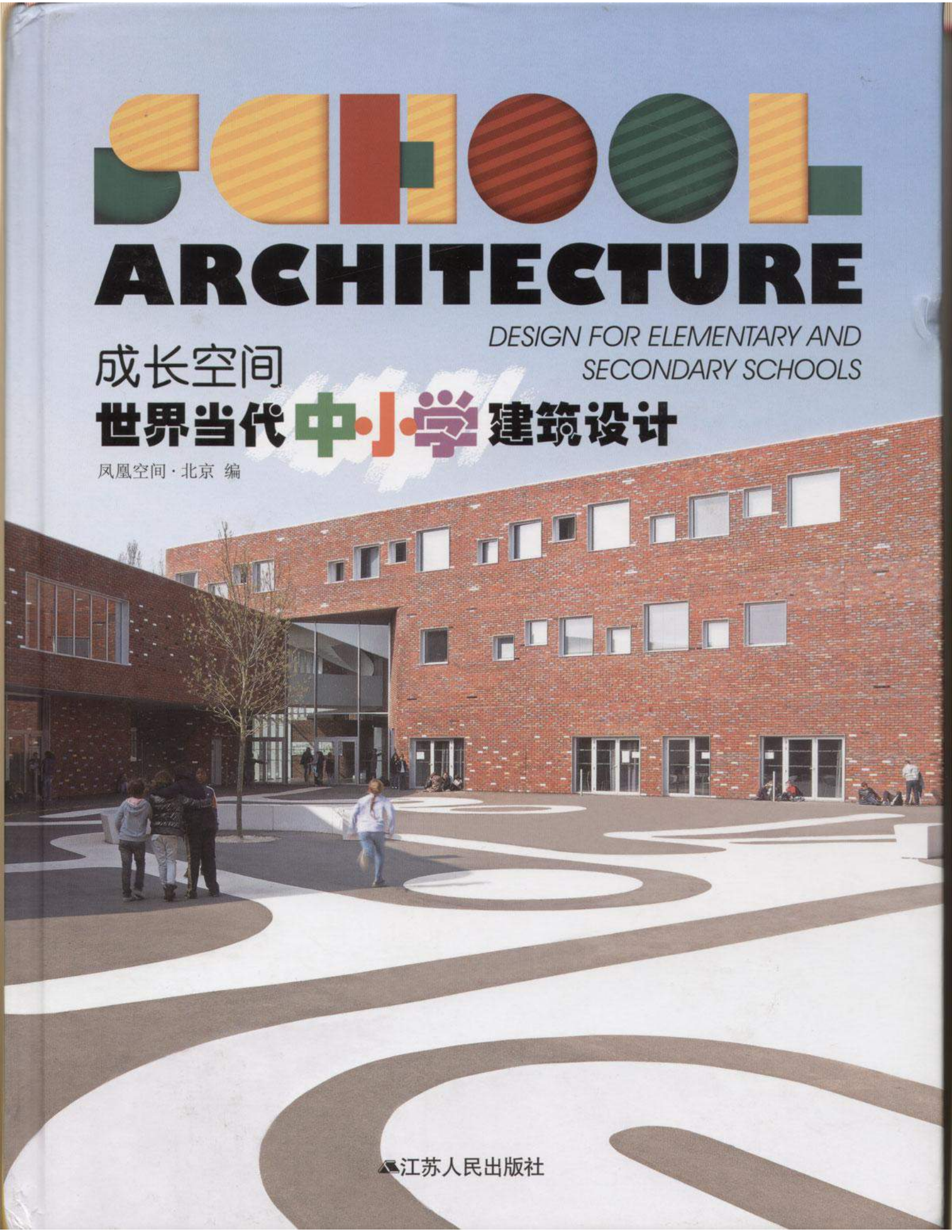
SCHOOL ARCHITECTURE

DESIGN FOR ELEMENTARY AND SECONDARY SCHOOLS

成长空间
世界当代中小学建筑设计

凤凰空间·北京 编



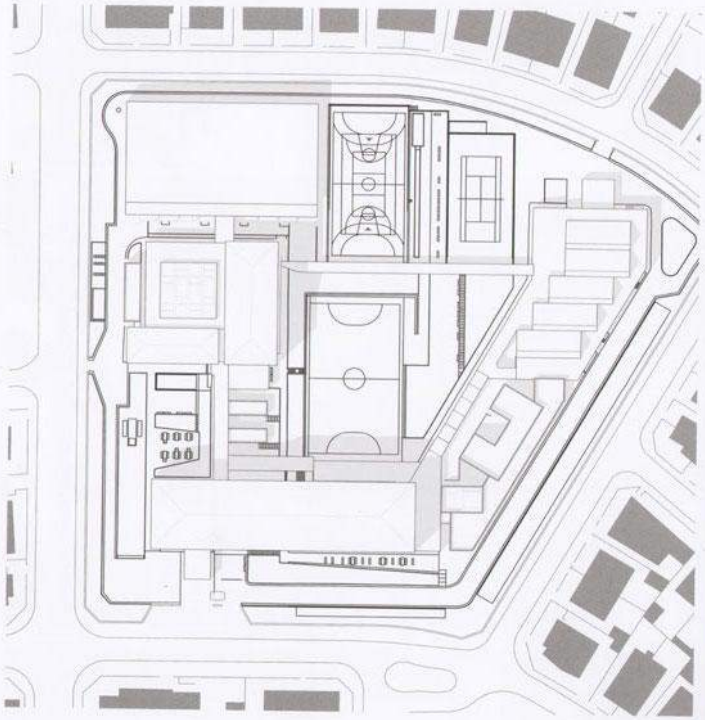
江苏人民出版社

MANUEL I SECONDARY SCHOOL

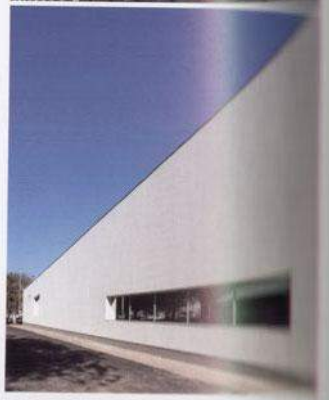
葡萄牙 曼努埃尔一世中学

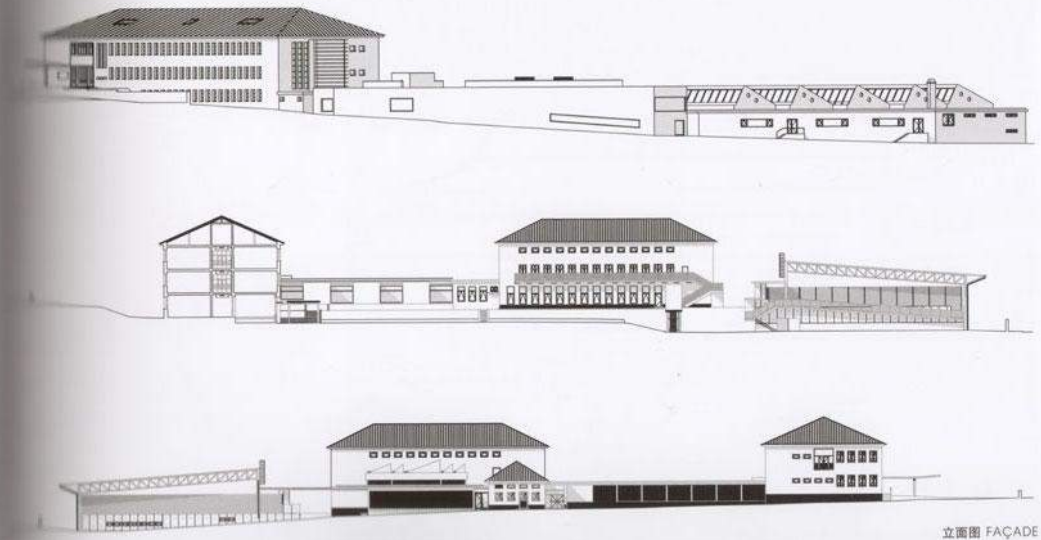
项目设计：BFJ Arquitectos - Francisco Amaral Pólvora
项目地点：葡萄牙，贝贾
合作者：Bernardo Campos Pereira,
José Amaral Pólvora
项目面积：14 730 m^2
项目年份：2008－2010年
总建筑面积：11 000 m^2
设计时间：2007－2008年
施工时间：2008－2009年
摄影：FG+SG - Fernando Guerra, Sergio Guerra

Architects: BFJ Arquitectos - Francisco Amaral Pólvora
Location: Beja, Portugal
Co-authors: Bernardo Campos Pereira,
José Amaral Pólvora
Project Area: 14,730 m^2
Project Year: 2008 - 2010
Total Building Area: 11,000 m^2
