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A CRITIQUE OF CHINESE EDUCATION

**An Elementary School
In Beijing**

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School of Architecture

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INTRODUCTION



The biggest problem of the state-controlled children's education in the People's Republic of China is that the system focuses more on the method of education rather than learning of children themselves. Thus the children lack of internal motivation to learn. Moreover, the typical education in China tend to isolate the students from the neighborhood, lacking a chance for students to really interact and experiement hands on with new knwoledge. However, this problem aspect can be overcame by learning from the western pedagogical strategies, such as the Montessori Education. For this educational approach, the primary goal is to stimulate children's internal motivation to learn. Children have more freedom to make decisions. What are they going to learn? Where? When? and How?

A school building designed to spatialize these pedagogical strategies could rely on architectural tactics which produce the following effects. The school itself becomes a part of the urban infrastructure to connect the school community with the neighborhood, which allows children to have more interaction with its surroundings and the society. Also, within the school, minor learning space is added to create a framework within which children can use to develop their own meaning of learning. At the same time, informal learning spaces are created to extend and enhance children's learning experiences outside the classroom boxes.

In this way, **I contend that the school as a learning institution and the architecture that gives it spatial form and urban presence both act as a critique of current practice.**

LEARNING

ENVIRONMENT



"I think of school as an environment of spaces where is good to learn. Schools began with a man under a tree, who did not know he was a teacher, discussing his realization with a few who did not know they were students . . . the existence-will of school was there even before the circumstances of a man under a tree. That is why is good for the mind to go back to the beginning, because the beginning of any established activity is its most wonderful moment."

-- Louis I. Kahn

WHAT IS LEARNING ENVIRONMENT?

According to the Glossary of Education Reform, a learning environment is a physical location, a context, or a culture in which learning experience happens. The term is not limited to the traditional connotation of classroom, a room with rows of desks, chairs, and a chalkboard. A learning environment not only has traditional academic settings, such as schools and classrooms, but also has nontraditional settings, such as outside-of-school locations and outdoor environment. Obviously, the core of the learning environment is learning. To truly understand what a learning environment is, it is critical to understand what learning is.

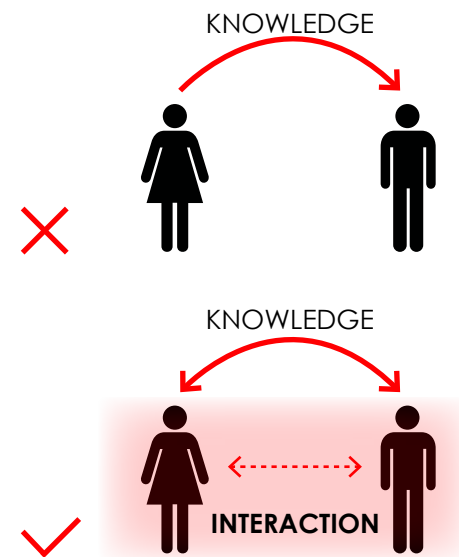
Learning

Learning is a process of absorbing new knowledge, or modifying and reinforcing existing knowledge. Four main learning theories conceptually describes how knowledge is absorbed, processed, and retained during learning; they are behaviorism, cognitive theory, humanism, and constructivism.

Behavioristic learning focuses on instrumental conditioning, in which an individual's behavior is stimulated and modified through systems of rewards and goals in education. Cognitive theorists believe that learning happens as changes occur in an individual's behavior and memory, but less on the influence of the environment. Humanism in learning emphasizes the learning process, and how that initiates the skills of self-knowledge for individuals. Constructivists propose that acquisition of knowledge should be added onto existing ones through the process of learning. Among these four theories, behaviorism, the cognitive theory, and humanism were more inclined to the factory model of education systems, which were more subjected to an individual's behavior and learning

process rather than the perceived environments. Constructivism, on the other hand, focuses not only on the learning experience of each individual, but also on the environment that creates and prompts one's learning.

According to the theory of Constructivism, knowledge is not an independent subject that directly exists in our mind. Instead, it is a cognitive subject, which deals with the previous experience, a constructed perceptual and conceptual structure resulted from our sensory world of seeing, hearing, and feeling. (Fosnot 4-5) The process involves an interaction and an adaptation of experience. Therefore, learning is an interpretive, recursive, building process by active learners interacting with



Idea of Theory of Constructivism.

the physical and social world. (Fosnot 30) Learners learn by constructing knowledge and meaning based on the experience and understanding of their surrounding world. The importance of this learning theory is the interaction of the learners to their experiences and the environment. The environment means not only the physical world around us, but also the totality of permanent objects and their relations that are abstracted from the flow of experience. (Fosnot 5) The learning environment includes the traditional educational interaction, meaning the learning from schools, or nontraditional interactions, meaning learning through games etc.

Architecture Facilitates Learning

In the comprehensive system of learning environment, architecture plays an important role on physical location, which facilitates children's learning experience. Its influences include children's engagement on what is being taught to them, their self-motivation to learn, and their senses of well-being, belonging, and personal safety. (The Glossary of Education) When designing a learning environment, besides the nature of learning process, it is also important to integrate architecture and educational philosophy.

In the book *Linking Architecture and Education*, Taylor has mentioned that the learning environment itself can become the learning tool, or a three-dimensional book, which represents the philosophy of education. She also listed several educational implications, which are helpful for designing a learning environment (Taylor 10-11):

1. Schools are moving from the old factory model (the mode of education that relies on uniformity and lecture learning) into the digital information age, with a

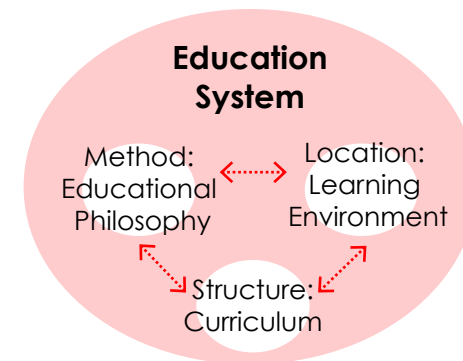
consequent shift from the old style of "broadcast" learning to interactive learning.

2. The old "assembly line" model no longer supports what we know about how the brain/mind learns.

3. The factory model must be replaced by a model based on the way the mind develops, recognizing the variety of children's developmental profiles.

4. Current educational best practices and learning theories indicate that environmentally based, project-based, hand-on, active, relevant, constructivist learning can close the achievement gap. Project-based learning often requires more learning space and architectural support for different space usage and for changing student/teacher/community relationships

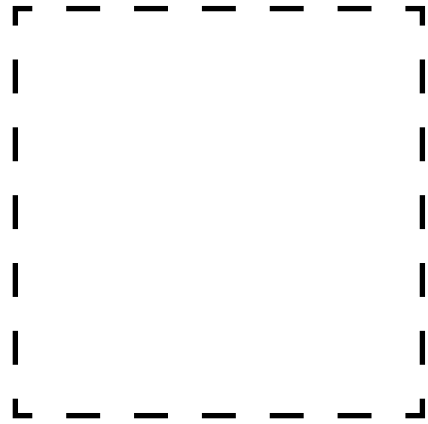
5. Schools must become more community oriented through shared facilities, multiple use and community participation in the planning process.



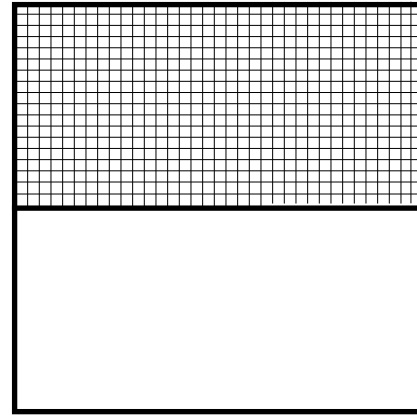
Education System.

EDUCATION IN CHINA

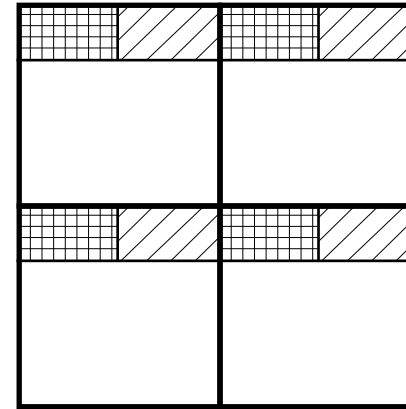
DEVELOPMENT OF EDUCATION SPACE UNDER CHANGING OF EDUCATIONAL MODEL



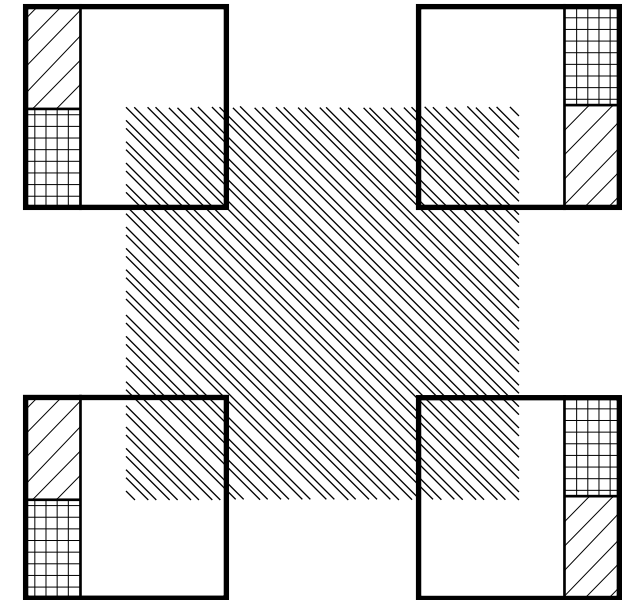
Early Education
No specific site.
Vague boundary.



Ancient Education
Individual education.
Restricted in a boundary.
Monotonous space.



Modern Education
Factory-style education.
Restricted in a boundary.
Multiple monotonous
space.



Contemporary Education
Personalized education,
Restricted in a boundary.
Multiple open education
space.

Education Space



Assisted Education
Space



Living Space



Resources Information
Center

Diagram drawn by author of paper "Research on the Architectural Design of Primary and Middle School under the Educational Model "

EDUCATION EVOLUTION IN CHINA

Ancient Education

School Running Model:

Official school of government, academy, school founded by individuals

Educational model:

LEARNING of student is the focus. The function of educator is to give advice and instruct.

Selection:

Civil Service Examination

Modern Education

School Running Model:

Schools running by government, local gentries, individuals or foreign churches

Educational model:

Based on the foreign education philosophies
Class teaching

Selection:

Examinations

Contemporary Education

School Running Model:

School running by either local government or individuals, under the Education Law of China

Educational model:

Class teaching

Selection:

Examination based on main subjects

Architecture

Official school of government: located in the center of the city, political center, strictly followed the planning rules and the spatial hierarchy.

Academy:

far from the city, free spatial organization, focus on the natural environment

Architecture

No standards. Basically designed for class teaching

Architecture

Standardized. Basically designed for class teaching



Fig. 1



Fig. 2



Fig. 3

“We need a pedagogy free from fear and focused on the magic of children’s innate quest for information and understanding.

In the networked age, we need schools, not structured like factories, but like clouds.”

-- Sugata Mitra

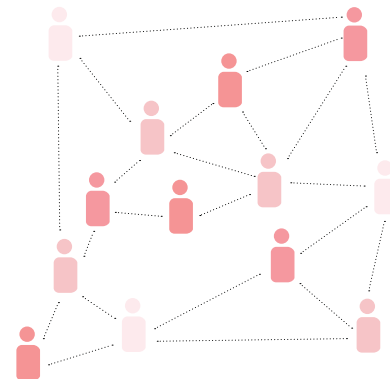
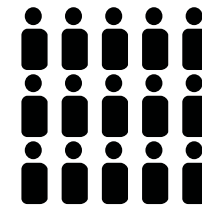
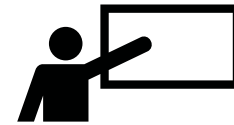
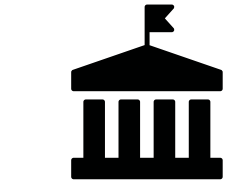
EXISTING EDUCATION IN CHINA

In China, the existing education system still follows the western traditional model, which is being called the factory model. As said by Elwood Cubberly, the dean of Stanford University’s School of Education, schools are “factories” in which the raw products, children, are to be shaped and fashioned into products to meet the various demands of life. In this factory, the manager was the administrator, and the worker was the teacher. However, the factory model of education was designed to fulfill the demands of factory workers during the industrial revolution. Whereas China’s situation was driven primarily for the fast development and the demands of more talented people. The system is based on the theory of behaviorism, which believes that an individual’s behavior is stimulated and modified through systems of rewards and goals in education. (Lillard, 2008) Children were considered as empty vessels, which were to be filled with common knowledge, and to share the same interests. (Lillard, 2008) Examinations became one of the only methods to testify how well each child has absorbed the knowledge. Under such factory model, children lost their incentive to make decisions, and gave up motivation to initiate their learning.

Taking a closer look at the situation in China, the education system mainly focuses on the extrinsic values of education, but ignores its intrinsic values. Here, the intrinsic value refers to the value directly gained from the education. It is absorbing new knowledge, yet modifying and enhancing the old knowledge. Extrinsic value is the value gained by using the education as a tool to accomplish other social purposes; for example, the political value, economic value, cultural value etc. (Liu and Liu 69) In the existing Chinese education, the extrinsic value of education has become the

fundamental purpose, and the intrinsic value has become a method or a tool to accomplish extrinsic value. (Liu and Liu 69) Education has become the tool to accomplish social, political, and economic achievement. Whereas, the establishment of personal intelligence has been ignored. The development of multiple intelligence has been considered as the living skills of training. For instance, playing piano is not considered to be a personal hobby or a way to develop the music intelligence, but a supplementary tool to enter a university. Moreover, the method applied in the system does not help children to absorb and translate the materials provided in class into the real knowledge of their own. Based on the theory of Constructivism, children's experiences are lack of practice in this situation.

Schools, as the main learning environments in China, have also expressed the problems of Chinese education as mentioned above. Elementary, or primary schools are especially obvious and critical. Unlike kindergartens, where schools are designed with less restrictions, elementary schools are usually designed without interactions that enhance children's abilities to explore through learning. The settings of classrooms are based on the requirements of the factory model. Physical structure of the classroom is designed for passivity that children sit and listen to the teacher, who stands at the blackboard and delivers knowledge. Moreover, the design of schools only target on classrooms, where the traditional education interaction takes place, and ignore the non-traditional education interaction, that takes place outside of classrooms.



ADMINISTRATION



TEACHERS



STUDENTS

[UNDER FACTORY MODE]
Children are treated as same empty vessels.



or **STUDENTS**
[WITH MORE FREEDOM]
Children are treated as different individuals.

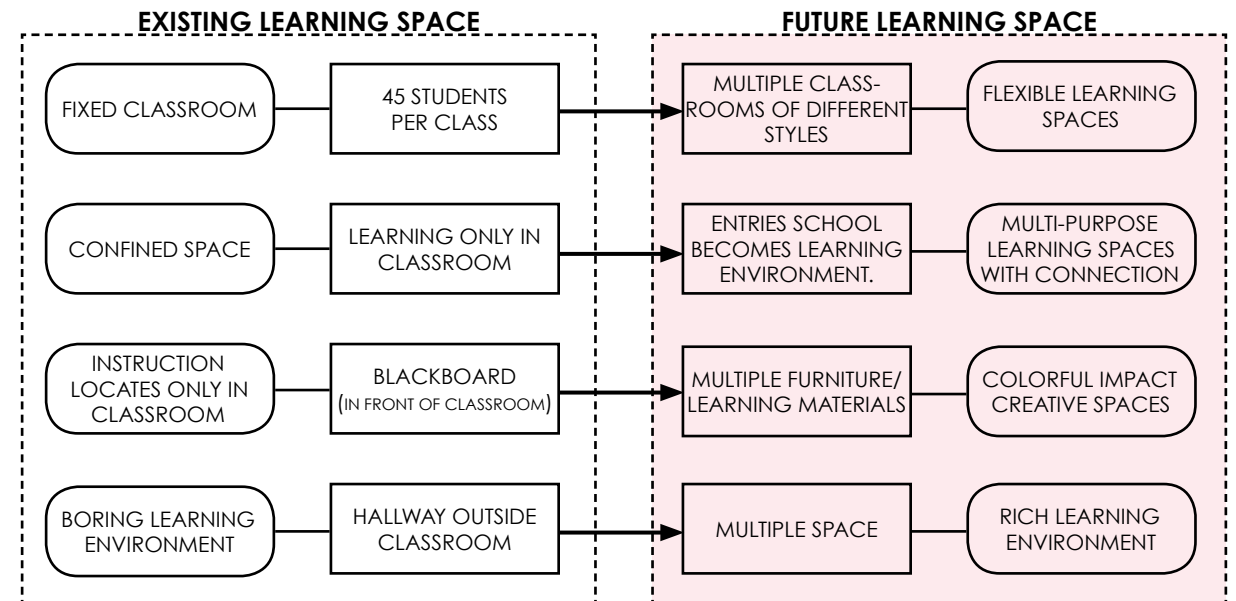
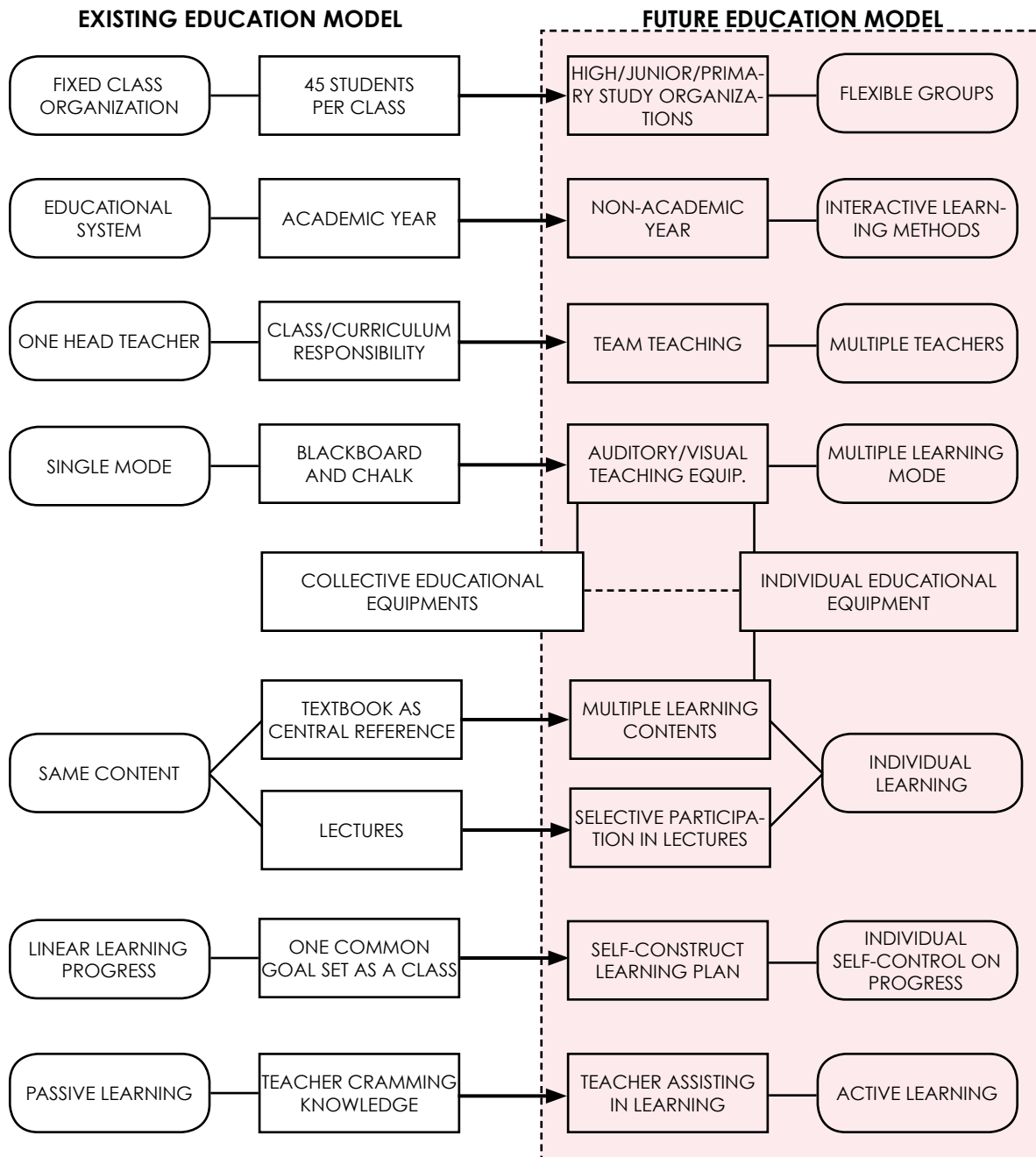
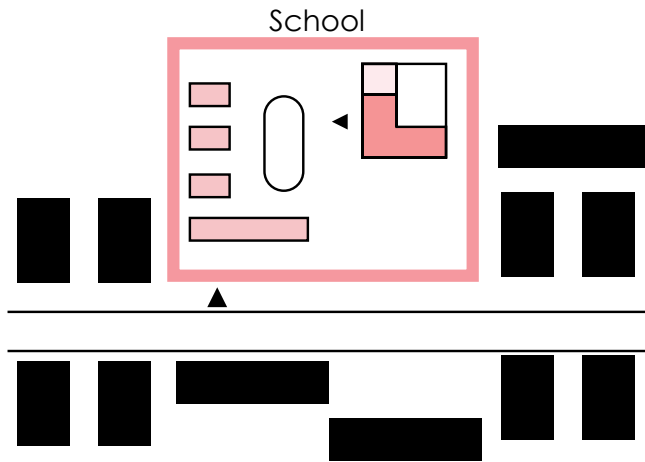


Diagram drawn by author based on paper "Study on Dynamic Adaptability of Interior Teaching Space Design in Junior School".

ARCHITECTURAL PROBLEMS OF SCHOOLS

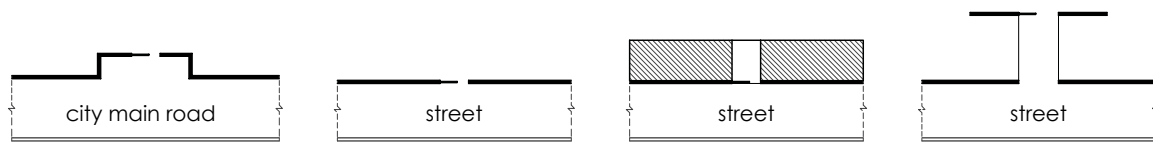
OVERALL PLANNING

School, as a small community in the city, lacks interaction with the social and cultural contexts within the city.



Fences enclose the campus to the city. Strong boundary between the school and the surroundings.

Campus Entrance is the main threshold connecting outside with the school. It has four main types.

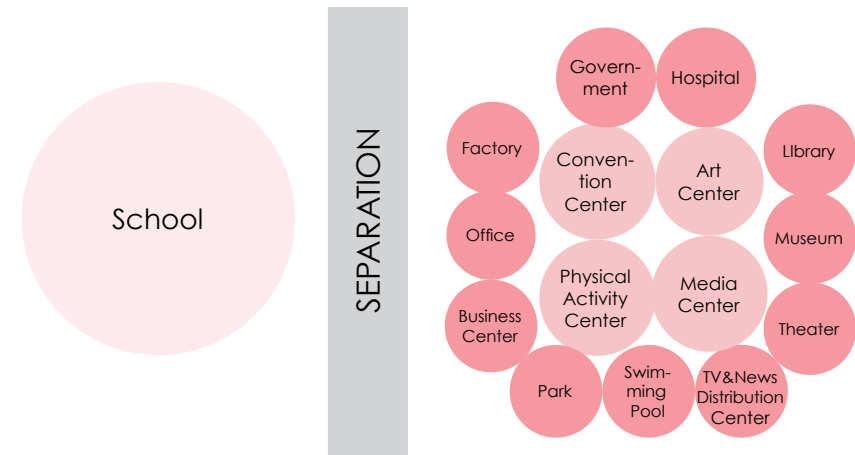


Type one: "Concave"
Usually the main entrance is facing the main road of the city. It concaves from the street, and creates a small plaza in front of the main gate of the school.

Type two: "Line"
Usually the main gate is attached to the street in a residential area. This type requires a transitional space behind the entrance.

Type three: "Through building"
Usually the entrance is under an existing building.

Type four: "Lead-in"
This type uses a pedestrian to connect the city road with the entrance of the school.



The enclosure of the campus should open up to create more interactions with the social and culture contexts.

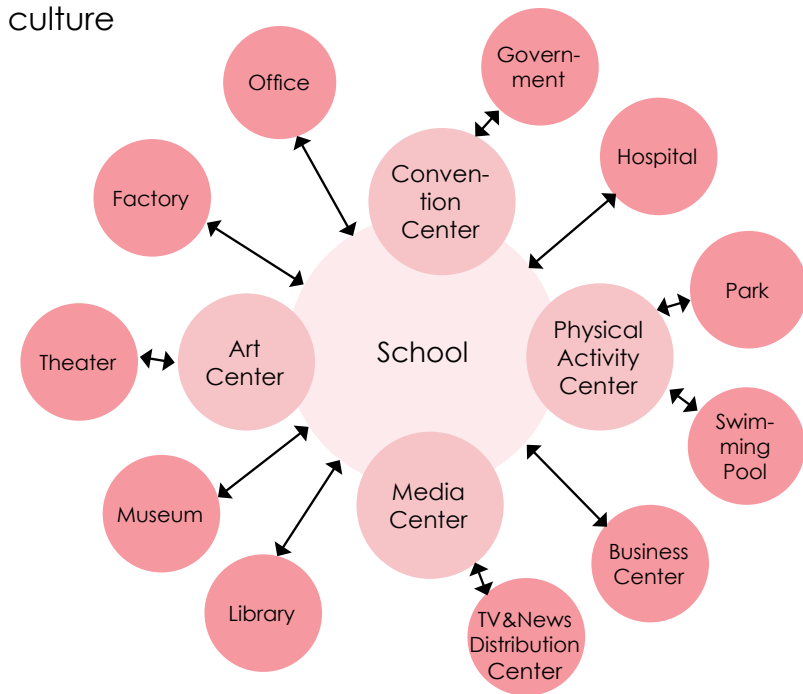
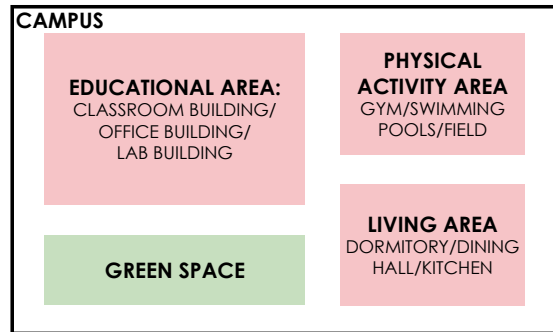


Diagram drawn by author based on book: *Architectural Design of Primary and Secondary Schools*

The campus is being divided into four main areas, including the educational area, physical activity area, living area, and green area.



The overall planning of the campus depends on the particular situation of each school. There are five basic ways to plan the four areas in a school campus. Basically, the main entrance is directly leading to the educational area, which is the core of the whole school.

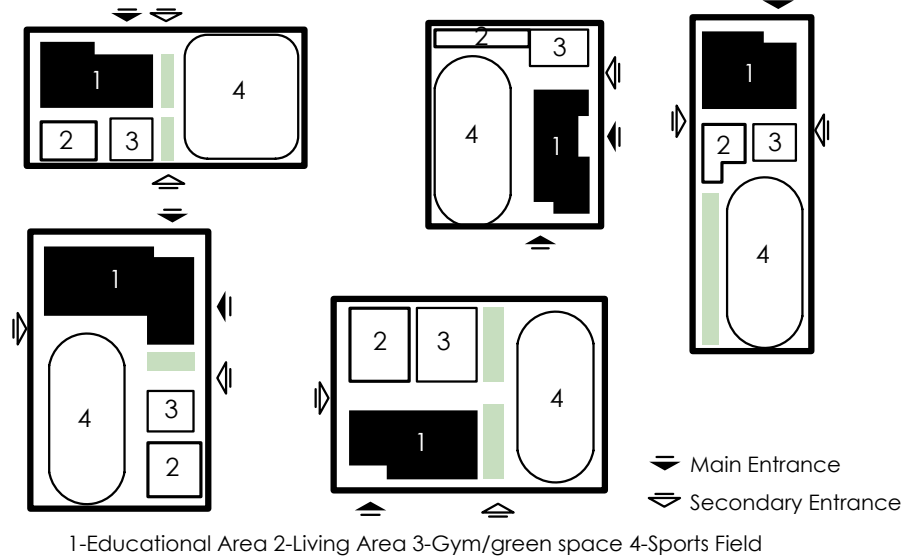
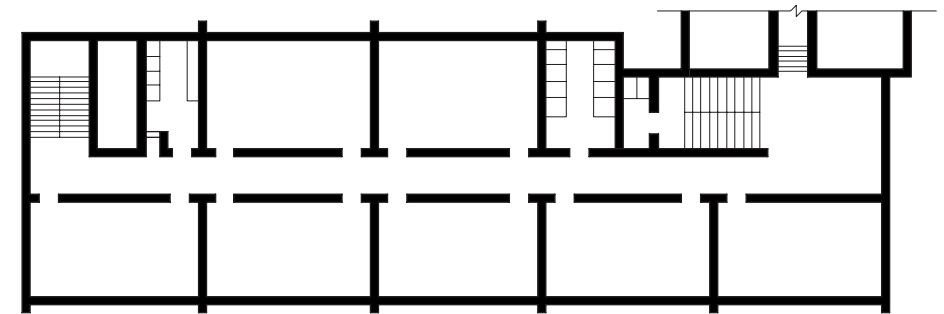


Diagram drawn by author based on book: *Architectural Design of Primary and Secondary Schools*.

