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## Re-active Architecture: Exploring the Japanese educational Experience

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# Re-Active Architecture

## Exploring the Japanese Educational Experience



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December 2009





**Re-Active Architecture**  
Exploring the Japanese Educational Experience

John J Barker III

Signature .....

Date .....

Advisor: Julian Bonder

Signature .....

Date .....

Dean of SAAHP: Stephen White AIA

Signature .....

Date .....



## Abstract



This design seeks to transform the Japanese educational experience through the use of architecture. The aim is to provide an alternative school that breaks from the uniformity of the current system and provides an educational environment that places an emphasis on interaction, community, and learning. The school would serve as a junior high school combined with a small community library. The school would accommodate 250-300 children. Ultimately, this school could serve as a model for future educational buildings within the Japanese educational system.







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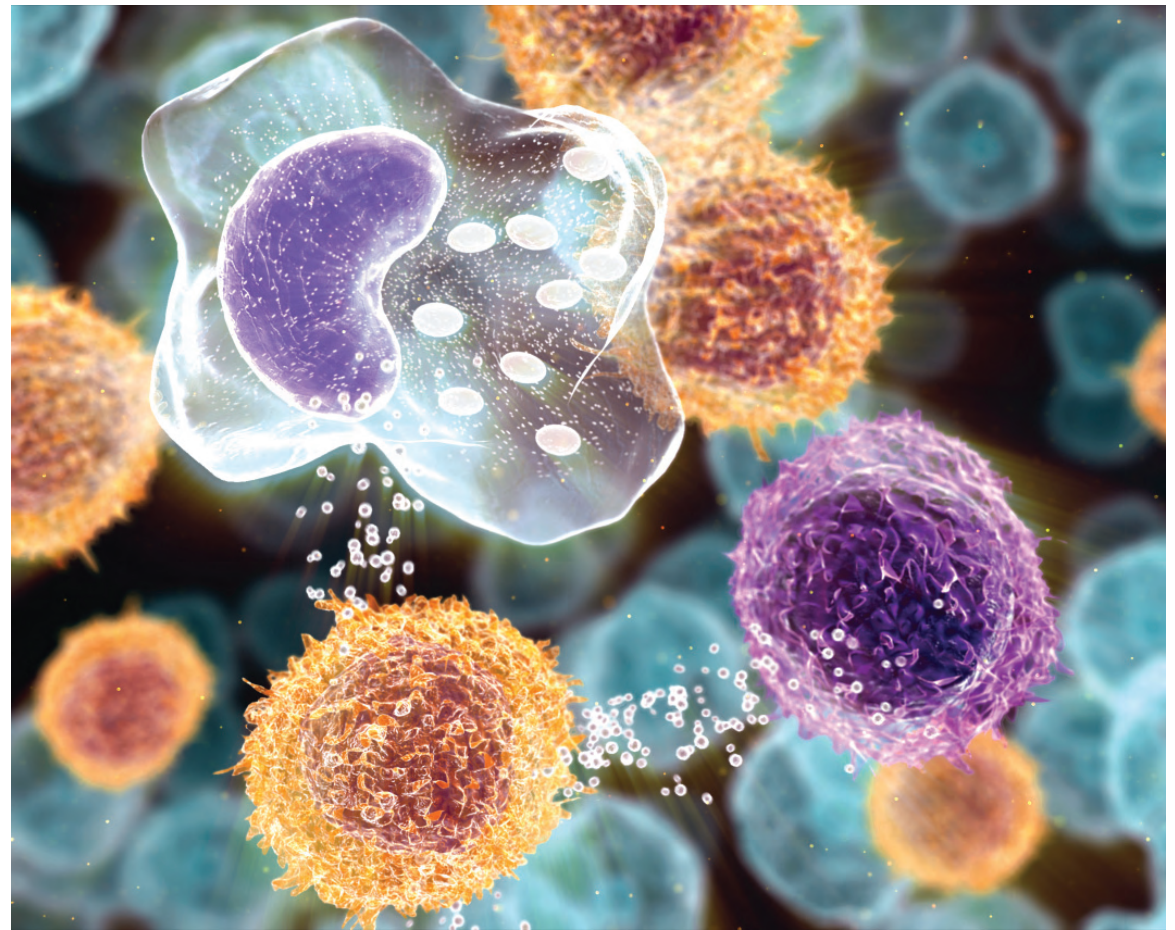
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## Preface