Design Phase: 2007-2008
Construction Phase: 2008-2009
Photographs: FG+SG - Fernando Guerra, Sergio Guerra



总平面图 SITE PLAN





立面图 FAÇADE

曼努埃尔一世中学的更新改造是Parque Escolar公司（EPE）所推动的中学现代化规划项目的一部分，该项目的主要措施如下：对现有建筑进行整修，提升其空间品质和结构特性，使其符合当前舒适性、安全性和方便性的要求。

在场地中新建一座图书馆大楼，将原建筑的主楼和老工作坊连为一体。

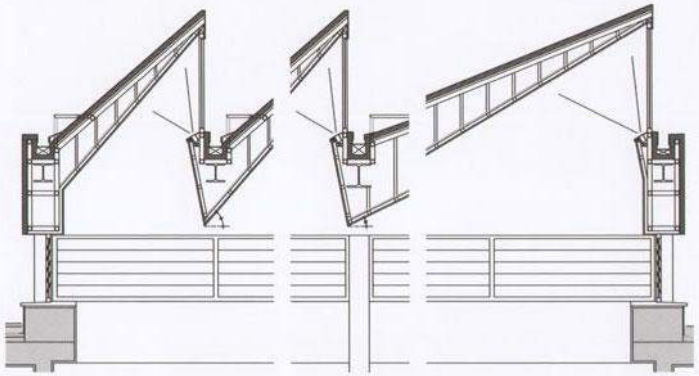
建筑师对原来的学生休闲区进行了革新。该区域的地理位置独特，连接着原有的多个建筑。经过改造，它成为一个室内的多功能区，促进了整个学校社区的互动交流。该项目还包括一个朝北的不规则锯齿形屋顶，这使得各个斜坡漫射来的多变光线得以照入室内。同时，这样的设计还使这个空间免受南方过度的太阳辐射。

新建新图书馆和资源中心：这一区域紧邻室内休闲区域，由于其高度的流动性和与中央空间连接的特性，被公认为学校最具动感的区域之一。图书馆充分利用其所处位置及自身所具有的活力和辨识度，提升其互动性。图书馆的布局旨在将入口向室内休闲区敞开，并设立了一个非正式的阅读区和多媒体室。参考文献区设在对面，是一个更为隐私和安静的空间。

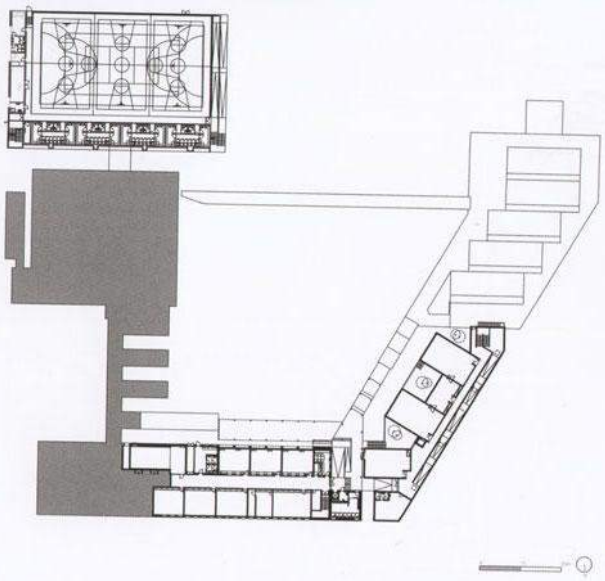
项目还新建了一个室内体育场，并配备了完善的运动设备和辅助设施。其位置的选择和独特的设计使之免受侧风和阳光直射的侵扰。淋浴室和更衣室利用了场地的自然坡度，拥有适宜的整体性和热舒适度。

