

Green Building Design


A Business Case Study on the Integration of Green BIM towards Sustainable Architectural Design

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(2009 - present)

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(2012 - 2016)

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The Chinese University of Hong Kong
(2011 - 2016)



AEDAS

Green Building and Management Conference
HKU MSc ENVM – EMAHK - BSOMES

8 April 2017

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Aedas





Source: Aedas

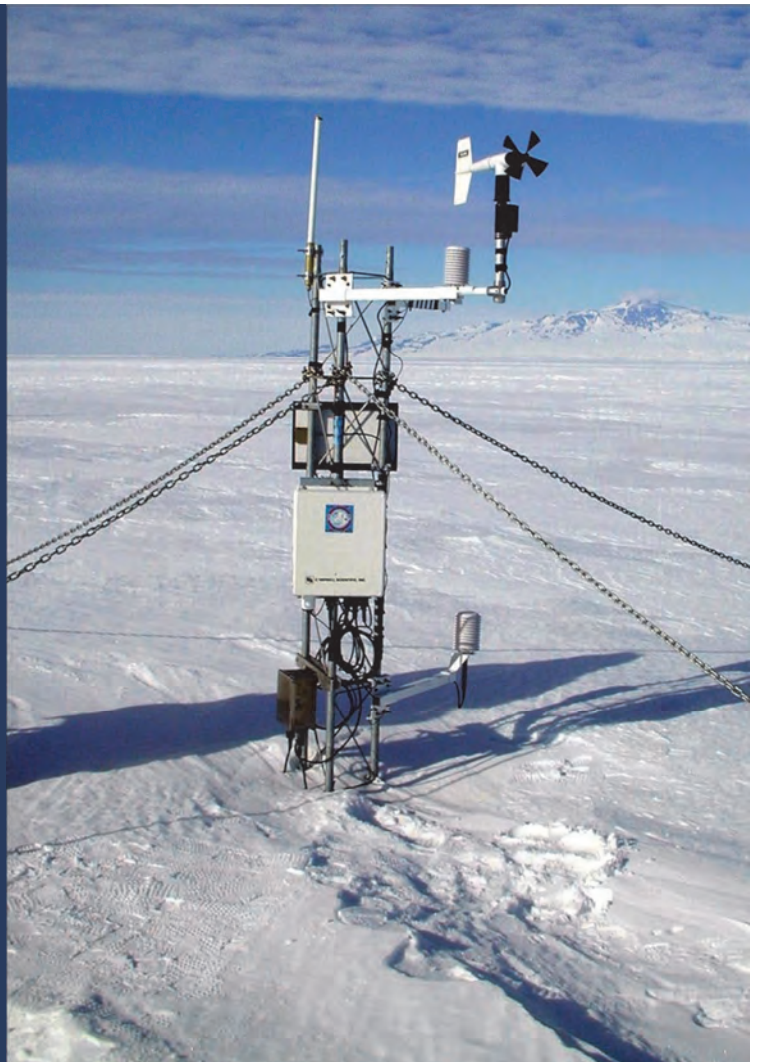
基础气候分析 Basic Climate Analysis

服务范畴 Scope of works:

- 搜集当地的基础气候资料；
Collect basic climate information of the site
- 制作气候资料说明图表、文字等，简要分析当地的气候特征、限制以及被动设计的潜力等。
Prepare tables, charts and text to illustrate the climatic characteristic and design limitation and potential of the site

所需资料 Information required:

- 项目所在位置
Location of project
- 业主设计说明
Design brief



计算机风环境模拟 CFD Wind Environment Simulations

服务范畴 Scope of works:

- 在不同的设计阶段进行建筑风环境模拟分析；
Conduct CFD simulations in different stages
- 判断地块的通风走廊和静风区，以最大化地块的通风潜力；
Identify wind corridor and calm wind areas to maximize ventilation potential
- 评估建筑设计的通风性能；
Evaluate ventilation performance of proposed design
- 判断空气流动极端区域；
Identify extreme wind patterns
- 判断基地风力发电的潜力。
Identify wind power generation potential

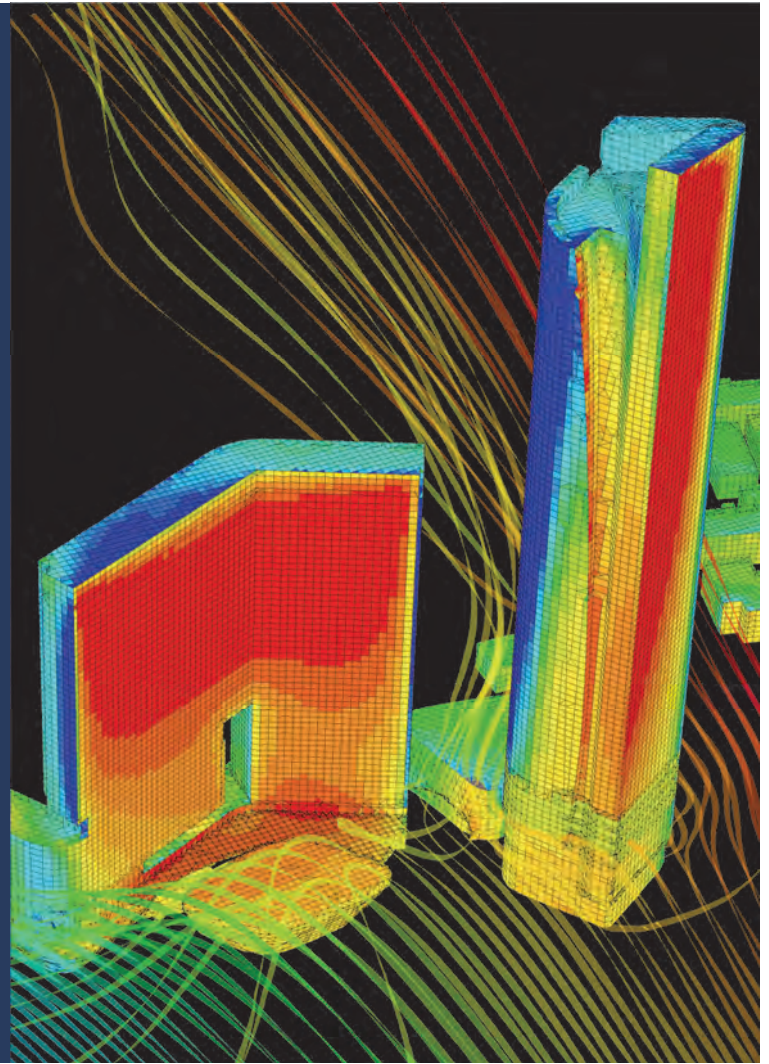
所需资料 Information required:

- 项目所在位置
location of project
- 包括周边建筑物的三维建筑设计体量模型
Massing model of proposed design with surroundings

PD2

CD1

SD1



方案设计
Scheme Design stage

概念设计
Concept Design stage

前期设计
Pre-Design stage

Aedas
Sustainability

Tonre Chongqing Zhongxian Project, PRC
通瑞重庆忠县项目

Computational Fluid Dynamics Analysis | Pathline of Air Movement & Static Wind Pressure on Building Envelop

建筑立面太阳热得量分析 Envelope Solar Heat Gain Analysis

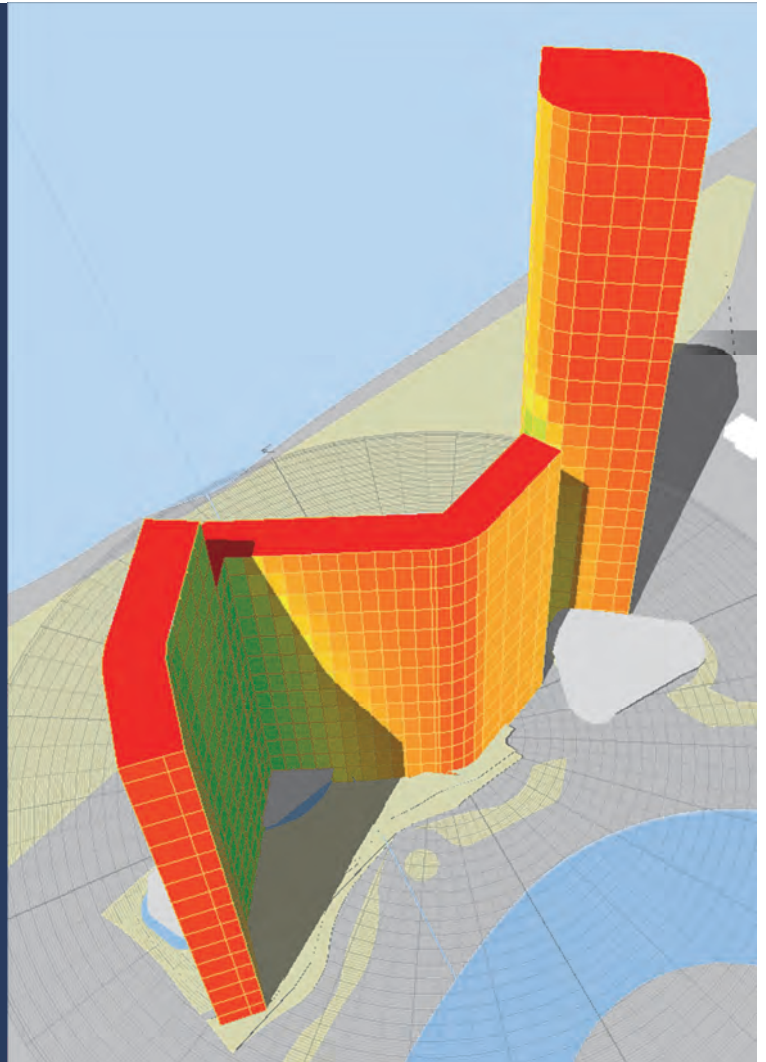
服务范畴 Scope of works:

- 分析建筑不同里面的太阳热辐射得量的情况；
Analyze solar heat gain on all building façades
- 根据立面的受热不同，提供适当的遮阳设计策略。
Propose appropriate shading strategies for façades in accordance with its solar heat gain analysis result

所需资料 Information required:

- 项目所在位置
Location of project
- 包括周边建筑物的三维建筑设计体量模型
Massing model of proposed design with surroundings

CD2



公共空间阳光照射数量分析 Open Space Sunlight Access Study

服务范畴 Scope of works:

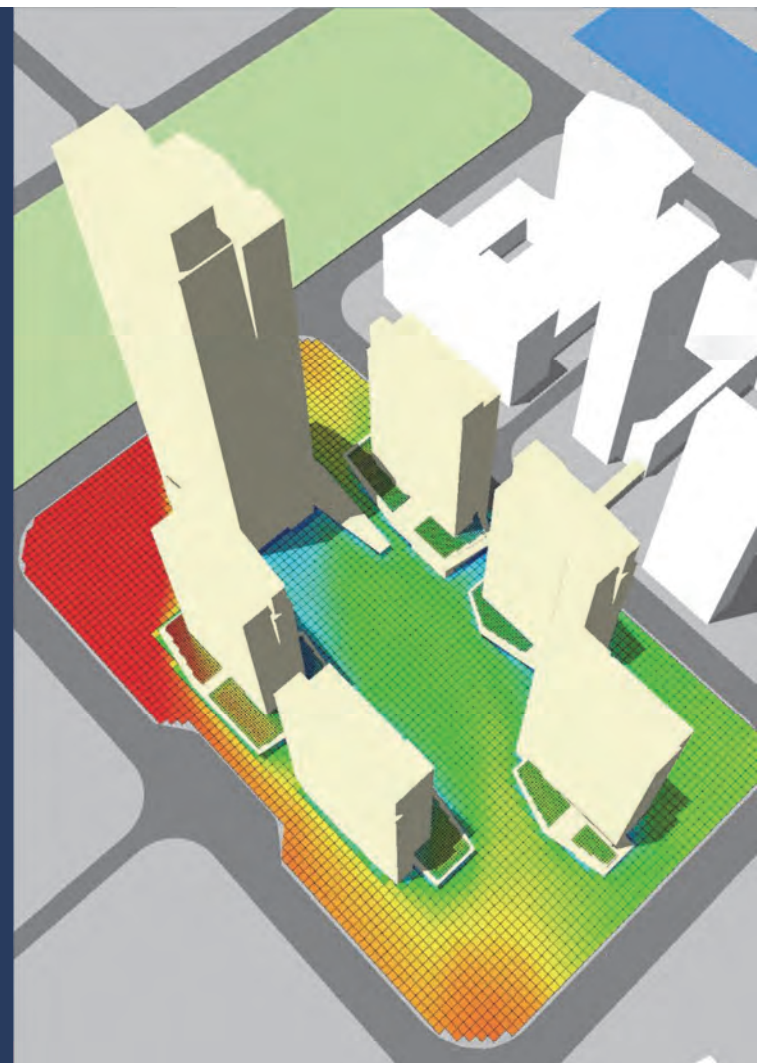
- 模拟分析地面和裙房屋顶等建筑开放空间的全年、夏季和冬季等时段的平均日照数量；
Study average solar access on open space, including ground and podium levels, during different timer period
- 因应模拟的结果对室外设施和景观布局体出建议。
Recommendations on planning of outdoor recreational facilities and landscape

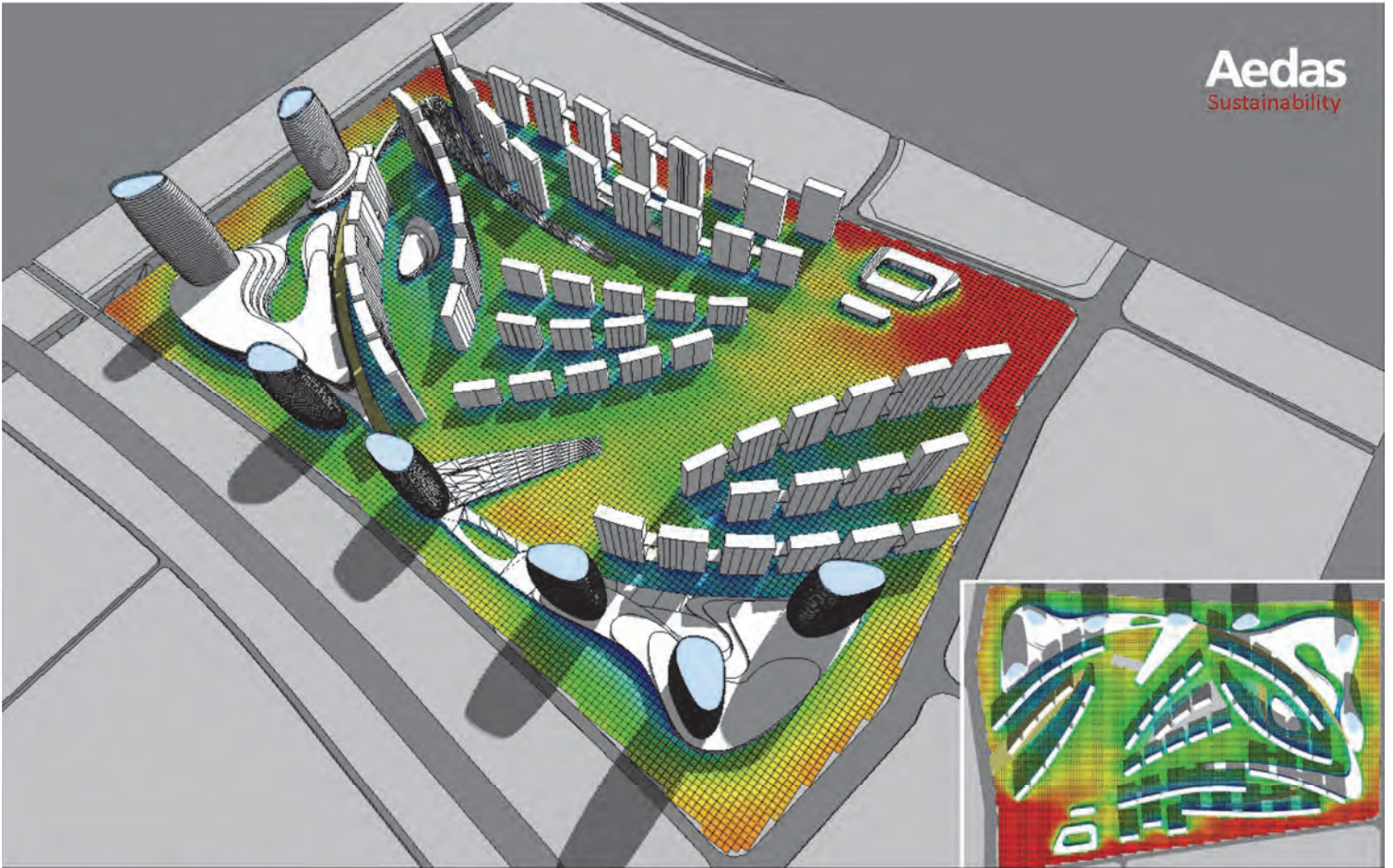
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Massing model of proposed design with surroundings

CD3

SD3





XiAn CBD Development, PRC
西安中央商业区开发项目

Solar Access Analysis | Solar Access Hours on Ground Level for Landscape Design

建筑日照规范模拟 Sunshine Regulation Study

服务范畴 Scope of works:

- 检查规划设计自身是否满足国家日照规范的要求；
Conduct computer sunshine simulations to evaluate compliance with regulations
- 对不能满足要求的方案提出修改建议，以符合规范的要求。
Provide recommendations for non-complied options to meet the requirement

所需资料 Information required:

- 项目所在位置
Location of project
- 业主设计说明
Design brief
- 附有建筑高度的规划平面图
2D CAD Plans with building height

PD3

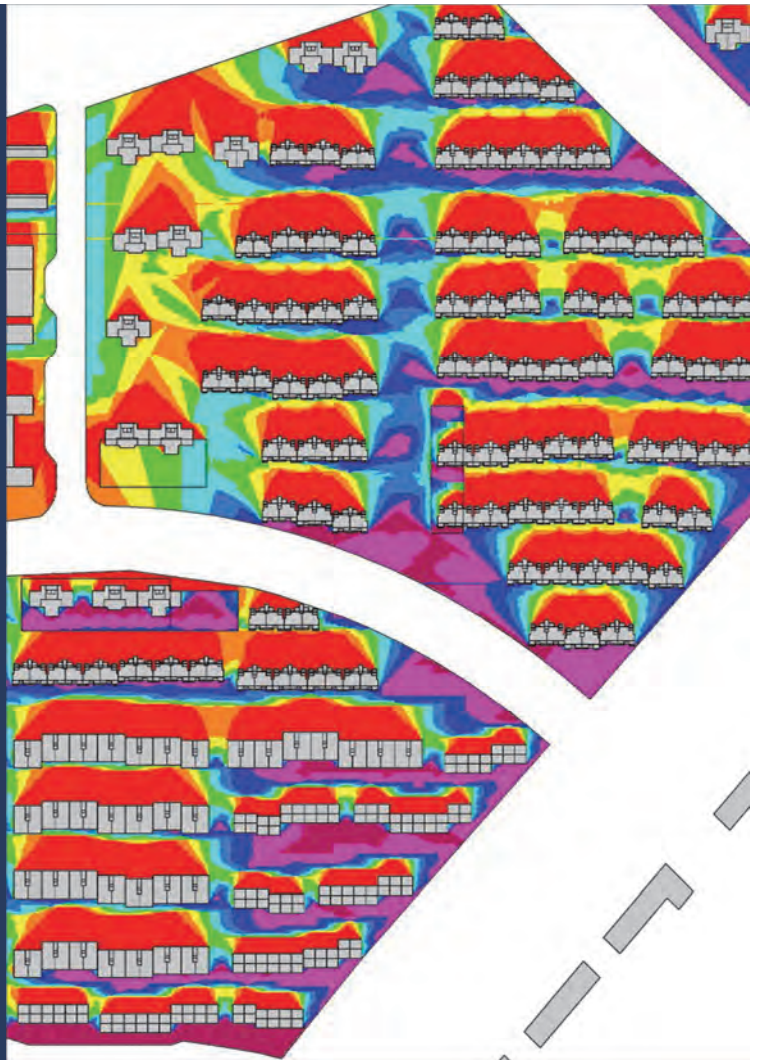
CD4

SD5

方案设计
Scheme Design stage

概念设计
Concept Design stage

前期设计
Pre-Design stage



建筑日照极限容积计算 Sunshine GFA Optimization

服务范畴 Scope of works:

- 使用返回光线切割器和遗传算法计算地块极限容积率；
Using the backward solar cutter and generative algorithm to estimate the optimized site GFA.
- 对不能满足要求的方案提出修改建议，以符合规范的要求。
Provide recommendations for non-complied options to meet the requirement

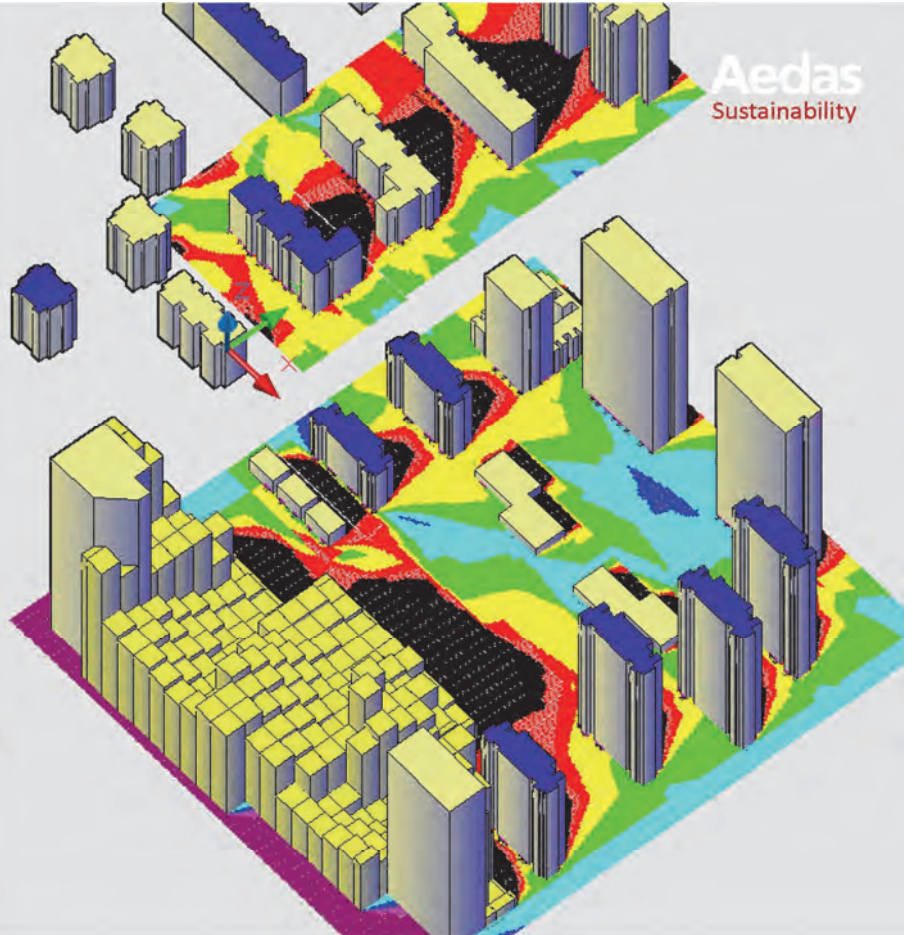
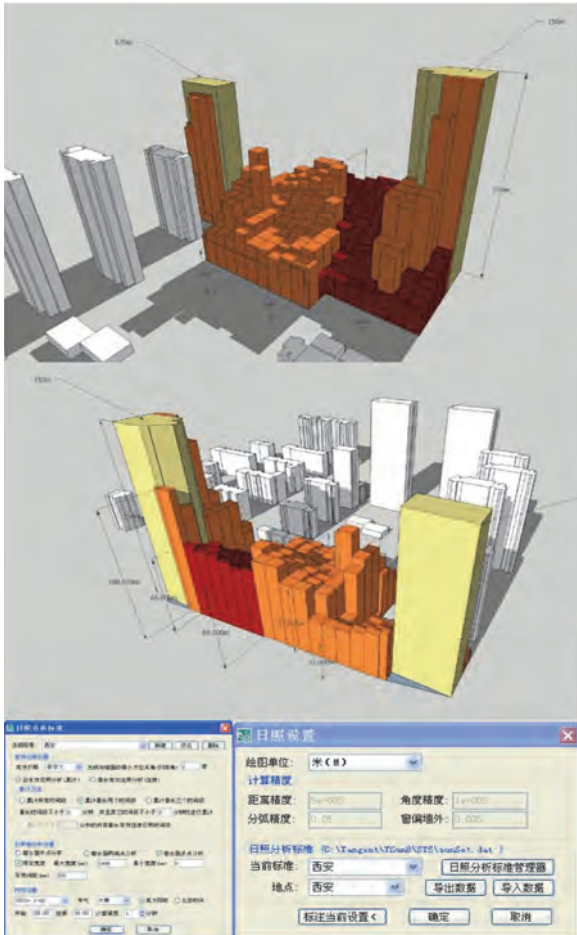
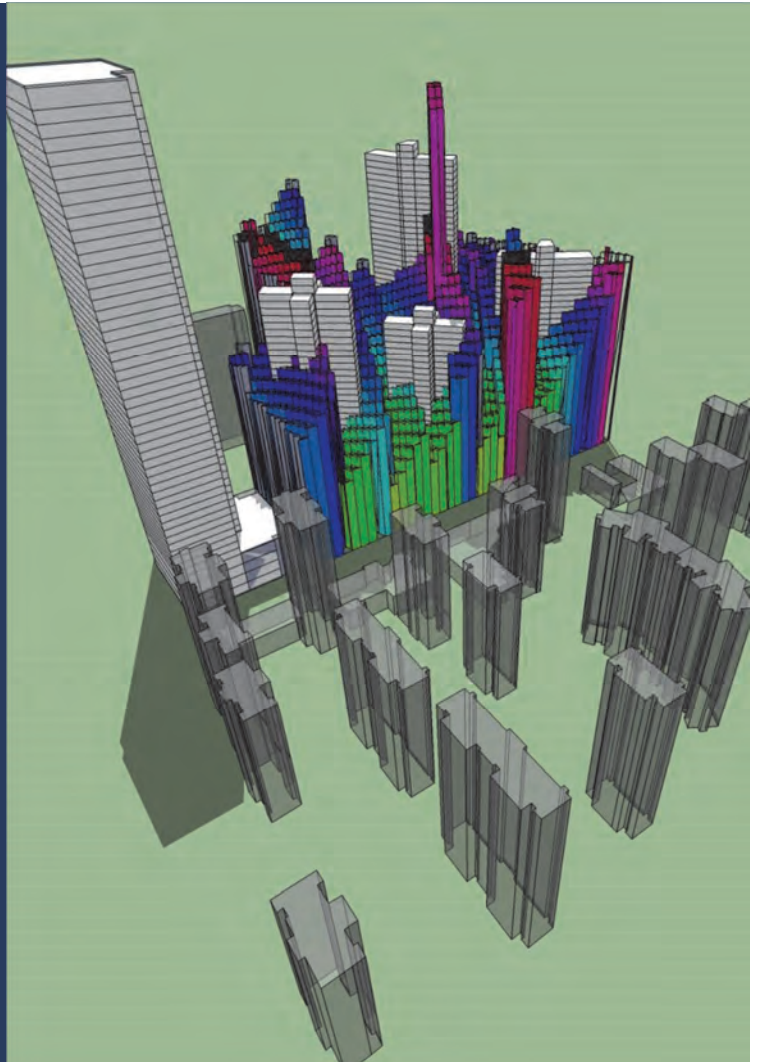
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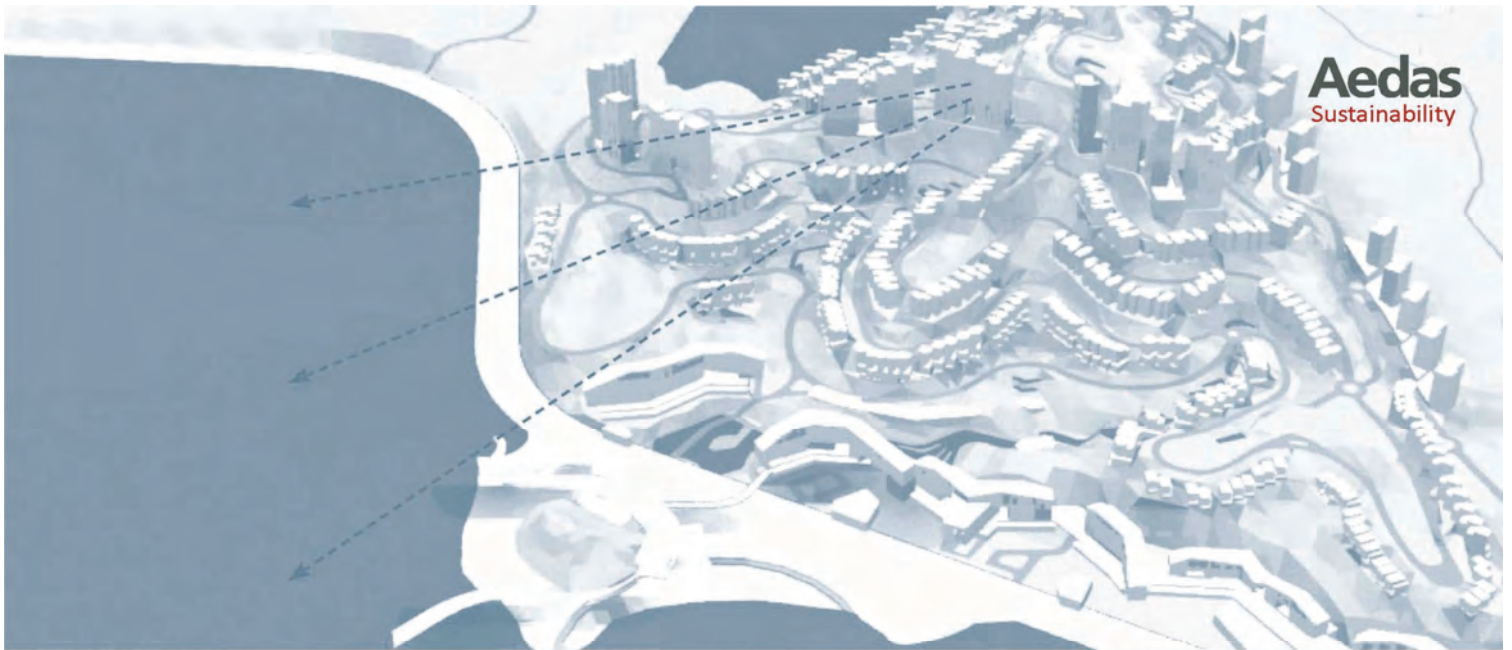
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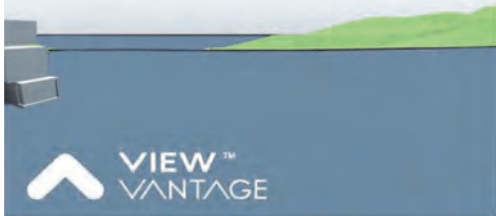




