

Skylight Illumination Design of Primary Education Building Space
——Case of Indoor Playground of Yueyang County
No.3 Middle School

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SUP Atelier
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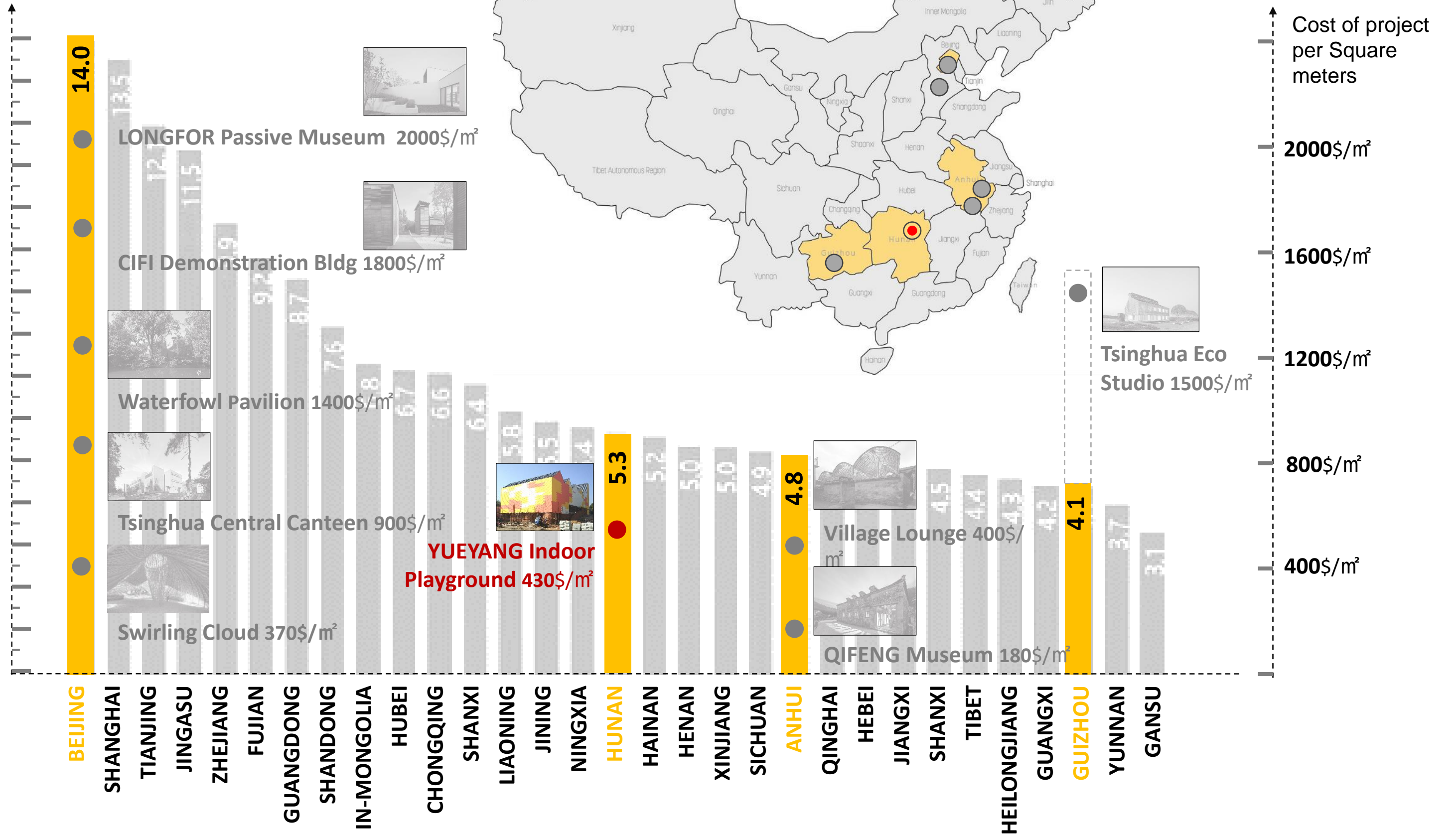
- Waterfowl Pavilion of Beijing Zoo
2012.09
- Tsinghua University Student Canteen
2014.06
- Tsinghua Eco Studio
2015.06
- CIFI Zero Carbon Sustainable Bldg
2016.09
- Longfor Sundar Passive Museum
2017.08
- Village Lounge of Shangcun
2017.10
- **Yueyang Middle School GYM**
2017.12
- Swirling Cloud
2018.09
- Village History Museum of Qifeng
2018.09



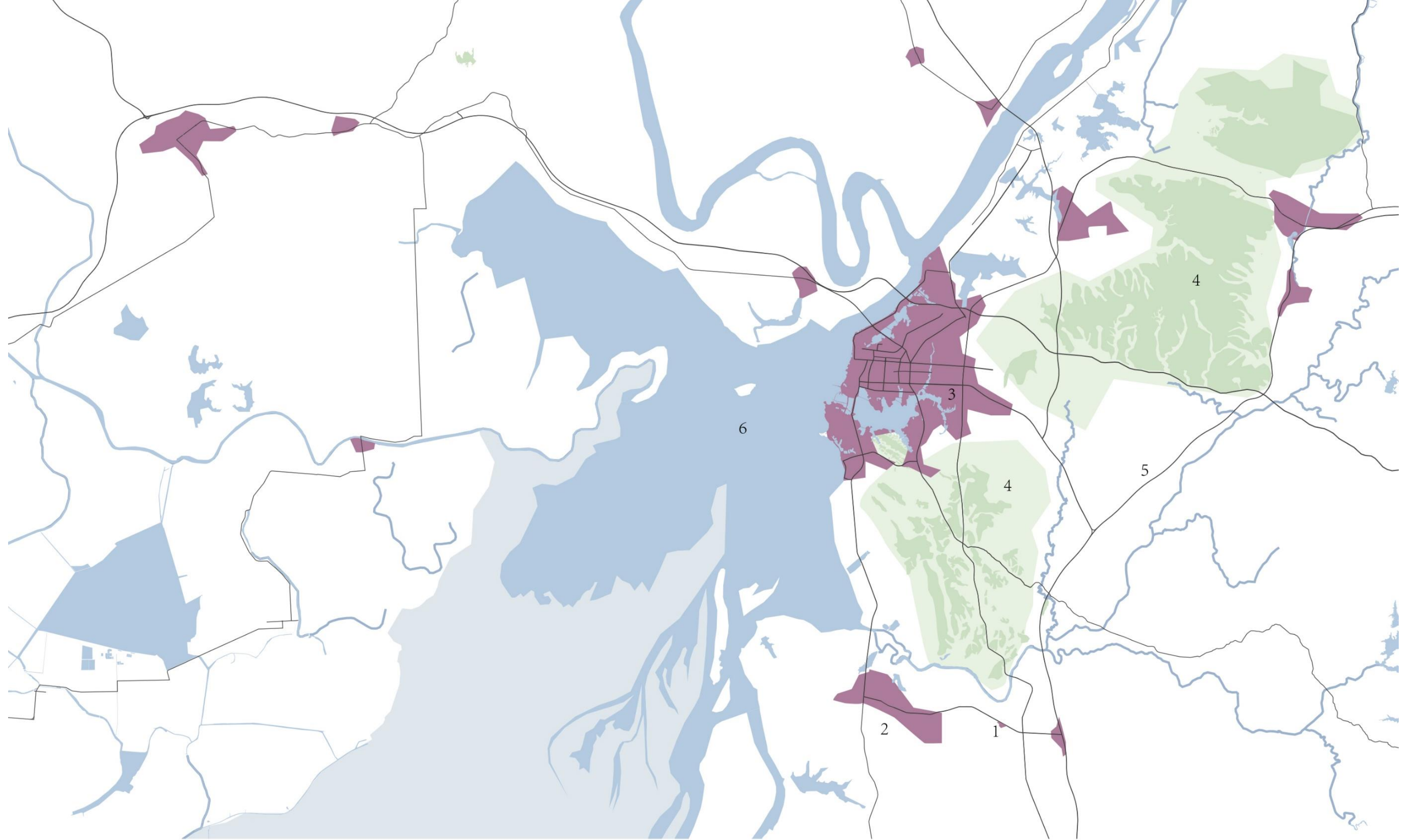
严寒地区 Severe cold zone
 寒冷地区 Cold zone
 夏热冬冷地区 Hot summer and cold winter zone
 夏热冬暖地区 Hot summer and warm winter zone
 温和地区 Moderate zone

2018 GDP
per capita of
each province
in mainland China

10000¥/ person
=1470\$/person







1.项目地点 Site 2.岳阳县 Yueyang County 3.岳阳市 Yueyang City 4. 铁山Tie Mountain 5. 岳临高速 Yvelin Highway 6. 北洞庭湖 North Dongting Lake