学生休闲娱乐室
1 “VMZinc” 钛锌板
2 隔板
3 聚苯乙烯挤塑板(厚度50 mm)
4 隔气层
5 船用胶合板支撑(厚度22 mm)
6 RHS50矩形空心型钢
7 石膏板(厚度12.5 mm)
8 锌粉
9 照明设备
10 金属结构
11 维修轨道
12 窗框
13 “Sikaplan” 聚氯乙烯防水卷材
14 “Grisol” 绝热板
15 层压顶盖
16 花岗石地板
17 双层玻璃 外层玻璃：“SGG Securit Planitherm” 厚度8mm，中间：e=12 mm，内层玻璃 “SGG Stadip 55.1” 厚度10.4 mm
18 固定铝合金窗(Technal Série FB – Linhas Direitas)

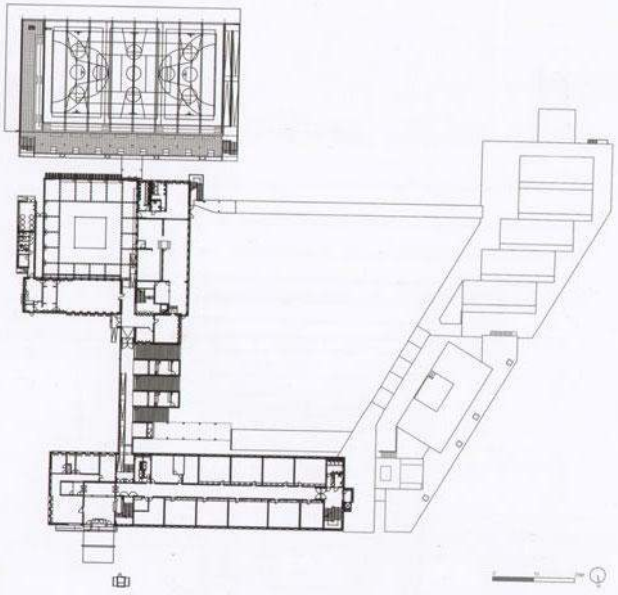
STUDENT ROOM
1 “VMZinc” cladding in titanium zinc n.°12
2 Separation Screen
3 Extruded Polistyrene (thk. 50 mm)
4 Vapour Barrier
5 Maritime Plywood Support (thk. 22 mm)
6 Secondary Structure in RHS50 Sections
7 Plasterboard (thk. 12.5 mm)
8 Zinc Duct
9 Lighting
10 First metallic structure
11 Maintenance Track
12 Window frame with glass slides adjustable opening “Beta”
13 Proofing system with PVC tiles type “Sikaplan”
14 Thermal slabs type “Grisol”
15 Co-laminate capping
16 Groundsill in granite stone
17 Double Glass “Saint-Gobain”: Ext.“SGG Securit Planitherm” thk. 8 mm; Air Box thickness 12 mm; int. “SGG Stadip 55.1”thk. 10.4 mm
18 Fixed Window in aluminium (Technal Serie FB – Straight Lines)



细部图 DETAIL



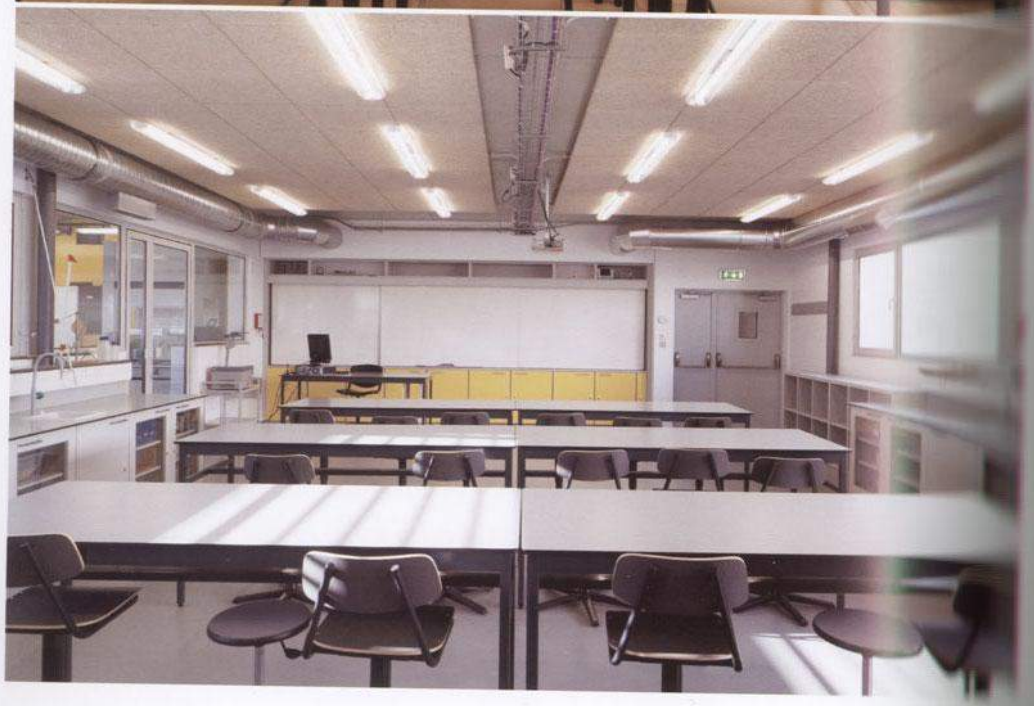
一层平面图 GROUND FLOOR PLAN



二层平面图 FIRST FLOOR PLAN

The modernization of the D. Manuel I Secondary School in Beja is part of a phase of secondary school moder program promoted by Parque E and can be resumed in the follow Renovation of the existing buildings and enhance their spatial and features, assuring up to date and accessibility requirements.