*Re-activism – Faced with a scenario of contradictions, the reactive demands an understanding and a critical and selective compression of information, which is potentially evolutionary...Rather than regenerating (completing) or transforming (redefining) reality, re-activism is an issue of “resonating” with, in order to reform, restructure, reactivate – reality.*

-Manuel Gausa



Source: [http://sarahschemblog.blogspot.com/2007\\_07\\_01\\_archive.html](http://sarahschemblog.blogspot.com/2007_07_01_archive.html)

The Re-Active works with many of the same functions as a virus cell. In order to survive, a virus cell must learn its context or its host. It then finds ways to adapt and resist the host's natural anti-bodies. This adaptation seeks to resonate throughout the body to promote the life of the virus cell. In a similar sense, the re-active seeks to understand its environment in order to reform, restructure, and/or reactivate the environment.

# Introduction

Throughout the course of history, Japan has experienced several radical cultural and social changes. Dating back to the Meiji Era in the mid-19th century, Japan went from a feudal, shogunate society to a centralized Westernized government. Under the new emperor, Meiji, Japan adopted Western political, judicial and military institutions. During the “Meiji Restoration,” Japan transformed into an industrialized world power. Japan’s economic and political influence grew over time, culminating in its complete collapse after World War II. In the post-war reconstruction, the Japanese sacrificed individual liberties for safety and predictability, as these became society’s new goals. Japan soon became a nation with lifetime employment and a corporate system with stable cross-holdings of shares. Individuals within the largely middle-class population had an assigned place within the hierarchical structure of society and their workplaces. A strong attitude developed that valued one’s work ethic, which prominently figured into the role of Japanese citizen in society. However, by the 1970s, Japan had achieved its national goal: to restore the country from the ruins of World War II, develop the economy, and build a modern technological state. When that goal was attained, Japan lost much of the motivating force that had knit the nation so tightly together. Currently, affluent Japanese do not know what they want to pursue and what defines them. Japanese author and filmmaker, Ryu Murakami further explains the current situation in Japan:

*...I do not think the Japanese people have an identity in the first place. That is the problem. Now, an identity is something that you establish when you realize that there is “another,” something that is different from you, and from that point, you start defining yourself. In America, there are all kinds of people, all kinds of religions. Here in Japan, though, basically, all the people are the same. So how can we establish our identity without having something or somebody different? Gradually, the people have started to become aware of this and that is what bothers them. They are asking themselves, “Do we really have an identity?” It is not really a doubt of what you already have, but an anxiety towards the fact that they do not really have anything to start off with.<sup>1</sup>*

Japan currently faces a social dilemma- the work ethic that propelled Japan to the forefront of the global marketplace after World War II has started to fade. With the postwar generation aging, Japan has come to the realization that in the process of reconstruction, creativity, individuality, and a sense of personal identity were sacrificed for the greater good of rebuilding the country. Now that Japan has become successful, the country turns to its youth for a new direction. Yet, the young people in Japan are showing resistance to the traditional expectations of their parents and seem lost in the search for a new identity.



Source: <http://www.globalcompassion.com/shibuya.html>



Source: <http://www.globalcompassion.com/shibuya.html>

1. Sekiya, Junko. "Identity Crisis of the Japanese People". Interview with Ryu Murakami. <http://www.isc.meiji.ac.jp/~nomad/erickson/murakami/Part-5.html>. 3/23/09.



In short, Japan is in the midst of a generational crisis. The successes following the reconstruction during World War II have made Japan a global, economic power. However, the post-war urgency has faded and the will and determination of past generations has been lost among the youth of Japan. Today, youth and young adults no longer see the need to follow the social mold created after the war. Yet, these youth are caught in a difficult position, with no say in government and an educational system that is outdated and that perpetuates the post-war production mentality. Young people are inevitably faced with corporate jobs for the men, while the women become stay-at-home mothers upon marrying. This social structure has caused the youngest generation to be termed the “fatherless generation”. Many young people are growing up with fathers who work 16 hours per day and the family structure that was once thought to be a highlight of Japanese society is beginning to fade. Young people are struggling with issues of identity, destiny and dignity. When there is a lack of direction and guidance, youth turn to rebellion for identity; sexual adventures for love; cliques and cults for power and belonging; and fantasy- the hikikomori, for a better reality. This thesis will attempt to provide a new model for the education system in Japan, a system that allows students the opportunity to find their own identity and assert their own direction in life, that nurtures them to discover their academic interests and to pursue them. Murakami writes:

