahead greatly. As the prime element in the Expo Site, the architecture there serves as the venue for various exhibitions and activities, as well as shining items on display itself, for which photographers at home and abroad have taken enormous excellent photographic works.

Mr. Shen Zhonghai, a professional architectural photographer, takes down the charm of Expo architecture by his works, further illustrating the change in lights and shadows within the Expo Site from the perspective of architecture. Mr. Zheng Shiling, the academican of Chinese Academy of Science and professor of School of Architecture and Urban Planning in Tongji University, assumes the editor in chief this time, pushing the book into a new high transcending the photographing itself, thus making it a highly collectable coffee-table book.

This book includes 248 photographs on Expo architecture taken by Mr. Shen Zhonghai, covering all pavilions from Zone A to Zone E in Expo Shanghai. With multiple full-page photographs and a 300,000-word introduction both in Chinese and English, the book gives an exhaustive illustration for architectural characteristics and design concepts of all pavilions. It is not only a book worthy reading for photographing amateurs, but also, a perfect album of pictures for professional photographers to collect Expo architecture.

## 世界建筑博览会的记录与表现

世博建筑创导未来，世博建筑凝聚了各国、各地区和各民族的文化，成为时代的象征。世博建筑引领了世界建筑的思潮和建筑技术，具有鲜明的先锋性和实验性，表现了新技术和建筑的实验性，创导了多元化的艺术。世博建筑在建筑艺术和技术上的创造在一定程度上改变了城市的生活方式，改变了人们的空间观念和空间体验。2010年上海世博会以其建筑的整体意义表现标志性，表现世博会的核心价值，必将流传至永久。

上海世博会是一次世界建筑的博览盛会，园区内的建筑也是精彩绝伦的展品和装置艺术，其艺术价值丝毫不逊于展馆内的展品，让世界各国各地区的建筑师在上海得到实验新建筑的机遇，并注入了生态和可持续发展的价值和理念，出现了新的建筑材料和生态技术，展示了当代世界建筑的最新倾向。

上海世博会正创下了历届世博会之最，比如，最多的参展方，最多的自建馆，最多的参观者，最多的工作人员，最多的志愿者，最多的园区雕塑，最多的世博会出版物等等。相信也创下了最多的建筑摄影记录，世博会建筑摄影集也已经有可观的数量，已经超过了历史上的任何一届世博会。摄影师们从各个视角表现上海世博会的建筑，刻意表现建筑的美。作者群来自专业摄影师、建筑师和新闻工作者。

由于世博会建筑的临时性特点，人们对世博会建筑是通过电影或建筑摄影才认识的。从某种意义上说，超越了时空的摄影中的世博建筑，似乎比建筑本身更为真实。建筑通过摄影的表现往往比建筑本身更为世人所熟知，人们对世博建筑的认知在某种程度上可以说是通过建筑摄影才获得的。摄影教会人们观看并认识建筑，提供一种理解建筑的方式。在今天的技术条件下，摄影已经成为生活方式的一部分，随着科学技术的发展，建筑摄影不仅是摄影师的专长，也成为公众的行为。然而，摄影师和一般摄影爱好者的照相机拍出来的结果却天差地别。我自诩有将近30年的建筑摄影经历，但是与许多摄影师的作品相比，往往使我汗颜。

世博建筑摄影成为知识传播和教育民众的有效媒介，这就要求世博建筑摄影具有真实性和艺术性，摄影师要具备丰富的专业知识、完美的技术、忍耐力与体力、学识与审美的结合才能产生优秀的世博建筑摄影。

上海世博会具有世博会历史上几乎没有过的一些特点，为摄影师带来了极大的困难。在世博会正式开园之前，园区几乎一直是建设的工地，没有合适的角度、光影和环境表现展馆建筑的全貌和真实的美。开园后的大量人流以及临时搭建的遮阳棚又遮挡了建筑，摄影师面临着比通常的建筑摄影要困难得多的问题，通常意义上完美的世博建筑摄影几乎是不可能的。正因为如此，我们要感谢那些日日夜夜在世博园辛勤工作的摄影师和建筑师，是他们让我们更全面而又深刻地认识了上海世博会的建筑。