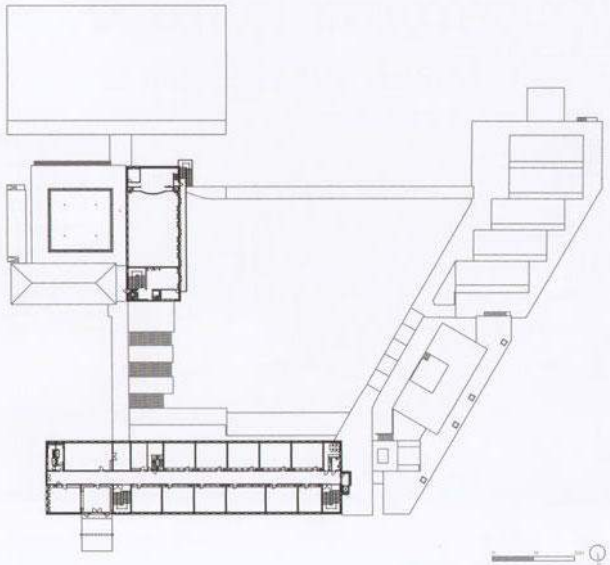
Construction of a new laboratory It inserted in the terrain to connect existing building with the old work



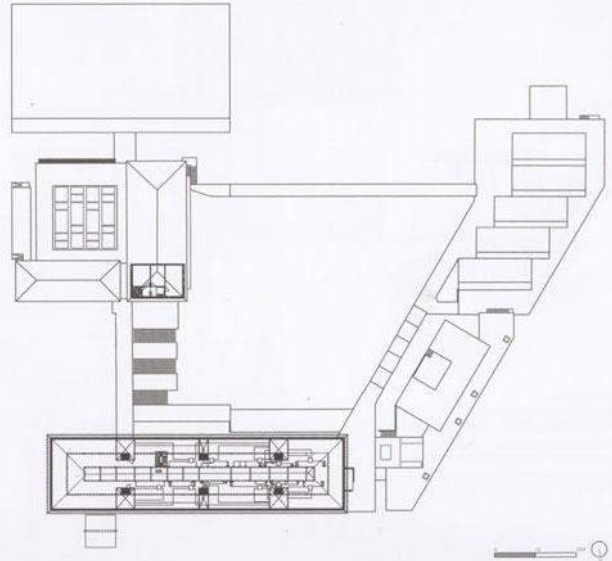
of the student's old covered
Due to its location it functions as
between various existing buildings.
covered area with multifunctional
encouraging social interaction
the entire school community. The
incorporates a North-facing irregular
roof, providing this space with diffuse
natural light originating from the
different slopes, and simultaneously
the space from the excessive
solar radiation.

Library / Resource Centre: Situated next
recess area, it is understood as
the most dynamic zones in the school
the high flows and its connection to the
space. The library's situation is another
for promoting this interaction, taking
of the dynamics and visibility which
itself provides. The layout reveals
of exposing the library entrance to
recess area, using the informal
area and the multimedia room for this
The documentation reference area is
on the opposite side, where a more
and quiet space is intended.

of a new covered sports field,
athletic and ancillary facilities. It is
and designed to offer protection
and direct sunlight. The shower
rooms take advantage of the
natural slope, easing their integration
comfort.



三层平面图 SECOND FLOOR PLAN



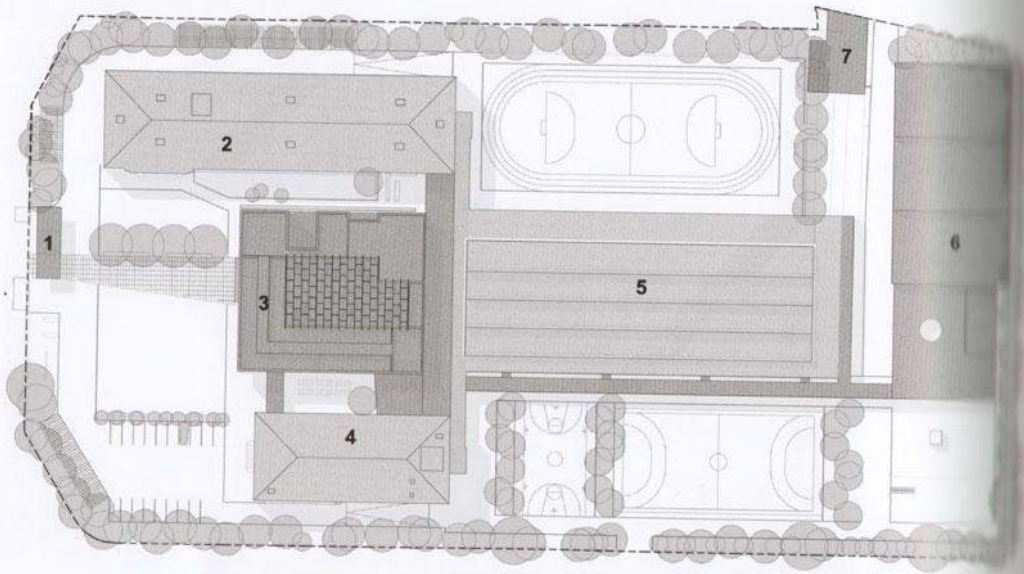
四层平面图 THIRD FLOOR PLAN

DOMINGOS SEQUEIRA SECONDARY SCHOOL

葡萄牙 多明戈斯塞凯拉中学

项目设计：BFJ Arquitectos - Francisco Amaral Pólvora
项目地点：葡萄牙，莱里亚
合作者：Bernardo Campos Pereira, José Amaral Pólvora, Francisco Amaral Pólvora
项目面积：14 730 m^2
项目年份：2008－2010年
摄影：FG+SG - Fernando Guerra, Sergio Guerra

