阿布扎比沙瓦哈广场，阿拉伯联合酋长国

Sowwah Square, Abu Dhabi United Arab Emirates

业主 John Buck International Mubadala Development Company

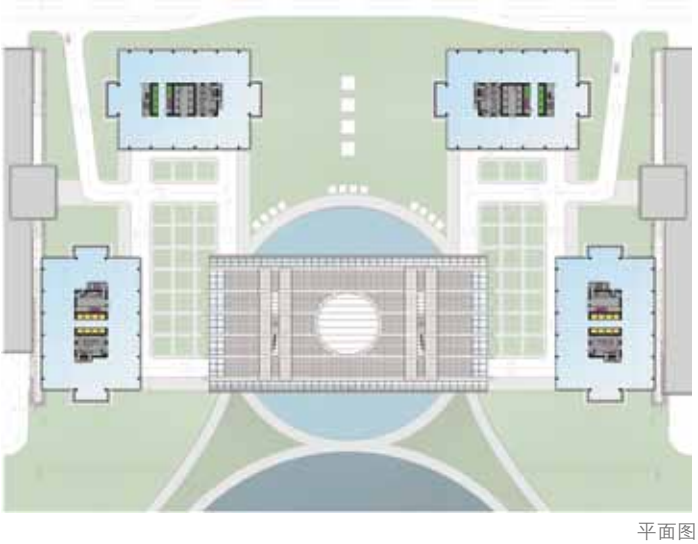
建筑设计 Goettsch Partners

设计/建成时间 2007~2012

摄影 © Goettsch Partners

资料提供 Goettsch Partners

美国GP建筑设计有限公司 (GP) 被Mubadala Development Company委任为沙瓦哈广场进行建筑设计，这是他们在阿拉伯联合酋长国阿布扎比沙瓦哈海岛的旗舰商业项目。项目共计3 125 500平方英尺的办公面积，标志性的阿布扎比证券交易所总部被4座办公塔楼所包围，并可俯瞰其下的水景。此外，项目还包括两层的零售空间和两层的地下停车空间。阿布扎比最近推出了命名为“阿布扎比2030”的都市规划计划，选定了沙瓦哈岛和毗邻的Mina Zayed、Reem岛作为城市的新中央商业 区。

