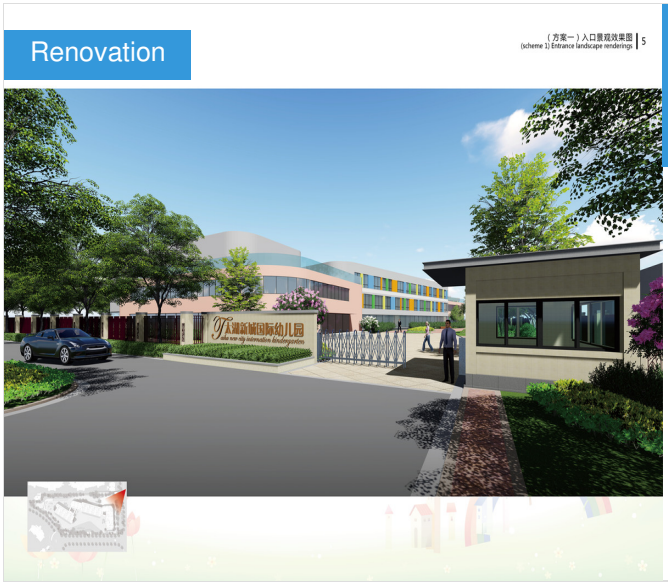
WuXi Experimental Kindergarden---Landsea New County Branch

by / 2017-06-16 06:25:48 / China / 10742 / CN

Renovation



Primary energy need :

371.91 kWhpe/m².

(Calculation method : Primary energy needs)

ENERGY CONSUMPTION

Economical building *Building*

- *< 50* **A**
- *51 à 90* **B**
- *91 à 150* **C**
- *151 à 230* **D**
- *231 à 330* **E**
- *331 à 450* **F**
- *> 450* **G**

Energy-intensive building

Building Type : Preschool, kindergarten, nursery
Construction Year : 2016
Delivery year : 2016
Address 1 - street : 214000 ,
Climate zone : [Cfa] Humid Subtropical - Mild with no dry season, hot summer.

Net Floor Area : 6 835 m² NGF
Construction/refurbishment cost : 5 000 000 ¥
Number of Children : 720 Children
Cost/m2 : 731.53 ¥/ m ²

General information

The project is NewSchool kindergarten construction project in Wuxi city,Jiang Su province. Land area is 10807 squere meter, Construction area is 6835.3 squere meter. The main functional rooms for kids include activitiy room domitory library multifunction auditorium and office for teachers.
As a famous kindergarten in Wuxi, Wuxi Experimental Kindergarten is invested and developed by Taihu New City Group and constructed by Landsea, with technical support provided by Landleaf. It has been opened at 1st September in 2016 for 24 classes.Wuxi Experimental Kindergarten dedicates to creating the first high-standard green, healthy and environment-friendly kindergarten in Eastern China where the healthy and conformable indoor air environment are provided for children to study and rest.The kindergarten with good environment not only makes parents rest assured but also contributes to establishing the public praise and image of “caring children’s health” and showing humanistic concern of the kindergarten.
Due to the severe air pollution status in Wuxi, the project from construction as a whole, controls the multiple stages such as design construction installation commissioning acceptance monitoring and operation in order to guarantee the indoor air quality of kindergarten. The specific health technical measures include these aspects: the design of the fresh air system, high efficient haze removal, system-intelligent monitoring, measures of energy conservation and ultralow noise.

Data reliability

3rd part certified

Stakeholders

Stakeholders

Function : Thermal consultancy agency

021-61076408

http://www.landleaf-tech.com/
Participate in full-process design consultation, procurement consultation, engineering consultation, marketing promotion, commissioning and operation, maintenance service delivery of fresh air haze-removal system and Finland S1-level decoration.

Owner approach of sustainability

Landsea New County Branch of Wuxi Experimental Kindergarten is in the forefront of peers in terms of hardware facilities, education, teaching and teacher resources, etc. All decorative materials of the kindergarten are strictly selected by Landleaf R&D Base; five categories, totaling 38 materials, are tested for 152 times to guarantee that air environment reaches the world strictest Finland S1-level standard. As the first “breathable” kindergarten in Wuxi, it filters out PM2.5 effectively by mechanical ventilation, physical filtration and other technologies. Through controlling the source control of particulates, fresh oxygen is filled indoors; and fresh air is kept always. The kindergarten also sets up the monitor screen to monitor the air quality.

