Science Tower for the Panum Complex, Part of the University of Copenhagen

哥本哈根大学Panum综合楼科学之塔

客户 The Danish University and Property Agency
地点 Blegdamsvej, Copenhagen, Denmark
建筑设计 C. F. Møller Architects
景观设计 SLA
工程 Rambøll
合作设计 aggebo&henriksen, Cenergia, Gordon Farquharson, and Innovation Lab
获奖 1st prize in international architectural competition, 2010
规模 35 000m^2
建成时间 2014

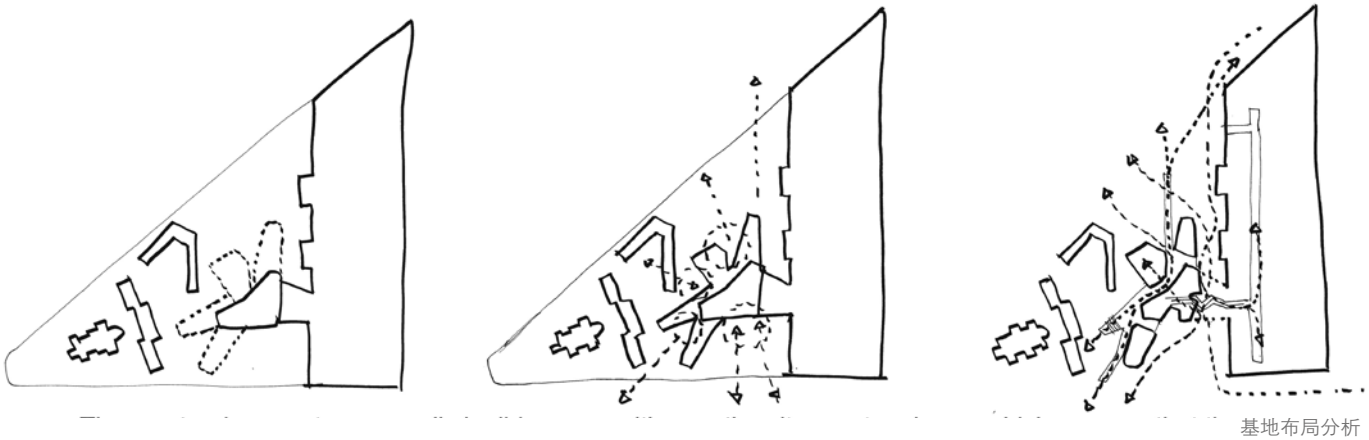
Panum综合体扩建项目的主要目的是为现代化的科研和教学创造最好的环境。同时，还要成为标志性建筑，为整个Panum综合体和大学北校区树立一个良好的形象。新综合楼还要积极推动周围城市的发展，促进这一地区与整个城市的联系。

16层高的科学大楼将以清晰可读的形式，为建筑提供一个统一而动态的焦点。正如一棵树要有支撑它的根系，这座塔楼也要依赖于一系列包含常用功能的较小的建筑物，如礼堂、教室、食堂、实验室、会议室和咖啡馆等。根系网络最引人注目的部分是巨大的科技广场，这将成为新综合楼的社交枢纽。广场设有主入口，这里将成为公众聚集的主要场所，连接新旧Panum综合体之间的所有功能。