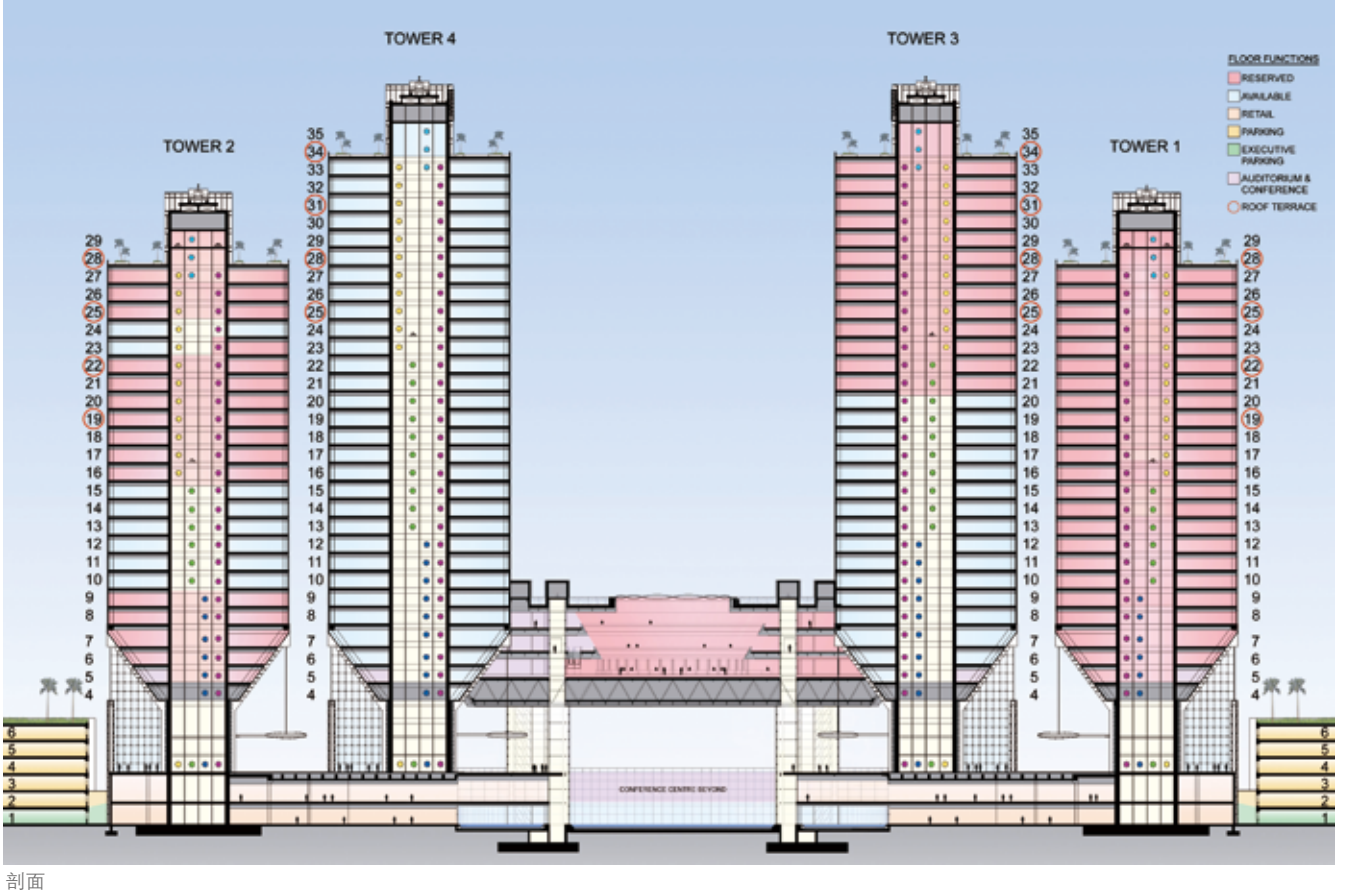


平面图

沙瓦哈广场

沙瓦哈广场的一期工程是一个商业中心，包含 一个233 000平方英尺的证券交易所大厦，共计2 892 500平方英尺的4座甲级办公塔楼，以及5 200个停车位的地下停车场和250 000平方英尺的商业零售区。施工于2007年夏天开始，于2010年完成。项目自始至终强