Architectural description

Wuxi Experimental Kindergarten dedicates to creating the first high-standard green, healthy and environment-friendly kindergarten in Eastern China where the healthy and conformable indoor air environment are provided for children to study and rest.The kindergarten with good environment not only makes parents rest assured but also contributes to establishing the public praise and image of “caring children’s health” and showing humanistic concern of the kindergarten.
As children of school age spend 7 to 8 hours on average in kindergarten every day, it is significantly important that the classroom can provide fresh and healthy air for children’s sound growth. The common indoor pollutants in the kindergartens mainly include finishing material, detergent, stationery and organic pollutants emitted by human body. In addition, as children are crowded in the classroom, it is easy for virus and bacteria carried in human body to generate influenza, chicken pox and other diseases; due to the weak immunity of children, it is easier for them to have cross infection; the high density of children will also bring over-high carbon dioxide; in the classroom with insufficient air change, the children’s learning efficiency or even their growths will be affected. Meanwhile, due to unsatisfactory air quality in Wuxi, no fresh and healthy air can be provided for the classroom by ventilation through opening the windows in the hazy weather. Therefore, only a set of comprehensive system solution with functions of fresh air supply, haze filtration, indoor exhaust gas discharge, safety, energy conservation and ultra-low noise can provide a “breathable kindergarten” for Wuxi citizens.

Building users opinion

Related departments of Wuxi and parents all give high praise on the founding philosophy of Wuxi Experimental Kindergarten who gives first priority to children’s health and safety

Energy

Energy consumption

Primary energy need : 371,91 kWhpe/m^2.

Primary energy need for standard building : 381,88 kWhpe/m^2.

Calculation method : Primary energy needs

Initial consumption : 115,72 kWhpe/m^2.

Envelope performance

Envelope U-Value : 0,75 $W.m^{-2}.K^{-1}$

More information :
Outside window heat transfer coefficient: 2.2 W / m2. K

Building Compactness Coefficient : 0,27

Indicator : n50

Renewables & systems

Systems

Heating system :
- Others

Hot water system :
- Individual electric boiler

Cooling system :
- VRV Syst. (Variable refrigerant Volume)

Ventilation system :
- Double flow heat exchanger

Renewable systems :
- No renewable energy systems

Other information on HVAC :
Heat recovery technology, the heat recovery unit can leave the cold energy (heat energy) of the classroom in winter and summer so as to save energy.

Smart Building

BMS :
The project adopts a visible smart integrated control panel which can control each classroom independently and can display temperature, humidity, PM2.5, formaldehyde, TVOC, CO2, etc. Parents and teachers can monitor the air in the classroom through the classroom environment monitoring system.

Environment

Urban environment

Jinkuili Park and Shangxianhe Wetland Park is located in the western of the project site; the subway stop Tangtieqiao is 500 meters away from the main entrance of the project site; complete medical treatment facilities and business districts are available around the project site, including Wuxi Bohai Hospital, Wuxi Municipal Services Center, Yajule Central Plaza, etc.

Land plot area

Land plot area : 10 807,00 m^2

Green space

Green space : 3 242,10

Products

Product

Mute-type total-heat haze-removal fresh air interchanger

5

http://www.dpurat.com

Product category : HLK / Belüftung, Kühlung

High-efficient dual heavy filtration is adopted: primary filter screen, second high-efficient filter screen; air supply and exhaust: no mixing and return to ensure healthy quality of fresh air, no diffusion of infection source to avoid cross infection inside the classroom. Heat-energy recovery: recover cold energy (heat energy) inside the classroom in winter and summer to save energy; heat recovery core is made of special heat exchange materials; the heat recovery efficiency is higher (60-70%); and its service life reaches over 10 years. Mute design: Panasonic DC motor is adopted; with air hose denoising technology, it has lower noise; under the pattern of high air volume, the noise level can also meet national codes.

The filtering efficiency of the fresh air filtering system reaches over 90%.