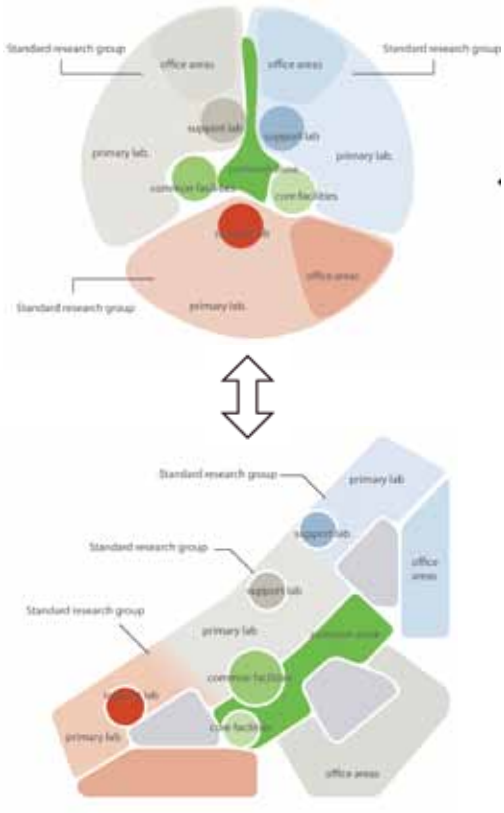
新建的Panum综合体将有一个开放和外向型的外观。透明的地面，模糊了建筑与城市之间的界限。咖啡厅、休息室和观景点则吸引市民来到塔楼顶层参观。

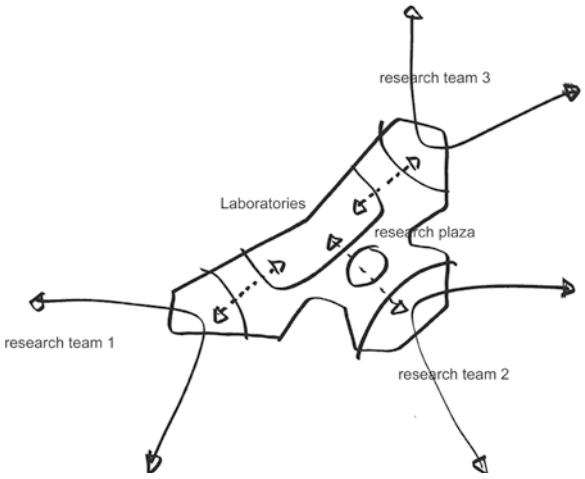
新广场连同配有凉亭和座椅的内部花园空间被设置在新旧综合楼之间。这里将不仅成为研究室和办公室的延伸，也会给城市增添新的绿色。穿过该地区的校园通道与行人和自行车道一起，不仅将校园营造成一个充满活力的城市公园，也与周边城市建立起密切的联系。