多功能报告厅

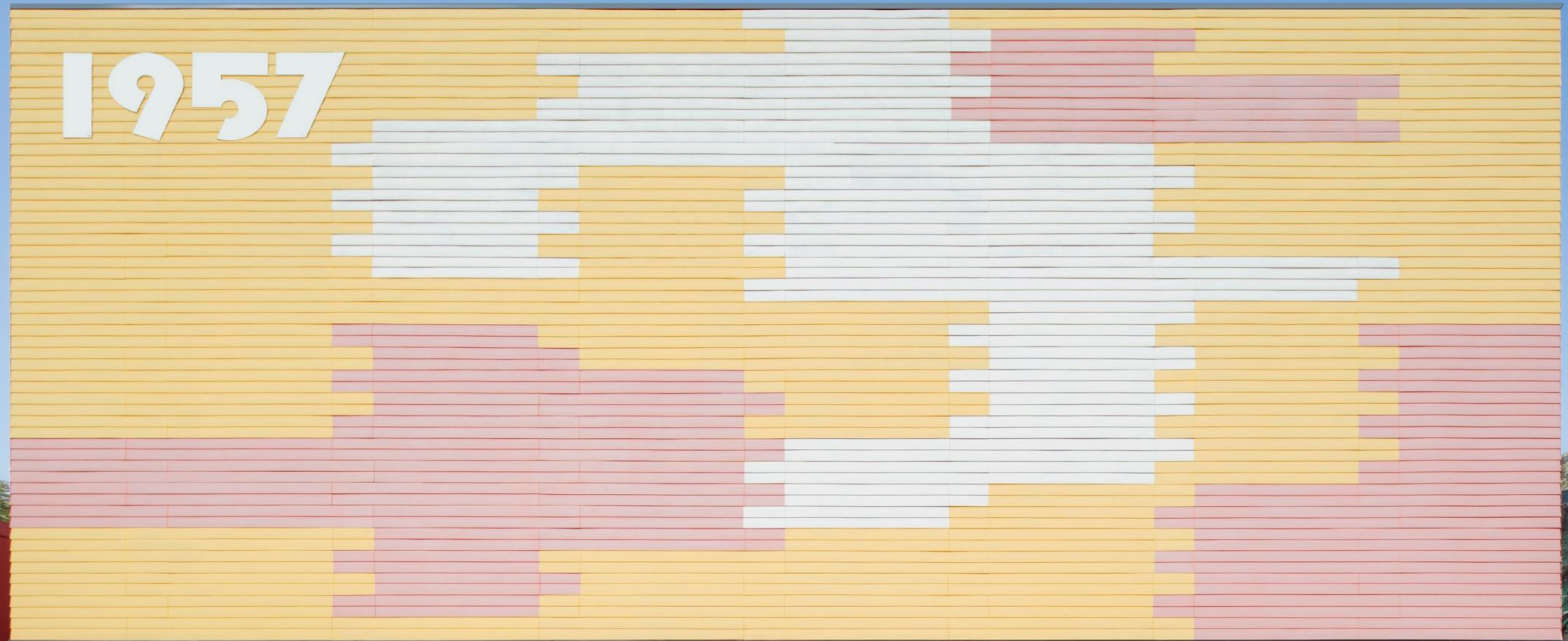
2017



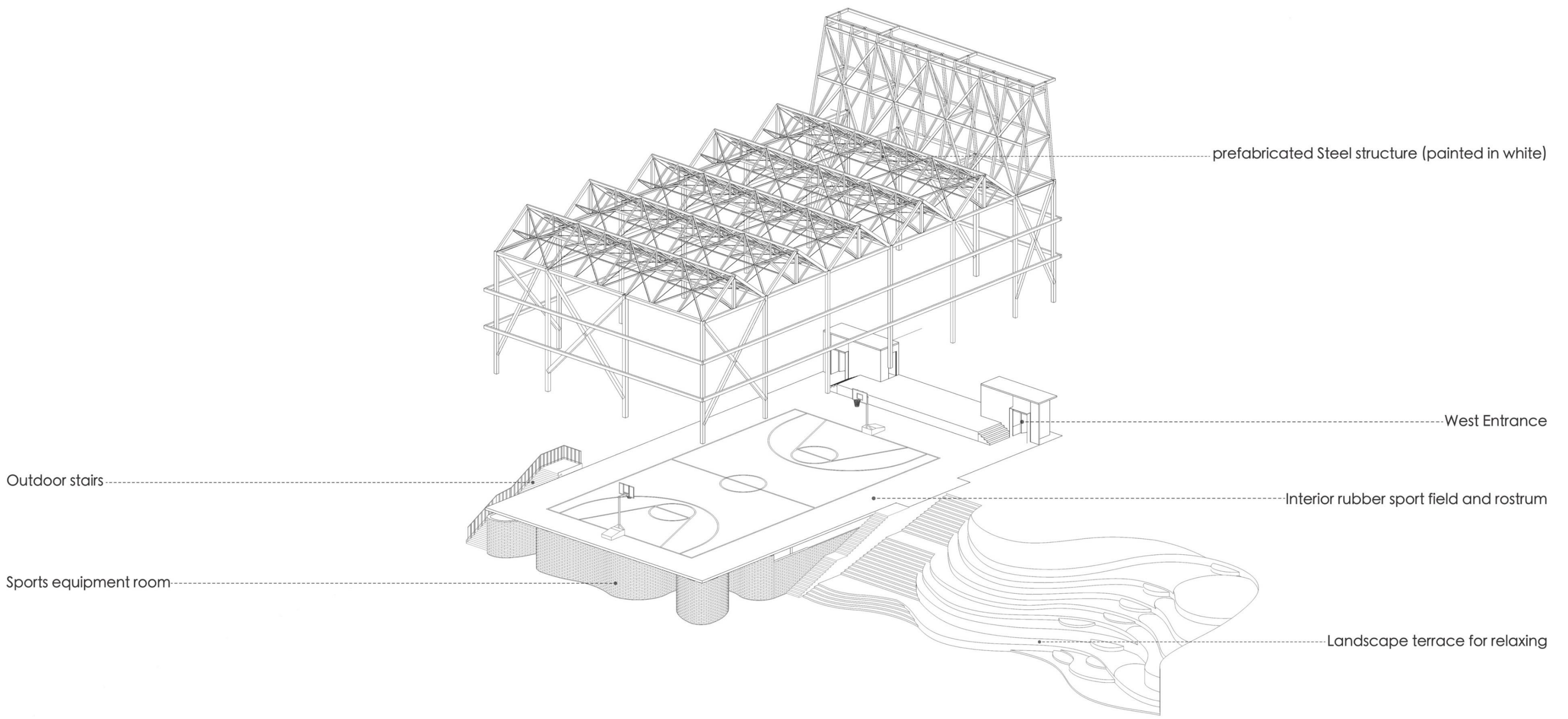
1957

多功能报告厅

1957







prefabricated Steel structure (painted in white)

