US-China Green Building Best Practice Forum

中美绿色建筑实践分享论坛

主办单位：
中美能源合作项目
中国城市科学研究会绿色建筑研究中心
美国国家标准化机构

支持单位：
美国贸易发展署
中国城市科学研究会
美国驻广州总领事馆

会议日程

08:00-08:20	注册入场 马莉 | 中美能源合作项目执行主任（主持人）
08:20-08:25	大会开幕致辞 徐文珍 | 中国城市科学研究会副秘书长
08:25-08:30	特邀嘉宾致辞 Steven Winkates（温凯时）| 美国贸易发展署东亚区项目管理主任
08:30-08:35	特邀嘉宾致辞 住建部领导
08:35-08:40	特邀嘉宾致辞 Elizabeth Shieh （谢贝晴）美国广州领事馆首席商务领事
08:40-09:00	主题演讲 LEED for Cities and SITES-Two Great Tools for Cities and Campuses Mark Ginsberg（马克）| 美国绿建委资深顾问
09:00-09:50	中美绿色建筑专题研讨会一：“中美建筑的绿色设计和绿色产品实践”（50分钟） 对话嘉宾一：李忠| 美国欧特克软件-工程建设技术经理 对话嘉宾二：程大章| 同济大学电子与信息技术系原主任、教授；智能建筑信息化专家 对话嘉宾三：白路| 美国江森自控-全球能源解决方案中国总监 对话嘉宾四：周清理| 美国索乐图日光科技-总经理
09:50-10:40	中美绿色建筑专题研讨会二：“绿色建筑的标准和认证”（50分钟） 对话嘉宾一：许方| 美国国家标准协会-中国代表处首席代表 对话嘉宾二：孟冲| 中国城市科学研究会绿色建筑研究中心-常务副主任 对话嘉宾三：黄逸钧| 美国联合技术君凯环境管理咨询（上海）有限公司-总经理 对话嘉宾四：Tony Armstrong（东尼）| 美国IWBI亚洲区高级副总裁
10:40-11:20	中美绿色建筑专题研讨会三：“绿色建筑的应用和未来”（50分钟） 对话嘉宾一：李昶| 万科集团雄安绿色研究发展中心总监 对话嘉宾二：郭宏光| 朗诗绿色 集团有限公司绿建研发室研发总经理 对话嘉宾三：冯威| 美国劳伦斯伯克利国家实验室能源技术部中国能源研究室首席研究员 对话嘉宾四：待定
11:20-11:30	大会总结发言

U. S. Trade and Development Agency

The U.S. Trade and Development Agency (USTDA) helps to promote U.S. technologies and expertise for priority development projects in emerging economies. USTDA links U.S. businesses to export opportunities by funding project planning activities, pilot projects, and reverse trade missions while creating sustainable infrastructure and economic growth in partner countries.
USTDA promotes economic growth in emerging economies by facilitating the participation of U.S. businesses in the planning and execution of priority development projects in host countries. The Agency’ s objectives are to help build the infrastructure for trade, match U.S. technological expertise with host country development needs, and help create lasting business partnerships between the United States and emerging economies.

USTDA's Program Activities

Project Development

Project identification and investment analysis generally involves technical assistance, feasibility studies and pilot projects that support large investments in infrastructure that contribute to host country development. Key sectors in China include the transportation, energy, and healthcare sectors.

Trade Capacity Building and Sector Development

Trade capacity building and sector development assistance supports the establishment of industry standards, rules and regulations, market liberalization and other policy reform. In China, USTDA has supported activities to support increased protection of intellectual property rights, fair and transparent government procurement practices, science-based agricultural biotechnology regulations, and standards across a wide range of industry sectors.

International Business Partnership Program

Under the Agency’ s International Business Partnership Program, USTDA has increased its support for programs designed to bring procurement officials to the United States to witness U.S. technology and ingenuity firsthand and develop the relationships with U.S. companies necessary to spur increased commercial cooperation with emerging economies. These investments include reverse trade missions, technology demonstrations, training and specialized sector-specific workshops and conferences.

Cooperation Programs

The Agency’ s success in China is due in part to the public-private cooperative programs that USTDA supports in country. These programs provide a forum wherein government agencies and private companies from both the U.S. and China can share technical, policy, and commercial knowledge relevant to a specific field. USTDA has successfully established programs based on this model in the aviation, standards and conformity assessment, energy, and healthcare sectors.
By adapting to the evolving needs of China’ s market and closely coordinating with Chinese decision makers, these public-private partnerships have enjoyed long-term success, providing continued trade opportunities and enhancing the development of China’ s key industries.

美国贸易发展署

美国贸易发展署(USTDA) 致力于在新兴经济体推动经济发展和美国的商业利益。美国贸易发展署通过对项目前期，试点项目以及反向代表团赴美考察等形式的资金资助, 达到在合作伙伴国家推动可持续性基础设施和经济增长的同时帮助美国企业寻找出口机会。

美国贸易发展署鼓励美国公司积极参与新兴经济体项目所在国重点发展领域里的项目规划和实施过程中的机会。目的是帮助美国有技术优势的公司配合项目所在国的发展寻求契机，并建立长期持久合作关系。

美国贸易发展署的项目活动

项目开发

美国贸易发展署支持的项目确认和投资分析通常为了支持项目所在国大型基础设施项目投资决策前以所需要的技术援助，可行性研究分析和试点项目等。在中国的项目集中在交通，能源和医疗卫生领域。

能力建设和行业发展

能力建设和行业发展是为了帮助推动建立行业标准，法规等相关政策需求的活动。在中国，美国贸易发展署支持过的项目内容涉及知识产权，公平透明政府采购，以科学为基础的农业生物技术规范，以及涉及其他更宽泛领域涉及行业标准的内容。

国际商业伙伴关系项目

通过国际商业伙伴关系项目，美国贸易发展署加大资金投入力度，组织更多灵活多样的赴美考察团，技术交流/研讨会和培训等，选择特定的一些行业，帮助中方人员了解美国技术，掌握第一手资料，加深对美国企业的了解并能推动潜在的商务合作。

政府企业合作平台

美国贸易发展署在中国取得成功的部分原因是与其他相关机构共同支持了政府企业合作项目的平台。在这个平台上，美国和中国的政府机构和私营企业均可以共享在特定领域的技术、政策和商业知识。美国贸易发展署已经成功地在航空、标准合格评定、能源和医疗保健等行业推动了该模式。

American National Standards Institute

As the voice of the U.S. standards and conformity assessment system, the American National Standards Institute (ANSI) empowers its members and constituents to strengthen the U.S. marketplace position in the global economy while helping to assure the safety and health of consumers and the protection of the environment.

The Institute oversees the creation, promulgation and use of thousands of norms and guidelines that directly impact businesses in nearly every sector: from acoustical devices to construction equipment, from dairy and livestock production to energy distribution, and many more. ANSI is also actively engaged in accrediting programs that assess conformance to standards – including globally-recognized cross-sector programs such as the ISO 9000 (quality) and ISO 14000 (environmental) management systems.

ANSI has served in its capacity as administrator and coordinator of the United States private sector voluntary standardization system for more than 90 years. Founded in 1918 by five engineering societies and three government agencies, the Institute remains a private, nonprofit membership organization supported by a diverse constituency of private and public sector organizations.

Throughout its history, ANSI has maintained as its primary goal the enhancement of global competitiveness of U.S. business and the American quality of life by promoting and facilitating voluntary consensus standards and conformity assessment systems and promoting their integrity. The Institute represents the interests of its nearly 1,000 companies, organization, government agency, institutional and international members through its office in New York City, and its headquarters in Washington, D.C.

