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
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.
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
Wall Luminance: 152 cd/m²
Exterior Luminance: 452 cd/m²
Floor Luminance: 100 cd/m²
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.