High level view assessment
高层住宅景观分析

Mid level view assessment
中层住宅景观分析

Low level view assessment
低层住宅景观分析



VIEW™
VANTAGE

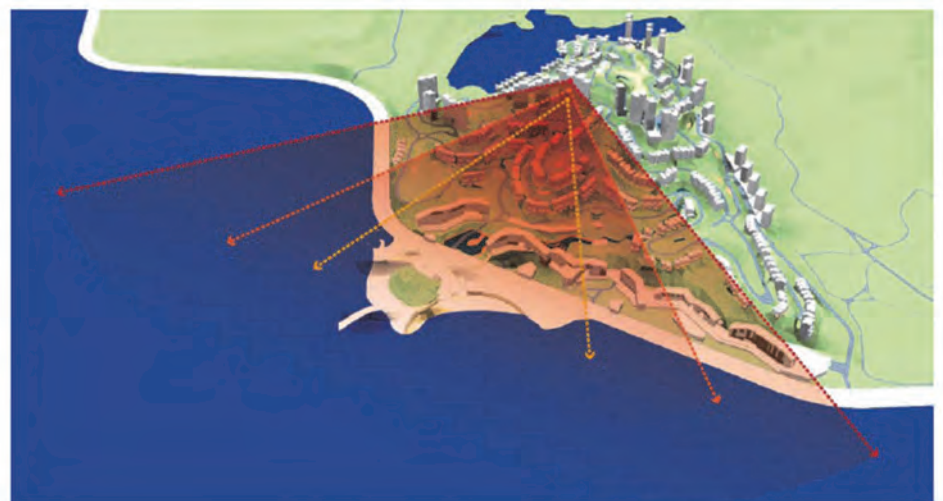
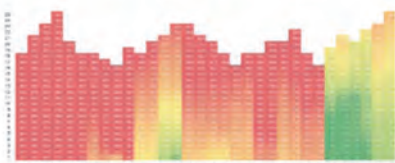
Xunliao Beach Resort in Huidong, PRC
中国惠东巽寮海边别墅项目

View Vantage | Scientific View Value Assessment System

Sustainable Approach



ViewVantage™ Aedas in-house developed GREEN software on the science of quantifying Visual View Quality



High level view assessment

Mid level view assessment

Low level view assessment



VIEW™
VANTAGE

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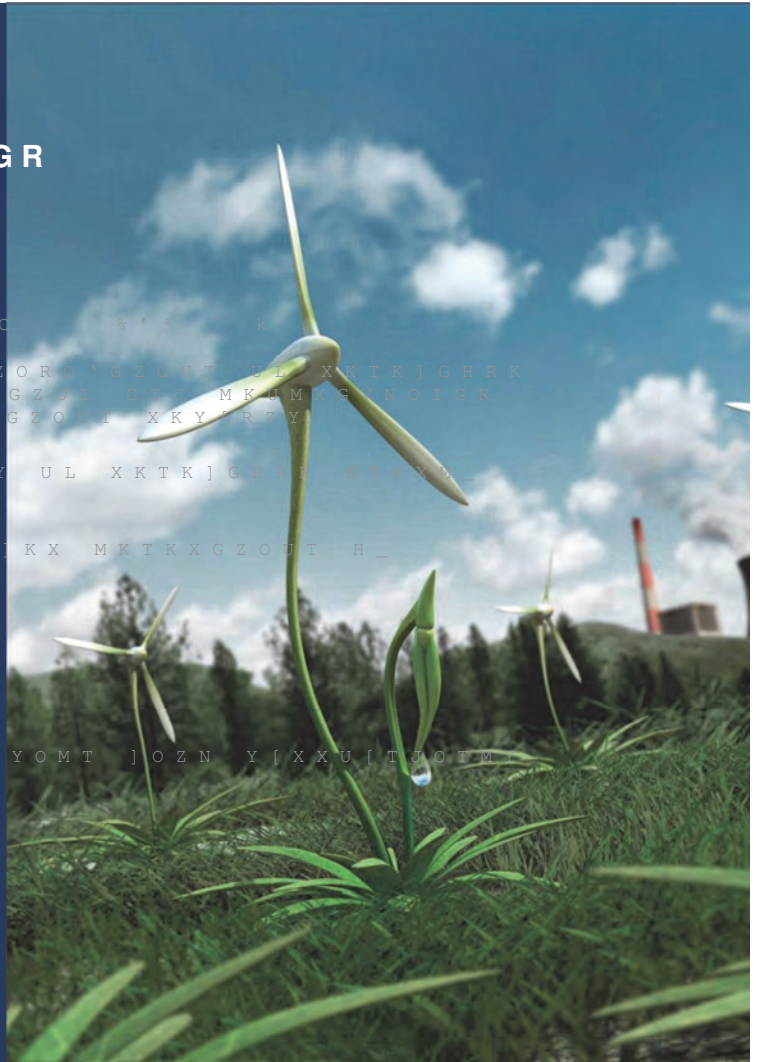
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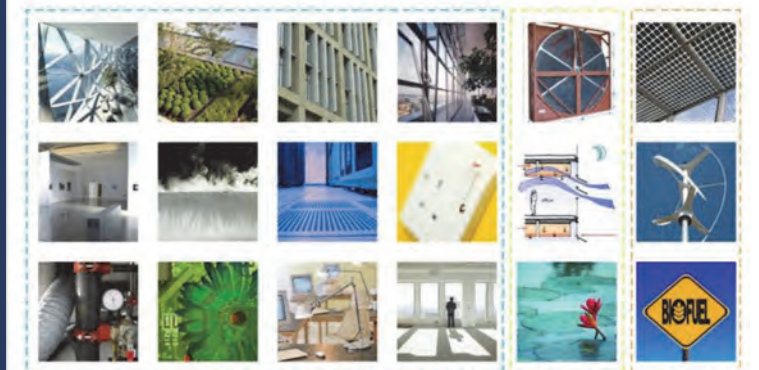
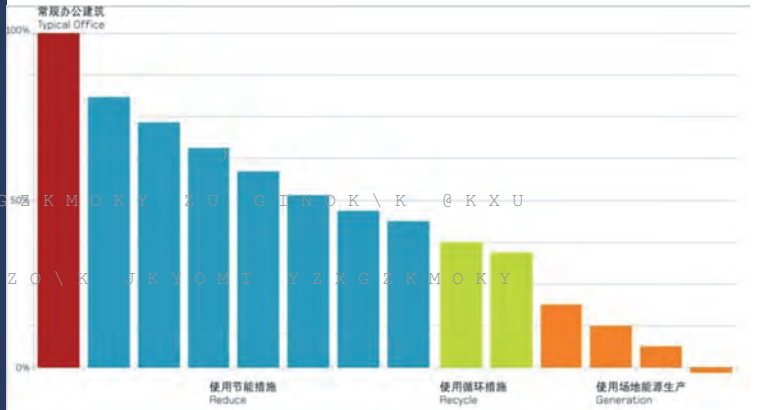
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Microclimate Studies & Passive Design Strategies

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Daylight vs Sunlight vs Skylight?



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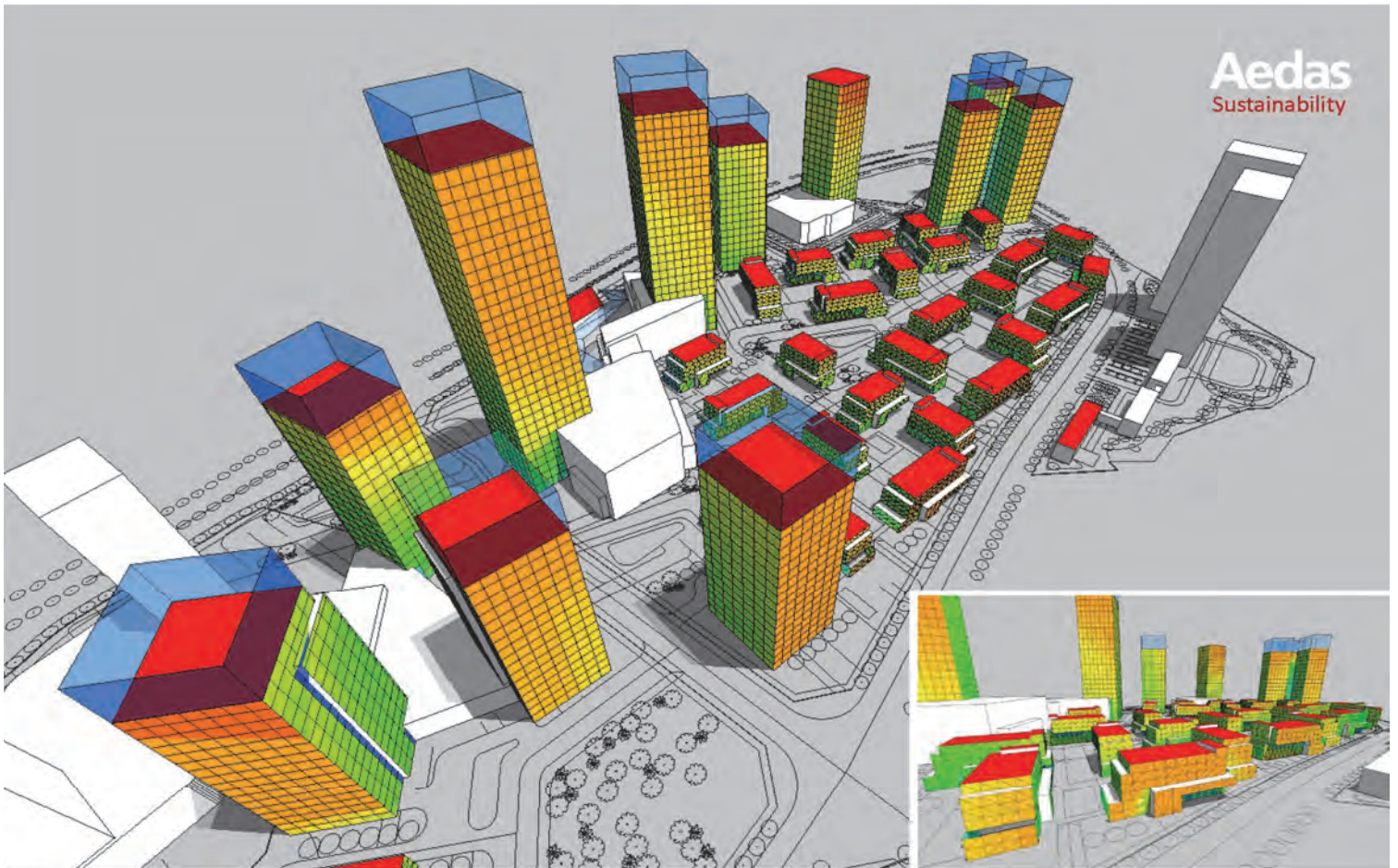
Microclimate Studies & Passive Design Strategies

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Daylight = **Sunlight** (directional) + **Skylight** (non-directional)



Chongqing International Port Project, PRC
重庆置尚两江规划项目

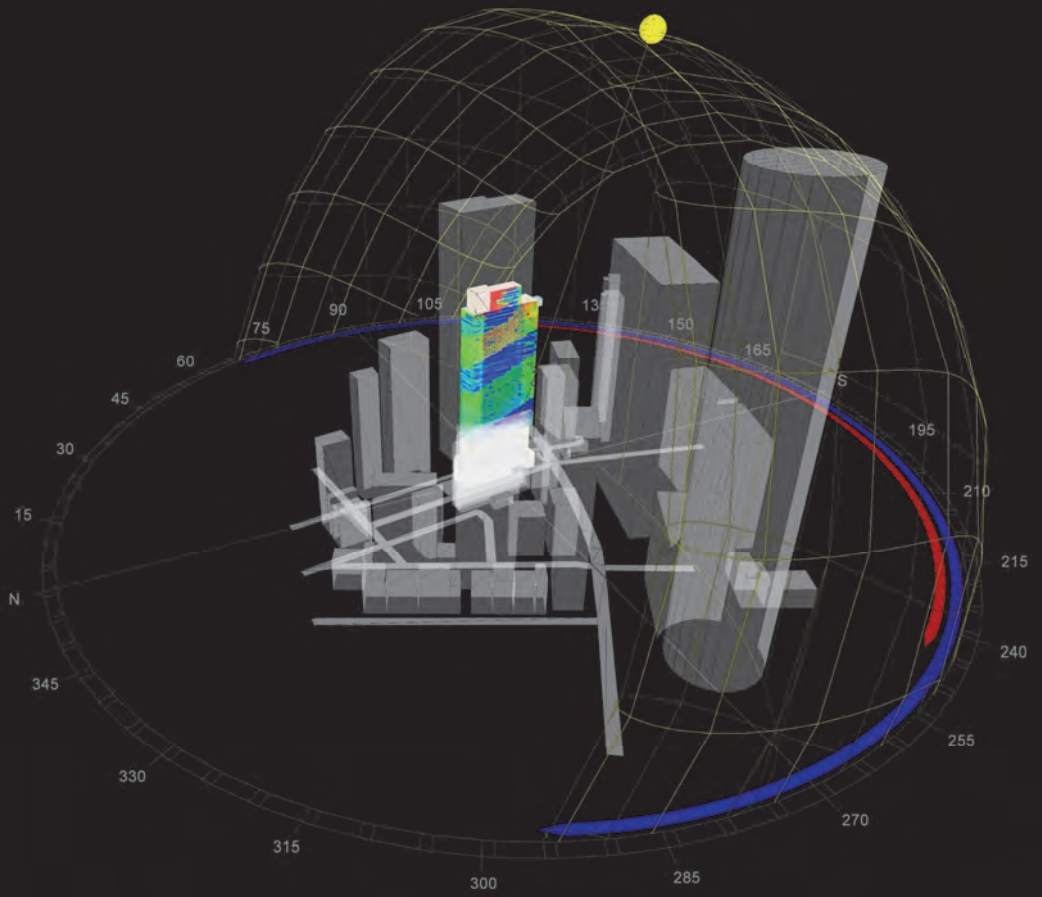
Façade Solar Heat Gain Analysis | Study for External Shading Strategies



**Urban Context
X
Climatic Responsive Design**

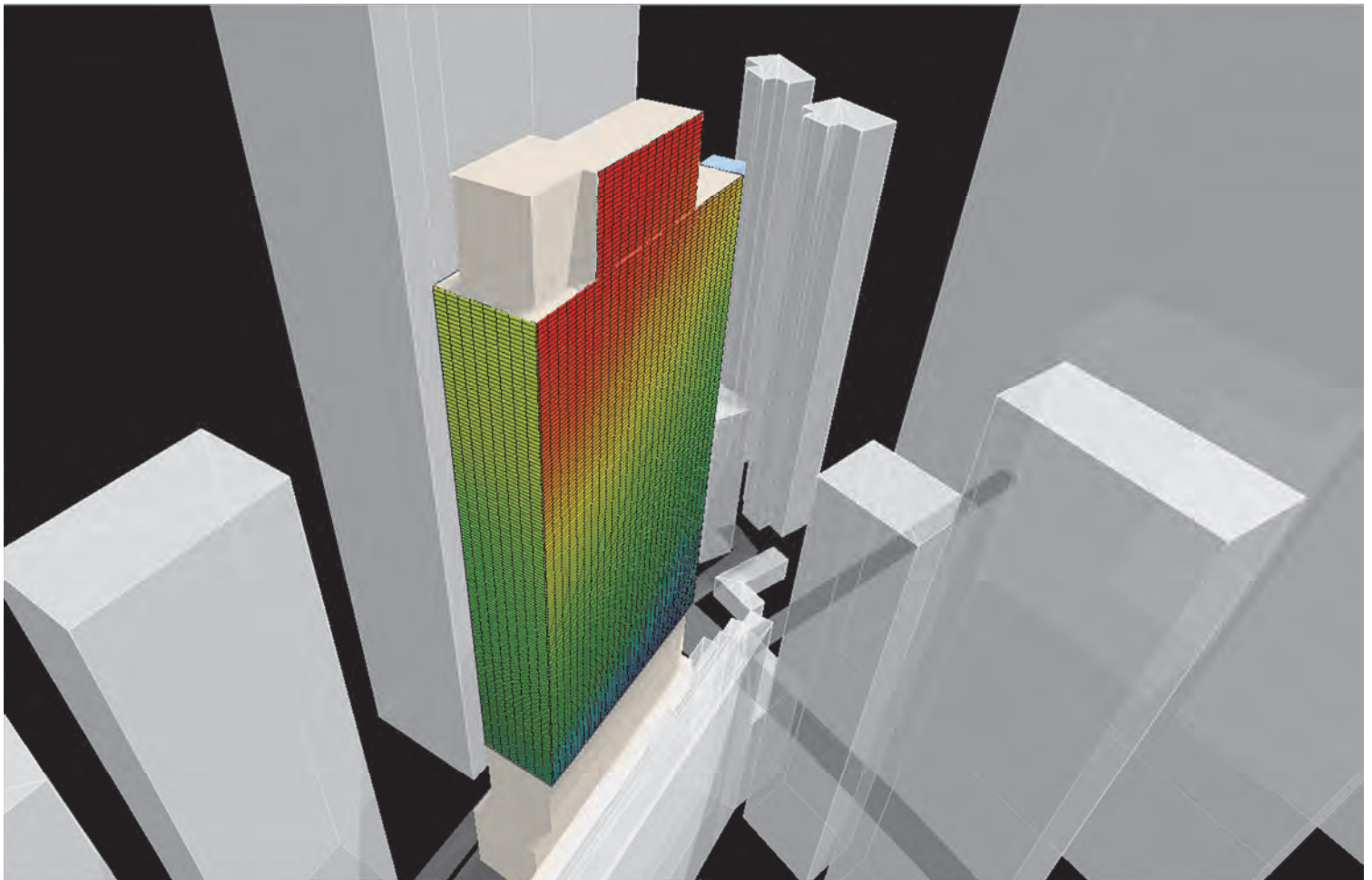
A Hotel Project in Wanchai





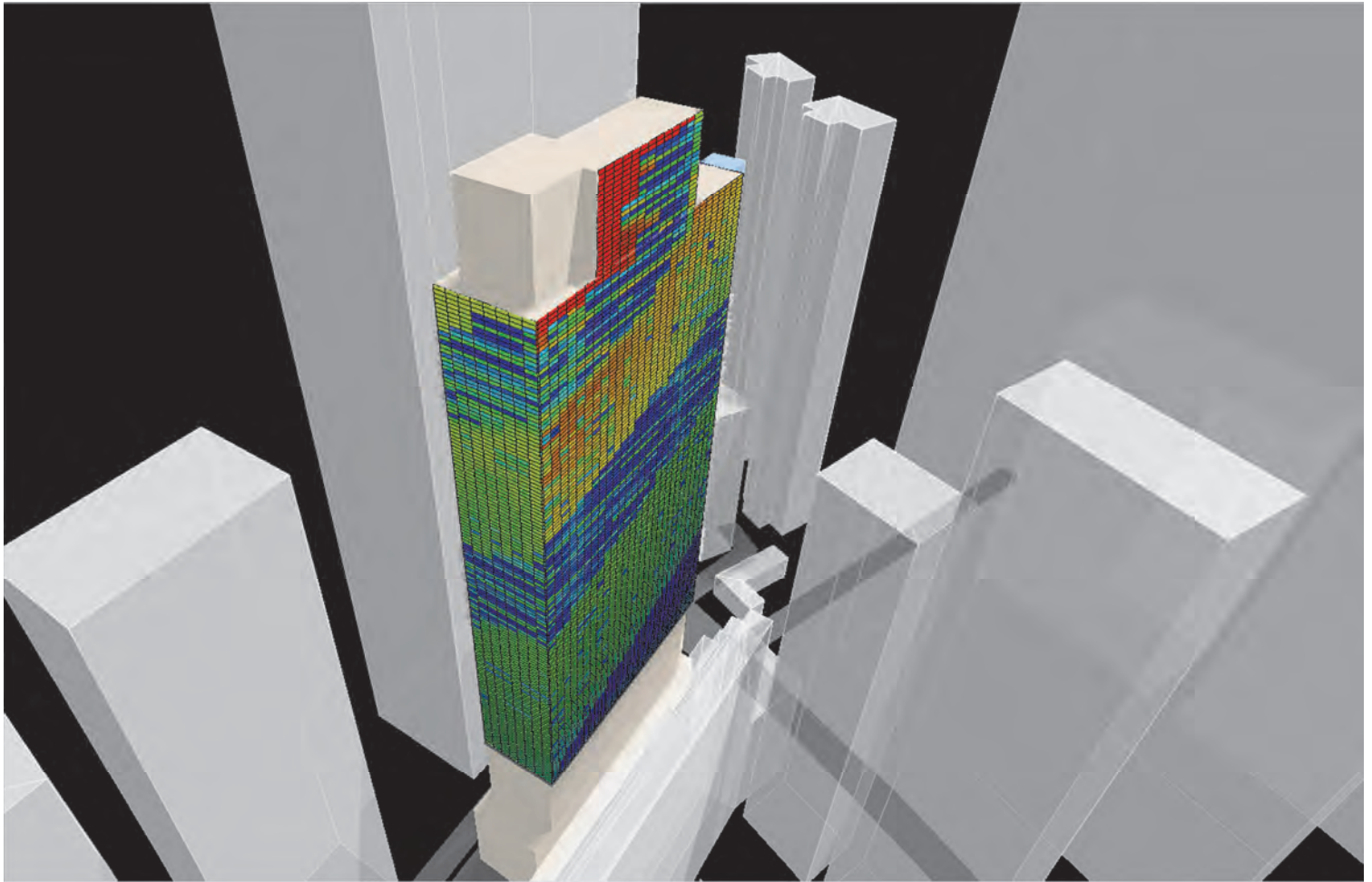
A Hotel Project in Wanchai

Source: Aedas



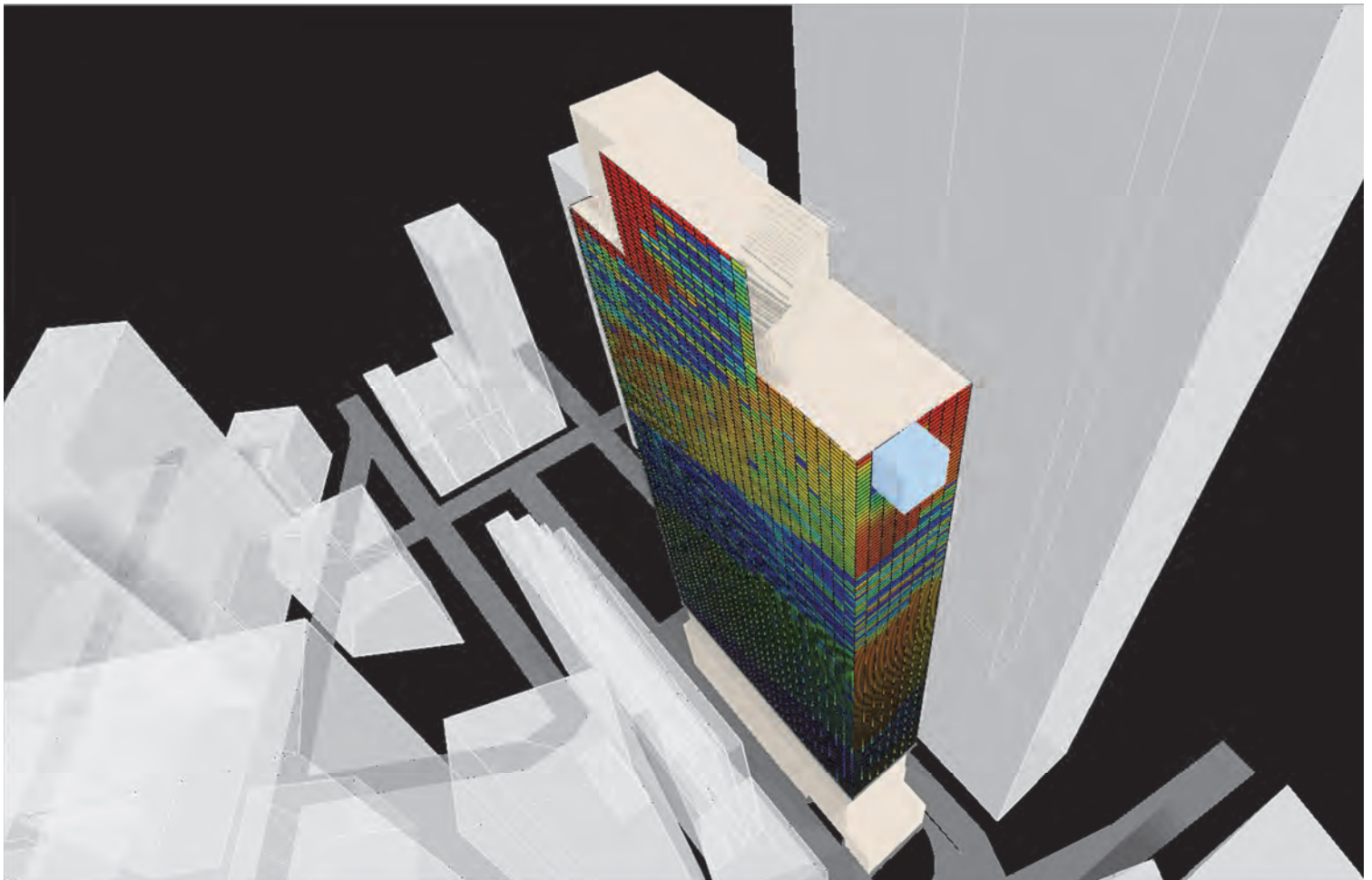
A Hotel Project in Wanchai

Source: Aedas



A Hotel Project in Wanchai

Source: Aedas



A Hotel Project in Wanchai

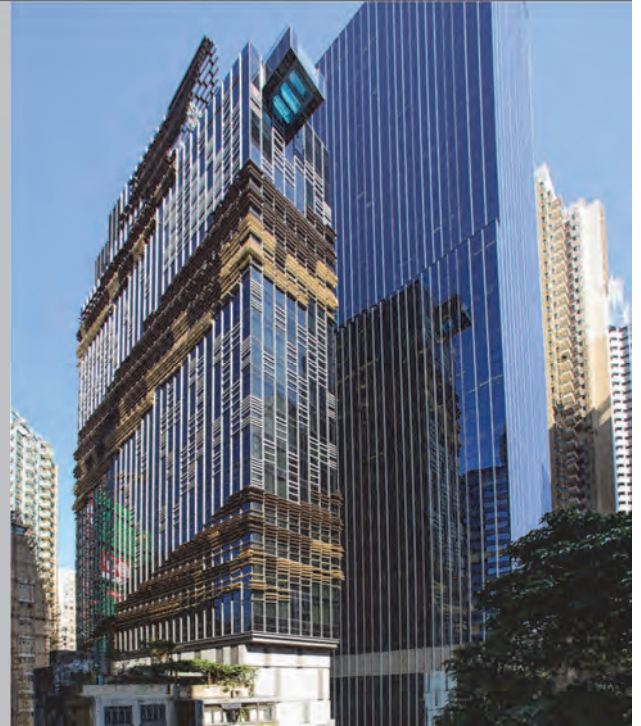
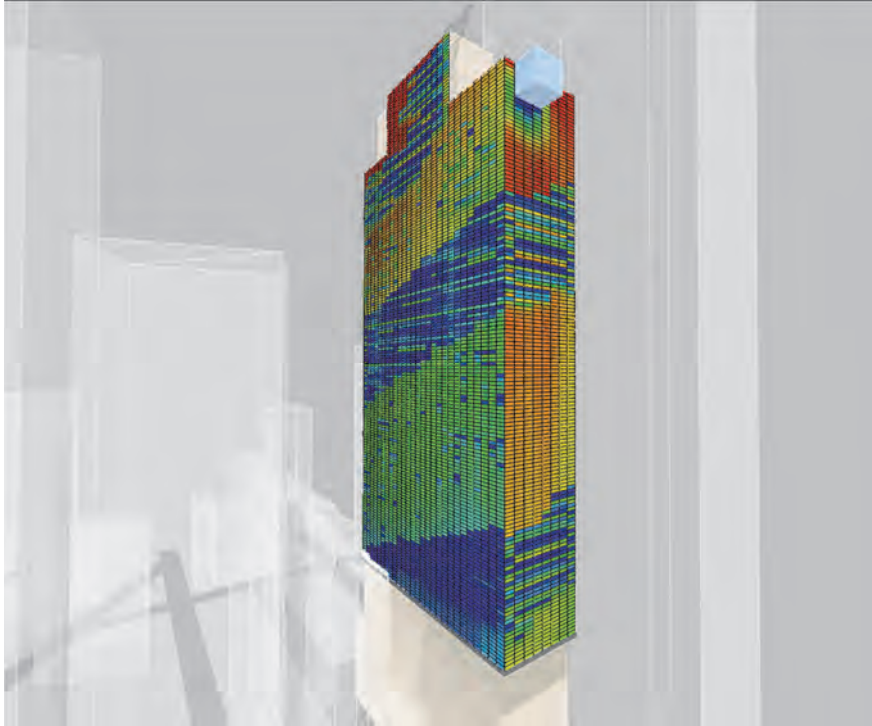
Source: Aedas



Solar Loads / Radiation Analysis in BIM

Solar Heat Gain Analysis

Aedas



Hotel Indigo / Hong Kong



Hotel Indigo Hong Kong Island / Hong Kong

香港港岛英迪格酒店

Client Tai Hung Fai Enterprise Co. Ltd. | Involvement Project & Design Architect | Completion Year 2012 |

