

HKASP 佳图文化 编

# ROOFTOP GARDEN

屋顶花园

 华南理工大学出版社  
SOUTH CHINA UNIVERSITY OF TECHNOLOGY PRESS

Public Leisure 公共休闲  
Community Ecology 社区生态  
Private Rooftop 私家屋顶  
Ecological Green 生态绿化

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·广州·

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# FOREWORD

## 前言

Domestic professional books on roof garden design is relatively few, Overall, relatively too old or too few of the cases make it difficult to grasp the latest development trend around the world for readers. While some other books can not show the roof garden design fully because of the lacking of professional editors, experts, compiled together with design company and so on. Base on those facts, **Hong Kong Architecture Science Press** Editorial Board plans carefully to compile the book *Roof Garden 2012* to help flush the teaching material in domestic education for this topic.

After the world wide selection, Editorial Board verified 40 representative projects in this book. Differing from program mode explanations in previous books, it focuses on the excavation of connotation value. Editors show the key points and hot spots of every project for readers. Project analyses show the highlights and features from geography, climate, vegetation, materials, and ecological value. We also invite experts in or outside of China to comment the project combined with realities, and put forward different views for readers' references. In addition, "tips" related with new trends attached to each layout of project, facilitate readers to understand the background, extending learning.

This book with carefully arranged of HD pictures and graceful sentence, lets readers enjoy science education informations, and at the same time makes them feel the charm of roof garden in aesthetics. Hope that this book can become a catalyst for advancing domestic rooftop garden design and construction.

Thanks for all the designer (experts) teams who participated in compiling this book again!

Hong Kong Architecture Science Press  
Editorial Board  
2013.3

国内关于屋顶花园设计介绍的专业图书相对偏少，总体来说，案例过久或者案例资料相对较少，使读者难以详尽地把握全球屋顶花园最新发展趋势。而另外一些图书则因缺少专业编辑、行业专家、设计公司参与编撰等其他原因，难以全面地为读者展示屋顶花园设计。基于行业需要和读者需求，香港建筑科学出版社为读者精心策划、编撰了此《屋顶花园》，为行业发展助力。

经过全球广泛甄选，编委会审核通过了本书中40个代表项目。不同于以往书籍的程序式讲解，本书更注重各个项目的内涵价值的挖掘。编辑推荐为读者展示项目突破及设计中的关键点和热点；项目分析从地理、气候、植被、材料、生态价值等方面展示项目的特色；邀请国内外专家结合实况，对项目进行点评，提出不同观点，供读者参考借鉴。另外，本书在各个项目的版面中还精心附上行业发展的相关“小贴士”，以方便读者了解项目的相关背景、扩展阅读。

本书以精心的编排、高清大图配以优美文字，让读者掌握专业资讯的同时，从美学上感受屋顶花园所带来的魅力。希望本书能够成为推进国内屋顶花园设计与建设的催化剂。

再次感谢所有参与本书编撰的设计师（专家）团队！

香港建筑科学出版社  
编委会  
2013年3月

# PREFACE

## 序言

### Turn the rooftop into green oasis!

The modern architecture with flat roof-space has provided us with new opportunity to bring the nature back to cities, making them greener and friendlier as well as healthier places to live. These vast lands which were long ago borrowed from the nature, turned into concrete jungles, lost all of its greenery with few exceptions in terms of parks and rare green avenues.

There is so much unused potential around us, just go up to a high-rise building and have a look from there - how many green dots you can spot? But how many empty roofs, smaller or larger space that could be turned into green oasis?

Roof gardens have rather impressive history, although there were very few privileged people who could really afford building these structures. The ancient representation of roof gardens were the Hanging Gardens of Babylon, the vaulted terraces that were lush with overhanging plants and trees in the middle of sun-baked and flat Mesopotamia, built around 600 BC. The Romans were known for their roof gardens in Pompei, Villa of the Mysteries excavations proved and identified the plants that were planted directly on soil in one of its terraces. Imperial city of the Aztecs, Tenochtitlan was also known to have had roof gardens as well as the impressive Mont Saint Michel, emerging from the sea in Normandy, France.