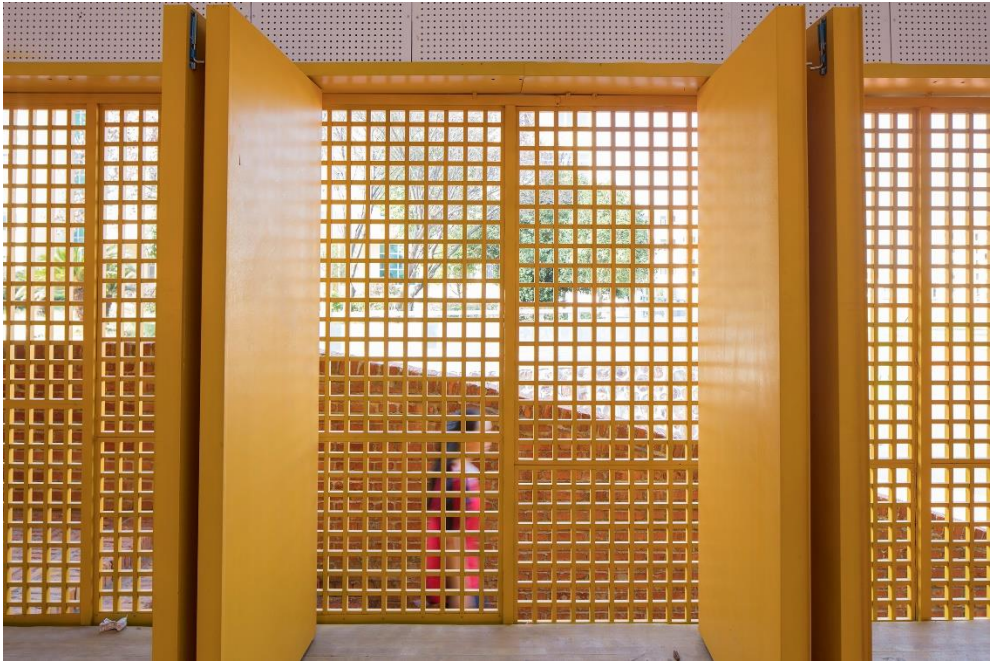
West Entrance

Interior rubber sport field and rostrum

Landscape terrace for relaxing

Outdoor stairs

Sports equipment room

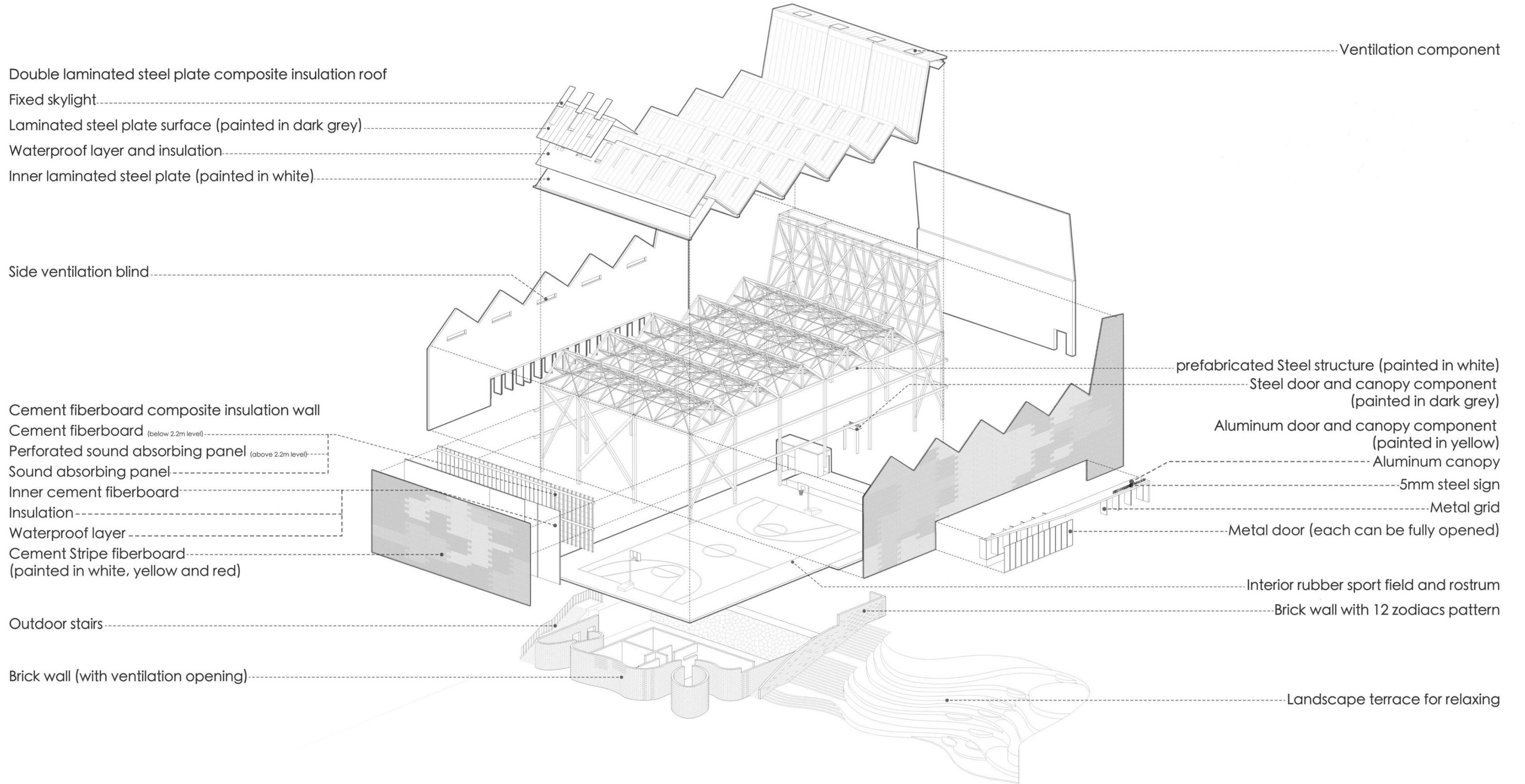




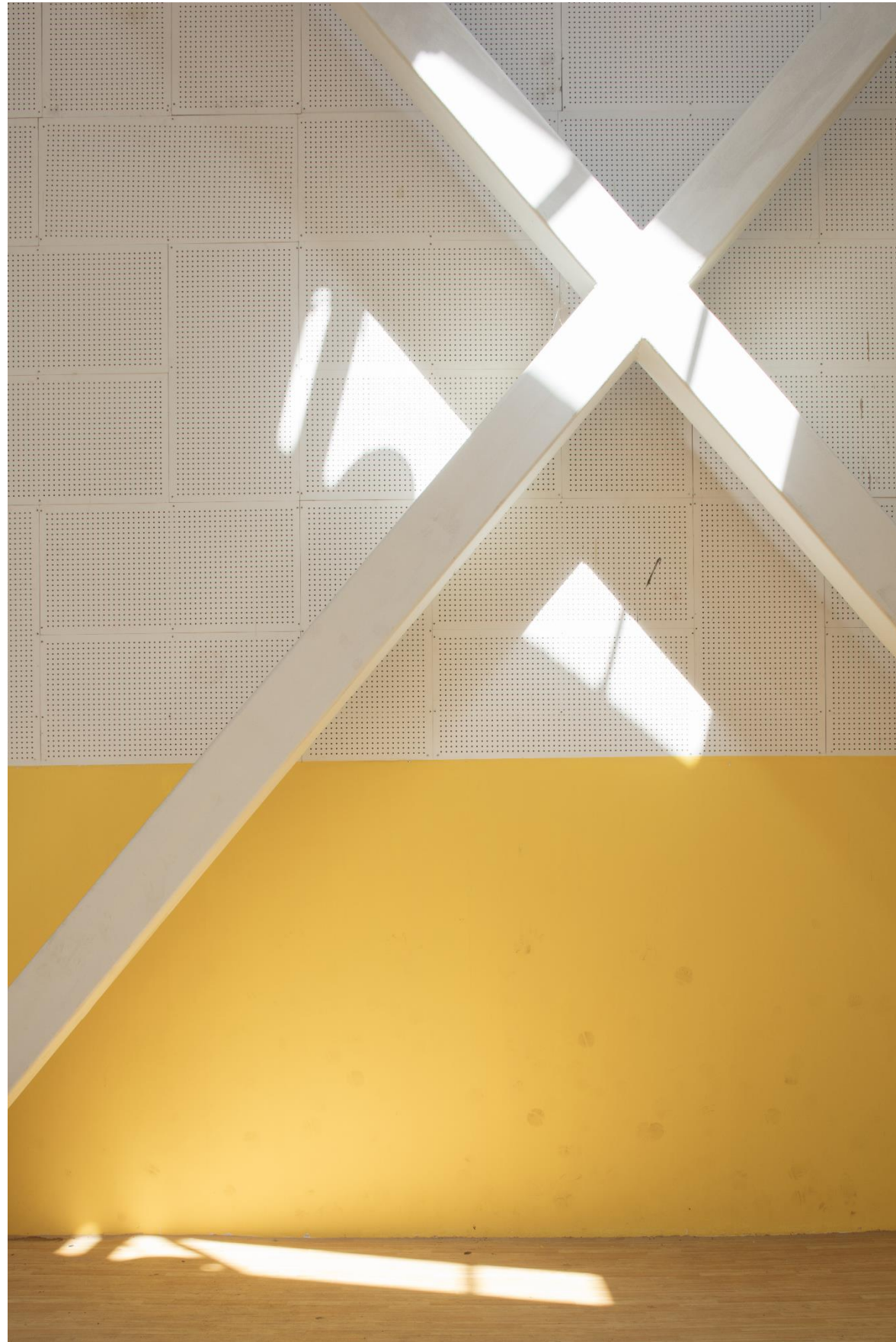
04

03

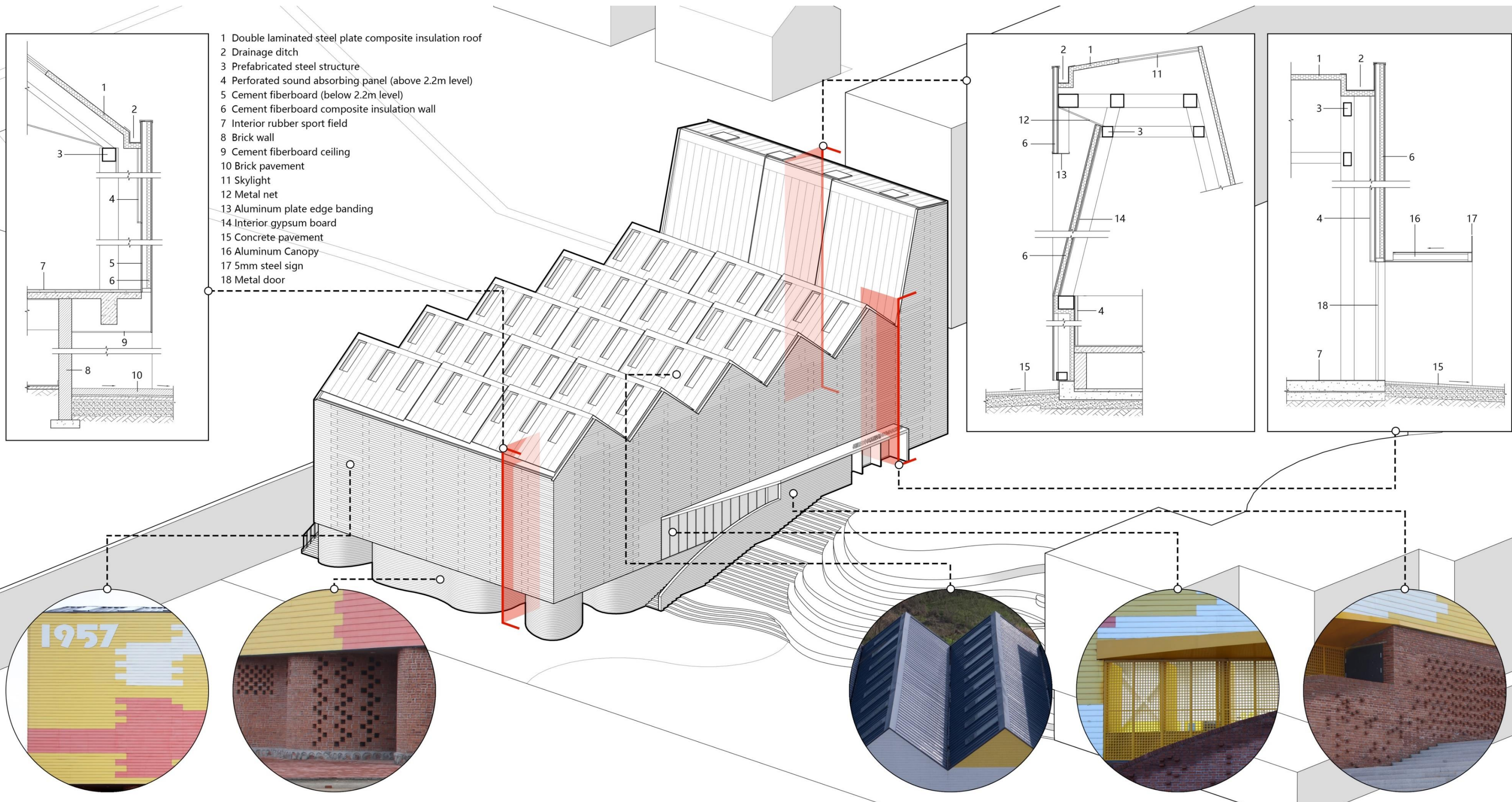




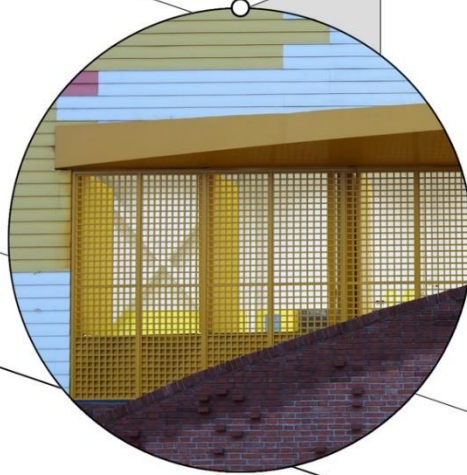
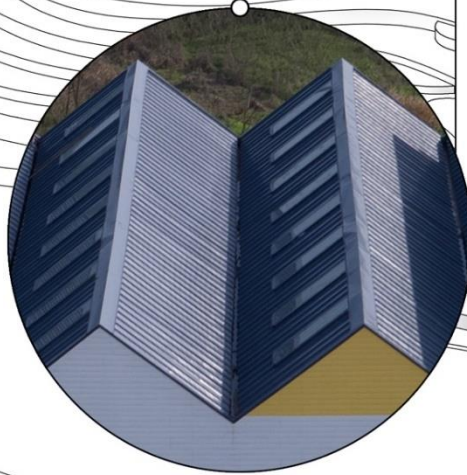
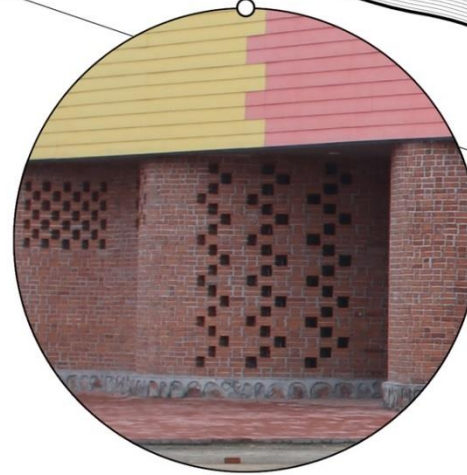
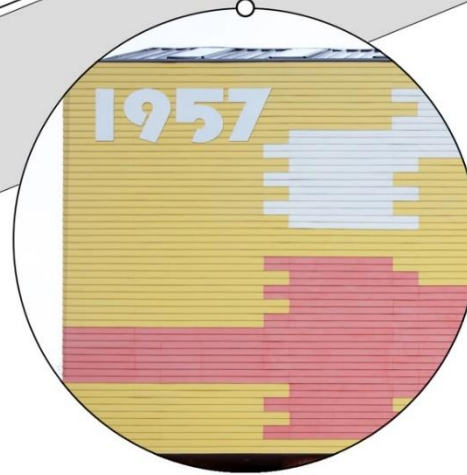
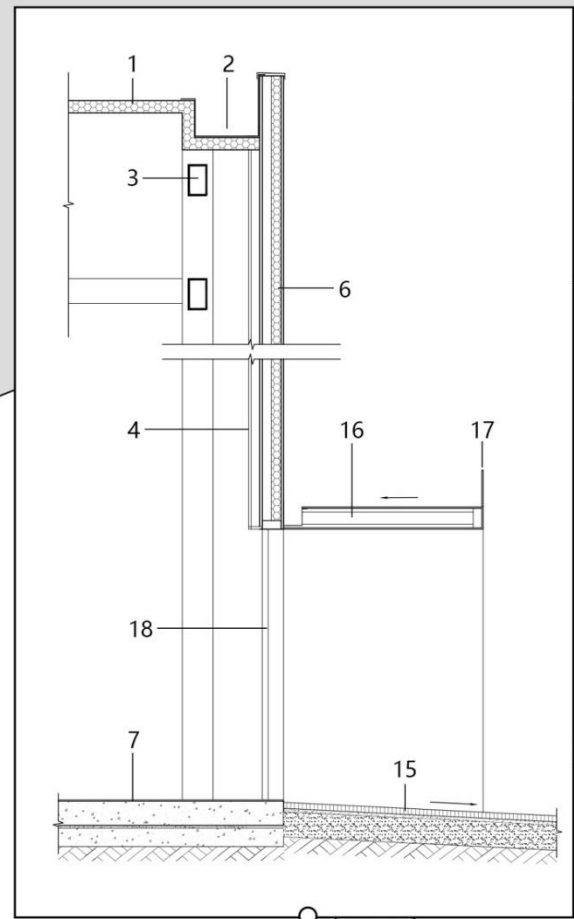
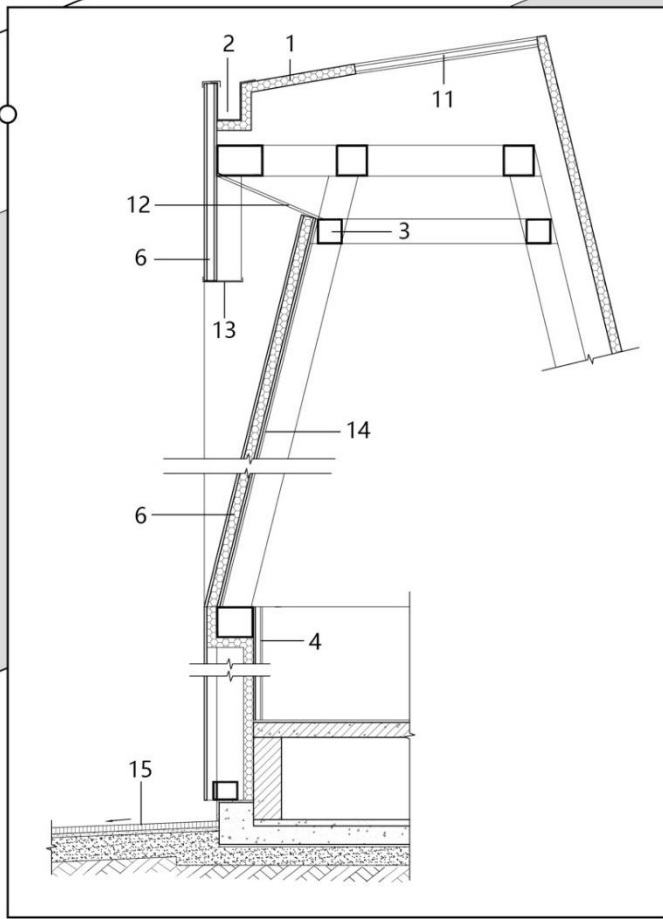
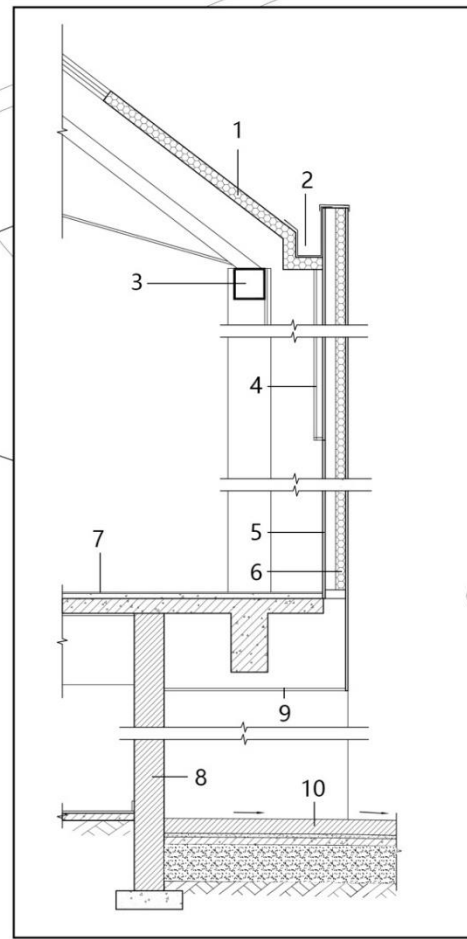