基地流线分析

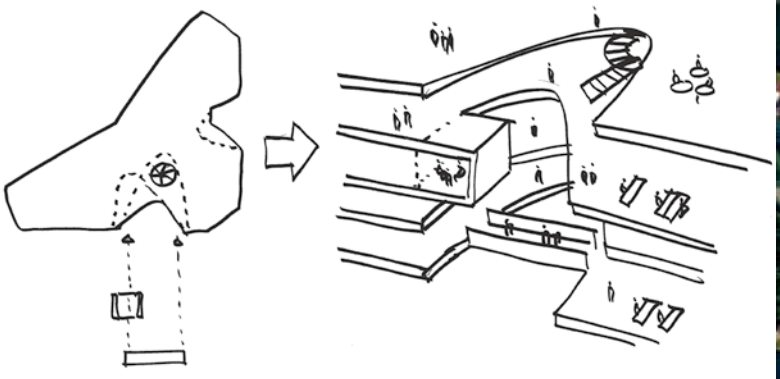


基地布局分析

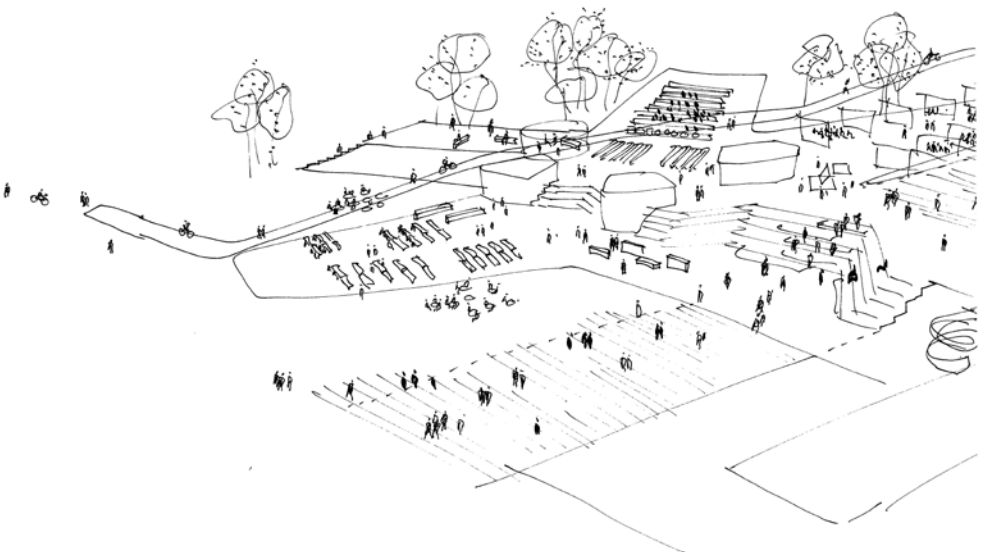

Standard research group
office areas
office areas
Standard research group
support lab
support lab
primary lab.
primary lab.
common facilities
core facilities
office areas
Standard research group
primary lab.
Standard research group
primary lab
support lab
office areas
Standard research group
support lab
Standard research group
primary lab
common facilities
primary lab
core facilities
office areas

