brief

Raintree is a kindergarten designed for children of 1.5-5 years old, with Pre-K, K1, and K2 classrooms, along with supporting facilities such as a library, a cooking studio, and a sensory room.

The design of the school was inspired by the school's Reggio Emilia approach, which recognizes children not as the target of instruction but as active constructors of knowledge themselves. With this approach, the environment is very significant and is considered a child's 'third teacher' and children should be able to express themselves freely when they are in an environment which fosters a sense of exploration, interaction, and expression of ideas.

The school's goals are to foster creativity and communication, while developing each unique child within our community of lifelong learners; therefore, architecture plays a vital role in helping the children connect to one another and to nature.

site and surrounding

The site is located at Nanglinchi road in Sathorn, Bangkok. The north is adjacent to the owner's land plot and the south faces an empty plot. The narrow back side is facing a small road and would be used for staff and service access.

The site is one of the few plots in this neighborhood with large trees that provide the site with soft overhead shades, making the air temperature cooler, contributing to its uniqueness.

The ideas were to preserve existing trees and to keep the building low. The transitional areas would be naturally ventilated.

Environmental simulations were conducted as the site is a narrow strip of land facing east-west. It was found that the south wind would enter and exit the site via the narrow ends due to obstructions.

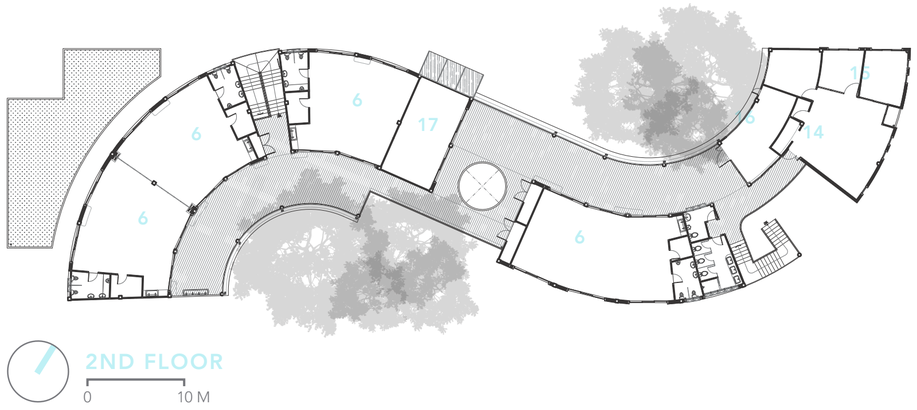
conceptual diagrams

Sweeping
under cluster of trees, forming two inner courts

Curving
from front to back to allow wind access

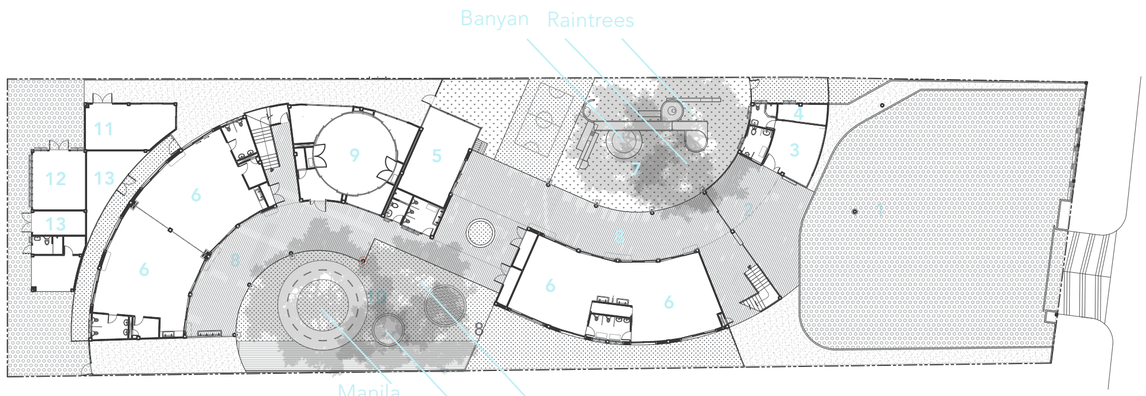
Porous
to connect courtyards & enhance ventilation

plans



2ND FLOOR
0 10 M

1 Parking
2 Drop-Off
3 Reception
4 Infirmary
5 Library
6 Classroom
7 Treehouse Court
8 Shared Learning
9 Sensory Studio
10 Sensory Court
11 Cooking Studio
12 Kitchen
13 Mech.
14 Teacher Lounge
15 Admin
16 Meeting
17 Atelier