美国国家标准化机构

American National Standards Institute（ANSI——美国国家标准化机构）是由公司、政府和其他成员组成的自愿组织，负责协商与标准有关的活动，审议美国国家标准，并努力提高美国在国际标准化组织中的地位。ANSI是IEC和ISO的5个常任理事成员之一，也是4个理事局成员之一，参加79%的ISO/TC的活动，参加89%的IEC/TC活动。ANSI 是泛美技术标准委员会（COPANT）和太平洋地区标准会议（PASC）的成员。

美国国家标准学会（American National Standards Institute: ANSI）成立于1918年。当时，美国的许多企业和专业技术团体，已开始了标准化工作，但因彼此间没有协调，存在不少矛盾和问题。为了进一步提高效率，数百个科技学会、协会组织和团体，均认为有必要成立一个专门的标准化机构，并制订统一的通用标准。1918年，美国材料试验协会（ASTM）、与美国机械工程师协会（ASME）、美国矿业与冶金工程师协会（ASMME）、美国土木工程师协会（ASCE）、美国电气工程师协会（AIEE）等组织，共同成立了美国工程标准委员会（AESC）。美国政府的三个部（商务部、陆军部、海军部）也参与了该委员会的筹备工作。1928年，美国工程标准委员会改组为美国标准学会（ASA）。为致力于国际标准化事业和消费品方面的标准化，1966年8月，又改组为美利坚合众国标准学会（USASI）。1969年10月6日改成现名：美国国家标准学会（ANSI）。

美国国家标准学会是非赢利性质的民间标准化组织，是美国国家标准化活动的中心，许多美国标准化学协会的标准制修订都同它进行联合，ANSI批准标准成为美国国家标准，但它本身不制定标准，标准是由相应的标准化团体和技术团体及行业协会和自愿将标准送交给ANSI批准的组织来制定，同时ANSI起到了联邦政府和民间的标准系统之间的协调作用，指导全国标准化活动，ANSI 遵循自愿性、公开性、透明性、协商一致性的原则，采用3种方式制定、审批ANSI标准。

ANSI现有工业学、协会等团体会员约200个，公司（企业）会员约1400个。领导机构是由主席、副主席及50名高级业务代表组成的董事会，行使领导权。董事会闭会期间，由执行委员会行使职权，执行委员会下设标准评审委员会，由15人组成。总部设在纽约，卫星办公室设在华盛顿。

美中标准与合格评定合作项目

由美国贸易发展署 (USTDA) 提供资助、美国国家标准协会 (ANSI) 负责协调的美中标准与合格评定合作项目 (SCCP) 在以下几个方面为美国和中国相关行业和政府代表提供了一个论坛：

- 在标准、合格评定以及技术法规等领域的合作；
- 为促进美中在标准、合格评定以及技术法规等领域的技术交流建立必要的联系；
- 及时交流关于标准、合格评定以及技术法规等领域的最新议题和发展情况的相关信息

根据 SCCP 项目规定，从 2013 年开始的三年内，ANSI 将在中国协调举办20场研讨会。根据美国私营业界相关组织的建议，研讨会内容将覆盖不同的行业和领域。研讨会的主题将由相关行业组织、ANSI 以及 USTDA 协调选定。

欲了解该项目的更多情况或有意赞助或参与该项目，请访问下列网站：

www.standardsportal.org/us-chinasccp

了解其他信息，请联系
Ms. Madeleine McDougall
项目经 理
美国国家标准协会(ANSI)
1899 L St. NW – Eleventh Floor
Washington, DC 20036

T: 202.331.3624
F: 202.293.9287
E: us-chinasccp@ansi.org

U.S.-China Standards and Conformance Cooperation Program

Sponsored by the U.S. Trade Development Agency (USTDA) and coordinated by the American National Standards Institute (ANSI), the **U.S.-China Standards and Conformance Cooperation Program** (SCCP) provides a forum through which U.S. and Chinese industry and government representatives can:

- Cooperate on issues relating to standards, conformity assessment, and technical regulations;
- Foster the relationships necessary to facilitate U.S.-China technical exchange on standards, conformity assessment, and technical regulations; and
- Exchange up-to-date information on the latest issues and developments relating to standards, conformity assessment, and technical regulations.

Beginning in 2013, ANSI will coordinate 20 workshops over a 3-year period in China under the SCCP. The workshops will cover a wide range of sectors, as proposed by interested U.S. private-sector organizations. Workshop topics will be chosen in coordination with relevant industry associations, ANSI, and USTDA.

To learn more about the U.S.-China SCCP or to express interest in sponsoring or participating in a workshop, please visit our website at:

www.standardsportal.org/us-chinasccp

FOR MORE INFORMATION
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开幕致辞

马莉 | 中美能源合作项目执行主任

Ma Li | Executive Director, US-China Energy Cooperation Program (ECP)

嘉宾致辞

温凯时 | 美国贸易发展署东亚区项目管理主任

Steven Winkates | Director of Program Management, East Asia Region, U.S. Trade and Development Agency (USTDA)

嘉宾致辞

谢贝晴 | 美国驻广州总领事馆首席商务领事

Elizabeth Shieh | Principal Commercial Officer, U.S. Consulate General Guangzhou

LEED for Cities
LEED 城市

A New Tool to Help Cities
Measure and Track Performance

一个全新的城市运营与管理工具，帮助城市持续衡量、监测发展状况。

Cultivate Sustainable Cities & Communities

营造可持续的城市&社区

LEED for Cities:
LEED 城市

- ✓ Supports continuous progress toward a better city & a higher quality of life
- ✓ 旨在让城市变得更美好，为居民提供更好的生活质量
- ✓ Helps a city set performance goals & implement strategies to reach those goals
- ✓ 帮助城市设立发展目标，并执行实现目标的行动措施
- ✓ Tracks performance data to measure progress towards those goals
- ✓ 持续监测城市运营数据，评估现状与目标的差距
- ✓ Leverage a wide range of rating system, standards, protocols & guidelines
- ✓ 协助城市利用各种评级系统、标准、协议和准则

The benefits:
益处：

- ✓ Demonstrate your city’ commitment to sustainability, human health, economic prosperity & quality of life
- ✓ 有助于兑现城市致力于可持续发展、提升人类健康、促进经济繁荣并改善居民生活质量的承诺
- ✓ Educate residents & visitors on the importance of sustainability measures
- ✓ 教育城市的居民与游客可持续发展措施的重要性
- ✓ Support voluntary reporting of achievements at the city-scale
- ✓ 支持城市自愿呈报已取得的成就