Size 8,500 sq m (GFA) / 138 Rooms

业主 大鸿辉兴业有限公司 | 服务范围 项目及设计建筑师 | 竣工年份 2012 | 面积 8,500 平方米 (总建筑面积) / 138 房间

Design Director Max Connop
设计董事 江立文

Aedas



AWARDS

- A' Design Awards 2013 - 2014 - Platinum Winner, Architecture, Building and Structure Design
- Cityscape Awards for Architecture in Emerging Markets 2013 - Leisure and Tourism Project Awards (Built)
- Asia Pacific Hotel Awards 2013 - 5 Stars Best Hotel Architecture Hong Kong
- 2013 - 2014年A'设计奖 - 白金奖, 建筑, 楼宇及结构设计
- 2013年Cityscape新兴市场建筑大奖 - 已建休闲旅行项目优胜奖
- 2013年亚太酒店大奖 - 香港最佳酒店建筑5星奖



A Hotel Project in Wanchai

Source: Aedas



A Hotel Project in Wanchai

Source: Aedas



Hotel Indigo / Hong Kong

Aedas

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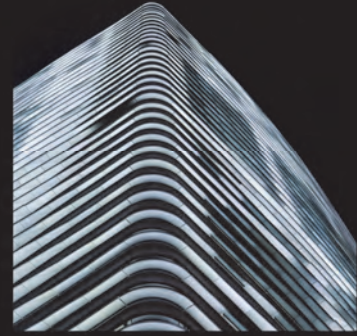
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Xiamen Fortune Centre / Xiamen / PRC
中国厦门财富中心

Client Hengxing Groups | Involvement Project & Design Architect | Completion Year 2011 | Size 54,886 sq m (GFA)
业主 厦门恒兴集团有限公司 | 服务范围 项目及设计建筑师 | 竣工年份 2011 | 面积 54,886平方米 (总建筑面积)

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Aedas

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Xiamen Fortune Centre / Xiamen / PRC
中国厦门财富中心

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Aedas

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New Rich Port Center Tower One / Shanghai / PRC
中国上海新富港中心一座

Client Guilherme Holdings (Hong Kong) Ltd. | Involvement Project & Design Architect | Completion Year 2010 | Size 59,575 sq m (GFA)
业主 丰盛地产控股有限公司 | 服务范围 项目及设计建筑师 | 竣工年份 2010 | 面积 59,575 sq m (总建筑面积)

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Aedas
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AWARDS

- Asia Pacific Property Awards 2013
- Highly Commended Office Architecture China
- Hong Kong Institute of Architects Annual Awards 2011
- Merit Award outside Hong Kong, Commercial Building - Shortlisted
- Shanghai Commercial Real Estate Professional Committee of ASSC 2011
- Excellence Work Award

- 2013年亚太房地产大奖
- 中国办公楼建筑优秀奖
- 2011年香港建筑师学会年奖
- 境外优异奖商业建筑入围作品
- 2011年上海建筑学会商用建筑创新奖
- 佳作奖



Passive Design FIRST (PDF)!
X
A Matter of Selection

Microclimate Studies & Passive Design Strategies

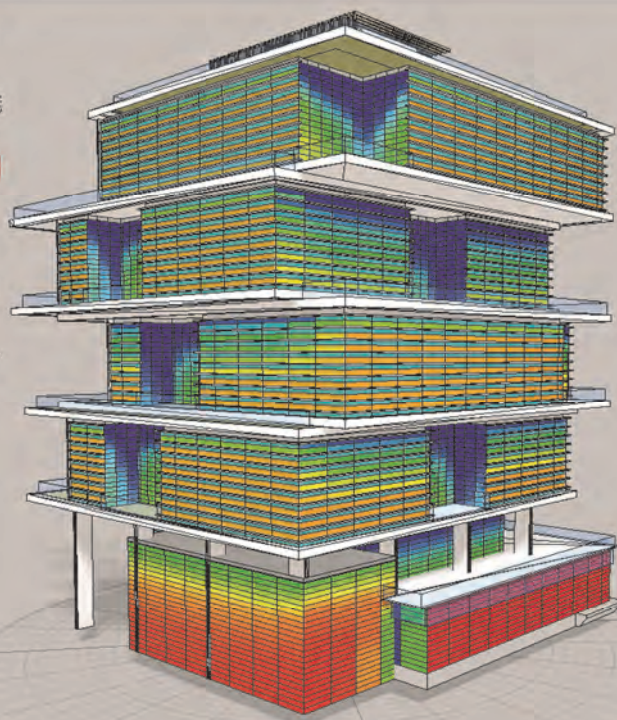


SOHO Office in Guangzhou

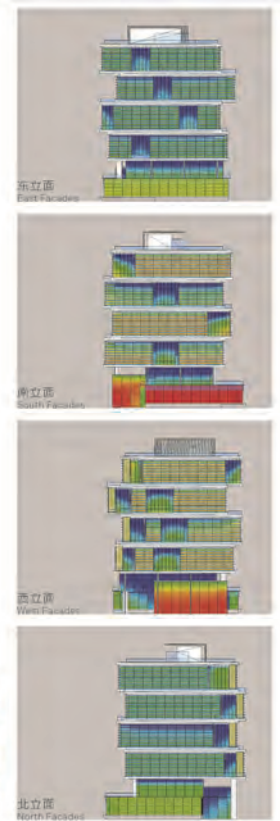
Source: Aedas

Microclimate Studies & Passive Design Strategies

1. 南方夏热冬暖地区建筑节能·首重建筑遮阳；
2. 设计**错开式的建筑体量**·能提供第一重的遮阳；
3. 而环绕建筑外窗的**水平外遮阳**条子则提供了二重的遮阳·大大减少照射到建筑立面的热辐射；
4. 计算机模拟分析显示了这两重的遮阳设计·能**显著减少**照射到立面的太阳热辐射量达**36%**！
5. 最后·加上双层Low-E中空玻璃·绿化屋顶·空中花园和垂直绿化等措施·建筑所吸收的太阳热量更少。



东南和西南立面全年太阳热辐射量
Annual Total Solar Heat Gain on SE & SW Facades



SOHO Office in Guangzhou

Source: Aedas

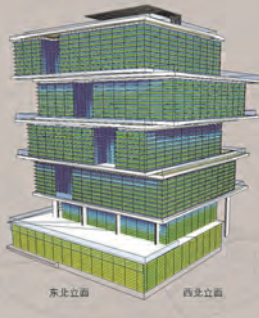
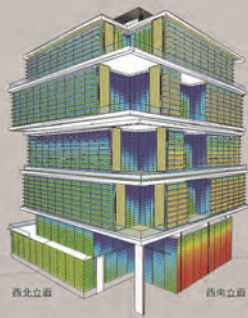
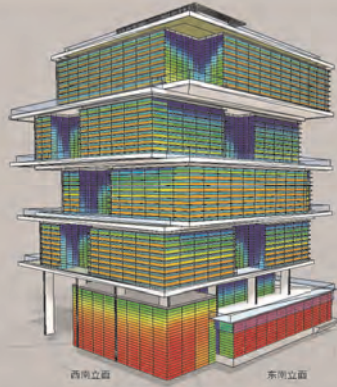
Microclimate Studies & Passive Design Strategies

建议错开体量和外遮阳设计
Proposed Design

整体立面夏季太阳辐射得量：
Summer Total Solar Heat Gain (All Facades)

305.3 kWh/m²

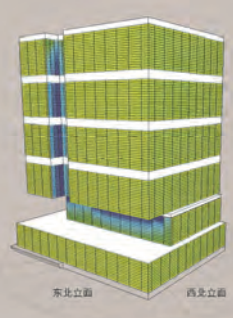
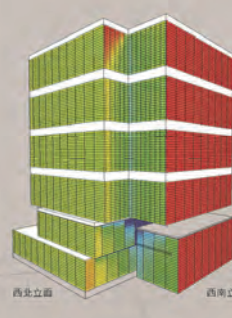
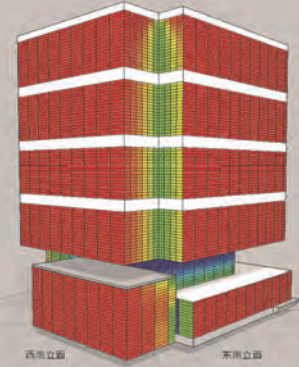
↓ **36.2** ↓



参考设计
Baseline

整体立面夏季太阳辐射得量：
Summer Total Solar Heat Gain (All Facades)

478.2 kWh/m²



SOHO Office in Guangzhou

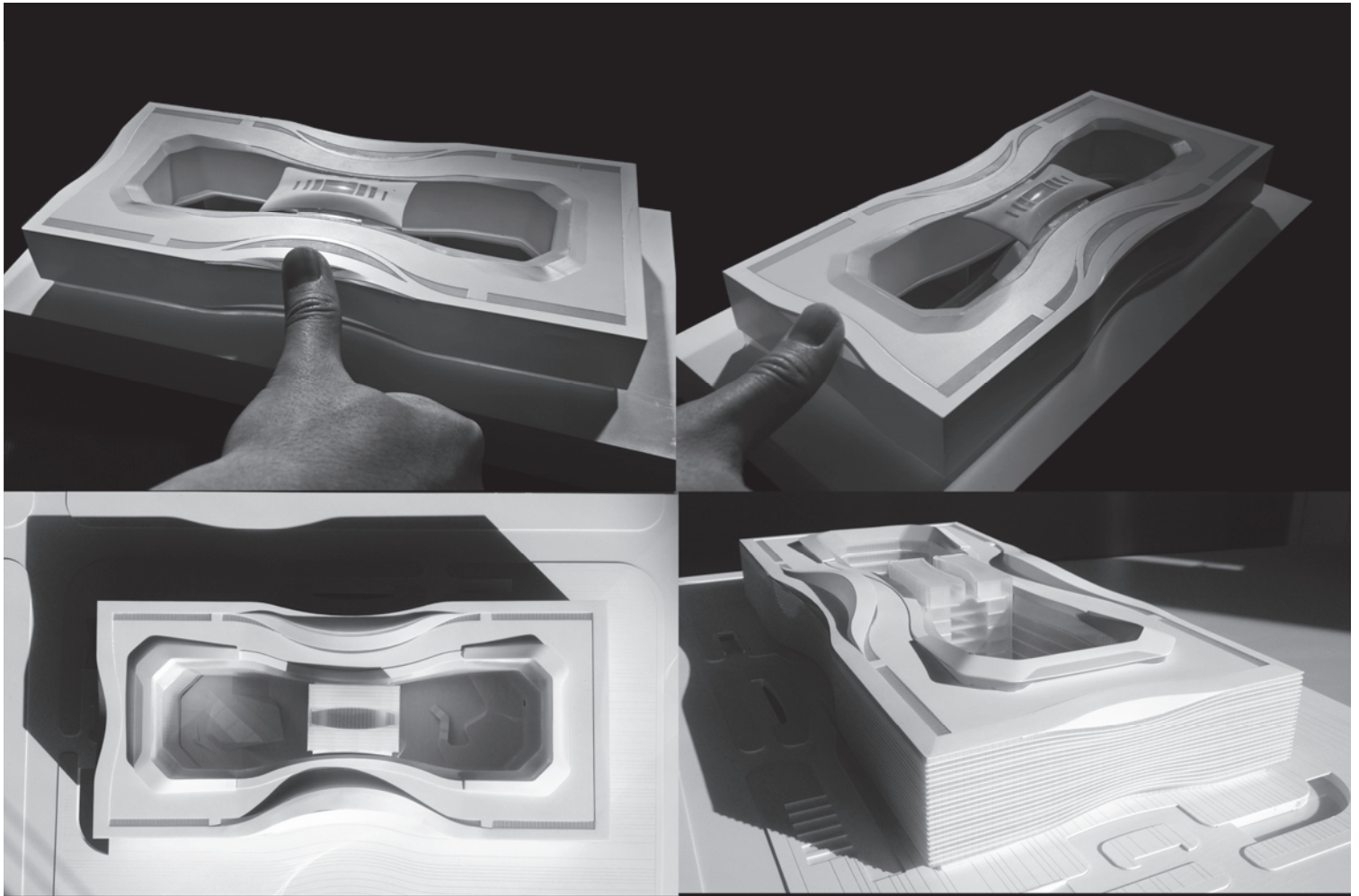
Source: Aedas

Microclimate Studies & Passive Design Strategies



SOHO Office in Guangzhou

Source: Aedas



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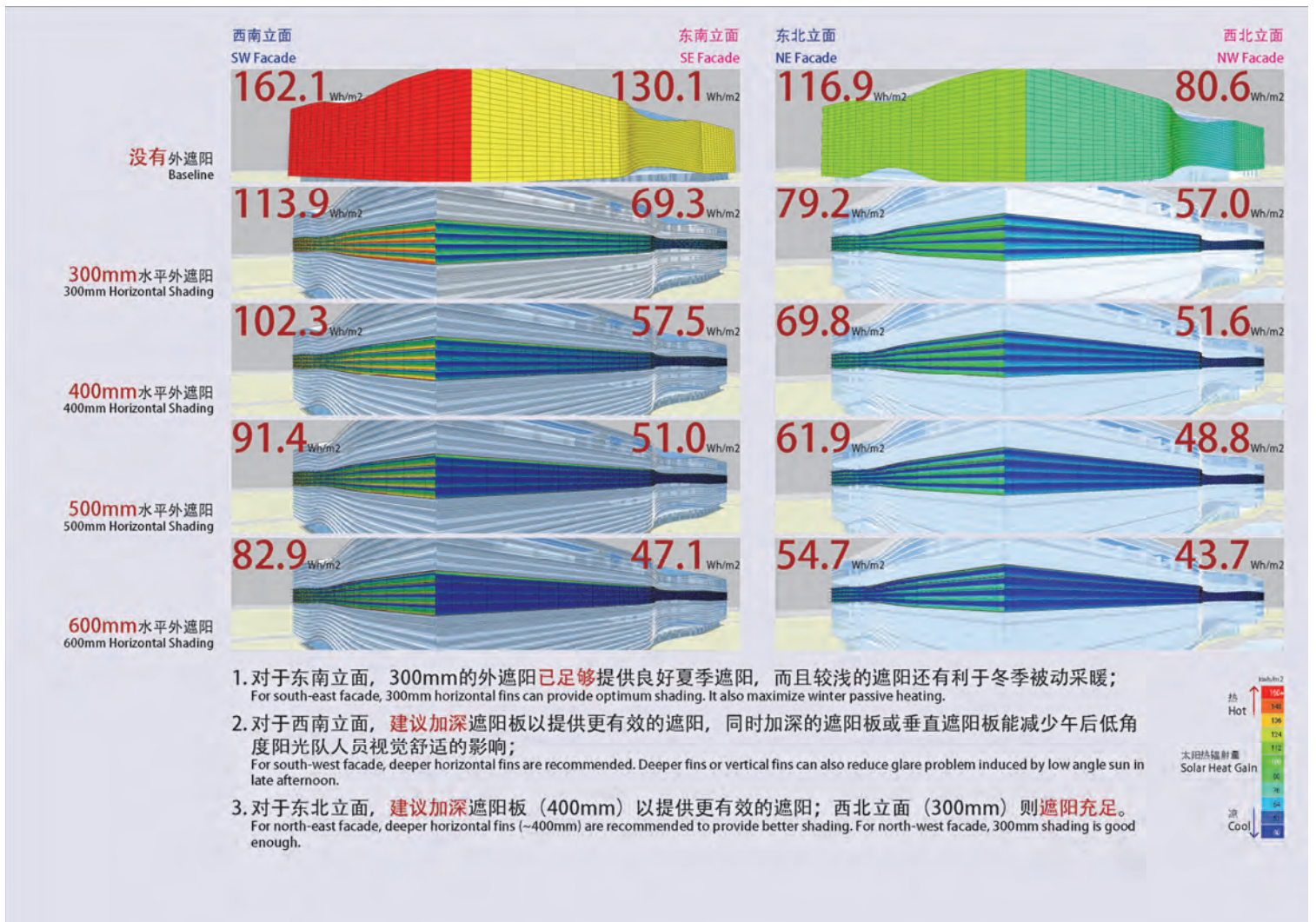
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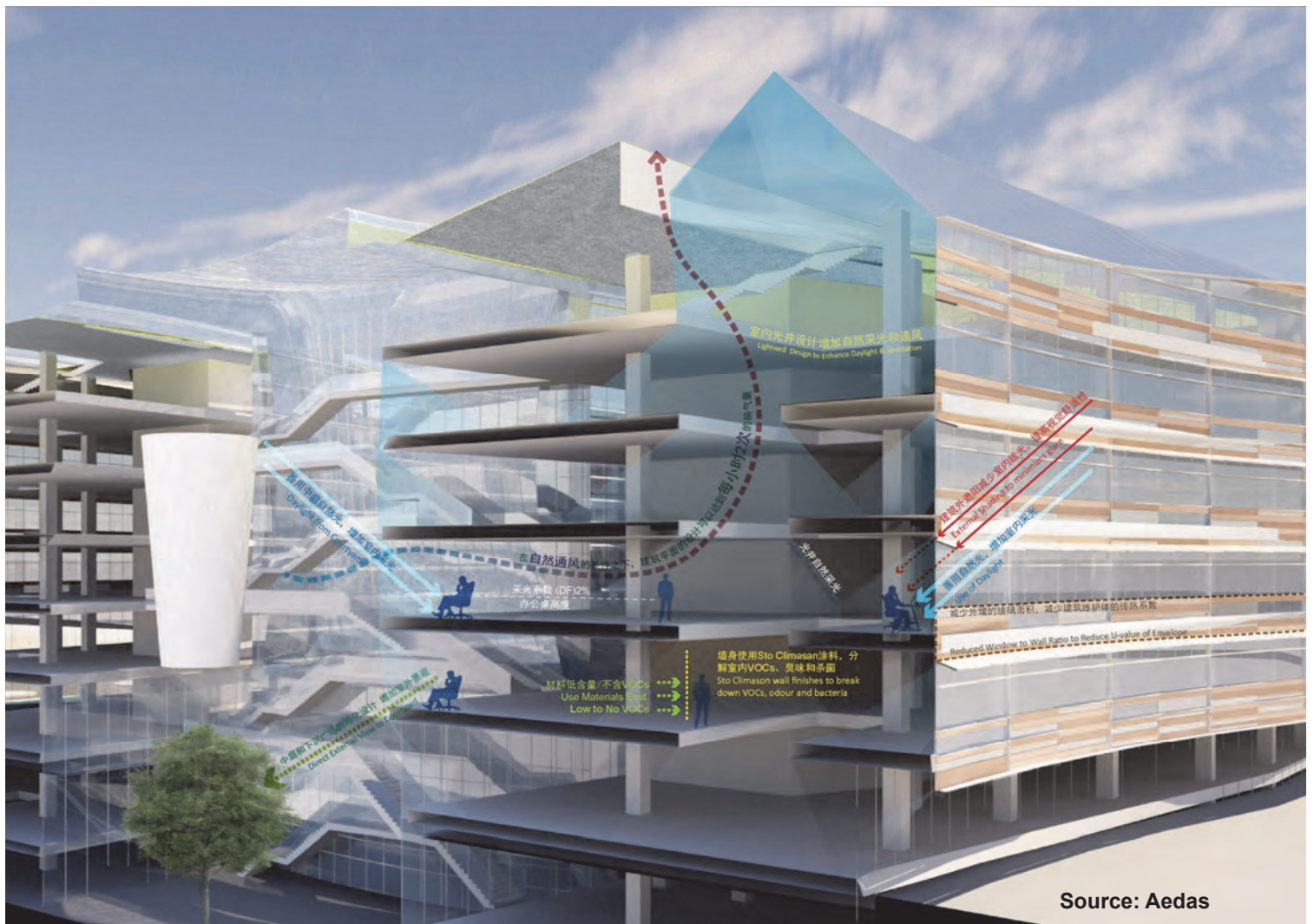


Source: Aedas





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Source: Aedas





Source: Aedas



Health, Wellbeing & Productivity in Offices
The next chapter for green building

September 2014

BETTER PLACES FOR PEOPLE FOR WELLBEING AT THE HEART OF YOUR BUILDING

HEALTH, WELLBEING & PRODUCTIVITY IN RETAIL: THE IMPACT OF GREEN BUILDINGS ON PEOPLE AND PROFIT

FEBRUARY 2016

BETTER PLACES FOR PEOPLE FOR WELLBEING AT THE HEART OF YOUR BUILDING

BUILDING THE BUSINESS CASE: Health, Wellbeing and Productivity in Green Offices
EXECUTIVE SUMMARY

PROJECT LED BY: CAMPAIGN SPONSORS:

Source: WorldGBC

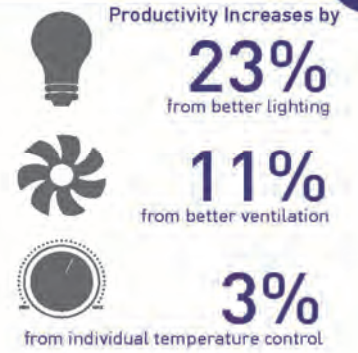
OUTSIDE VIEWS



DAYLIGHT

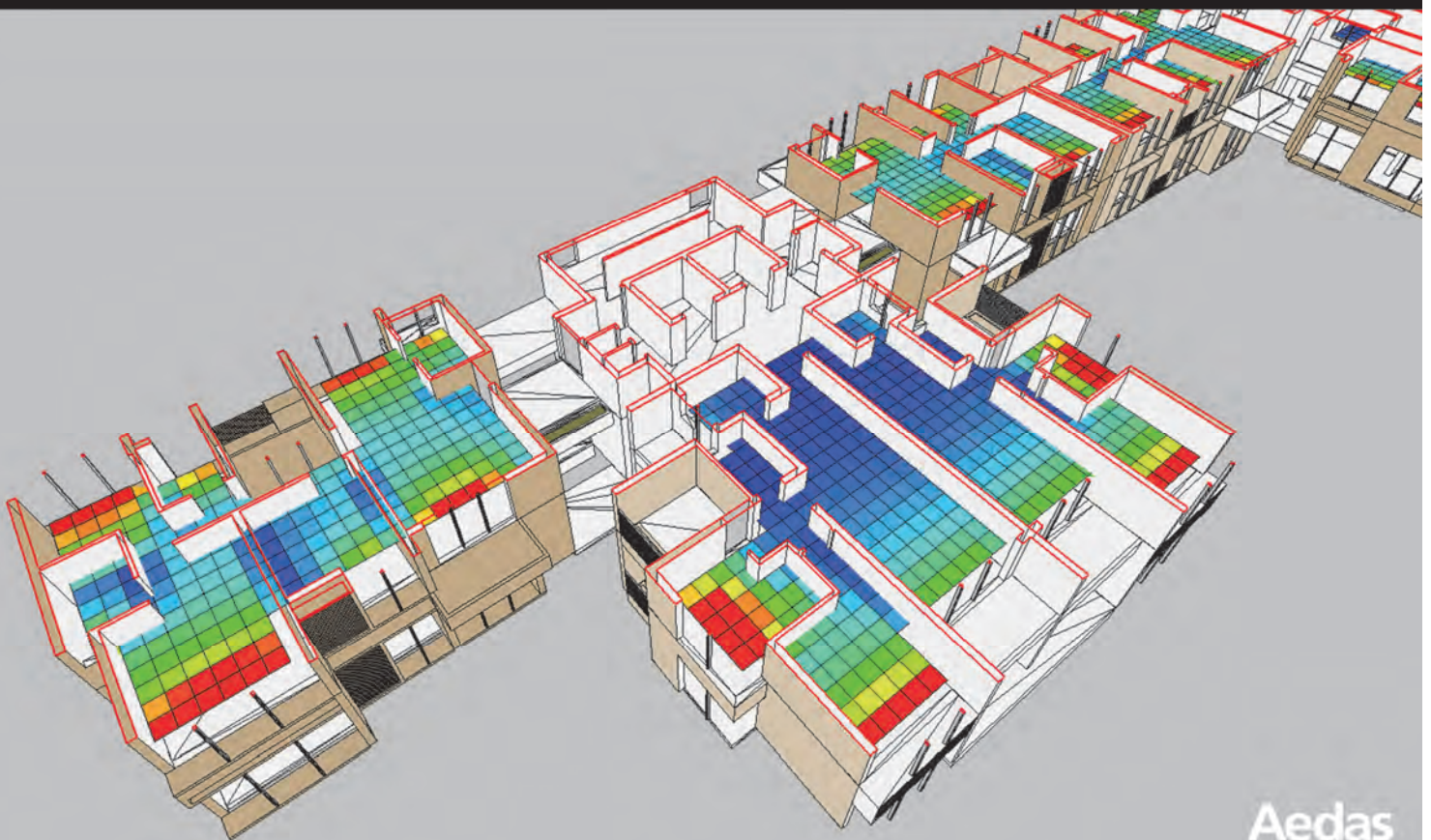


SYSTEMS

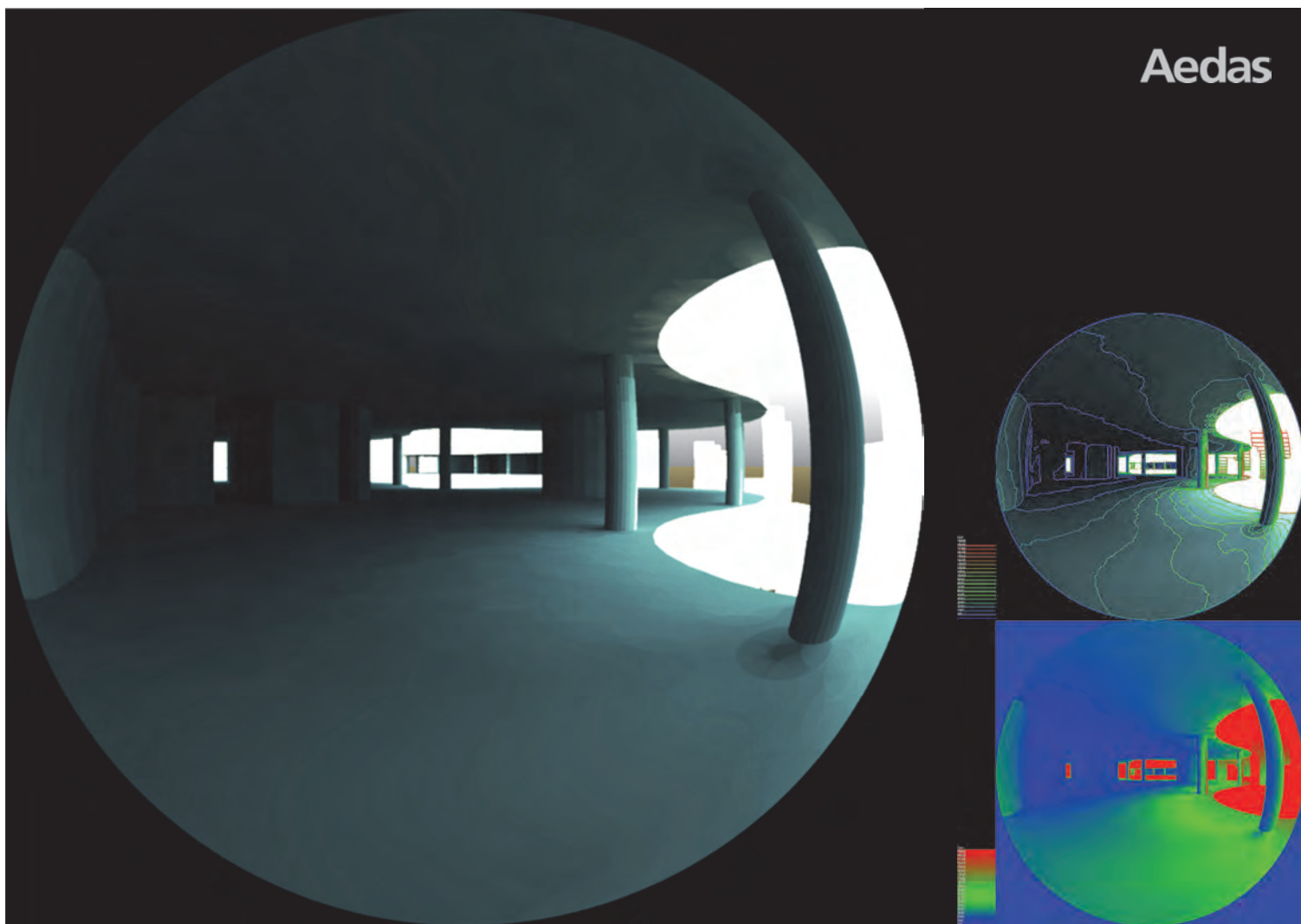
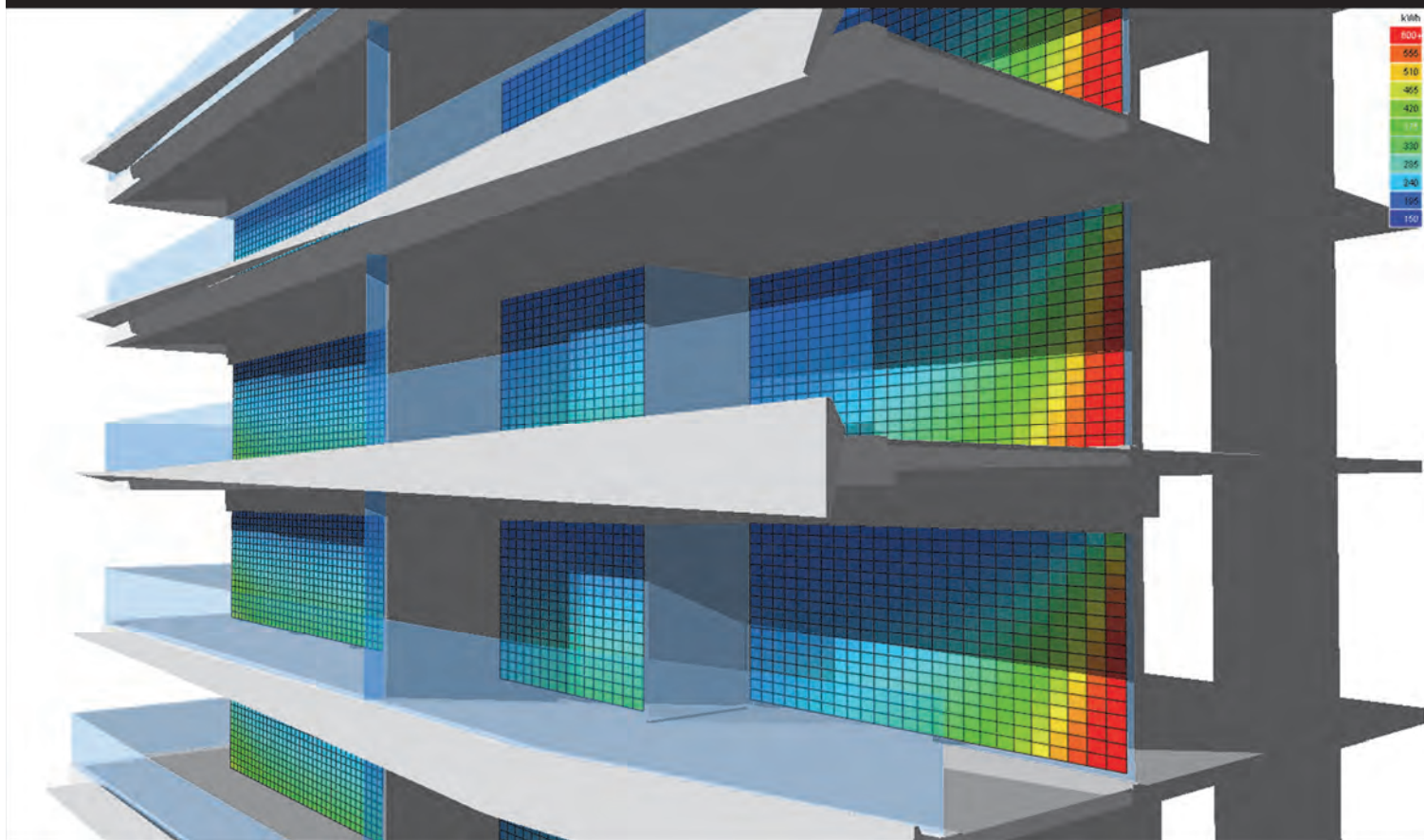