施工现场



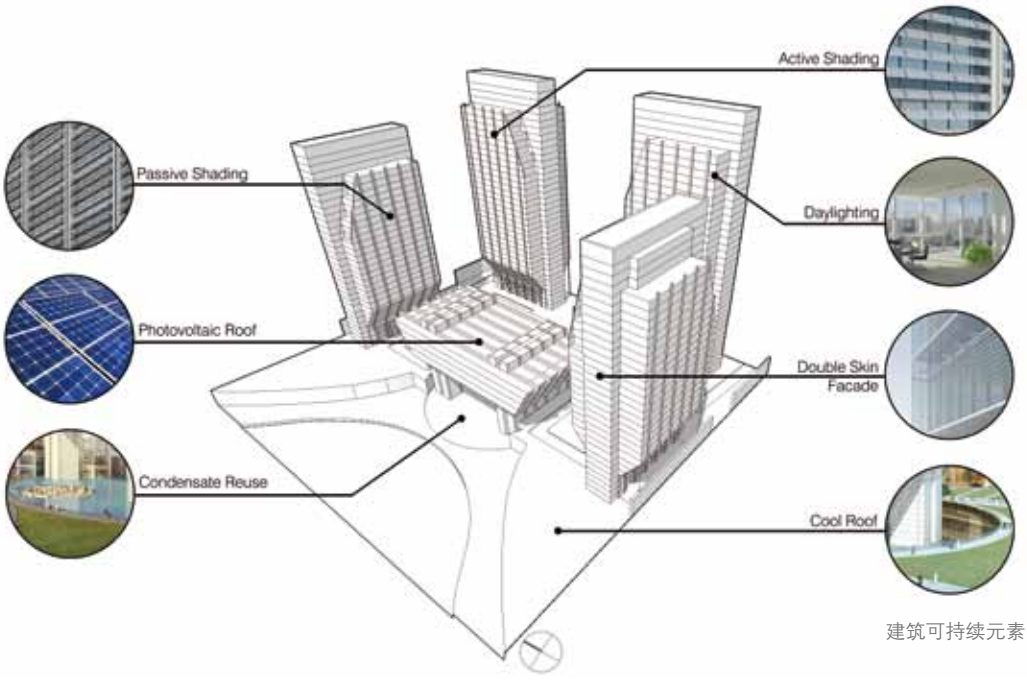
剖面

调可持续性设计，使用主动式和被动式的设计策略使之超越了LEED认证标准。

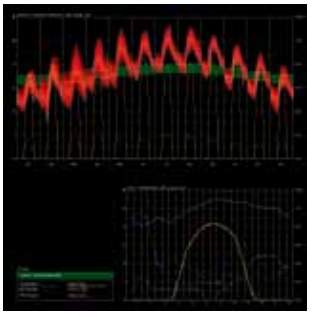
阿布扎比证券交易所总部

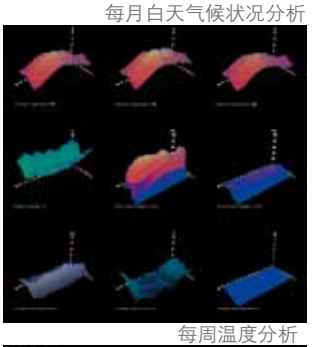
项目将成为阿布扎比证券交易所的新总部大厦，因此证券交易所大厦被设计得极具标志性，建筑共四层，被玻璃包覆，并设计有一个橄榄球球场大小面积的屋面。建筑被抬高在一个160英尺直径的水景之上，由四根巨大的花岗岩石柱支撑上升90英尺，楼梯、电梯

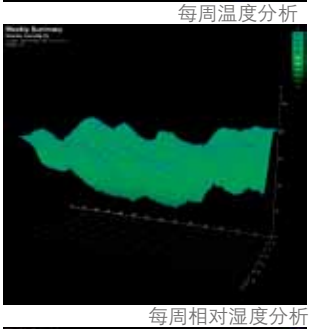
Goettsch Partners (GP) has been commissioned by Mubadala Development Company to design Sowwah Square, their flagship commercial development on Abu Dhabi's Sowwah Island in the United Arab Emirates. The project totals 3,125,500 square feet of office space and features the iconic new headquarters building for the Abu Dhabi Securities Exchange surrounded by four office towers, all overlooking the water. In addition, the project integrates two levels of retail and two underground parking structures. Abu Dhabi's recently published urban framework plan, entitled Plan Abu Dhabi 2030, has designated Sowwah Island and the adjacent edges of Mina Zayed and Reem

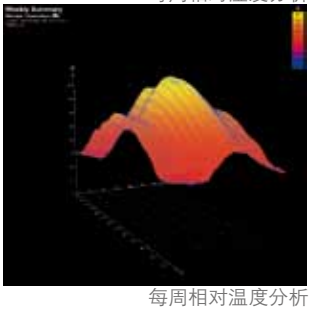


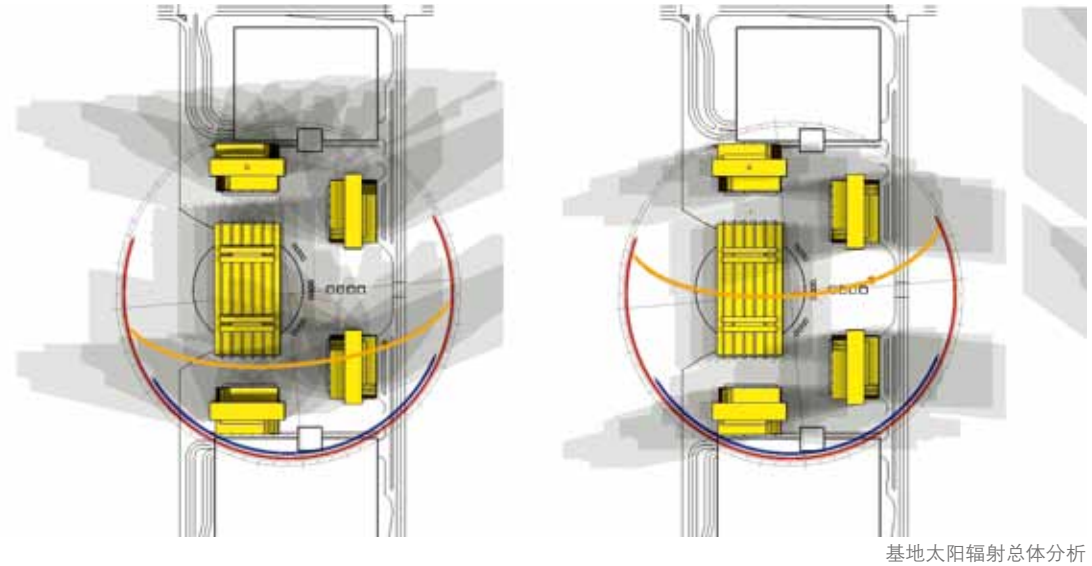
建筑可持续元素示意


每月白天气候状况分析


每周温度分析


每周相对湿度分析


每周相对温度分析


基地太阳辐射总体分析

和建筑配套设施均位于四个花岗岩石柱内。在体现了力量和稳健的同时，建筑俯视水面并背靠现在的城市中心。

办公楼

四座办公塔楼围绕着证券交易所布置：两座31层，另外两座37层。办公楼层的首层始于110英尺的高度，由此提供了一个透明、开放的大堂和开阔的视角，此外设计了景观广场在地面连接四座塔楼和证券交易所。

零售和停车

广场下为两层的商业零售裙房，提供了滨水式的高级购物场所。在项目场地的南北两侧有着两个连通的停车场，各提供超过2 600个的停车位。

可持续性设计

可持续性设计是项目的设计重点，集成了多种可持续性措施，包

Island as the city’s new Central Business District.