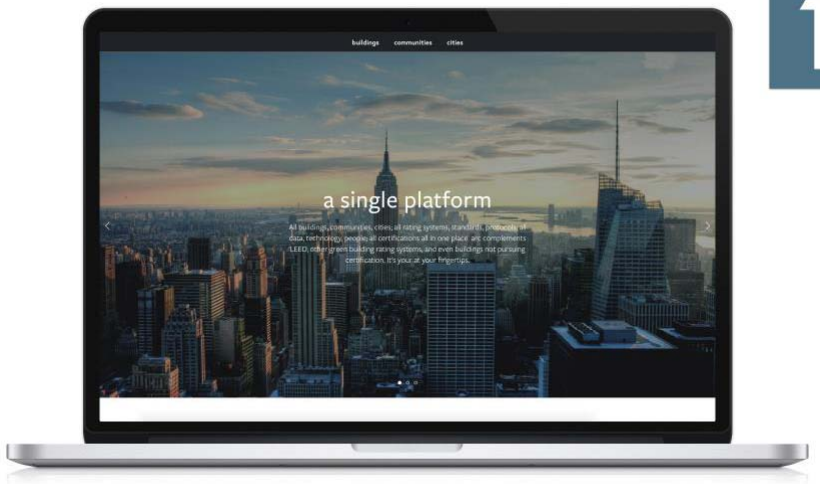
The benefits:
益处：

- ✓ Meet your city’s CO2 emissions reduction targets & support your country in meeting its climate action goals
- ✓ 帮助城市达到所设定的CO2减排目标，从而支持国家设定的气候行动目标
- ✓ Communicate your city’s sustainability performance consistently
- ✓ 城市可以与同在该平台的其它城市交流可持续发展的情况与目标
- ✓ Identify policies that will reduce the impact & improve the performance of your city over time.
- ✓ 通过制定城市范围的降低能源/资源消耗、减少对生态环境影响的相关政策，不断提升城市可持续发展水平

提升城市可持续发展水平，获得LEED城市认证：

Improve performance and certify to LEED for Cities:

Step 1: Register your city in arc	Step 2: Pre-certify	Step 3: Share data to receive a score	Step 4: GBCI review of data	Step 5: Certify to LEED for Cities
第一步：在Arc注册您的城市	第二步：申请预认证	第三步：提交运营数据获得分数	第四步：GBCI审核数据资料	第五步：获得LEED城市认证



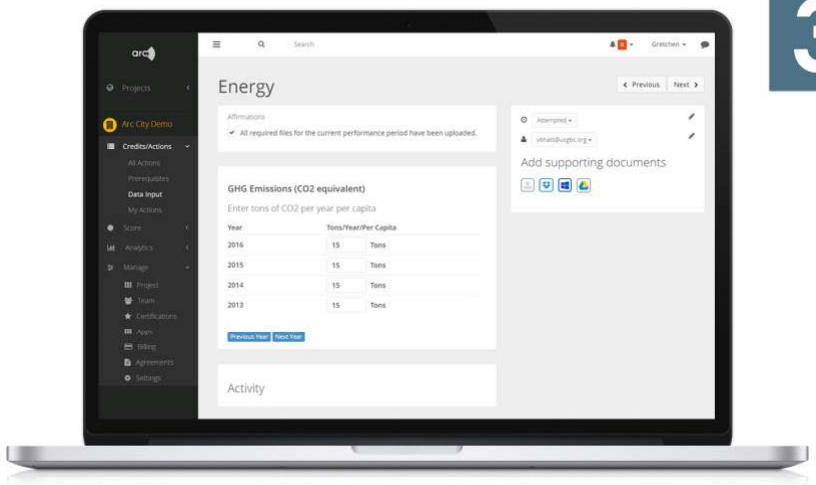
1

PreCertify 预认证

2

- ✓ Commit to track data & measure progress
  承诺持续监测关键指标数据并评估进展
- ✓ Identify city boundaries, governance structure, and stakeholders
  明确项目边界、行政结构与利益相关方
- ✓ Conduct goal setting/planning charrette/meeting
  开展目标设定/规划研讨会
- ✓ Share your plans, goals, and & strategies for sustainability and quality of life
  分享促进城市可持续发展、改善居民生活质量相关的目标、计划与策略等
- ✓ Outline education, awareness & community engagement plans
  制定公众教育、启发认知和社区参与的计划

3



4

5

- 城市需提供以下五大类所涵盖的关键指标数据以计算得分：
- City provides data across 5 categories to generate score:

• Energy	• 能源
• Water	• 水
• Waste	• 废弃物
• Transportation	• 交通
• Human Experience	• 人的体验

SCORING 1-100
得分 1–100

The Sustainable SITES Initiative

SITES: Ideal Tool To Support Sponge City
SITES: 支持海绵城市的理想工具

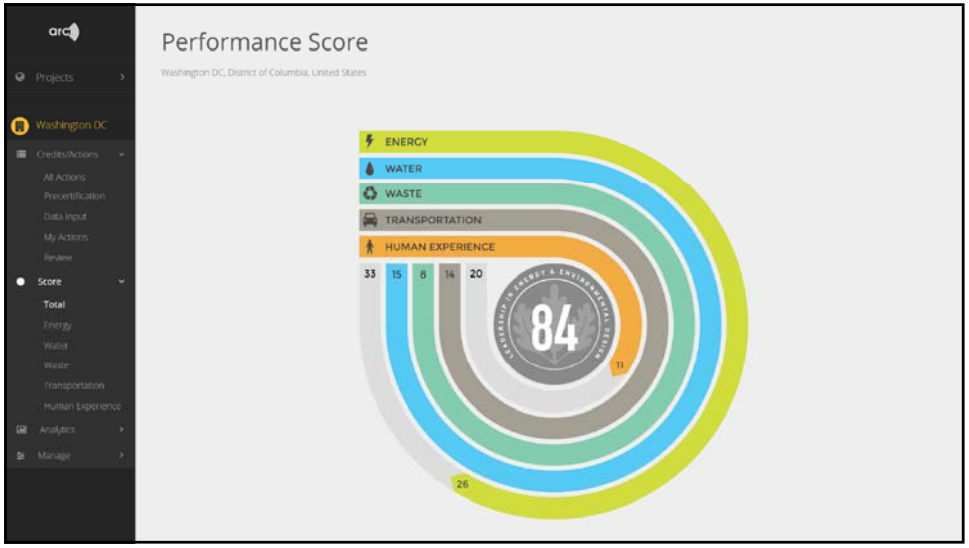
SITES-certified landscapes help reduce water demand, filter and reduce stormwater runoff, provide wildlife habitat, reduce energy consumption, improve air quality, improve human health and increase outdoor recreation opportunities.

SITES认证的景观有诸多优势，包括可有效地降低场址对灌溉的需求，过滤并减少雨水径流，为野生动物提供良好的栖息地，降低场址的能源消耗，提升周围环境的空气质量，为人们在户外活动提供舒适的环境，从而提升居民的健康水平。


The University of Texas at El Paso's
Campus Transformation Project
SITES Silver
美国德州大学厄尔巴索分校
校园升级项目
SITES银级认证
校园位于德州与墨西哥交界的沙漠地带，该地区每年雨量仅为9英寸，但由于之前的开发方式，导致地下室和街道积水严重，通过建设绿色基础设施解决了校园雨水径流和洪水的问题，同时重新融入地方生态系统。