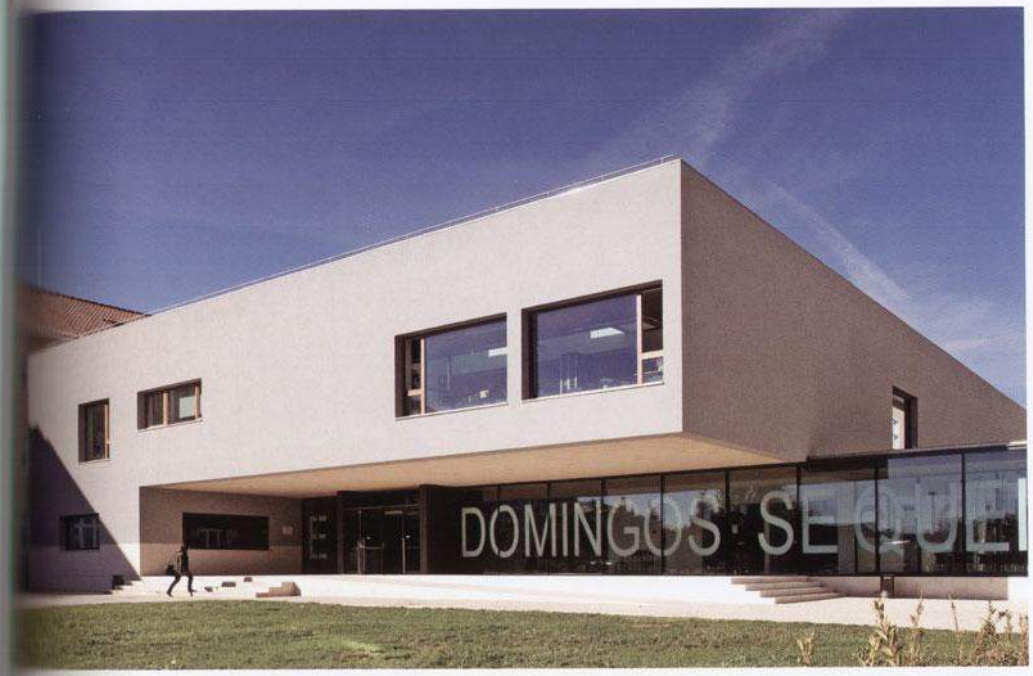
Architects: BFJ Arquitectos - Francisco Amaral Pólvora
Location: Leiria, Portugal
Co-authors: Bernardo Campos Pereira, José Amaral Pólvora, Francisco Amaral Pólvora
Project Area: 14,730 m^2
Project Year: 2008 - 2010
Photographs: FG+SG - Fernando Guerra, Sergio Guerra



1 Reception
2 Main Classroom Block
3 New Building (Entry, Administration And Common Spaces)
4 Multipurpose Room / Cafeteria
5 Laboratory And Workshop Building
6 Covered Sports Field (+Shower And Change Rooms)
7 Technical Block

1 接待处
2 主教室楼
3 新建筑（入口，行政区域和公共空间）
4 多功能室/自助餐厅
5 实验室及大楼工作间
6 室内体育馆（内设浴室，更衣室）
7 科技楼

总体规划 GENERAL PLAN



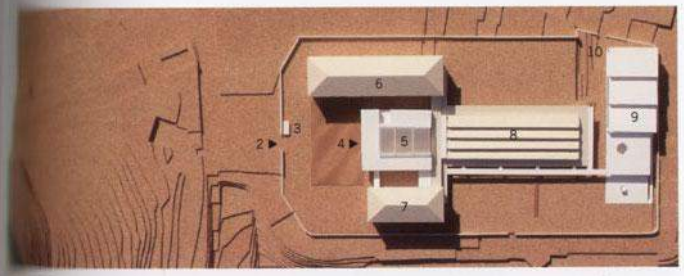
莱里亚的多明戈斯塞凯拉中学的现代化升级项目是Parque Escolar公司（EPE）所引领的中学现代化[illegible]的一部分。该项目的主要内容如下：

[illegible]大楼用做学校的新入口，利用学校的地理位置和地形将新旧建筑连接。新的区域将涵盖众多公共[illegible]以促进学生、老师等人员更好地融合和互动，从而创造了一个新的聚合中心。

[illegible]管理区域外，大楼还包括一个新的图书馆和资源中心。另外，还为学校建设了其他配套设施，如[illegible]、复印中心、学生会以及为弥补自助餐厅不足而设立的小吃店。

[illegible]中央天井是一个光线充沛的大型空间，它是整个学校的集会点。悬挂在墙壁上的学生们的绘画作品[illegible]空间增色不少。

[illegible]筑的改造提升了空间和结构品质，并满足了目前舒适性、安全性和通畅性等方面的需要。而新建的[illegible]体育场涵盖了各种配套设施（淋浴室更衣室和支持空间）。另外，改造了学校的室外区，使人行道[illegible]区域分离开来。



[illegible] Castle
[illegible]ance to The School Grounds
[illegible]ception
[illegible] Central Building Entrance
[illegible] Building (Entry, Administrative and Common Spaces
6 Main Classroom Block
7 Multipurpose Room/Cafeteria
8 Laboratory and Workshop Building
9 Covered Sports Field (+Shower and Change rooms)
10 Technical Block

1 莱里亚城堡
2 学校入口
3 接待处
4 中心建筑入口
5 新建筑（入口，行政区域和公共空间）
6 主教室楼
7 多功能室/自助餐厅
8 实验室及车间大楼
9 室内体育馆（内设浴室，更衣室）
10 科技楼

总体规划图 GENERAL PLAN

东立面图 EAST FAÇADE

北立面图 NORTH

西立面图 WEST FAÇADE

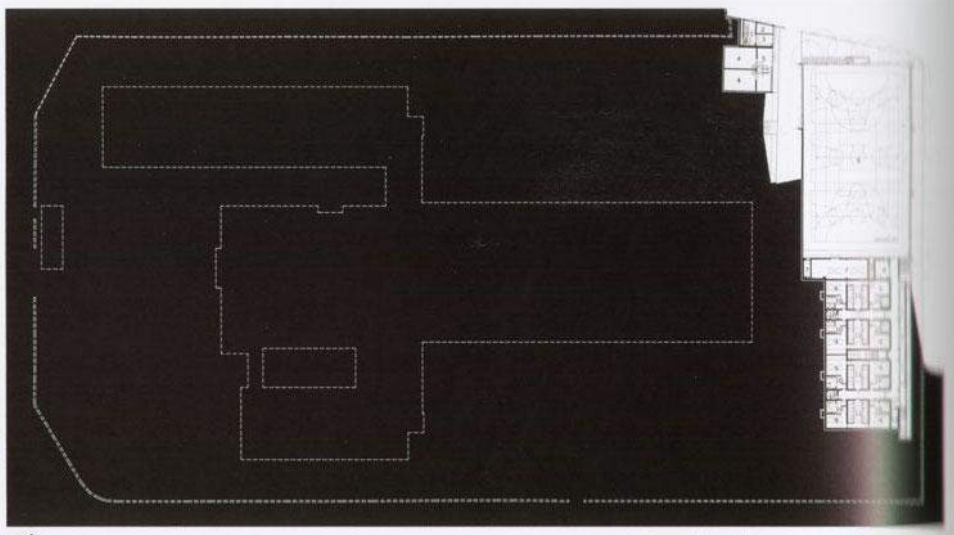
The modernization of Domingos Sequeira Secondary School in Leiria is part of the secondary school modernization program promoted by Parque Escolar - EPE, and can be resumed in the following operations:

Construction of a new building, which will function as the new school entrance, taking advantage of its location and configuration to serve as a connection between the existing buildings. This new block will incorporate common spaces, allowing for a greater integration and interaction between the various school users, thus creating a new centrality.