沈忠海先生从事建筑摄影已经有相当长的历史，而且他为之工作多年的一流建筑杂志也使他与建筑结下了不解之缘，对建筑的深刻领悟使他的建筑摄影作品具有不同凡响的品质。今年三月，我有幸和沈先生一起随同一个建筑师和媒体人组成的团队赴挪威考察，挪威的三月冰雪天实在不是考察和摄影的好时光，有时候一阵冷风袭来，一切都隐没在雪雾中。阴霾的天空使得所有立体的东西变得平面化，建筑与环境成为一种不得不融合，而又什么都无法表现的景观。对我辈这种凡人而言，要在短短的一周时间中用照相机把史诗般的挪威建筑加以记录与表现几乎是不可能的，而沈忠海的摄影家素质使他拍下了建筑的精髓。他利用各种技法来表现，炉火纯青的夜景表现弥补了白天景观的不足，发挥了挪威气候的特点，在困难的条件下创造了奇迹般的摄影作品。

2010年上海世博会成为沈先生的摄影创作的机遇与源泉。他对世博会建筑的阐述和表现留存在几千幅摄影作品中，从各个角度和不同的时段加以表现。我们从中可以看到建筑的全景、细部，建筑的日景和夜景，我们也可以看到世博园区的景观和设施，建筑师和建设者，这是上海世博会全景式的记录和完美的表现。我从他的摄影表现和光影的应用中也学习了建筑摄影。

郑时龄 教授

中国科学院院士

中国2010年上海世博会主题演绎顾问

意大利2015年米兰世博会学术委员会委员

2010年8月18日

## Record and Rendition: Exhibition of the World's Architecture

Combining various cultures from different countries, regions and nationalities together, the Expo architecture creates and guides the future, thus becoming a symbol of our age. By leading the thoughts and architectural technologies of the world's architecture, the Expo architecture features distinct vanguard and experimental capability, manifests the experimental capability of new technology and architecture, as well as initiates diversified art. To some degrees, the Expo architecture has changed the city's lifestyle in architecturally artistic and technological creation, and also, it has changed people's spatial conception and experience. With its overall architectural significance demonstrating the landmark and the core value, Expo 2010 Shanghai is bound to prevail forever. Expo Shanghai being a rich pageant for world's architecture, its buildings within the Expo Site represent fantastic items on display and established art too, whose artistic value seldom gives way to exhibits inside pavilions at all. Thanks to this, architects across the world are given the opportunity to make an experiment on new architecture. In this sense, injected with ecological and sustainable values and ideas, there appear new building materials and ecological technologies in Expo Shanghai, showcasing the latest tendency in current world's architecture.

Expo Shanghai is creating the utmost in the history of World Expo, for instance, most exhibitors of all, most self-built pavilions of all, most visitors of all, most working staff of all, most volunteers of all, most sculptures within the Expo Site of all, most publications on Expo of all. We can also believe that, there produces the record of most architectural photographing, say, a substantial number of photography collections has already surpassed any other World Expo in history. Our photographers reveal the architecture in Expo Shanghai from different perspectives, giving prominence to the beauty of the architecture. The author groups come from professional photographers, architects and journalists.

Due to its temporality, only through movies and architectural photographing can people get an idea of the Expo architecture. In a sense, Expo architecture in photographs transcending the time and space seems to be more real than the architecture itself. Shown in photographs, the architecture tends to win more familiarity among people than itself and to some degrees, it can be said that people's knowledge about the Expo architecture derives from architectural photographing. Photographing teaches people watch and cognize the architecture, as well as offers a way to understand the architecture. Under the condition of today's technology, photographing has become a part of our life, and along with the advancement of scientific technology, architectural photographing serves not only photographers' expertise, but also a public behavior. However, the results made by photographers and photographic amateurs are poles apart. Though I boast of my nearly 30 years of experiences in architectural photographing, when compared with many photographers' works, I always feel deeply ashamed.

As an effective medium for knowledge dissemination and educating people, the Expo architectural photographing should maintain authenticity and artistic quality, moreover, the photographers should be equipped with profuse professional knowledge, perfect skills, the combination of endurance and physical strength, acquirement and aesthetic appreciation, with all of which can excellent Expo architectural photographing be generated.