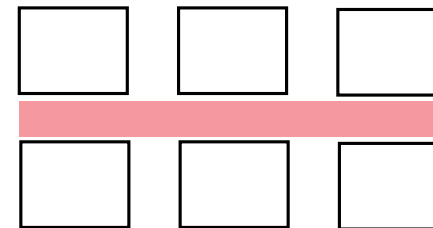
EDUCATIONAL BUILDING PLAN

As the core of school designs, plan of educational building is the main focus in China. Basically, there are three types, including "INTERIOR AISLE", "EXTERIOR HALLWAY", AND "CLUSTER".

Interior Aisle

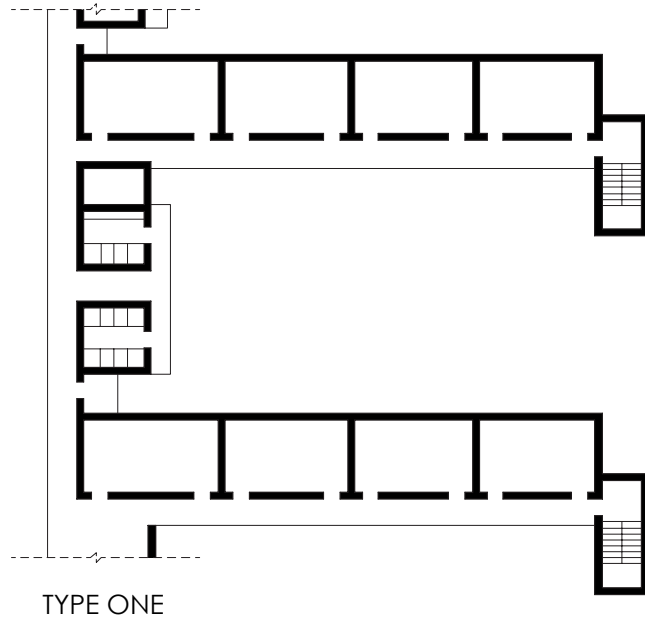


Plan drawn by author based on book: *Architectural Design of Primary and Secondary Schools*.

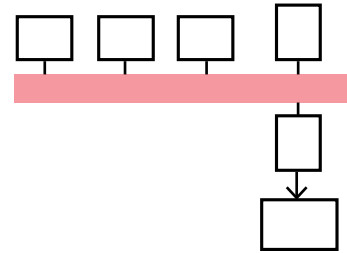


Classrooms are separated on both side of the aisles, which is the main circulation in the building. The learning spaces were pushed together. Some rooms might have less natural light and ventilation.

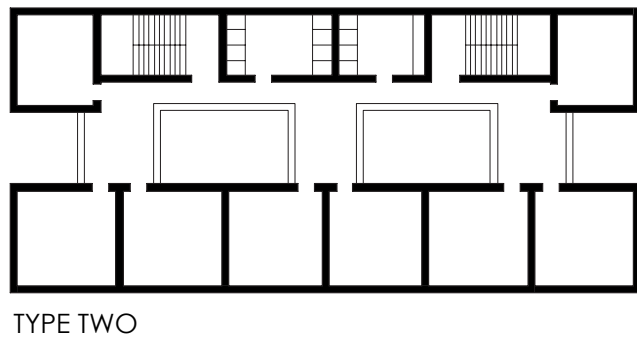
Exterior hallway



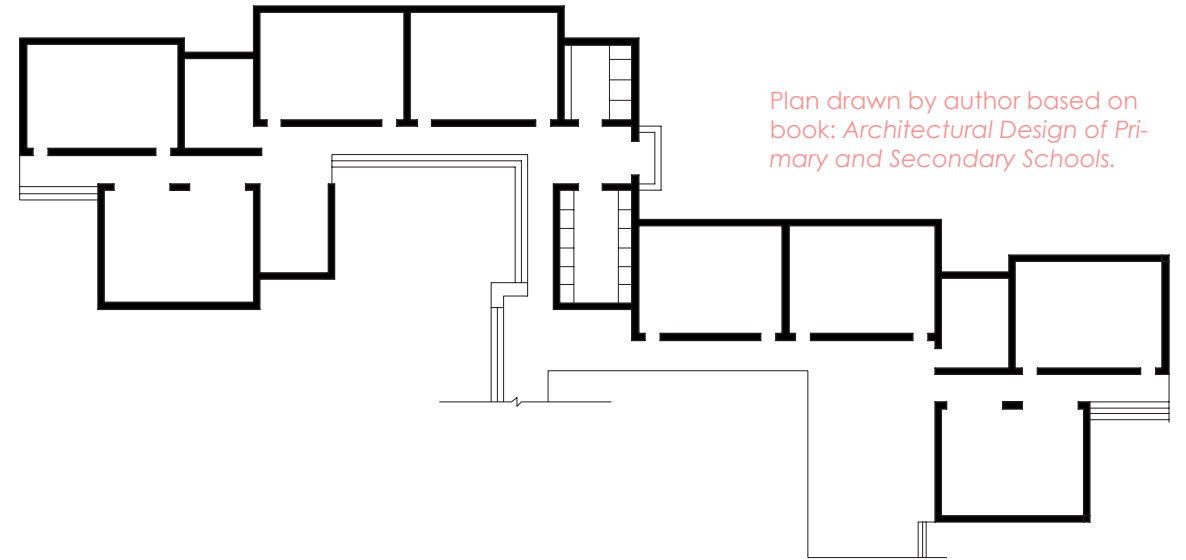
Plan drawn by author based on book: *Architectural Design of Primary and Secondary Schools*.



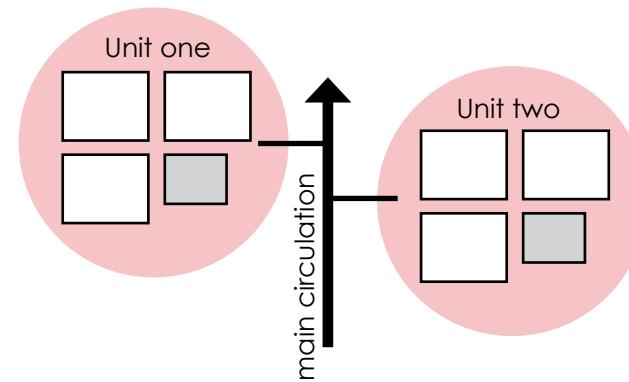
This type requires linear arrangement for all the rooms. Classrooms are placed on one side of the hallway, leaving the other side exposed to outside. This type allows each room for better nature light and ventilation.



Cluster



Plan drawn by author based on book: *Architectural Design of Primary and Secondary Schools*.

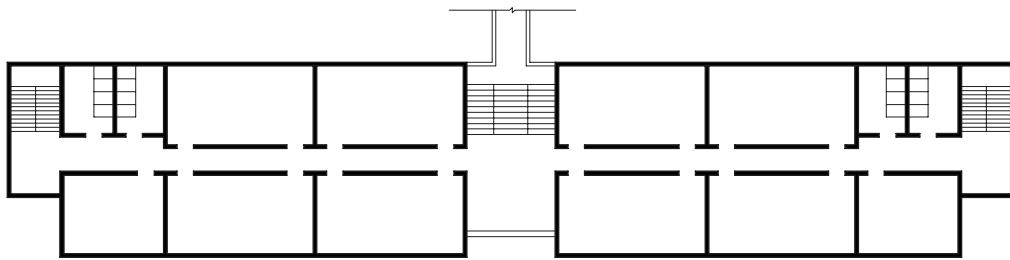


This type separates students of each grade into different units. Each unit is independent from each other that has its own classrooms and other service rooms, such as restrooms. Within the unit, there is less circulation.

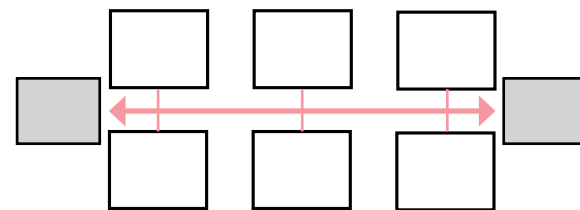
RELATIONSHIP BETWEEN CLASSROOMS AND OTHER SERVICE ROOMS

Within a educational building, there is not only the ordinary classrooms, but also specialized classrooms and collective learning space. Between each of the space, there are different relationships.

Relationship between ordinary classrooms



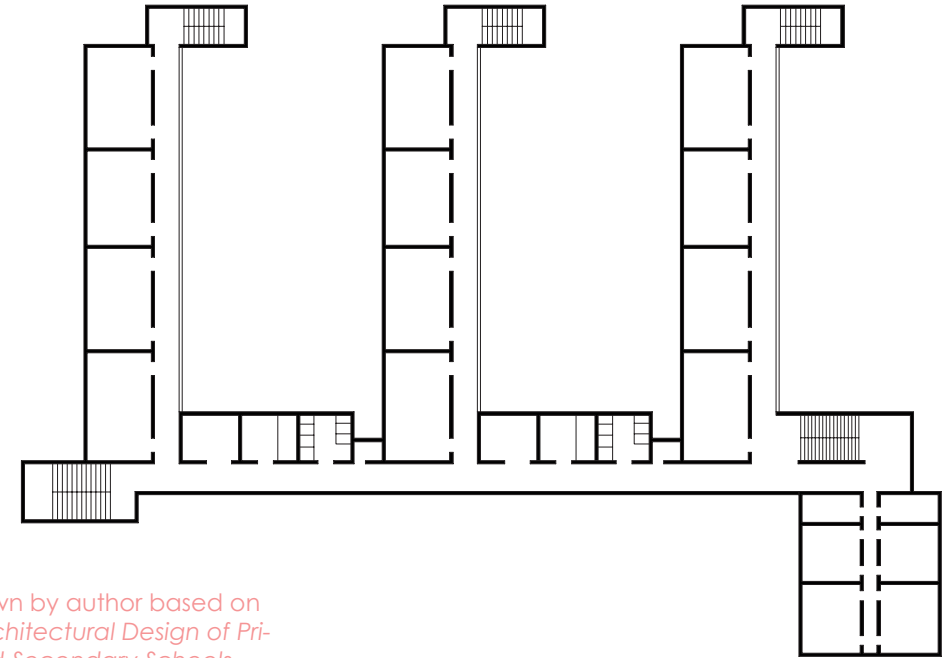
Plan drawn by author based on book: *Architectural Design of Primary and Secondary Schools*.



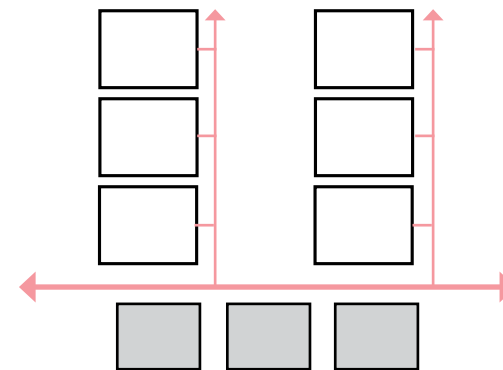
- Classroom
- Service Room

Type one: Longitudinally Linear Arrangement

Classrooms are arranged on the sides of a linear hallway. Other service rooms arranged at both end of the hallway. It might have long circulations when there is a large amount of classrooms.

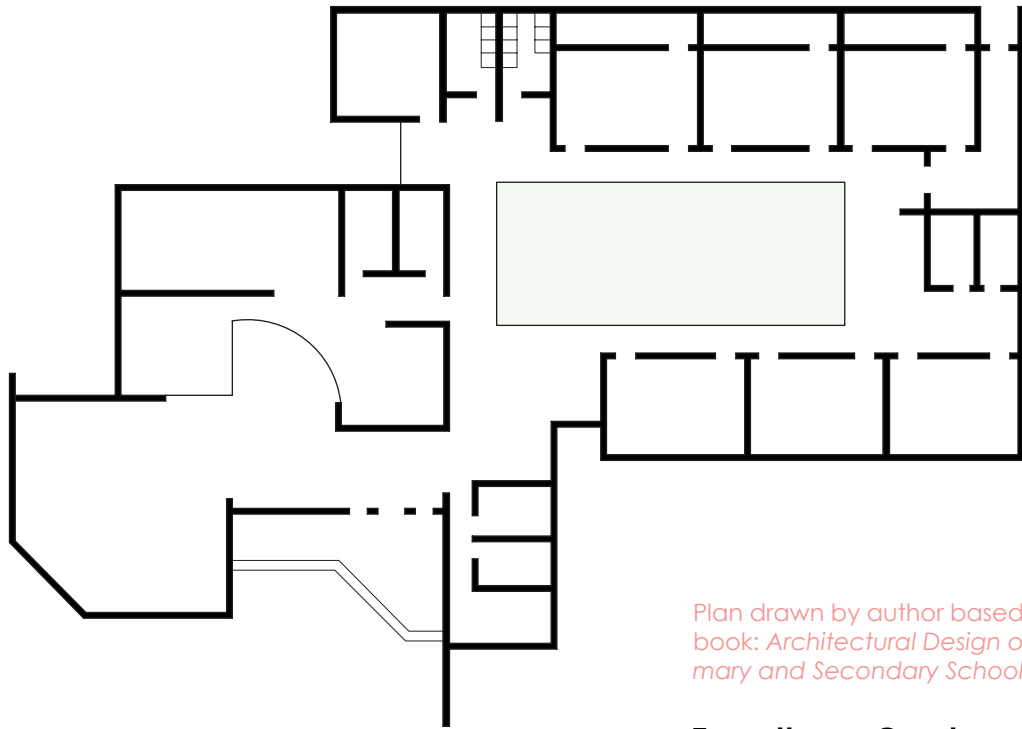


Plan drawn by author based on book: *Architectural Design of Primary and Secondary Schools*.



Type two: Laterally Linear Arrangement

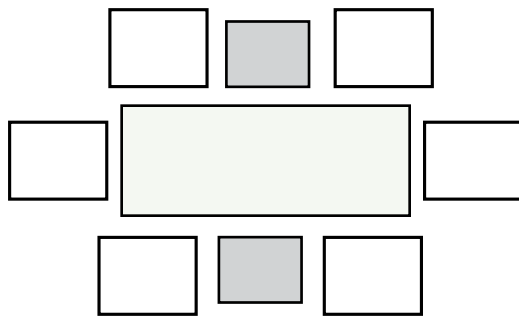
Classrooms are laterally arranged on the sides of a longitudinal hallway. Other service rooms are attached to the longitudinal hallway. Each of the classroom group has less interaction with others.






Plan drawn by author based on book: *Architectural Design of Primary and Secondary Schools*.

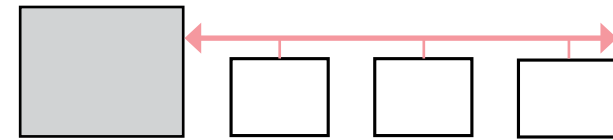
Type three: Courtyard-style Arrangement

Classrooms and other service rooms were arranged around a courtyard.



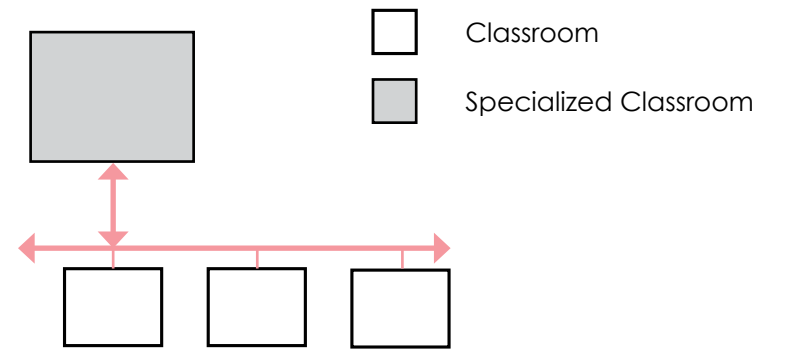
-  Classroom
-  Service Room
-  Courtyard

Relationship between ordinary classroom and specialized classrooms



Type one

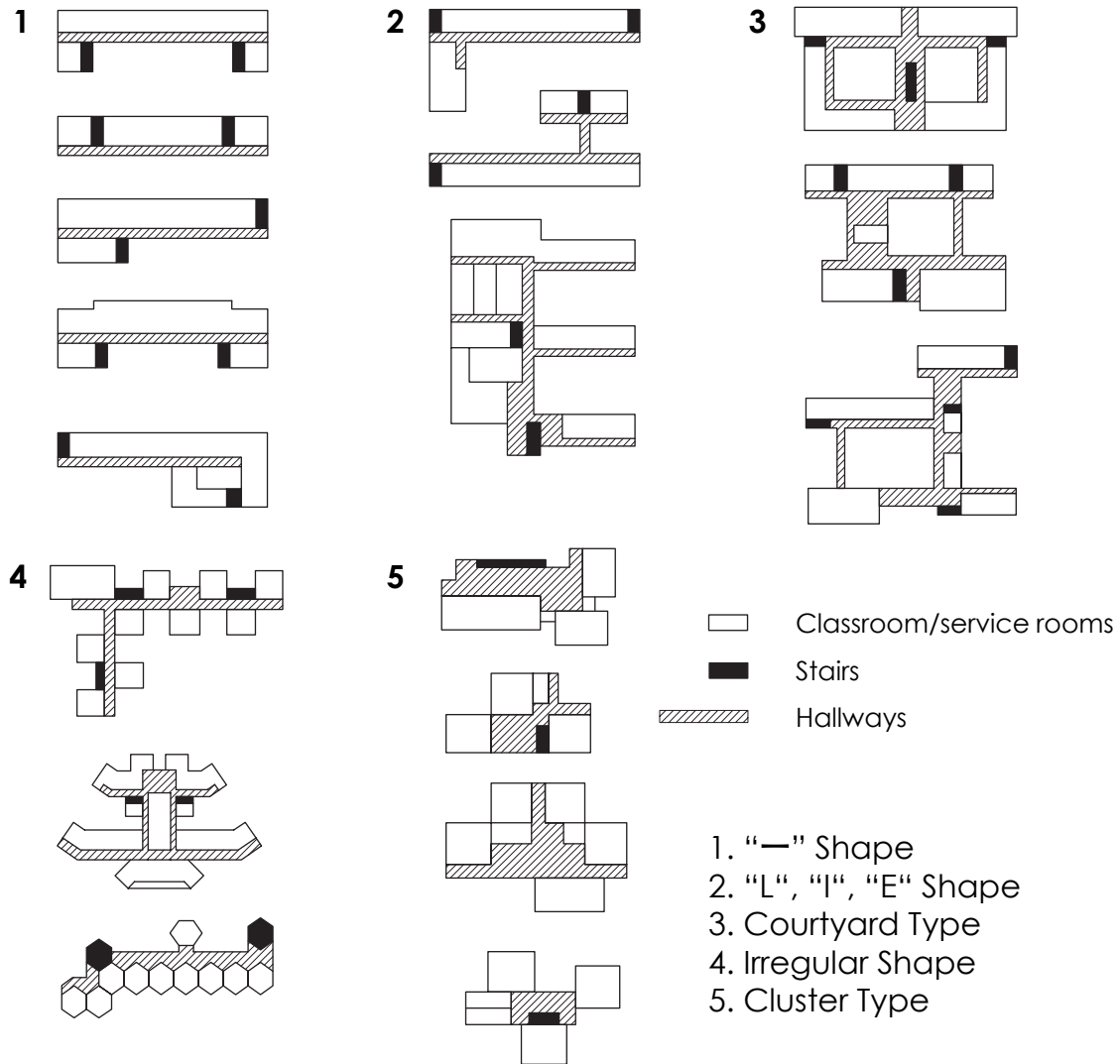
Ordinary classrooms are next to a specialized classroom that is at the end of the hallway.



Type two

The specialized classroom is separated from the ordinary classrooms with a secondary hallway.

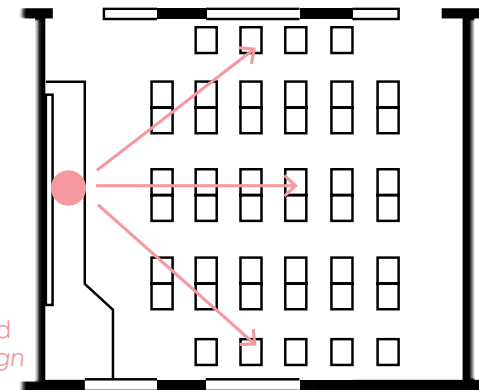
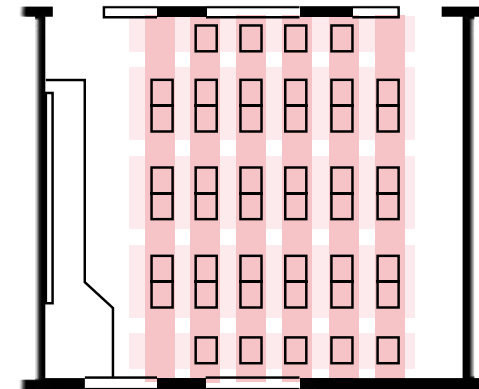
Different Arrangement Plan



Diagrams drawn by author based on *Architectural Design of Primary and Secondary Schools*.

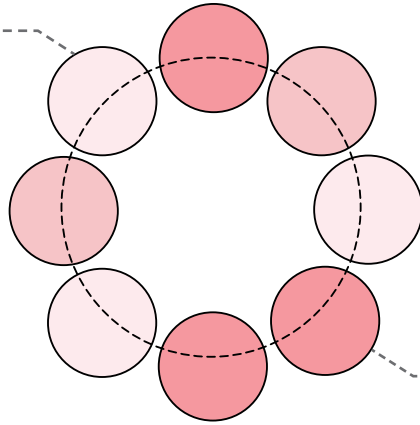
INDIVIDUAL CLASSROOM PLAN

Most of the time, classrooms have rectangular or square shapes in China. Almost all classrooms have similar settings. Desks and chairs are arranged in rows and columns. Blackboard is placed in the front where teachers give their lectures to the whole class. There are limited interactions between the teachers and students, and almost no interactions happen between students.



Plan drawn by author based on book: *Architectural Design of Primary and Secondary Schools*.

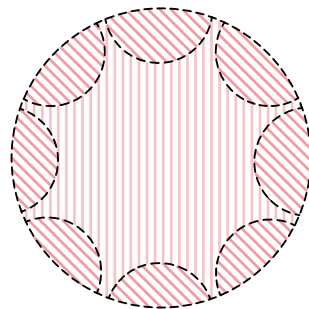
Specified spaces for different learning purposes



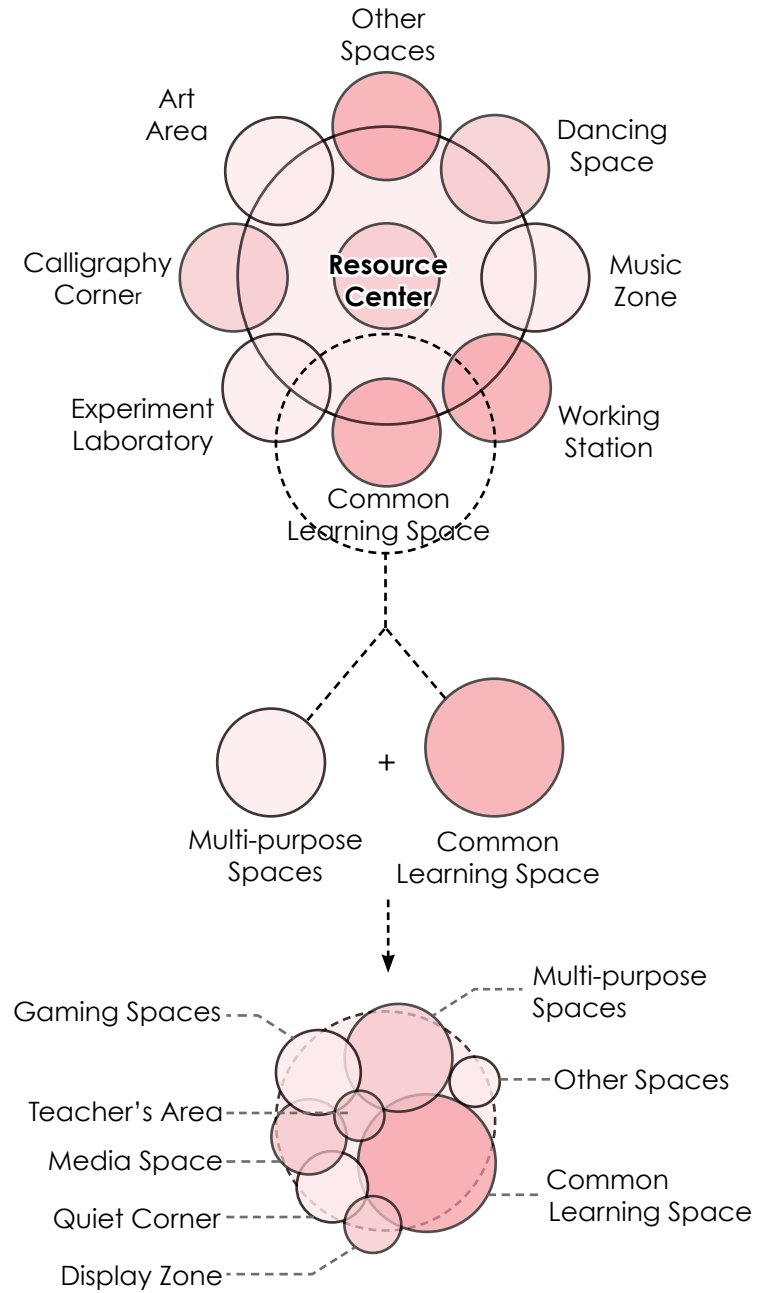
Specified spaces for different learning purposes



Undefined spaces that become flexible for children to explore and conduct self-learning experiences