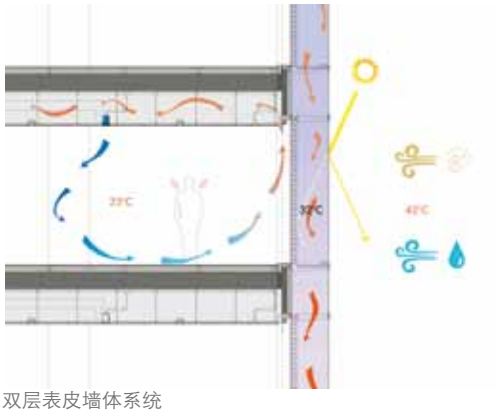
Sowwah Square

The centerpiece of the development’s first phase will be the business center, which will include: a 233,000–square–foot stock exchange building, four Class A office towers totaling 2,892,500 square feet, parking for 5,200 cars and 250,000 square feet of retail. Construction commenced on the site of Sowwah Square in summer 2007, with the full development scheduled for completion in 2010.

The complex emphasizes a sustainable design approach throughout and looks beyond the LEED certification process to integrate both active and passive sustainable design strategies.

Abu Dhabi Securities Exchange Building

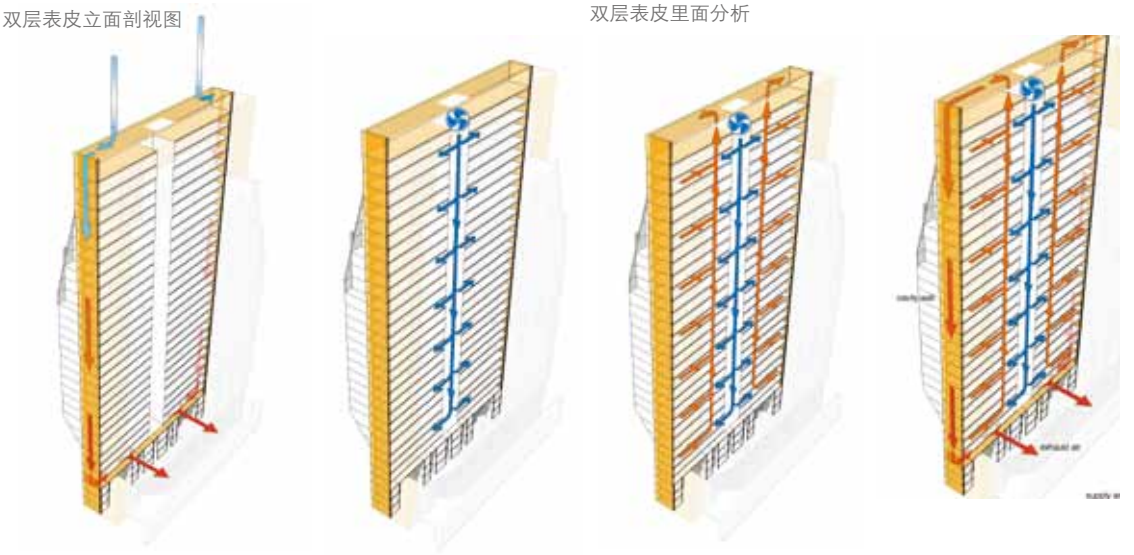
As the distinctive new headquarters of the Abu Dhabi Securities Exchange, the stock exchange building is an iconic, four–level facility. Glass–enclosed with a roof the size of a football field, the building rises 90 feet above a 160–foot–diameter water feature on massive stone piers. The four granite piers house the stairs, mechanical risers and service elements for the exchange. The building projects an image of strength and solidity