It brings huge difficulties for photographers with some characteristics almost unprecedented in the history of World Expo in Expo Shanghai. Prior to the official opening of the Expo Shanghai, there almost seemed to be a work site under construction in the Expo Site, with no suitable angles, lights and shadows as well as environment to display a full view and true beauty of pavilions. After the opening of the Expo Shanghai, visitors of large quantity flooding in, together with provisionally built sunshades blotting the architecture, pose a much-more-difficult-than-ever problem to photographers, making it hardly possible for perfect Expo architectural photographing in traditional way. Just because of this, we ought to cherish gratitude for those who work day and night within the Expo Site, those photographers and architects. It was they who endowed us with an all-round and profound knowledge about the architecture in Expo Shanghai.

Mr. Sheng Zhonghai has been undertaking architectural photographing for a rather long time, and the first-class architecture journal he worked for many years brings him indissoluble bonds with architecture. Such deep insight into architecture lends his works of architectural photographing a vein out of the common run. This March, I was honored to go to Norway with a survey group including Mr. Shen, an architect and a media person, when the snow days there made it difficult to conduct a tour of observation and photographing. Sometimes, we were greeted with a gust of cold wind, with everything immersed amid the snowy fog. The cloudy sky flattened all cubic things, blurring architecture with environment haplessly, with nothing expressible. To common people like me, it's nearly impossible to record and render with the camera an epic Norwegian architecture within a short week. Nevertheless, with his qualification as a photographer, Sheng Zhonghai took photographs of essence in architecture. Employing various skills and techniques, he compensated for deficiency of landscape during the daytime with the night view of highly technical and professional degree, thus exerting Norwegian climatic traits and creating marvelous photographic works under such difficult conditions.

Expo 2010 Shanghai represents Mr. Shen's opportunity and source in photographic creation. He retains his illustration and rendition towards Expo architecture in thousands of photographic works, from different perspectives and in different periods of time. We can see from within the full view of the architecture, the details, the day view and night view, and also the scenery and facilities inside the Expo Site, the architects and constructors, all of which demonstrate a panoramic record and perfect rendition. From his photographic show and application of lights and shadows, I've also learned the architectural photographing.

Professor Zheng Shiling

Academician of Chinese Academy of Science

Consultant on theme deduction for Expo 2010 Shanghai

Committee member of Scholarship Committee for 2015 Expo Milan (Italy)

014	世博轴 Expo Boulevard	054	哈萨克斯坦馆 Kazakhstan Pavilion	088	墨西哥馆 Mexico Pavilion
016	世博文化中心 Expo Cultural Center	056	世界气象馆 MeteoWorld Pavilion	090	比利时-欧盟馆 Belgium-EU Pavilion
020	主题馆 Theme Pavilion	058	马来西亚馆 Malaysia Pavilion	092	西班牙馆 Spain Pavilion
022	世博中心 Expo Center	060	泰国馆 Thailand Pavilion	094	法国馆 France Pavilion
024	中国国家馆 China Pavilion	062	新加坡馆 Singapore Pavilion	096	波兰馆 Poland Pavilion
030	澳门馆 Macau Pavilion	064	新西兰馆 New Zealand Pavilion	098	瑞士馆 Switzerland Pavilion
032	香港馆 Hong Kong Pavilion	066	澳大利亚馆 Australia Pavilion	100	爱尔兰馆 Ireland Pavilion
034	尼泊尔馆 Nepal Pavilion	068	美国馆 USA Pavilion	102	德国馆 Germany Pavilion
036	台湾馆 Taiwan Pavilion	070	卢森堡馆 Luxembourg Pavilion	104	挪威馆 Norway Pavilion
038	沙特阿拉伯馆 Saudi Arabia Pavilion	072	英国馆 UK Pavilion	106	丹麦馆 Denmark Pavilion
040	巴基斯坦馆 Pakistan Pavilion	074	荷兰馆 Netherlands Pavilion	108	芬兰馆 Finland Pavilion
042	以色列馆 Israel Pavilion	076	意大利馆 Italy Pavilion	110	拉脱维亚馆 Latvia Pavilion
044	阿曼馆 Oman Pavilion	078	加拿大馆 Canada Pavilion	112	瑞典馆 Sweden Pavilion
046	阿联酋馆 UAE Pavilion	080	罗马尼亚馆 Romania Pavilion	114	印度馆 India Pavilion
048	摩洛哥馆 Morocco Pavilion	082	奥地利馆 Austria Pavilion	116	委内瑞拉馆 Venezuela Pavilion
050	日本馆 Japan Pavilion	084	俄罗斯馆 Russia Pavilion	117	印度尼西亚馆 Indonesia Pavilion
052	韩国馆 Republic of Korea Pavilion	086	智利馆 Chile Pavilion	118	卡塔尔馆 Qatar Pavilion