Chicago Navy Pier
SITES Gold
芝加哥海军码头
SITES金级认证


WASHINGTON, D.C


Performance Score
Washington DC, District of Columbia, United States
Projects
Washington DC
Credits/Actions
All Actions
Precertification
Data Input
My Actions
Review
Score
Total
Energy
Water
Waste
Transportation
Human Experience
Analytics
Manage
ENERGY
WATER
WASTE
TRANSPORTATION
HUMAN EXPERIENCE
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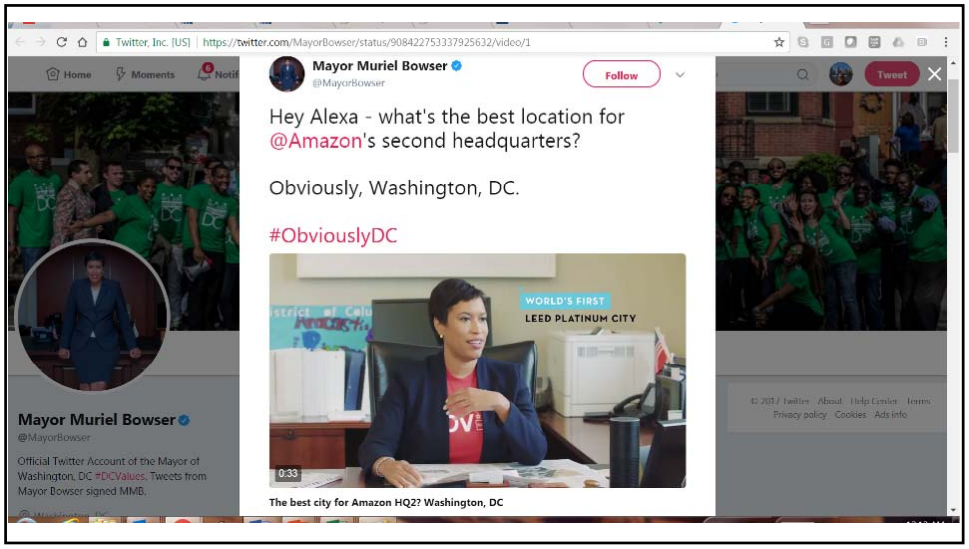
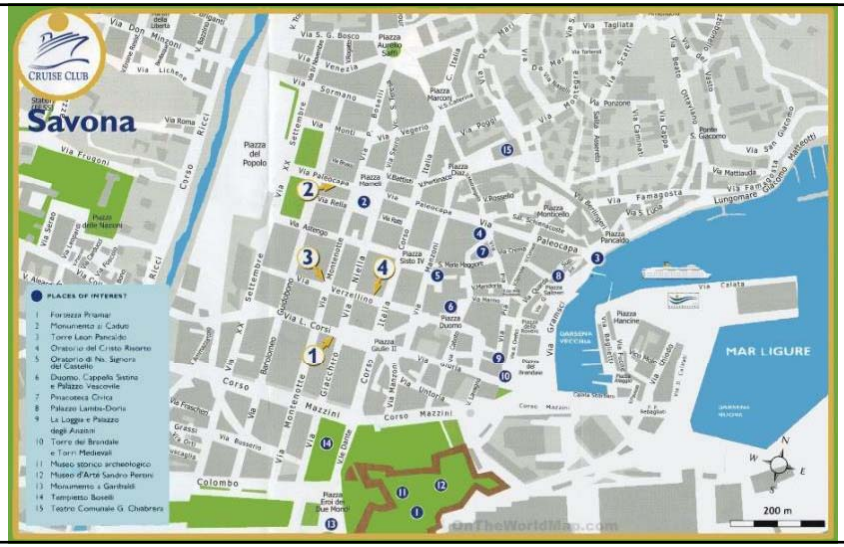


Songdo International Business District (Songdo IBD) is a $35 billion smart and sustainable city that is setting new benchmarks for urban development.

耗资350亿美元，韩国松岛国际都市将被打造成一座国际领先的智慧可持续发展新城，它的诞生将为城市发展设立新的里程碑。


인천광역시
Airport
410
Siheu
Map data ©2018 SK telecom


SAVONA


CRUISE CLUB
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MAR LIGURE
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SEAMAP

GREENBUILD China

For the first time ever, the world's largest and most influential green building conference in the world—Greenbuild—is coming to China. And India

greenbuild.usgbc.org/china **Shanghai - October 2018**

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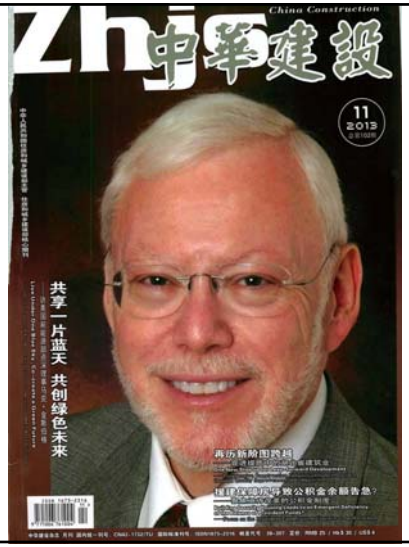
资深专家
马克·金斯伯格



中美绿色建筑专题研讨会一
“中美建筑的绿色设计和绿色产品实践”
Panel Discussion One: Green Design and Green Products

Jack Lee | Senior Technical Sales Specialist, Autodesk Software

李忠
美国欧特克软件工程建设技术经理

- 项目名称：周家渡01-07地块项目
- 所在地：中国上海
- 建立时间：2015年
- 规模：20000平米左右

Cheng Dazhang| Intelligent Building Specialist

程大章
智能建筑信息化专家

- 项目名称：上海中心大厦
- 所在地：中国上海
- 高度：632米
- 建筑面积：43.4万平方米
- 中国绿建认证：超高层绿建三星
- LEED：白金

Michelle Bai | Director of Global Energy Solution-China, Johnson Controls

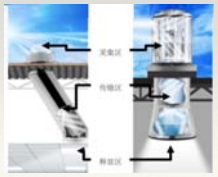
白路
美国江森自控全球能源解决方案中国总监

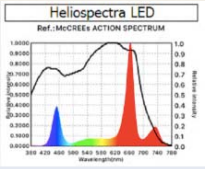
- 江森自控亚太总部
- 创新之源
- 中国首座“三重认证”绿色建筑

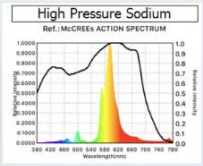
Catherine Zhou | General Manager, Solatube Daylight Technology

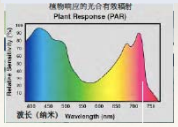
周清理
美国索乐图日光科技总经理

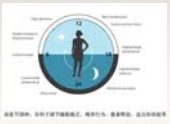
- 项目：Algea to Omega
- 地点：Oakland Park, FL











SOLATUBE®索乐图

Innovative Daylighting Strategies for Commercial Buildings
商业建筑的创新性采光策略

Introduction to Tubular Daylighting Devices (TDDs)
索乐图管道式日光照明设备（TDDs）介绍

SOLATUBE
Innovation in Daylighting.

CREDIT信誉

CERTIFICATE认证

CREDENTIAL 证书

AIA-APPROVED AIA认可

LEARNING OBJECTIVES
学习目标

What are the reasons for using daylight?
使用日光的理由

What are the daylighting strategies?采光策略是什么？

What are the technology zones that make up a TDD?
构成TDDs的三个技术部分是什么？

List the tools available to design with TDDs.
TDDs设计的可用工具清单？

Learn how others have incorporated TDDs in their projects.
了解其他人如何将TDDs设计进其项目中？

PERFORMANCE
表　　现

PRODUCTIVITY
生　产　力

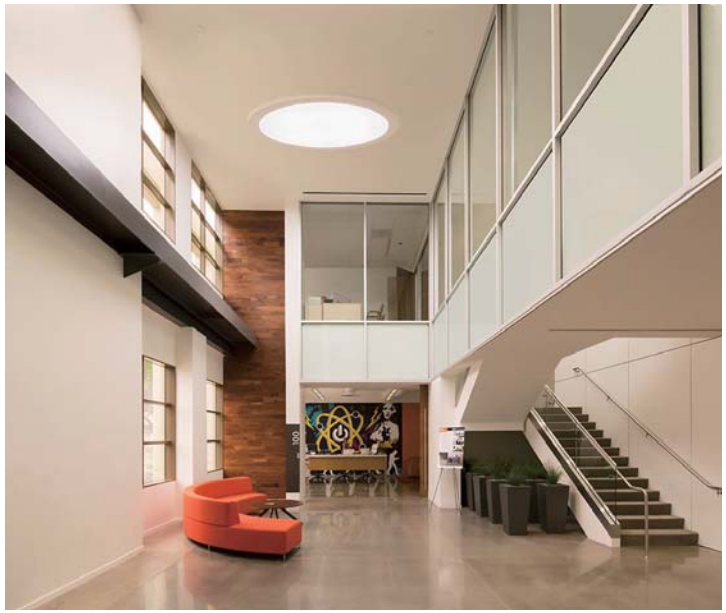
EFFICIENCY
效　　率

Why Daylight?
为什么要采用日光?