双层表皮墙体系统

双层表皮立面剖视图

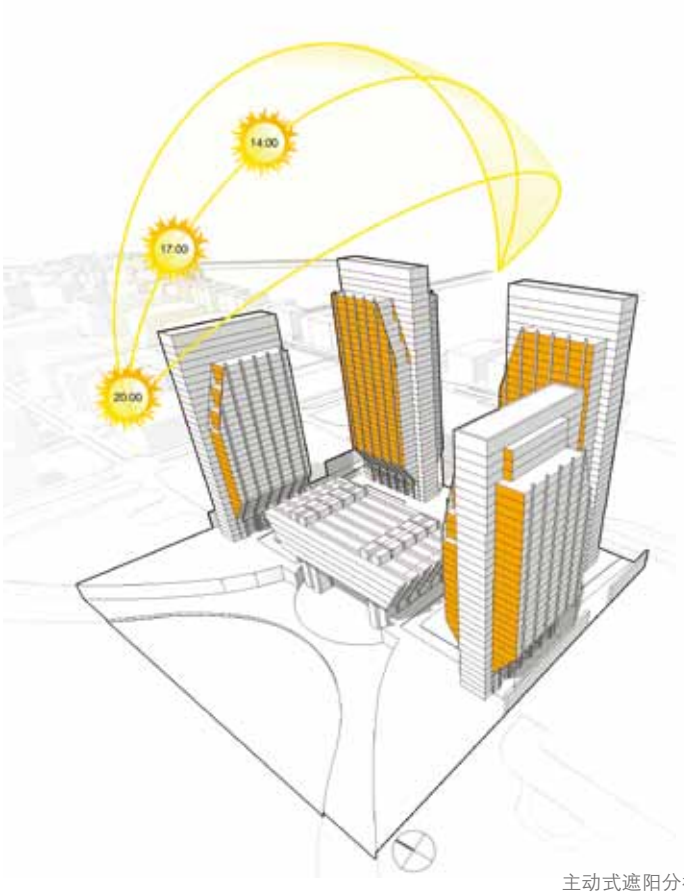
双层表皮里面分析



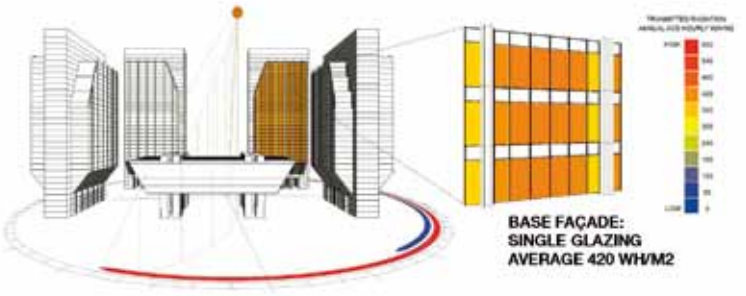
双层表皮冬季空气循环分析

双层表皮夏季空气循环分析

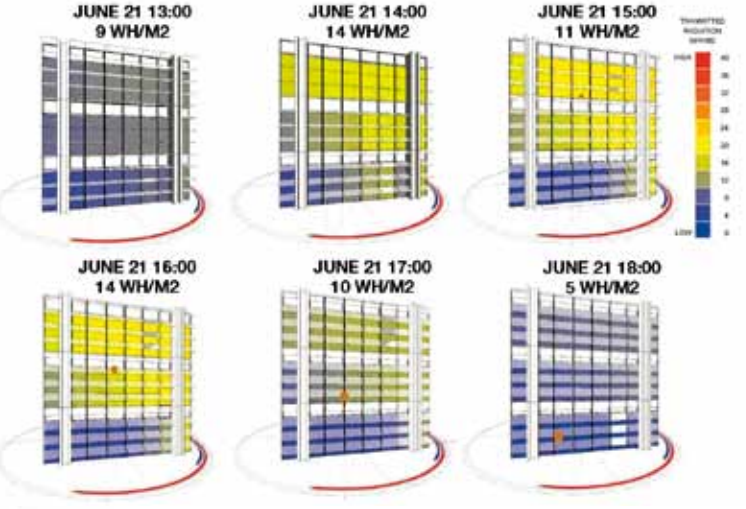
双层表皮



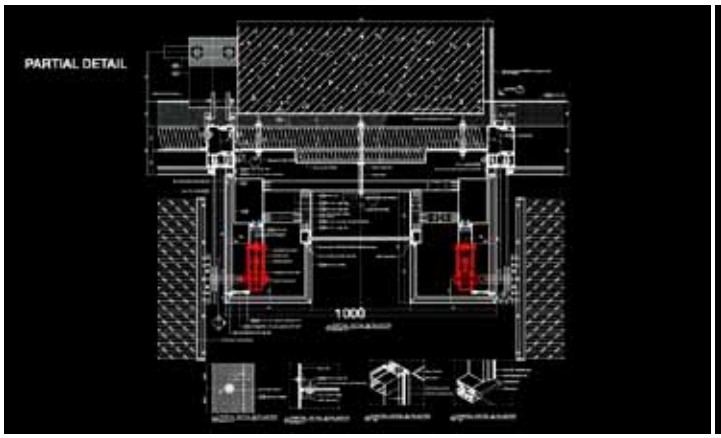
主动式遮阳分析

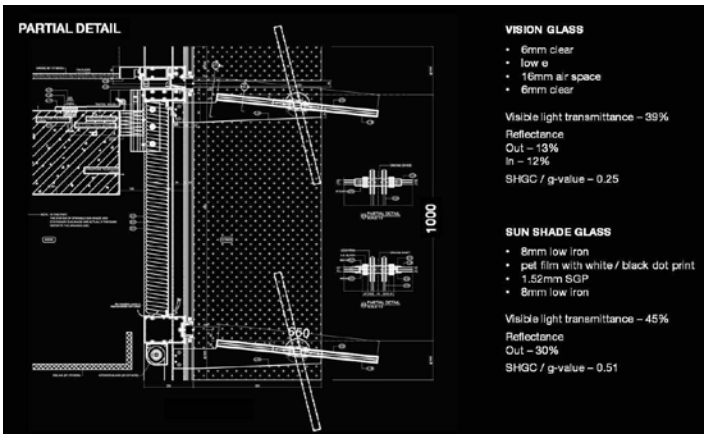


西立面无遮阳太阳辐射分析



东立面主动式遮阳分析





主动式遮阳部分节点

括可通风的双层幕墙，使建筑在极端气温下得到隔热保温；主动式和被动式的遮阳设计，进一步控制了光线和热量吸收；屋面上27 500平方英尺的光伏太阳能板，并且回收制冷系统的冷凝水作为水景用水和灌溉用水，以及使用智能灯光控制以平衡自然光和人工照明。

高性能幕墙系统

大面积的办公塔楼外墙使用了机械通风式双层幕墙来准确地对外界环境做出反应，这些措施缓和了40°F的室内外温差，保护了使用者免受强烈的沙尘暴袭击和来自邻近海湾腐蚀性湿气的侵蚀。