GROUND FLOOR
0 10 M

clerestories + slanted ceiling

Photo showing daylight flushing the room from clerestories facing existing trees, bouncing onto slanted ceiling

cozy courtyard

Existing trees provide overhead shades, allowing diffuse daylight into the courtyard.

overhang

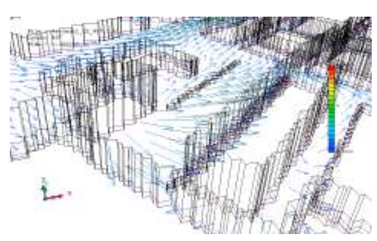
With shading mask calculation, projecting overhang shades the side windows during class hours.

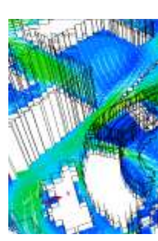
daylit classroom

Two-sided floor-to-ceiling openings maximize daylight access for ground floor (Simulation results have shown 100% Daylight Autonomy at 300 lux)

shaded walkway

Shaded by architectural element for high angle sun, and tree canopies for low angle sun, allowing day-round comfortable use.





Cfd simulations for blank site and during mas
showing wind flow pattern through the wind chan

GROWING UNDER THE RAINTREES

Children's exhibit is vital to the Reggio-inspired approach; material palettes are neutral tones to become the background children's artwork and project display.

The front courtyard is for active play with the treehouse, whereas the back one is for sensory play.

Flow between walkway and outdoor play court

Floor-to-ceiling sliding glass doors connect to the covered walkway. Daylight through clerestory onto activity area.

RAINTREE KINDERGARTEN

Reconnecting children to nature

Children recollect their learning experiences with their school environment. Designing educational space which fosters delightful learning experiences could help to take part in creating pleasant memories and nurturing kids who are nature-loving, creative, and engaged with the world around them.

Tree-shaded clerestory

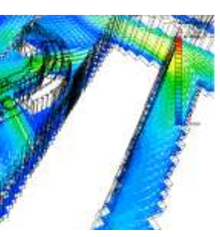
Daylit teacher lounge via clerestory opening

The semi-outdoor walkways enlarged to double as free learning space or class extension

maximized ventilation

Cfd simulation was performed to fine-tune the wind channel size and location.

Non-toxic and easy-to-clean materials are prioritized for a safe and healthy indoor environment.



ssing development, nels

The transitional area, 'Wind Channel', provides connection between courtyards. It serves as functional shared space and has become a popular spot for school events and gatherings. (Wooden stools in play area are made of the branches taken out during construction to teach children about nature.)

PROJECT DATA

Owner:
Raintree Education

Architect:
GreenDwell

Interior Designer:
Sensory, Library - Studiomake
Meeting - Curious Gang

Identity Designer:
Play Along Studio

Playground Designer:
Studiomake

Engineering:
Next Innovation Engineering

General Contractor:
Billionaire Construction

Photos:
Dsgn Something, GreenDwell

Area: 1,500 sq.m.
Location: Sathon, Bangkok
Year: 2015-2017

For ASA Emerging Architecture Awards 2019 "Living Green"

By: GreenDwell

2.1 Project Info

Project Name:	Raintree Kindergarten
Location:	Nang Linchi Road, Sathon, Bangkok
Project Type:	Educational Facilities

2.2 Design Concept

Raintree is a kindergarten designed for children of 1.5-5 years old, with Pre-K, K1, and K2 classrooms, along with supporting facilities such as a library, a cooking studio, and a sensory room.

The design of the school was inspired by the school's Reggio Emilia approach, which recognizes children not as the target of instruction but as active constructors of knowledge themselves. With this approach, the environment is very significant and is considered a child's 'third teacher' and children should be able to express themselves freely when they are in an environment which fosters a sense of exploration, interaction, and expression of ideas.