Apart from the administrative and executive spaces, this building will include the new library and resource center and other support spaces for the schooling community such as a convenience store, a copy centre, the students' association and a snack bar that will complement the current cafeteria.

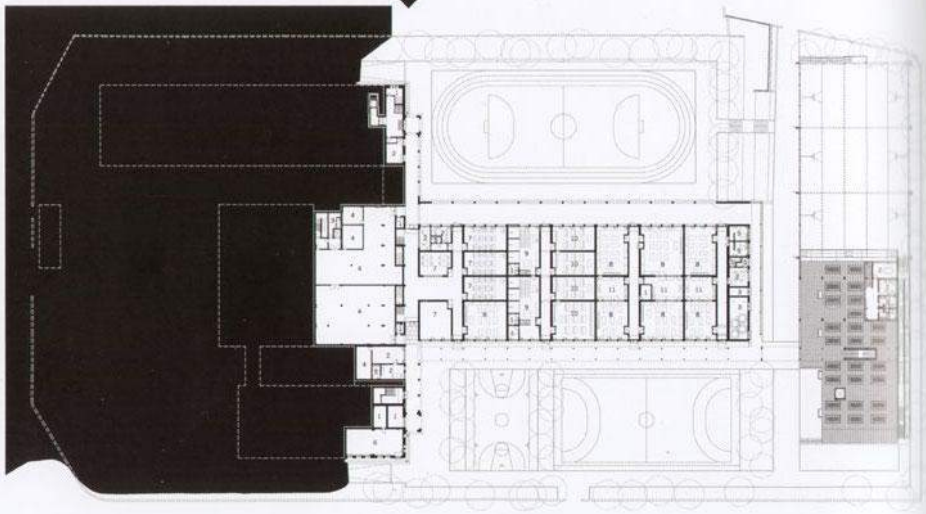
The school's central atrium is a large space with natural light, serving as a meeting point for the entire school community. Spatial features are enhanced by the paintings produced by the school students.

Besides, this project also includes work as follows: remodeling the existing buildings in order to enhance their spatial and construction qualities, ensuring the fulfillment of the current demands in terms of comfort, security and accessibility; building a new covered sports field, including support facilities (shower, change-rooms and support area); remodeling the school's exterior areas and the detachment between pedestrian circulation and automobile parking zones.