Source: WorldGBC

Aedas



Aedas



North Star Mixed-use Development / Beijing / PRC
中国北京北苑北辰综合发展项目

Client Beijing North Star Company Ltd. | Involvement Project & Design Architect | Completion Year 2010 | Size 161,780 sq m (GFA)
业主 北京北辰实业股份有限公司 | 服务范围 项目及设计建筑师 | 竣工年份 2010 | 面积 161,780 平方米 (总建筑面积)

Aedas



AWARDS

- Perspective Awards 2012
- Certificate of Excellence, Architecture (Professional) Mixed Use
- China's Outstanding Architectural Design & Planning Award 2011
- Best Design Award – Gold Award
- Cityscape Awards for Architecture in The Emerging Market 2010
- Highly Commended in Commercial / Mixed Use Built Category
- 2012年 <<透视>> 杂志大奖 – 综合用途(专业) 建筑优秀奖
- 2011年全国人居经典规划设计方案竞赛 – 最佳设计方案金奖
- 2010年Cityscape新兴市场建筑大奖 – 商业及综合用途类别优秀奖

North Star Mixed-use Development / Beijing / PRC
中国北京北苑北辰综合发展项目

Aedas



North Star Mixed-use Development / Beijing / PRC
中国北京北苑北辰综合发展项目

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Center 66 / Wuxi / PRC
中国无锡恒隆广场

Aedas

Client Hang Lung Properties | Involvement Project and Design Architect | Completion Year 2014 |

Size 376,800 sq m (GFA)

业主 恒隆地产有限公司 | 服务范围 项目及设计建筑师 | 竣工年份 2014 | 面积 376,800 平方米 (总建筑面积)

Design Director David Clayton & Christine Lam
设计董事 祈礼庭及林静衡



AWARDS

- A' Design Awards 2013 - 2014 - Golden Winner, Architecture, Building and Structure Design
- CIHAF Design China Award 2013 - Winner, Mall
- Cityscape Awards for Architecture in Emerging Markets 2013 - Retail Project Awards (Future)
- 2011 International Property Awards - Winner, International Awards of Best Retail Development
- 2011 Mipim Asia Awards - Bronze Winner in Best Chinese Futura Category
- 2011 Asia Pacific Commercial Property Awards - The Architecture Award (Retail), Asia Pacific 5 Stars
- 2013-2014年A'设计奖 - 金奖, 建筑, 楼宇及结构设计
- 2013年CIHAF设计中国大奖 - Mall类别优胜奖
- 2013年Cityscape新兴市场建筑大奖 - 未来零售项目优胜奖
- 2011年国际房地产奖 - 最佳零售建筑国际大奖
- 2011年MIPIM ASIA大奖 - 最佳中国未来建设项目铜奖得奖作品
- 2011年亚太区商业房地产大奖 - 亚太区最佳零售建筑大奖 - 中国最佳零售建筑5星大奖

+ Center 66 / Wuxi / PRC
中国无锡恒隆广场

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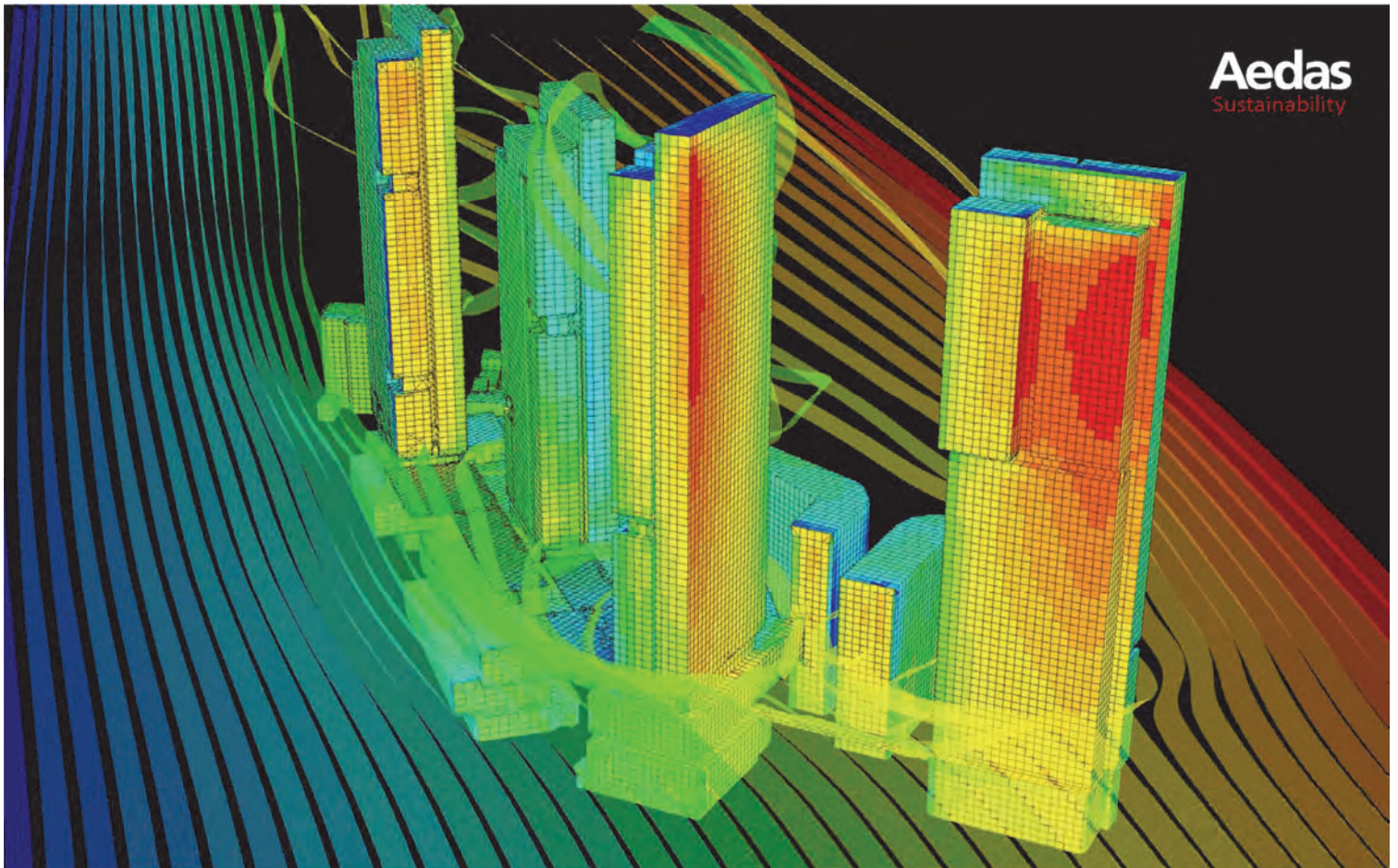
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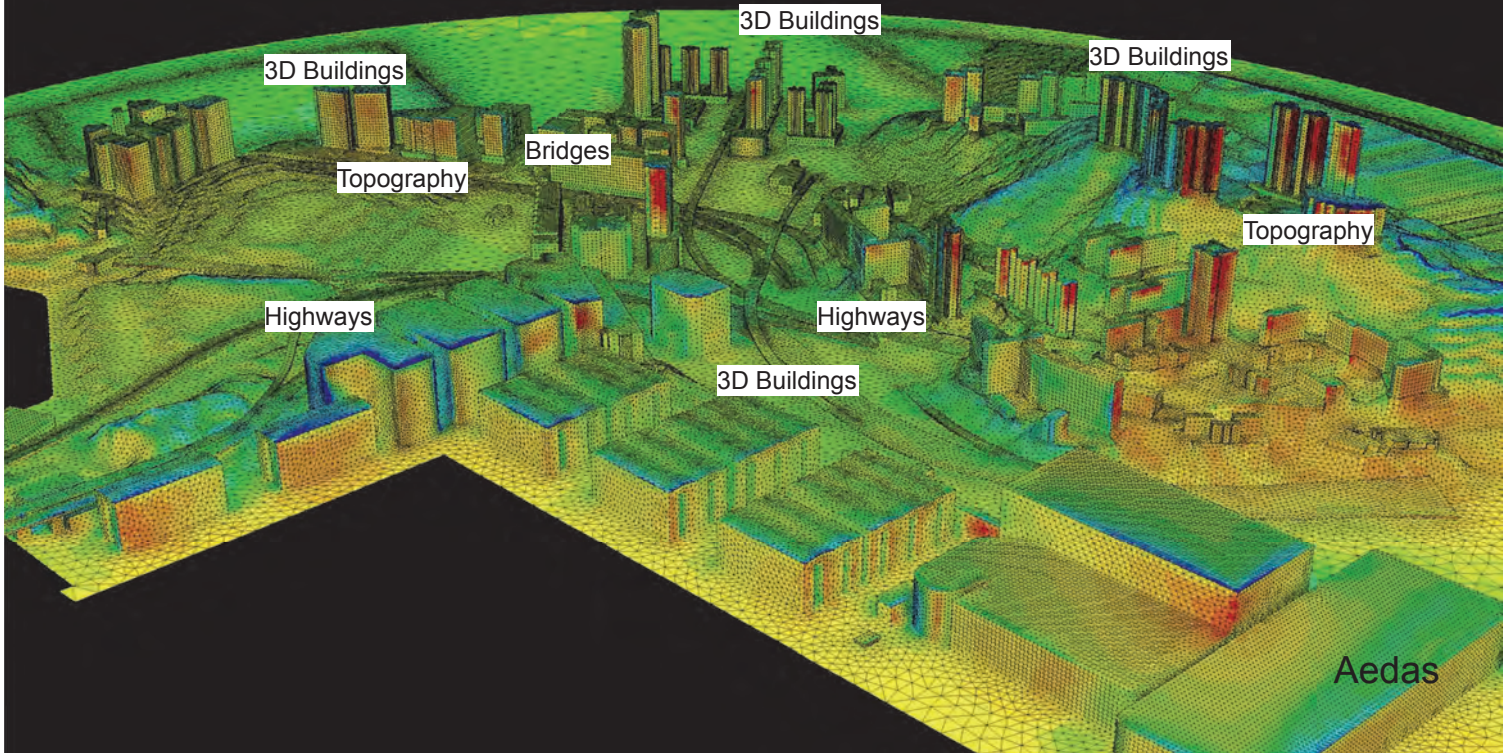
Aedas
Sustainability

Tonre Chongqing Zhongxian Project, PRC
通瑞重庆忠县项目

Computational Fluid Dynamics Analysis | Pathline of Air Movement & Static Wind Pressure on Building Envelop

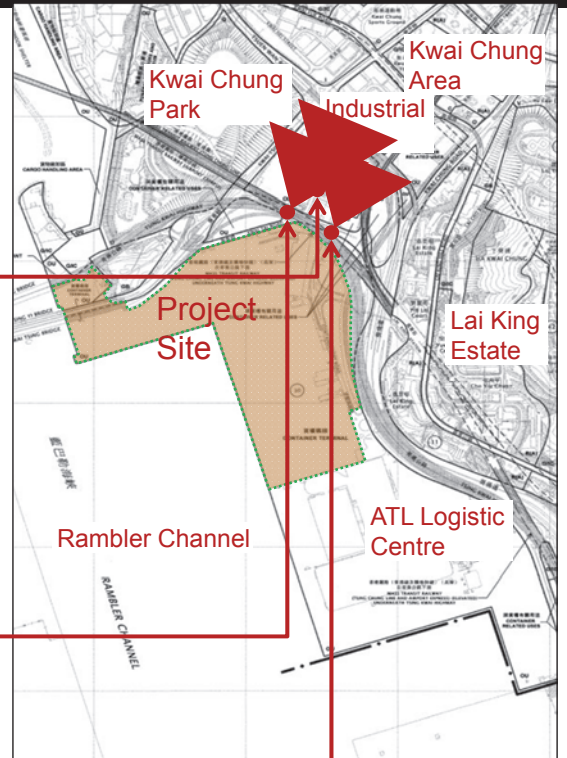
Computational Fluid Dynamics (CFD) Wind Study
Air Ventilation Assessment (AVA)

Aedas



Computational Fluid Dynamics (CFD) Wind Study
Air Ventilation Assessment (AVA)

Aedas



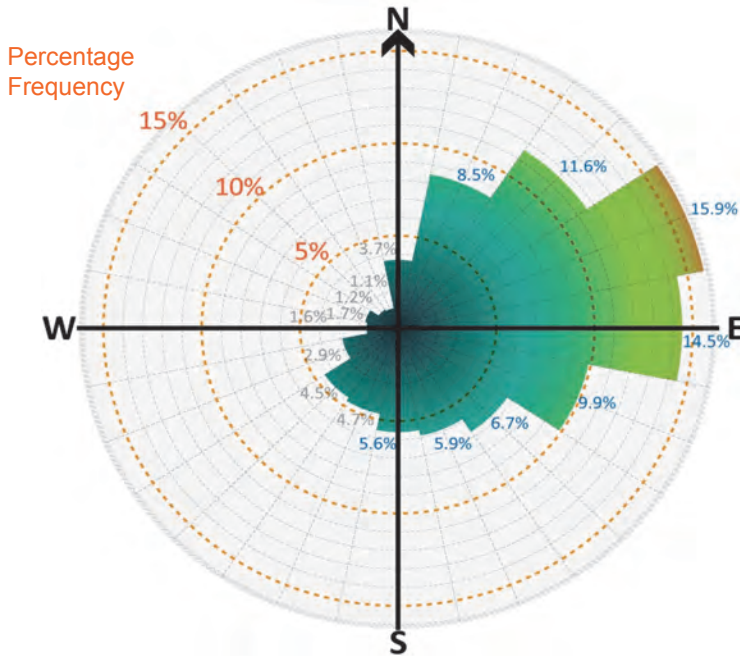
Computational Fluid Dynamics (CFD) Wind Study

Air Ventilation Assessment (AVA)

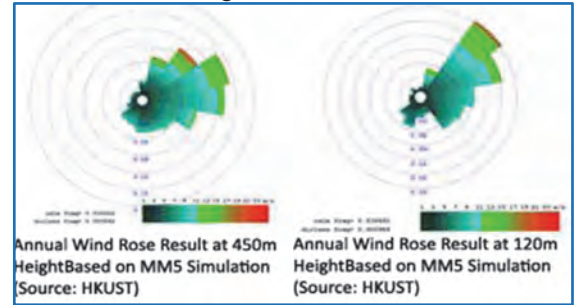
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Source: MMS simulation, HKUST

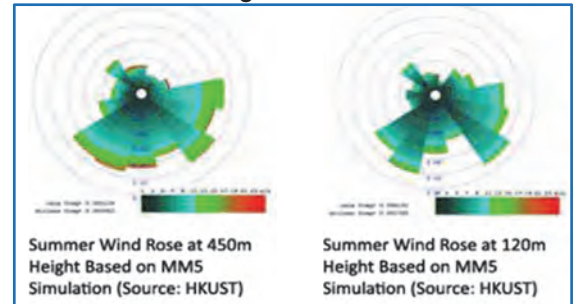
Annual Wind Rose Result at 450m Height



Annual Prevailing Wind



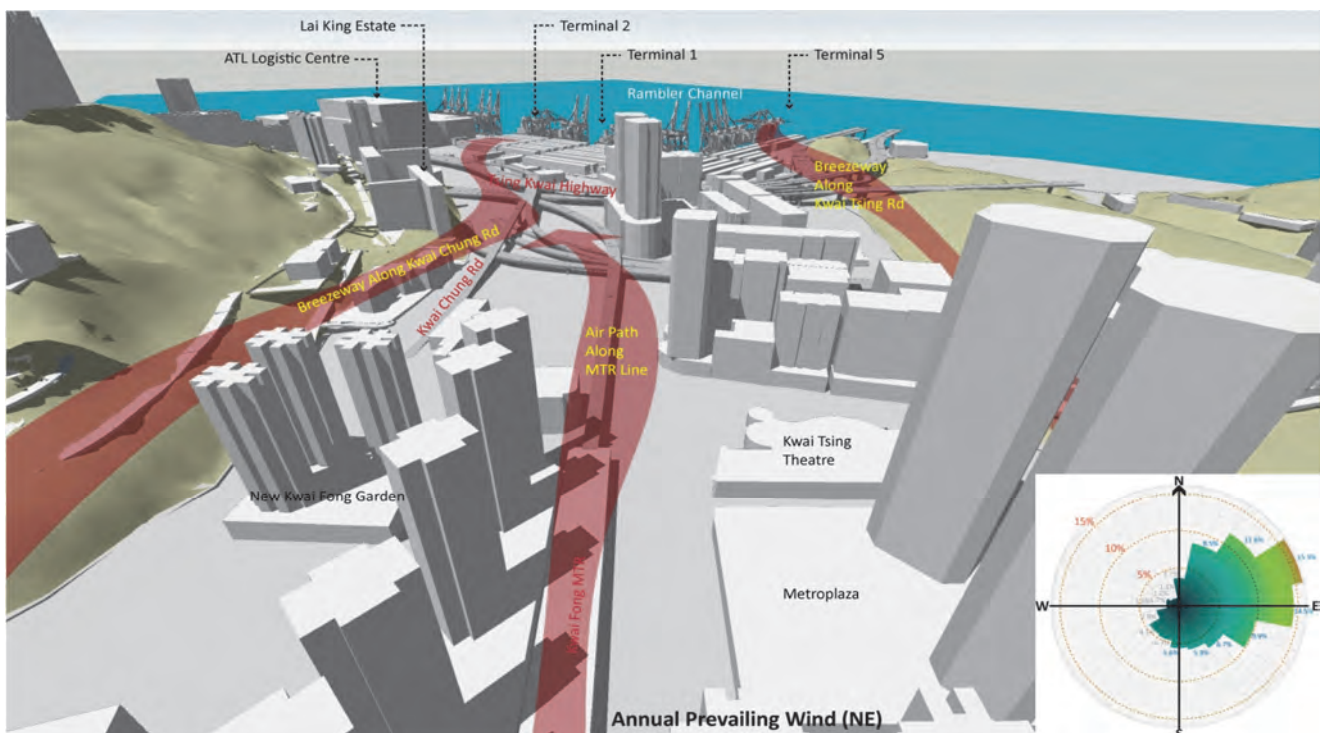
Summer Prevailing Wind



Computational Fluid Dynamics (CFD) Wind Study

Air Ventilation Assessment (AVA)

Aedas



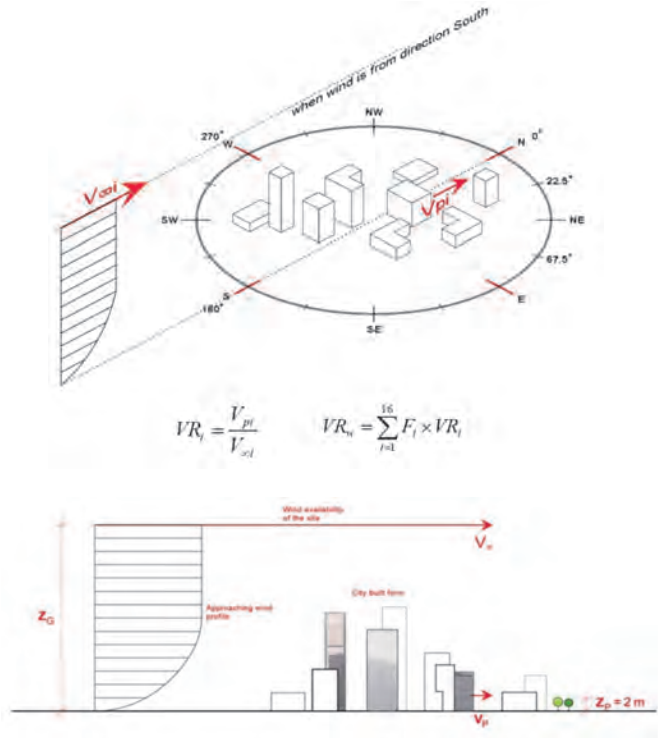
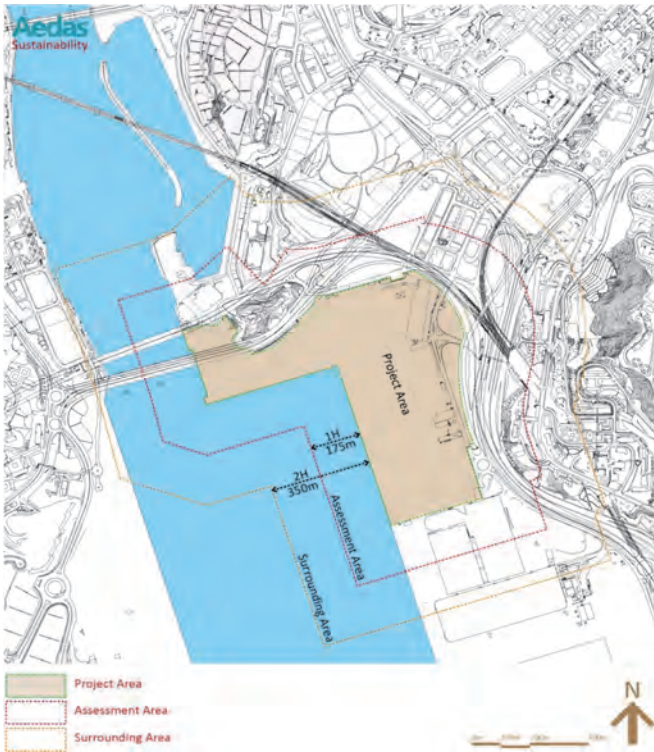


Computational Fluid Dynamics (CFD) Wind Study

Air Ventilation Assessment (AVA)



Aedas

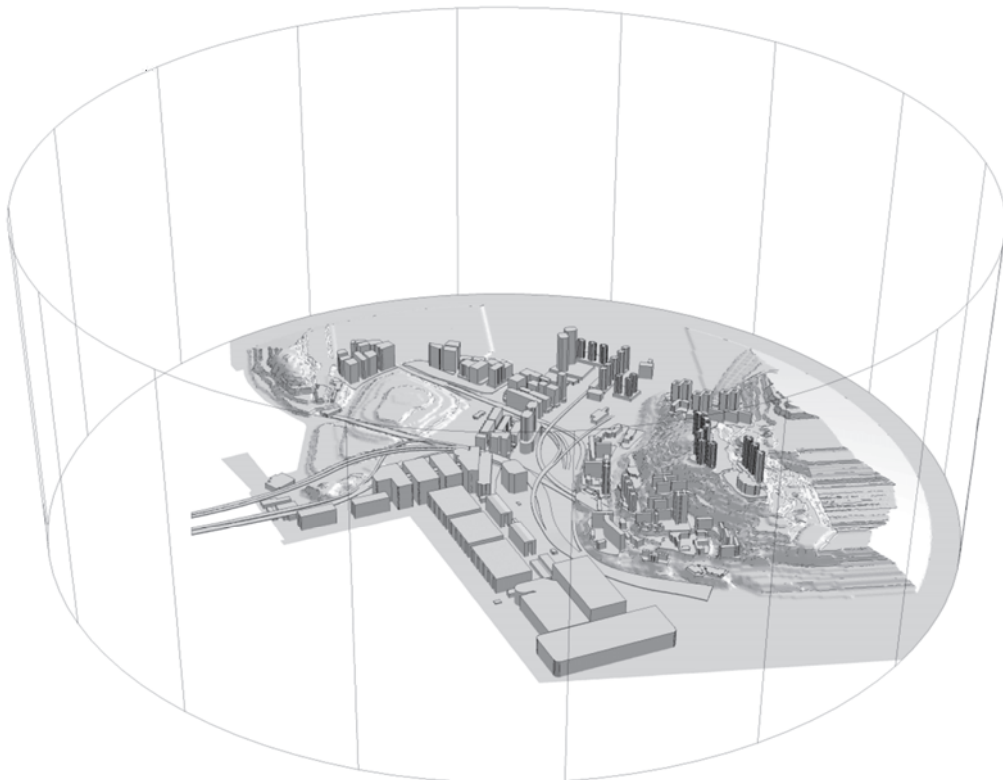


Computational Fluid Dynamics (CFD) Wind Study

Air Ventilation Assessment (AVA)



Aedas



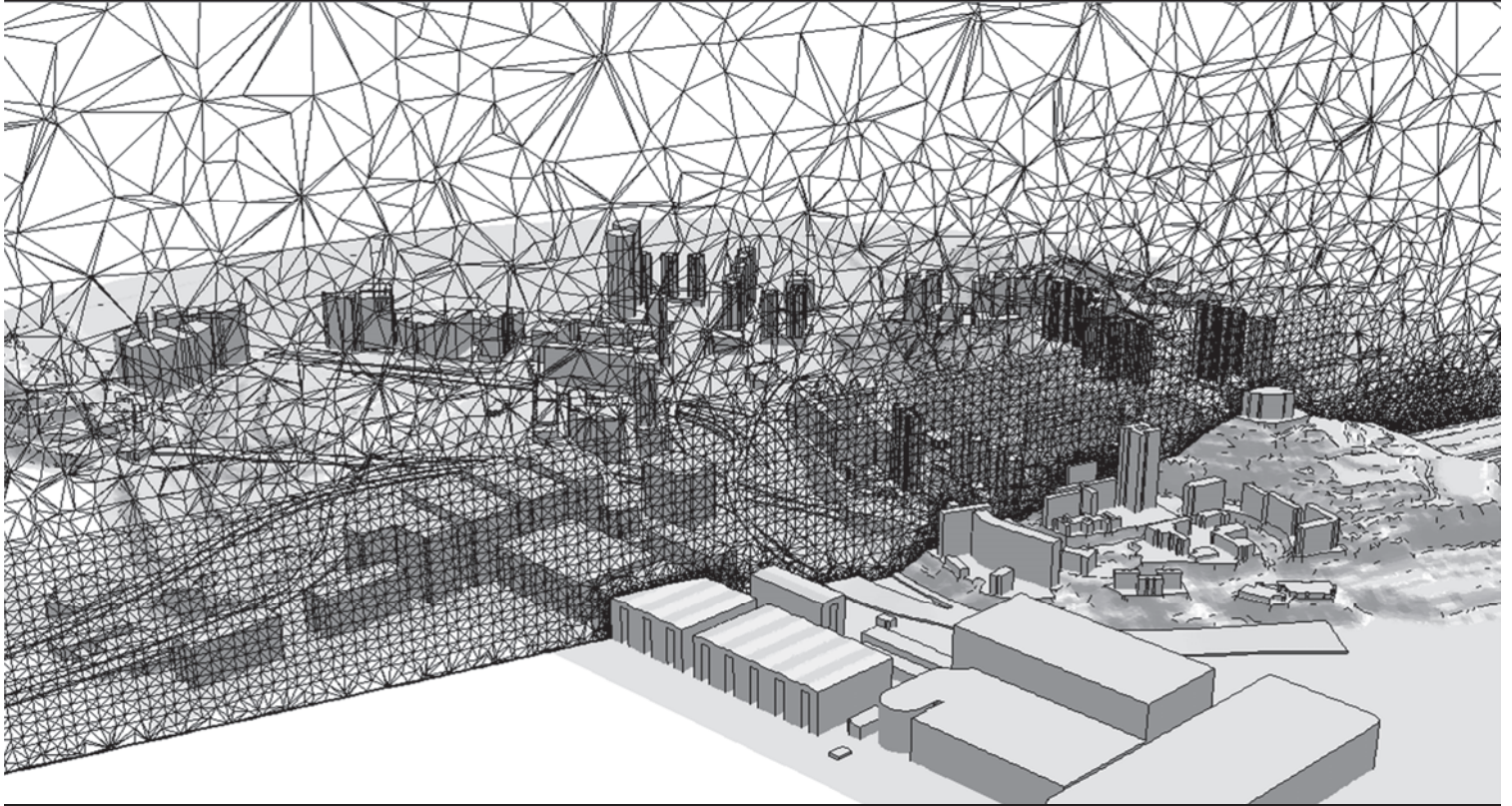
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Computational Fluid Dynamics (CFD) Wind Study
Air Ventilation Assessment (AVA)