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|-----|--|-----|---|-----|---------------------------------------|
| 120 | 葡萄牙馆<br>Portugal Pavilion                      | 138 | 万科馆<br>Vanke Pavilion                           | 164 | 案例联合馆3<br>Cases Joint Pavilion 3      |
| 121 | 捷克馆<br>Czech Pavilion                          | 140 | 上汽集团-通用汽车馆<br>SAIC-GM Pavilion                  | 166 | 案例联合馆4<br>Cases Joint Pavilion 4      |
| 122 | 斯洛伐克馆<br>Slovakia Pavilion                     | 142 | 中国航空馆<br>China Aviation Pavilion                | 168 | 上海案例馆<br>Shanghai Case Pavilion       |
| 123 | 希腊馆<br>Greece Pavilion                         | 144 | 信息通信馆<br>Information and Communication Pavilion | 170 | 汉堡案例馆<br>Hamburg Case Pavilion        |
| 124 | 土耳其馆<br>Turkey Pavilion                        | 146 | 中国民企联合馆<br>Chinese Private Enterprises Pavilion | 172 | 罗阿案例馆<br>Rhône - Alpes Case Pavillion |
| 125 | 巴西馆<br>Brazil Pavilion                         | 148 | 太空家园馆<br>Space Pavilion                         | 174 | 伦敦案例馆<br>London Case Pavilion         |
| 126 | 冰岛馆<br>Iceland Pavilion                        | 150 | 日本产业馆<br>Japan Industry Pavilion                | 176 | 阿尔萨斯案例馆<br>Alsace Case Pavilion       |
| 126 | 乌克兰馆<br>Ukraine Pavilion                       | 151 | 远大馆<br>Broad Pavilion                           | 178 | 宁波案例馆<br>Ningbo Case Pavilion         |
| 126 | 安哥拉馆<br>Angola Pavilion                        | 152 | 上海企业联合馆<br>Shanghai Corporate Pavilion          | 180 | 西安案例馆<br>Xi'an Case Pavilion          |
| 127 | 突尼斯馆<br>Tunisia Pavilion                       | 154 | 中国铁路馆<br>China Railway Pavilion                 | 182 | 成都案例馆<br>Chengdu Case Pavilion        |
| 127 | 爱沙尼亚馆<br>Estonia Pavilion                      | 155 | 可口可乐馆<br>Coca-Cola Corporate Pavilion           | 184 | 麦加案例馆<br>Makkah Case Pavilion         |
| 127 | 白俄罗斯馆<br>Belarus Pavilion                      | 156 | 中国人保馆<br>PICC Pavilion                          | 185 | 温哥华案例馆<br>Vancouver Case Pavilion     |
| 130 | 石油馆<br>Oil Pavilion                            | 157 | 震旦馆<br>Aurora Pavilion                          | 186 | 马德里案例馆<br>Madrid Case Pavillion       |
| 132 | 国家电网馆<br>State Grid Pavilion                   | 158 | 城市未来馆<br>Urban Future Pavilion                  | 187 | 澳门案例馆<br>Macau Case Pavilion          |
| 134 | 韩国企业联合馆<br>Republic of Korea Business Pavilion | 160 | 案例联合馆1<br>Cases Joint Pavilion 1                | 190 | 世博村<br>Expo Village                   |
| 136 | 中国船舶馆<br>CSSC Pavilion                         | 162 | 案例联合馆2<br>Cases Joint Pavilion 2                |     |                                       |