First commercial rooftop gardens in New York are dated from 1882 when the Casino Theatre was built, quickly followed by Madison Square Garden. The absence of air-conditioning guaranteed the success of these spaces as hot summers closed the theatre season indoors and brought the opera, dances and plays to the outdoors. The beginning of 20th century saw huge growth in using the rooftop space - many hotels opened up pleasure gardens on their roofs, office buildings created open-air restaurants and wealthy house-owners used it for enhancing the upscale apartments. It was rather common to use the rooftop for games such as basketball, baseball and tennis, also dances. The not-so-wealthy people also found their own way to creatively use the 'new' and valuable space.

The first gardens on roofs in Europe were born in the 1930s and 1940s. London's Derry and Toms Roof Garden, today known as Kensington Roof Garden was commissioned by a department store that gave the garden its name and covered an area of 1,5 acres (about 6070 m<sup>2</sup>) with fountains, ponds and bridges, different walks and even a woodland garden. It sits on the top of a 30 m high building. The other better-known roof-garden was designed by Swiss architect Le Corbusier in Marseilles, France. La Cité Radieuse, so-called vertical living for over 1600 people with a communal space on the roof, was completed in 1952. It features a swimming pool, recreation ground and children's nursery.

Today, with all that history and exciting examples, why is there still so much unused potential? Why have we not seen that space, nor dared to do anything with it? There must be multiple reasons, financial, constructional or simply no available information on how to fill these spaces effectively and successfully. True, a rooftop garden needs a wise approach, some detailed research and knowledgeable

completion but is not that complicated that one should not consider using that space for its advantage.

Why to create a rooftop garden overall? Gardens in the sky enjoy privileged status for many reasons. They are highly valued as being a limited space where every square metre counts, a potential for different activities, relaxing or just enjoying the beauty of nature, enlarging the indoor living space. Being higher up and closer to the sky, it offers cleaner, fresh air which may not be a commonplace in a busy city. A space which cuts off the traffic noise, lends beautiful or interesting views, curious perspectives, something you would not see unless you are higher up. Rooftop gardens also enjoy greater privacy. Being in a green haven, in the middle of a bustling city, makes it all more valuable, every tree and every bloom there stands out, every season becomes more apparent with its changes, moods and colours. It is a living organism which you can create and direct the way you wish.

True, these spaces present us with many challenges that you would normally not be concerned about when creating a garden on ground. Weight concerns, structural and safety issues, harsh winds and weather conditions that are quite different, heat or freezing matters, unexpected microclimates and a number of other aspects are to be taken into account. There are some general rules which apply to most of the rooftop gardens in the world, and thanks to fast globalization, there is increasing amount of literature available regarding construction, specifications and planting on roofs. But you should also be ready and know that there are some surprises, good or bad that do not follow these facts and rules of thumb. Just enjoy the process and be prepared for what may come, it is a learning curve for even the best of designers.

This book will first of all, inspire you giving some great ideas what to do with an empty roof-space, whether it is tiny or rather spacious one. It will advise how to create interesting and effective garden rooms, allow different moods, point out which furniture to use, how to approach lighting and sculpture, use creative accessories to a garden's advantage. And of course feature lot of planting which has a final say in every rooftop garden. There are plans, some construction drawings, views and other details, great tips and general information about these spaces. It is a valuable first step towards creating more and more of them, giving you a gentle nudge towards being more open to creative possibilities, things you may not have seen earlier or considered possible. May it lead you into something wonderful, whether it is in a form of an idea, end result, exciting cooperation or help you becoming just a brighter happier person.

**Merilen Mentaal**  
Member of Society of Garden Designers,  
Garden Designer  
MentaalLandscapes

## 将屋顶变成绿洲吧!

现代建筑提供了众多平坦的屋顶空间，这给我们带来创造更多绿色、亲自然、健康居所的契机。人类从很久以前就占用了自然的大片土地，将其变成了钢筋丛林，结果除了部分公园和少有的绿地外，自然已经失去了原有的广阔绿色。