The school's goals are to foster creativity and communication, while developing each unique child within our community of lifelong learners; therefore, architecture plays a vital role in helping the children connect to one another and to nature.

The site is located at Nanglinchi road in Sathorn district of Bangkok. The longitudinal north side is adjacent to the owner's land plot and the south facing an empty land plot (now developed). The narrow back side is facing a small road and would be used for staff and service access. The site is one of the few plots in this neighborhood with large trees, namely, 3 raintrees, a Banyan, a Tamarind, and a Cassia. These trees provide the site with soft overhead shades, contributing to its uniqueness. These existing trees noticeably help to cool

down the air within the site, as observed when entering the site from the main road.

To preserve the site's distinct characteristics, it was decided to preserve as many trees as possible. The team has consulted with the tree preservation specialist during design and construction stages. The building would be kept low so that it could be shaded from the trees while the children can play outdoor comfortably. The transitional areas would be naturally ventilated so the building should be able to harness incoming prevailing wind. The classrooms would have the option of natural ventilation if outdoor air quality permits.

Environmental simulations were conducted during pre-design to detail design stages to assess the site and building's shading and ventilation, as the site has a long and narrow strip shape, facing east-west. Future development was factored into ventilation simulation to assess wind access should more buildings are built around the site. Results have shown that the annual south wind would enter and exit the site via the narrow ends due to obstruction from neighboring buildings.

The building was conceived as a 2-storey section of connected indoor, semi-outdoor, and outdoor learning space, sweeping under clusters of existing trees, forming two inner courtyards. The narrow and curved plan enhances wind access through the site, especially at the semi-outdoor space which would be used for free learning. The courtyards are connected via the central transitional space, so called the 'wind channel', to enhance through-wind from the back towards the front court. A circular hole is punched on the upper floor to visually connect the two floors. This connected semi-outdoor area allows passive surveillance in both courtyards as there are no hidden corners. Along the building curves, more 'holes' are inserted to generate a porous building, maximizing ventilation.

The front courtyard play area is for a more active play such as the treehouse whereas the back courtyard is targeted for sensory play. The semi-outdoor walkways were enlarged to double as free learning space or class extension which seamlessly connects the fully openable indoor classrooms to outdoor tree-shaded courtyards.