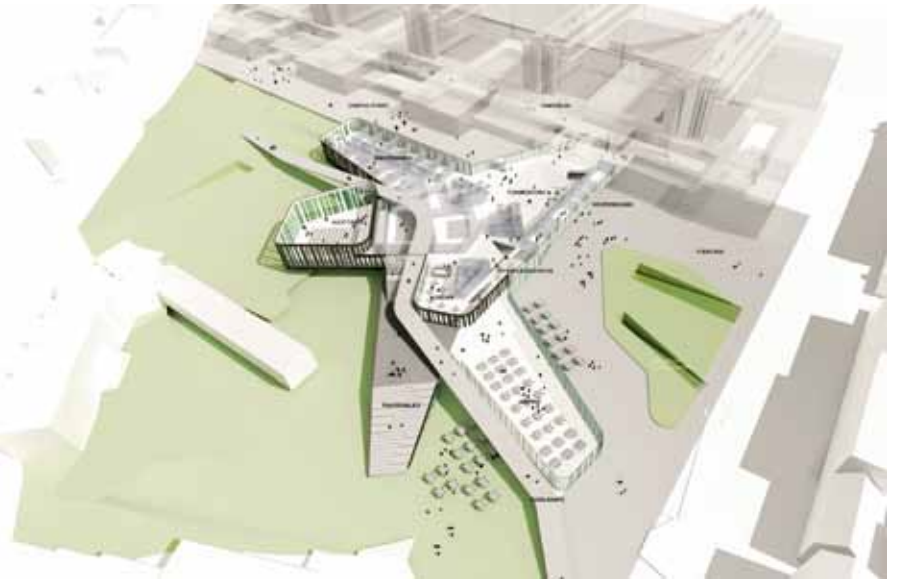

research team 3
Laboratories
research plaza
research team 1
research team 2

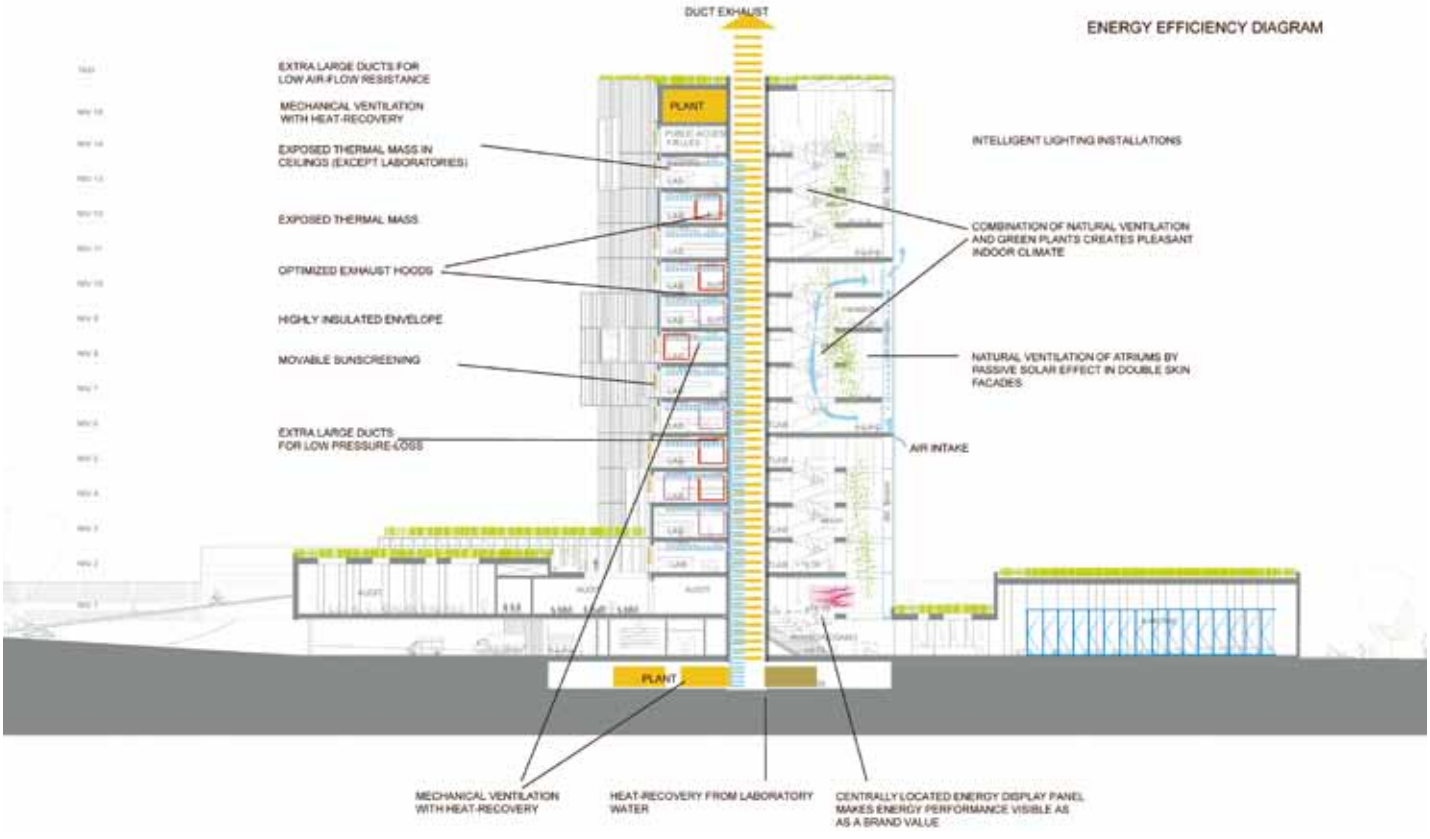
平面布局分析

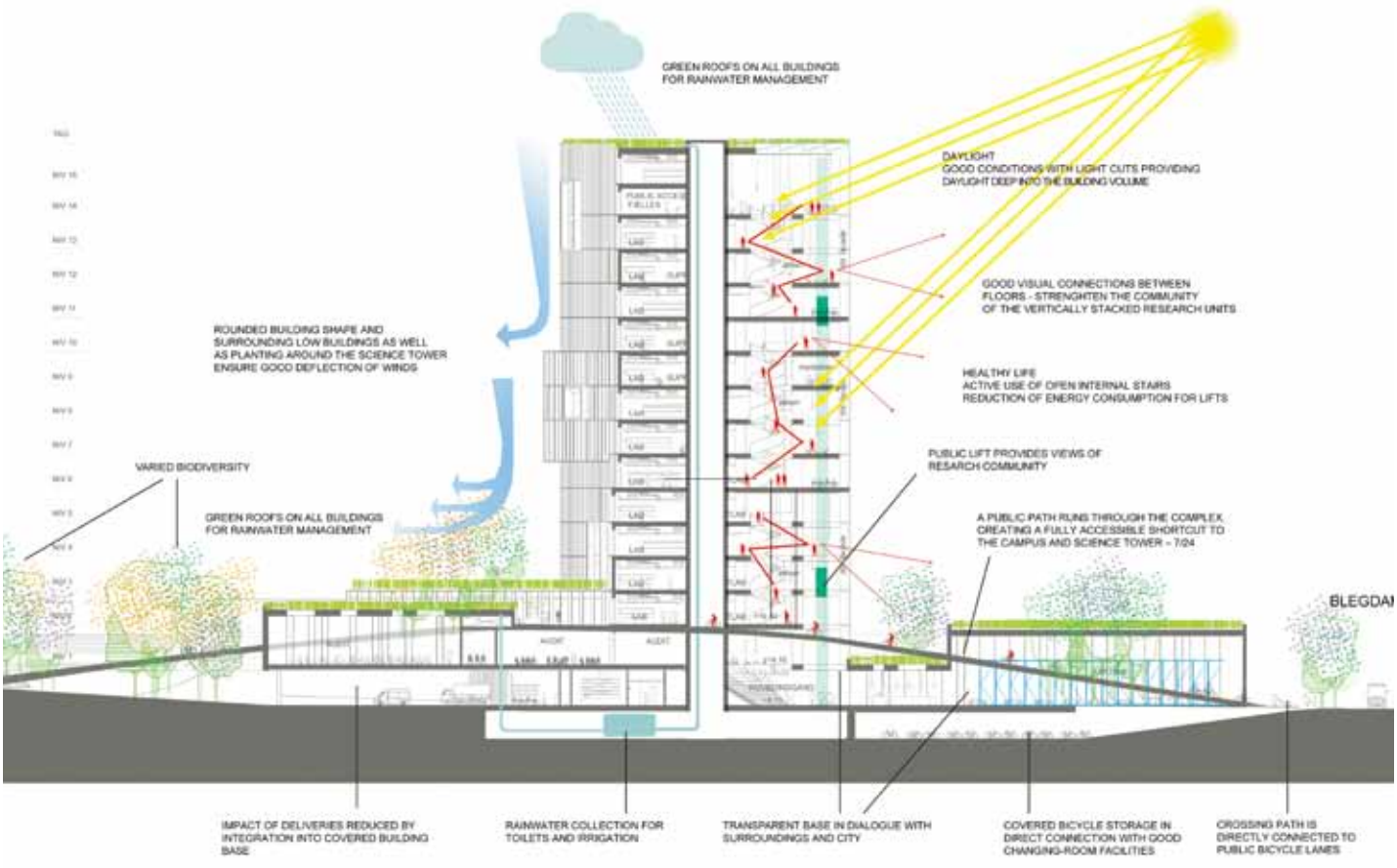


中庭分析






DUCT EXHAUST
ENERGY EFFICIENCY DIAGRAM
EXTRA LARGE DUCTS FOR LOW AIR-FLOW RESISTANCE
MECHANICAL VENTILATION WITH HEAT-RECOVERY
EXPOSED THERMAL MASS IN CEILINGS (EXCEPT LABORATORIES)
EXPOSED THERMAL MASS
OPTIMIZED EXHAUST HOODS
HIGHLY INSULATED ENVELOPE
MOVABLE SUNSCREENING
EXTRA LARGE DUCTS FOR LOW PRESSURE-LOSS
PLANT
INTELLIGENT LIGHTING INSTALLATIONS
COMBINATION OF NATURAL VENTILATION AND GREEN PLANTS CREATES PLEASANT INDOOR CLIMATE
NATURAL VENTILATION OF ATRIUMS BY PASSIVE SOLAR EFFECT IN DOUBLE SKIN FACADES
AIR INTAKE
PLANT
MECHANICAL VENTILATION WITH HEAT-RECOVERY
HEAT-RECOVERY FROM LABORATORY WATER
CENTRALLY LOCATED ENERGY DISPLAY PANEL MAKES ENERGY PERFORMANCE VISIBLE AS AS A BRAND VALUE