STUDENT PERFORMANCE
学 生 绩 效

STUDENT TEST SCORES
学 生 分 数 ↑

A.D.D. AND DEPRESSION
注意力缺失症和沮丧 ↓



EMPLOYEE PERFORMANCE
员 工 绩 效

STAFF PRODUCTIVITY
员工劳动生产率 ↑

EMPLOYEE SATISFACTION
员 工 满 意 度 ↑

RETAIL PERFORMANCE
零 售 业 绩

SALES
销 售 ↑

SHOPPING EXPERIENCE
购 物 体 验 ↑

HEALTHCARE FACILITIES
医 疗 机 构

IMPROVED HEALING TIMES
改 善 愈 合 时 间 ↑

IMPROVED WORKPLACE
改 善 工 作 场 所 ↑

BUILDING PERFORMANCE
建 筑 性 能

ENERGY CONSUMPTION
能 源 消 耗

BUILDING PERFORMANCE
建 筑 性 能

CARBON FOOTPRINT
碳 足 迹

NET ZERO ENERGY
净 零 能 耗

SIDE LIGHTING
侧 向 采 光

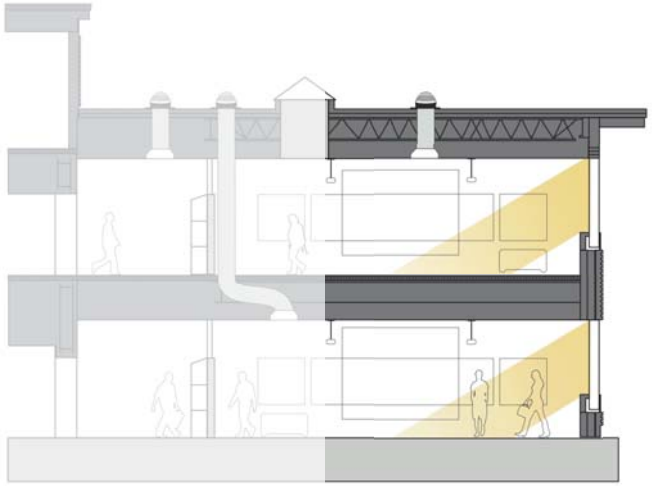
TOP LIGHTING
顶 部 采 光

Daylight Strategies
采光策略

SIDE LIGHTING / WINDOWS
侧 向 采 光 / 窗

Benefits益处:
- View of the World
- 观看外部景观
- Design Feature
- 建筑设计元素
- Reduce Electrical Lighting
- 减少电力照明

Chanllenges局限:
- Orientation Dependent
- 依赖于朝向
- Perimeter Limitation
- 仅照亮建筑四周
- Shifting Light Patterns
- 光照模式随时间移动
- Inconsistent Light Levels
- 亮度不一致
- Glare
- 眩光
- Thermal Performance
- 热工性能



TOP LIGHTING / TRADITIONAL SKYLIGHTS
顶部采光/传统天窗

Benefits益处:

- Independent of Building Orientation
- 不依赖于建筑朝向
- Daylight Deeper into Building
- 照亮建筑进深空间
- Reduce Electrical Lighting
- 减少照明用电

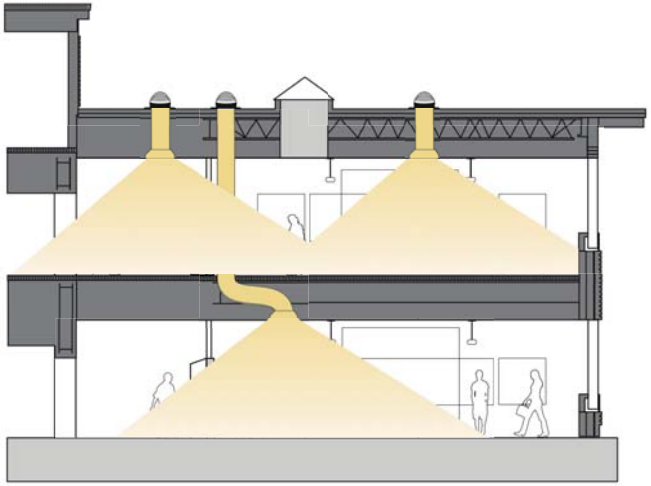
Challenges挑战:

- Roof Structure Impact屋顶结构影响
- Top Floor Limited顶层屋顶空间限制
- Complex Architectural 复杂建筑集成Integration
- Shifting Light Patterns移动性光照模式
- Inconsistent Light Levels不均匀的照明水平
- Glare眩光
- Thermal Performance保温隔热问题

TOP LIGHTING / TUBULAR DAYLIGHTING DEVICES (TDDs)
顶部采光/管道式日光照明装饰（TDDs）

Benefits益处:

- Highly Consistent and Controllable
- 高度均匀和可控
- Daylight Any Space in Nearly Any Climate
- 可用于任何气候下的任何空间
- Minimal Roof Structure Impact
- 最小的屋顶结构影响
- Superior Thermal Performance
- 优越的热工性能
- Endless Possibilities with Highly Flexible, Modular System
- 极具灵活性的模块化系统设计



CAPTURE捕捉

TRANSFER传输

DELIVER漫射

TUBULAR DAYLIGHTING DEVICE (TDDs)管道式日光照明装置

When incorporating a TDD into your design, it is important to consider the specific technologies of each zone, which will ultimately define the performance of the system.
当您TDD集成到您的设计中时，必须考虑每个区域的特定技术，这将最终定义系统的性能。

CAPTURE ZONE: MATERIALS
捕捉区：材料

The actual form or composition and materials used to create the dome can greatly enhance the product's effectiveness and longevity.
采光罩的结构形式和采用的材料可以极大的提高产品的寿命和有效性

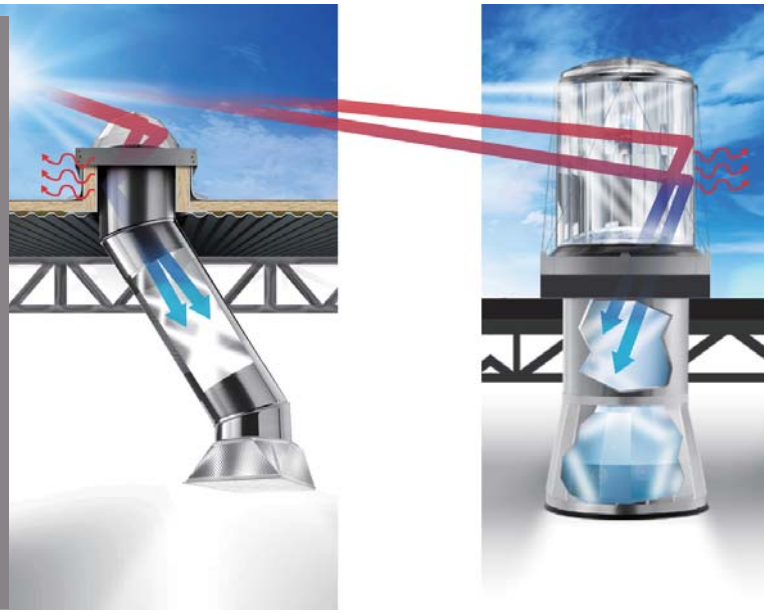
- Inhibits damaging UV radiation
- 抑制破坏性紫外线
- High impact resistant
- 高抗冲击性能
- Injection molded design provides enhanced structural integrity
- 注塑成型设计增强了产品的完整性