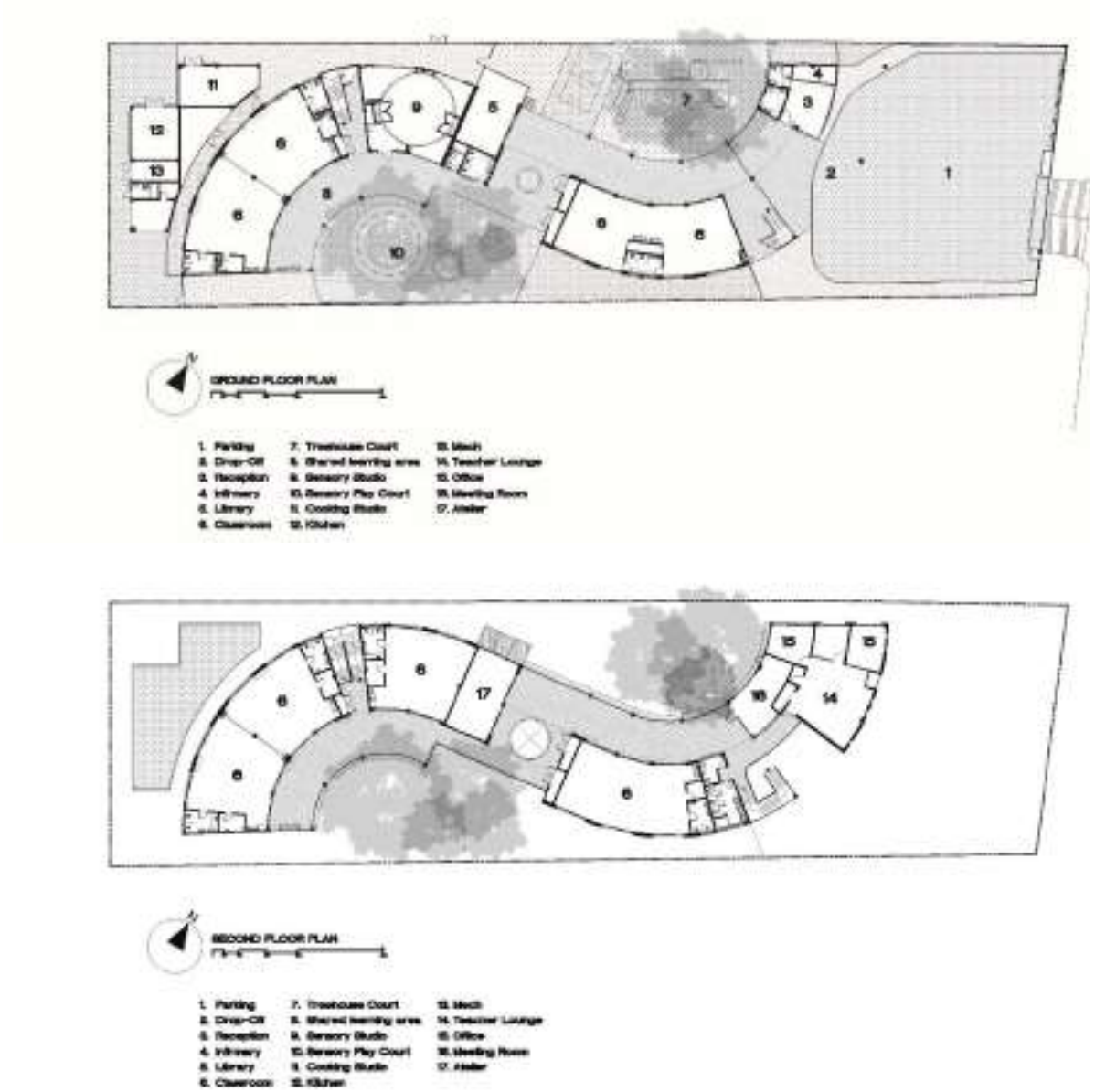
The classrooms are designed to be open-plan and each of the 2-classroom cluster can be connected when needed. The floor-to-ceiling sliding glass doors connect the class to the covered patios and the outdoor, extending the indoor space seamlessly into the outdoor environment. All classrooms are filled with natural light from two-sided windows which also help to provide cross ventilation although they are generally air-conditioned. A combination of slanted ceiling with clerestory windows are integrated in classrooms on the second floor. The curved clerestories are facing the courtyards and therefore are shaded by the trees to provide diffuse daylighting to the learning space.

Shading mask and daylighting simulation were conducted to ensure enough daylight while reducing direct sunlight. All classrooms can be daylit throughout majority of the day without having to rely on electric lighting. Supporting learning facilities are in the central area and the administration rooms are in the front, on the second floor.

Since the exhibit is a visual representation of the Reggio-inspired approach, material palettes for architecture are neutral tones to offer space for children's artwork and project display.

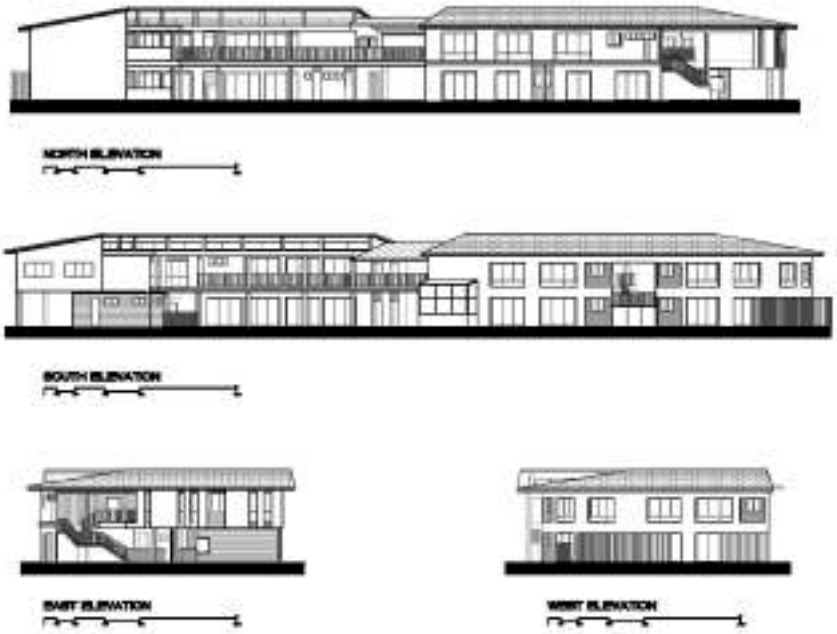
Children recollect their learning experiences with their school environment. Designing educational space which fosters delightful learning experience could help to take part in creating pleasant memories and nurturing kids who are nature-loving, creative, and engaged with the world around them.