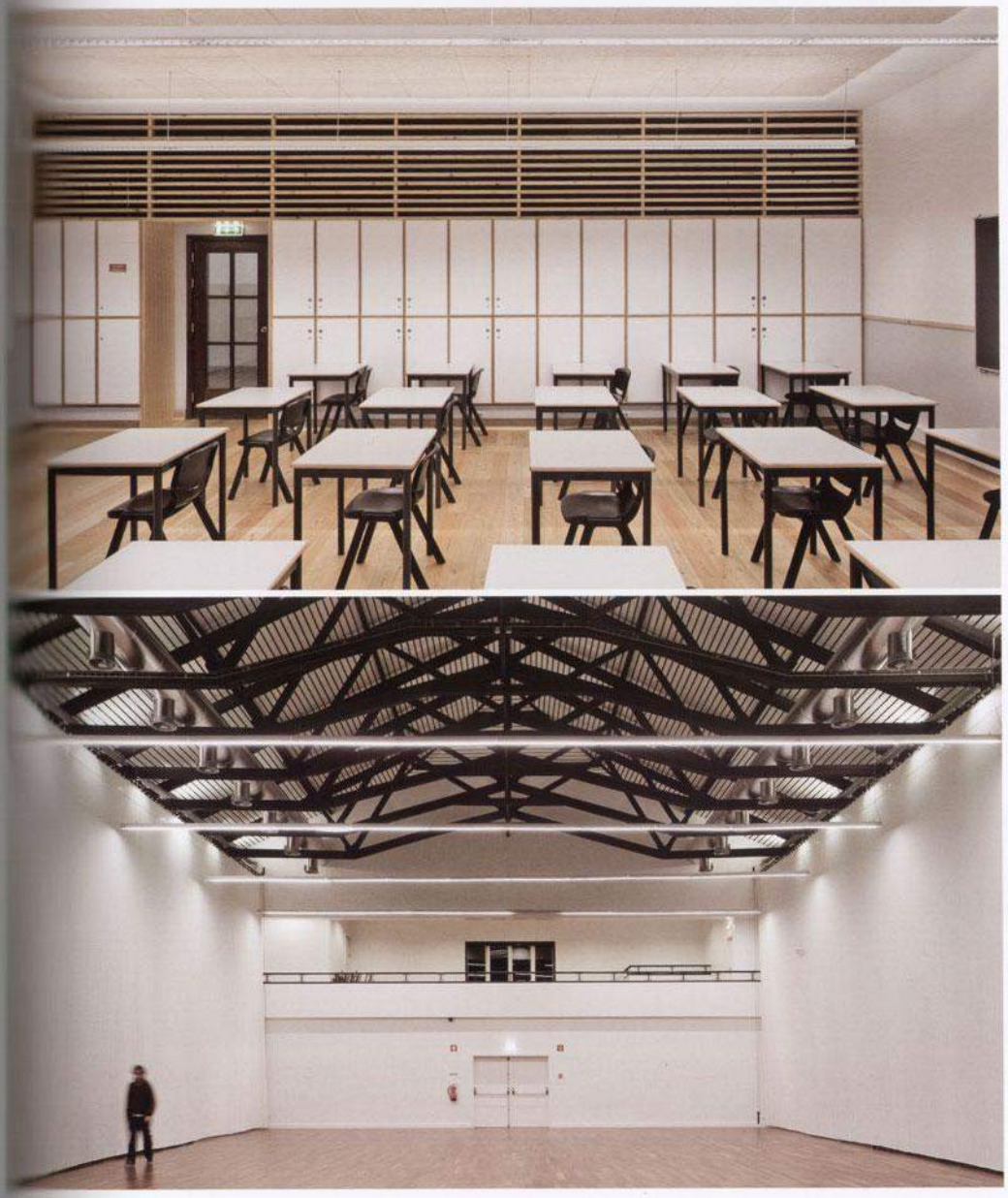


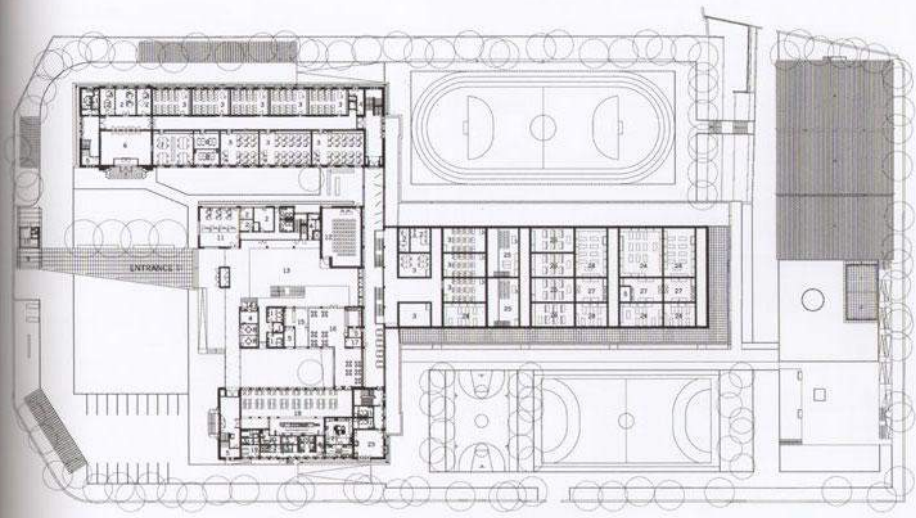
地下室总平面图 BASEMENT FLOOR SITE PLAN

1 Transformer Station	1 变电站	1 Storage	1 储藏室
2 Photovoltaic	2 光电	2 Workroom	2 工作室
3 General Framework	3 总框架	3 Technical Area	3 技术区
4 Water Tank	4 水箱	4 Archives	4 档案室
5 Booster Pumps	5 升压泵	5 Washroom	5 卫生间
6 Covered Sports Field	6 室内体育馆	6 Maintenance	6 维修室
7 Storage	7 储藏室	7 Classroom	7 教室
8 Nurse	8 医务室	8 Laboratory	8 图书馆
9 Change Room	9 更衣室	9 Workshop	9 车间
10 Washroom	10 卫生间	10 Electrical Installation	10 电气室
11 Showers / Change Room	11 浴室 / 更衣室	11 Preparation Room	11预备室 / 加工间
12 Technical Area	12 技术区		



一层总平面图 FIRST FLOOR SITE PLAN



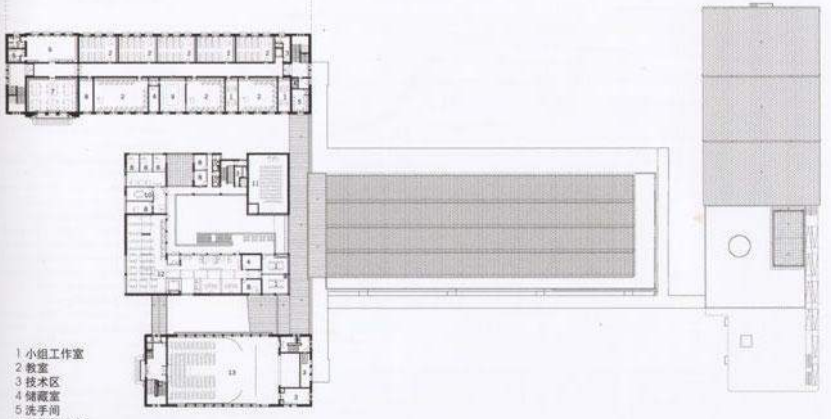


10 Reception
11 Secretariat
12 Auditorium
13 Central Atrium
14 Reception
15 Student Store
16 Bar
17 Students' Association
18 Cafeteria
19 Lounge
20 Kitchen
21 Cooking Area
22 Preparation Area
23 Non-Teaching Staff Room
24 Laboratory
25 Workshop
26 Electrical Installation
27 Preparation Room

1 卫生间
2 工作室
3 教室
4 技术区
5 储藏室
6 中庭/ 展区
7 教师工作室
8 会议室
9 学校入口
10 接待处
11 秘书处
12 礼堂
13 中庭
14 接待处
15 学生商店
16 酒吧
17 学生会
18 餐厅
19 休闲室
20 厨房
21 烹饪间
22 预备室/加工间
23 非教学人员办公室
24 图书馆
25 车间
26 电气室
27 预备室/加工间

二层平面图 SECOND FLOOR PLAN

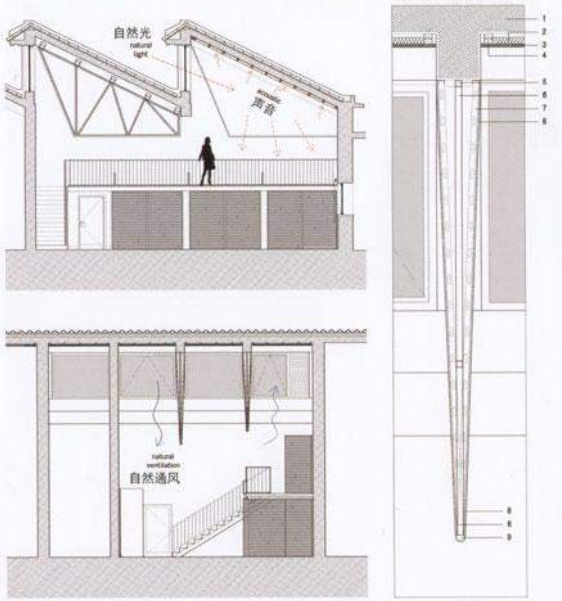
四层平面图 FOURTH FLOOR PLAN



1 小组工作室
2 教室
3 技术区
4 储藏室
5 洗手间
6 教师休闲室
7 教师工作室
8 工作室
9 计算机工作室
10 会议室
11 礼堂
12 图书馆
13 多功能室