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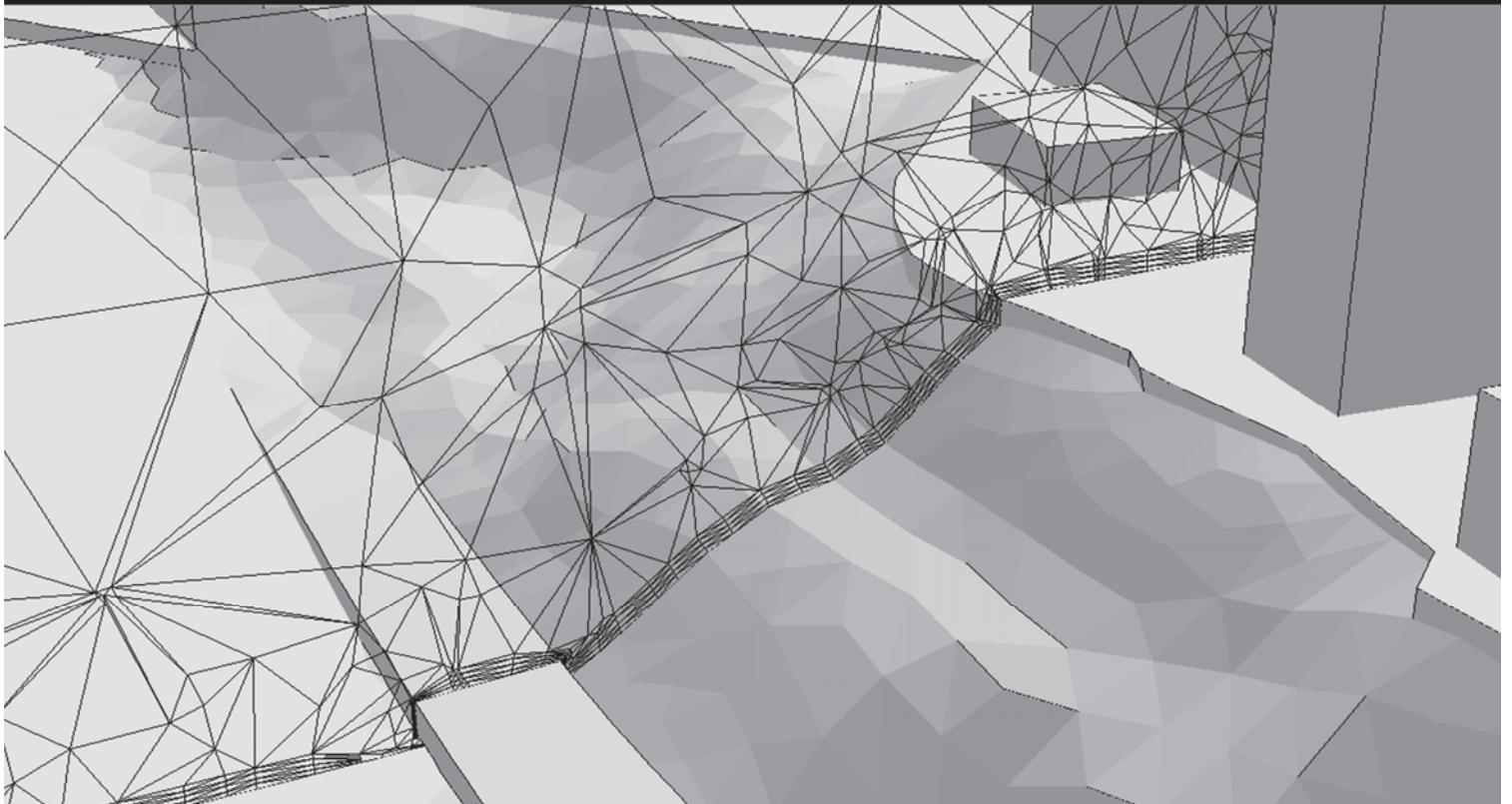
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Computational Fluid Dynamics (CFD) Wind Study
Air Ventilation Assessment (AVA)

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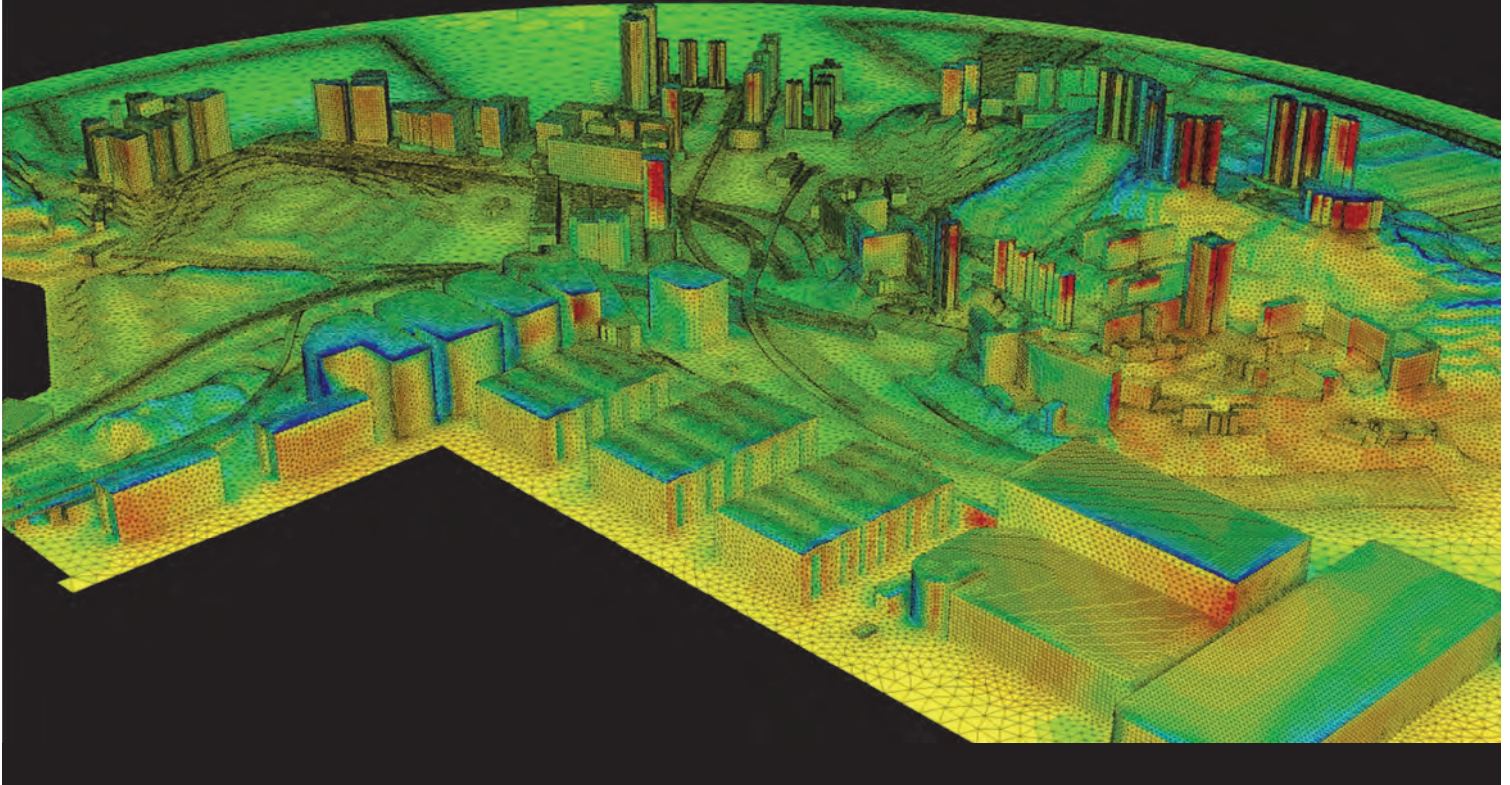




Computational Fluid Dynamics (CFD) Wind Study Air Ventilation Assessment (AVA)



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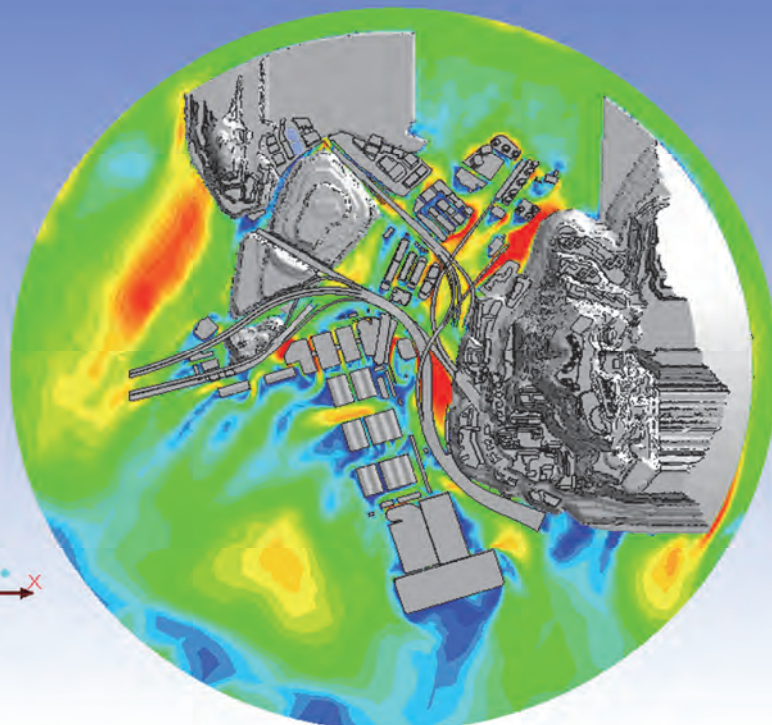
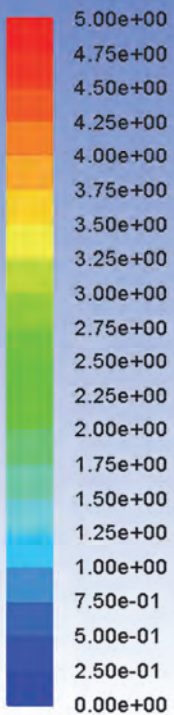


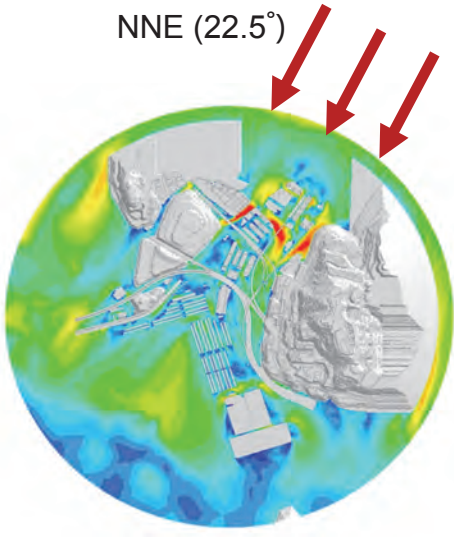
Computational Fluid Dynamics (CFD) Wind Study Air Ventilation Assessment (AVA)



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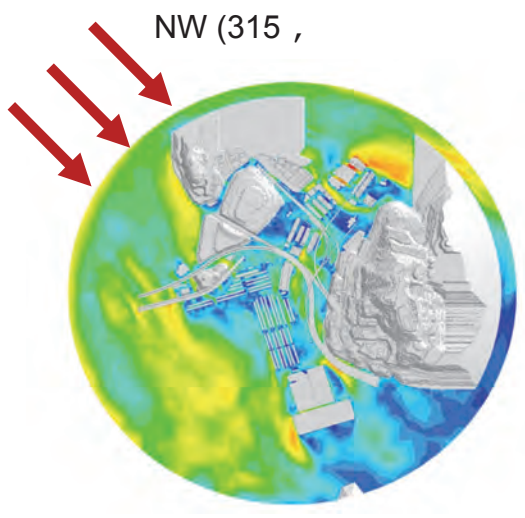
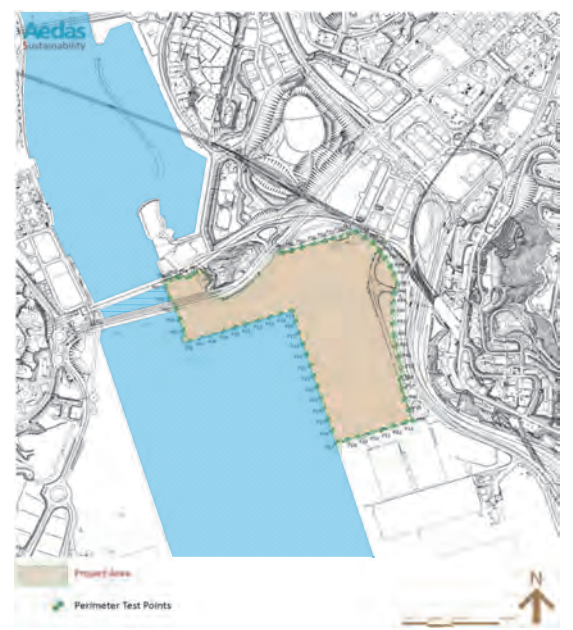
Contours of Velocity Magn





Velocity Ratio of Perimeter Test Points

Perimeter Points	NNE (22.5)
perimeter-01	0.4758
perimeter-02	2.0642
perimeter-03	1.9282
perimeter-04	0.9313
perimeter-05	1.2273
perimeter-06	1.3287
perimeter-07	1.8927
perimeter-08	2.1442
perimeter-09	1.5239
perimeter-10	1.0242
perimeter-11	2.2261
perimeter-12	1.9582
perimeter-13	0.9344
perimeter-14	1.0796
perimeter-15	1.4976
perimeter-16	1.8465
perimeter-17	2.9471
perimeter-18	3.2529
perimeter-19	2.0880
perimeter-20	2.7901
perimeter-21	2.0627
perimeter-22	2.4693
perimeter-23	2.2204
perimeter-24	2.2051
perimeter-25	2.5082
perimeter-26	2.3019
perimeter-27	2.9396
perimeter-28	1.9215
perimeter-29	3.8068
perimeter-30	4.7398
perimeter-31	3.2578
perimeter-32	2.8439
perimeter-33	0.9263
perimeter-34	0.7169
perimeter-35	0.8702
perimeter-36	1.9202
perimeter-37	1.9949
perimeter-38	2.4306
perimeter-39	2.1624
perimeter-40	2.6757
perimeter-41	2.8988
perimeter-42	3.0747
perimeter-43	3.1867
perimeter-44	3.4269
perimeter-45	3.2423
perimeter-46	3.0799
perimeter-47	2.9467
perimeter-48	3.0172
perimeter-49	3.0237
perimeter-50	2.9709
perimeter-51	2.6442
perimeter-52	1.9354
perimeter-53	3.2068
perimeter-54	2.5502
perimeter-55	2.2806
perimeter-56	3.6223
perimeter-57	3.1795
perimeter-58	3.0819
perimeter-59	2.7645
perimeter-60	1.1855
perimeter-61	2.3124
perimeter-62	1.6841
perimeter-63	2.4340
perimeter-64	1.8098
perimeter-65	1.3389
Weighted Average	2.3985



Velocity Ratio of Perimeter Test Points

Perimeter Points	NNE (22.5)	NE (45.0)	ENE (67.5)	E (90.0)	ESE (112.5)	SE (135.0)	SSE (157.5)	S (180.0)	SSW (202.5)	SW (225.0)	WSW (247.5)	NW (315.0)	Annual Weighted Average Ratio	Summer Weighted Average Ratio
perimeter-01	0.4758	0.4250	0.3768	0.3039	0.4667	0.7291	2.6888	4.5248	3.9551	2.2934	0.1696	3.9473	0.0872	0.1109
perimeter-02	2.0642	1.5213	0.6860	0.9146	0.9748	0.4954	0.6814	4.2206	2.8833	2.5884	1.2136	3.7151	0.1271	0.1932
perimeter-03	1.9282	1.2919	1.0817	2.0089	2.4773	1.7962	4.8717	3.6169	1.9841	2.8553	2.6155	1.3768	0.2008	0.2631
perimeter-04	0.9313	0.4264	0.8667	1.5217	1.5141	2.9201	5.9255	3.7991	2.5451	3.1242	2.0006	3.9539	0.1772	0.1970
perimeter-05	1.2273	2.0387	2.7346	2.3070	2.2026	4.2269	3.9028	2.6749	1.5896	1.2442	2.0077	3.0100	0.2671	0.2989
perimeter-06	1.3287	2.5206	3.6723	3.1624	3.7488	4.6567	4.5363	3.4319	1.6726	3.5888	3.2421	2.9321	0.3202	0.3616
perimeter-07	1.8927	2.9642	4.1288	3.2225	3.5721	4.0885	4.5869	3.4201	2.5488	3.9265	4.0095	2.4671	0.3465	0.3555
perimeter-08	2.1442	3.6664	3.9612	3.1743	3.6122	3.5162	2.6650	2.4052	2.1700	2.7494	3.1387	2.9101	0.3195	0.2865
perimeter-09	1.5239	2.9455	3.8506	3.1539	3.4297	3.8403	4.3999	3.4684	3.1551	3.1692	3.7674	1.8287	0.3293	0.3401
perimeter-10	1.0242	1.7163	3.7624	2.5156	3.6137	3.2074	4.0291	3.0975	3.4206	3.7986	3.9561	2.4464	0.3105	0.3284
perimeter-11	2.2261	3.3099	3.9817	2.6695	3.2594	3.2383	4.2294	3.4057	3.6766	3.3187	4.0962	1.4312	0.3271	0.3202
perimeter-12	1.9582	3.1249	3.5238	2.5579	3.3501	3.7963	3.6839	2.8776	2.7146	2.8960	3.3323	0.9698	0.3062	0.2983
perimeter-13	0.9344	3.0499	1.9085	1.8524	2.4678	2.7171	3.3905	2.1764	1.6665	1.9150	1.9274	1.2969	0.2843	0.3117
perimeter-14	1.0796	2.9737	2.8945	1.5081	2.3349	2.7676	1.6606	1.7536	1.5136	1.8392	1.8564	1.4268	0.2142	0.1843
perimeter-15	1.4976	2.9199	1.0268	1.7071	1.4025	2.6758	3.3624	2.8633	2.7588	2.6265	2.5128	1.3540	0.2042	0.2407
perimeter-16	1.8465	3.6636	2.4124	1.5512	1.7494	1.0404	4.1359	3.2562	1.0952	2.2860	2.8579	1.2582	0.2534	0.2616
perimeter-17	2.9471	3.6575	1.8293	0.8917	2.2826	3.2609	4.3208	3.4760	3.3986	2.7305	1.9513	2.8771	0.2529	0.2811
perimeter-18	3.2529	3.4986	1.5454	1.5138	3.2218	3.4974	4.7122	3.5753	3.3160	1.8780	2.4133	2.0643	0.2794	0.2988
perimeter-19	2.0880	1.8038	0.9478	1.6812	3.3617	3.3145	4.1277	3.4191	3.1994	2.2160	1.4600	2.5839	0.2240	0.2874
perimeter-20	2.7901	1.4035	0.8661	0.1124	2.9609	2.6007	4.2157	3.4409	2.8820	2.1062	2.1463	2.3609	0.1864	0.2518
perimeter-21	2.2051	1.6010	2.0081	0.1625	3.2147	2.6574	4.4025	3.4323	2.8183	2.3002	2.0946	2.4492	0.2105	0.2595
perimeter-22	2.4693	1.4992	1.7548	1.0365	3.5201	3.2023	4.5321	3.2689	2.8533	2.9072	2.0996	2.6381	0.2321	0.2905
perimeter-23	2.2504	1.5540	1.7423	1.6125	3.4745	3.4467	4.3488	3.6510	2.8390	2.5120	2.9755	0.0168	0.2448	0.3087
perimeter-24	2.2051	1.2887	1.7823	2.3979	3.9000	4.1777	1.2672	1.2355	2.2347	2.2461	1.1776	0.2441	0.3051	0.3185
perimeter-25	2.5082	1.4683	1.5795	0.7352	1.4939	4.3699	3.3328	2.0311	2.0409	1.4269	0.9331	1.9646	0.1892	0.2104
perimeter-26	2.3019	1.9779	1.7784	1.3888	0.9966	3.9093	3.2175	2.0542	2.0674	1.7241	0.8601	2.0921	0.1902	0.2081
perimeter-27	2.9396	2.0458	1.0941	2.0287	2.1746	3.3504	4.0113	3.5146	3.3781	2.9647	2.5042	4.0066	0.2325	0.3073
perimeter-28	1.9215	1.4112	1.5761	2.9165	2.3445	4.3174	4.4421	4.3678	4.2261	3.2251	2.6239	1.9383	0.2381	0.3060
perimeter-29	3.8068	2.2902	2.6751	2.4600	2.8028	4.4584	5.1414	4.4611	5.2938	4.4464	1.4920	1.1712	0.3195	0.3991
perimeter-30	4.7398	2.7211	2.8088	1.2925	2.5671	3.0991	3.2374	2.4580	4.0738	3.2701	3.4679	1.2693	0.2787	0.2843
perimeter-31	3.8064	1.6358	1.7917	1.0450	0.5130	0.9938	1.9475	1.5862	5.0508	3.5489	3.8468	1.3605	0.1797	0.2702
perimeter-32	2.8439	1.5840	0.5461	0.7951	0.8784	1.5101	0.2040	0.1166	0.8770	2.4872	1.9824	1.4054	0.1063	0.1097
perimeter-33	0.9263	1.8959	1.7181	0.5068	0.2880	1.3544	2.0981	1.6581	1.8837	2.9523	0.1184	0.9218	0.1086	0.1137
perimeter-34	0.7169	0.6932	2.1650	0.7296	0.7800	0.7273	0.9321	1.3033	2.9991	3.8281	1.7714	1.0170	0.1650	0.1650
perimeter-35	0.8702	1.4999	1.5171	0.4516	0.5714	0.5951	0.4917	1.4138	3.0503	3.2968	2.7997	1.6527	0.0959	0.1542
perimeter-36	1.1855	2.1388	2.7911	1.6540	1.2707	0.8678	0.9376	2.5058	2.8655	2.4817	2.0909	1.0326	0.1519	0.1621
perimeter-37	1.9949	2.4839	1.2491	6.2402	3.8706	0.9556	2.9304	1.1627	2.3397	2.9687	0.8436	0.8165	0.2635	0.1540
perimeter-38	2.4306	2.8739	0.3509	3.3902	6.0941	2.8114	3.8054	1.5442	2.9528	1.3994	0.7276	1.4818	0.1726	0.2742
perimeter-39	2.1672	2.4919	0.9225	2.7959	4.5793	2.8437	4.8924	1.6530	3.8568	1.6224	0.3030	1.3655	0.2121	0.2407
perimeter-40	2.6757	3.0846	0.9425	0.8783	3.9092	3.0156	1.8814	2.6627	4.0842	2.1163	0.8947	0.8902	0.2162	0.2393
perimeter-41	1.8098	2.2654	1.9056	1.6490	1.8916	2.0791	1.7616	3.4328	4.4238	4.4328	3.0946	1.8039	0.1970	0.2298
perimeter-42	3.0747	3.2649	3.3774	0.6245	1.6317	2.7491	2.9284	3.7563	4.0660	1.2147	1.2605	1.9219	0.2538	0.2419
perimeter-43	3.1867	2.9396	3.5236	1.1423	0.6505	2.8739	3.2093	3.9767	3.7988	2.1110	1.8236	2.5088	0.2547	0.2479
perimeter-44	3.2578	3.0390	3.0722	1.3748	0.9114	2.4289	2.9788	4.0168	3.9760	2.2597	2.3183	2.7568	0.2513	0.2523
perimeter-45	3.2423	2.9059	3.0183	1.8664	1.6644	2.2309	2.8721	3.8689	4.0885	2.7450	2.0152	2.9122	0.2632	0.2716
perimeter-46	3.0799	2.7127	2.0589	2.2102	1.3075	2.4468	3.2625	4.2674	4.4658	3.1167	2.1157	2.7462	0.2806	0.2836
perimeter-47	2.9467	2.4886	2.7598	1.7853	1.5014	1.9117	3.4311	4.5535	4.2979	3.3114	2.4315	2.6607	0.2005	0.2899
perimeter-48	3.0172	2.1408	2.3889	1.4906	1.6098	1.9094	3.2548	4.7747	4.0957	3.6049	2.6080	2.2919	0.2333	0.2824
perimeter-49	2.5082	1.9692	2.4615	1.6077	0.7473	1.0513	1.1158	4.0178	3.6536	3.9514	3.1834	1.8461	0.2715	0.2788
perimeter-50	2.9709	1.9419	1.6027	1.1953	2.6695	2.6223	3.9018	1.6659	3.8641	3.9492	2.8122	0.2202	0.2202	0.2971
perimeter-51	2.6442	1.4036	0.8615	2.2544	1.8012	3.1862	3.2775	3.9166	3.3063	3.5779	3.1626	3.3945	0.2817	0.2962
perimeter-52	1.9154	0.2581	1.0026	1.9324	1.0416	2.1537	1.6558	1.2913	0.6822	0.6568	0.9120	0.4744	0.1183	0.1204
perimeter-53	3.2068	3.5562	2.7211	1.2416	0.4199	0.5827	0.6025	0.4347	0.4117	0.5277	1.0619	4.6375	0.3814	0.0887
perimeter-54	2.5903	2.8937	2.0615	1.5077	0.7773	0.5713	1.0751	1.9322	2.9241	1.8251	2.7323	1.8113	0.1750	0.1681
perimeter-55	2.2806	2.1775	1.5390	1.6145	0.2538	0.3268	0.3747	1.0748	0.2729	0.7604	0.7777	2.3013	0.1374	0.0788
perimeter-56	3.6223	2.8400	3.3962	1.8405	0.3029	1.9186	1.1050	1.6038	0.7483	1.4962	1.8182	1.4312	0.2492	0.1439
perimeter-57	3.1795	3.0019	2.0625	3.9838	0.4765	1.1607	2.4448	0.5144	1.8471	0.2921	1.4771	1.2716	0.1620	0.0886
perimeter-58	3.0819	3.2492	2.3796	1.9869	0.3058	1.8453	1.0102	0.5016	1.2857	1.9929	0.4173	2.6049	0.1965	0.1282
perimeter														

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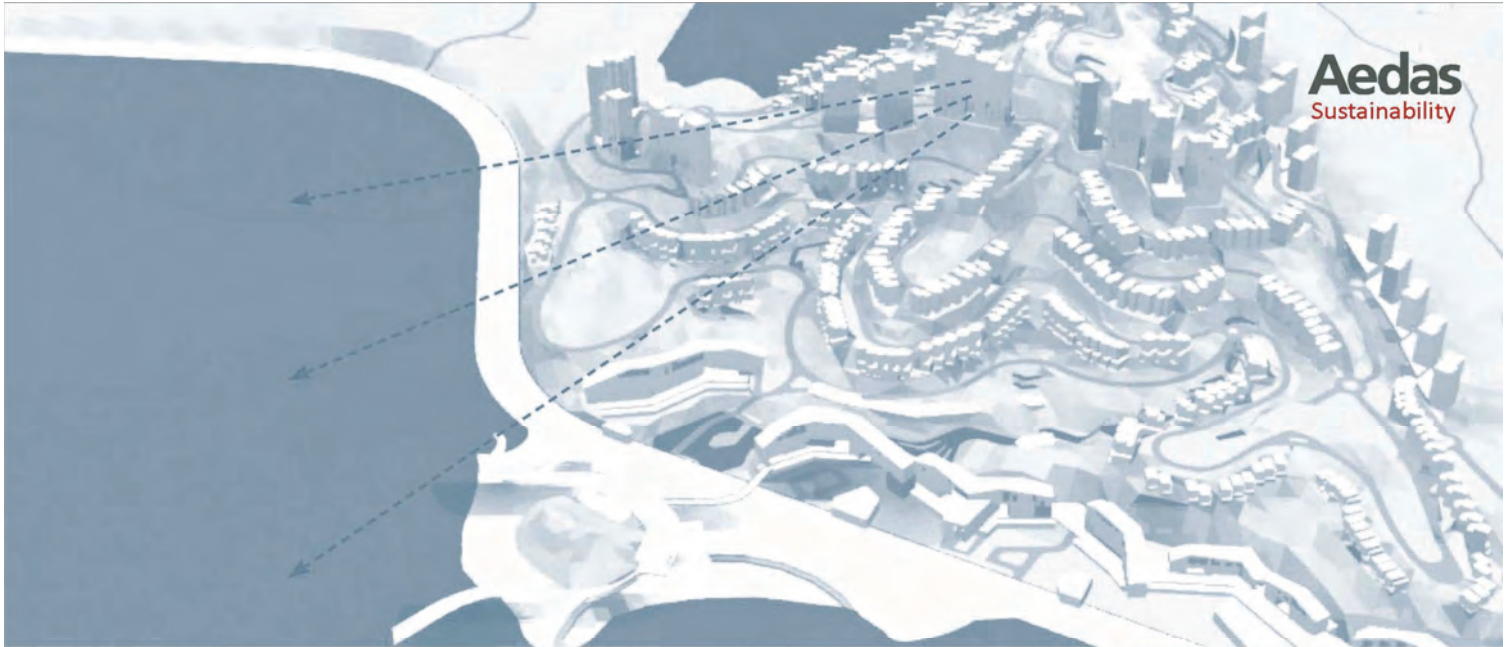
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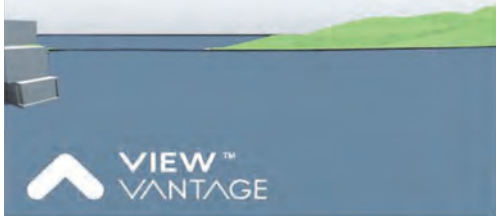
View Quality Estimation
X
Design Optimization



High level view assessment
高层住宅景观分析

Mid level view assessment
中层住宅景观分析

Low level view assessment
低层住宅景观分析



VIEW™
VANTAGE

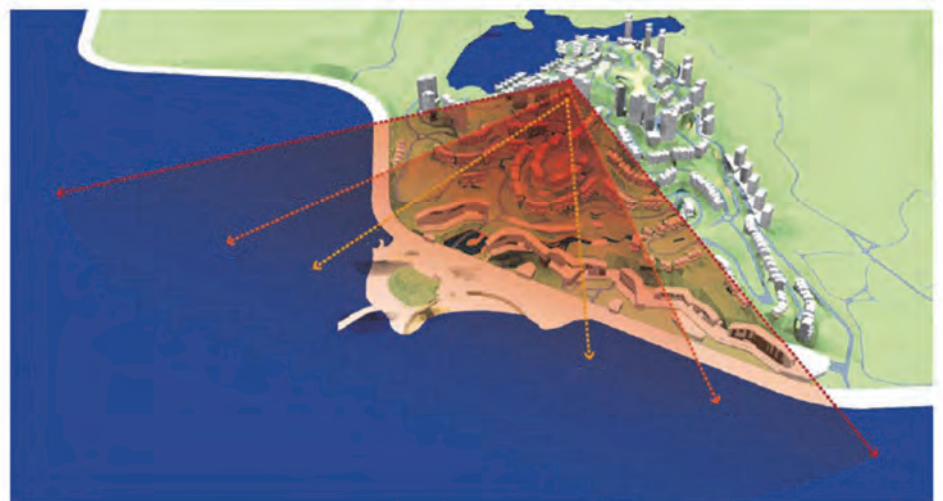
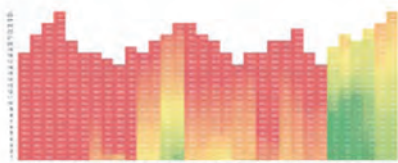
Xunliao Beach Resort in Huidong, PRC
中国惠东巽寮海边别墅项目