# 世博轴 | Expo Boulevard

设计单位：现代设计集团华东建筑设计研究院有限公司  
上海市政工程设计研究总院联合团队  
德国SBA公司

建设单位：上海世博土地控股有限公司  
建设地点：上海世博园区B片区  
建筑面积：约25.1万m²  
层数：4层（地下2层，地上2层）



世博轴是世博园区最大的单体项目，全长约1 000m，宽约110m。世博会期间，世博轴是世博园区空间景观和人流交通的主轴线；世博会后，将成为上海第三个市级中心的都市空间景观和城市交通主轴，提供市民活动、商业服务、交通换乘的空间。其由三个主要部分组成——四层混凝土框架结构层面，6个穿插其中的“阳光谷”以及世界上面积最大的PTFE张拉索膜顶棚。该项目采用了三层立体交通方案：地下二层入口与轨道交通八号线接驳；地面层直接联系世博园区地面交通；地上二层与世博园人行高架步道系统相连。这种设计既避免了人流交叉，又保证了安检通过的高效。

世博轴选用PTFE（聚四氟乙烯）张拉索膜结构，膜总面积约77 224m²，是迄今为止世界上最大的张拉索膜体。膜的最大跨度约97m，由31个外侧桅杆、19个下拉点以及18个与阳光谷的拉接点通过13种不同功能索张拉而成，膜片数量69片，其中最大的膜单片面积达1 780m²。

阳光谷为单轴或双轴对称自由形（Freeform），从地下-6.5m（以下均为绝对标高）一直延展到地上35m，总高度达41.5m。其自由曲面基于NURBS（Non-Uniform Rational B Spline，非均匀有理B样条曲线）方法之上，通过拓扑分析将曲面转化为三角形网格系统，多次调整并最终成型。

在节能方面，江水源热泵和地源热泵作为空调系统冷热源的运用，使半敞开的世博轴不用担心能源浪费的问题。同时，世博轴底部设置了总长度约800m、宽5m、深2.5m雨水沟渠，以收集各

阳光谷积蓄的雨水和轴两侧草坡雨水，总计约7 000t。既能满足特大暴雨时的蓄洪要求，又进一步节约了水资源。

Expo Boulevard, which is about 1 000m long and 110m wide, is the largest individual project in the Expo Site. During the Expo, Expo Boulevard is the principle axis of landscape and streams of traffic. After the Expo, it will become the axis of urban landscape and transportation, forming the third center of a new urban district of Shanghai and providing spaces for activities of the residents, commercial services, and traffic exchange.

The three major parts, the four-story concrete framework structure, six alternate sun valleys and the largest PTFE tensile membrane structure in the world, constitute the Expo Boulevard.