其实我们有许多未被使用的潜力土地。走上一栋高楼的屋顶放眼望去，你能看到多少绿色？但是，这么多或小的空旷屋顶，为什么不能把它们变成绿洲呢？

虽然古时只有少数拥有特权的人才有能力营造花园结构，但屋顶花园的历史也相当深远。古代屋顶花园的代表无疑是巴比伦的空中花园。巴比伦的空中花园建于公元前600年左右，位于美索不达米亚的中部的平坦地区，日光充足。其特点是在拱形露台上种满了郁葱的悬垂植被和树木。罗马人在庞贝古城中建造的屋顶花园也颇为有名。出土的神秘遗址能表明并证实在某栋建筑的露台上曾直接覆盖有土层，并在上面种植过植物。阿兹特克皇城、特诺奇蒂特兰城等也拥有过屋顶花园，如同矗立在法国诺曼底海上圣米歇尔山一样令人惊叹。

第一个商业屋顶花园出现在1882年的纽约，位于一座剧院的楼顶，紧接着出现了麦迪逊广场花园。屋顶花园为当时缺乏空调设备的建筑带来了巨大优势：在夏季的歌剧旺季时能将酷暑阻挡在室外，或者直接将歌剧、舞蹈、戏剧等直接转移到室外表演。20世纪初则是屋顶花园蓬勃发展的时期，许多酒店在屋顶增设休闲花园，办公楼则开办了露天餐厅，拥有私家住宅的富人则将之作为提供住所档次的形式。将屋顶作为运动场所，如篮球、棒球、网球、舞蹈等也并不少见。平民百姓也开始用自己的方式来使用这个新兴、宝贵的空间。

欧洲的第一座屋顶花园——伦敦德里和汤姆斯天台花园，出现在20世纪30~40年代现今又被称为肯辛顿屋顶花园。开发商是一家百货公司，也是花园的命名者。花园位于一栋30m高的建筑楼顶，占地1.5英亩（约6070m<sup>2</sup>），里面有喷泉、水池、小桥、小路和林地花园。另外还有一座知名的屋顶花园，位于法国马赛，由瑞士建筑师勒·柯布西耶设计，坐落在名为马赛公寓的建筑上，于1952年正式建成。屋顶花园里的公共空间为超过1600人提供垂直生活的场所，并设置有游泳池、游乐场和幼儿园。

屋顶花园发展历史不短，经典案例众多，反思现今，为什么还有那么多具开发潜力的屋顶被荒废着呢？为什么我们都忽视这个空间，也不敢在这里发挥呢？其中确实有很多原因，如经济、建筑问题，或只是根本没用可用信息来辅助成功有效地利用屋顶空间。诚然，建造一座屋顶花园需要明智的方式、详细的研究和渊博知识，但这并不复杂到

足以让我们无视这个空间的优势和利用价值。

为什么要建造屋顶花园？因为空中花园能带来许多方面的优势。屋顶花园在有限的空间里充分利用每寸空间，为各种活动提供场所，如放松、欣赏风景或扩大室内的生活空间。因为更高、更靠近天空，人们在这里能呼吸到和喧嚣城市里不一样的干净、清新空气。屋顶花园是一处没有交通噪音的世外桃源，只有美丽而有趣的景色，新奇的景象，拥有站在一定高度才能邂逅的风景。屋顶花园还享有更隐秘的私人空间。身处繁忙城市中心的绿色天堂，一切绿色显得更有价值，每一棵树、每一朵花都显得与众不同，每个季节变化时的氛围、色彩都变得更为丰富。这里是一个具有生命力的有机体，人们可以按照自己喜好创造、改造它。

但是，屋顶花园也给我们带来了许多在建造地面花园时不会遇到的挑战，如承重、结构和安全问题、强风和各种极端天气条件，如酷暑或严寒，预料之外的微气候和其他各种方面的考虑。一般性规则也适用于世界上多数的屋顶花园，多亏全球化的快速发展，关于建筑方法、规范和植被种植的可用文献也越来越多。但我们也必须为一些意外状况做好准备，无论是好是坏，只需享受这个过程，为即将到来的事物而时刻准备着。就算是对于最优秀的设计师，这也是一个渐进学习的过程。