An interactive learning space





**WUXI
QINYUAN ELEMENTARY SCHOOL**

Wuxi Architecture Design Institute

Wuxi, Qinyuan
1989

24 classes / 1080 students
10,000 m² 9.26 m² per student

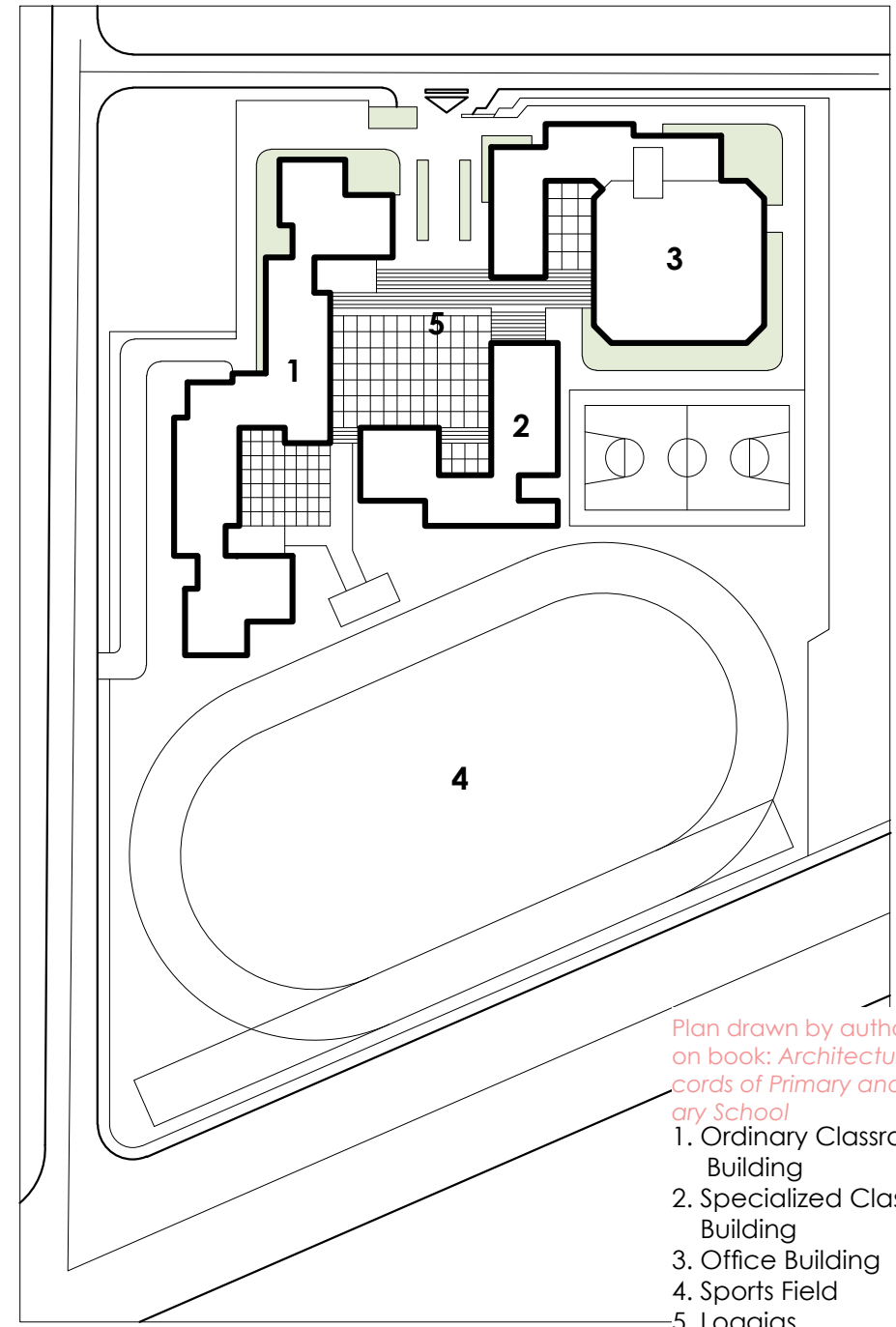
LOCATION
YEAR
SCALE
SIZE



Fig. 5

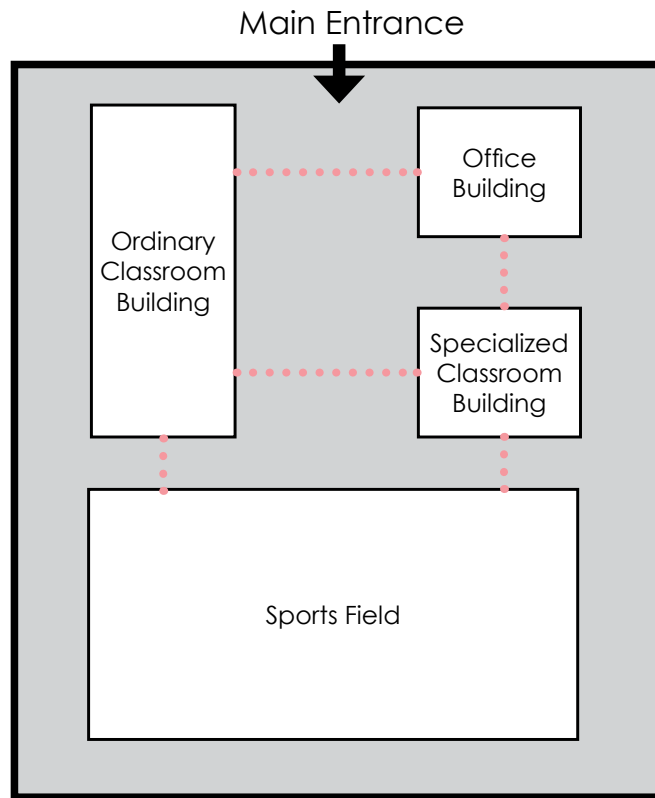


Fig. 6

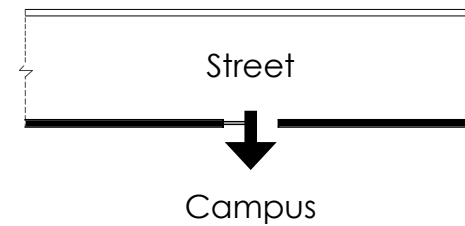


Plan drawn by author based on book: *Architectural Records of Primary and Secondary School*
1. Ordinary Classroom Building
2. Specialized Classroom Building
3. Office Building
4. Sports Field
5. Loggias

The school has been divided into four parts: the ordinary classroom building, the collaborative and specialized classroom building, office building, and the sports field.

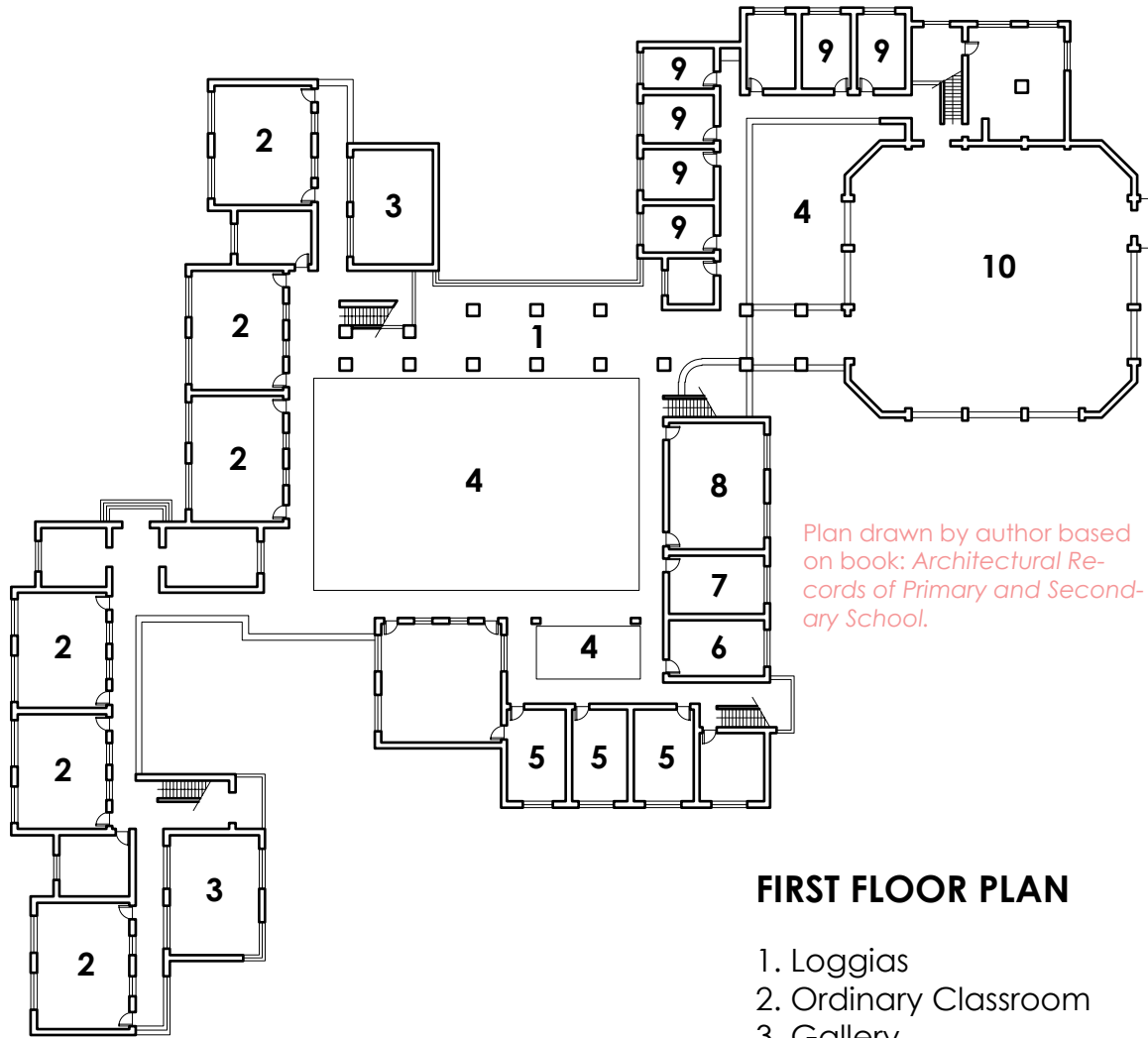


Each building is independent from each other. There are no interactions between the four parts in terms of learning, except for the pedestrian pathways and green spaces.



Since the school has wall boundaries around the campus, the main entrance is the only space that creates interaction with the outside environment. This school has a “Line” type. It is directly attached to the street. Behind the entrance is a big open space for transition.

However, the space is designed for pedestrian and transportation transition that allows no learning interaction happened.



Plan drawn by author based on book: *Architectural Records of Primary and Secondary School*.

FIRST FLOOR PLAN

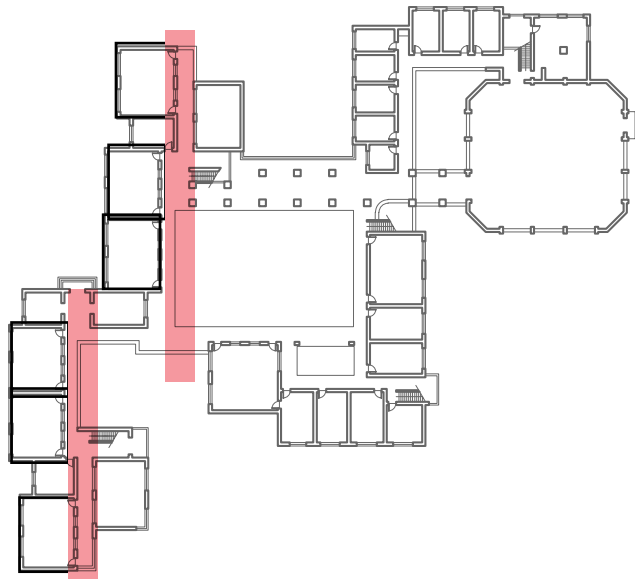
1. Loggias
2. Ordinary Classroom
3. Gallery
4. Courtyard
5. Play Room
6. Athletics Room
7. Preparation Room
8. Music Classroom
9. Office
10. Multi-function Classroom



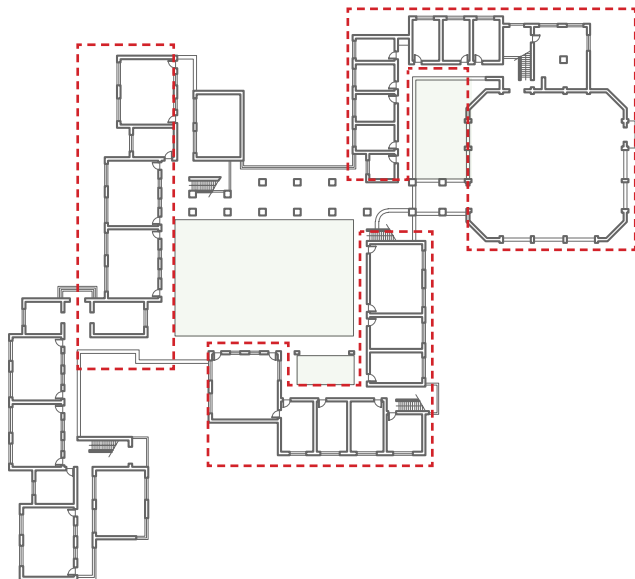
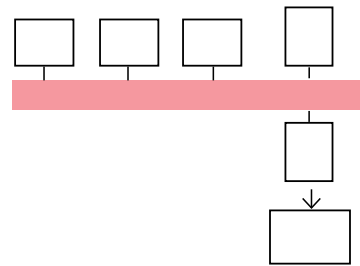
Fig. 8



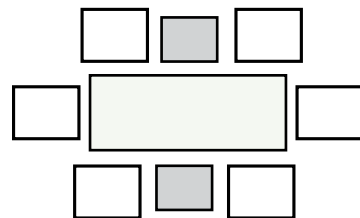
Fig. 9



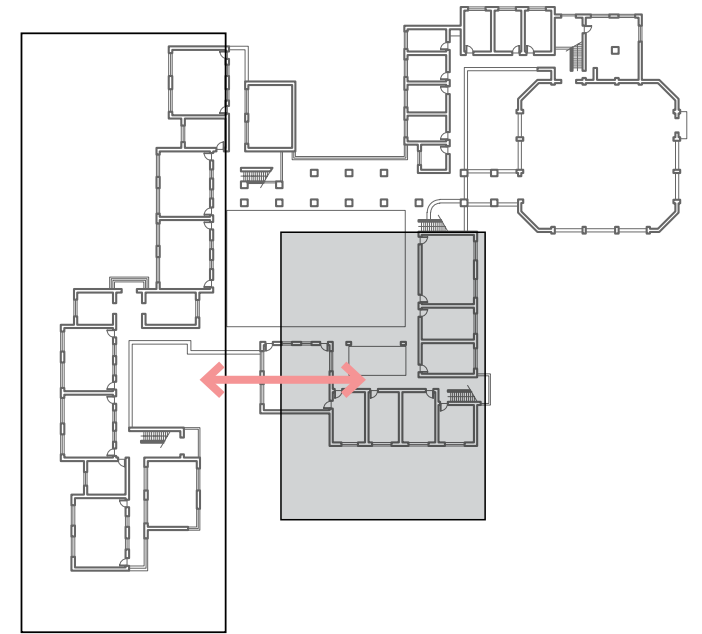
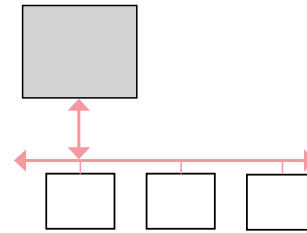
In the educational building plan, this school uses the exterior hallway as the spatial organization guide.



The spatial relationship is the courtyard-style. Classrooms and service rooms are all arranged around the courtyard.



The ordinary classrooms and specialized classrooms are placed separately, connected by an exterior hallway.



Overall, Qinyuan Elementary School follows the basic principles of school designs in China. Even though there are some refreshing ideas in its school plans, the fundamental idea of the design still follows the factory model of the educational philosophy. The primary learning environment is the classroom. Spaces outside of the classroom are used only for circulation, but could have been considered as parts of the learning environment.

MONTESORI EDUCATION



Following the impact of industrial revolutions and civil wars, China is slowly climbing from a developing country to one of the most profitable countries in the globe. China should thus adapt to a more efficient education method. As introduced previously, learning could be categorized as behaviorism, cognitive theory, humanism, and constructivism; the first three systems focused more primarily on the learning behavior and process that neglects alternative learning methods such as interactive experience happening within the learning environment. Constructivism is a more advanced learning method that makes use of interactive experiences as means and methods to bring out learner's initiation to learn, and this could be added on his or her existing knowledge. Examples of constructivism in education could be found in the works of John Dewey in 1930s, Maria Montessori in the 40s, and David Kolb in the 70s. I would like to elaborate on the Montessori Education method. In addition to the Western education theories, I would also like to introduce the essence wisdom from Confucius both as a retrospect and introspect into the origins of Chinese Education.

The Montessori education is fundamentally an educational approach based on the model of human development that guides children to initiate education through self-construct by building up their experiences while interacting with the environment. The Montessori Education was developed in

the late 19th century by Maria Montessori, who was occupied as a physician and educator. She started off her study and career in the pharmacy field; and she was especially dedicated in helping mentally retarded children. She designed and developed a series of sensorial materials as stimulants to lead learning for special children. Montessori later developed her models on normal children, and realized that the ideas of setting children at liberty and allowing them to act freely within a prepared environment could initiate their inherent will to conduct learning through self-construction. Based on careful observations and experiments, the Montessori Education as a scientific pedagogy explores human's innate tendencies of learning through experiencing and interacting to generate children's liberty, self-construction, and spontaneous activity. Such method could not only better initiate children's passion and willingness to learn, but increase the learning efficiency as well.

MONTESSORI EDUCATION VS. CHINESE EDUCATION

Movement and Learning

Chinese Education

For most of the elementary school children, learning is accomplished through listening to teachers, taking notes in class, reading the textbooks, and reciting what has been taught in class for examinations. Children need to sit at their desks, except during Physical Education (PE) classes.

Classrooms are designed with lack of movement. They are more suitable for the Lockean model of education, in which learning occurs because children take in new information and commit it to memory. (Liliard, 2008).

Montessori Education

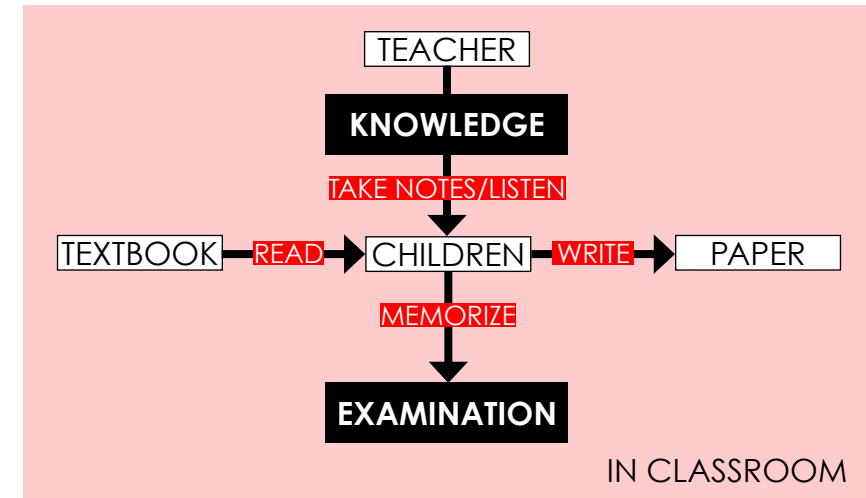
"One of the greatest mistakes of our day is to think of movement by itself, as something apart from the higher functions... Mental development must be connected with movement and be dependent on it. It is vital that educational theory and practice should become informed by this idea."

-- Maria Montessori, "The Absorbent Mind"

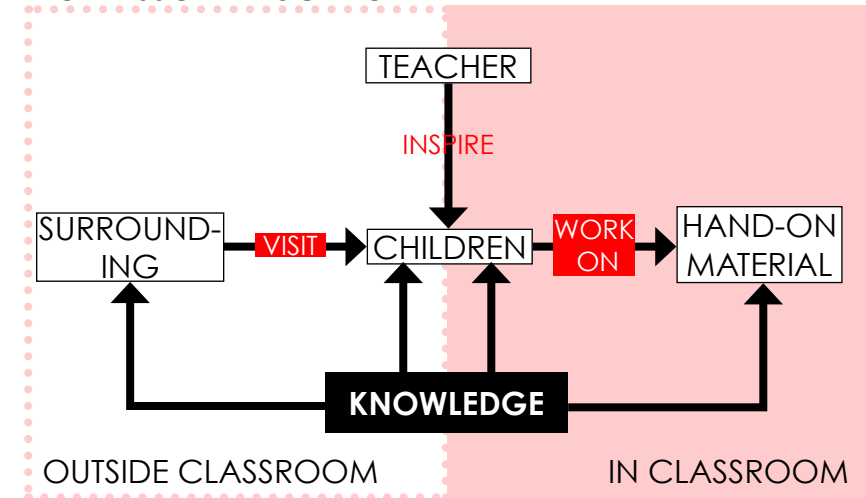
To children taking the Montessori education, learning is linked to movement. Elementary children have hands-on materials for most topics, including math, science, music, art, grammar, and culture studies. They are also encouraged to go out of the classrooms, not only to learn about nearby surroundings, but also to experience more about the world.

Montessori classrooms are designed for children to have free movements. They can freely move about, either working at tables or at small rugs on the floor.

CHINESE EDUCATION



MONTESSORI EDUCATION



Choice upon Learning

Chinese Education

In a Chinese school classroom, teacher, school administrator, and the Minister of Education decide for children what they should and will learn in each level of education. In most situations, learning occurs when teachers pour knowledge into children and force children to memorize correct answers. The curriculum is not designed for children to make a lot of choices over what they have learnt. Their schedules, books, and topics are set. Adults have more controls in the classroom.

Montessori Education

"These children have free choice all day long. Life is based on choice, so they learn to make their own decisions. They must decide and choose for themselves all the time... They cannot learn through obedience to the commands of another."

-- Maria Montessori "The Child, Society, and the World: Unpublished Speeches and Writings"

In Montessori Education, choices exist in the day-to-day program. The educational system is designed for children to choose what they want to do within reasonable limits. Montessori environments are designed to facilitate children in making choices and having self-controls. Instead of having children sitting in adult-sized chairs, furnitures in Montessori schools are movable and are made in proper sizes for children. Children's choices are only limited to the amount of materials. By requirements, children will know how to use and play with materials; and learn to be constructive and responsible through the process. (Liliard, 2008)

Interest towards learning

Chinese Education

Schools rarely pursue topics of particular interest. Similar to the factory model, every child in the unit of a class has the same schedule, curriculum, and learning context. Children are more driven by extrinsic motivators, such as grades or parents' expectations. Curriculum in Chinese school lacks of interconnections between subjects. The systems are usually not very well integrated.

Montessori Education

"The secret of success (in education) is found to lie in the right use of imagination in awakening interest, and the stimulation of seeds of interest already sown."

-- Maria Montessori "To Educate the Human Potential"

The Montessori Education is designed to awake children's interest of learning and to allow them to pursue learning about issues that they had already find interesting. (Liliard, 2008) Children can choose to do what they are interested in. Instead of memorizing facts chosen by teachers or school administrators, children in Montessori school present what fascinates them in forms of reports, drawings, or models. Educators stimulate children's interests through engaging lessons, materials, environments, prior to knowledge. In Montessori Education, children are more intrinsically motivated. Learning in Montessori Education takes the form of a vast web, the content topics are connected across subject areas, and different grade years. It is called a "Cosmic Education," where everything is interconnected.

Extrinsic Reward within the Learning Process

Chinese Education

In Chinese education, the outcome of children's learning largely depends on the extrinsic rewards.

Montessori Education

Besides grades, gold stars, demerits and other extrinsic rewards, Montessori education evaluates children through three-period lessons, observations, products of their work, and reviewing their work journals. The evolution process is invisible to children, with comments limited to matter-of-fact notes.

Learning with and from Peers

Chinese Education

In Chinese schools, teachers provide children information directly. Children rarely learn from each other, but directly from materials. The only material they use is the textbooks, which usually inform children information rather than guide them to discover knowledge. Most of the time, children work on homework and tests individually, but play together.

Montessori Education

In Montessori schools, the situation is the opposite. Children work individually or in self-groups by choice. Peer learning is embedded in the structure of Montessori education. (Lillard, 2008)

Learning in Context of Real life

Chinese Education

In China, schools are not related to real life. Children learn without understanding how to apply the knowledge to other things besides examinations. Schools are too authoritarian, conveying a "do it because we said so" attitude that does not generate positive feedbacks on children. Many of the skills and facts taught in school are intended to serve children real life contexts, but the manner the education was carried obscured the purpose of the knowledge. Chinese schools separate from other life contexts in other two ways. First, schools are separated from the neighbor communities. There are no connections among all the classrooms. Classrooms are restrained in one building, while other purposed rooms are separated from them. Secondly, learning is restrained to textbooks, lacking real-life applications.

Montessori Education

Superior to Chinese education, Montessori Education makes strong connections between learning and the social climate they support. Instead of learning largely from what teachers and textbooks inform, children in Montessori schools learn largely through doing. Every child is familiar in applying and understanding what one has been learning. Connections are created through playing with imitating models, peer tutoring, and collaborating with each other.

Orders in Environment and Mind

Chinese Education

Chinese education systems have strictly ordered schedules, but have less orders on the tasks or routines within activities. Under Chinese curriculum, each subject is developed individually without reference to other subjects. Each year, new textbooks and programs will be adopted into the curriculum. In the physical order of the school, the arrangements of the classroom vary accordingly to the teacher.

Montessori Education

School organizations have little adult-imposed structure. It has very organized structures for tasks and routines within activities. There is no daily schedule, except for three hours of uninterrupted work. In order to facilitate children's independence and their senses of order, classrooms are arranged in a more logical way. (Liliard, 2008) Each subject area is in a designated part of the classroom. The aesthetics and color of the classroom are carefully chosen, in order to attract children and invite them to perform activities.

EDUCATIONAL PHILOSOPHY OF CONFUCIUS

Educational Goals

子曰：“有教无类。”

The Master said, Instruction knows no class distinction.

子曰：“自行束脩以上，吾未嘗無誨焉。”

The Master said, “From the man bringing his bundle of dried flesh for my teaching upwards, I have never refused instruction to any one.”

Everybody can be educated.

Education Function

子曰：“性相近也，習相遠也。”

The Master said, “By nature, men are nearly alike; by practice, they get to be wide apart.”

“居！吾語女。好仁不好學，其蔽也愚。好知不好學，其蔽也蕩。好信不好學，其蔽也賊。好直不好學，其蔽也絞。好勇不好學，其蔽也亂。好剛不好學，其蔽也狂。”

“There is the love of being benevolent without the love of learning;-- the beclouding here leads to a foolish simplicity. There is the love of knowing without the love of learning;-- the beclouding here leads to dissipation of mind. There is the love of being sincere without the love of learning;-- the beclouding here leads to an injurious disregard of consequences. There is the love of straightforwardness without the love of learning;--



the beclouding here leads to rudeness. There is the love of boldness without the love of learning;-- the beclouding here leads to insubordination. There is the love of firmness without the love of learning;-- the beclouding here leads to extravagant conduct."

Education Principles

1. Inducing and Enlightening

子曰：“不憤不啟，不悱不發。舉一隅不以三隅反，則不復也。”

The Master said, "I do not open up the truth to one who is not eager to get knowledge, nor help out any one who is not anxious to explain himself. When I have presented one corner of a subject to any one, and he cannot from it learn the other three, I do not repeat my lesson."

Learning of the students is the focus of education.
The purpose of educator is to advise and to instruct.

2. Individualized Teaching

柴也愚，參也魯，師也辟，由也喭。

Ch'âi is simple. Shan is dull. Shih is specious. Yû is coarse.

子路問：“聞斯行諸？”

子曰：“有父兄在，如之何其聞斯行之！”

冉有問：“聞斯行諸？”

子曰：“聞斯行之！”

公西華曰：“由也問‘聞斯行諸’，子曰：‘有父兄在。’求也

問‘聞斯行諸’，子曰：‘聞斯行之。’赤也惑，敢問。”

子曰：“求也退，故進之。由也兼人，故退之。”

Tsze-lû asked whether he should immediately carry into practice what he heard. The Master said, "There are your father and elder brothers to be consulted;-- why should you act on that principle of immediately carrying into practice what you hear?" Zan Yû asked the same, whether he should immediately carry into practice what he heard, and the Master answered, "Immediately carry into practice what you hear." Kung-hsî Hwâ said, "Yû asked whether he should carry immediately into practice what he heard, and you said, 'There are your father and elder brothers to be consulted.' Ch'iû asked whether he should immediately carry into practice what he heard, and you said, 'Carry it immediately into practice.' I, Ch'ih, am perplexed, and venture to ask you for an explanation." The Master said, "Ch'iû is retiring and slow; therefore I urged him forward. Yû has more than his own share of energy; therefore I kept him back."

Students have their own unique Intelligence. Education should base on different situations of students.

3. Learning and Thinking

子曰：“學而不思則罔，思而不學則殆。”

The Master said, "Learning without thought is labor lost; thought without learning is perilous."

子曰：“飽食終日，無所用心，難矣哉！不有博弈者乎？爲之猶賢乎已！”

The Master said, "Hard is it to deal with who will stuff himself with food the whole day, without applying his mind to anything good! Are there not gamblers and chess players? To be one of these would still be better than doing nothing at all."

4. Gaining new Knowledge by reviewing the old

子曰：“溫故而知新，可以為師矣。”

To be able to teach others one must from his old stores be continually developing things new.

The Master said, “If a man keeps cherishing his old knowledge, so as continually to be acquiring new, he may be a teacher of others.”

Theory of Constructivism: new knowledge is based on older experiences.

子曰：“學而時習之，不亦說乎”

The Master said, “Is it not pleasant to learn with a constant perseverance and application?”

子貢曰：“貧而無諂，富而無驕，何如？”子曰：“可也；未若貧而樂，富而好禮者也。”

子貢曰：“《詩》云：‘如切如磋，如琢如磨。’其斯之謂與？”

子曰：“賜也，始可與言《詩》已矣，告諸往而知來者。”

1. Tsze-kung said, “What do you pronounce concerning the poor man who yet does not flatter, and the rich man who is not proud?” The Master replied, “They will do; but they are not equal to him, who, though poor, is yet cheerful, and to him, who, though rich, loves the rules of propriety.”