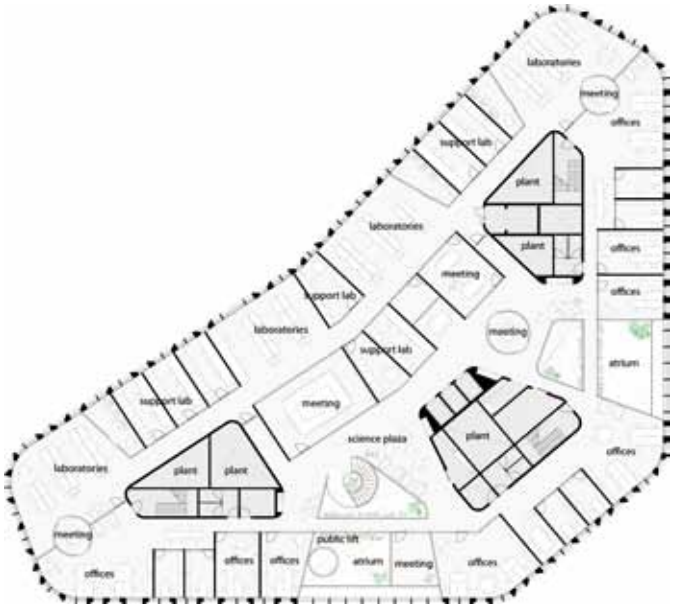

GREEN ROOFS ON ALL BUILDINGS FOR RAINWATER MANAGEMENT
DAYLIGHT
GOOD CONDITIONS WITH LIGHT CUTS PROVIDING DAYLIGHT DEEP INTO THE BUILDING VOLUME
GOOD VISUAL CONNECTIONS BETWEEN FLOORS - STRENGHTEN THE COMMUNITY OF THE VERTICALLY STACKED RESEARCH UNITS
ROUNDED BUILDING SHAPE AND SURROUNDING LOW BUILDINGS AS WELL AS PLANTING AROUND THE SCIENCE TOWER ENSURE GOOD DEFLECTION OF WINDS
HEALTHY LIFE
ACTIVE USE OF OPEN INTERNAL STAIRS
REDUCTION OF ENERGY CONSUMPTION FOR LIFTS
PUBLIC LIFT PROVIDES VIEWS OF RESARCH COMMUNITY
VARIED BIODIVERSITY
GREEN ROOFS ON ALL BUILDINGS FOR RAINWATER MANAGEMENT
A PUBLIC PATH RUNS THROUGH THE COMPLEX CREATING A FULLY ACCESSIBLE SHORTCUT TO THE CAMPUS AND SCIENCE TOWER – 7/24
IMPACT OF DELIVERIES REDUCED BY INTEGRATION INTO COVERED BUILDING BASE
RAINWATER COLLECTION FOR TOILETS AND IRRIGATION
TRANSPARENT BASE IN DIALOGUE WITH SURROUNDINGS AND CITY
COVERED BICYCLE STORAGE IN DIRECT CONNECTION WITH GOOD CHANGING-ROOM FACILITIES
CROSSING PATH IS DIRECTLY CONNECTED TO PUBLIC BICYCLE LANES