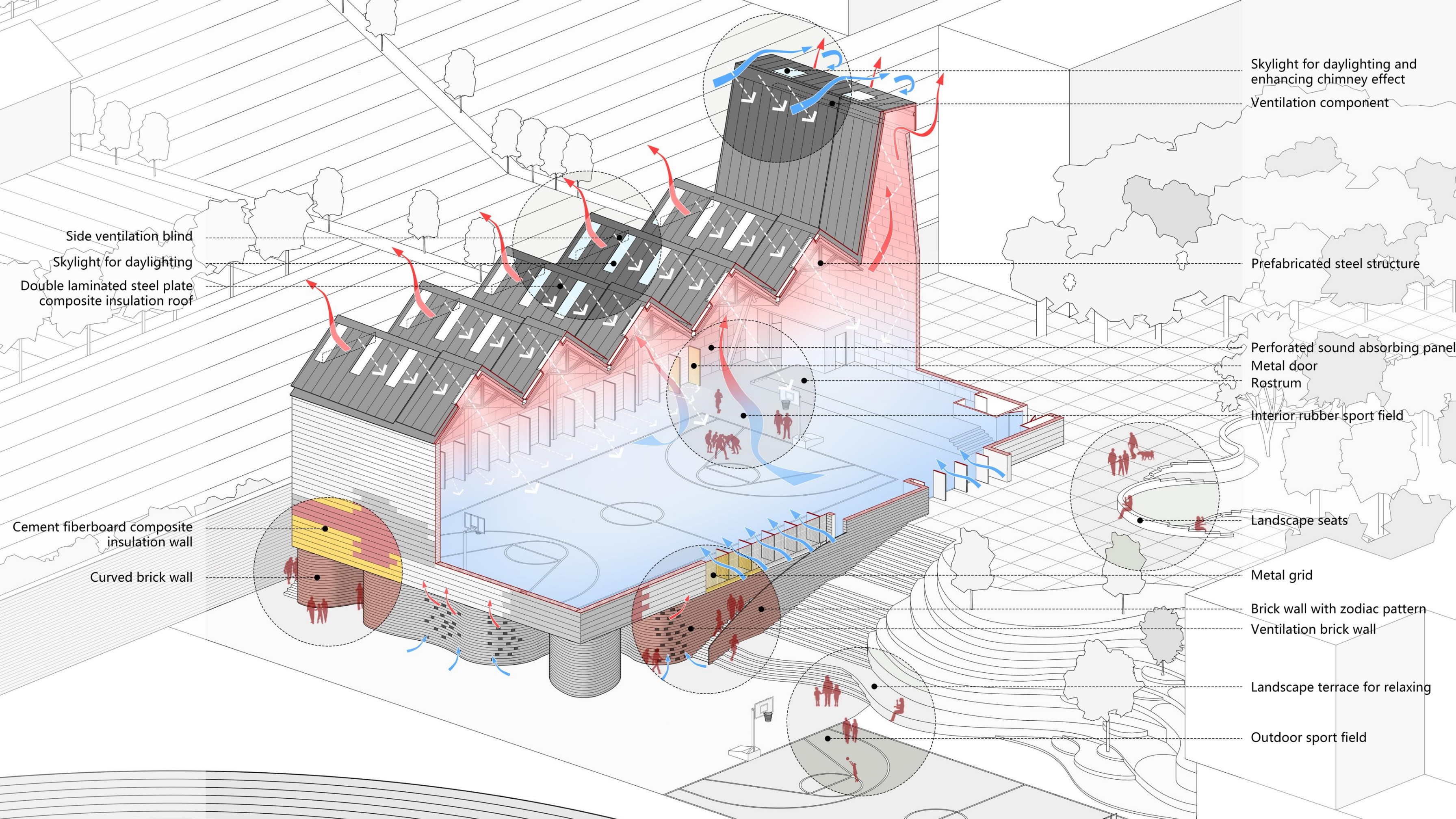


- 1 Double laminated steel plate composite insulation roof
- 2 Drainage ditch
- 3 Prefabricated steel structure
- 4 Perforated sound absorbing panel (above 2.2m level)
- 5 Cement fiberboard (below 2.2m level)
- 6 Cement fiberboard composite insulation wall
- 7 Interior rubber sport field
- 8 Brick wall
- 9 Cement fiberboard ceiling
- 10 Brick pavement
- 11 Skylight
- 12 Metal net
- 13 Aluminum plate edge banding
- 14 Interior gypsum board
- 15 Concrete pavement
- 16 Aluminum Canopy
- 17 5mm steel sign
- 18 Metal door









Skylight for daylighting and enhancing chimney effect
Ventilation component

Side ventilation blind
Skylight for daylighting
Double laminated steel plate composite insulation roof

Prefabricated steel structure

Perforated sound absorbing panel
Metal door
Rostrum
Interior rubber sport field

Cement fiberboard composite insulation wall
Curved brick wall

Landscape seats

Metal grid

Brick wall with zodiac pattern
Ventilation brick wall

Landscape terrace for relaxing

Outdoor sport field

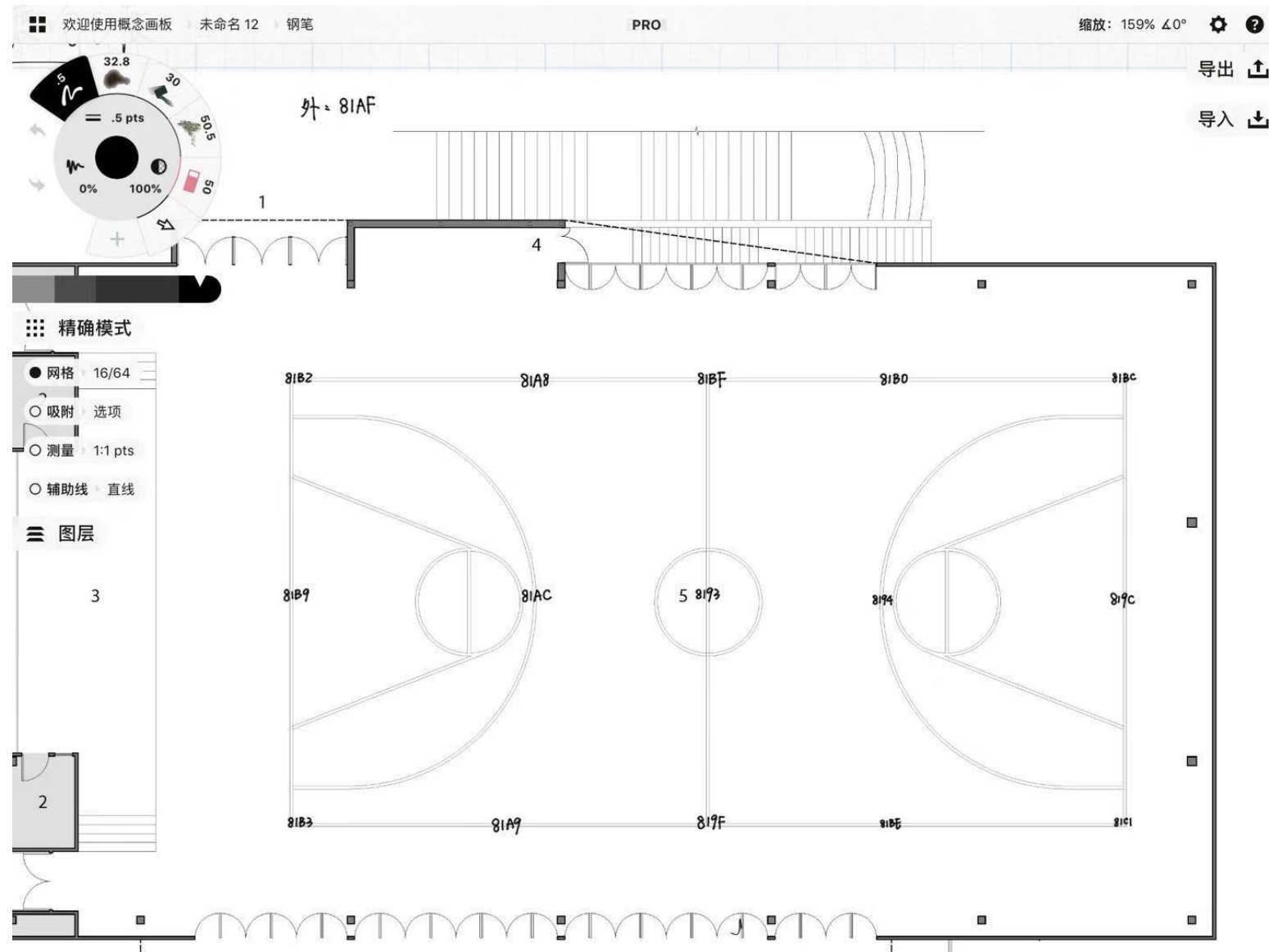
Luminous and Glare Effect Measurement

Date:

- 2019-08-03 to 2019-08-06

Measurement Conducted:

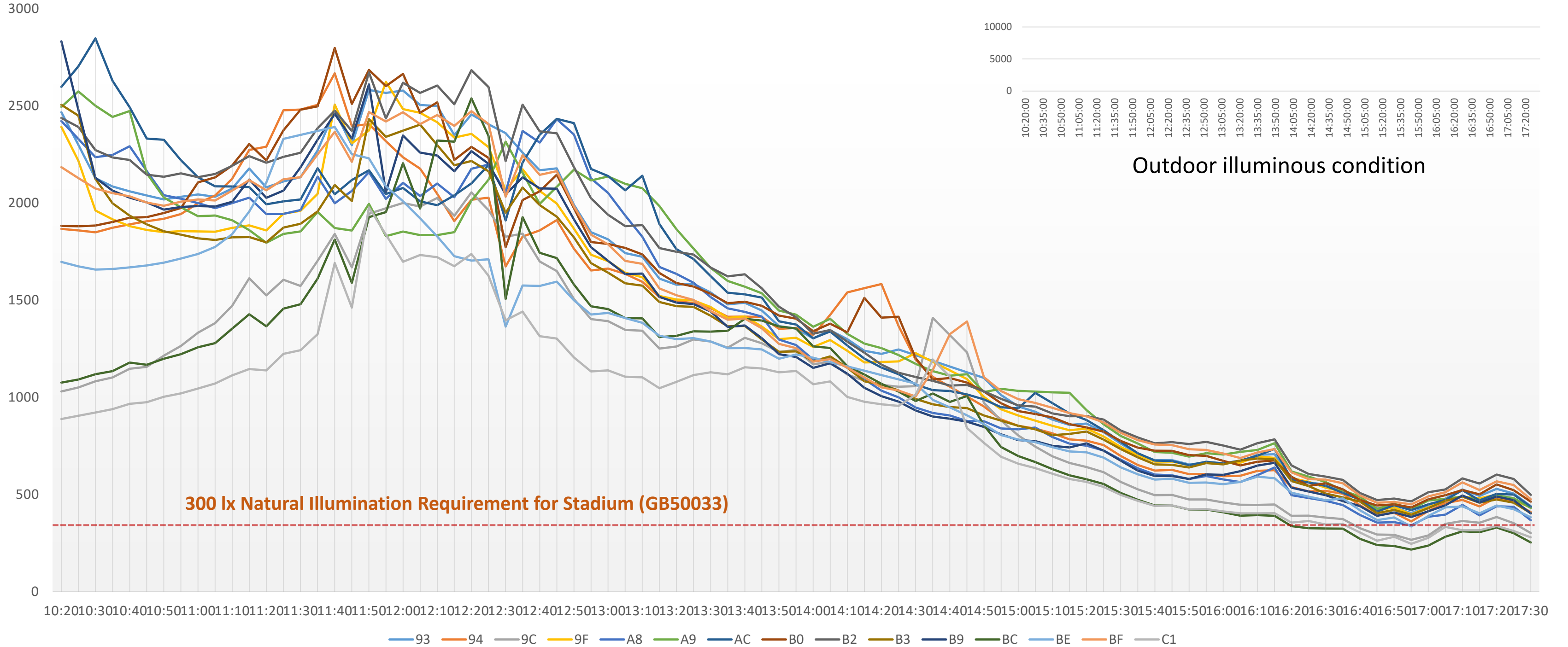
- 5*3 grid of Luminosity sensors is arranged and whole day illuminous data;
- Outdoor sky-background illuminous data;
- The luminous of different surface is measured for glare effect evaluations;