2. Tsze-kung replied, “It is said in the Book of Poetry, ‘As you cut and then file, as you carve and then polish.’ -- The meaning is the same, I apprehend, as that which you have just expressed.”

3. The Master said, “With one like Ts'ze, I can begin to talk about the odes. I told him one point, and he knew its proper sequence.”

Confucian. “Confucian Analects”. Trans. James Legge. Yanzi Academy, n.d. Web. 12 Nov. 2013. <http://www.cnculture.net/ebook/jing/sishu/lu-nyu_en/>.

MILWAUKEE MONTESSORI SCHOOL STUDIO WORKS

PROJECT: Milwaukee Montessori School, Milwaukee

SITE: A 2.5-acre lot in a residential suburb of Milwaukee.

PROGRAM: renovation of an existing school building into a facility for 340 students.

For Maria Montessori, the learning environment played an important role in children's development as did the teachers. The building architecturally reflects Montessori's teachings.



Fig. 12

DESIGN ACHIEVEMENT

In the design of Milwaukee Montessori School, architects have reached the Montessori curriculum to elaborate its lessons at an architectural and environmental scale. They have succeeded in taking the curriculum out of the classrooms and into the public spaces and the yard, suggesting that architecture is the largest instructional tool.



Fig. 13



Fig. 14

Butterfly-shaped false skylights lit from behind, simulate daylighting in the lunchroom, art room, and the library.

The Wooden Triangle Theater, is an informal theater in the middle of the corridor. The space's triangular shape is furred out with ordinary plywood and sealed with urethane. The floor slopes upward at the theater's apex, giving students an unusual perspective space in which to perform doors, which allow corridors and adjacent rooms to be transformed into open-plan environment.

The theater is an ambiguous space that students can interpret and reinterpret through shifting uses.

The door of the art room is a pivoting door, which allows the art-room expand into the adjacent area. This design follows the Montessori principle: adjustable space is preferable to static one.



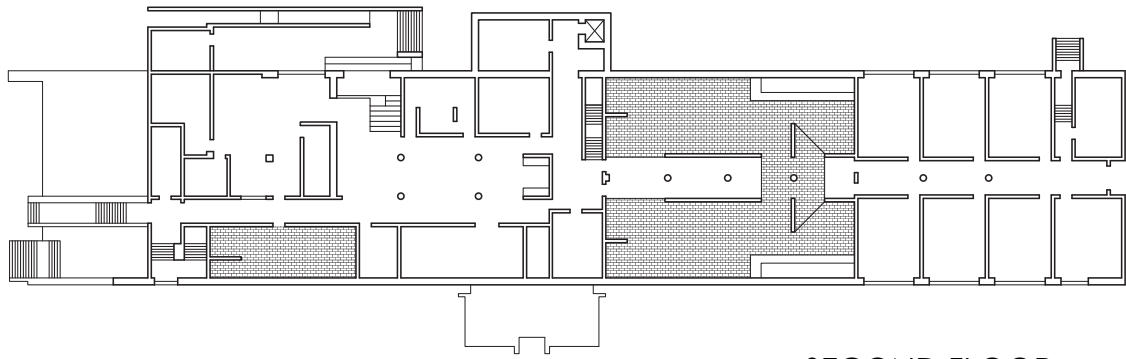
Fig. 15



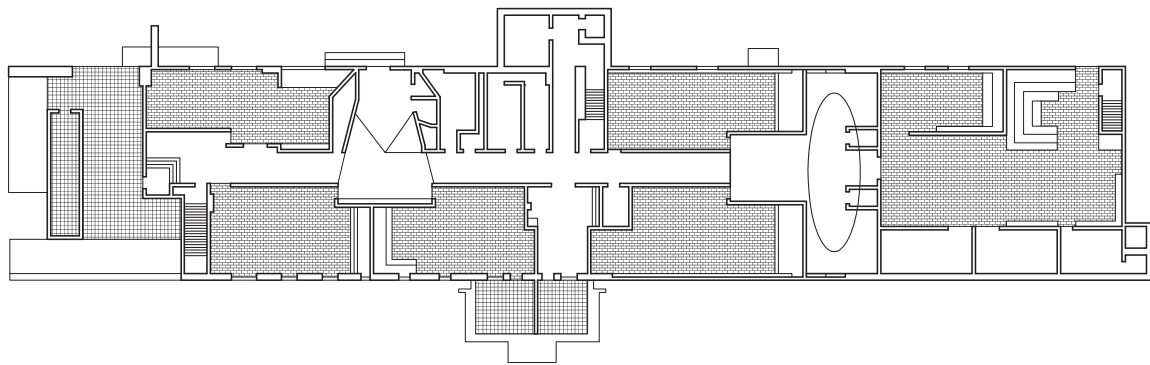
Fig. 16



Fig. 17



SECOND FLOOR



GROUND FLOOR

Plan drawn by author based on record drawings in *Architecture*; Apr 1998; 87, 4, Pg.88

Bridgeadrium

A covered ramp leading to the outdoor play field from the second floor.

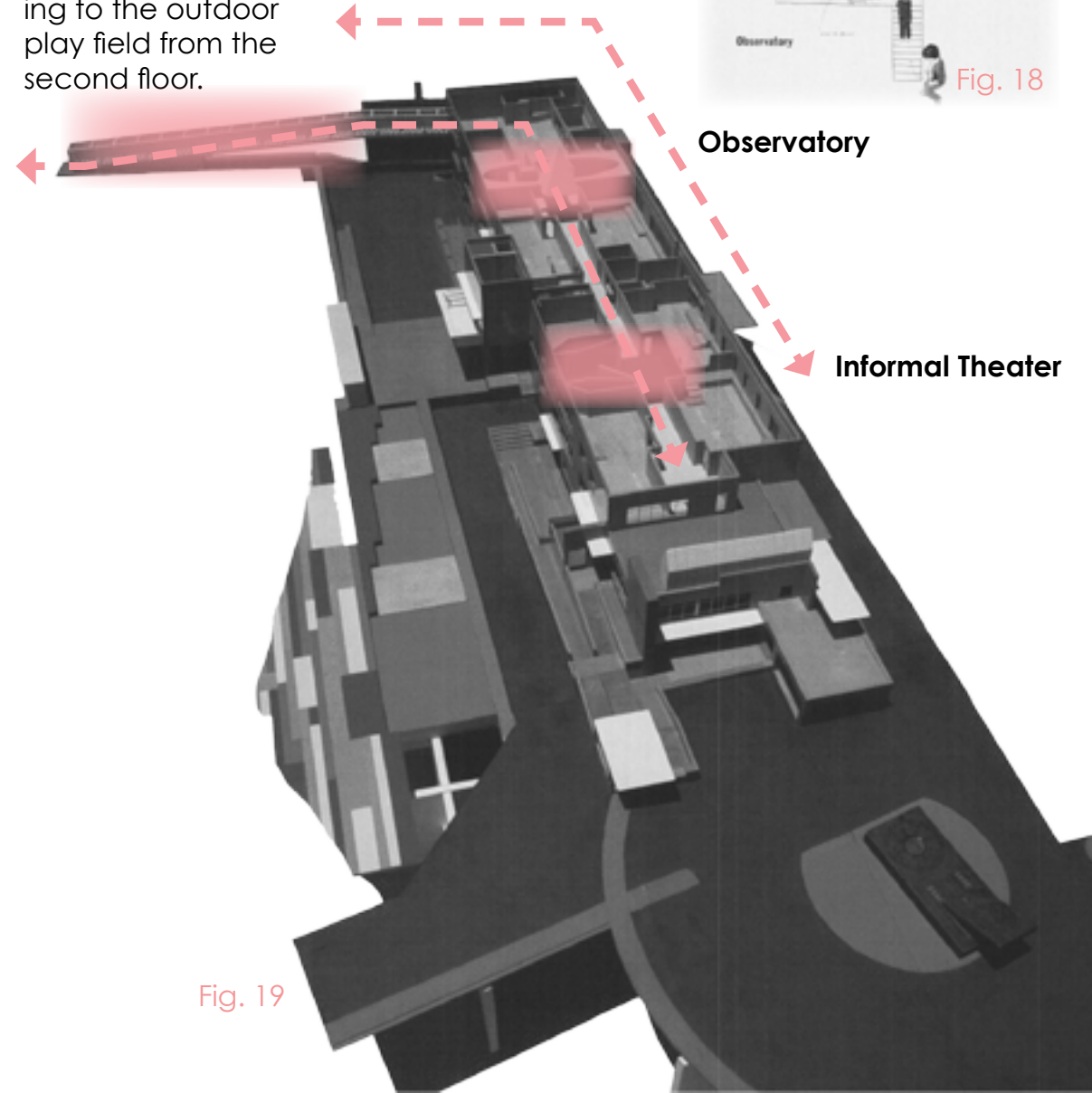
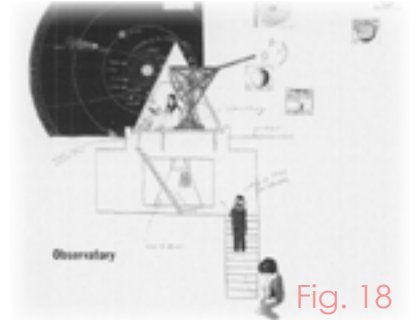


Fig. 19

Fig. 20



The classroom was designed with an open plan and has an access to the outdoor playing area. It was called the "Earth Island Play Area", for the studying of geography and botany.

Classroom
Children's House

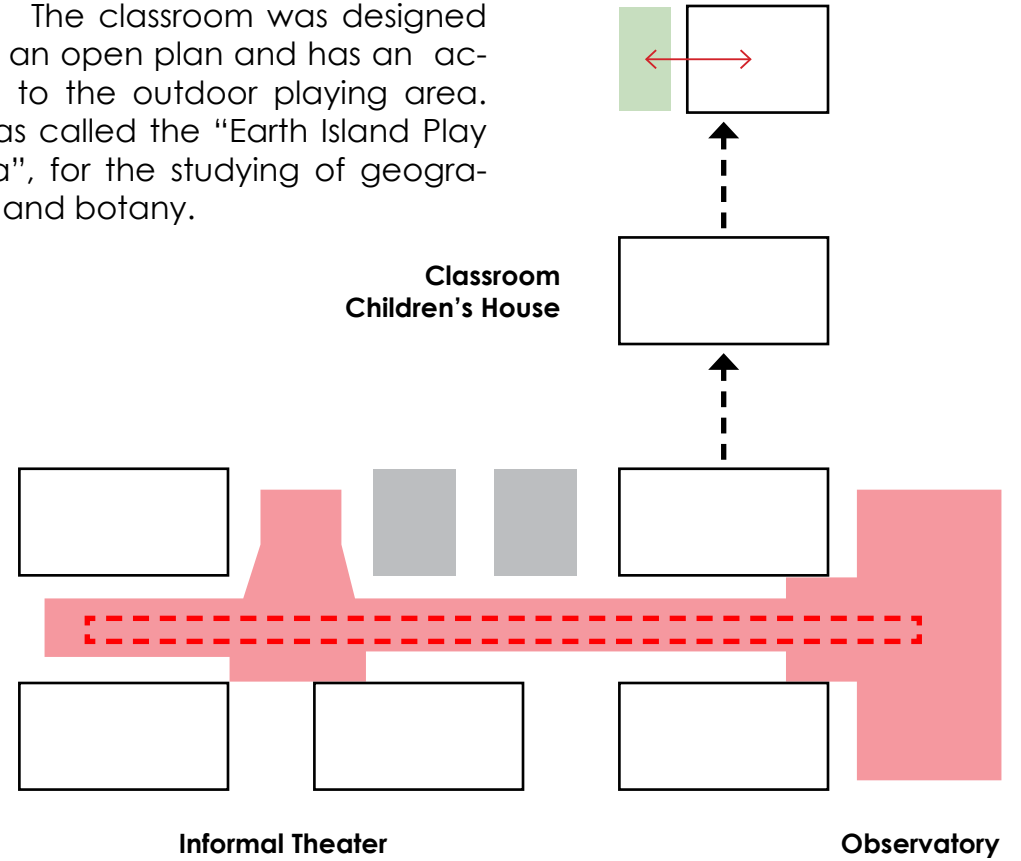
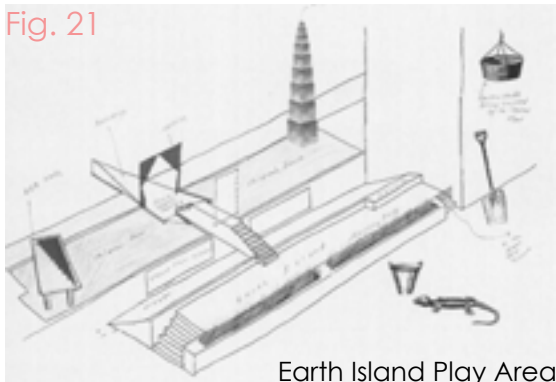
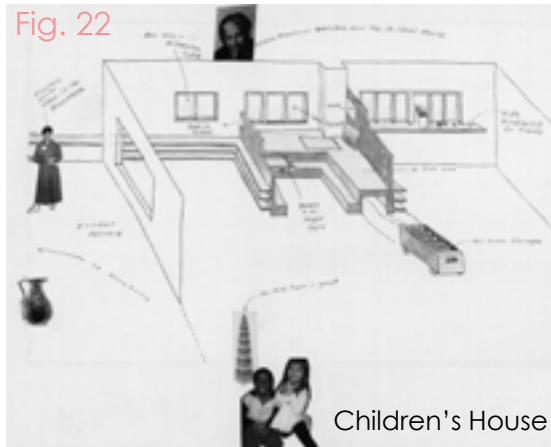


Fig. 21

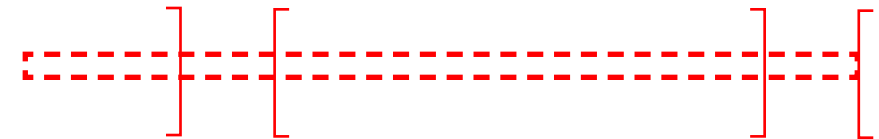


Earth Island Play Area

Fig. 22



Children's House



The architect treated the school as a city. The corridor is designed as an interior street, interrupted by the two double-height public gathering spaces.

SITE

AND

PROGRAM



CHINA



BEIJING

SITE: BEIJING

Beijing, also called Peking, is the capital of China. It is a metropolis located in northern China and surrounded by Hei-bei Province. It is always considered as the political, cultural, and educational center of the nation. The city has a variety of resources in culture, architecture, art, media, sports and education. It not only has the best universities of China, but also has the best elementary and middle schools, which can well represent the education system of China.

Fig. 23



Geography

Beijing sits at the northern tip of the triangular North China Plain. Beijing is shielded with mountains from the north to west. The Great Wall of China runs across the northern part of Beijing to defend against nomadic invasions from Mongolia. There are three branch streams flowing through the municipal of Beijing from the Hai River system.

Climate

Beijing has a rather dry, monsoon-influenced humid continental climate, characterized by hot, humid summers due to the East Asian monsoon, and generally cold, windy, dry winters. Sandstorms may happen in spring, with rapidly warming, but generally dry wind. Autumn, like spring, has little rain, but is short. The average temperature is 24.3°F in January, and 79.2°F in July. The Precipitation average is around 570 mm annually, mostly happens from June to August.

Air Quality

In Beijing, the air pollution is really severe. According to the China Statistical Yearbook, the PM10 number is 0.140 in 2004. Today, Beijing is polluted under severe haze problem.

Population Distribution

The total population of Beijing in 2012 is 20.69 million.

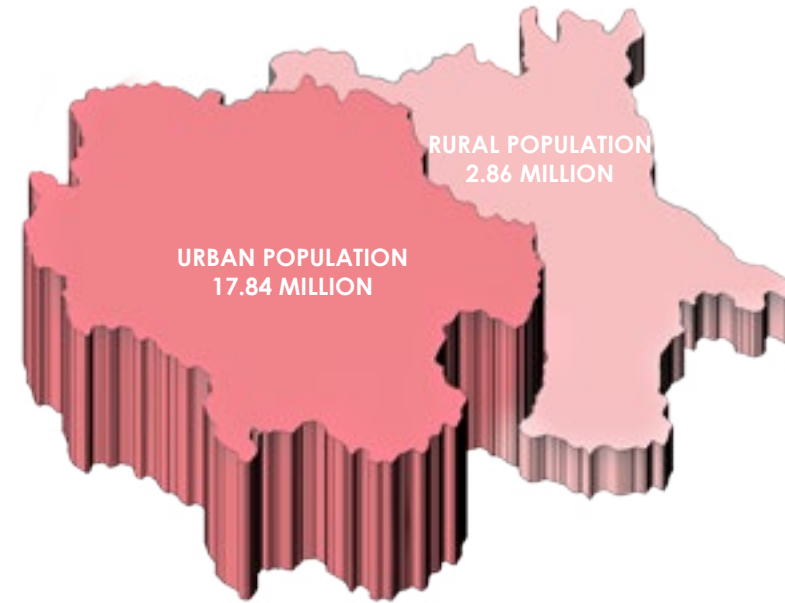


Diagram drawn by author based on statistic number in 2013 China Statistical Yearbook.

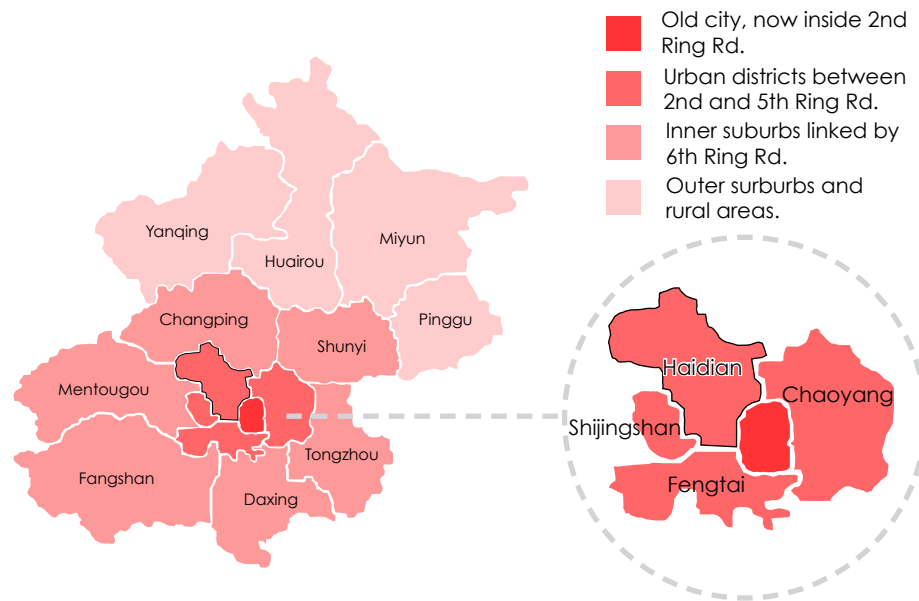
Urban Planning

The city spreads out in concentric ring roads, from the Second Ring Road to the Sixth Ring Road. The Second Ring Road traces the old city walls and the Sixth Ring Road connects the satellite towns in the surrounding suburbs. Tian'anmen and Tian'anmen Square are at the center of the city.

Haidian District is located from the Second Ring Road to the outside of the Sixth Ring Road.

Administrative Division

Beijing municipality currently comprises 16 administrative county-level subdivisions including 14 urban and suburban districts and two rural counties.

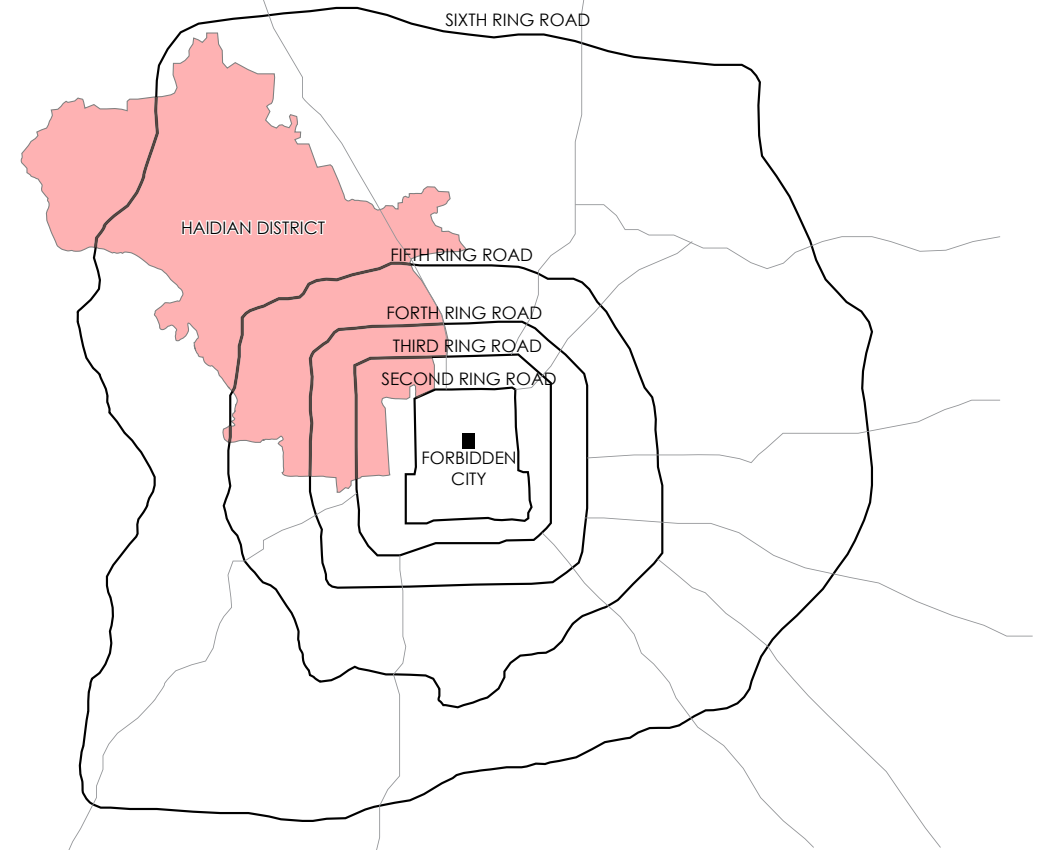


Transportation

Urban transport in Beijing is dependent upon the five “ring roads” that concentrically surround the city. The Forbidden City area is marked as the geographical center for the ring roads. There is no official “1st Ring Road”. The 2nd Ring Road is located in the inner city. Ring Roads tend to resemble expressways progressively as they extend outwards, with the 5th and 6th Ring Roads being full-standard national

expressways, linking to other roads only by interchanges. Expressways to other regions of China are generally accessible from the 3rd Ring Road outward. Within the urban core, city streets generally follow the checkerboard pattern of the ancient capital.

In Beijing, public buses and subway are the primary public transportation. There are nearly 1000 bus lines in the city, including four rapid bus transit lines. Subway has 17 lines.





SUBWAY MAP OF BEIJING
 <<http://www.bjmtv.com>>



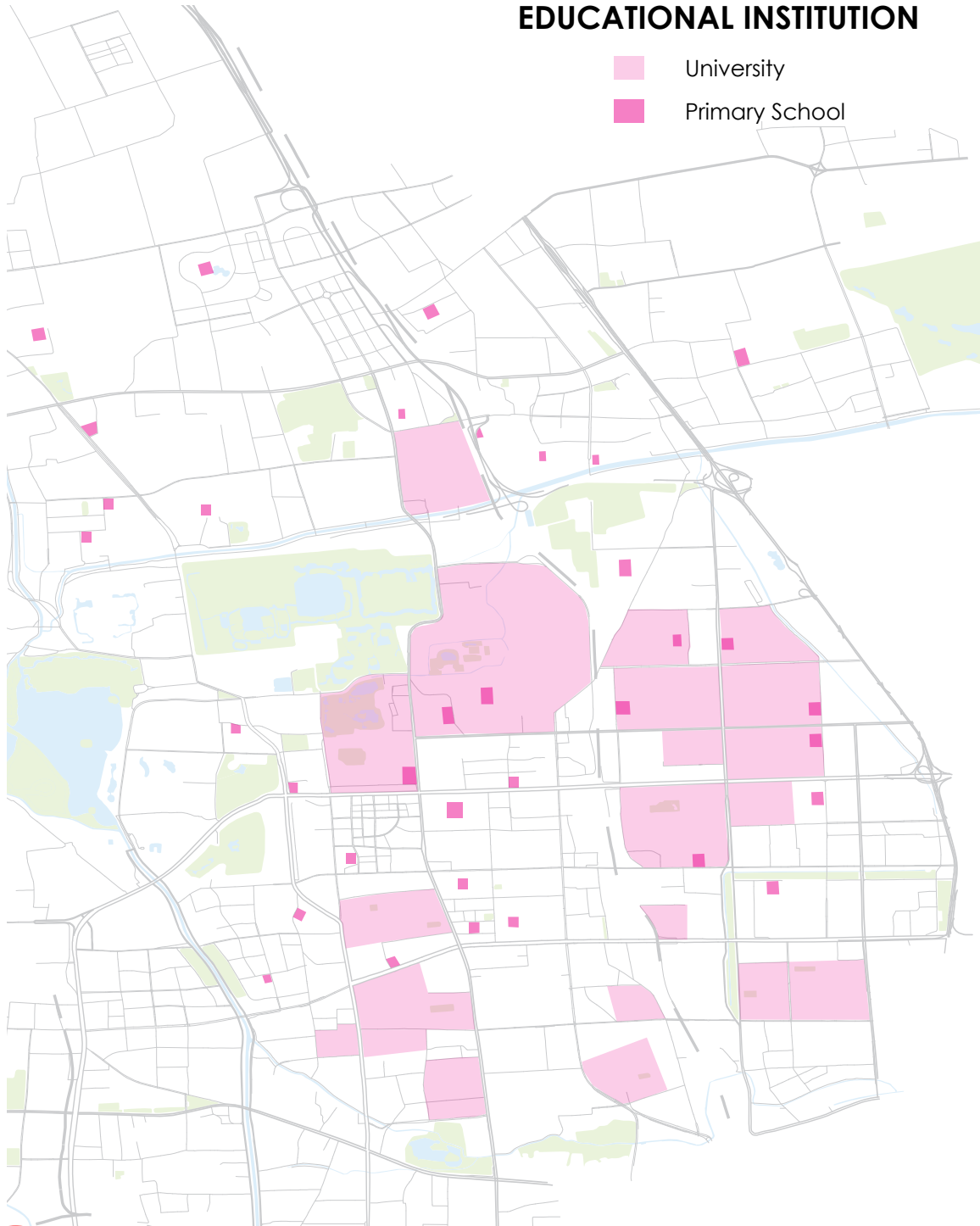
DISTRICT: HAI DIAN

Since this thesis is to critic Chinese education system, it is fairly to pick Beijing as the location for the project since Beijing is the representative of education in China, .

Taking a closer look at Beijing, among the sixteen districts of the city, Haidian district is the best choice, not only because of various famous schools are located in this district, but also because of its rich educational institutions such as the National Library, museums, technology institutions and theaters.