*Today, in a Japan fully conscious that modernization is over and that we have caught up with the West, we turn to our youth and ask them not for the devotion that served us so well in the past but for fully developed skills and immediately useful knowledge... The problem is that society has not made it clear enough to them that to lead a full life they now need specialized skills. So many elementary school children are still locked into gruelling exam preparation schedules, but no one is encouraging them to think about what sort of training they are heading for or how best to prepare for the future.<sup>1</sup>*



Source: <http://www.globalcompassion.com/gallery01.html>



Source: <http://t9610100.hp.infoseek.co.jp/pics.html>

1. Murakami, Ryu. "Japan's Lost Generation." <http://www.time.com/time/asia/magazine/2000/0501/japan.essaymurakami.html>



# Hikikomori

## The New Generation of Japan

Since youth have become disconnected from the strong sense of duty and purpose found in the post-war generation, a new population of young people, rebellious and in most cases socially withdrawn, has appeared. The Japanese word for this new demographic is “hikikomori”. Roughly translated, hikikomori means “pulling away or socially confined”. These, “socially withdrawn” people find it extremely painful to communicate with the outside world, and thus they turn to the tools that bring virtual reality into their closed rooms.

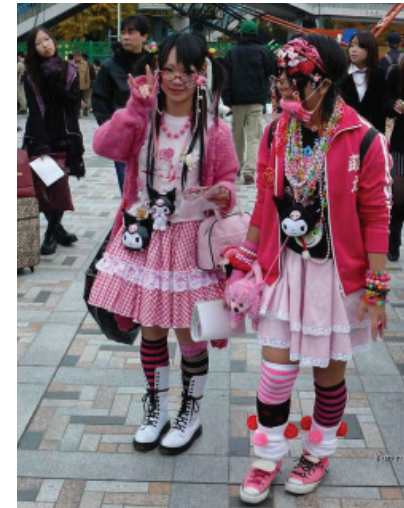
Japanese society is caught in a paradox: it is concerned with the increasing number of socially withdrawn kids, while at the same time it applauds gizmos like new video games and manga comics. These new technologies have made it possible to produce movies and graphics, as well as conduct commercial transactions, without ever stepping out of the house. It inevitably fixes people in their individual spaces. In this information society, none of us can be free from some form of social withdrawal. However, a culture of young people fixated on gadgetry and virtual reality creates more than just a problem of identity. Japan ranks the highest among developed nations in teenage suicides.

The pressures associated with traditions and collectivism create serious problems for people who do not conform with society’s expectations. In most cases of suicide, young people are diligent, hard-workers who get overwhelmed with company or school demands and see death as the only way to end their anxiety. The lack of flexibility and diversity in schools and companies, where people who are unorthodox or who have personal troubles can be ostracized, forces many young people, who are trying to find an accepted role in society, into depression and mental anguish.

The problem of hikikomori is fostered within the current education system in Japan. Traditional education focuses almost entirely on listening to a teacher’s lecture, not on discussion. Teachers give the only true answer and students are expected to memorize these answers. Students are not encouraged to think for themselves and when someone expresses his/her opinion, others agree almost automatically. There are several other problems in education including: intense bullying, even in elementary schools and a lack of originality or creativity, which stems from the lack of engagement between students and the faculty. The current education creates conversations focused on yesterdays TV animation or some new video game. Students tend to be bullied if they miss the pop culture dialogue of the day. With the advent of new technologies and the ever-growing young population who lose themselves in virtual reality, Japan has a major problem of miscommunication in society.

*Miscommunication prevails throughout our society: in the family, in the community, between management and employees, between the financial world and the Ministry of Finance, between the government and the people.<sup>1</sup>*

The cause of the malfunctioning is due to the fact that by the 1970s, Japan had already achieved the national goal; restore the country from the ruins of World War II, develop the economy and build a modern technological state. When that great goal was attained, the Japanese lost their clearly defined role in society. That uncertainty has pushed people further apart and caused a society with several major social issues. Hikikomori is one of them.