Daylight Illuminous distribution analysis

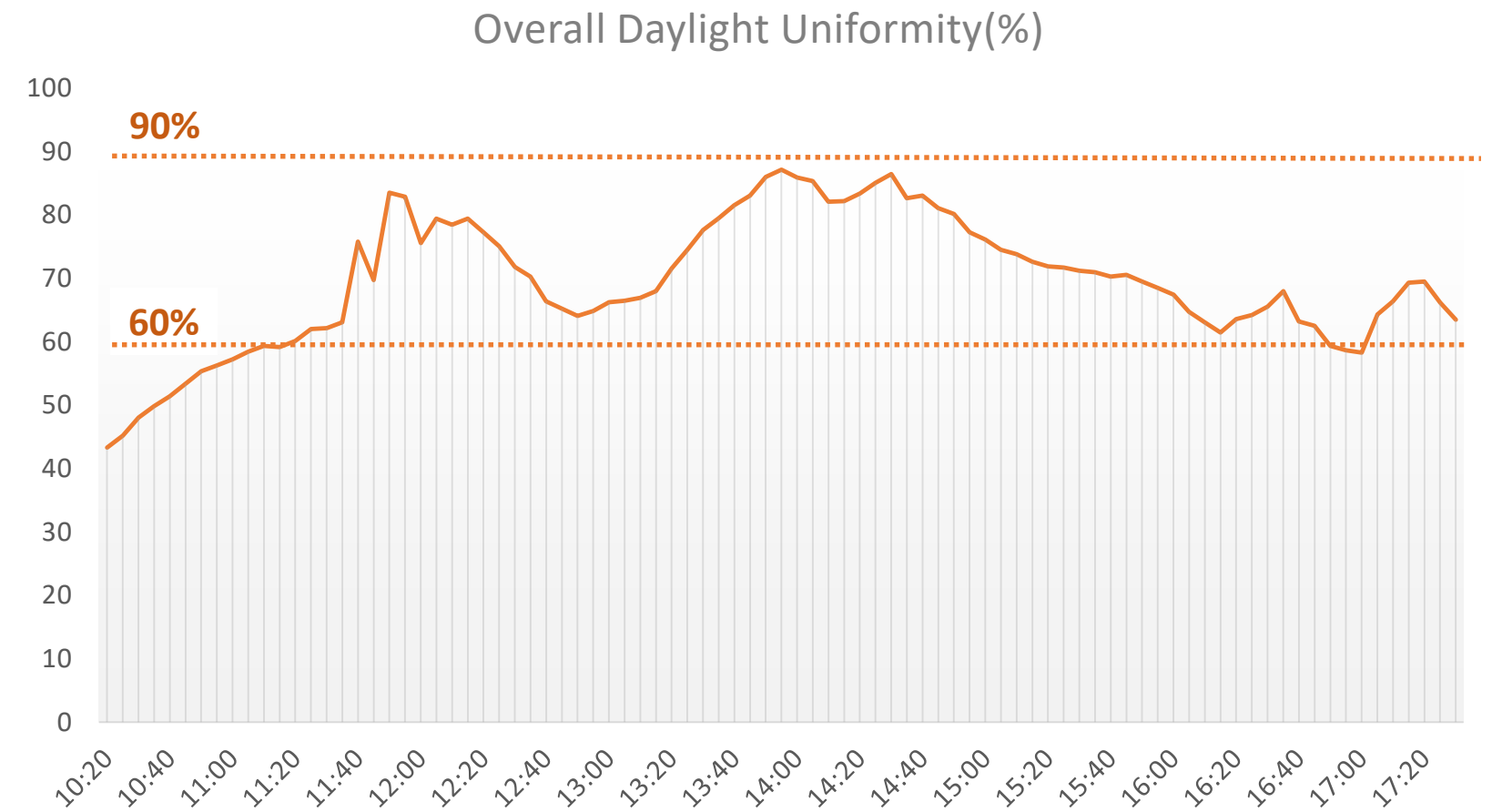
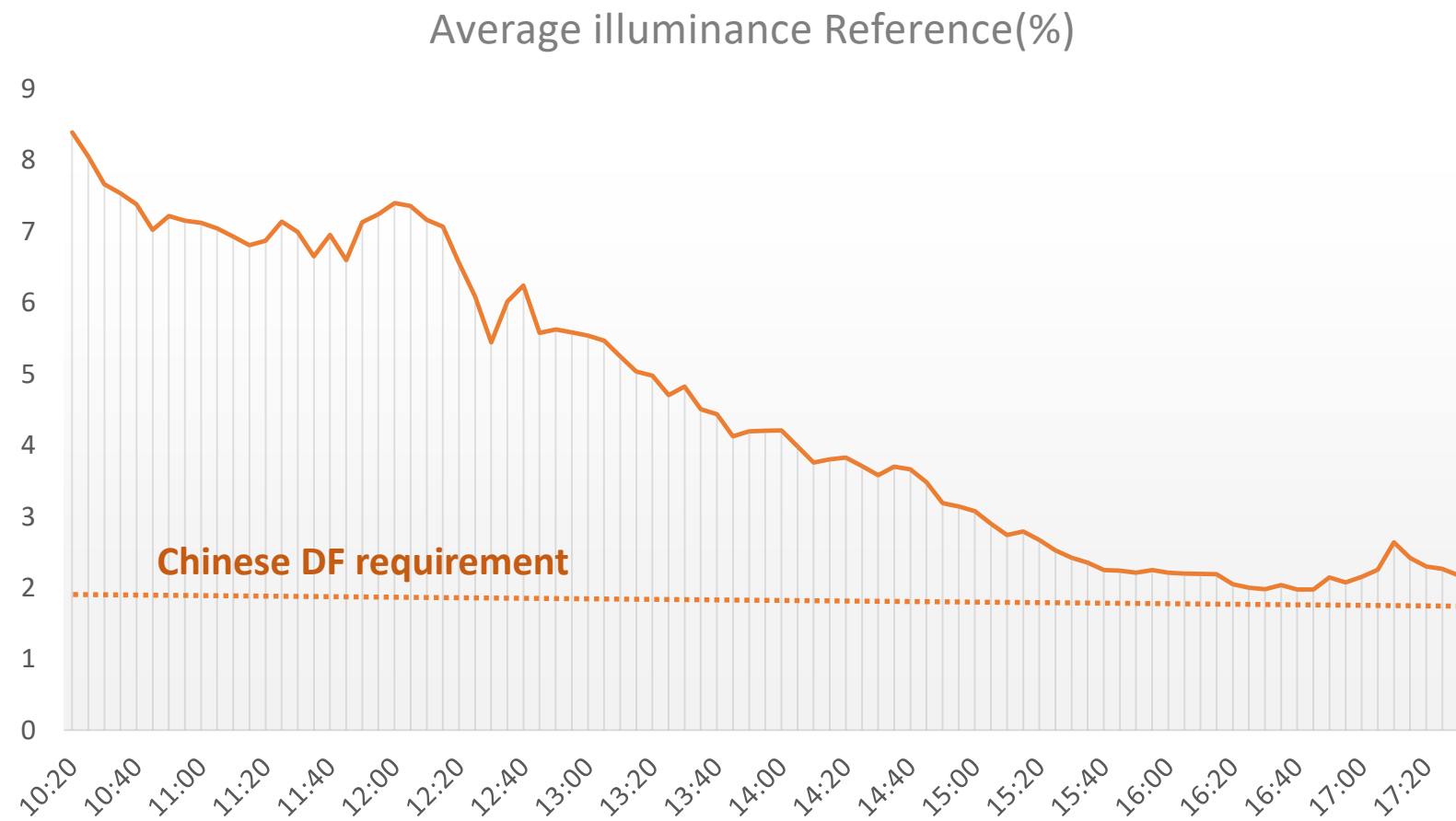
Most of the space have much higher illuminous compared with Chinese regulation

(Unit: lx)