本书的问世将起到一个引领的作用，为充分利用原始屋顶空间提供了多重构想，无论它的空间是狭小还是宽敞。它展示优秀案例中如何创建有趣又实际的花园空间，容纳不同的思绪，选择什么样的家具，如何处理照明和雕塑，使用创意配饰点缀花园，等等。当然，花园的特色功能拥有最终发言权。规划、建筑图纸、视图、精湛的建筑技巧和庞大的空间信息是花园建造的必备信息。这本书是非常有价值的一步尝试，将引导更多优秀案例的呈现，温婉地让你意识到创造的可能性将会更加开放，甚至有些是你未曾意识到的。本书将带领读者走进一个奇幻的世界，不管是形式上的还是精神上的，其最终结果是促成合作，或是帮助你成为一个光明快乐的人。

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# PUBLIC LEISURE

公共休闲

# "Star skygarden standing on Marina Bay"

" 矗立在金沙湾上的明星空中花园 "

## Marina Bay Sands

Landscape Architect: PWP Landscape Architecture

Client: Las Vegas Sands

Location: Singapore

Site Area: 9,941 m<sup>2</sup>

Photography: Tim Hursley, Timothy Hursley

## 新加坡滨海湾金沙屋顶花园

设计公司: PWP 景观建筑事务所

客户: Las Vegas Sands

地点: 新加坡

占地面积: 9941m<sup>2</sup>

摄影师: Tim Hursley, Timothy Hursley

## CLIMATIC CONDITIONS

Singapore belongs to tropical rainforest climate, temperature is hot and humid, the minimum difference in daily and yearly temperature, monthly average temperature 24-27 degrees, annual rainfall is about 2,460 mm, with no typhoon disturbance.