四座办公塔楼有着全高的双层幕墙，双层幕墙的空腔从四层起延伸至建筑上部的机电层。在这些空腔内，主动式遮阳设施可连续跟踪太阳的角度来调整及提供理想的遮阳效果。同时这些空腔被密封来保护遮阳设施免受空气中悬浮粒子的侵害。

as it overlooks the water facing back toward the city’s existing downtown.

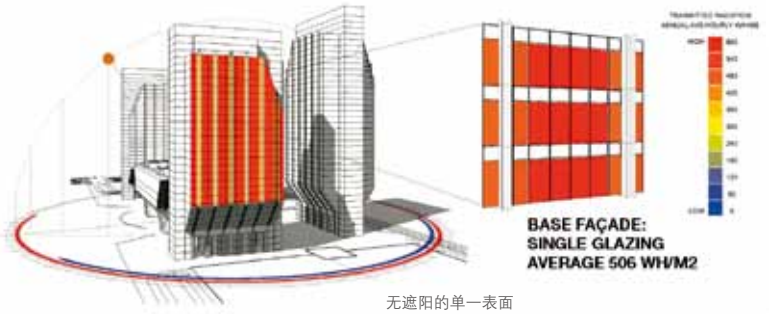
Office Buildings

Four office towers frame the stock exchange building: two at 31 stories and the other two at 37 stories. The first full office floor of each building starts 110 feet above the ground level, providing a highly transparent, open lobby and elevating the views on all tenant floors. A landscaped plaza connects the four buildings and the exchange at grade.