EDUCATIONAL INSTITUTION

- University
- Primary School




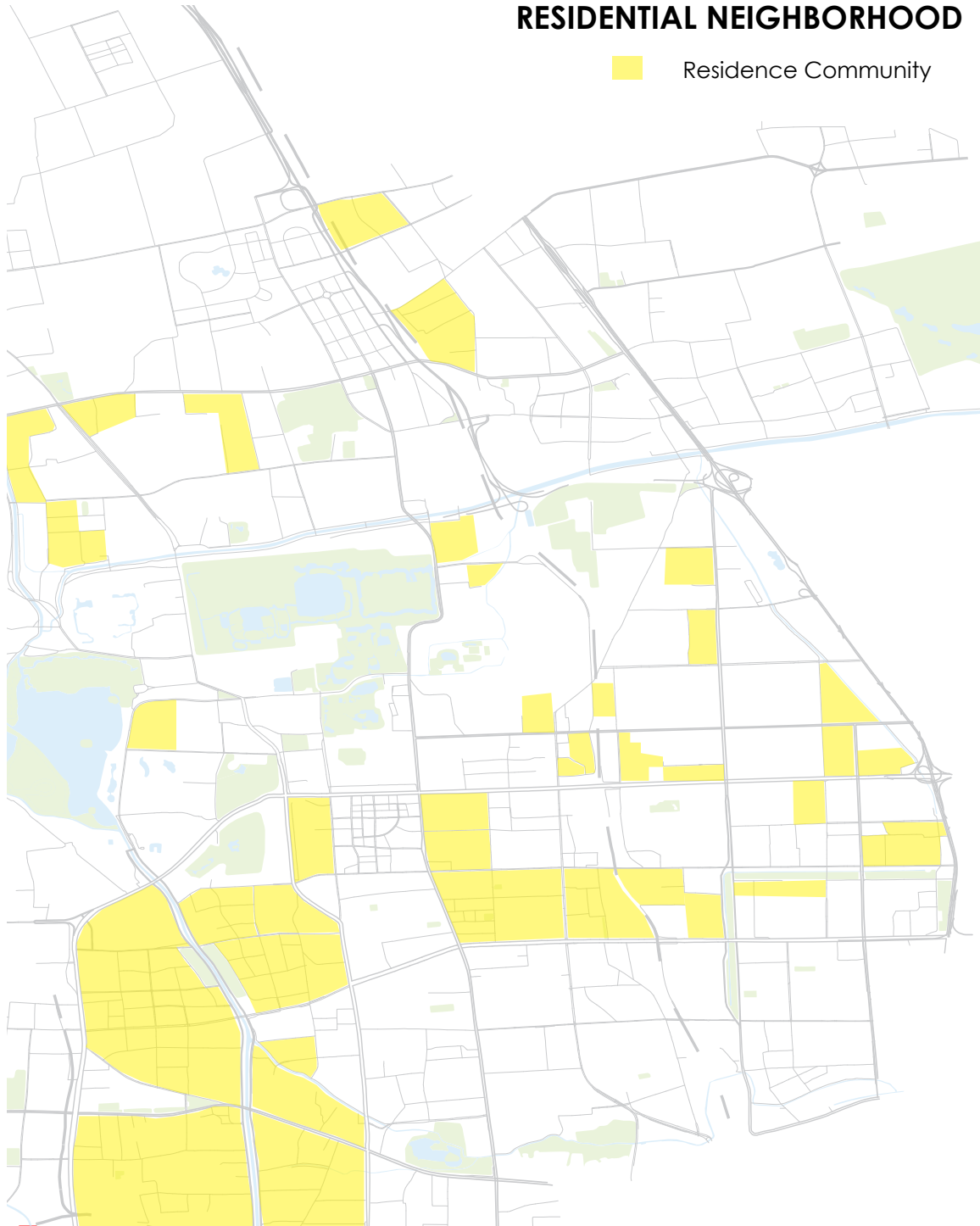
OTHER LEARNING INSTITUTIONS

- Library
- Theater
- Museum







RESIDENTIAL NEIGHBORHOOD

 Residence Community



PUBLIC TRANSPORTATION

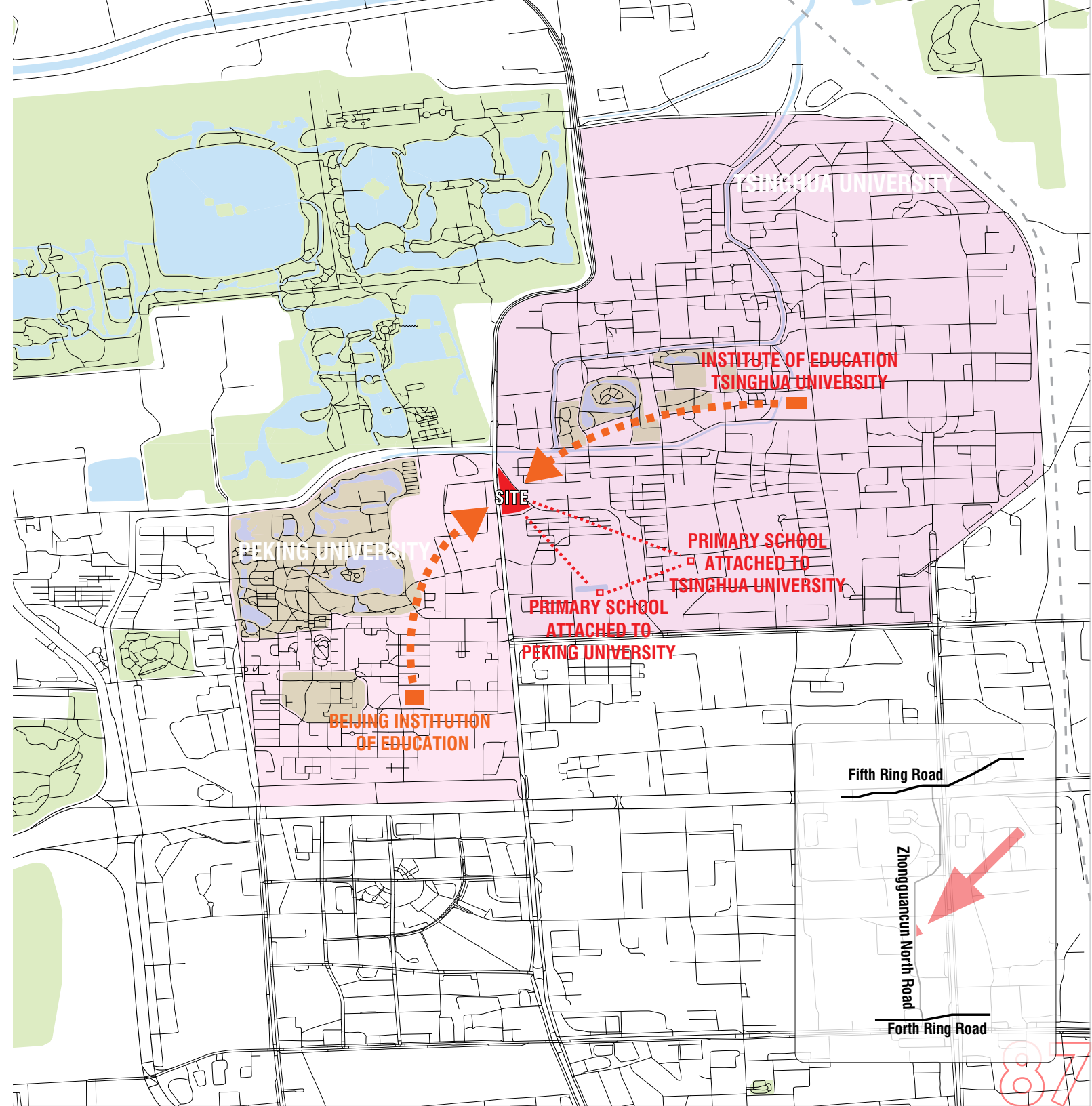
 Subway Line 4
 Subway Line 10
 Subway Line 13
 Subway Station



SITE SELECTION

Haidian District is one area full of different educational institutions including the world-known universities such as Peking University, and Tsing-hua University. There are other colleges such as the China Technology School of Astronomy, the Technology Institute of Engineer, the Beijing Film Academy and so on. The convergence of different college campuses provide Haidian District a healthy precedent condition for positive learning atmosphere.

My proposed site will be situated between Tsing-hua University and Peking University. (As indicated in the next page.) Both Universities have their own School of Education. My proposed school can become part of the universities, used as an experimental learning environment. Moreover, there are several existing elementary schools, which can be used as comparisons to my proposed design.

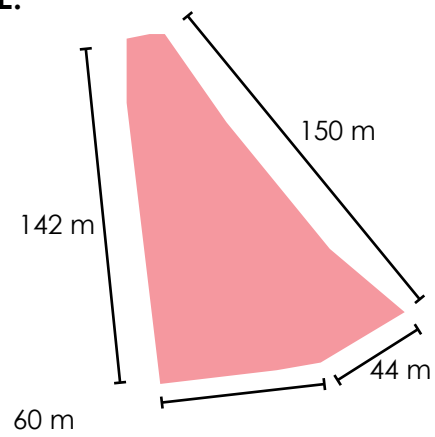


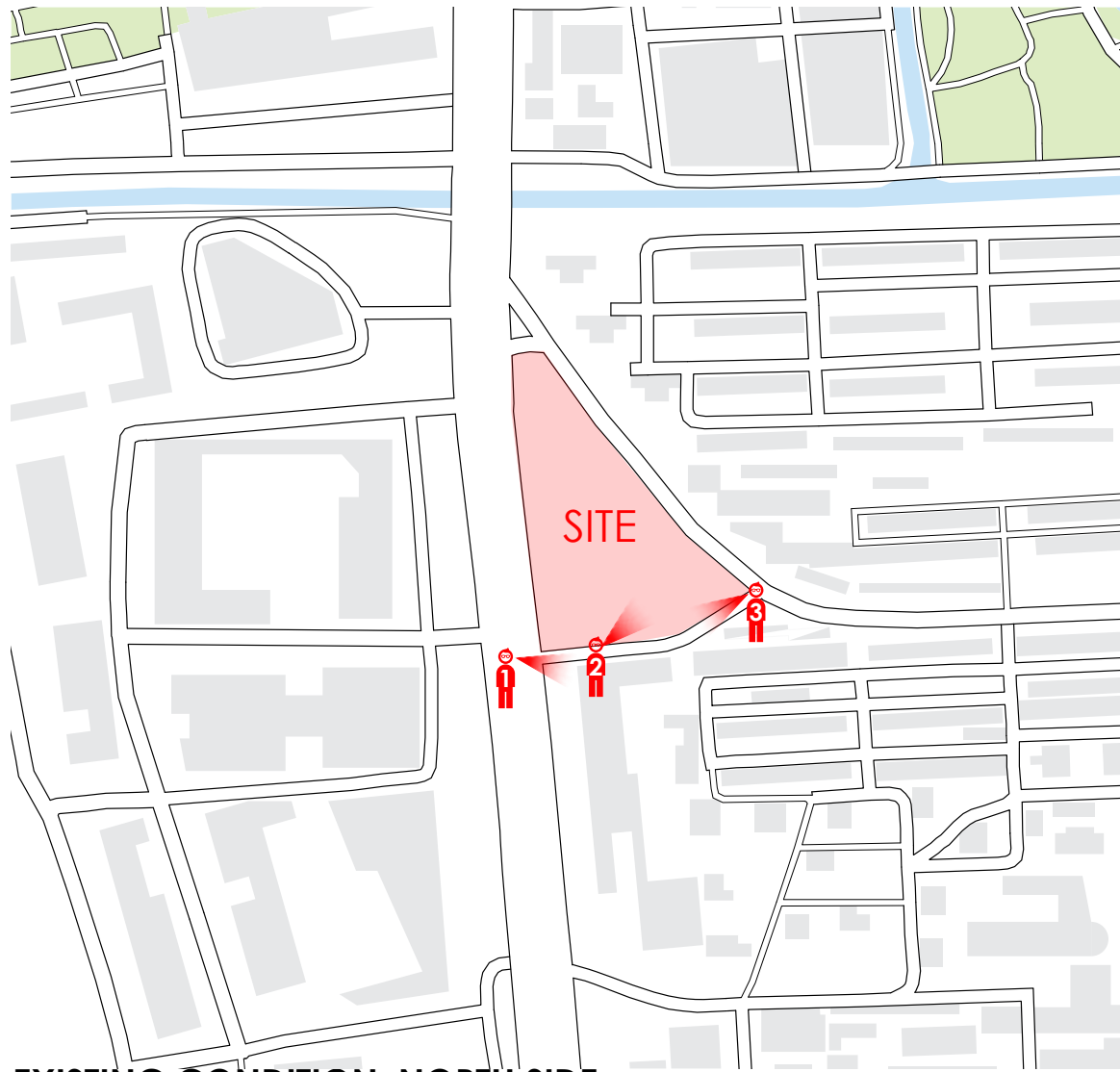
BASIC INFORMATION

LOCATION: near Zhongguancun North Avenue, and Tsing-hua North Road

AREA: 8,000 m²

SIZE:





EXISTING CONDITION: NORTH SIDE



Fig. 24



Fig. 25

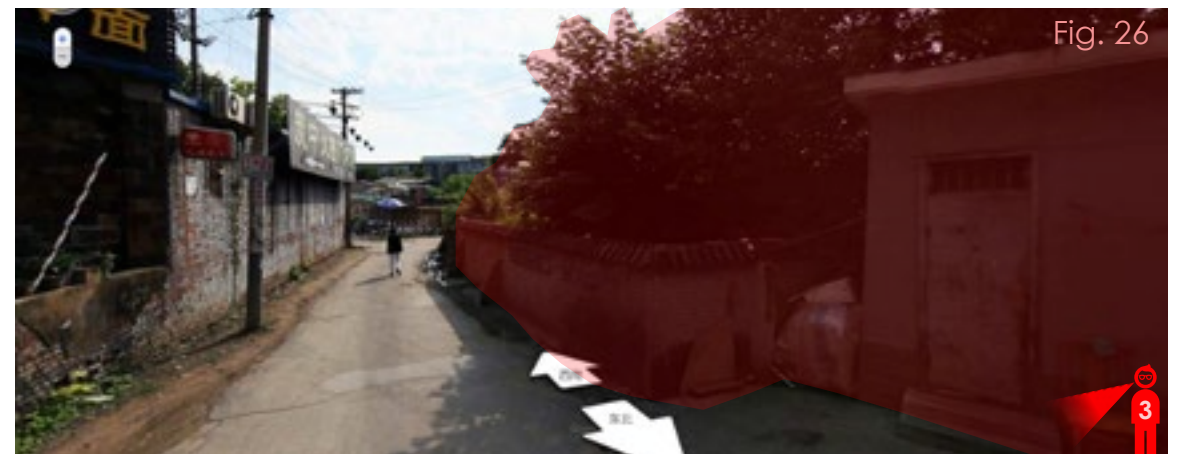
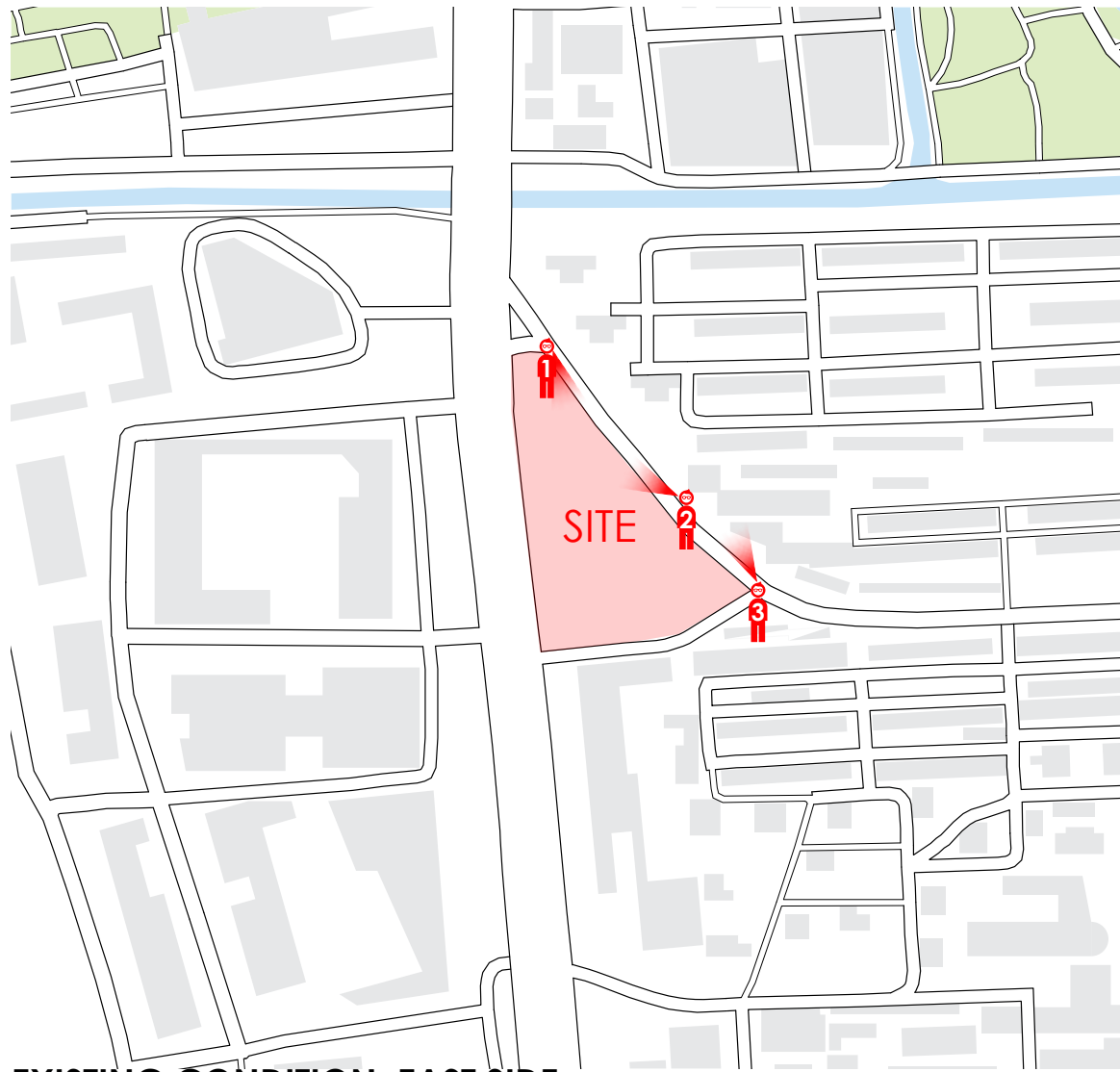
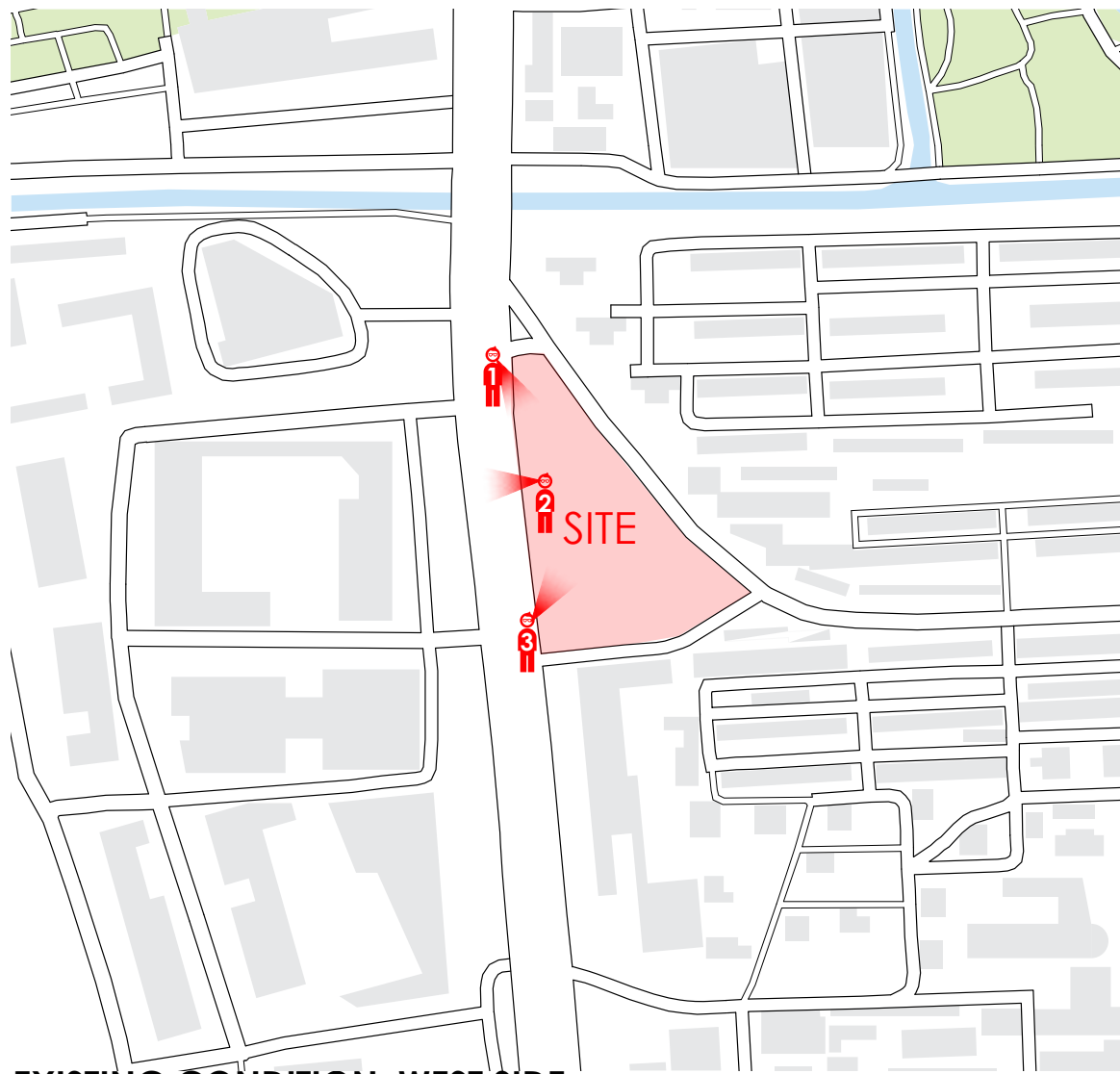


Fig. 26



EXISTING CONDITION: EAST SIDE





EXISTING CONDITION: WEST SIDE



Fig. 30



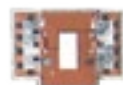
Fig. 31



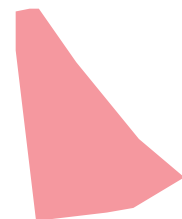
Fig. 32

SITE ANALYSIS

Scale in Relevance



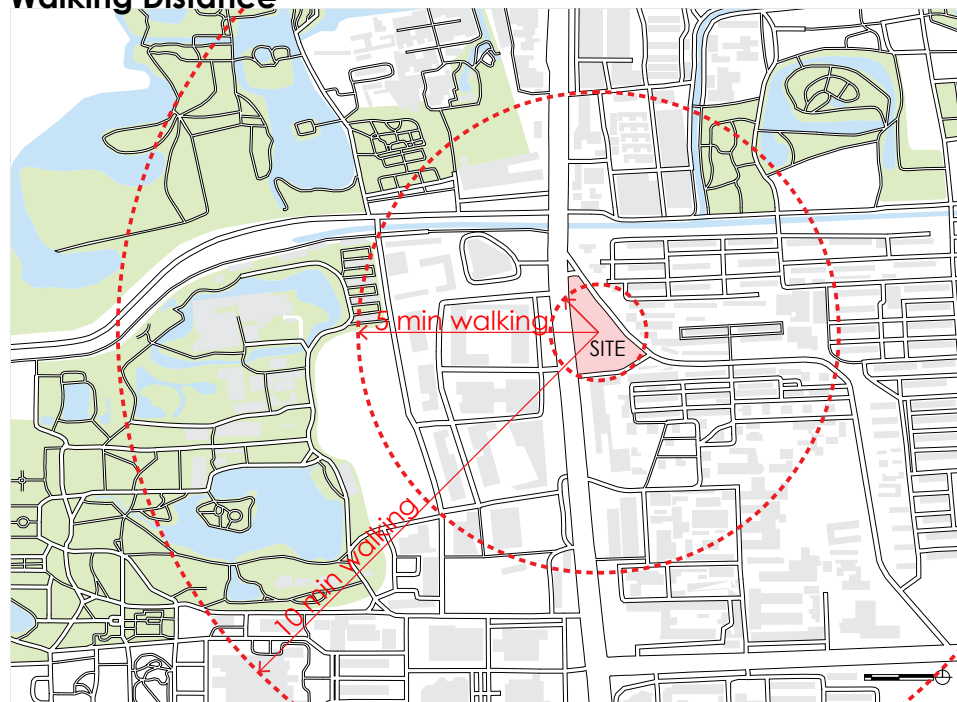
SLOCUM HALL
= 2,000 m²



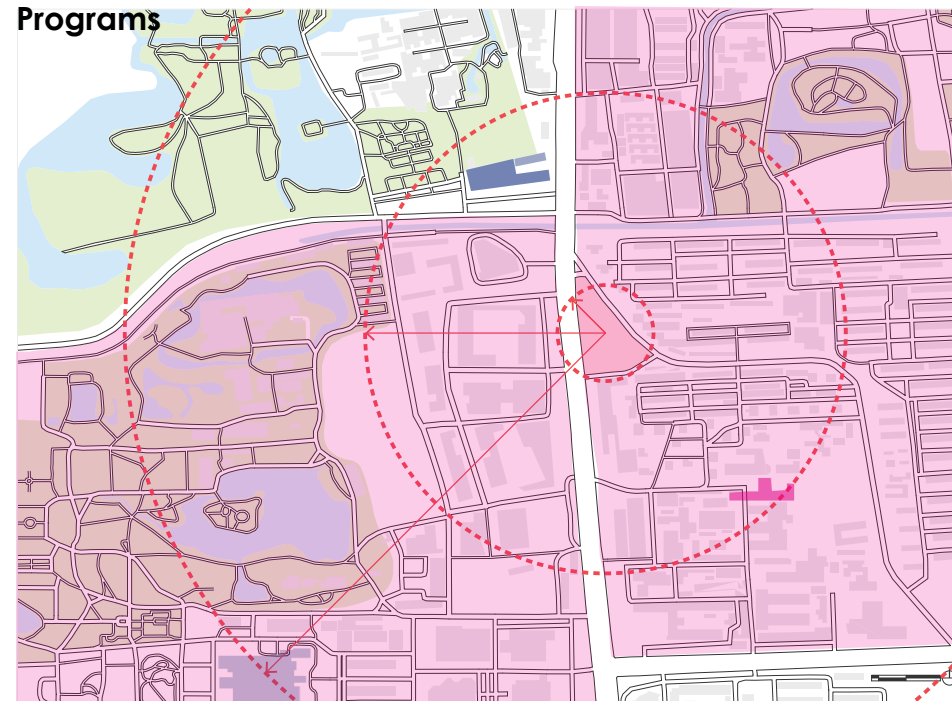
SITE
= 8,000 m²



Walking Distance

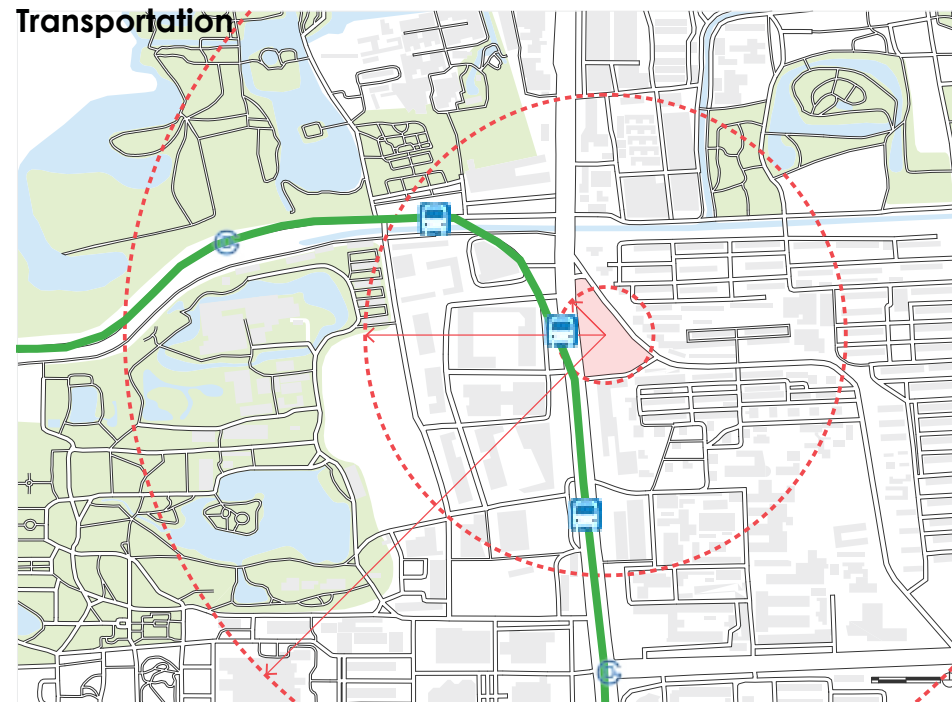


Programs



- Library
- Theater
- Museum
- University
- Primary School

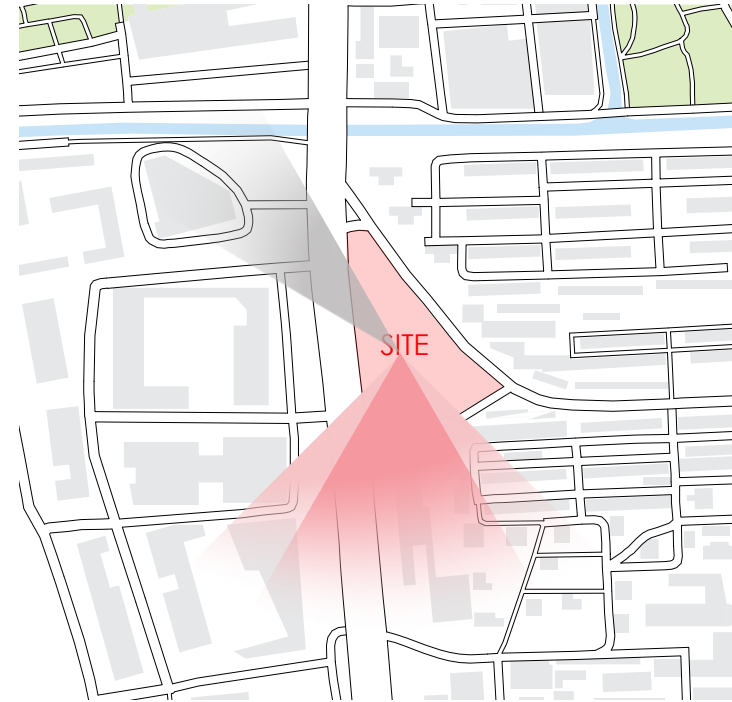
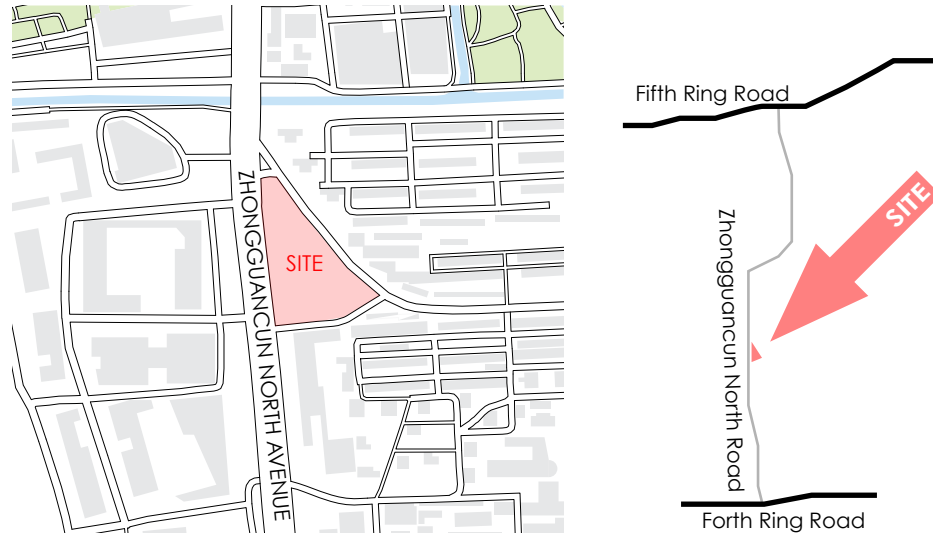
Transportation



- Subway Line 4
- Subway Station
- Bus Station

Street Scale

Zhongguancun North Avenue is a six-lane county-level road, connecting the Forth Ring Road and the Fifth Ring Road. It is an non-express route.