## PLANTS

Palm, Khaya, Ficus, Alstonia

## 气候条件

新加坡属热带雨林气候, 气温湿热, 日温差和年温差极小, 月平均气温 24-27 °C, 年降雨量 2400mm, 没有台风的骚扰。

## 植被

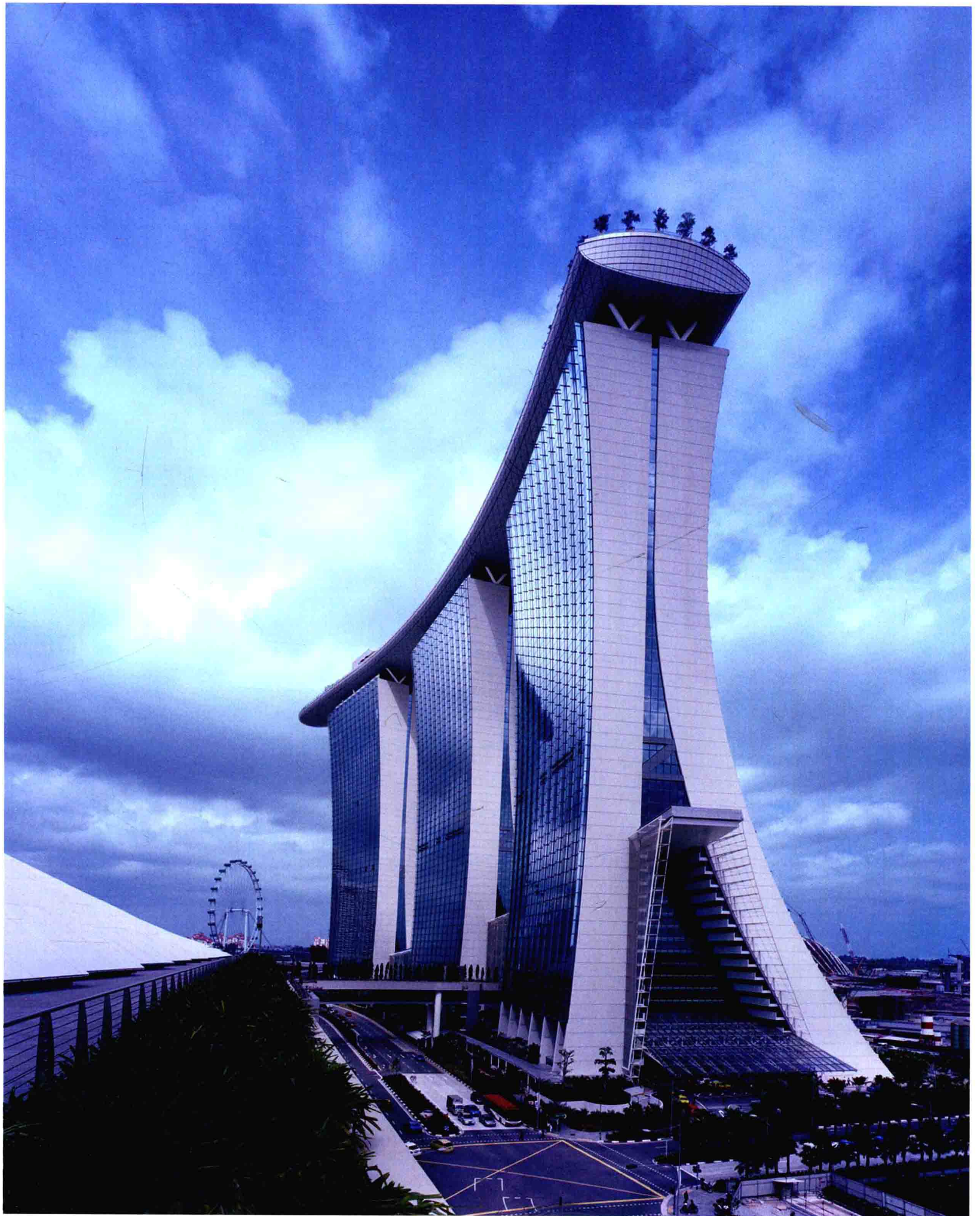
棕榈树, 非洲桃花心木、双翼豆、鸡骨常山属

## EDITOR'S CHOICE

The super sky garden attracts world's attention by its impressive shape as a ship connecting the top of three volumes. It includes an infinite pool and a spacious viewing platform that offers 360-degree views around downtown Singapore.