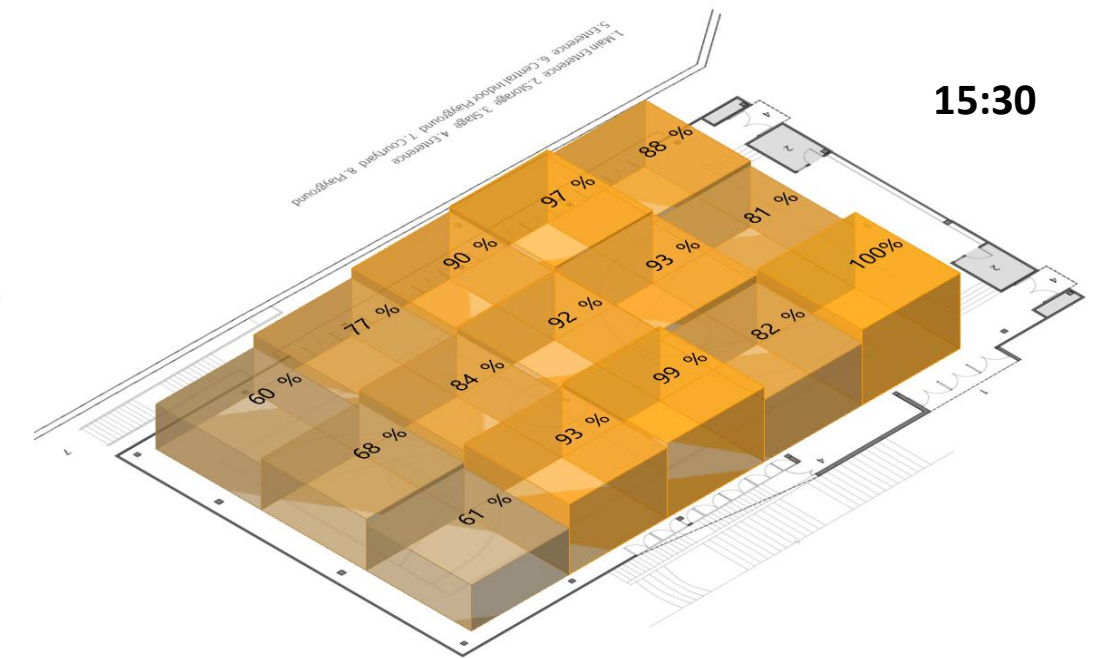
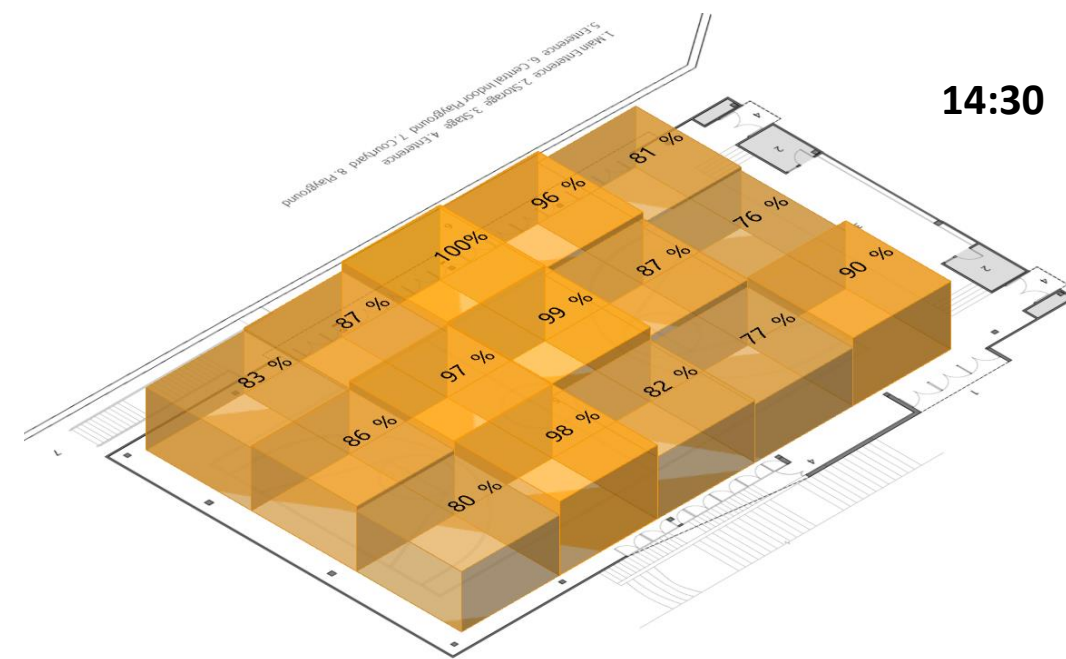
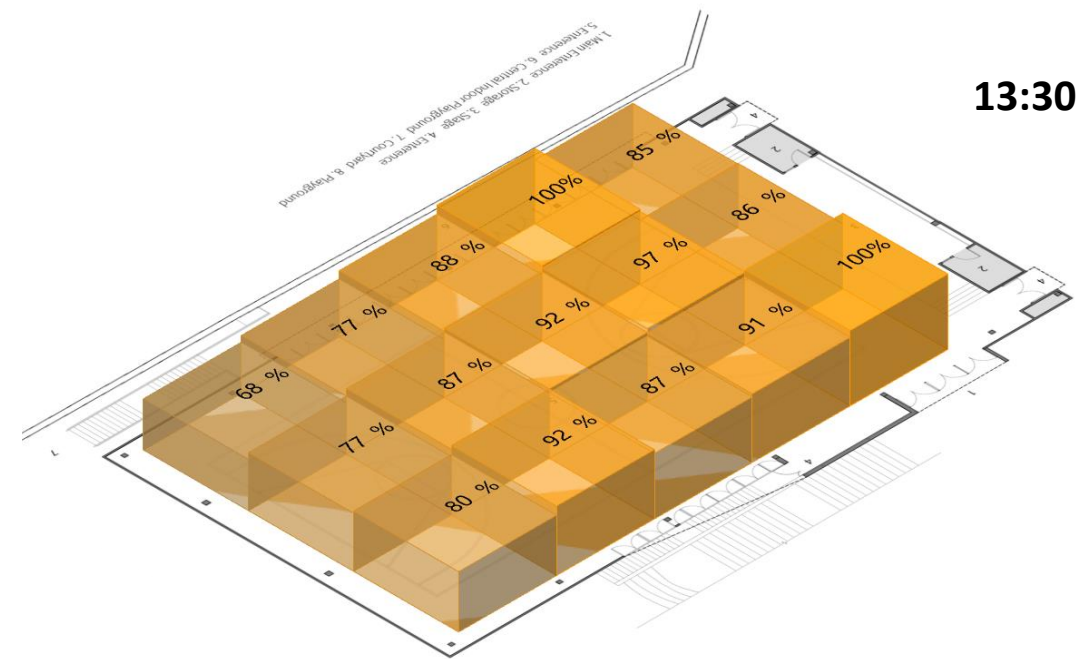
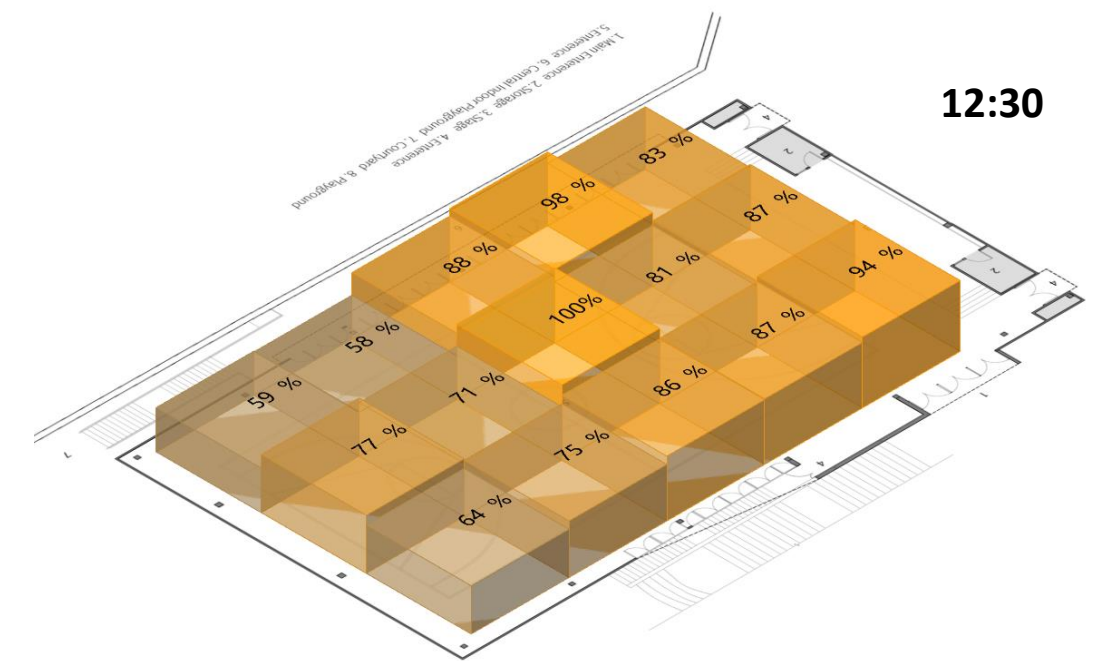
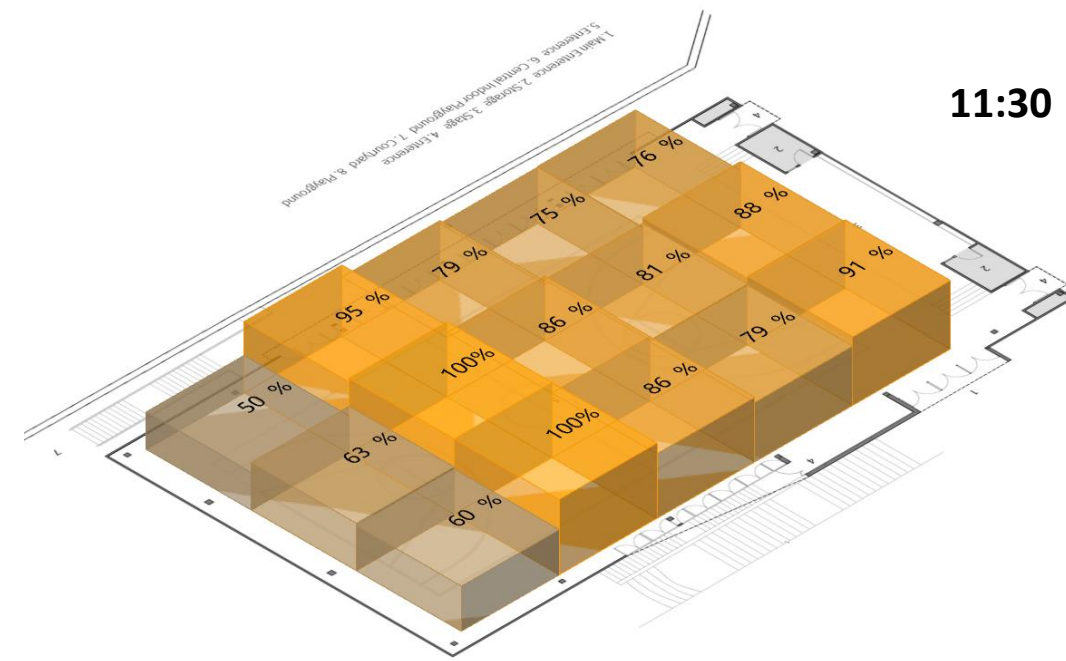
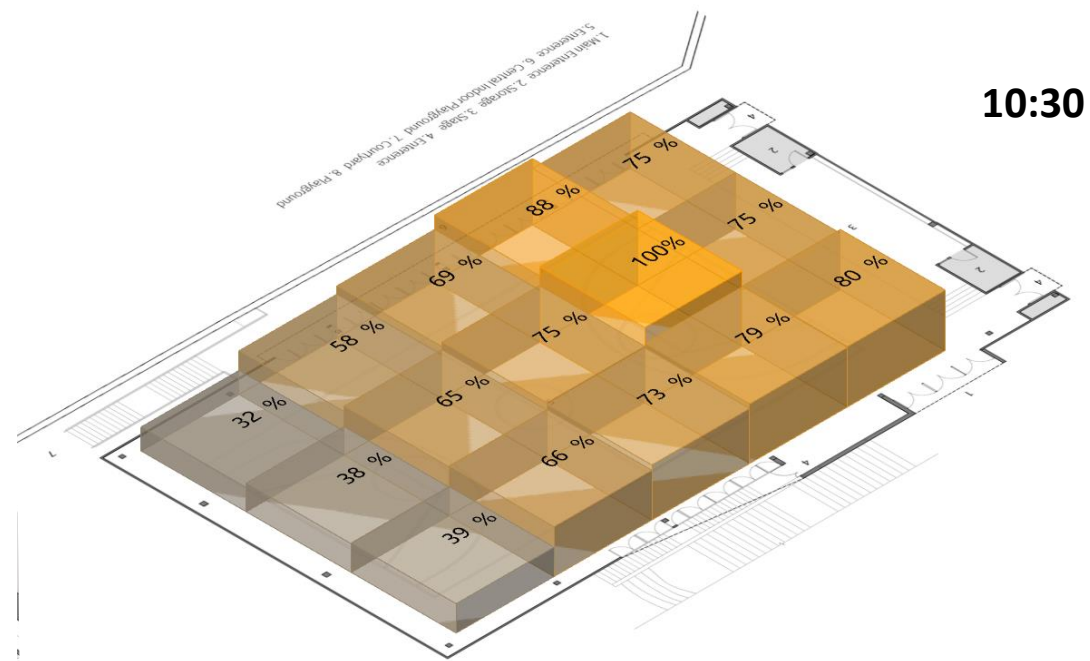


Average illuminous distribution

The average daylight illuminous keep higher than the country regulation among most of the day and the overall uniformity is among 60% to 90% most of the day, providing steady daylight for the students.

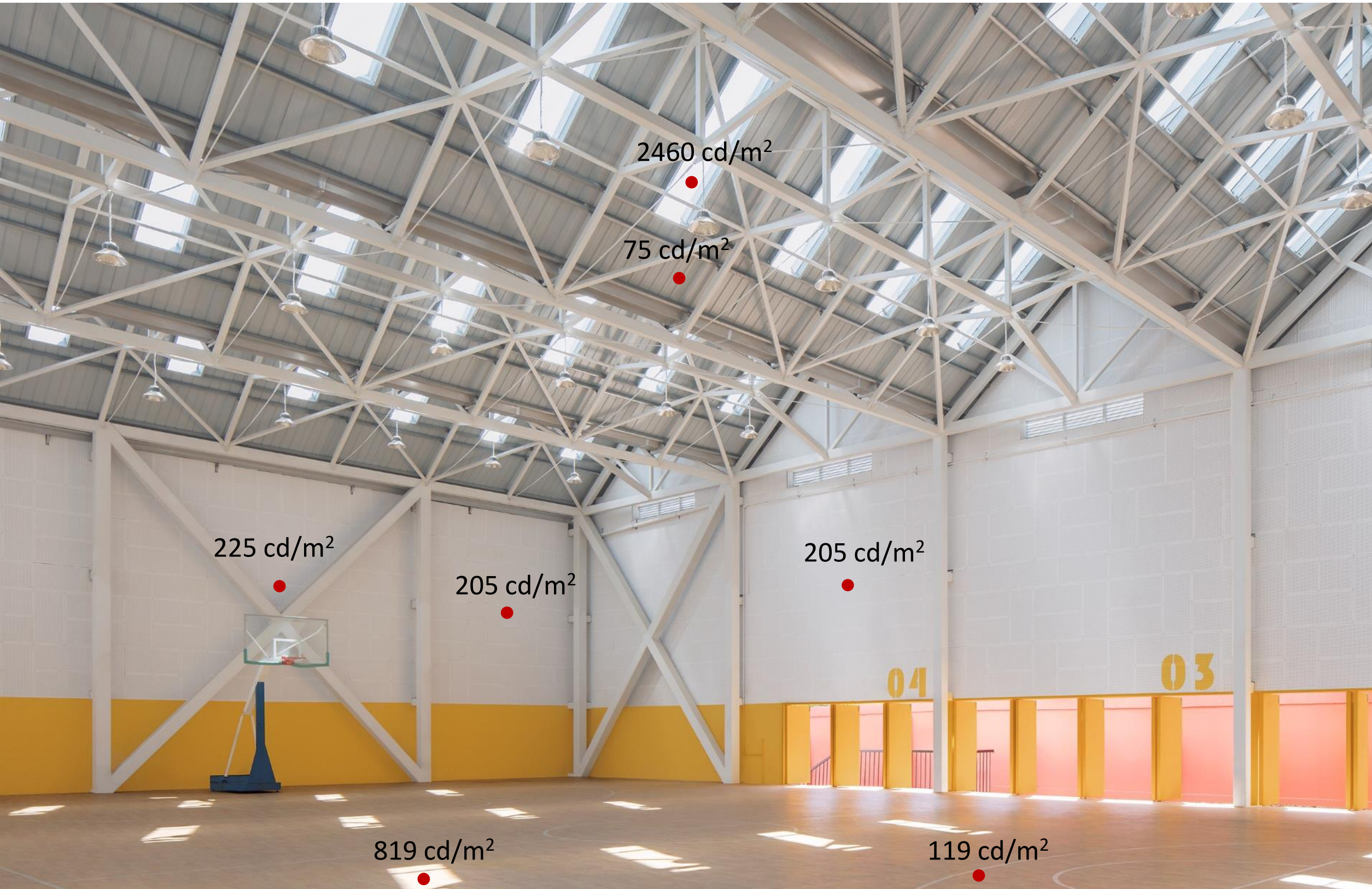


Time based illuminance distribution



Morning: Stage have better illuminance, which would be suitable for school events and festivals
Afternoon: Space become more uniformity with illuminance which would suitable for sports

Surface luminance Evaluation



Morning: East-facing roof window cast light and shadow into the space, boost the overall indoor luminance while create small glare zone.