View Vantage | Scientific View Value Assessment System

Sustainable Approach



ViewVantage™ Aedas in-house developed GREEN software on the science of quantifying Visual View Quality



High level view assessment

Mid level view assessment

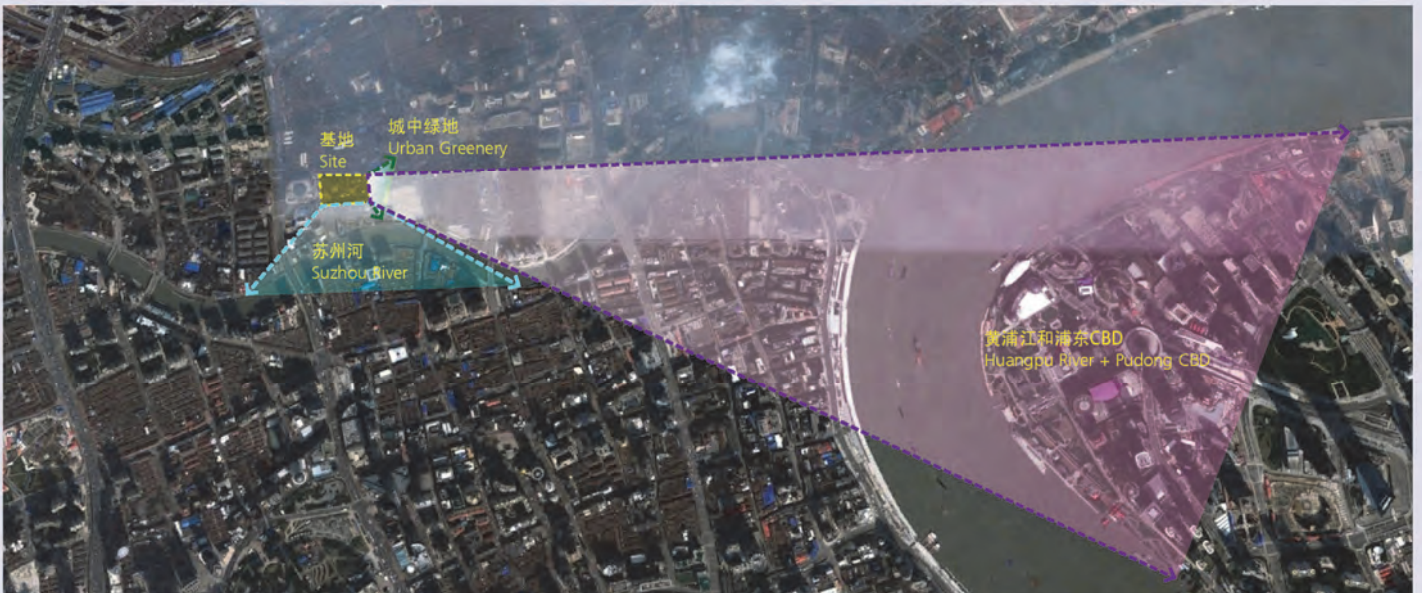
Low level view assessment



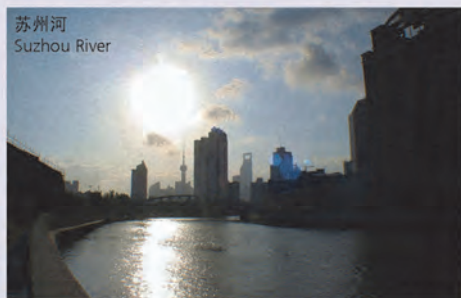
VIEW™
VANTAGE



A Residential Project in Shanghai



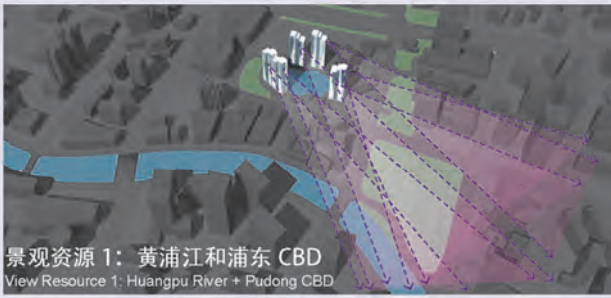
黄浦江和浦东CBD
Huangpu River + Pudong CBD



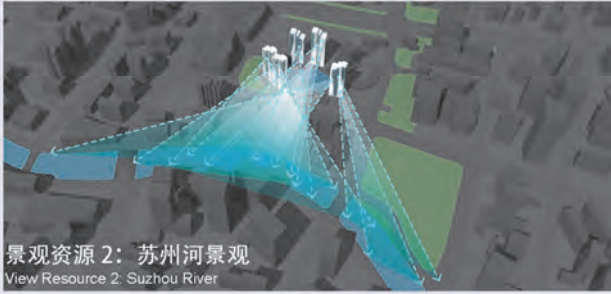
苏州河
Suzhou River



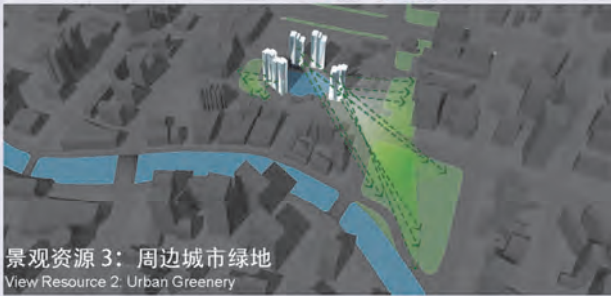
城中绿地
Urban Greenery



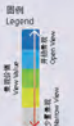
约**46.6%** (125)
住宅能够观赏到
黄浦江和浦东
BCD繁华市景;
优质景致: ~25%
开扬景致: ~21%



约**47.0%** (126)
住宅能够观赏到
恬静河景;
优质景致: ~15%
开扬景致: ~14%



约**97.0%** (260)
住宅能够观赏到
绿地翠绿景致;
优质景致: ~27%
开扬景致: ~38%

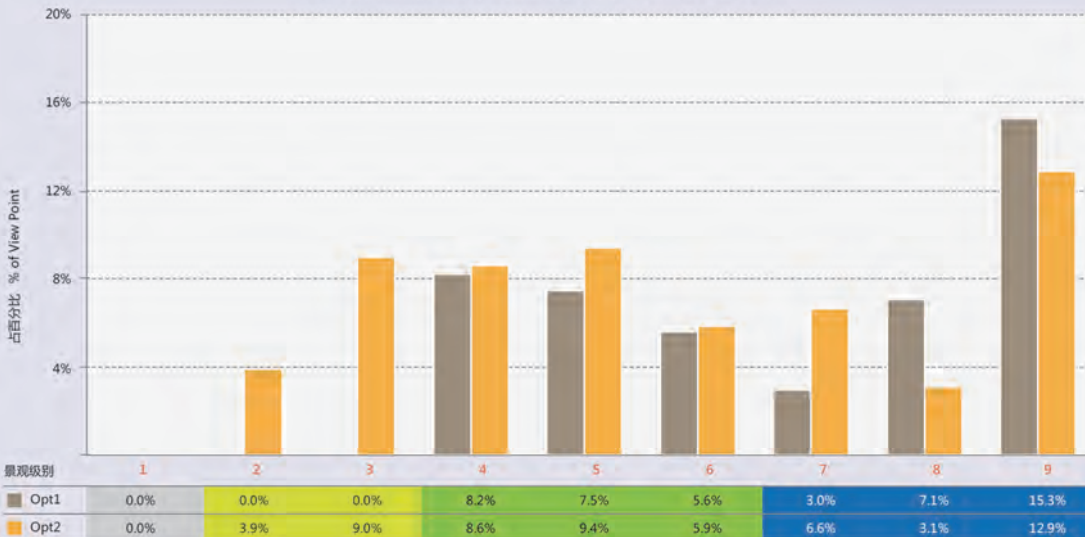


A Residential Project in Shanghai

Source: Aedas



景观价值评估分析 (黄浦江和浦东CBD繁华市景)
Visual Performance Analysis (Huangpu River + Pudong CBD View)



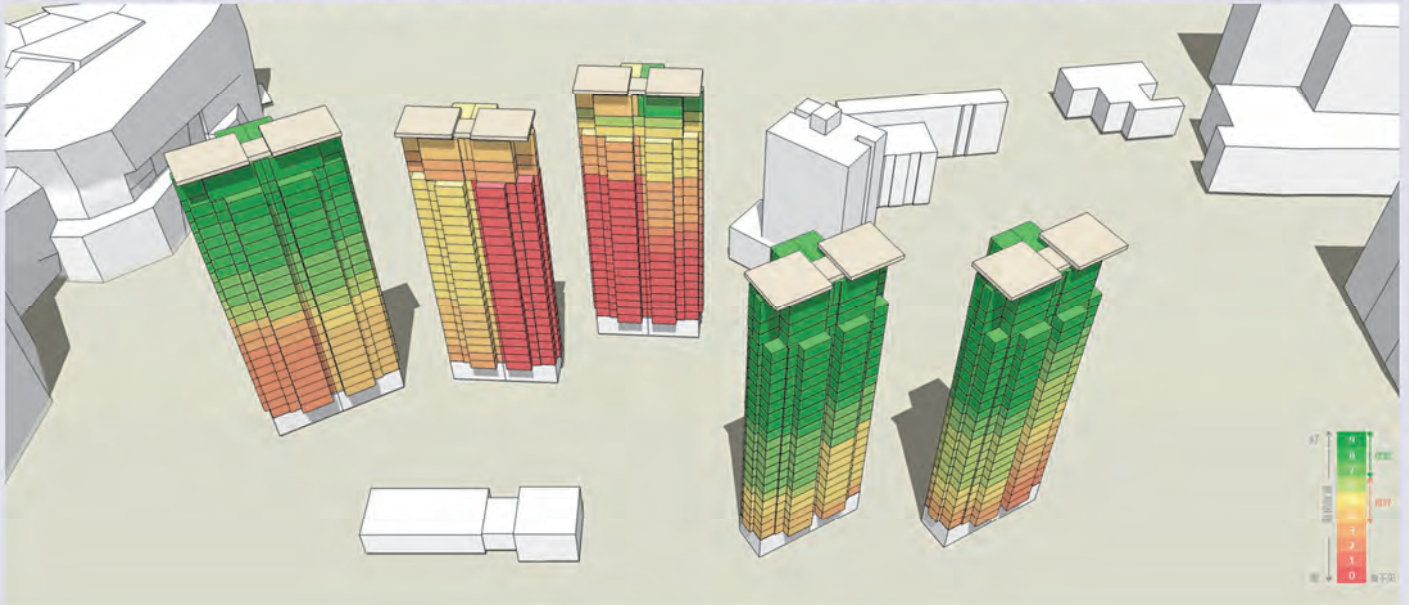
景观资源 1: 黄浦江和浦东 CBD
View Resource 1: Huangpu River + Pudong CBD

- 方案一, 约**46.6%**住宅能观赏到黄浦江和浦东BCD繁华市景; 方案二则有**59.4%**;
- 方案一有**25%**住宅拥有优质景致; 有**21%**住宅拥有开扬景致;
- 方案二有**23%**住宅拥有优质景致; 有**24%**住宅拥有开扬景致;
- 总体来说, 方案二拥有较好的黄浦江和浦东CBD繁华市景。

A Residential Project in Shanghai

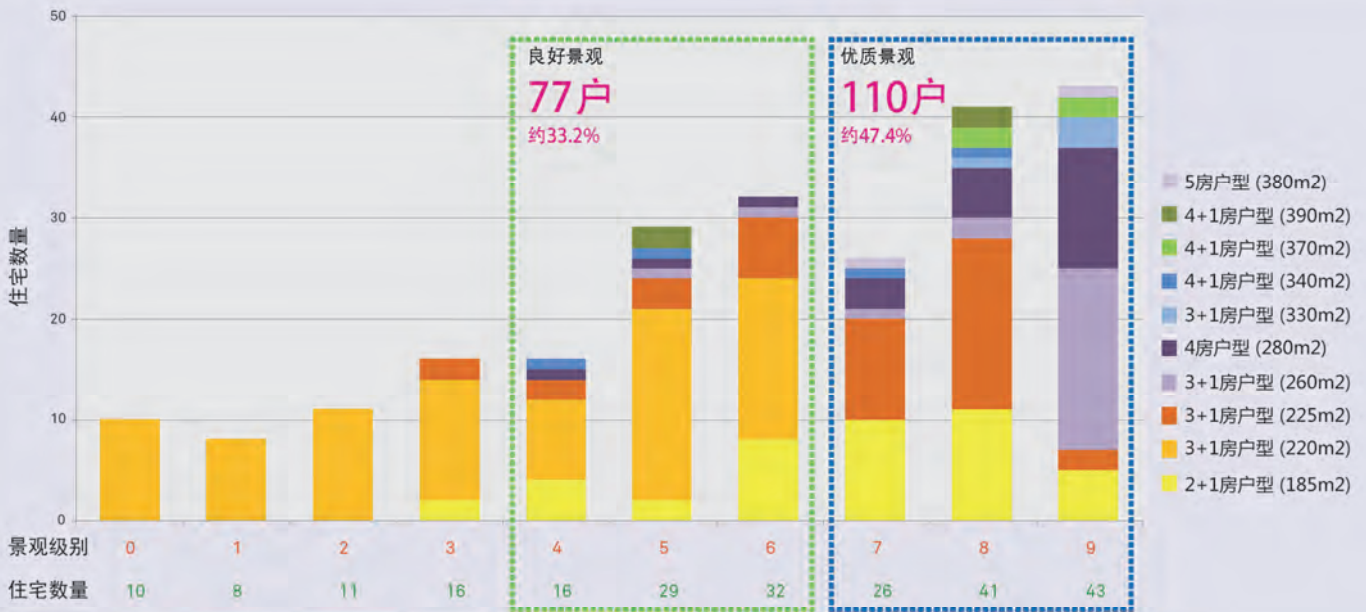
Source: Aedas

浦东陆家嘴
Pudong CBD



A Residential Project in Shanghai

Source: Aedas



景观级别	2+1房户型 (185m ²)	3+1房户型 (220m ²)	3+1房户型 (225m ²)	3+1房户型 (260m ²)	4房户型 (280m ²)	3+1房户型 (330m ²)	4+1房户型 (340m ²)	4+1房户型 (370m ²)	4+1房户型 (390m ²)	5房户型 (380m ²)	总户数
9	5	0	2	18	12	3	0	2	0	1	43
8	11	0	17	2	5	1	1	2	2	0	41
7	10	0	10	1	3	0	1	0	0	1	26
6	8	16	6	1	1	0	0	0	0	0	32
5	2	19	3	1	1	0	1	0	2	0	29
4	4	8	2	0	1	0	1	0	0	0	16
3	2	12	2	0	0	0	0	0	0	0	16
2	0	11	0	0	0	0	0	0	0	0	11
1	0	8	0	0	0	0	0	0	0	0	8
较差	0	10	0	0	0	0	0	0	0	0	10
总户数	42	84	42	23	23	4	4	4	4	2	232

A Residential Project in Shanghai

Source: Aedas

Artificial Intelligent X Design Automation

建筑日照规范模拟 Sunshine Regulation Study

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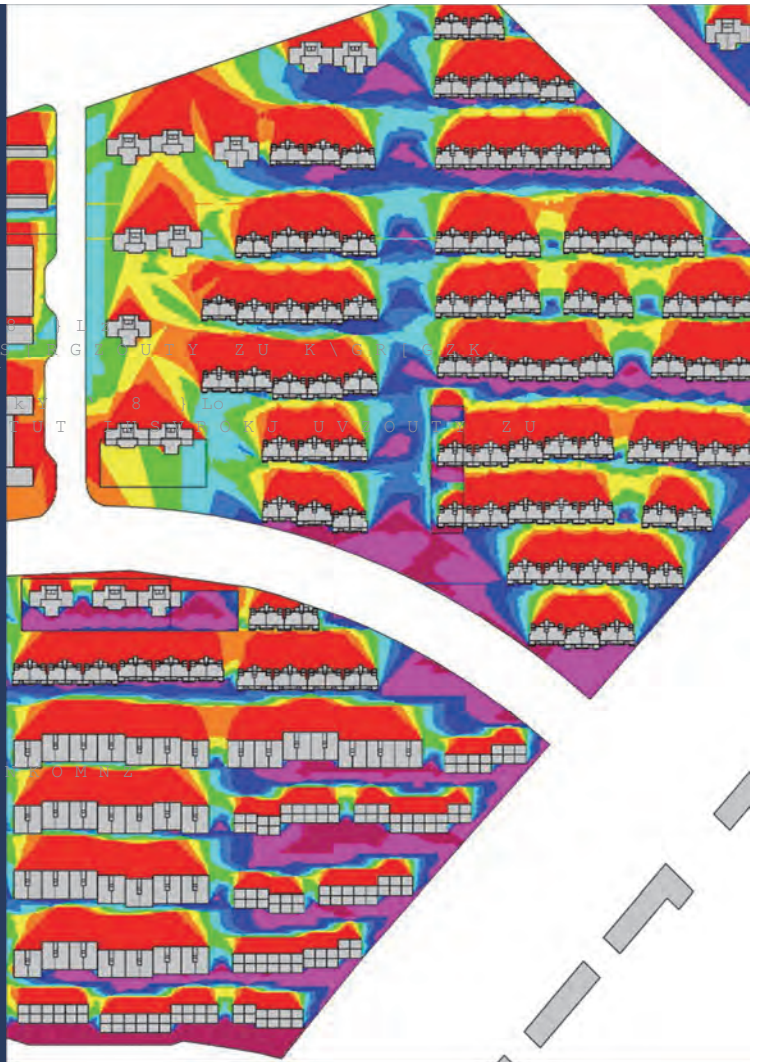
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PD3

CD4

SD5



方案设计
Scheme Design stage

概念设计
Concept Design stage

前期设计
Pre-Design stage

建筑日照极限容积计算 Sunshine GFA Optimization

服务范畴 Scope of works:

- 使用返回光线切割器和遗传算法计算地块极限容积率；
Using the backward solar cutter and generative algorithm to estimate the optimized site GFA.
- 对不能满足要求的方案提出修改建议，以符合规范的要求。
Provide recommendations for non-complied options to meet the requirement

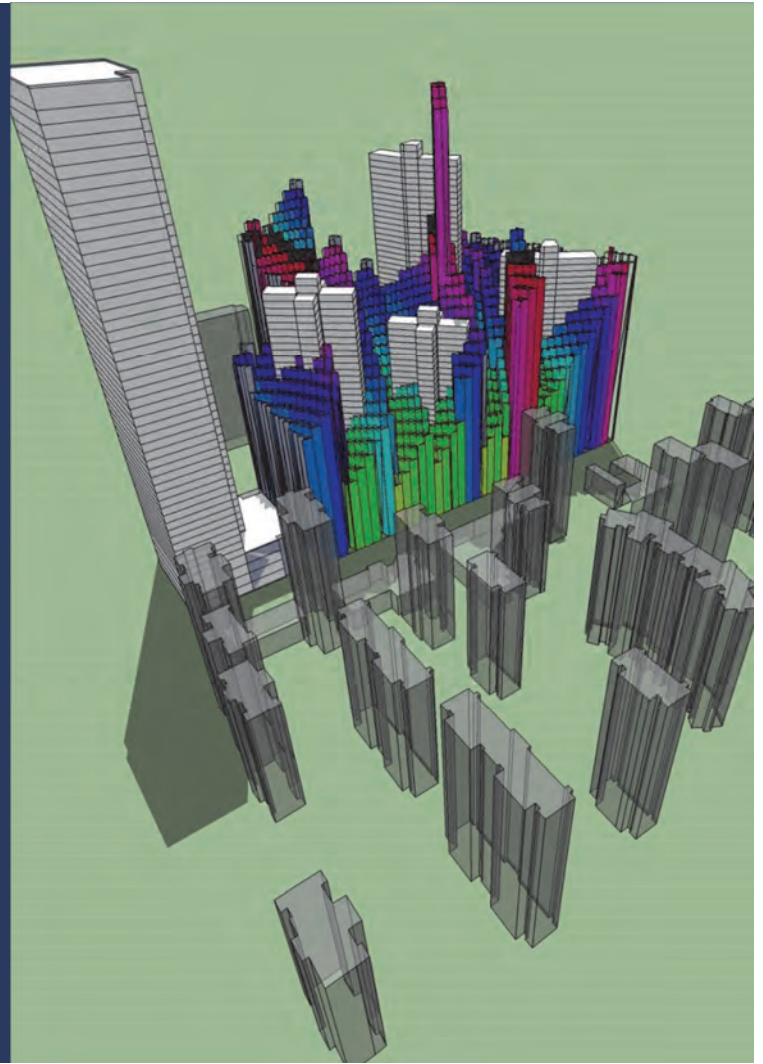
所需资料 Information required:

- 项目所在位置
Location of project
- 业主设计说明
Design brief
- 附有建筑高度的规划平面图
2D CAD Plans with building height