## 编辑推荐

令人瞩目的超级屋顶花园将建筑三部分体量连为一体, 高空中的无边界泳池, 宽敞的观景平台, 游客可以 360 度全角俯瞰新加坡的繁华之美。







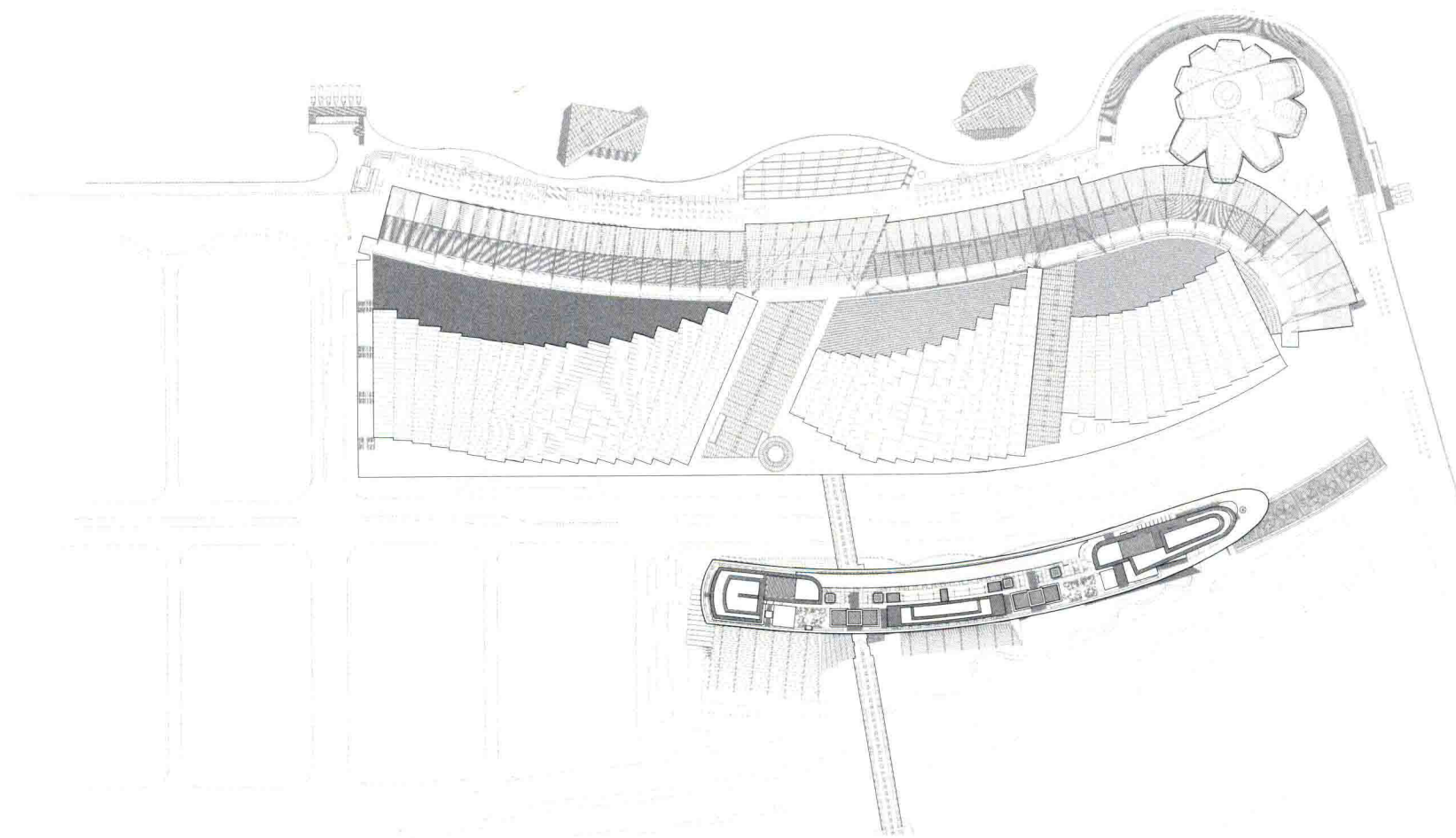
Sands Sky Park: The three hotel towers are connected at the top (200 meters/656 feet) by a 5,941 square meter (107,600 square foot) park that brings together a public observatory, jogging path, gardens, restaurants, lounges, and an infinity swimming pool. This 1.2 hectare (3 acre) tropical oasis is longer than the Eiffel Tower which is tall and large enough to park four-and-a-half A380 jumbo jets. It spans from tower to tower and cantilevers 65 meters (213 feet) beyond to form one of the world's largest public cantilevers. It is 340 meters (1,115 feet) long from the northern tip to the south end. The park's maximum width is 40 meters (131 feet). The 1,396 square meter (15,026 square foot) swimming pool is the largest outdoor pool of its height and has a 145 meter (475 foot) vanishing edge. The entire park can host up to 3,900 people. Its lush gardens include 250 trees and 650 plants.

PWP worked with the Singapore government, Mustie Saldie, and a team of local landscape architects and horticulturalists as well as engineering, architectural, and business professionals to create the landscape for this project at the entrance to Singapore Bay. It includes a public waterfront promenade, a public rooftop promenade, and a 1,000-meter-long landscaped bridge. The 2.5-acre sky park spans the roofs of three hotel towers on the 57th floor and offers views of downtown Singapore.

金沙屋顶花园将三栋酒店大楼的顶部在 200 m 的高空连接到一起，共占地 9,941 m<sup>2</sup>，包括公共天文台、慢跑道、花园、餐厅、休息室和一个无边游泳池。这个 12,000 m<sup>2</sup> 的热带绿洲甚至比埃菲尔铁塔的高度还长，面积足够停泊 4.5 架 A380 大型喷气式客机。横跨在塔楼之间的悬臂高 65 m，是世界上最大的公共悬臂结构。从南端到北端共长 340 m，公园最大宽度为 40 m。占地 1,396 m<sup>2</sup> 的水池是世界上最大的高空户外泳池，边长 145 m。整个公园能够容纳 3,900 名游客，里面共有 250 棵树木和 650 株花草。

设计师与新加坡政府、设计师摩西·萨夫迪、本地的景观设计、园艺师、工程师、建筑家和商务人士共同打造花园，作为新加坡湾的入口景观，包括公共水边长廊、公共屋顶长廊和长 1,000 m 的园境桥。面积达 10,117 m<sup>2</sup> 的空中花园位于第 57 层，享有新加坡市中心的美景。





Site Plan  
总平面图