Roof Luminance: 75 cd/m²
Wall Luminance :210 cd/m²
Floor Luminance :120 cd/m²
Floor Glare: 819 cd/m²

Surface luminance Evaluation



Afternoon: No glare light cast into the space, providing better lighting quality for student sports.

Roof Luminance: 62 cd/m²
Wall Luminance :152 cd/m²
Exterior Luminance :452 cd/m²
Floor Luminance :100 cd/m²

Surface luminance Evaluation

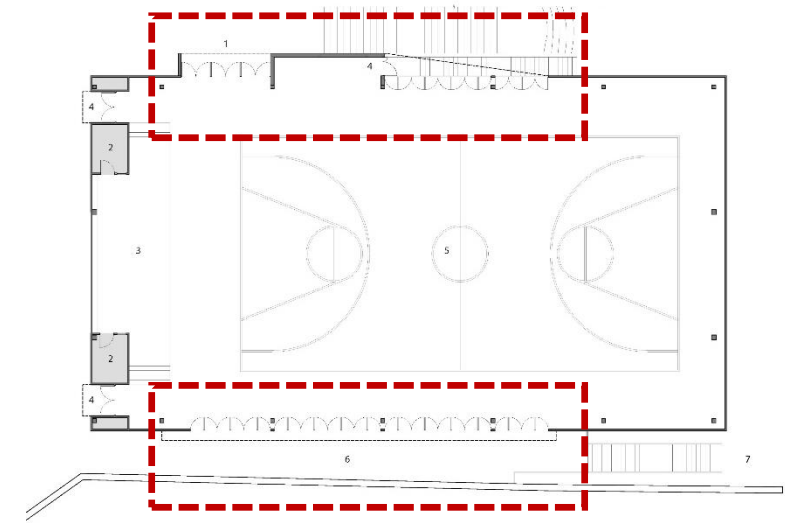


Afternoon: No glare light cast into the space, providing better lighting quality for student sports.

Roof Luminance: 62 cd/m²
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Glare effect prevention

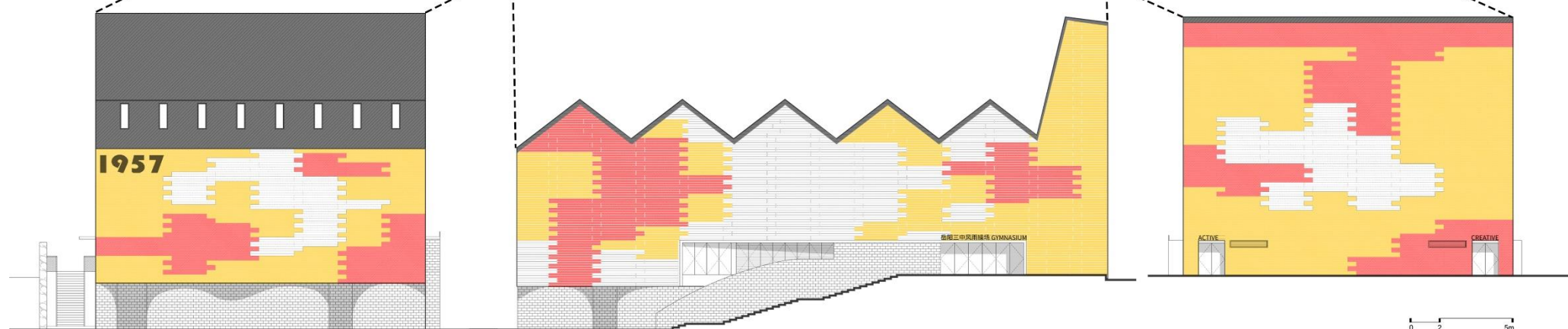
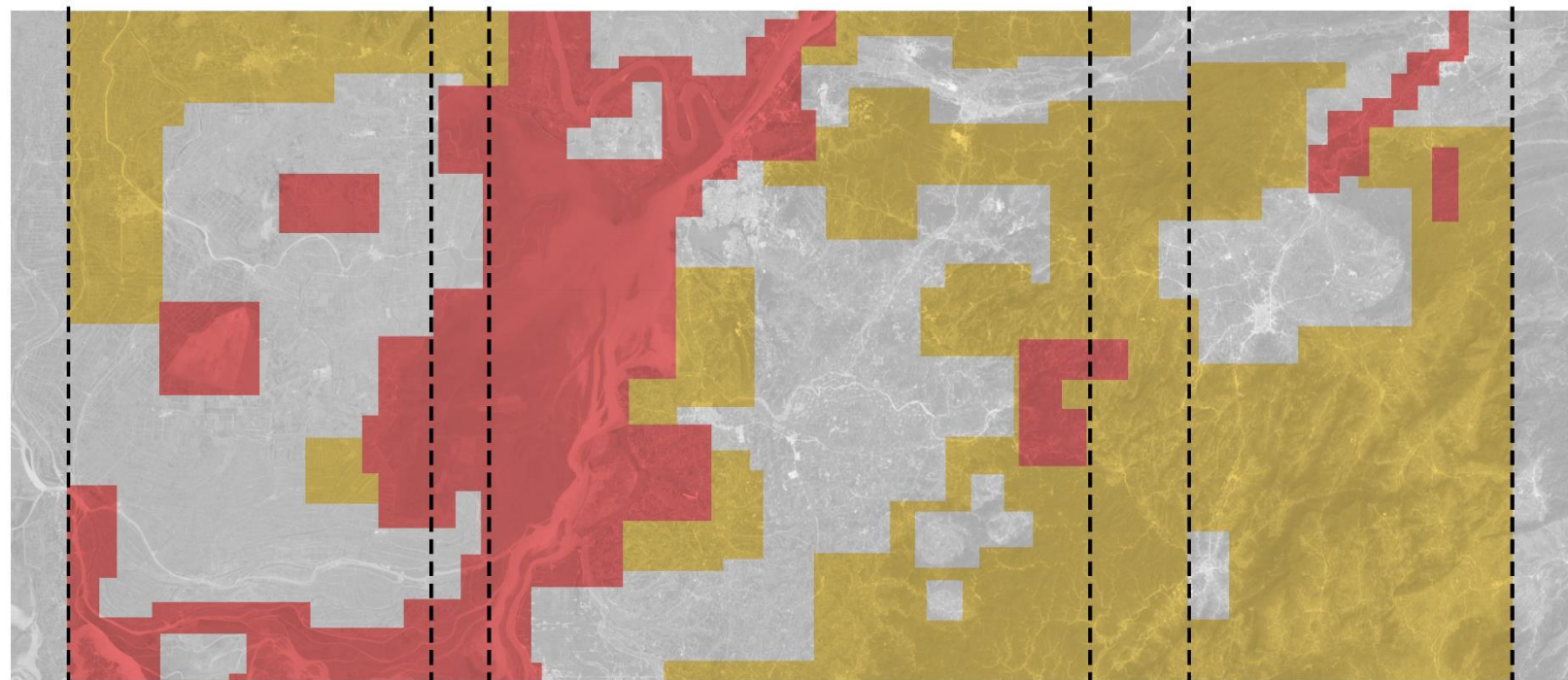
The glare effect of north and south entrance are improved with reflected wall and fixed louver, reduce the luminance of this area with natural ventilation maximized.