PD3

CD4

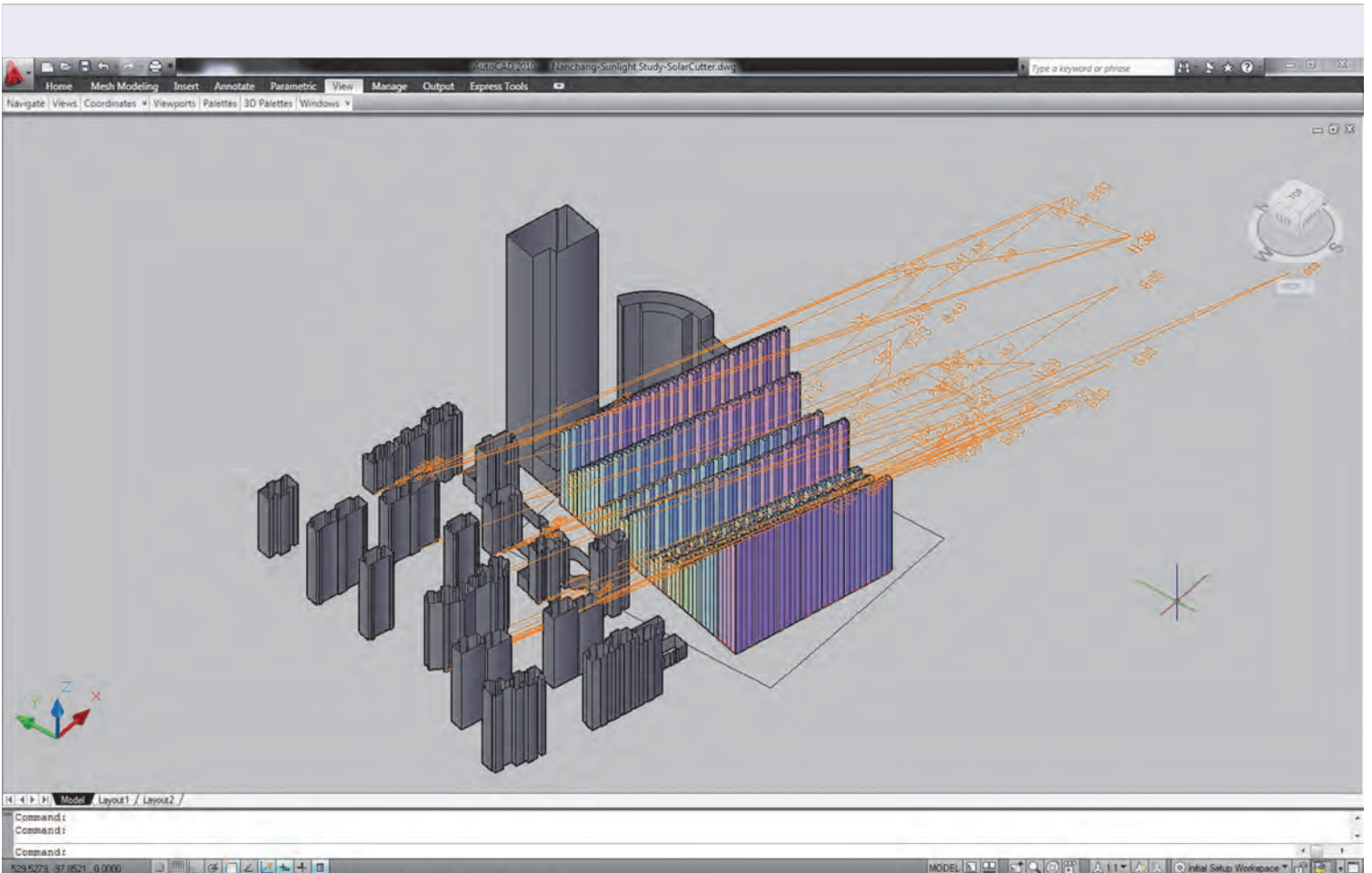
SD5



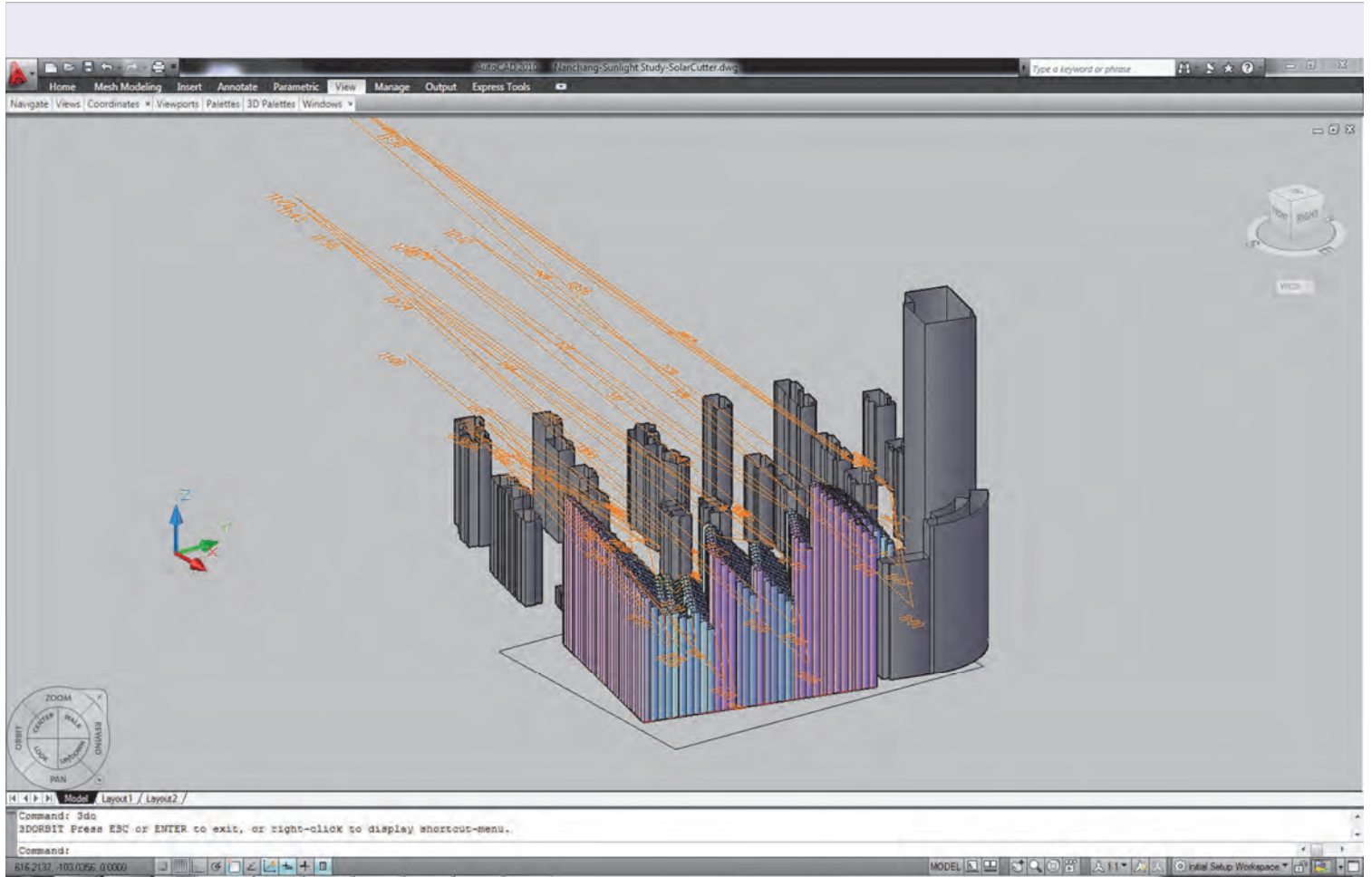
方案设计
Scheme Design stage

概念设计
Concept Design stage

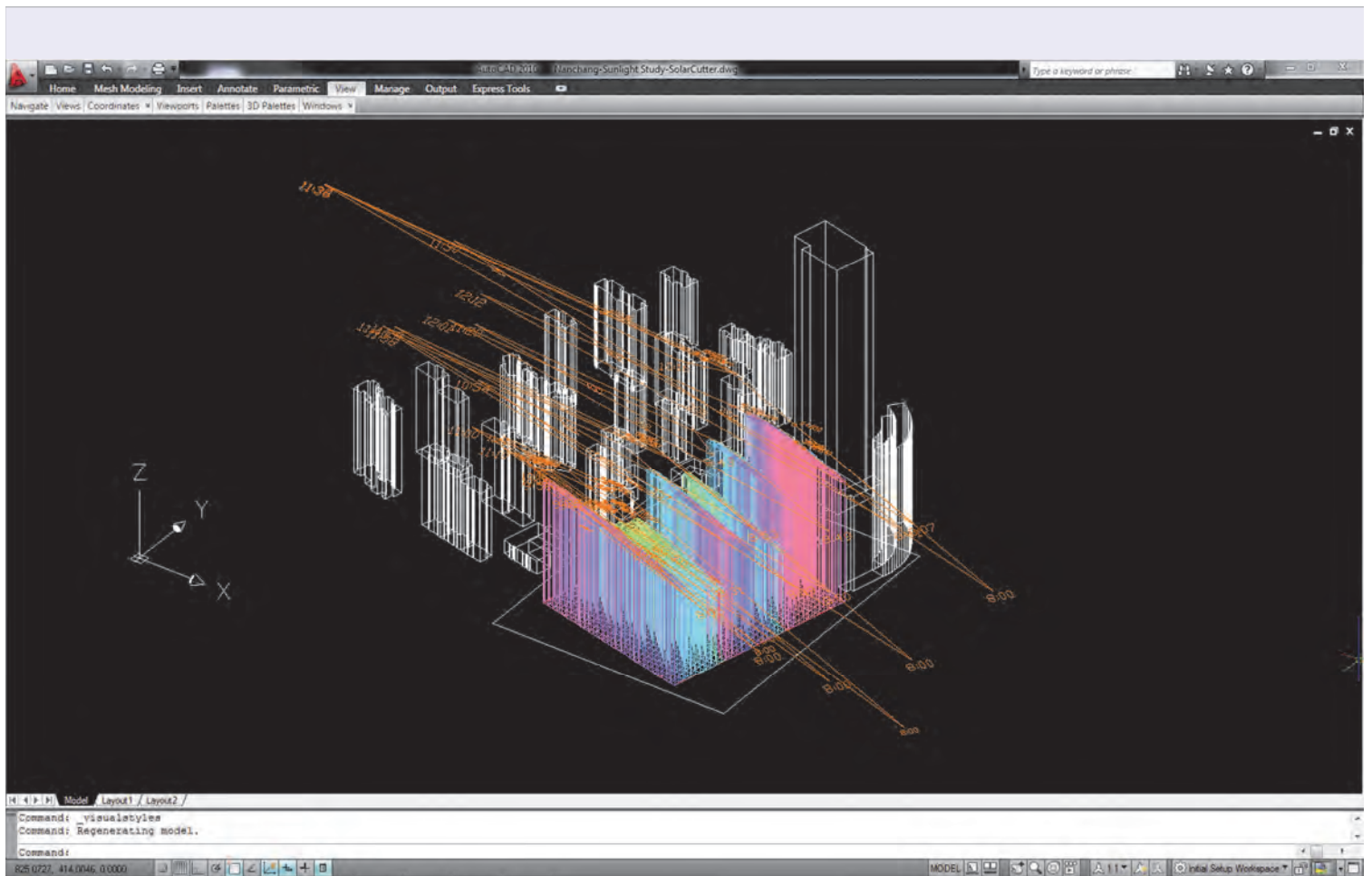
前期设计
Pre-Design stage



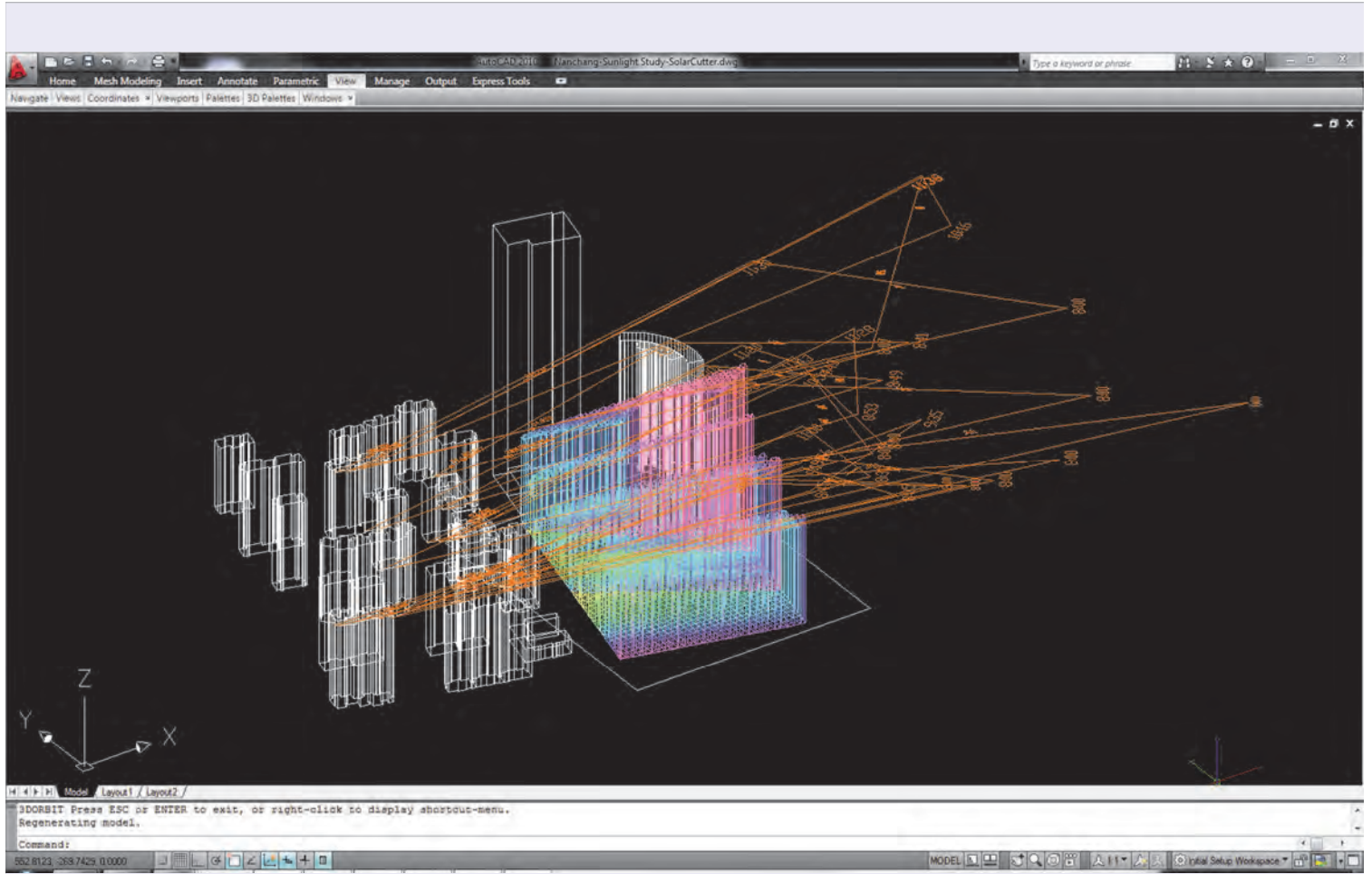
Source: Aedas



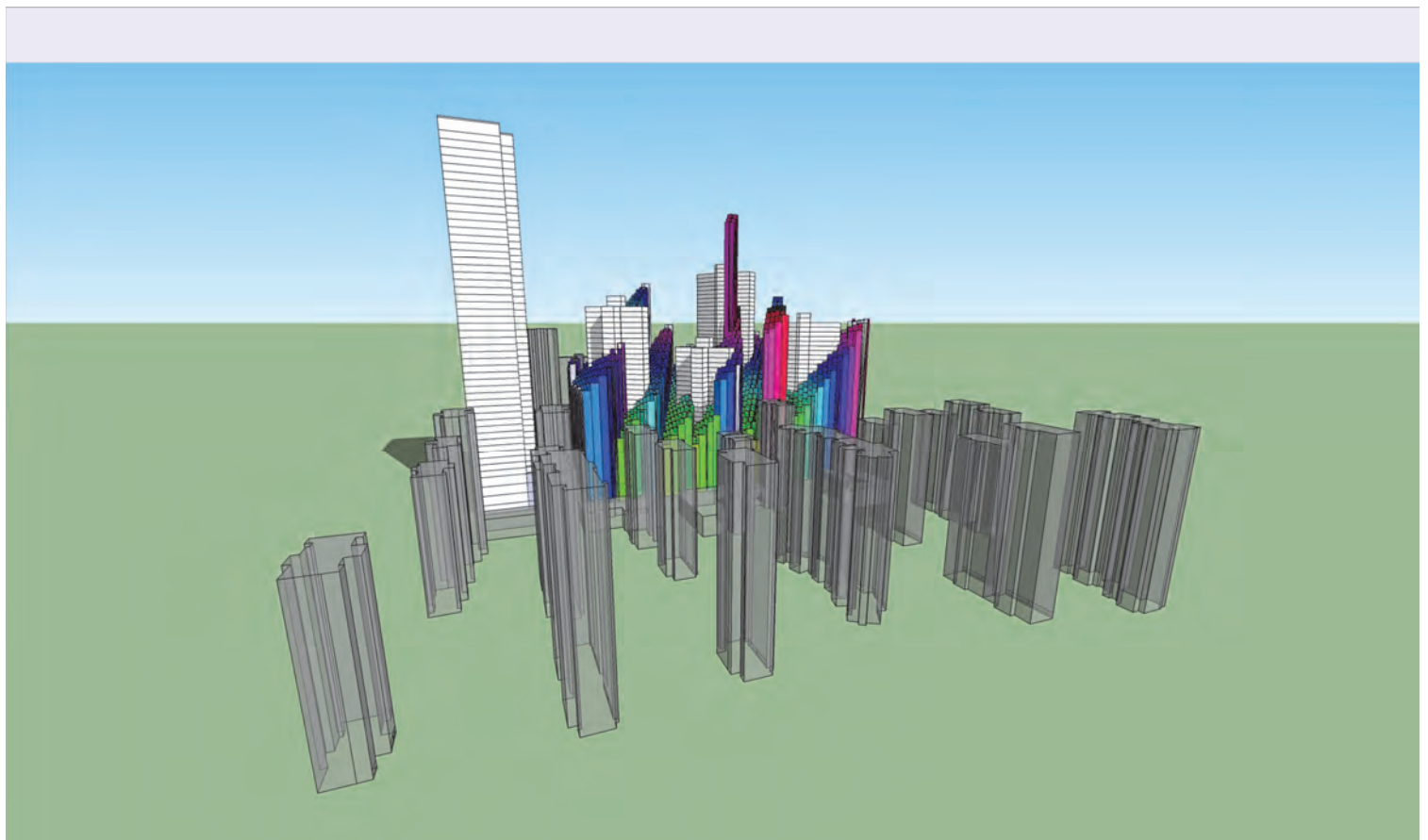
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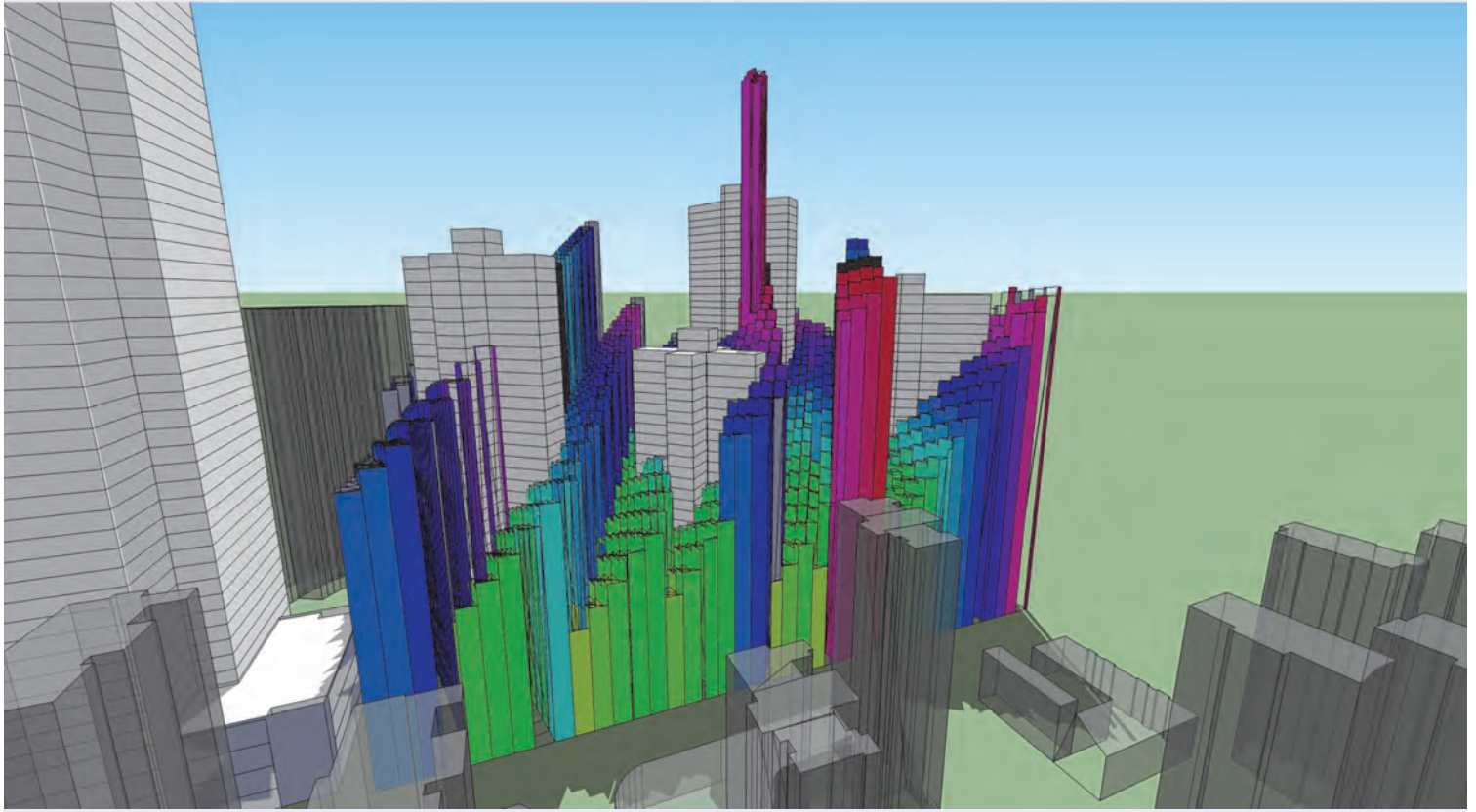
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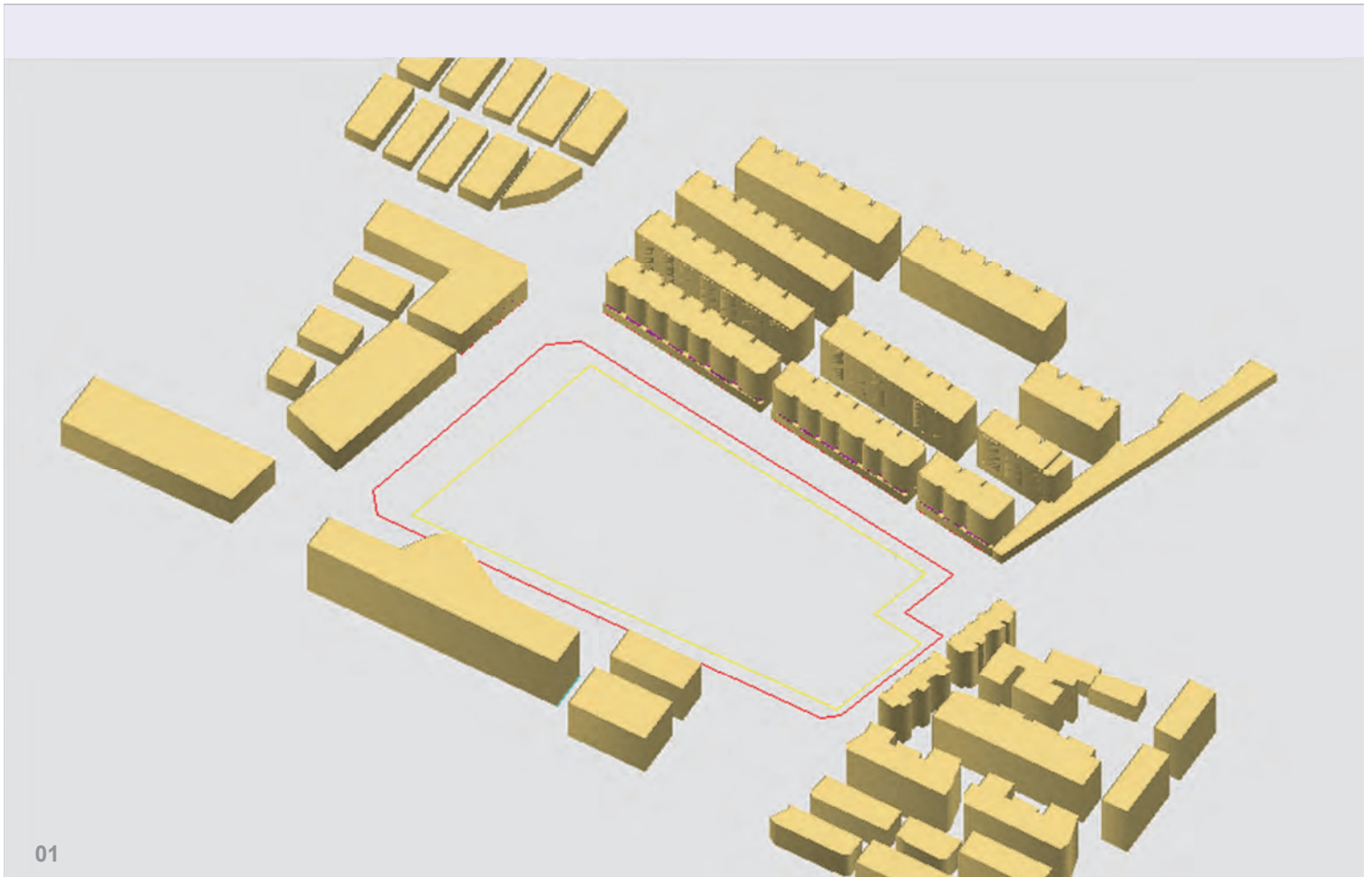
Source: Aedas



Source: Aedas

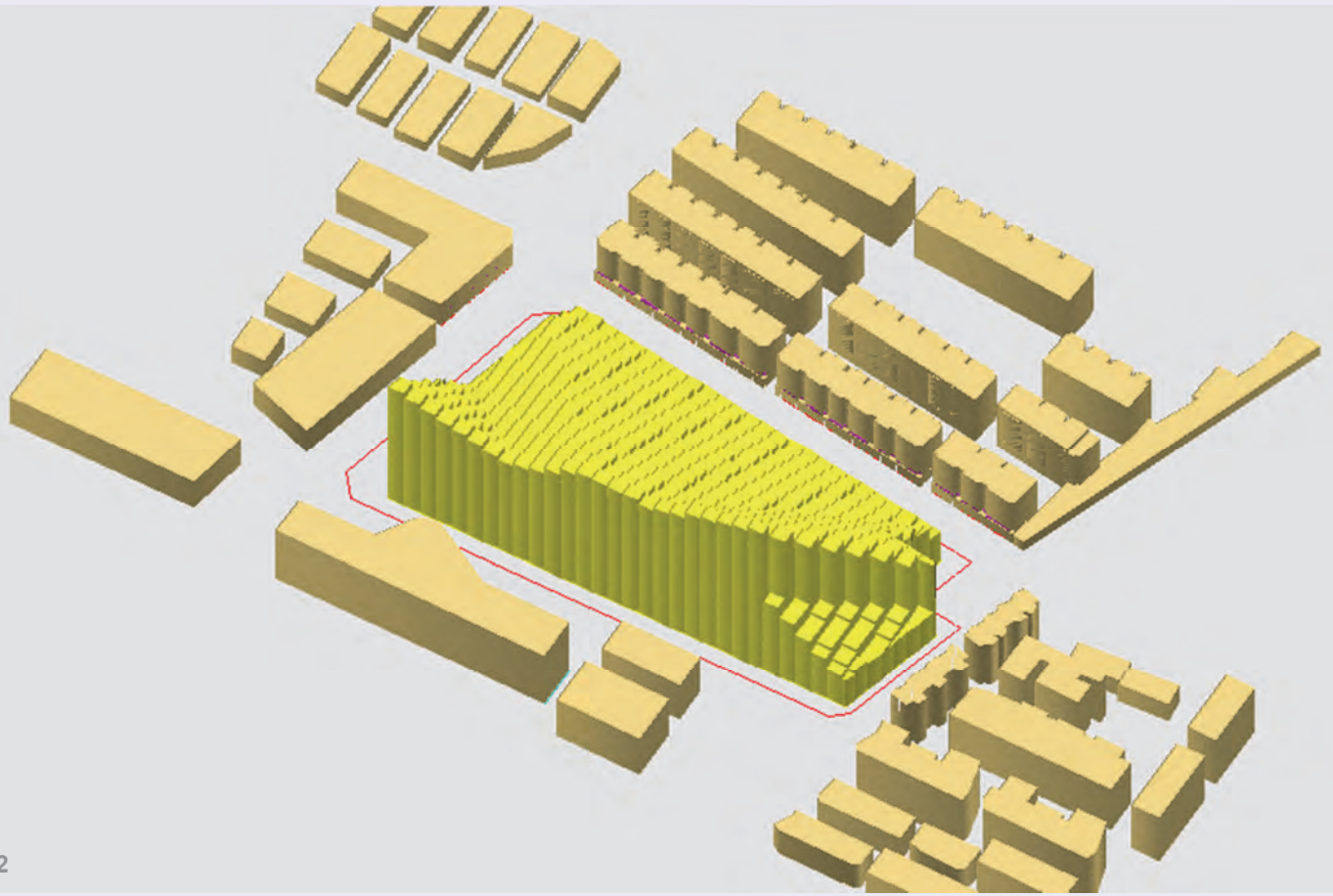


Source: Aedas



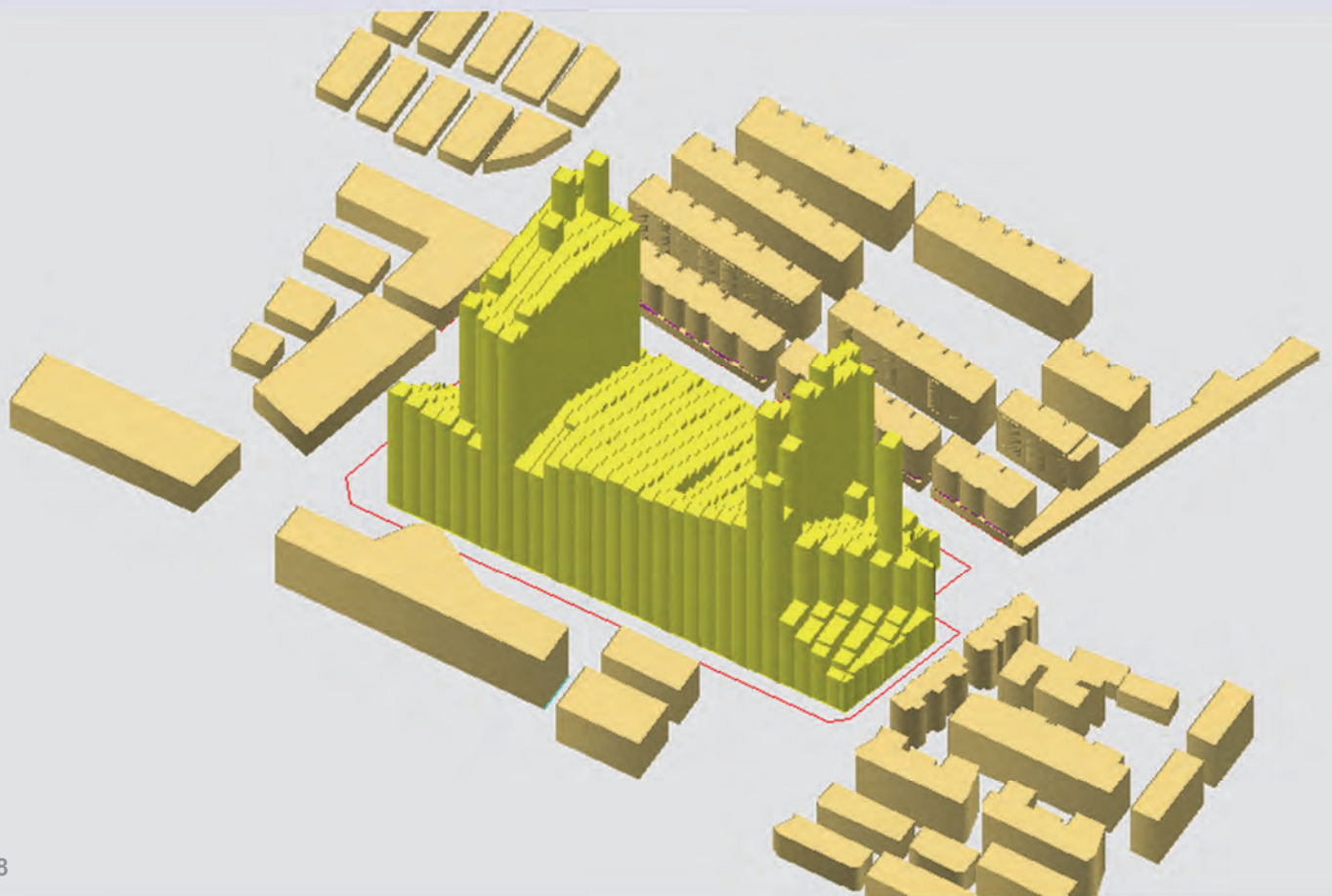
01

Source: Aedas



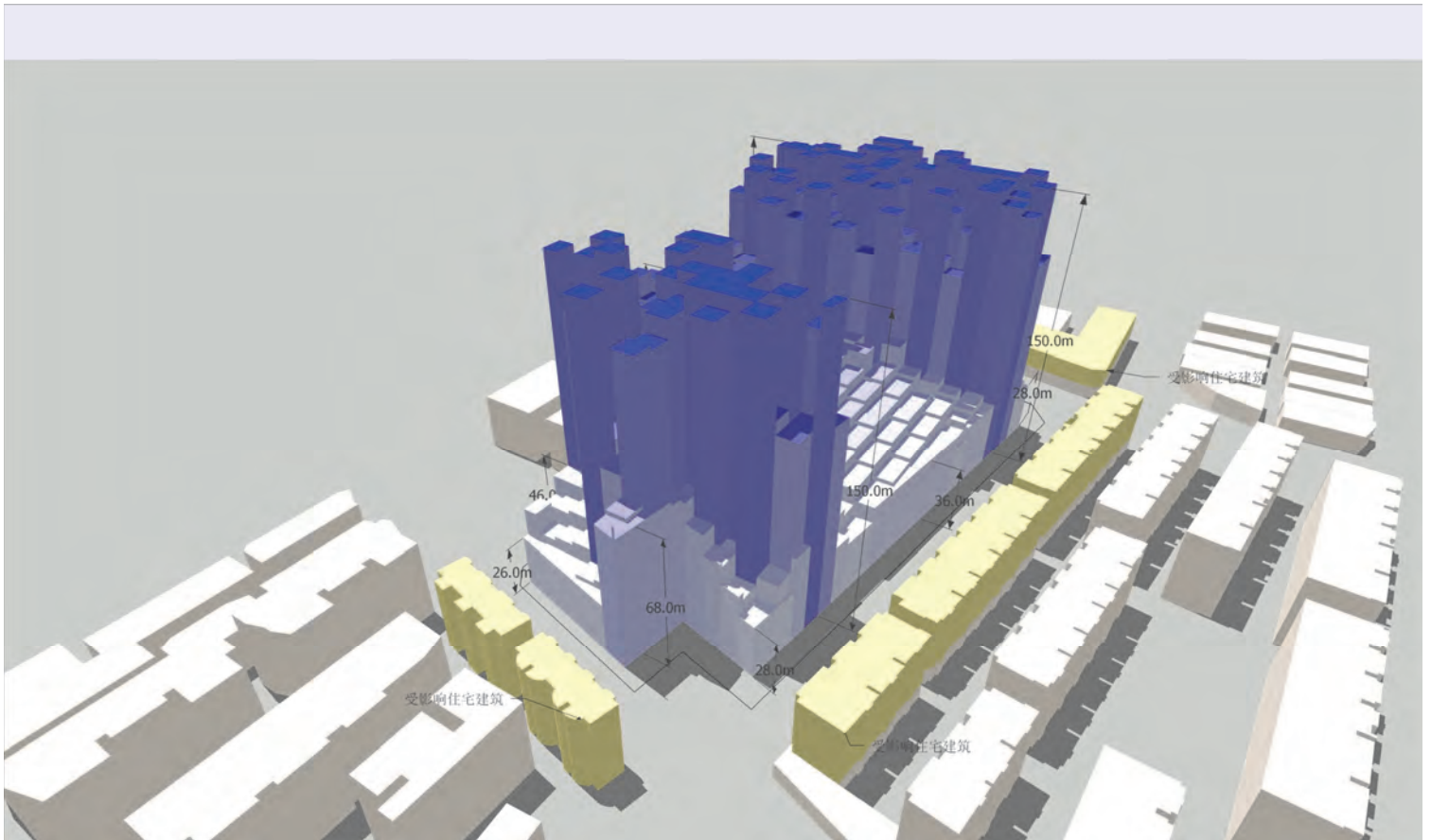
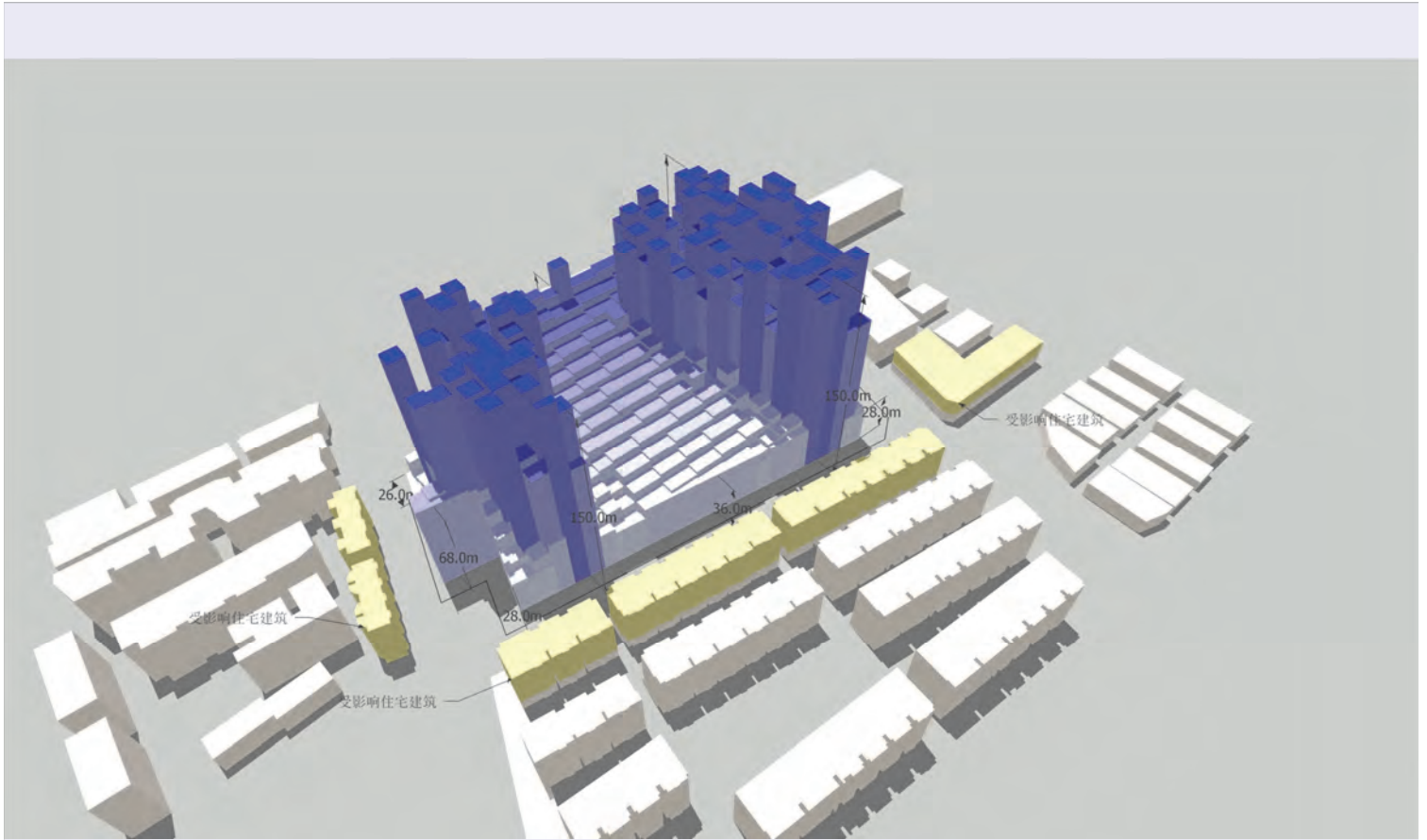
02