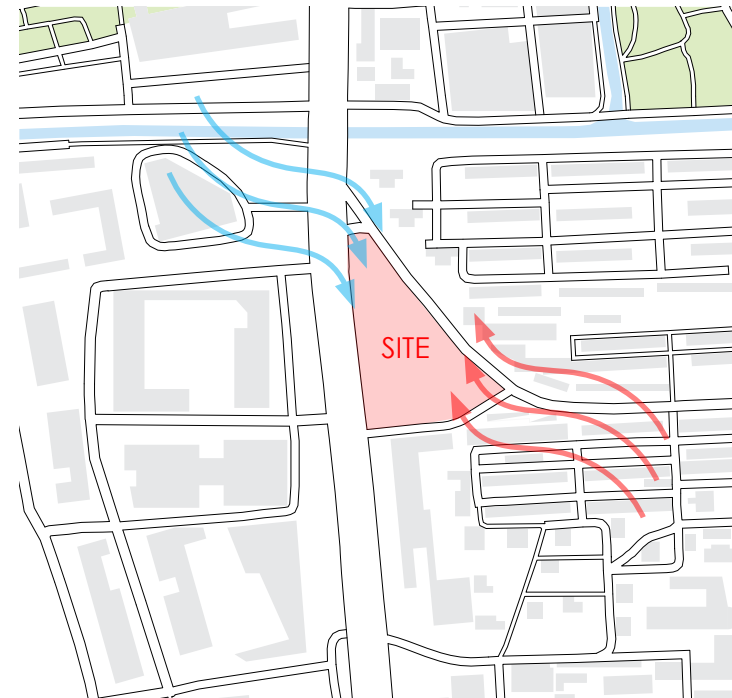


Solar Orientation

The best solar orientation is 30° South to East, and 30° South to West. It is not desirable to have the solar orientation 30° to 60° North to West.



Fig. 33



Prevailing Wind

The prevailing wind is from northwest in winter, and southeast in summer.

PROGRAM PROPOSAL

A small elementary school, composed of twelve classes for six grades, and a public infrastructure.

Site Distribution

TOTAL AREA OF THE SITE

8,000 m²

PUBLIC
INFRASTRUCTURE

1,893 m² 24%

THE ELEMENTARY SCHOOL

6,107 m²

76%

PUBLIC
INFRASTRUCTURE

1,893 m²

GREEN
SPACE

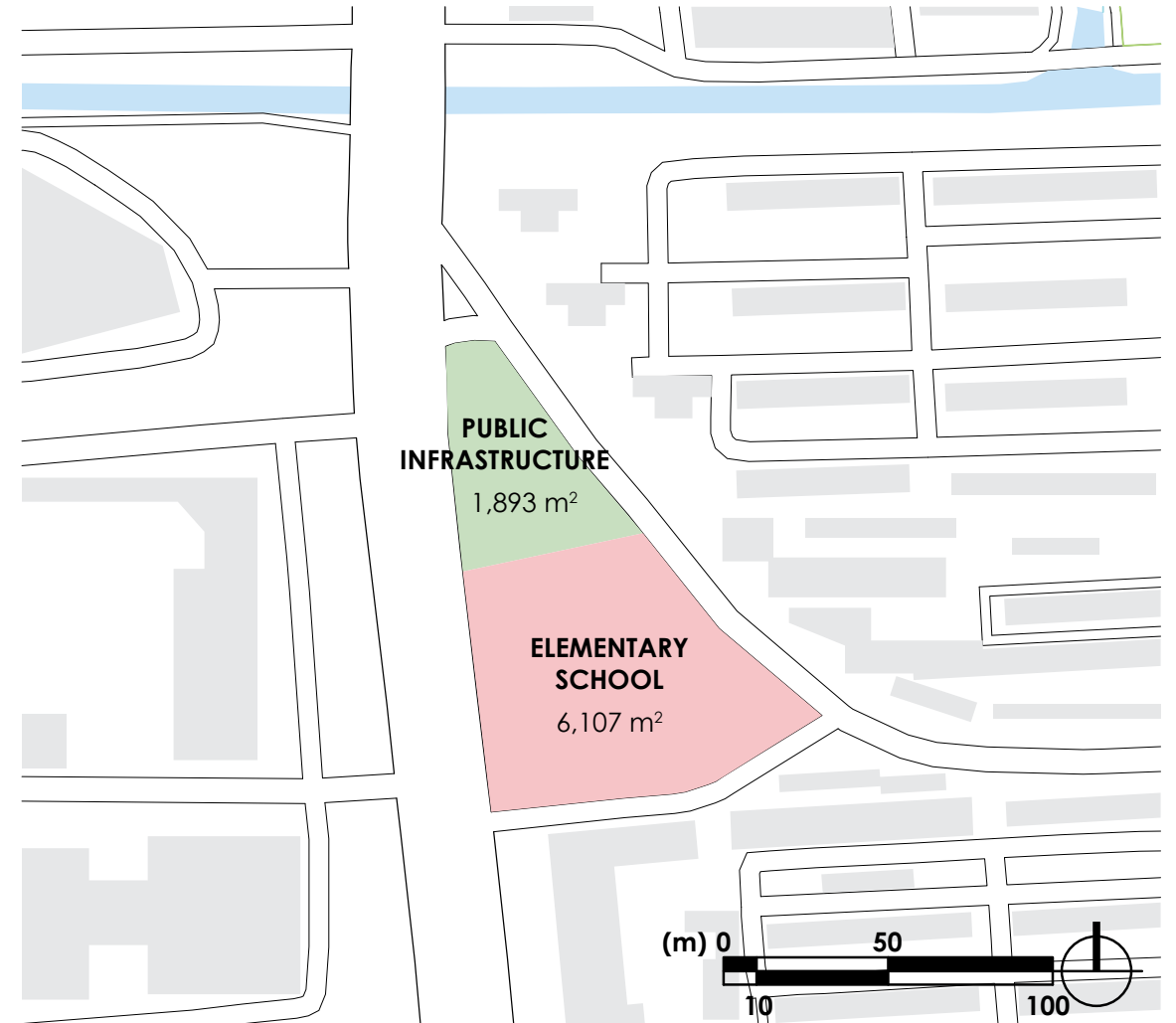
270 m²

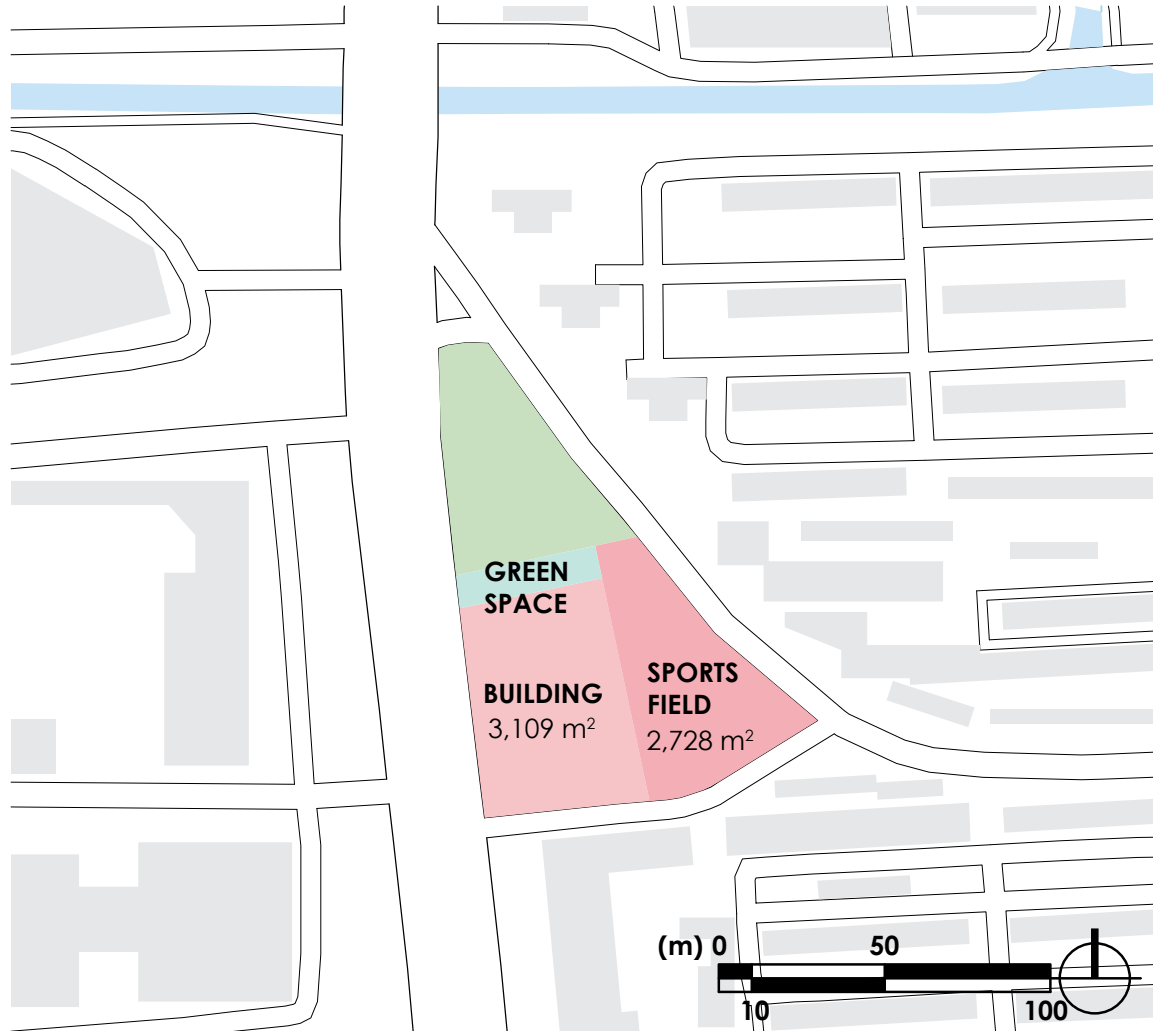
SPORTS
FIELD

2,728 m²

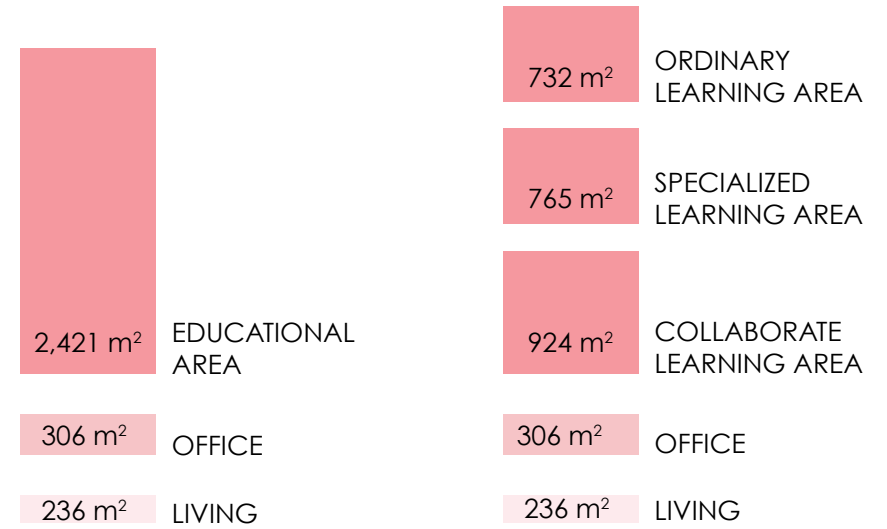
BUILDINGS

3,109 m²

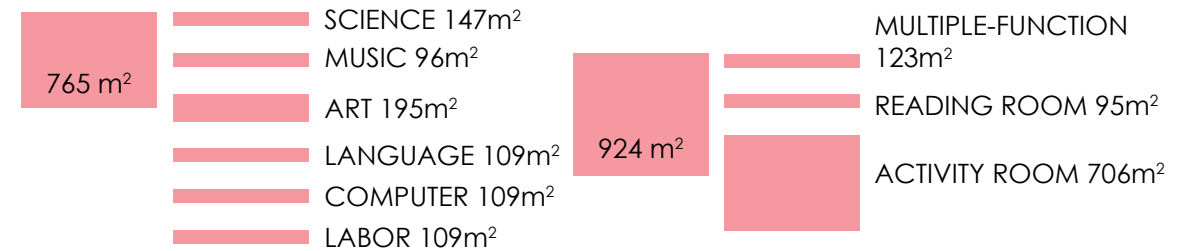




Program Distribution

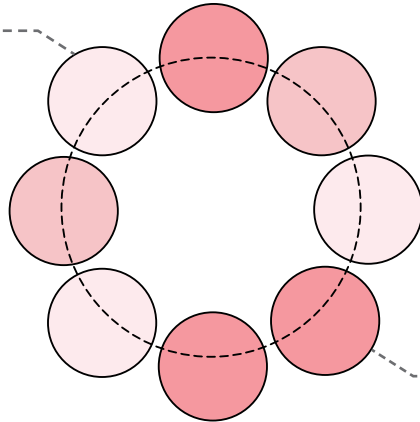


Specialized Learning Area Distribution

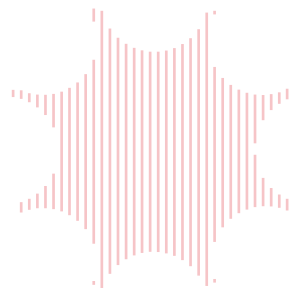


SPECULATION

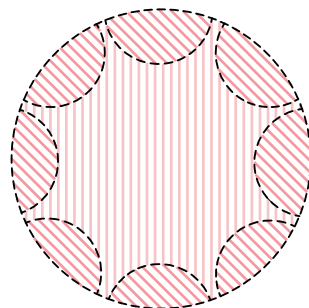
Specified spaces for different learning purposes



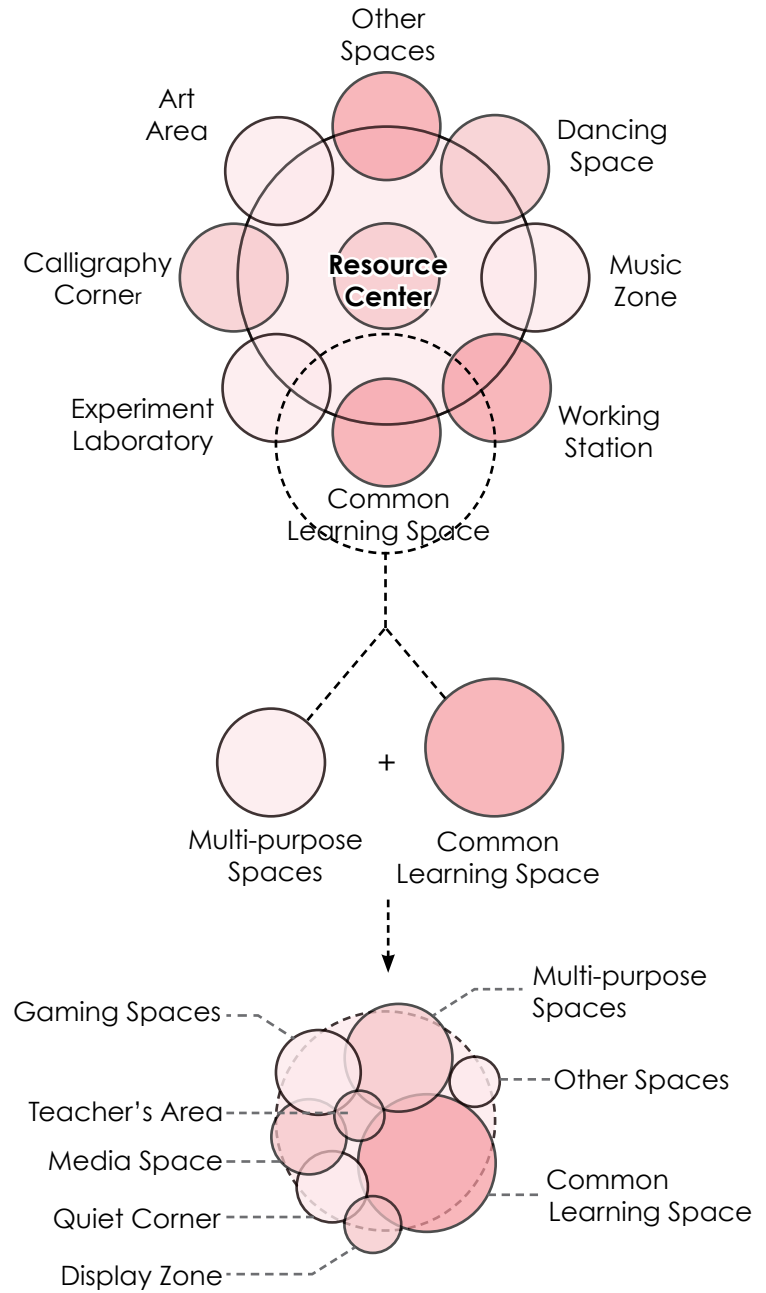
Specified spaces for different learning purposes



Undefined spaces that become flexible for children to explore and conduct self-learning experiences



An interactive learning space



PRECEDENTS



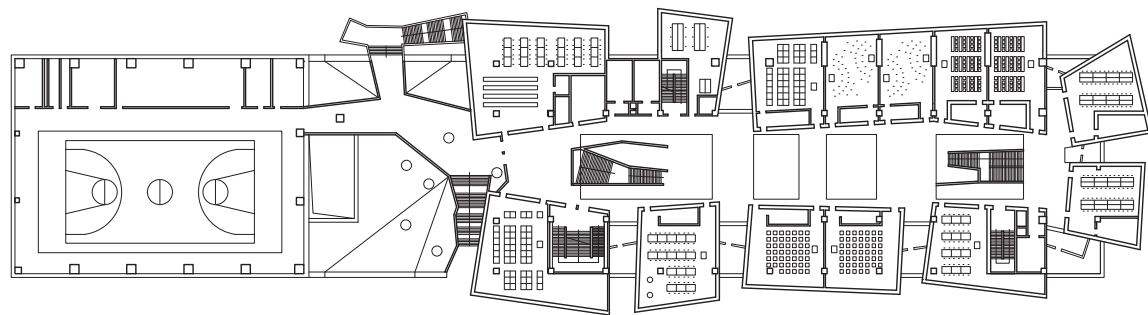
Fig. 34

**TIANJIN
ELEMENTARY SCHOOL**

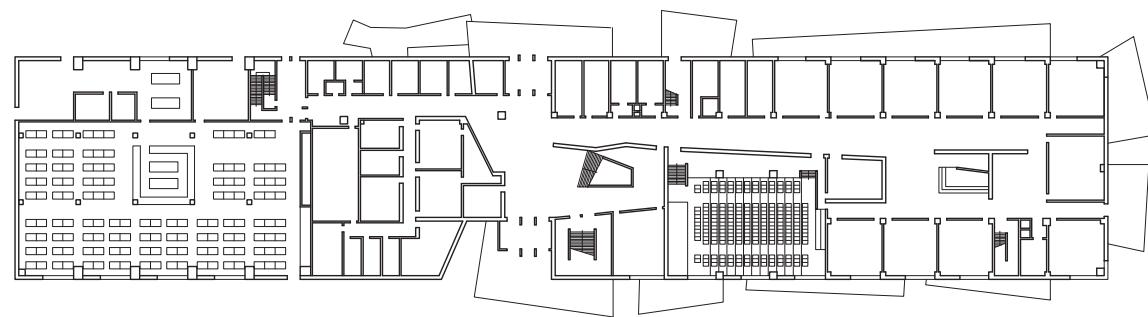
Vector Architects +CCDI

Xiqing, Tianjin, China
2010
18,000 sqm

LOCATION
YEAR
AREA



SECOND FLOOR



TYPICAL FLOOR

Plan drawn by author based on record drawings on archdaily.com

Fig. 35

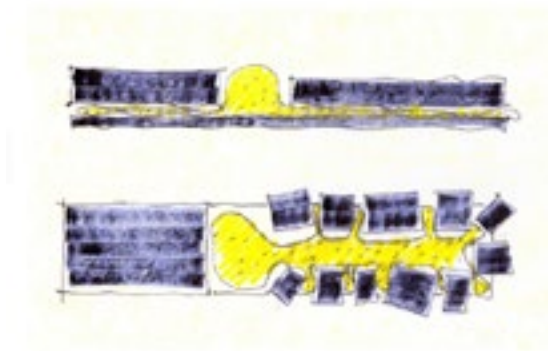


Fig. 36



PROS & CONS

The goal of the project is to create a unique place in the school building to encourage the interaction between students and teachers through their daily learning and teaching life. The primary interactive space and the specialized classrooms are located at the second floor. The second floor is also connected to a green roof deck at the south side of the building. The idea is similar to the “Earth Island Play Area” of the Milwaukee Montessori School.



The alignment of the classrooms with different angles can enhance interactions through increasing usage of the hallway.

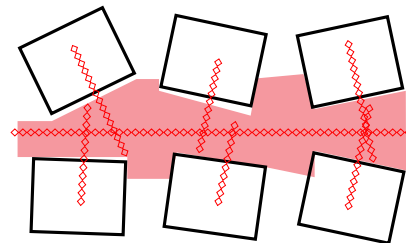
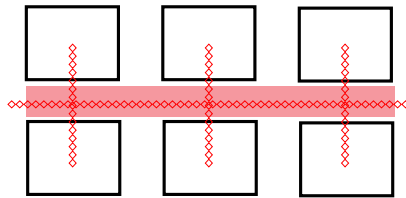


Fig. 37

The design of the third and fourth floor, where the ordinary classrooms are located, still follows the principle of the traditional school organization.

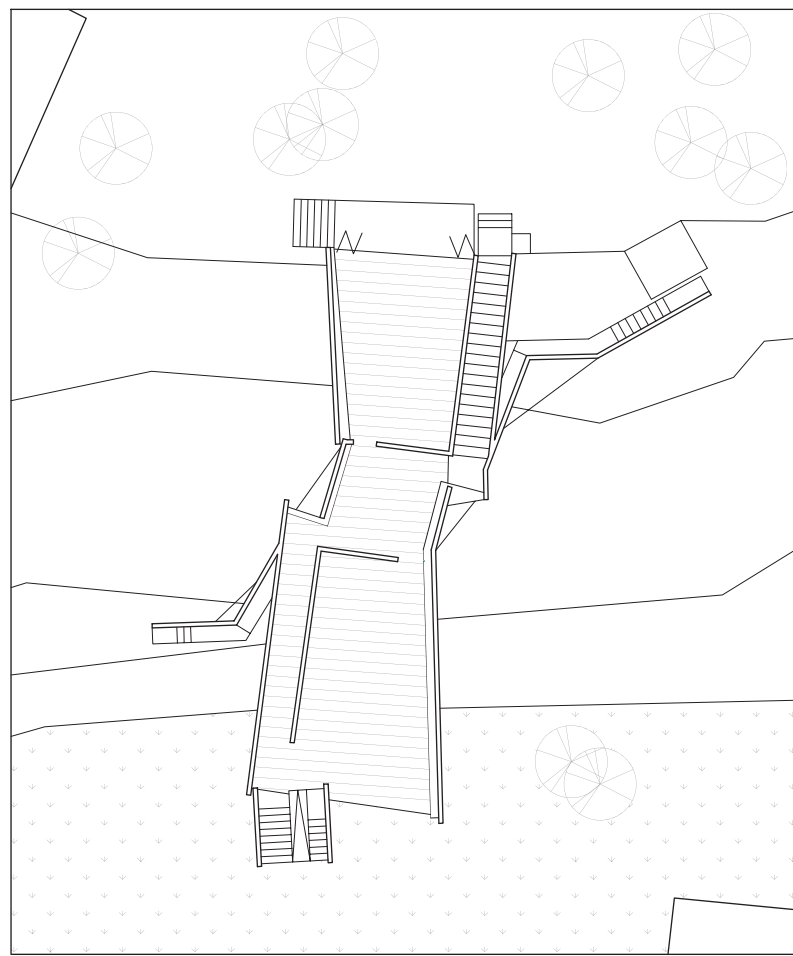
Moreover, the decoration inside of the school lacks of considerations of the children's scale. It is more like a space for the adults.



BRIDGE SCHOOL
XIAODONG LI

PROJECT: Primary school
LOCATION: Pinghe, Fujian, China
PROGRAM: Two classrooms and a library

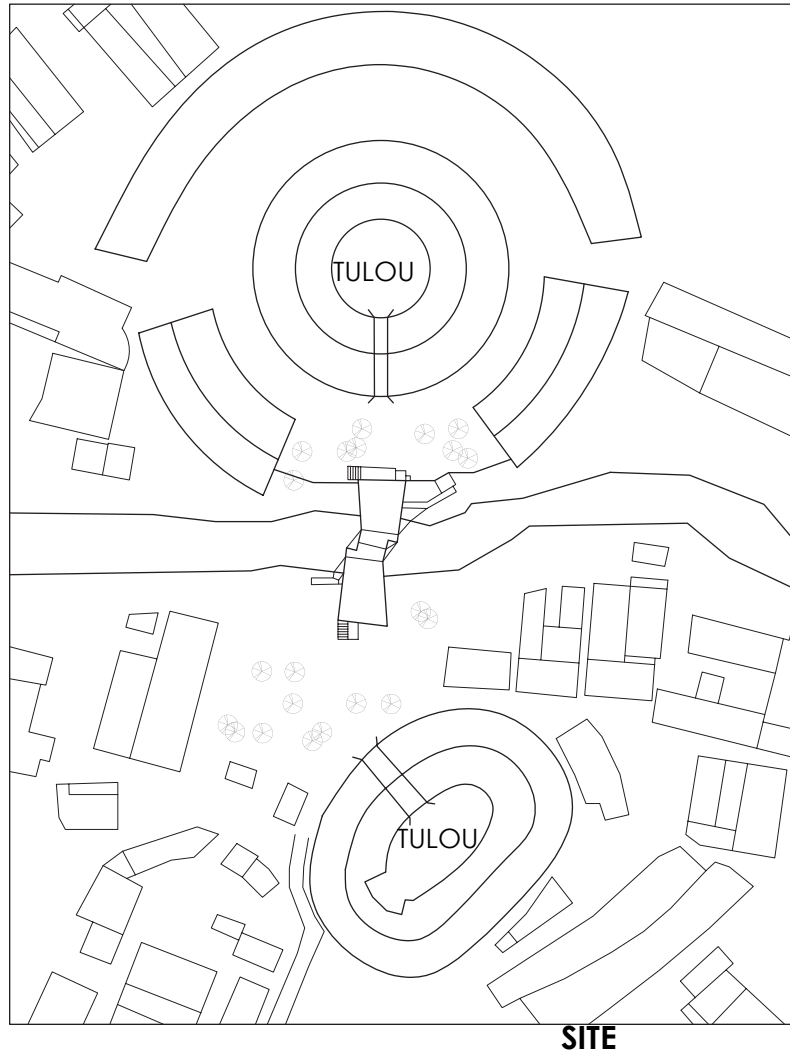
The Bridge, the School, the
Playground, the Stage



PLAN

Plan drawn by author based on original drawings.