Source: <http://emohairstylesfashion.blogspot.com/2007/12/japanese-emo-hairstyles-for-young-girls.html>



Source: <http://emohairstylesfashion.blogspot.com/2007/12/japanese-emo-hairstyles-for-young-girls.html>

1. <http://www.time.com/time/asia/magazine/2000/0501/japan.essaymurakami.html>

# Hikikomori

## Parasite Singles & Hyper-Consumerism

The young people who don't want to follow the social order become "parasite singles". Parasite singles are unmarried people who live with their parents even after graduation from university, and who depend on their parents for basic living necessities. According to a national report titled *Youth Employment and Labour Market Policies in Japan* by Keiichi Yoshimoto, Associate Professor at Kyushu University, parasite singles, total no less than 10 million. The number of such single people is most probably increasing across the country. Unwilling to lower their living standards by marrying, or living independently from their parents, these parasite singles prefer the higher living standard achieved by continuing to live in their parents' home. Accordingly, the increase in the numbers of parasite singles results in rapidly growing numbers of late marriages and couples with fewer children, which helps explain the declining birthrate in Japan.

Yoshimoto argues that the emergence of parasite singles can be partly explained by social and cultural factors unique to Japan, and partly by political and economic factors. As for the latter factors, the structure of the lifetime employment system, and employment practices such as the seniority wage system, which favor middle-aged and elderly people, as well as social security schemes that treat elderly people generously, seem to affect the creation of parasite singles. Since parasite singles do not face financial difficulties, they do not look for jobs with high wages, treating work as something akin to a hobby. Because of this attitude, if they find their job uncongenial, they immediately give it up. The resulting unemployment of young people is a "luxury unemployment" that does not involve dire financial circumstances. "To them, work is a discretionary pastime, or a means of earning pocket money." This pocket money presents another problem within society, the hyper-consumerism mentality, which developed from a sufficient source of income and no direction in life. It has reached a point where girls are willing to sell their bodies in order to acquire designer bags and clothes. "Love Hotels" as they are loosely called provide opportunities for young girls to meet with men in exchange for these types of popular items. This behavior fuels the "kawaii" image. Kawaii roughly translated means cute. It represents the cute, innocent, almost infantile image of girls as a sex symbol. The kawaii image is also seen in the manga comics that many of the parasite singles tend to follow.

Ryu Murakami believes that Japan's future goals need to be redirected in order to accommodate the identity crisis among its youth. From the children in junior and high schools to the young professionals in the workforce, the identity crisis of Japan's younger generation has affected every aspect of the culture. In post-WWII Japan, the notion of individuality and personal identity was abandoned for the security associated with the collective. This has become a serious issue for Japan. In the last two decades, complacency with the post-war model of society has driven out creativity and progress in Japan. It has forced Japan into a state of paralysis. Masaru Tamamoto, a Japanese citizen and fellow of the World Policy Institute, further explains the issue in the NY Times:

*Since the middle of the 19th century, our economic success has relied on the availability of outside models from which to choose. Our model for social security took inspiration from Bismarck's Germany, state planning from the Soviet Union, public works from the Tennessee Valley Authority, automobile assembly and manufacturing from Ford. Much of Japanese innovation has involved perfecting what others have created... Japan's rise to economic greatness was basically a game of catch-up with the advanced West. So, what happened once we caught up? Over the past two decades, the answer has largely been paralysis. Japan's ability to imitate outside models was mistaken for progress. But if progress is defined by pursuing a vision of a desirable future, then the Japanese never progressed. What we had was a concept of order and placement, which is essentially stasis. In the West, on the other hand, the idea of progress rests on establishing individual autonomy and liberty. In Japan, bureaucratic rule offered security and predictability — in exchange for personal freedom...<sup>1</sup>*