CAPTURE ZONE
捕捉区

CAPTURE ZONE捕捉区: OPTICS光学性能

TDD's vary greatly with the level of optics in the dome and some TDDs have domes with no optics.
TDD的性能随着采光罩上的光学技术不同而变化很大，某些TDD的采光罩上甚至没有光学技术。

- Capture and redirect daylight
- 捕捉并重新定向光线
- Rejects overpowering midday summer sunlight
- 反射中午过强的阳光
- Provides consistent lighting and superior visual comfort
- 提供均匀一致的照明并提高视觉舒适性



TRANSFER ZONE传输区：REFLECTIVITY反射率

The second zone is the transfer zone, consisting of the tubing system that transfers the light from the dome on the roof to the diffuser at the ceiling.
The most important aspect of the transfer zone is the reflectivity of the tubing system.

第二个区域是传输区，由管道系统组成，它将屋顶采光罩捕捉的光传输到天花板上的扩散器上。传输区最重要的性能是传输管道的反射率。

TRANSFER ZONE
传输区

COLOR RENDITION显色性

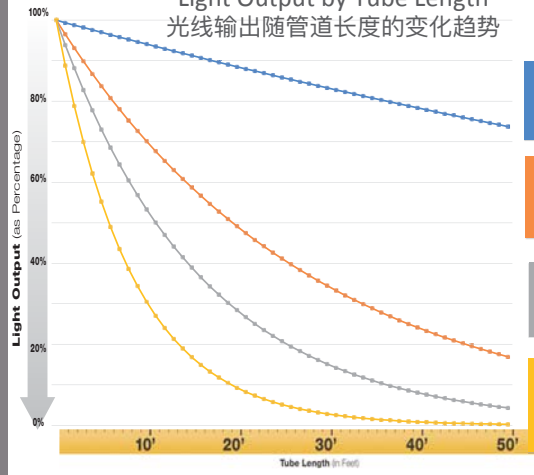
As well as providing the most daylight, Non-Metalized film also delivers the highest quality of light, so colors stay true to their natural state.

除了提供最多的日光，非金属化薄膜也提供最高质量的光，因此颜色保持真实的自然状态。

TRANSFER ZONE传输区：
LIGHT OUTPUT光线输出

Light Output for Daylight
光线输出
Entering a 21" diameter TDD
进入530mm直径的管道
at a 40°Solar Altitude Angle
太阳高度角40度

Light Output by Tube Length
光线输出随管道长度的变化趋势



Non-Metalized Film
99.7% Reflectance*
索乐图99.7%反射率

Enhanced Silver
98% Reflectance
增强银98%反射率

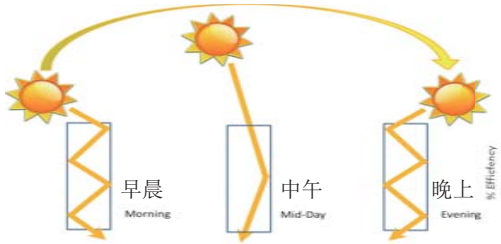
Enhanced Aluminum
95% Reflectance
增强铝95%反射率

Corrugated/Flexible
84% Reflectance
波纹/柔性
84%反射率

* Per Optical Reference Laboratory Testing 2016

光学传输效率对比——哈尔滨, 12月21日

太阳角度和光线的反射次数



每天传输的光通量随时间变化趋势
Light Delivery by Time of Day

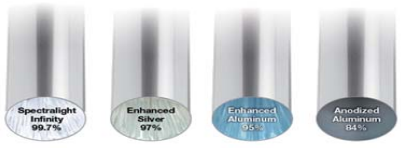
索乐图传输的光量:

- 3倍于增强银传输的光量
- 10倍于增强铝传输的光量

光学传输效率对比——法兰克福, 12月21日

索乐图的照明时段是其他材料的2倍以上

Percentage of light delivered after 20 bounces



= 94.17% =54.38% =35.85% =3.06%

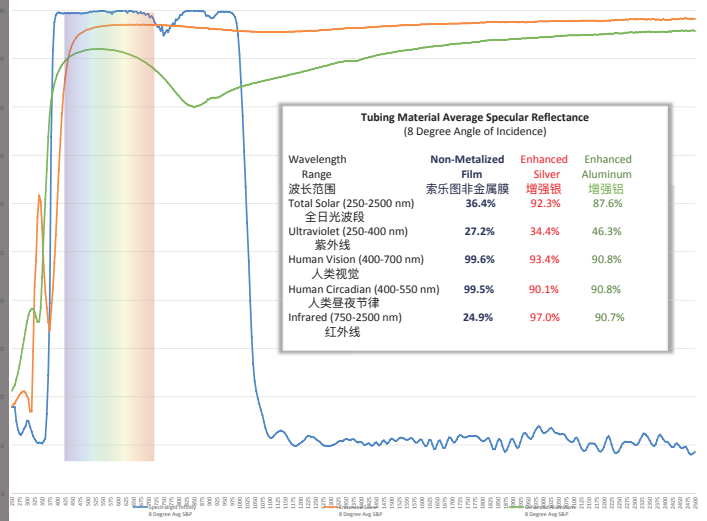
索乐图 增强银 增强铝 阳极铝

时间	Efficency in Open Ceiling (3' of tubing)		
	Solatube	Enhanced Silver	Enhanced Aluminum
8:06	28.52%	0.24%	0.00%
8:30	82.90%	40.69%	16.24%
9:00	91.47%	65.21%	42.13%
9:30	94.34%	75.61%	56.82%
10:00	95.77%	81.29%	65.77%
10:30	96.63%	84.84%	71.72%
11:00	97.20%	87.25%	75.90%
11:30	97.58%	88.93%	78.89%
12:00	97.85%	90.10%	81.00%
12:30	98.02%	90.87%	82.40%
13:00	98.12%	91.28%	83.15%
13:30	98.13%	91.35%	83.29%
14:00	98.07%	91.10%	82.82%
14:30	97.94%	90.50%	81.72%
15:00	97.72%	89.52%	79.95%
15:30	97.39%	88.09%	77.38%
16:00	96.92%	86.05%	73.80%
16:30	96.21%	83.09%	68.76%
17:00	95.09%	78.56%	61.39%
17:30	93.07%	70.85%	49.81%
18:00	88.26%	54.93%	29.78%
18:30	63.46%	11.29%	1.22%

TRANSFER ZONE 传输区:
SPECULAR REFLECTANCE镜面反射率

Non-Metalized film has the ability to remove ultraviolet and infrared light that can damage interior finishes and bring in heat

非金属化膜具有去除紫外线和红外光的能力，这些光会破坏内部的光洁度并带来热量。



Tubing Material Average Specular Reflectance
(8 Degree Angle of Incidence)

Wavelength Range 波长范围	Non-Metalized Film 索乐图非金属膜	Enhanced Silver 增强银	Enhanced Aluminum 增强铝
Total Solar (250-2500 nm) 全日光波段	36.4%	92.3%	87.6%
Ultraviolet (250-400 nm) 紫外线	27.2%	34.4%	46.3%
Human Vision (400-700 nm) 人类视觉	99.6%	93.4%	90.8%
Human Circadian (400-550 nm) 人类昼夜节律	99.5%	90.1%	90.8%
Infrared (750-2500 nm) 红外线	24.9%	97.0%	90.7%

DELIVERY ZONE漫射区

The final element of the TDD is the delivery zone, which includes the diffuser and optional daylight control.