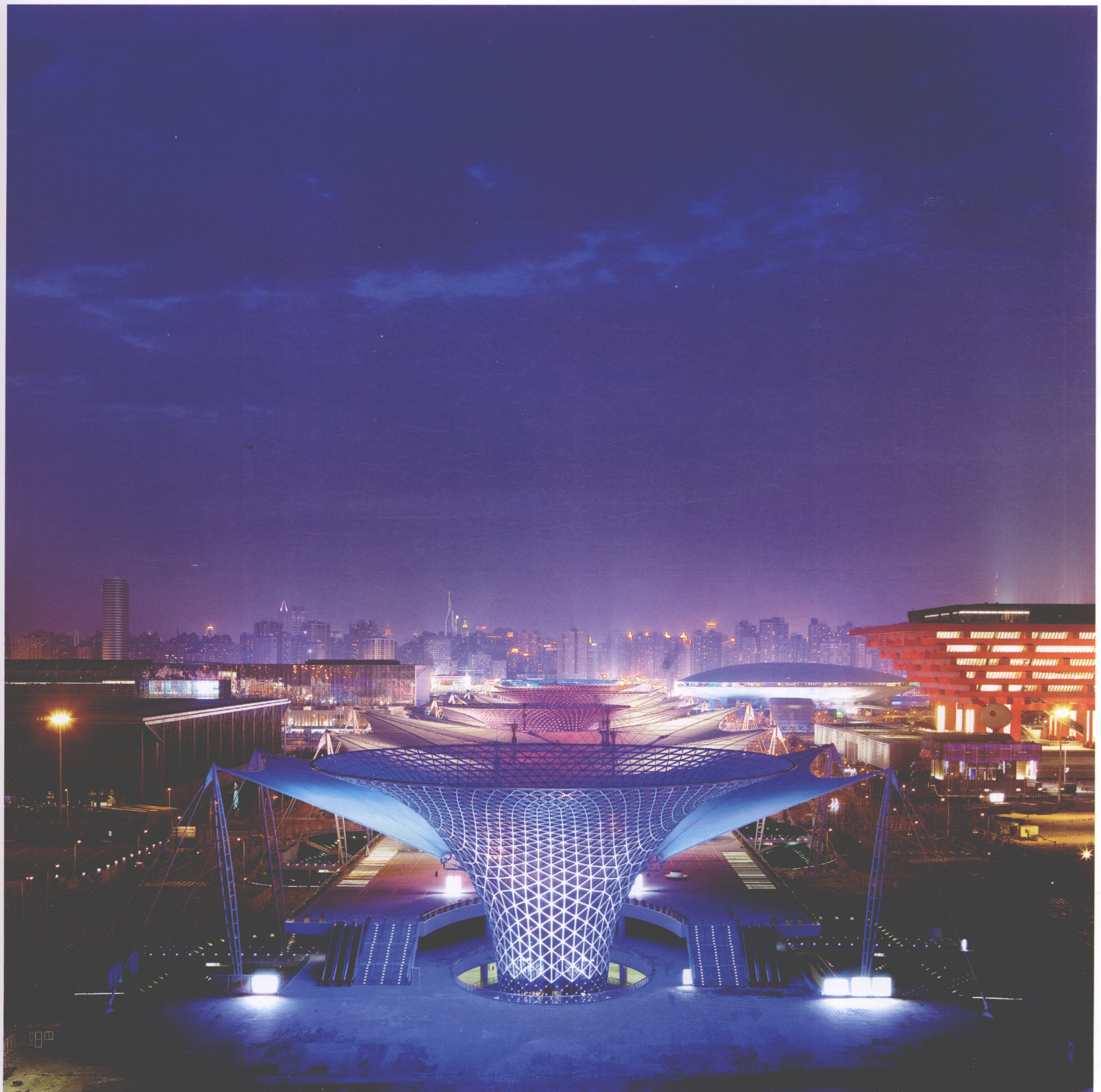
The project applies three-tier and three dimensional traffic program, with the entrance of the second floor underground connected with Metro Line 8, the ground floor directly connected with the ground traffic of the Expo Site, and the second floor over ground connected with the elevated pedestrians' walk. The design not only avoids the interferences of streams of people, but also guarantees the high efficiency of security check.

Expo Boulevard uses PTFE tensile membrane structure with a

surface of about 77 224m², which is the largest of its kind in the world. The maximum span of the membrane structure is about 97m, which is stretched by 13 cables of different functions with the help of 31 outboard masts, 19 pull-down points and 18 connection points with sun valleys. There are 69 membranes in total, among which the largest is as large as 1 780m².

The sun valleys are of monaxial or biaxial freeform structure, which stretches from 6.5m underground to 35m over ground, forming a 41.5-meter-high valley. All are measured by absolute altitude. Based on NURBS, the freeform surface is formed after many adjustments, through converting the curved surface into triangular net system by topology analysis.

In energy conservation, the application of river water-source heat pump systems and ground-source heat pump systems saves the half-open Expo Boulevard the trouble of worrying the waste of energy. Meanwhile, a storm collector, which is 800m long, 5m wide and 2.5m deep, is arranged on the bottom of the Boulevard to collect the rain water stored by the sun valleys as well as the rain water of the grass ramps on both sides of the Boulevard. With a capacity of 7 000t more or less, the storm collector not only satisfies the demand of flood storage, but also saves water resources.



# 世博文化中心 | Expo Cultural Center

设计单位: 现代设计集团华东建筑设计研究院有限公司

建设单位: 上海世博文化中心有限公司

建设地点: 上海世博园区B片区

建筑面积: 约14万m<sup>2</sup>

层数: 地下2层, 地上6层