首层平面

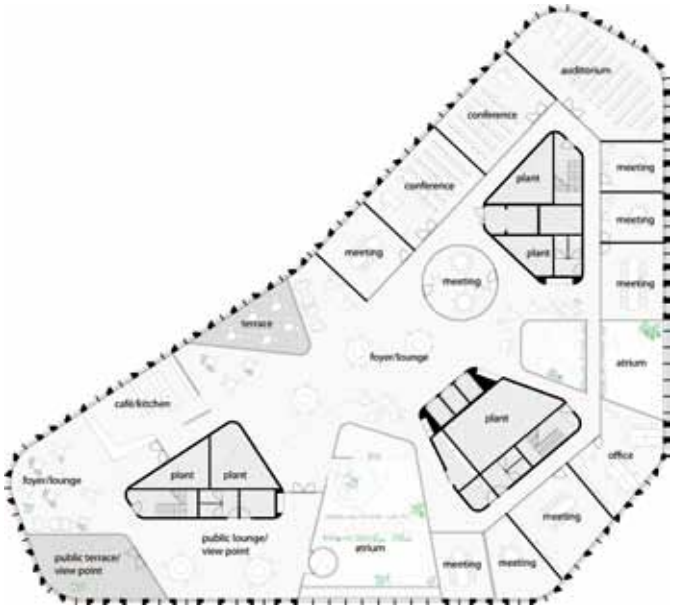
二层平面

建筑通过有机的形式传达出强大的力量和创新，同时通过色彩、韵律和体量与原有的Panum综合楼达到完美的协调。建筑立面采用多层通高的网架结构玻璃幕墙，打破了建筑巨大体量所带来的呆板形象。

通过与丹麦最好的能源利用实验室合作，该项目将在能源的高效率使用上处于领先地位。消耗的能源将从通风系统回收并进行再利用，使得建筑的整体能源利用尽可能达到平衡。（译/张岩，校/吴春花）


laboratories
meeting
offices
support lab
plant
laboratories
plant
offices
support lab
meeting
offices
laboratories
support lab
meeting
atrium
support lab
meeting
science plaza
plant
offices
laboratories
plant
plant
meeting
public lift
offices
offices
atrium
meeting
offices

标准层平面


auditorium
conference
meeting
conference
plant
meeting
meeting
plant
meeting
meeting
terrace
foyer/lounge
atrium
cafe/kitchen
plant
office
foyer/lounge
plant
plant
meeting
public lounge/
view point
atrium
public terrace/
view point
meeting
meeting

顶层平面

The extension of the Panum complex has been designed with the aim of creating the best possible environment for modern research and teaching. A parallel objective has been to create a building which will stand out as an identity-creating, sculptural linchpin for the entire Panum complex and the university's Nørre Campus (i.e. the North Campus) as a whole. The new complex is also intended to act as the generator of a positive urban development in its immediate neighbourhood and in relation to the entire city.

At sixteen storeys tall, the Science Tower will provide the complex with a unifying and dynamic focal point in a clear and readable form. But just as a tree has its root network, the tower rests upon on a series of smaller buildings which contain the common functions: the auditoriums, classrooms, canteen, show lab, conference rooms and book café. The most striking part of the root network is the extensive science plaza, which will form the new social hub of the complex. The plaza accommodates the main entrance and will serve as the main social meeting-place, linking all functions between the new and the existing Panum complex.

The new Panum complex will have an open and outward-looking appearance, with a transparent ground floor that will help to blur the boundaries between the building and the city. The public will also be invited to visit the top of the tower, where there will be a café, lounge and viewing points.

Between the buildings, new plazas will arise, together with internal garden spaces equipped with alcoves and seating. These will function as an extension of the study rooms and offices, but will also add new green oases to the city. A campus thoroughfare passing through the area, together with pedestrian and cycle paths, will create a vibrant urban park with intimate links to the surrounding city.

With its organic forms, the building expresses signal power and innovation, but is also adapted to the existing Panum complex through its colour scheme, rhythm and gravity. The facade is built up in the form of a grid structure of storey-high window fields that break up the building's large scale.

The project will be pioneering in energy usage, with Denmark's most energy-efficient laboratories, in which waste energy from the ventilation system will be recycled in the overall energy balance of the building to a hitherto unprecedented degree. AT