Costs

Energy bill

Forecasted energy bill/year : 328 000,00 ¥

Real energy cost/m2 : 47.99

Real energy cost/Children : 455.56

Building Environnemental Quality

Building Environmental Quality

- Building flexibility
- indoor air quality and health
- acoustics
- water management
- energy efficiency
- maintenance
- building end of life management
- products and materials

Health and comfort

Water management

Consumption from water network : 13 000,00 m^3

Water Consumption/m2 : 1.9

Water Consumption/Children : 18.06

Indoor Air quality

Interior CO2 testing concentration (mg/m3): 0.0003; interior formaldehyde testing concentration (mg/m3): 0.025; interior TVOC testing concentration (mg/m3): 0.24; interior benzene testing concentration (mg/m3): 0.008; interior PM2.5 testing concentration (μg /m3): 27.
In order to realize high-standard decoration pollutant control, Landleaf Technology strictly controls the decoration pollution through five steps.
Design optimization: under Landleaf decoration pollution control technology system, the control standard of formaldehyde concentration can be compared with the world strictest Finland S1-level standard; meanwhile, in the design stage, review and detailed design are carried out on the indoor design drawing; and the material control list needed is well defined. The environment-friendly materials are adopted while chemical synthetic material is prohibited to use in this project.
Procurement consultation: realize the limits of noxious substances of materials through strict procurement management, direct partnership with the manufacturers and real-time management will be carried out through the control platform in terms of the managing the whole source material supply chain, validating and sampling materials, guaranteeing quality safety, screening the building material vendors strictly and customizing core building materials (panel, paint, adhesive, etc.) controlled by Finland S1 formaldehyde control standards.
Entrance sampling: depending on the inspection ability of indoor environment lab with CAM qualifications, each batch of products is sampled to strictly control the pollutant load. Equipped with gaschromatograph environmental testing cabin, spectrophotometer and large-scale testing equipment in the specialized lab, various decorative material pollutants can be inspected and analyzed.
Construction management: the method of Party A's appointment and supply is adopted, in virtue of the centralized purchasing capacity of Landleaf, construction materials are available. Specialized person for site supervision is assigned; based on the inspection ability of Changxing experimental base products are periodically sampled to strictly control the pollutant load; formaldehyde inspections in key nodes of substrate engineering, decorative finish engineering, finished product manufacturing and installing engineering are carried out; WeChat is used for real-time communication with customers.
Data monitoring: visible smart integrated control panel which can control each classroom independently and display temperature, humidity, PM2.5, formaldehyde, TVOC, CO2, etc. Is adopted. Parents can monitor the air quality of classrooms at real time.

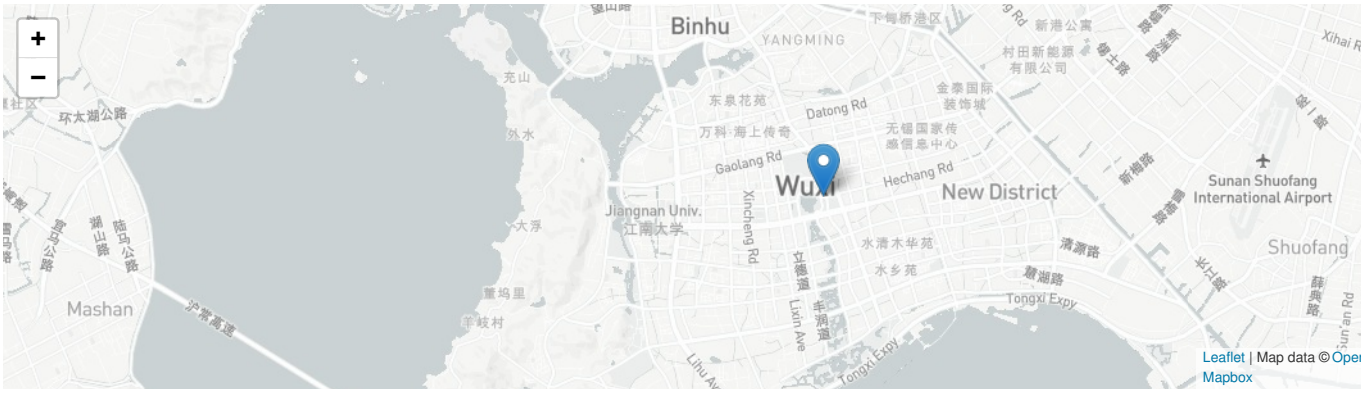
Comfort

Health & comfort : In January indoor average temperature: 19 ~ 22 °C indoor average humidity: 30% ~ 50%
In July indoor average temperature: 22 ~ 25 °C indoor average humidity: 40% to 60%

Acoustic comfort : The inner wall of the building is made of aerated concrete blocks; the cavity of the outer window glass adopts inert gas; the whole building is subject to air tightness test so that the whole sound insulation property of the building is superior to related national regulations.

Contest

Building candidate in the category



Date Export : 20230715002108