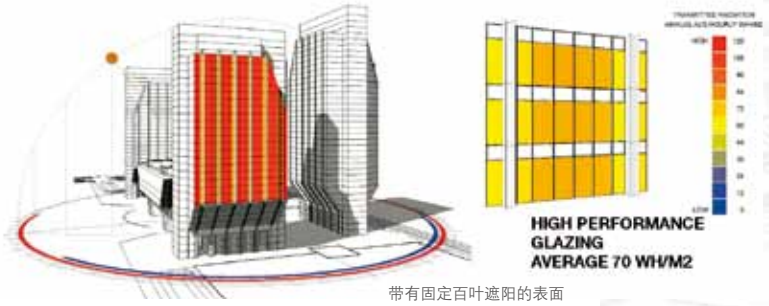
Retail and Parking

Beneath the plaza, a two–story retail

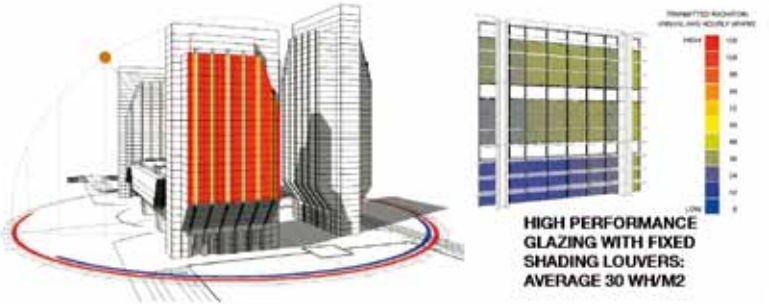
主动式遮阳立面分析



无遮阳的单一表面

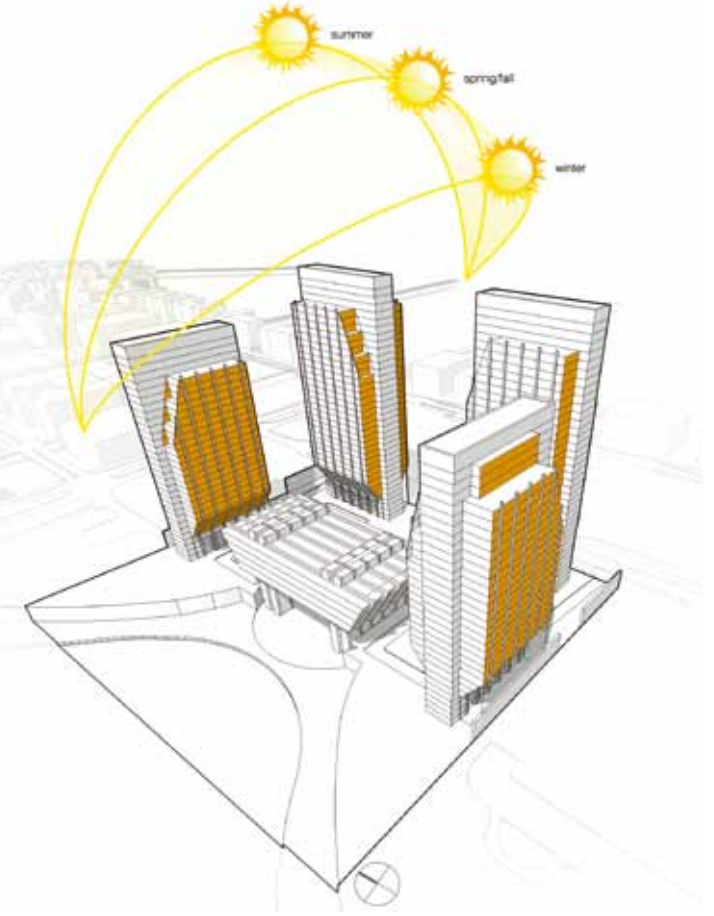


带有固定百叶遮阳的表面



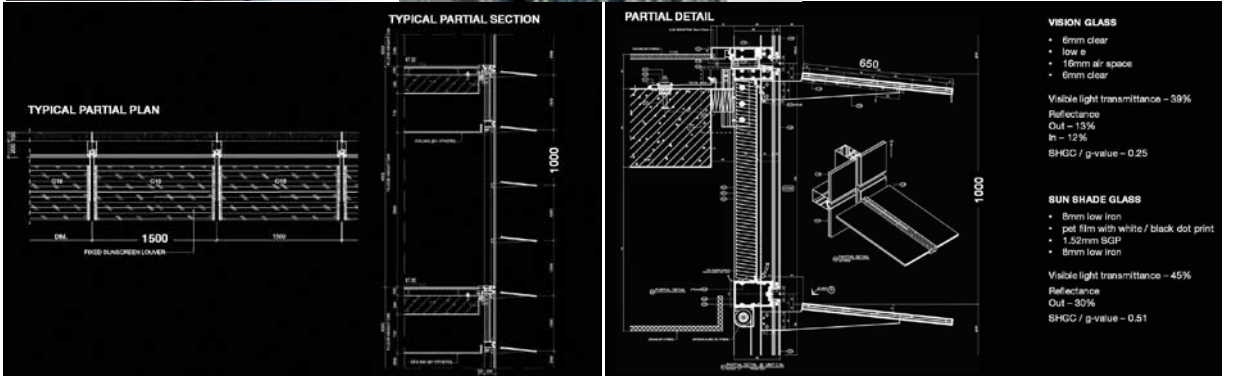
南立面太阳辐射分析

高性能表面



被动式遮阳分析

被动式遮阳立面



被动式遮阳节点

主动式遮阳设施和玻璃的选择使幕墙中的空腔和室内免于过热。为了将穿透双层幕墙外层的太阳热量减到最小，外层选择了遮阳系数（76%）非常高的玻璃，剩余的热量由内部的主动式遮阳阻挡在外，然而这也使得双层幕墙内的温度升高。