三层平面图 THIRD FLOOR PLAN

翻新的实验室和工作间
RENOVATION OF THE LABORATORIES AND WORKSHOPS

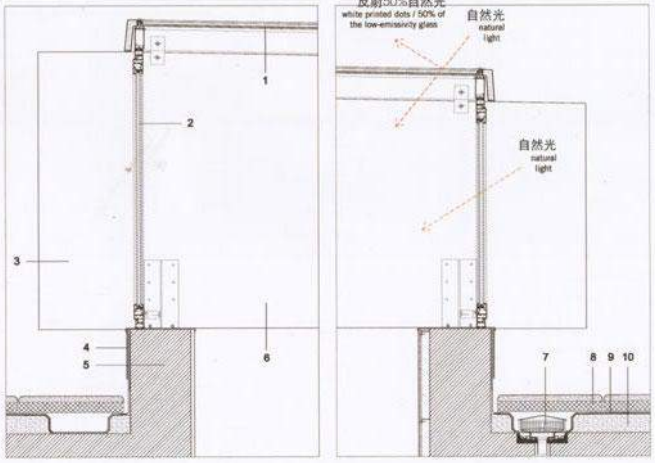


使用自然光 USE OF THE NATURAL LIGHT
建筑遗产的承认和保护
ACKNOWLEDGMENT AND CONSERVATION OF THE ARCHITECTURAL INHERITANCE

1 Existing structure
2 Board rock wool thickness 60 mm and density 40 kg/m³
3 Acoustic "Heraklith Herakustik Star" panel,
25 mm thick,and dimensions 600 mm × 1200 mm,
beveled edges like "AK-01"
4 Suspended ceiling structure
5 RHS 50 × 50 section
6 Metal structure according to structural design project
7 Inclined wall clad with "knauf W625-61/600" plasterboard
8 "Knauf" Plasterboard panel
9 Rounded corner in "knauf Techniplac R" plasterboard

1 原结构
2 岩棉板，厚60 mm，密度40 kg/m³
3 Heraklith超细纹木丝吸声板，厚25 mm，
大小600 mm×1200 mm，坡口AK-01
4 悬挂式天花板结构
5 RHS 50×50 矩形钢管
6 根据结构设计项目做的金属结构
7 覆有knauf Techniplac R 石膏板的斜墙
8 Knauf 石膏板
9 knauf Techniplac R 石膏板的圆角

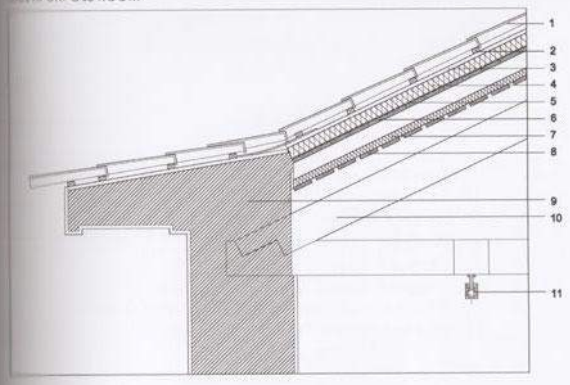
新学校的中心
NEW CENTRALITY OF THE SCHOOL



1 Fixed "Technal series MX-MECANO" vent in aluminium with double glazing
2 Projecting "Technal series FBI" window frame in aluminium with double glazing
3 Roof cladding in "VM Zinc" titanium zinc NO12
4 Exterior "Dryvit" thermal cladding type
5 Reinforced concrete structure
6 Roof structure in "Kerto-S" laminated veneer lumber
7 "Geberit Pluvia" drainage system
8 Thermal slab with integrated "Filtron R10" drainage (3.5 cm layer of gray porous concrete, 6 cm extruded polystyrene)
9 Waterproofing system : a) Protection - "Feltemper 300" geotextile layer,b) Waterproofing - "Rhenofol CG" PVC membrane,and c) separation - "Feltemper 300" geotextile layer
10 Lightweight concrete sloped screed,i=0.5%

1 Technal系列 MX-MECANO 双层玻璃铝制通风口
2 Technal系列Fbi 双层玻璃铝制窗架
3 屋顶覆有VM Zinc钛锌NO12
4 外部Dryvit 隔热包层
5 钢筋混凝土结构
6 屋顶结构 Kerto-S单板层积材
7 Geberit Pluvia 排水系统
8 绝热板及 Filtron R10排水装置
(3.5 cm多孔混凝土，6 cm挤压聚苯乙烯)
9 防水系统：a)保护—Feltemper 300 土工织物层，
b)防水—Rhenofol CG PVC膜，
c)隔离—Feltemper 300 土工织物层
10 轻质混凝土斜板，i=0.5%

多功能室
MULTIPURPOSE ROOM



1 Existing recovered and washed tile using "FILA NO ALGAE", and replacement of damaged or broken tiles
2 "Onduline" PVC support
3 "Onduline" sub-tile specified as per existing tile
4 Rigid double panel rockwool "Rockwool Rockciel-E 444", thickness 65 m, density 150/95 kg/m³
5 Vapour barrier
6 New liner in plywood,thickness 22 mm
7 Semi-rigid rock wool panel "Rockwool Rockciel-E 211", thickness 40 mm, density 40 kg/m³
8 Wooden ruler in painted Riga wood, dimension=110 mm × 20 mm
9 Existing wall
10 Treatment of existing visible wooden structure, with "Xylofene Sor 40" unidirectional injectors inside the affected parts, as well as the header, rafters and delivery ends of the trusses inserted into the masonry
11 "Gerriets-king" support structure for side curtains, with curved steel beam fixed to the existing wooden structure

1 使用FILA NO ALGAE修复和清洗过的瓦片，更换损坏或破裂的瓦片
2 Onduline PVC 支座
3 Onduline瓦被指定为per existing tile
4 双层刚性岩棉板Rockwool Rockciel-E 444，厚65 mm，密度150/95 kg /m³
5 隔气层
6 新胶合板衬板，厚22 mm
7 半刚性岩棉板Rockwool Rockciel-E 211，厚40 mm，密度40 Kg/m³
8 Riga木材制成的木尺，大小 110 mm × 20 mm
9 原墙体
10 对可见木质结构进行加工处理，使用Xylofene Sor 4 对受损部分及嵌入砖石的桁架顶端、椽子、末端进行加工修复。
11 Gerriets-king 侧帘支承结构，并在木质结构上固定有钢曲梁