2.3 Plan, Section, Elevation

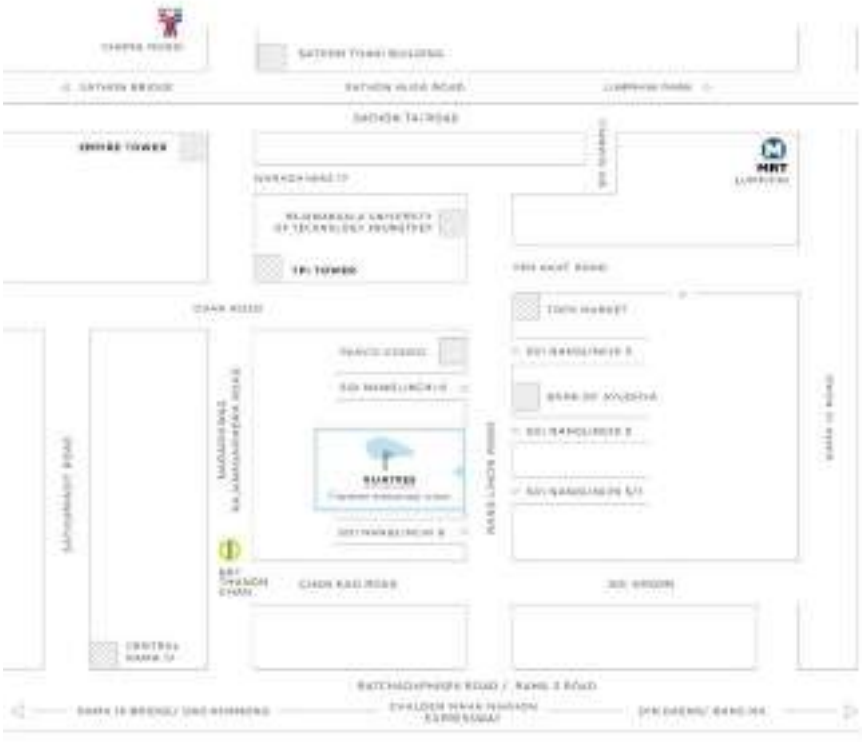



SECTION A-A


SECTION D-D


NORTH ELEVATION
SOUTH ELEVATION
EAST ELEVATION
WEST ELEVATION

2.4 Location Map



2.5 Project Team

Owner: Raintree Thailand

Architect: GreenDwell

Interior Designer: Sensory Room, Library - Studiomake

Meeting Room - Curious Gang

Engineering: Next Innovation Engineering

Playground Designer: Studiomake

Identity Designer: Play Along Studio

Contractor: Billionaire Construction

Photo credits: Dsgn Something, GreenDwell

2.6 Building Information

Building type: Kindergarten

Plot size: Approx. 500 sq.wa

Built-up area: 1,500 sq.m.

Structure: Reinforced concrete, post-tensioned

Lighting: LEDs for major rooms and fluorescent for service areas

A/C: Split type

2.7 Project cost: 35 MB

2.8 Team Photo:

GD Team (from Left to Right)
Teerayut Prukphanasant, Nattapong Piyathat, Teerapat Prongpanyasakul, Raksak Sukontatarm, Siritip Harntaweewongsa, Peerapuk Ruangcharoen