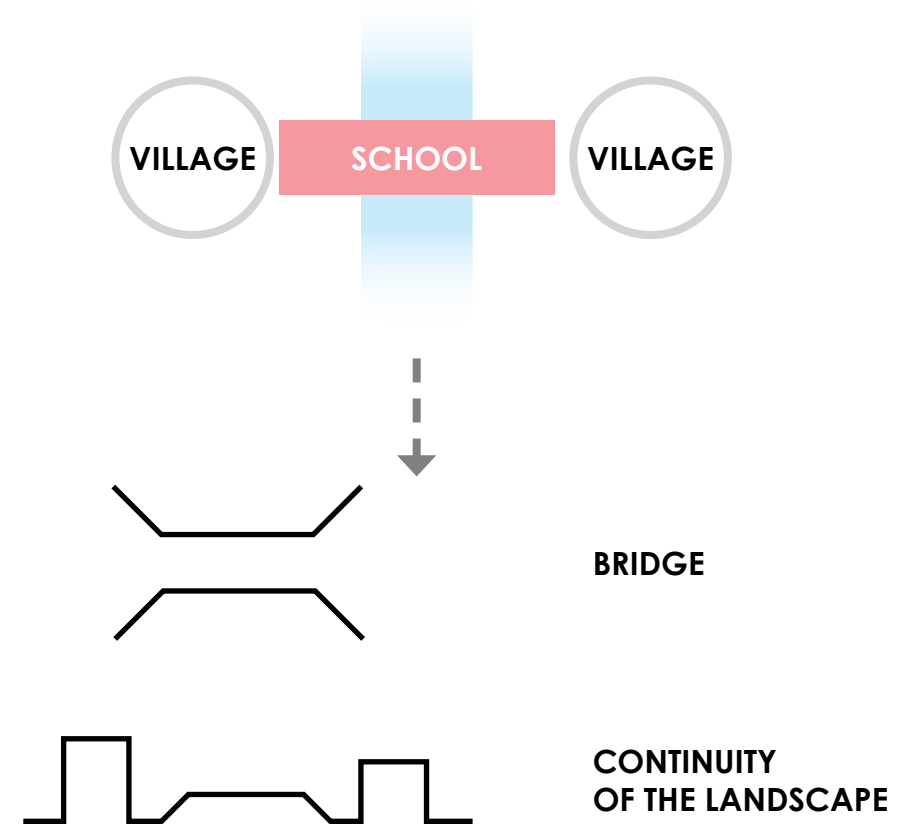




Plan drawn by author based on original drawings.

The project not only succeeds in its design as a school, but also its influences on the environment and the nearby community. The school is used as a small primary school with two classrooms and a library in between, and a bridge connecting the two villages. It creates interactions between learning, and the surrounding environment, as well as to the landscape.

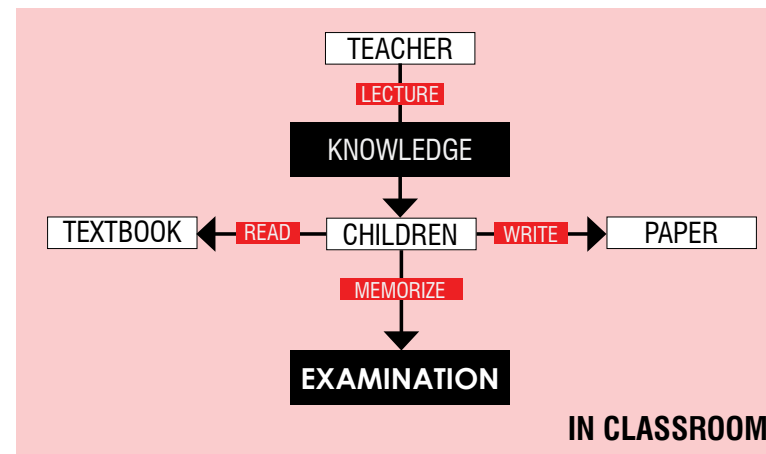
Also, the classrooms have an open plan. There are no desks or chairs. It allows students to have more freedom to choose the format of their learning.



C VS M



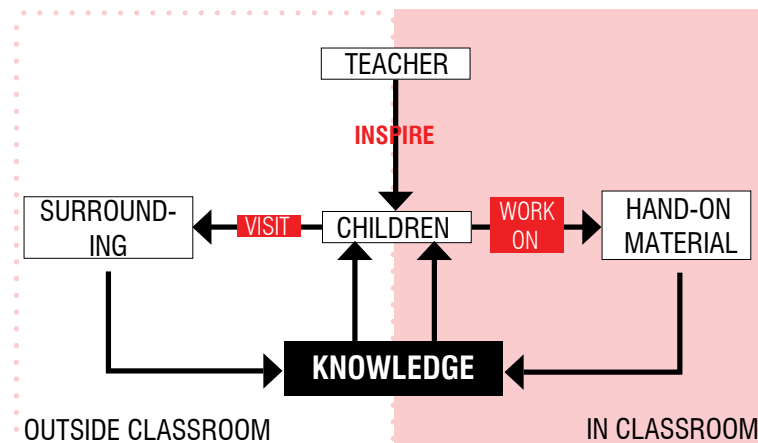
CHINESE EDUCATION



EDUCATION > LEARNING

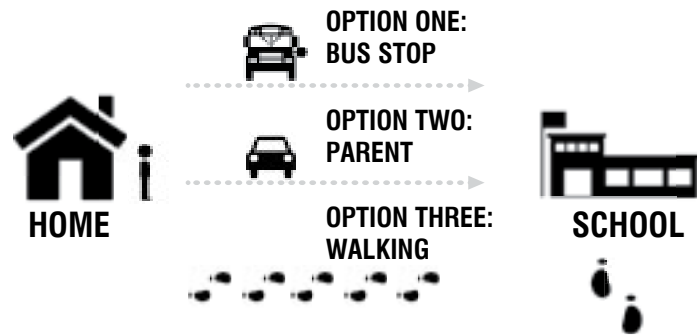


MONTESSORI EDUCATION



LEARNING > EDUCATION

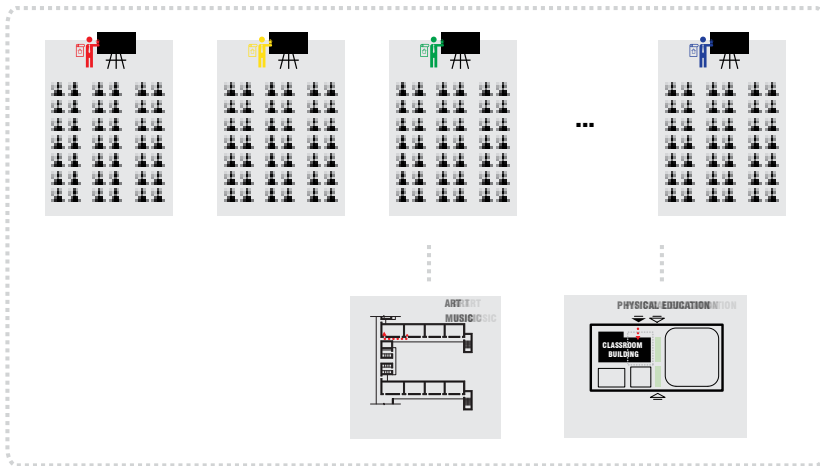
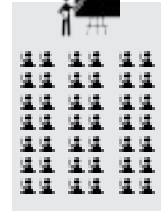
A DAY IN A CHINESE SCHOOL...



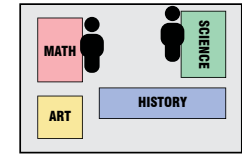
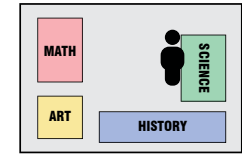
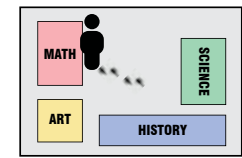
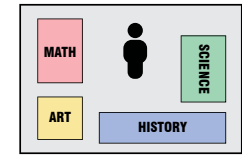
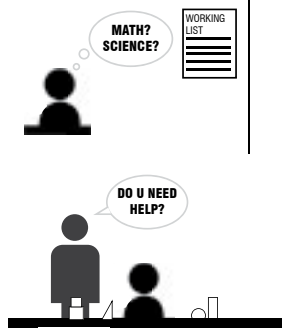
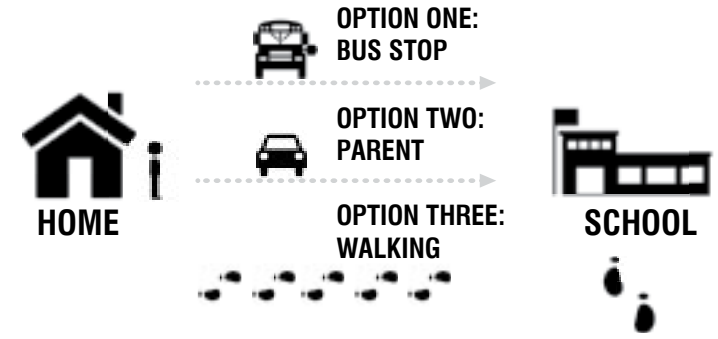
DAILY SCHEDULE

	Monday	Tuesday	Wednesday	Thursday	Friday
Morning (8:30-12:30)					
Afternoon (12:30-1:30)					

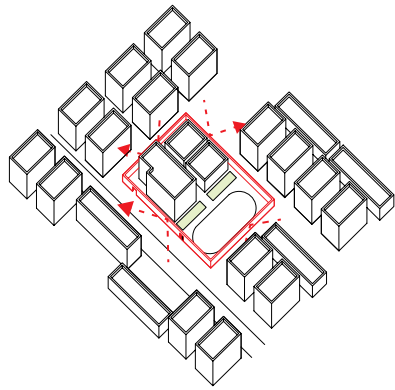
- CHINESE
- ENGLISH
- MATHS
- SCIENCE
- ART
- MUSIC
- PHYSICAL EDUCATION
- MORALS AND SOCIETY
- NATURE
- PRACTICAL WORK
- CLASS



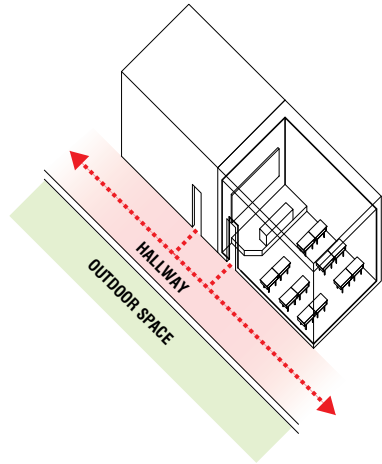
A DAY IN A MONTESSORI SCHOOL...



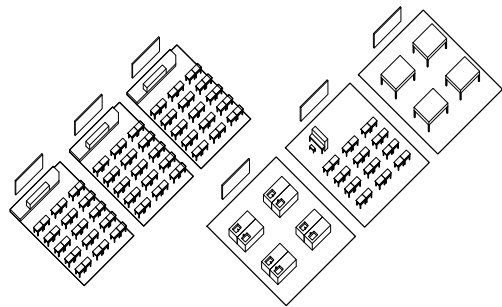
CHINESE SCHOOL ARCHITECTURE



SCHOOL IS DESIGNED AS "ISOLATED ISLAND"

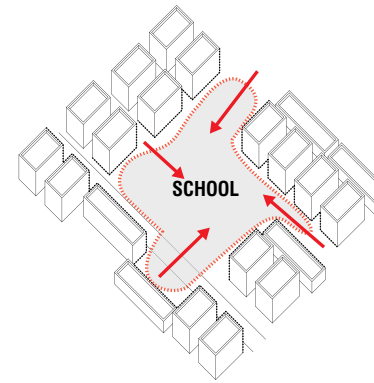


SPACE OUTSIDE THE CLASSROOM IS ONLY USED FOR CIRCULATION

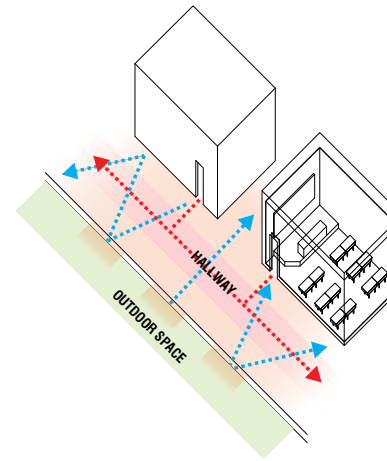


THE PROGRAM FOR THE MAJOR LEARNING SPACE IS ISOLATED DEFINED

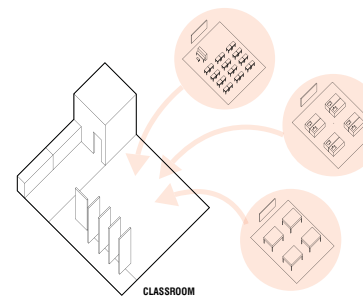
MY PROPOSAL



SCHOOL IS OPENED UP BECAME AN INFRASTRUCTURE



INFORMAL LEARNING SPACE IS ADDED TO THE CIRCULATION SPACE

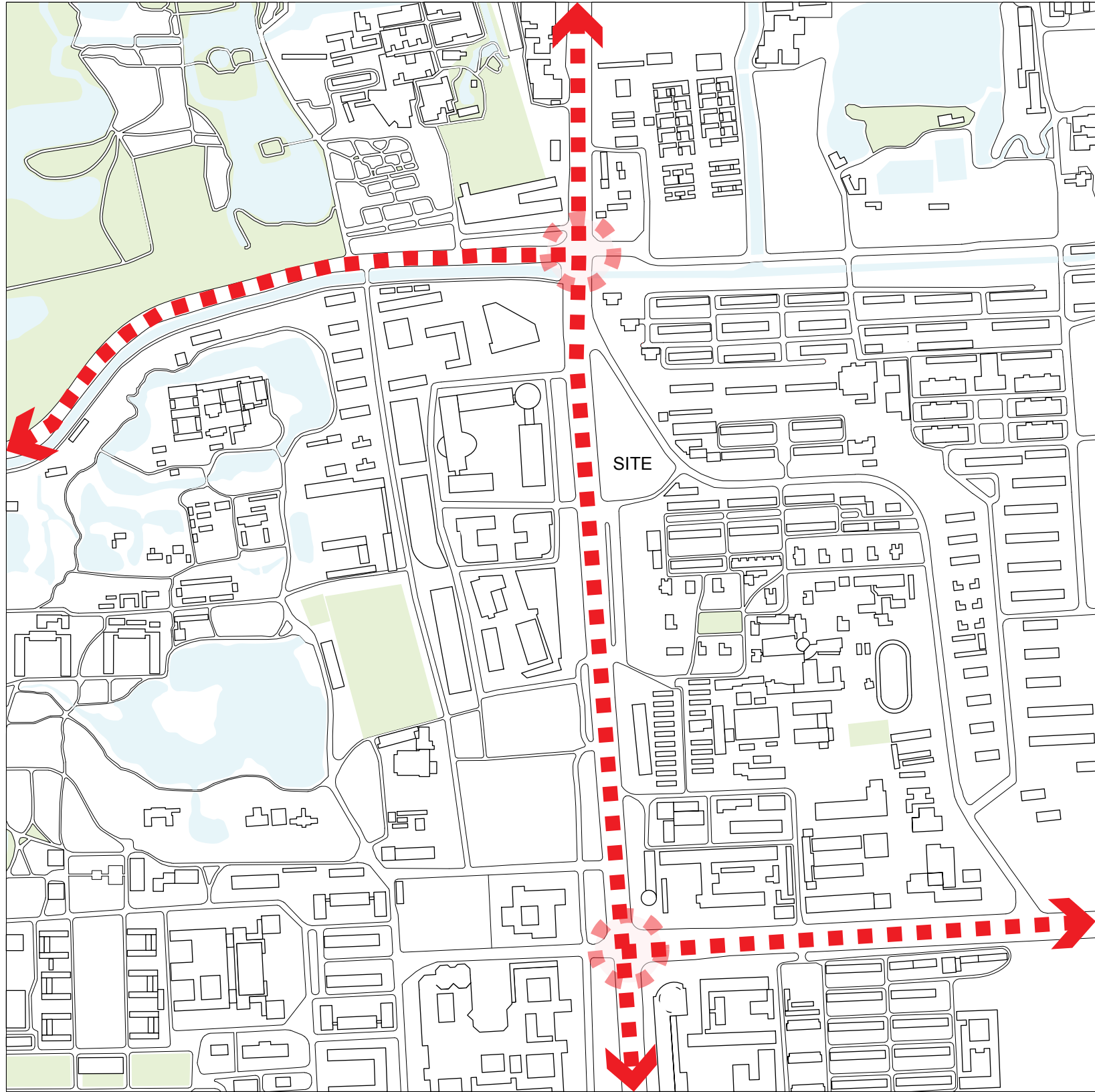


SECONDARY LEARNING SPACE IS ADDED TO THE MAJOR LEARNING SPACE TO ALLOW CHILDREN TO CREATE THEIR OWN LEARNING ENVIRONMENT ACCORDING TO DIFFERENT SITUATION

SITE ANALYSIS

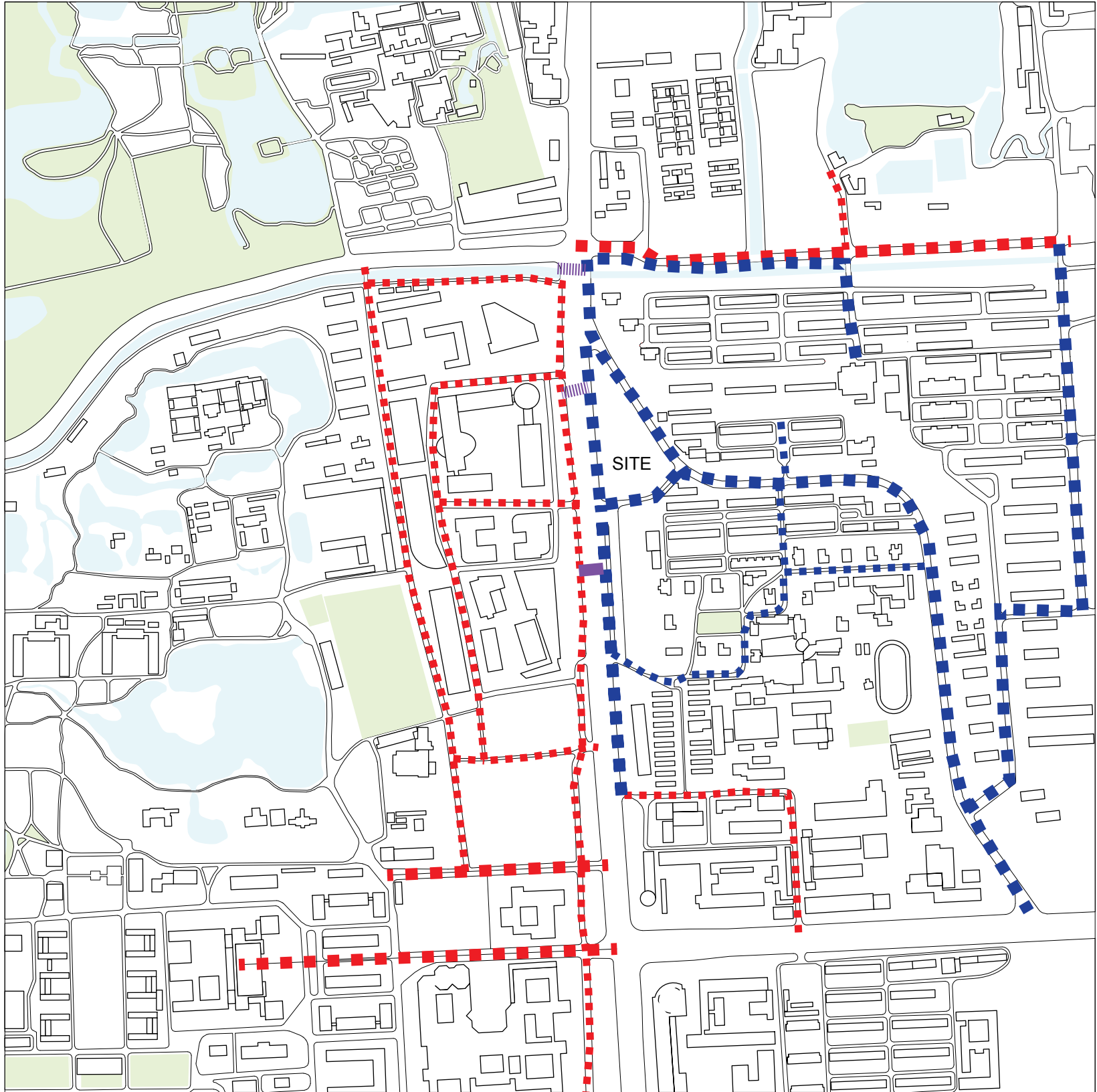
130

MAIN TRAFFIC



- ■ School Pathway
- ■ Residential Pathway
- ||||| Crosswalk
- ▬ Pedestrian Bridge

PATH WAY

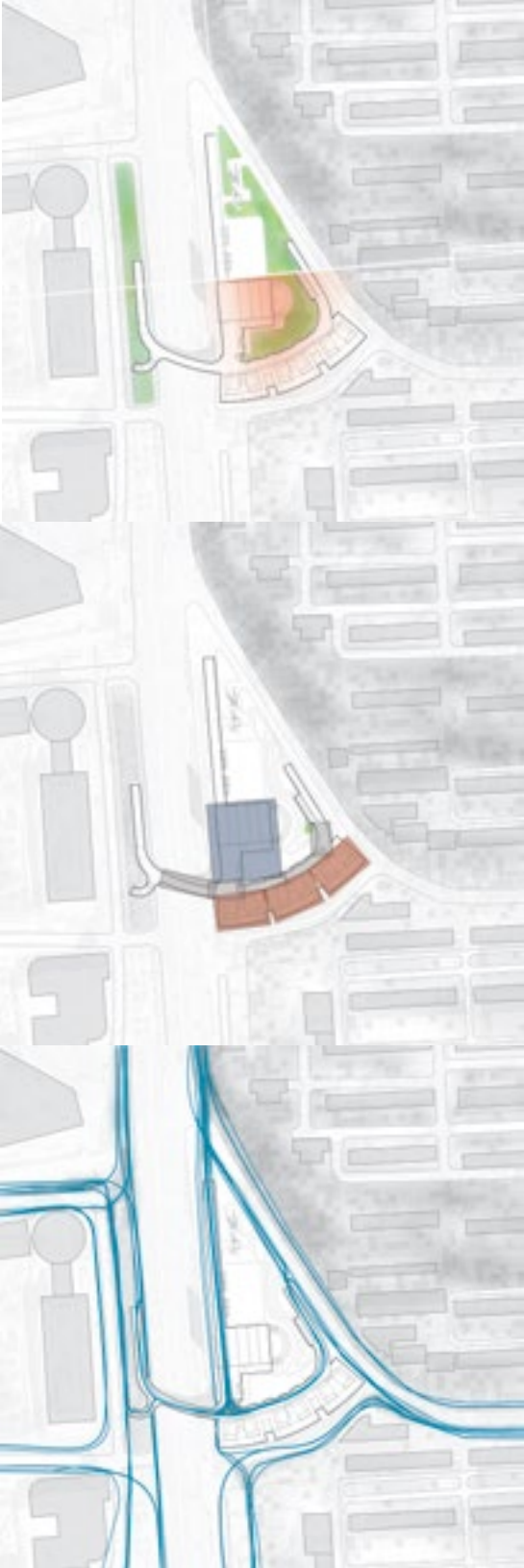


- Academic/
Administrative
building
- Residence
Building
- Service Building
- Industry Building
- Dining hall
- Restaurant

PROGRAM



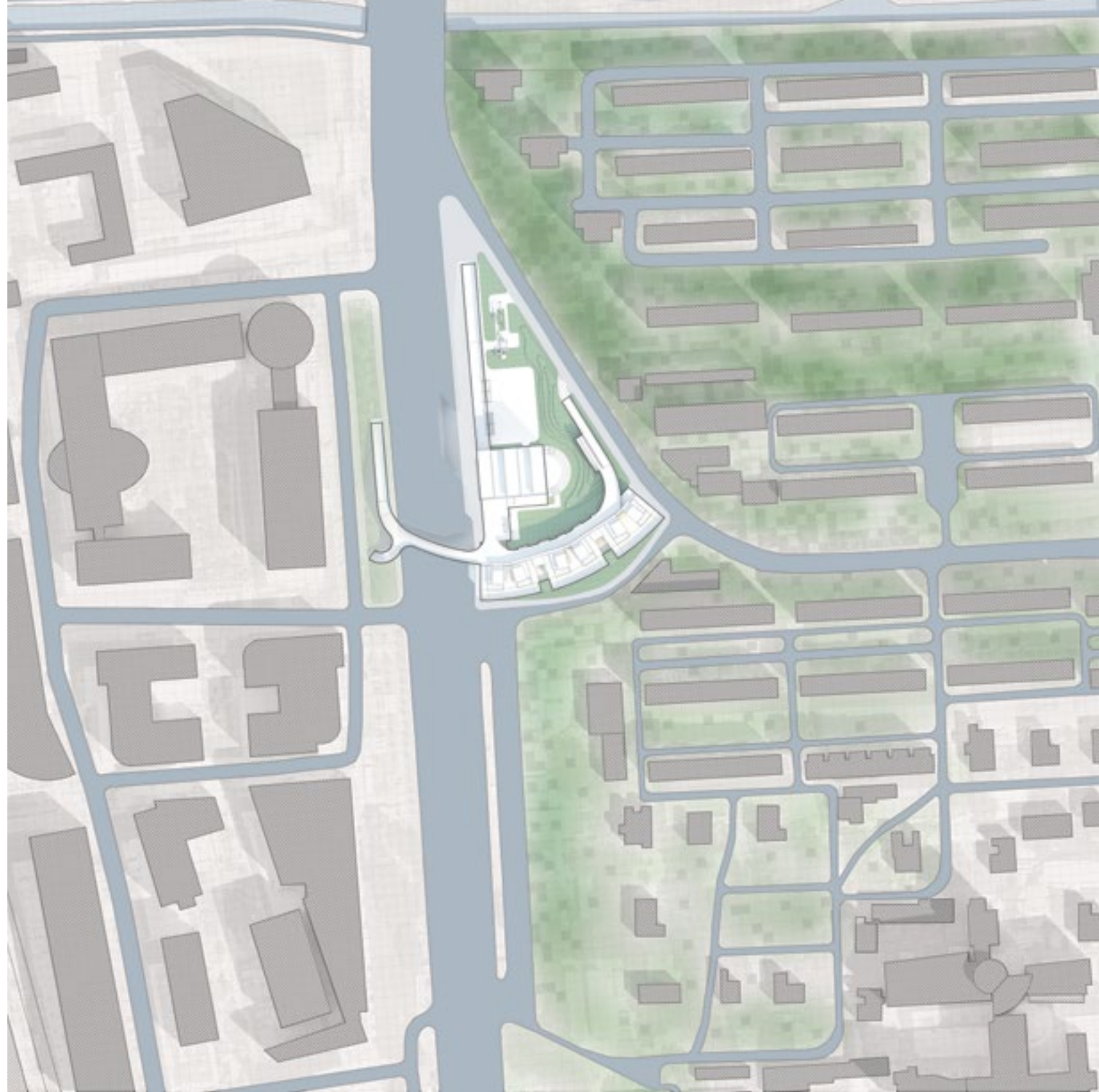
DESIGN



SCHOOL/PUBLIC PARK

PUBLIC/PRIVATE

PUBLIC CIRCULATION

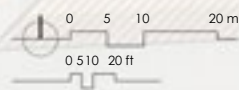


** The public play ground borrowed the design of Elysium Playground from Cox Rayner Architects

- 1. Classroom Cluster
- 2. Library
- 3. Entrance
- 4. Administration Office
- 5. Indoor Auditorium
- 6. Outdoor Theater
- 7. Small Shop
- 8. Public Playground