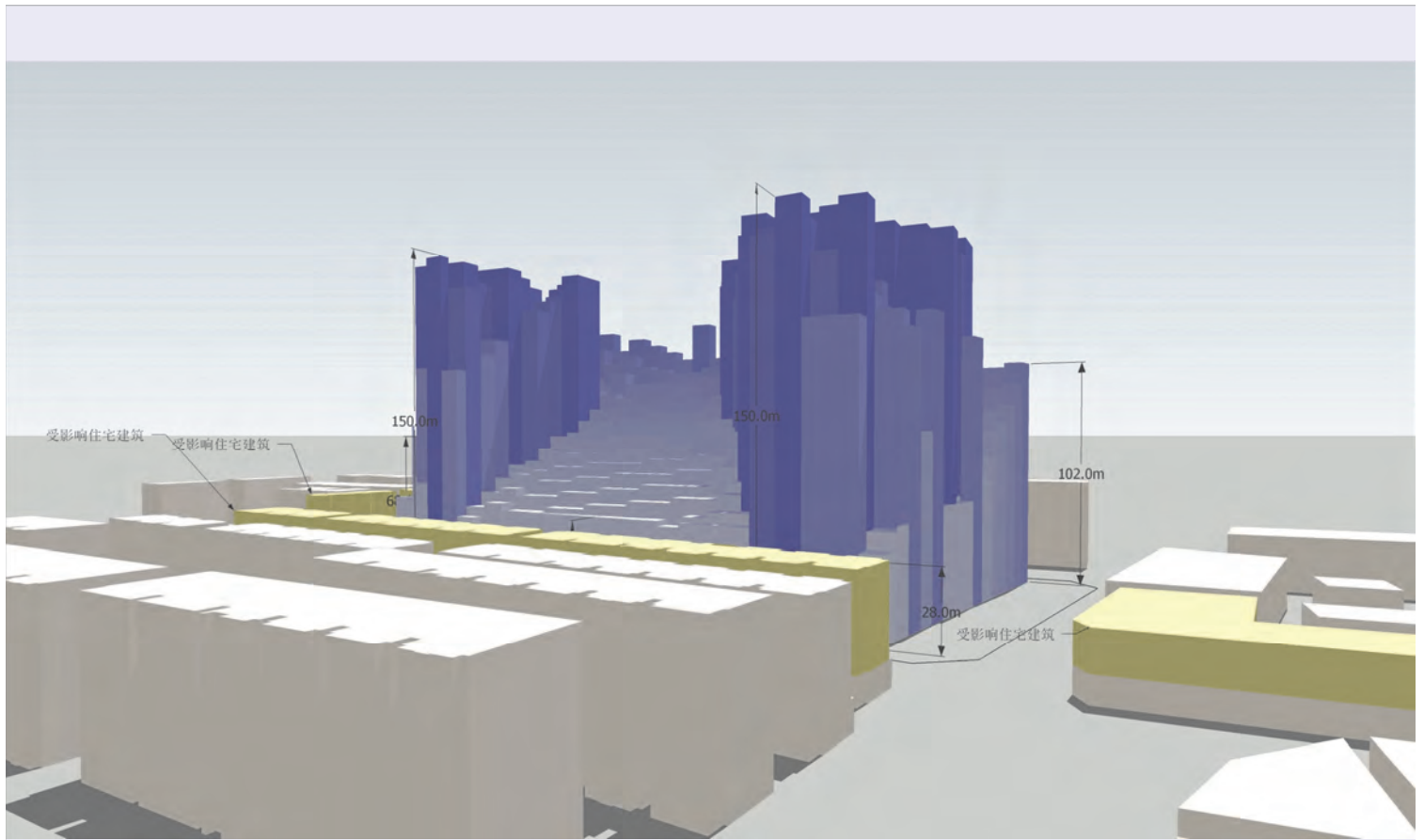
Source: Aedas



18

Source: Aedas





LEED® IN MOTION:

GREATER CHINA: CHINA, HONG KONG, TAIWAN



LEED-Certified Commercial Projects by Certification Level



CHINA: 41
HONG KONG: 8
TAIWAN: 6



CHINA: 112
HONG KONG: 20
TAIWAN: 3



CHINA: 281
HONG KONG: 33
TAIWAN: 30



CHINA: 29
HONG KONG: 12
TAIWAN: 7

source: www.usgbc.org

Olympia 66 (Dalian / PRC)



source: www.usgbc.org

Olympia 66 (Dalian / PRC)



source: www.usgbc.org

Olympia 66 (Dalian / PRC)



source: www.usgbc.org

USGBC Dynamic Plaque / “ARC”

(Living Green Building - real-time monitoring & reporting)



source: www.usgbc.org

USGBC Dynamic Plaque / “ARC”

– Real-time Monitoring & Measurements



source: www.usgbc.org

USGBC Dynamic Plaque / "ARC"

– Real-time Monitoring & Measurements



source: www.usgbc.org





WELL provides resources for creating healthy environments. It introduces a model for design and construction that codifies best practices and presents a performance-based system for measuring, certifying and monitoring features of the built environment that impact human health.

Source: www.wellcertified.com



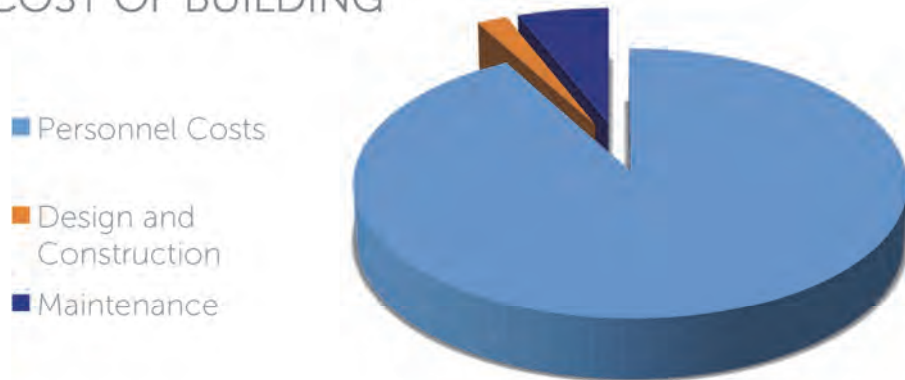
Source: www.wellcertified.com

INVEST IN PEOPLE

FOR RETURN ON INVESTMENT

When viewed over an extended period of time, the majority of corporate expenses incurred within commercial buildings can be attributed to personnel costs. Addressing human health in the built environment can reduce expenses associated with personnel throughout the lifetime of the building.

30 YEAR COST OF BUILDING



Source: www.wellcertified.com



Source: www.wellcertified.com

Improved Performance



Executives estimate that a **22 % INCREASE IN COMPANIES' PERFORMANCE** can be achieved if their offices are well designed.



The Gensler Design + Performance Index, The U.S. Workplace Survey (2006), www.gensler.com

Source: www.wellcertified.com

AIR

WATER

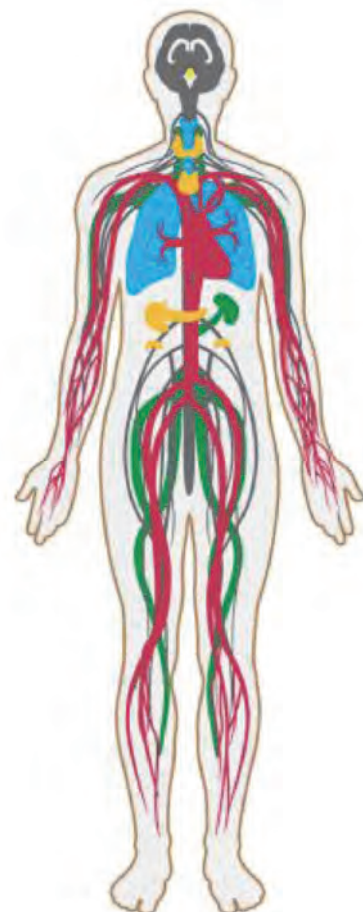
NOURISHMENT

LIGHT

FITNESS

COMFORT

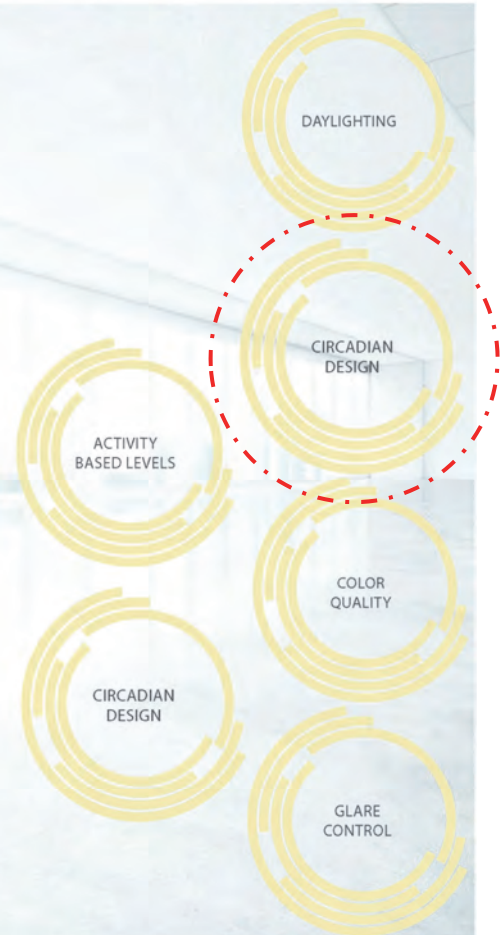
MIND



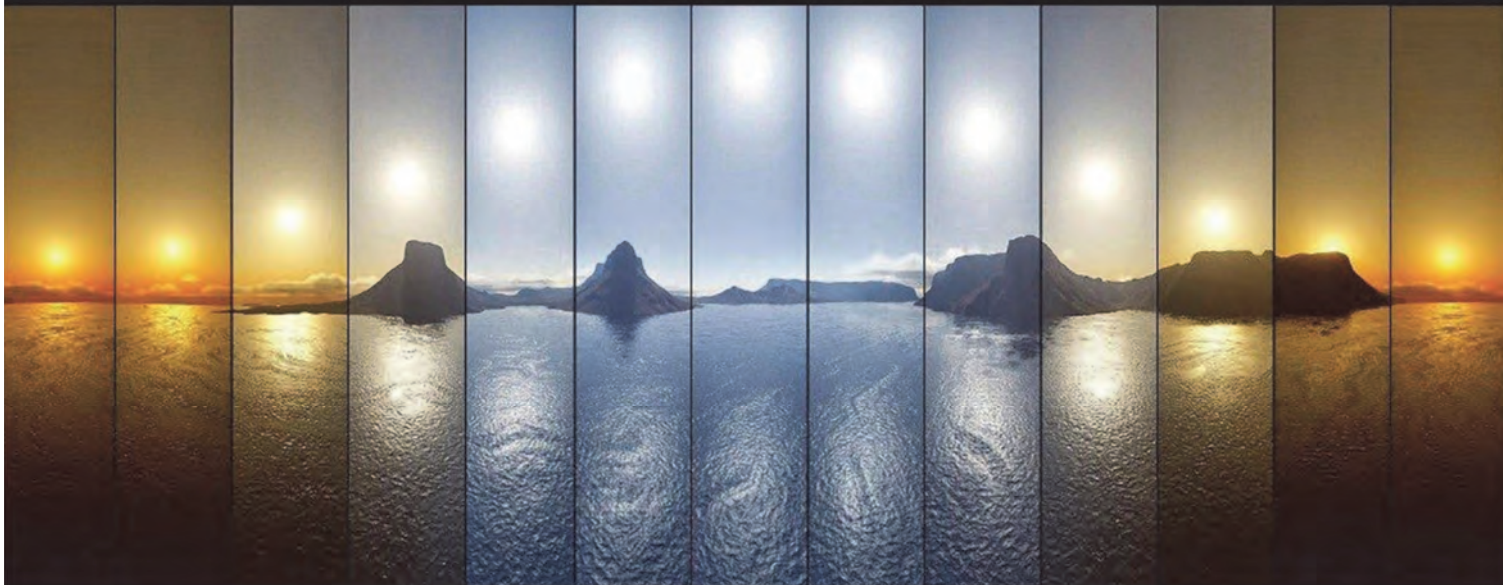
Source: www.wellcertified.com

LIGHT

The WELL Building Standard for Light establishes requirements to help reinforce the body's circadian rhythm. Requirements for window performance and design, light output and lighting controls, as well as task-appropriate illumination levels are included to improve energy, mood, and productivity.

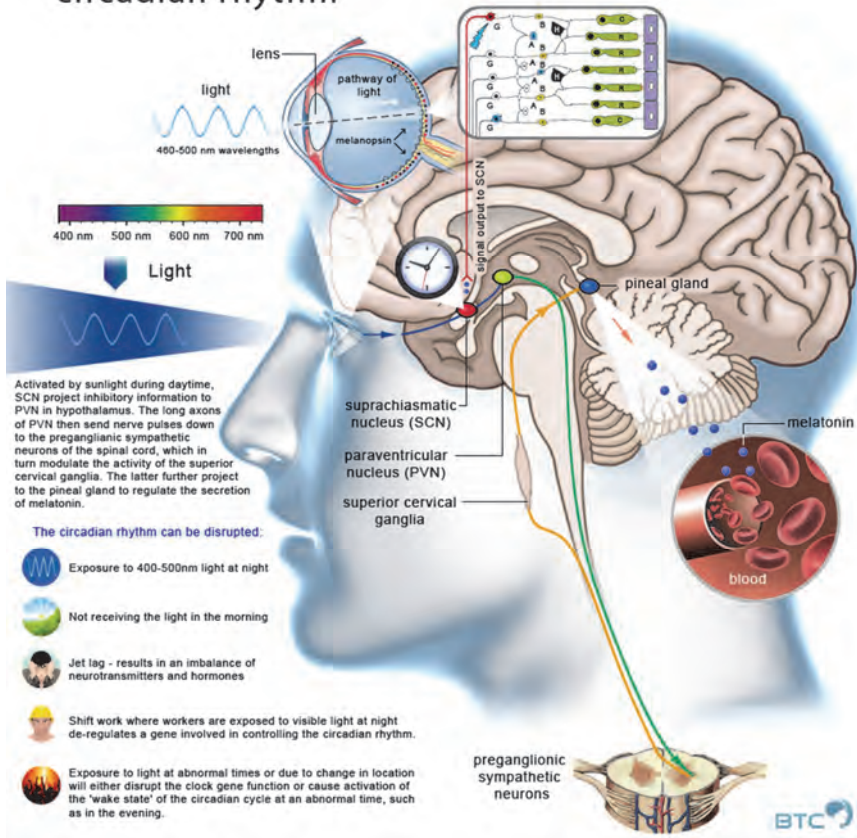


Source: www.wellcertified.com

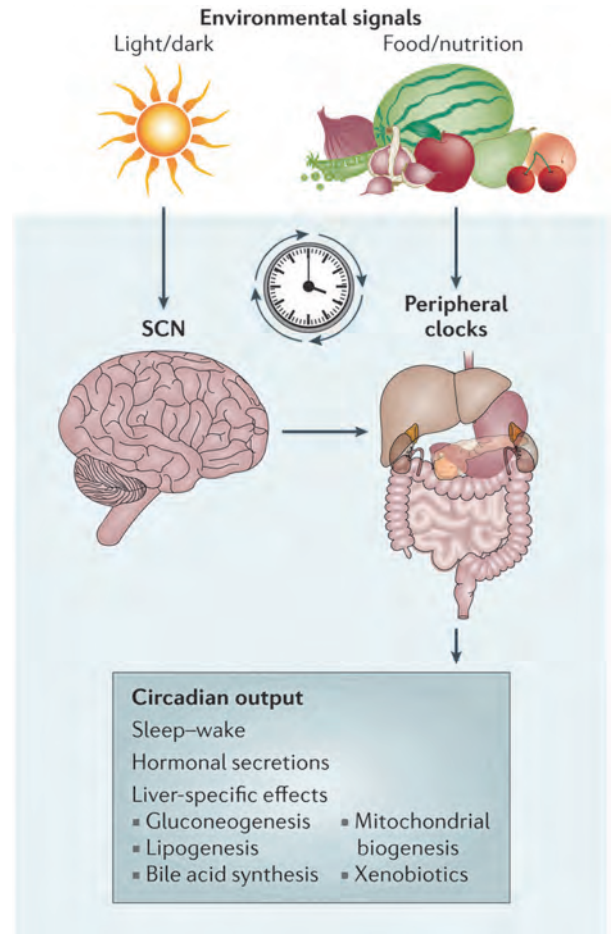


Source: Nature Reviews

circadian rhythm

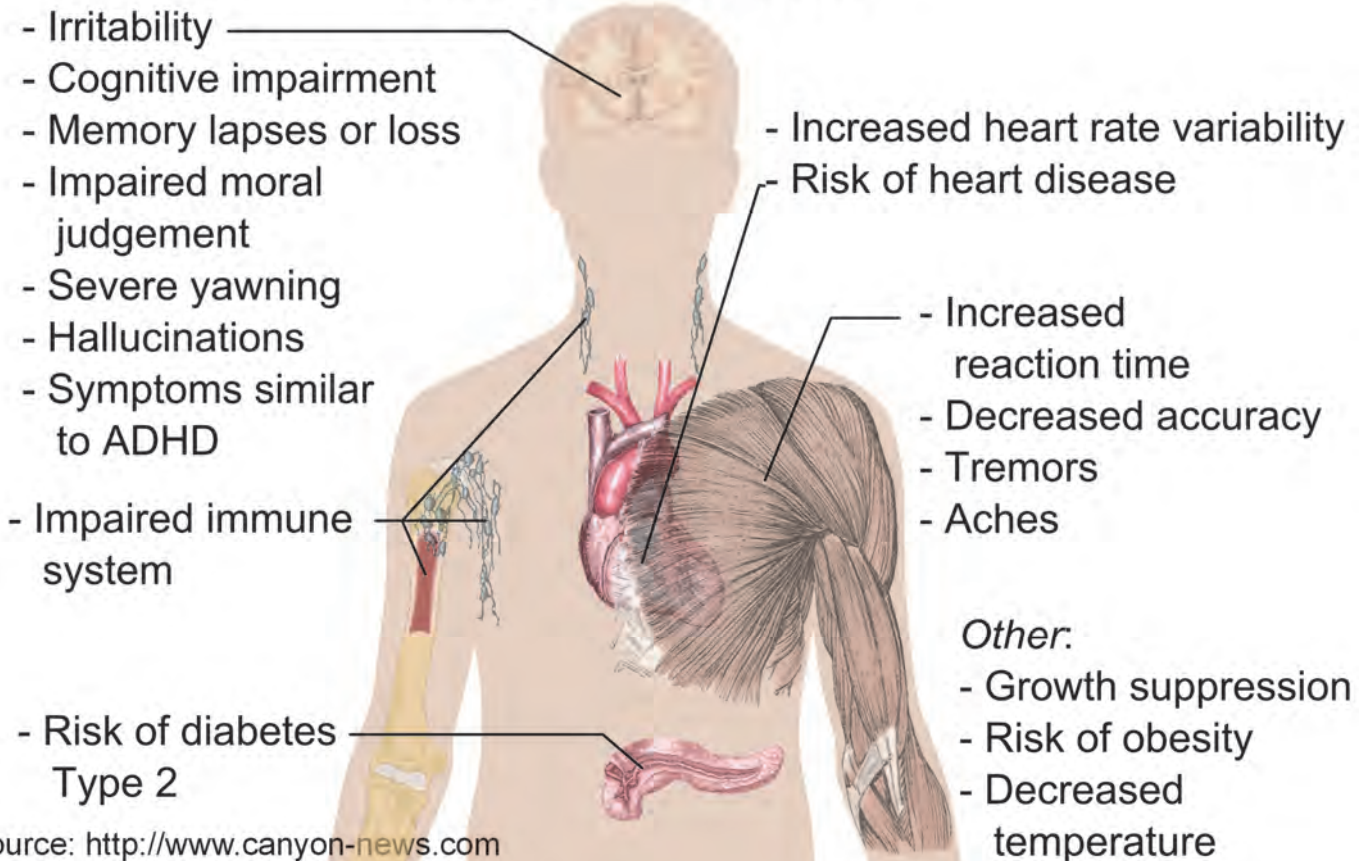


Source: s-media-cache-ak0.pinimg.com



Source: Nature Reviews

Effects of Sleep deprivation



Source: <http://www.canyon-news.com>



5500K, Full on 100%



3800K, Dimmed to 75%



2400K, Dimmed to 50%

Source: <http://www.illuminatingasia.com>



Source: Heavn One

FITNESS

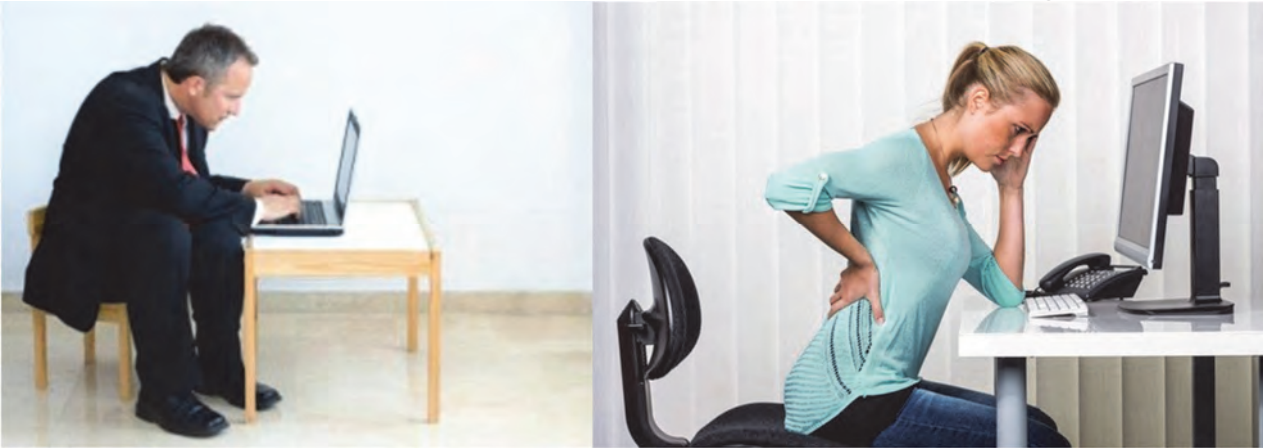
The WELL Building Standard for Fitness establishes requirements utilizing building design technologies and knowledge-based strategies to encourage physical activity. Requirements are designed to provide numerous opportunities for activity and exertion, enabling occupants to accommodate fitness regimens within their daily lifestyle.



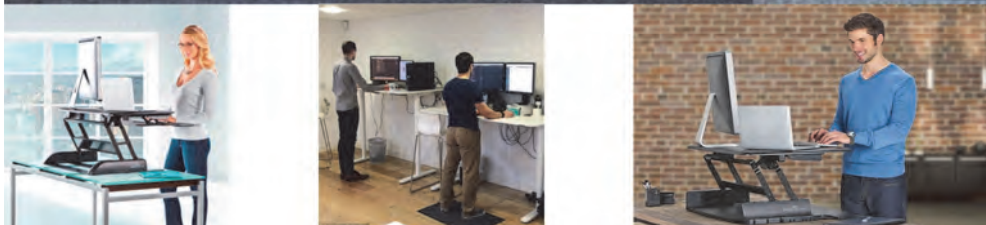
Source: www.wellcertified.com

“Physical inactivity poses one of the biggest modern threats to public health. It is an independent risk factor for numerous chronic diseases and is estimated to be responsible for 30% of ischemic heart disease, 27% of type 2 diabetes and 21-25% of breast and colon cancer cases. Lack of physical activity can also increase the odds of having a stroke by 20-30% and shave off 3-5 years of life.”

– WELL Building Standard



Source: www.wellcertified.com



Source: www.wellcertified.com



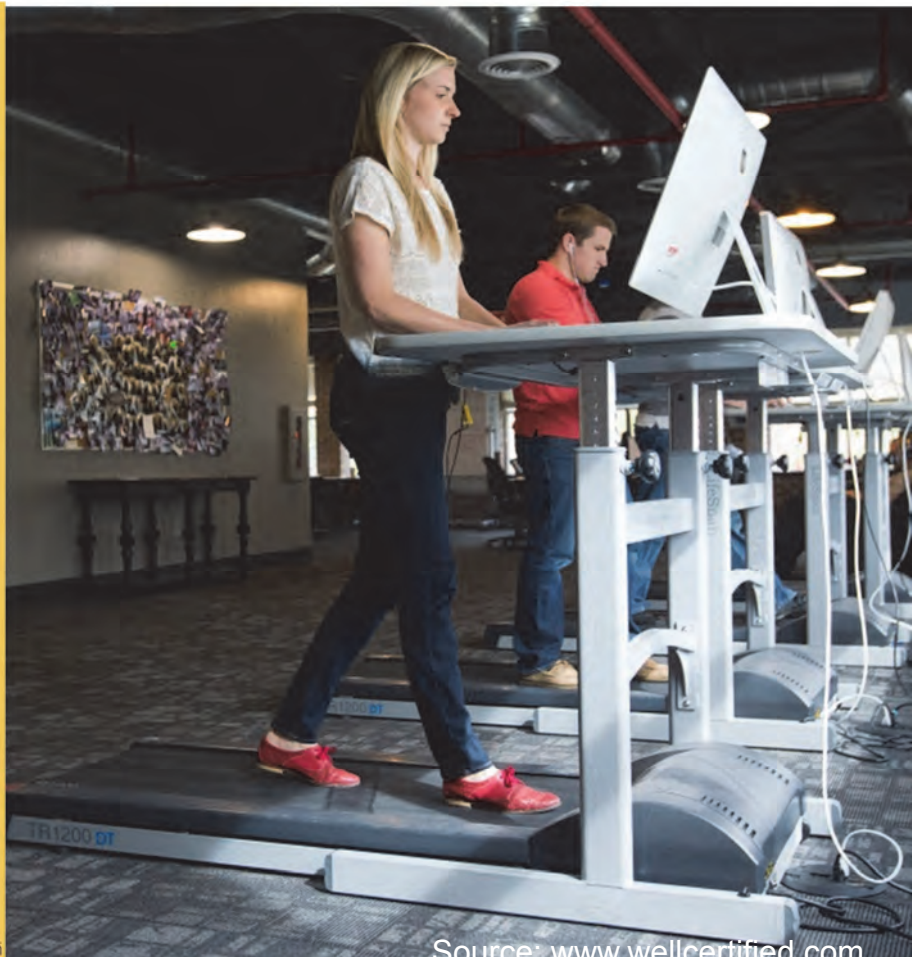
Source: www.wellcertified.com

walk
your way to health

ONLY 30 MINUTES OF WALKING A DAY...

- ALLEVIATES depression and fatigue
- INCREASES attention and decision making
- LIMITS chronic disease
- HALVES risk of alzheimer's
- LOWERS RISK of heart disease
- IMPROVES blood pressure by 5 points
- WORKS arm and shoulder muscles
- REDUCES lower back pain
- LIMITS colon cancer risk by 40%
- STRENGTHENS legs, quads, hips, hamstring
- improves FITNESS
- KEEPS WEIGHT in check

WalkBoston for Health (2015)



Source: www.wellcertified.com



Source: www.wellcertified.com

Green Building Design A Business Case Study on the Integration of Green BIM towards Sustainable Architectural Design

Adjunct Assistant Professor
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(2009 - present)

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(2012 - 2016)

Dr. Benny CHOW
Director of Sustainability
AEDAS

Adjunct Associate Professor
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(2011 - 2016)

AEDAS