为了减缓温度的上升和形成一个空气缓冲带，空腔内的热空气将通过空气降温器排出而不是自然降温。GP的解决办法是收集建筑室内的排出气体，而不是直接将其排至室外，将这些气体引至双层幕墙内部带走热空气，然后在位于建筑四层的机电层排出。通过空腔内的感应器来控制建筑上部的风阀，并根据时段和室外温度将空气引至指定部位的空腔。此外，还设有更多的风帽可以将过滤后有着合适温度的室外空气，如夜晚或冬季所收集的室内温度较低的空气引入空腔内。

通过这些措施，当外部温度达到115°F时，双层幕墙空腔的平均温度保持在89°F，使得具有高隔热性能的内部玻璃可以更加容易地遮挡空腔的热辐射。最重要的，节能计算显示双层幕墙为沙瓦哈广场的4座办公塔楼节省了7 200 kwh/日的能耗，并且在接近外墙的内部空间有着舒适的温度，同时也保护着建筑免受恶劣外部环境的破坏。（译/GP，校/朱晓琳）

podium weaves through the development, providing upscale shopping along the waterfront. At the north and south boundaries of the site, two parking structures, partially submerged, serve the complex with more than 2,600 parking spaces each.

Sustainable Design

Sustainability is a main focus of the development, and the design of the complex integrates many sustainable initiatives, including: ventilated, double-skin facades in order to insulate the buildings against extreme temperatures; active and passive solar shading to further control light and heat gain; 27,500 square feet of photovoltaic panels on the roof of the exchange; condensation collection from cooling coils to supply the water feature and provide irrigation; and active lighting controls to balance natural and artificial light.

High-Performance Enclosure

The environmentally responsive enclosure system uses a mechanically ventilated cavity and a double-skin facade system over large portions of the office buildings. These elements mitigate the 40 ºF interior/exterior temperature differential and protect building occupants from the intense sand storms and constant corrosive mist of the neighboring Gulf coast.

The double-skin cavities run uninterrupted along the entire height of the four office towers, starting from the fourth floor and extending to the penthouse mechanical floors. Within these cavities, active solar shades continuously track and adjust for the sun angle in order to provide optimal shading to the building's interior. The cavity is sealed to protect the gears from airborne particulates.

Active solar shading and glass selection keep the cavity from heating up and increasing the internal radiant temperature. To minimize the amount of solar energy penetrating the outer layer of the double-skin system, an outboard lite with a very high shading coefficient (76%) was selected. The remaining energy was then blocked from reaching the inner façade by the active shading; however, its presence contributed to an elevated air temperature within the double-skin cavity.

To alleviate the accelerated temperature and achieve the moderating air buffer, the warm cavity air needed to be flushed out using an air source cooler than the natural air temperature. The solution GP developed was to collect the exhaust air from the tower offices and, instead of allowing it to escape into the atmosphere, redirect it back down the double-skin cavities where it is exhausted at the fourth floor mechanical level. Sensors within the cavities will modulate dampers at the top of the building, directing the air to the optimal zones of the cavity depending on the time of day and outdoor temperature. Additional dampers will allow filtered exterior air to enter directly into the cavity during economizing periods such as night and winter, when the outdoor air is cooler than the collected exhaust air.

Through these efforts, the design team expects the double-skin cavity to be an average temperature of 89 ºF when the exterior temperature reaches 115 ºF. This condition will allow the high U-value of the insulated inner glazing to more easily block the air cavity's radiating energy. Most importantly, calculations estimate that the double-skin system designed for Sowwah Square will generate a savings of 7200 kwh of electricity per day across all four towers and provide a more comfortable thermal environment near the perimeter wall, all while protecting itself from the harsh external elements. AT

美国GP建筑设计有限公司简介

通过一系列所有权以及名称的变动，美国GP建筑设计有限公司成为密斯·范·德罗在1938年所创的建筑事务所的直系后裔。如今，GP公司的所有建筑师、规划师以及室内设计师都致力于为业主提供专业优质的服务和强调环境的责任性。出于对全人类环境问题的关心，GP的设计理念是建立在这样的信念上：任何特殊的规划和设计都应该积极考虑功能、技术、经济和美学这四大因素的组合。

公司的合伙人们近年来刻意寻求并鼓励多样化的实践发展。最终GP成功地完成了从挑战各种复杂项目向单一项目类型且具有持久影响力及价值的历史转型。GP在国内外的工作业绩主要包括办公环境的规划和设计、大规模的商业综合体、学校、文化和机构建筑、联邦及当地政府设施、酒店和住宅综合体以及公共开放空间。GP走的是一条当代建筑的道路，为业主提供最独特、最适合并且精细与永恒并存的设计方案。