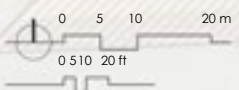
Ground Floor



- 1. Classroom Cluster
- 2. Indoor Gym
- 3. Pedestrian Bridge



Second Floor





SECTION ACROSS THE AUDITORIUM/GYM



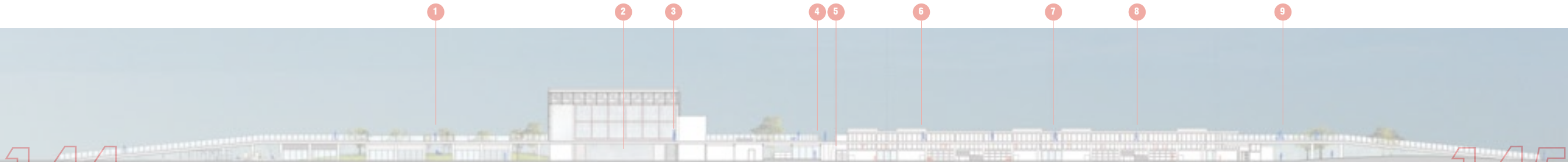
1 VIEW FROM THE BRIDGE TO THE OUTDOOR SPORT FIELD



2 VIEW TO THE INDOOR AUDITORIUM



3 VIEW FROM THE BRIDGE TO THE INDOOR GYM





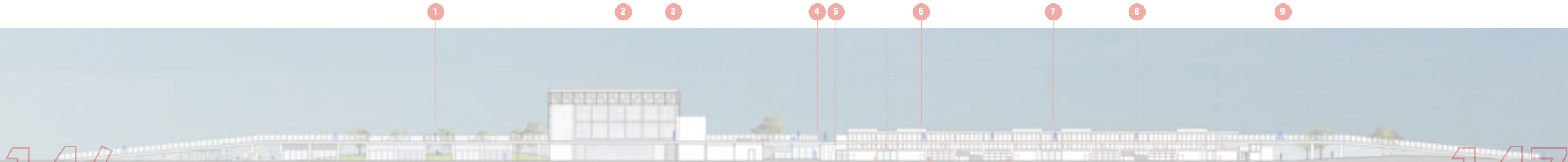
4 VIEW FROM THE BRIDGE TO THE SCHOOL COURT

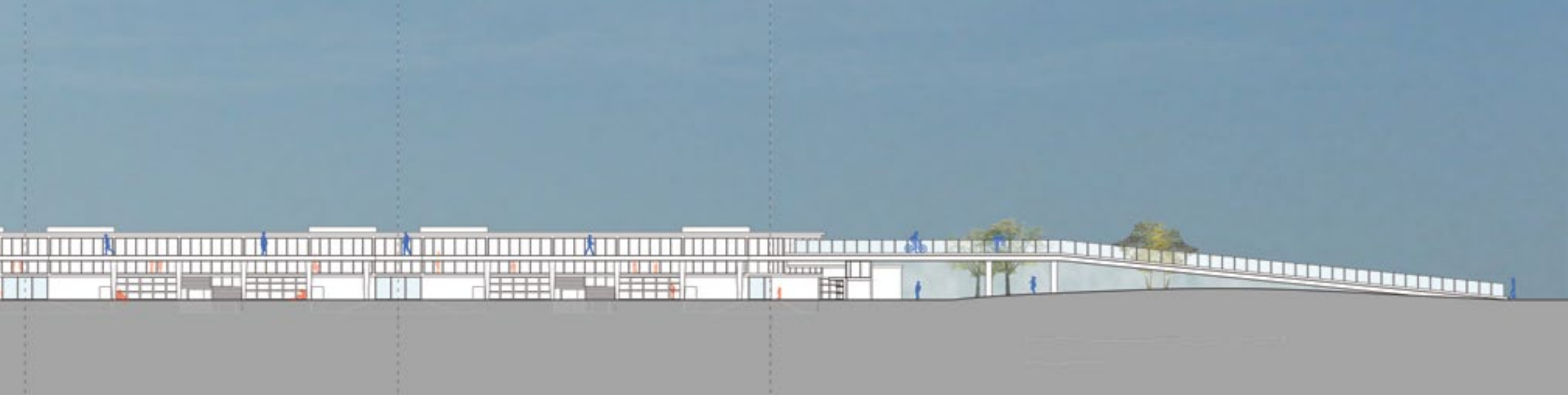


5 VIEW TO THE UNDER-BRIDGE LIBRARY



6 VIEW FROM BRIDGE TO THE CLASSROOM





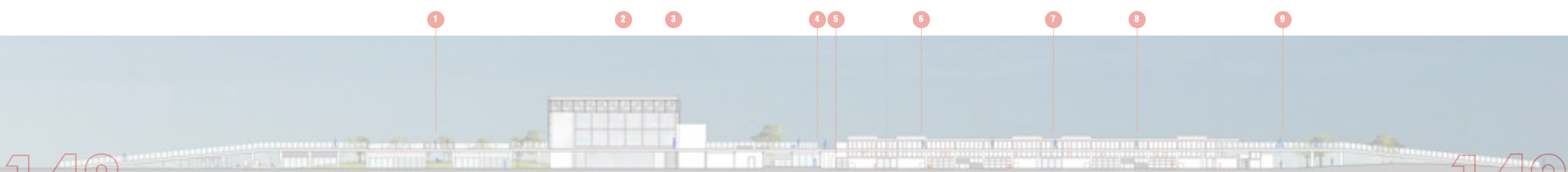
7 VIEW FROM BRIDEG TO THE OUTDOOR CLASSROOM



8 VIEW FROM BRIDEG TO THE READING AREA



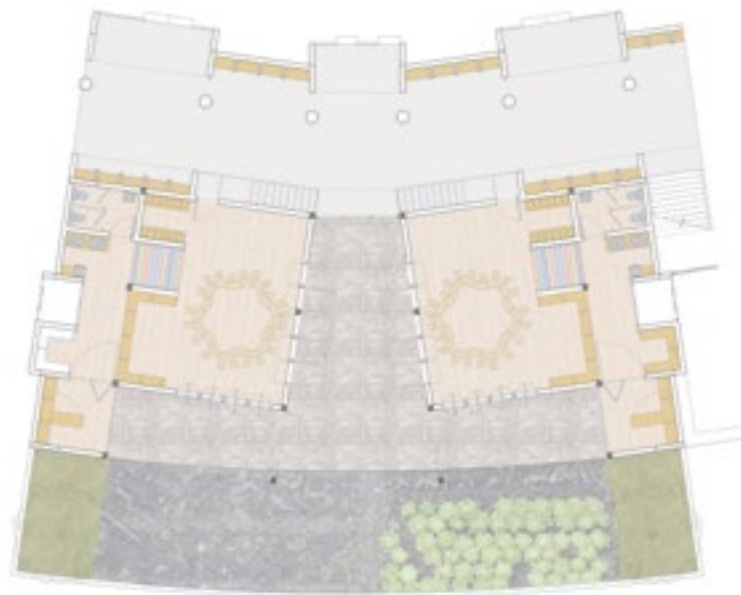
9 VIEW FROM BRIDEG TO THE OUTDOOR THEATER



CLASSROOM CLUSTER



SECOND FLOOR



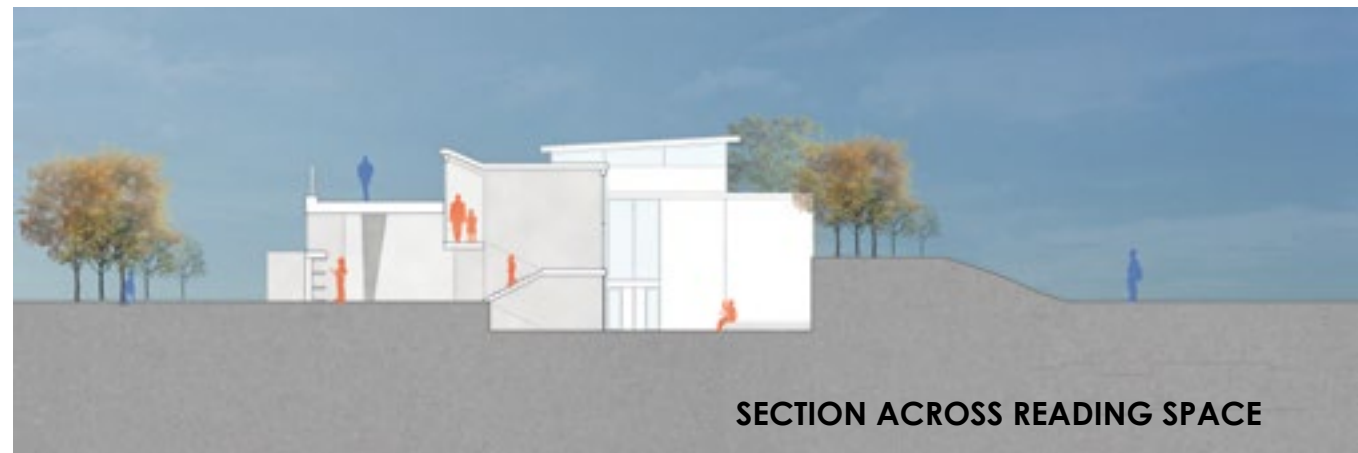
FIRST FLOOR



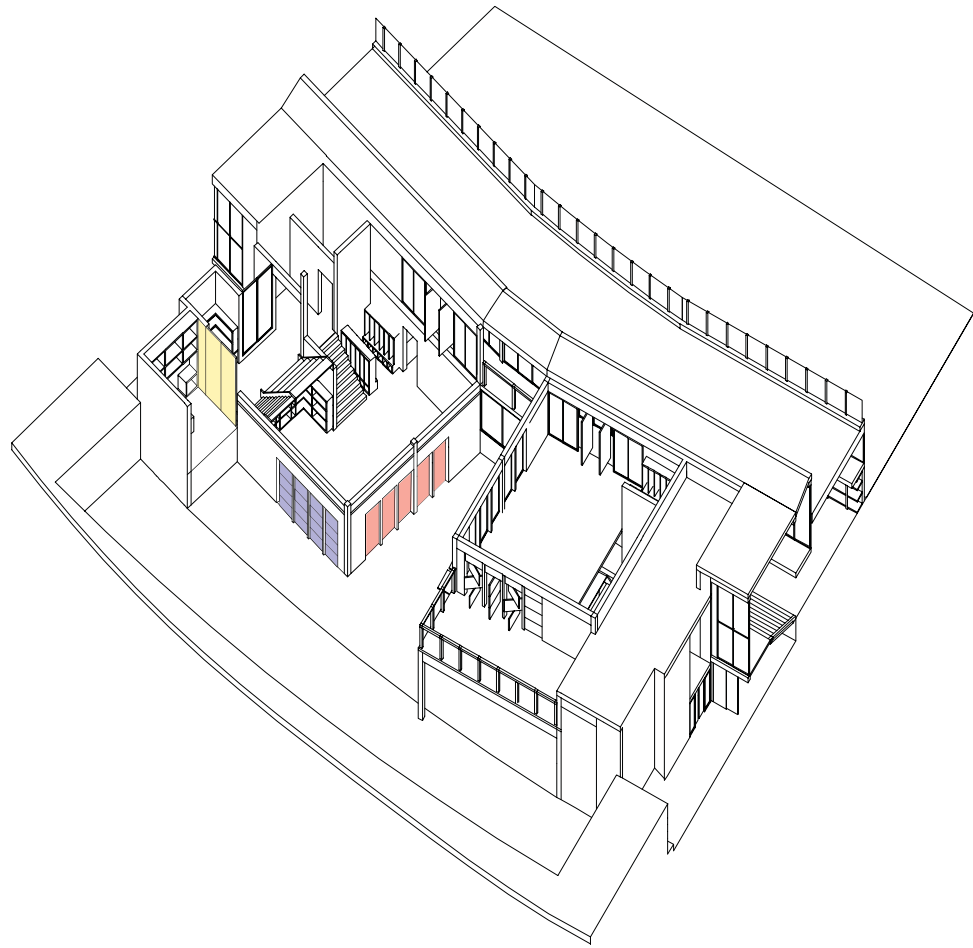
SECTION ACROSS OUTDOOR OVERFLOW



SECTION ACROSS CLASSROOM

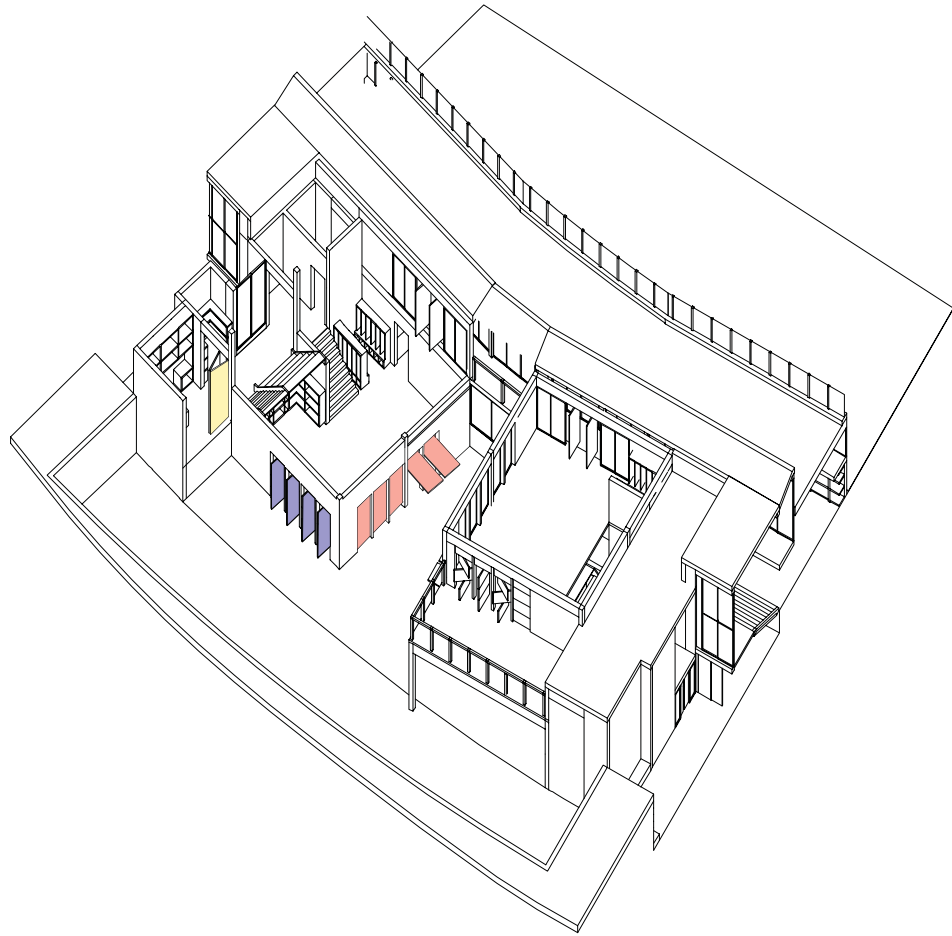


SECTION ACROSS READING SPACE



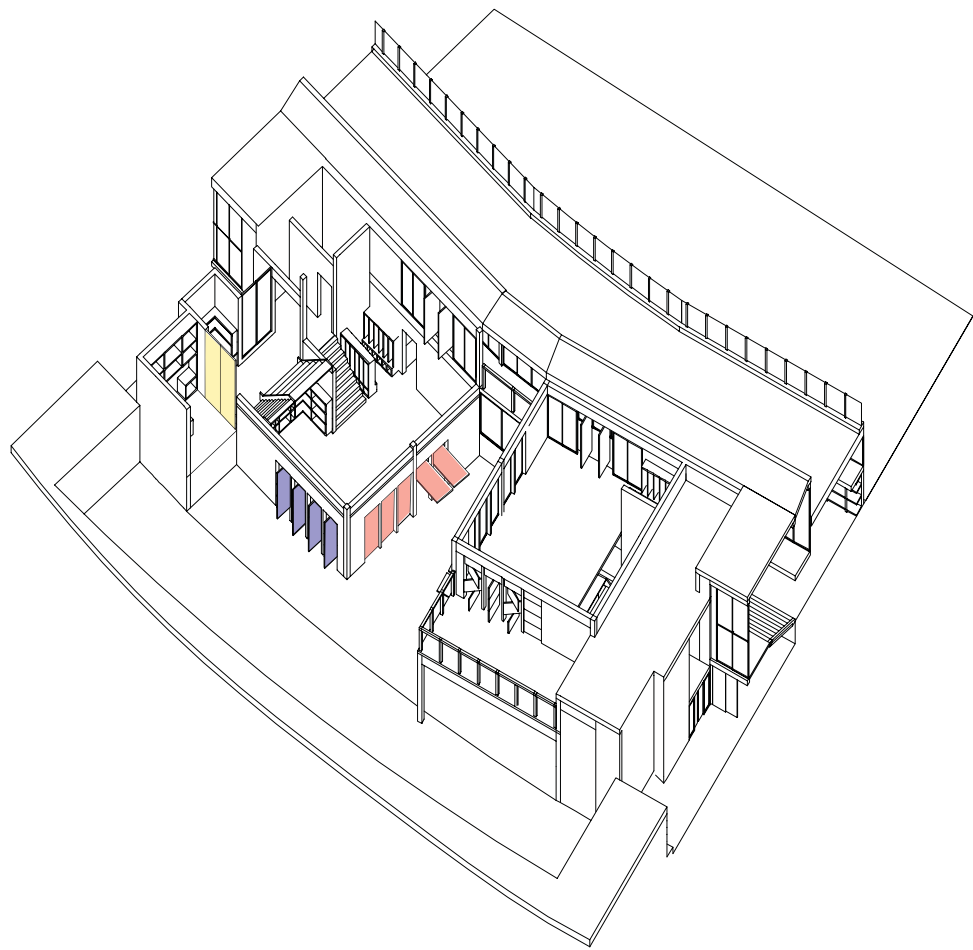
TYPE ONE: ALL PANEL CLOSED





TYPE TWO: ALL THE PANEL OPENED





TYPE THREE



APPENDIX

IX

GLOSSARY OF KEY WORDS

LEARNING

Learning is acquiring new, or modifying and reinforcing, existing knowledge, behaviors, skills, values, or preferences and may involve synthesizing different types of information.

KNOWLEDGE

Knowledge is not an independent subject that directly exists in our mind. Instead, it is a cognitive subject, which deals with the previous experience, a constructed perceptual and conceptual structure resulted from our sensory world of see, hear, and feel.

LEARNING EXPERIENCE

Learning experience refers to any interaction, course, program, or other experience in which learning takes place, whether it occurs in traditional academic settings (schools, classrooms) or nontraditional settings (outside-of-school locations, outdoor environments), or whether it includes traditional educational interactions (students learning from teachers and professors) or nontraditional interactions (students learning through games and interactive software applications). (Glossary of Education Reform)

LEARNING ENVIRONMENT

Learning environment refers to a physical location, a context, or a culture in which learning experience happens. The term is not limited to the traditional connotation of classroom, a room with rows of desks, chairs, and a chalkboard. It includes the learning resources and technology, means of teaching, modes of learning, and connections to social and global context.

INTERACTION

Interaction is a kind of action that occurs as two or more objects have an effect upon one another. The idea of a two-way effect is essential in the concept of interaction, as opposed to a one-way causal effect. (Wikipedia)

BEHAVIORISM

Behavioristic learning focuses on instrumental conditioning, in which an individual's behavior is stimulated and modified through systems of rewards and goals in education.

COGNITIVE THEORY

Cognitive theorists believe that learning happens as changes occur in individual's behavior and memory, but less on the influence of the environment.

HUMANISM

Humanism in learning emphasizes the learning process, and how that initiates the skills of self-knowledge for individuals.

CONSTRUCTIVISM

Constructivism, a perspective in education, is based on experimental learning through real life experience to construct and conditionalize knowledge. It is problem based, adaptive learning, that challenges faulty schema, integrates new knowledge with existing knowledge, and allows for creation of original work or innovative procedures. (Wikipedia)

MONTESSORI EDUCATION

Montessori education is an educational approach developed by Italian physician and educator Maria Montessori and characterized by an emphasis on independence, freedom within limits, and respect for a child's natural psychological, physical, and social development. (Wikipedia)

ANNOTATED BIBLIOGRAPHY

Learning Environment

Fosnot, Catherine Twomey, ed. *Constructivism: Theory, Perspectives, and Practice*. New York and London: Teacher College Press, n.d. Print.

The book thoroughly explains the Theory of Constructivism. It provides me an understanding of the learning process and how the knowledge forms in our mind.

Taylor, Anne. *Linking Architecture and Education: Sustainable Design for Learning Environment*. Albuquerque: University of New Mexico Press, 2009. Print.

The book stated the author's opinions on how architecture and education links. It provides me a fundamental understanding of the function of architecture in the education system.

"Learning Environment." Glossary of Education Reform. Great Schools Partnership, n.d. Web. 30 Oct. 2013. <<http://ed-glossary.org/>>.

Definition of the word.

"Learning experience." Glossary of Education Reform. Great Schools Partnership, n.d. Web. 30 Oct. 2013. <<http://ed-glossary.org/>>.

Definition of the word.

Education in China

Ding, Tiantian. "小学建筑空间形态初探" ["The Exploration of Architecture Space of Elementary School"]. 文档投稿. N.p., n.d. Web. 3 Dec. 2013. <<http://max.book118.com/html/2013/1006/4750400.shtml>>.

The paper explains the evolution of the architecture space of elementary school in China. It provides information for the background of my thesis.

Hu, Shi Ming, and Eli Seifman, eds. *Education and Socialist Modernization: a Documentray History of Education in the People's Republic of China, 1977 - 1986*. New York: AMS Press, 1987. Print.

Liu, Yanjin, and Jianhua Liu. "学业负担从何而来 ——基于教育史的回顾" ["Where Does the Burden Of Students Come from -- based on analyzing the history of education"]. *Journal of Hunan First Normal College* 4.3 (2004): 68-69. Print.

Both of the books talk about the history of Chinese education. It provides information for the background of my thesis.

Taylor, Robert. *China's Intellectual Dilemma*. Vancouver and London: University of British Columbia Press, 1981. Print.

The book talks about the Chinese education system. Explained the development of the system from the traditional one to the present one. It provides the information on the disadvantages of Chinese Education and the changes to solve the problem.

Wang, Wei. *Research on Association Space: Design of Primary School*. 2001. Print.

The paper explains the functions of association space in the primary school of China, and the disadvantages of the existing space in school. It provides me the ideas of the way to solve the problem of Chinese school architecture.

Wen, Yaling, Yifu Li, and Xuting Li. “中小学校建筑室内教学空间动态适应性研究” [“Study on Dynamic Adaptability of Interior Teaching Space Design in Junior School”]. *建筑研究 Architecture Research*: 116-23. Print.

“教育模式下的中国中小学建筑设计研究” [“Research on the Architectural Design of Primary and Middle School under the Educational Model”]. 维普仓储式在线出版. 维普资讯, n.d. Web. 3 Dec. 2013. <<http://ipub.cqvip.com/doc/98b728789a3e40d998b1c118cf4d0e75.html>>.

“素质教育模式下的中小校园设计初探” [“Research on Primary and Middle School Campus Design under the Education Model”]. *Urban Construction Theory Research*. Print.

All three papers explain the space organization in the primary schools. All papers help me to analyse the problems of the existing schools in China.

Xi'an Architectural Technology University, Zongrao Zhang, and Zhiming Li, eds. *Architectural Design of Primary and Secondary Schools*. 2nd ed. Beijing: China Architecture & Building Press, 2009. Print. Architectural Design Manual.

The development and Planning Department of the Ministry of Education. *Architectural Records of Primary and Secondary School*. Ed. Xi'an Architecture and Technology University, Zongrao Zhang, and Bixin Zhang. Beijing: China Architecture & Building Press, 2000. Print.

The two books provide me the examples of existing schools in China.

Montessori Education:

Anonymous. “Milwaukee Montessori School: Studio Works.” *Architecture* 87.4 (1998): 88-89. Print.

Giovannini, Joseph. “The Montessori Method.” *Architecture* 89.6 (2000): 116-121. Print.

Two papers provide the thorough information for the case study of Montessori school.

Lillard, Angeline Stoll. *Montessori: The Science Behind The Genius*. New York: Oxford University Press, 2008. Print.

The book compares between the Montessori Education and the traditional education. It provides information of the differences between the Montessori Education and Chinese Education.

FIGURE CREDITS

Fig. 1: Overall View of Temple of Confucius.
<<http://img.bimg.126.net> >.

Fig.2: Photo of Huadong Zhengfa University
<<http://pmyx.blog.163.com>>.

Fig.3: Photo of Huayang Elementary School.
< <http://livedoor.blogimg.jp>>.

Fig.4: Aerial View of Qinyuan Elementary School.
< <http://www.wxqyxx.net/> >

Fig.5: View of Logia in Qinyuan Elementary School.
< <http://www.wxqyxx.net/> >

Fig. 6: View of the courtyard in Qinyuan Elementary School.
< <http://www.wxqyxx.net/> >

Fig.7: View of the main gate of Qinyuan Elementary School.
Street View
<<http://map.baidu.com>>

Fig. 8: View of the art classroom in Qinyuan Elementary School.
< <http://www.wxqyxx.net/> >

Fig. 9: View of the library in Qinyuan Elementary School.
< <http://www.wxqyxx.net/> >

Fig. 10: Photo of Maria Montessori.
<<http://www5.milwaukee.k12.wi.us/>>

Fig. 11: The teaching Confucius.
Portrait by Wu Daozi, 685-758, Tang Dynasty.

Fig. 12: The photo of front gate of Milwaukee Montessori School.
(Giovannini, 118)

Fig. 13: The photo of art room of Milwaukee Montessori School.
(Giovannini, 119)

Fig. 14: The photo of library of Milwaukee Montessori School.
(Giovannini, 119)

Fig. 15: The photo of Wood Triangle Theater of Milwaukee Montessori School.
(Giovannini, 121)

Fig. 16: The photo of Wood Triangle Theater of Milwaukee Montessori School.
(Giovannini, 121)

Fig. 17: The photo of the pivoting door of the art room in Milwaukee Montessori School.
(Giovannini, 120)

Fig. 18: The sketch of the observatory of Milwaukee Montessori School.
(Anonymous, 89)

Fig. 19: The model of the second floor of Milwaukee Montessori School.
(Anonymous, 89)

Fig. 20: The photo of the classroom in Milwaukee Montessori School.
(Giovannini, 120)

Fig. 21: The sketch of the Earth Island Play Area of Milwaukee Montessori School.
(Anonymous, 88)

Fig. 22: The sketch of the classroom of Milwaukee Montessori School.
(Giovannini, 116)

Fig. 23: Landsat 7 Satellite image of Beijing Municipality with the surrounding mountains in dark brown.
< <http://en.wikipedia.org>>

Fig.24-32: Street view of the site.
<<http://map.baidu.com>>

Fig.33: Street view of Zhongguancun North Road.
<<http://map.baidu.com>>

Fig.34: Photo of the exterior of Tianjin Primary School.
<<http://www.archdaily.com>>

Fig.35 - 37: Photo of the interior of Tianjin Primary School.
<<http://www.archdaily.com>>

Fig.38: Photo of the exterior of Bridge School.
<<http://www.lixiaodong.net/>>

Fig.39-40: Photo of the interior of Bridge School.
<<http://www.lixiaodong.net>>

** All Diagrams without citation are created by the author.

SCHEDULE FOR NEXT SEMESTER

Since my contention is about creating more learning interactions in the transition spaces within a school, I will mainly test my contention by making diagrammatic models.

1. Making series of diagrammatic site models to analyze how to connect the school with the surroundings to test different ways for interactions to happen between the school and its neighborhood.

2. Making models to test ways of connecting different program spaces.

3. Working back to the scale of the campus, by drawings. Make conclusions from the larger scale and the smaller scale.

(First Review)

4. Working on the site plan, and floor plans of the school.

5. Test the interactions created in plans to the sections, by making section models.

6. Conclude how interactions can be created from both the plan and sectional drawings/models.

7. Working on final presentations.

(Final Review)