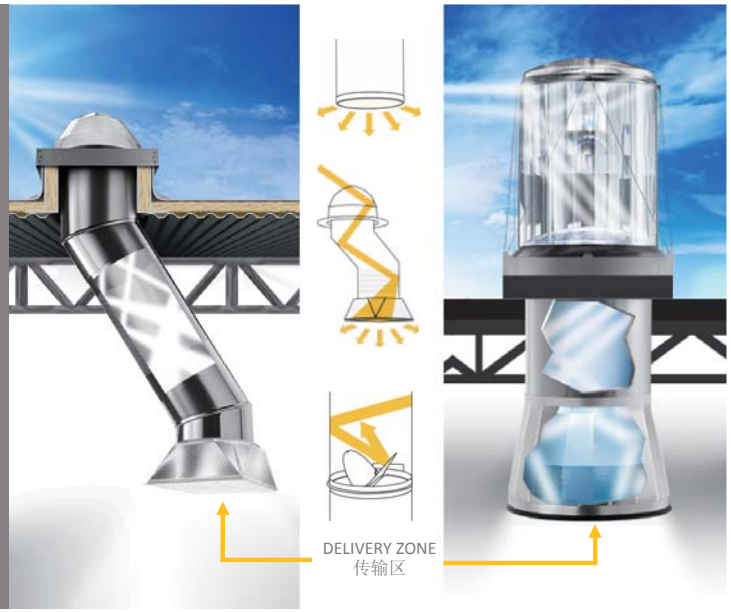
TDD最下部单元是漫射区，包括漫射器和调光器（可选）。

Light Diffusion日光扩散

- Blocks UV Transmission
- 阻断紫外线传输
- Optical Lens Provides Superior Results
- 光学透镜提供优越的结果
- Designed for Visual Comfort
- 视觉舒适设计

Daylight Contro日光控制

- Optional Dimming Capability to Control Your Daylight Levels
- 可选调光装置控制日光强弱

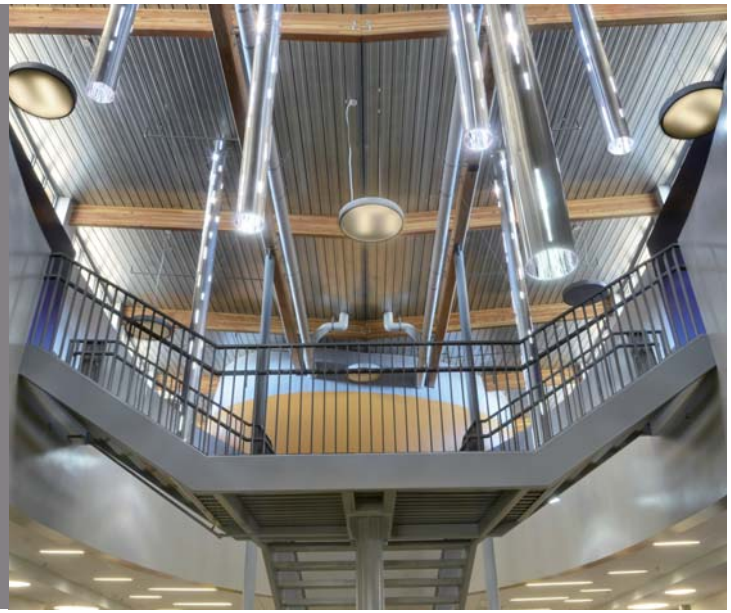


INCORPORATING TDDs INTO YOUR PROJECTS

将索乐图纳入您的项目

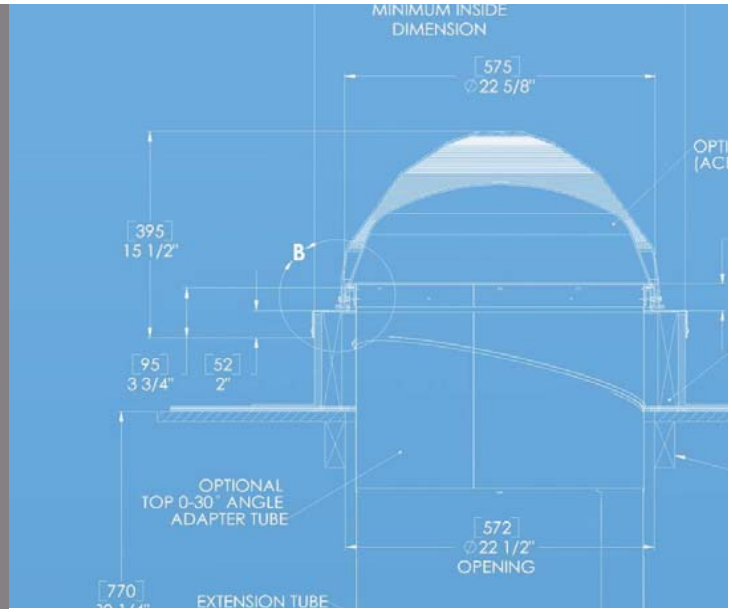
Tubular Daylighting Devices should be a part of your overall lighting strategy and when properly specified, the TDD can be applied during the design process with the same easy as any light fixture.

索乐图应该是您的整体照明策略的一部分，当适当地指定时，TDD可以在设计过程中与任何照明夹具一样容易地应用。



INCORPORATING TDDs INTO YOUR PROJECTS
将索乐图纳入您的项目

- BIM Objects　BIM模块
- Architectural Specifications
- 建筑规范
- CAD Drawings　图纸
- Installation Instructions
- 安装指南
- Codes & Approvals
- 规范和认证
- Photometric IES Files and Lumen Output Tables
- 照度文件和流明输出表
- CSI Div. 8 Section 02 62 23
- Cut Sheets配置清单
- Case Studies案例研究



SUSTAINABLE DESIGN

可持续设计

NET ZERO
净零能耗

The USGBC
美国绿色建筑委员会

The USGBC's LEED rating system version 4 are currently available for projects. Go to www.usgbc.org/LEED for more info.