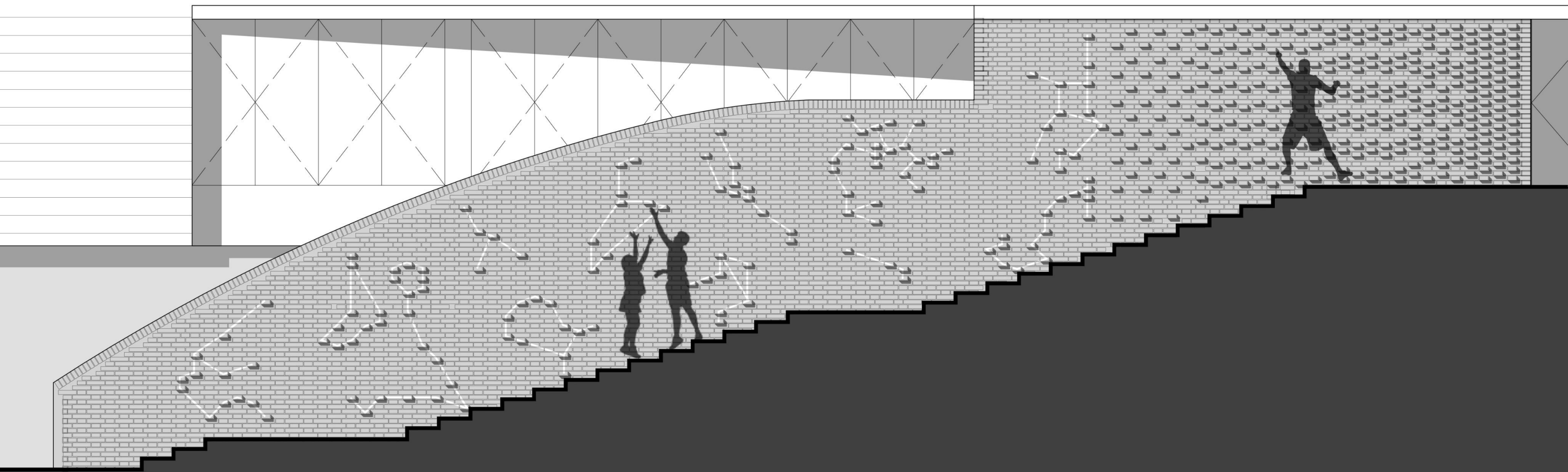


东立面图 / East Facade

北立面图 / North Facade

西立面图 / West Facade





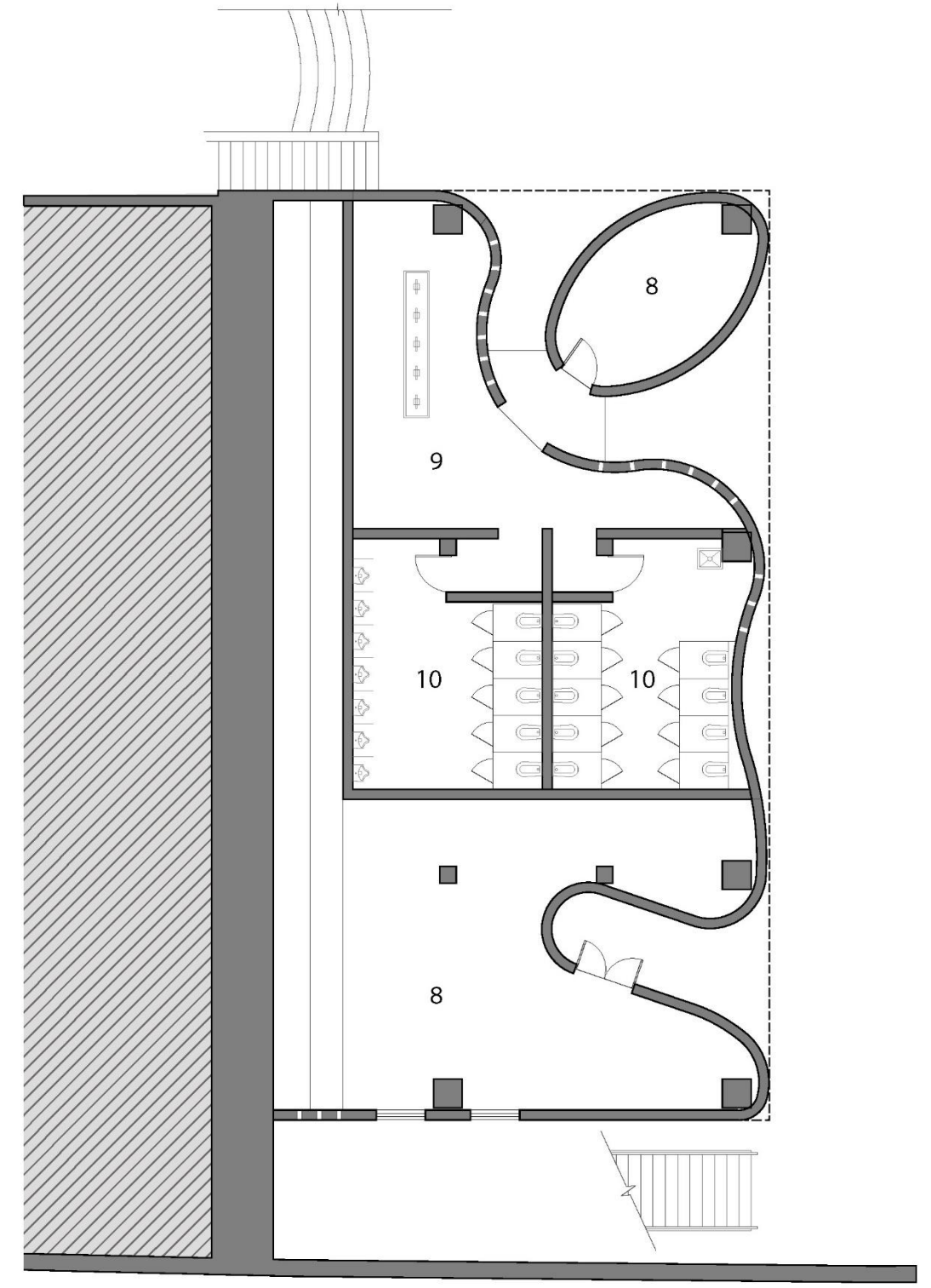
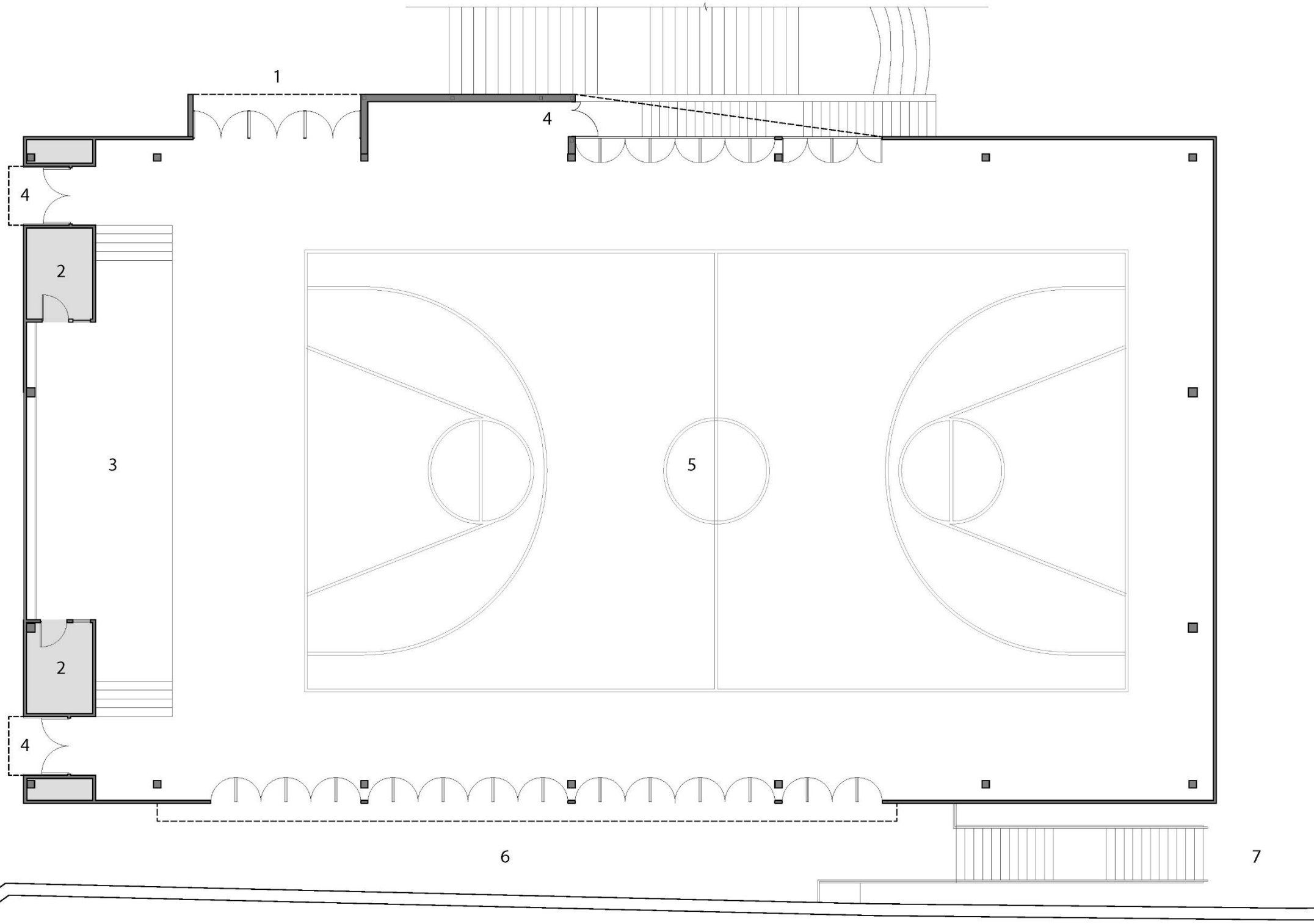




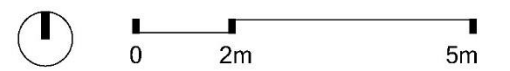


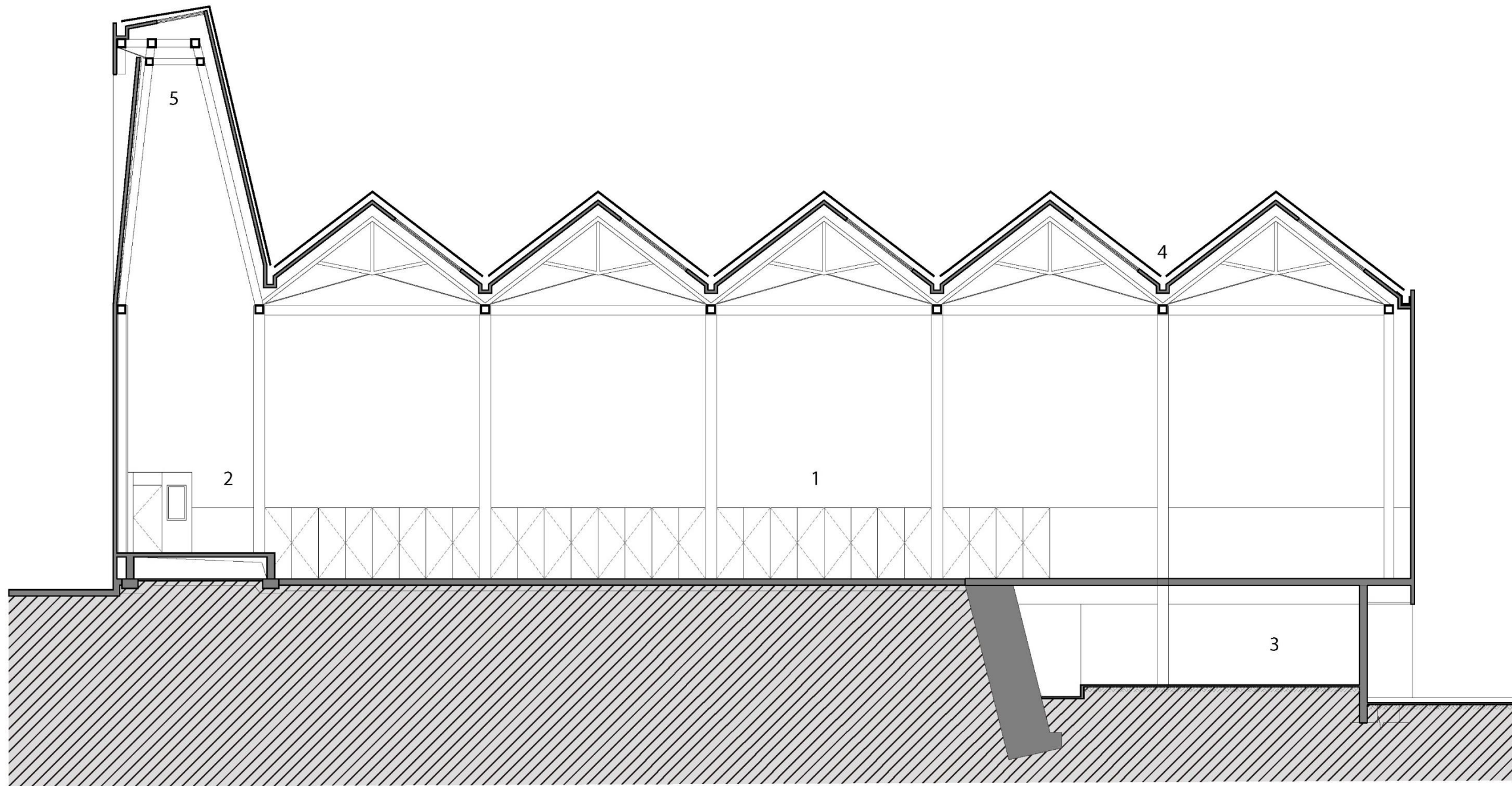
多功能报告厅





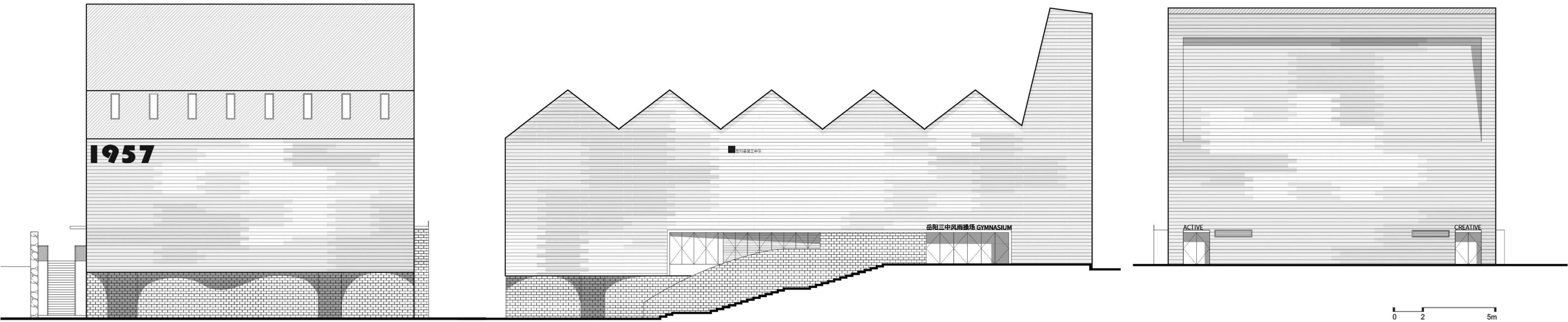
1.主入口Main Entrance 2.储藏间 Storage 3.舞台 Stage 4.次入口 Entrance
 5.次入口 Entrance 6.运动场地 Central Indoor Playground 7.狭院 Courtyard 8.操场 Playground





1. 运动场 Main Playground 2. 主舞台 Main Stage 3. 卫生间 Toilet 4. 通风窗 Ventilation Channel 5. 屋面排水沟 Roof Drainage

0 2 5m



0 2 5m

T H A N K S