USGBC的LEED评分系统第4版目前可用于项目。有关更多信息，请访问www.usgbc.org/LEED。

	Energy and Atmosphere: Energy Performance	Indoor Environmental Quality: Interior Lighting Control	Indoor Environmental Quality: Daylighting	Innovation and Design Process
LEED® Rating System	Possible Points	Possible Points	Possible Points	Possible Points
LEED® v4				
LEED® v4 Building Design and Construction (BD+C):				
New Construction and Major Renovation	18	1	3	5
Core and Shell Development	18	1	3	5
Schools	16	1	3	5
Retail	18	1	3	5
Data Centers	18	1	3	5
Warehouses and Distribution Centers	18	1	3	5
Hospitality	18	1	3	5
Healthcare	20	1	2	5
LEED® v4 Interior Design and Construction (ID+C)	25	1	3	5
LEED® v4 Building Operations and Maintenance (O+M)	20	1	3	5

SCHOOLS
学　校

GOVERNMENT BUILDINGS
政　府　建　筑

OFFICES
办公建筑

RETAIL
零　售

WAREHOUSES
仓　库

RECREATIONAL FACILITIES
娱　乐　设　施

HEALTHCARE FACILITIES
医 疗 健 康 设 施

TDDs In Practice

SCHOOLS
学　校

MAGNOLIA ELEMENTARY
CARLSBAD, CA

白玉兰小学
卡尔斯巴德 加州

SCHOOLS
学　　校

HOWARD NORMAN
ELEMENTARY SCHOOL
HUTTO, TX

霍华德·诺曼小学---胡图，
德克萨斯州

GOVERNMENT BUILDINGS
政　　府　　建　　筑

SOUTHERN SANDOVAL ARROYO FLOOD
CONTROL AUTHORITY
RIO RANCHO, NM

南方桑德维尔 阿罗约 防洪局
里约RANCHO，新墨西哥州

OFFICES
办公建筑

SIEMENS BUILDING TECHNOLOGIES
BELTSVILLE, MD
西门子建筑技术
贝尔茨维尔，马里兰州

OFFICES
办公建筑

AIR MILES
MISSISSAUGA, ON

GROCERY
食品杂货店

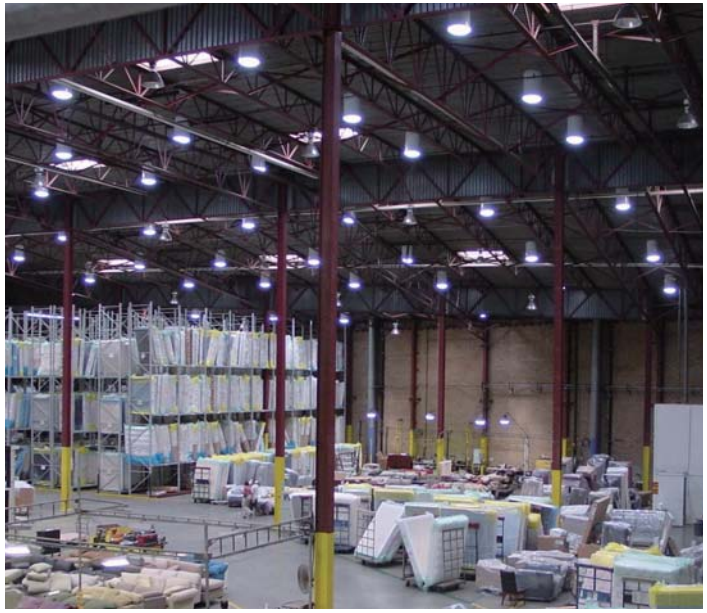
STATER BROS
CHINO HILLS, CA

斯泰特兄弟
加利福尼亚州奇诺山

RETAIL
零售

CALDWELL TOYOTA
CONWAY, AR

考德威尔丰田
康韦　　阿肯萨斯 州



WAREHOUSE
仓库

FEDERATED
(MACY'S AND
BLOOMINGDALES)
LOGISTICS
LOS ANGELES, CA

RECREATION

BEIJING SCIENCE &
TECHNOLOGY
UNIVERSITY GYMNASIUM
BEIJING, CHINA
北京科技大学体育馆
中国 北京

SOLATUBE
Innovation in Daylighting.

美国建筑师学会继续教育项目计划总结。

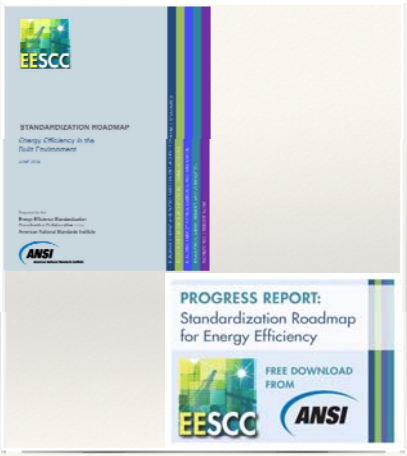
中美绿色建筑专题研讨会二
“绿色建筑的标准和认证”
Panel Discussion Two: Green Building Standards and Certification

Xu Fang | Chief Representative, American National Standards Institute (ANSI)

许方
美国国家标准机构中国代表处首席代表

建筑环境中能效标准化路线图(EESCC)
- 标准化路线图：建筑环境中的能耗 (2014年6月)
- EESCC过程报告(2016年4月)

EESCC主题领域
- 建筑能源和水资源的评估及性能标准
- 系统集成以及系统交流
- 建筑能源评级、标记以及模拟
- 评价测量和验证



Meng Chong | Executive Deputy Director, Green Building Research Center, Chinese Society for Urban Studies

孟冲
中国城市科学研究会绿色建筑研究中心常务副主任

- 项目名称：南京禄口国际机场二期建设工程2号航站楼及停车楼
- 所在地：南京
- 建立时间：2014年6月竣工
- 规模：T2航站楼建筑面积：23.69万m2，年客流量约2200万人次；停车楼建筑面积：10.96万m2，停车位2200个，年累计停车约120万次

Meng Chong | Executive Deputy Director, Green Building Research Center, Chinese Society for Urban Studies

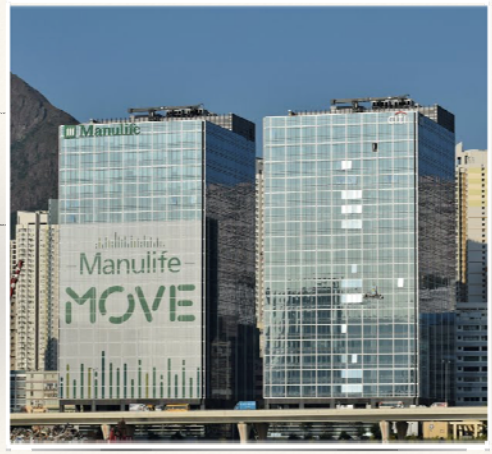
赵礼嘉
美国联合技术建筑解决方案亚太区市场总监

- UTC Center for Intelligent Buildings
- Global corporate headquarters for UTC Climate, Controls & Security and Otis Americas regional headquarters in Palm Beach Gardens, Fla.
- State-of-the-art innovation and technology center, conference center, and customer showcase
- 224,000 square-foot facility on 30 acres
- Developed to the U.S. Green Building Council's LEED® Platinum standard
- Up to 28% power supplied onsite with photovoltaics
- Showcase for a high performance multi-use building

Tony Armstrong | Senior Vice President, IWBI Asia

东尼
美国IWBI亚洲区高级副总裁

- Citibank – One Bay East
- Kwun Tong | Hong Kong



中美绿色建筑专题研讨会三
“绿色建筑的应用和未来”
Panel Discussion Three: Innovation and Application of Green Building

Li Chang | Director of Xiongan Green R&D Center, Vanke China

李昶
万科集团雄安绿色研究发展中心总监

- “城乡建设与生活配套服务商”
- 芦苇资源化利用

Guo Hongguang | Chief Manager, R&D Department, Landsea Green Group

郭宏光
朗诗绿色集团有限公司绿建研发室研发总经理

Feng Wei | Principal Scientific Engineering Associate, China Energy Group, Energy Technologies Area, LBNL

冯威
美国劳伦斯伯克利国家实验室能源技术部中国能源研究室首席研究员

Chen Jialong | Executive Deputy Director, National Committee of Construction Waste Management and Recycling, China Urban Environment and Sanitation Association

陈家珑
中国城市环境卫生协会建筑垃圾管理与资源化工作委员会常务副主任

建筑垃圾管理与资源化工作委员会
The National Committee of Construction Waste Management and Recycling

感谢您的支持