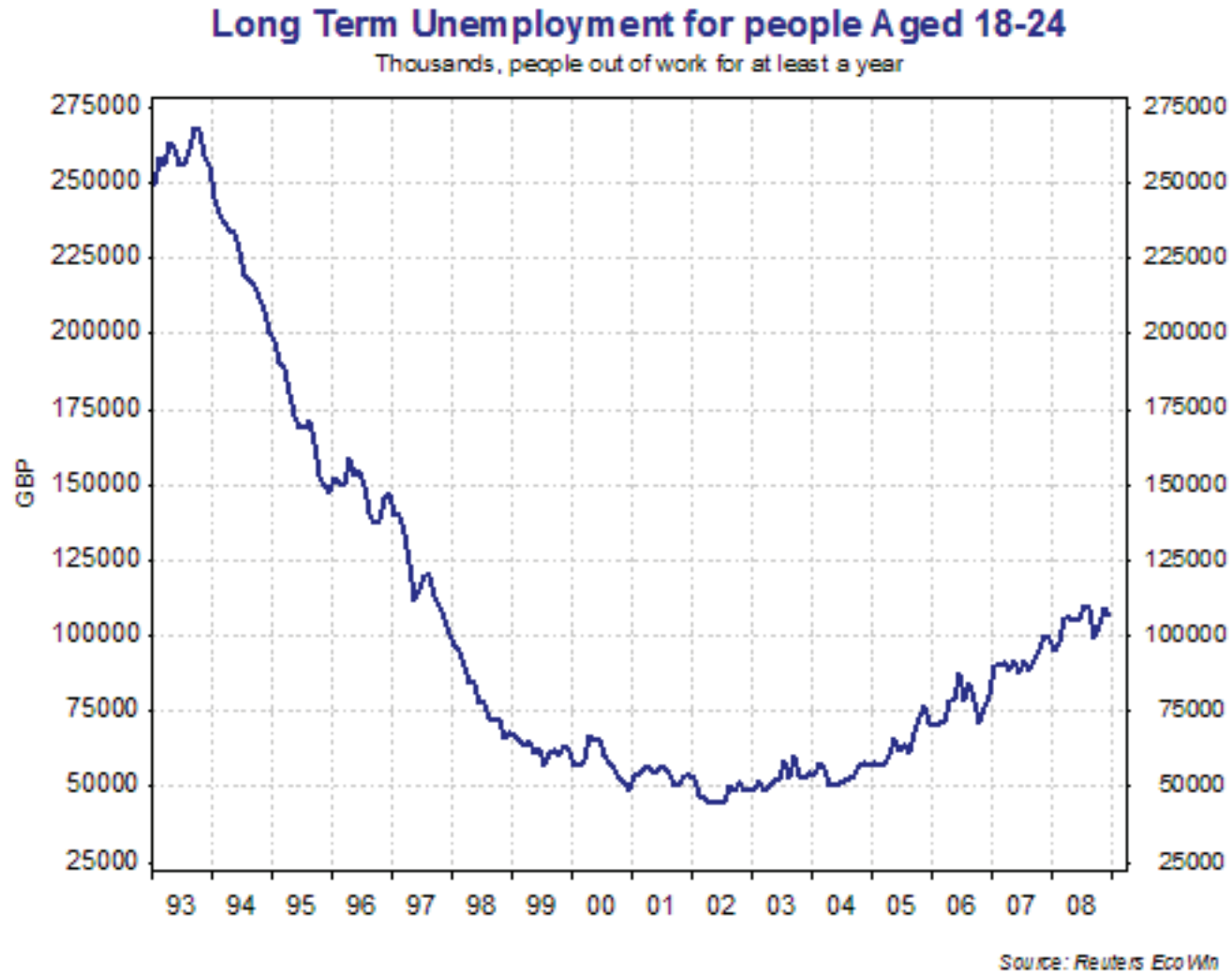


1. Tamamoto, Masaru. "Japan's Crisis of the Mind." <http://www.nytimes.com/2009/03/02/opinion/02tamamoto.html>

Source: <http://www.globalcompassion.com/shibuya.html>

# Hikikomori

## Unemployment and Suicide



With the technological and economic advances provided by the post-war generations, the youth of Japan do not see the need to seek out long term employment. Many young people see employment as a hobby that helps fill the time and provide a means for the hyper-consumerism that plagues the younger generations. Granted, some numbers reflect the recent economic downturn felt worldwide but even this problem reflects upon the broken education system. In continuing to work within a system that sacrifices creativity for conformity and production, the workforce in Japan has not found ways to adapt to the current economic crisis.

Suicide has a long-standing history in Japan's past. The notion of suicide comes from a strong cultural tradition of honor. In ancient and medieval Japan, society was based on honor; honor to the emperor; honor to the country and honor to your family and ancestry. If there was any dishonor related to these bodies, then living with the dishonor was not tolerated and culturally it was expected of you to end your life. There is no shame attached to suicide as most Westerners come to expect. In Japan, suicide is viewed as an acceptable, even honorable way of dealing with defeat or failure.

Suicides in modern day Japan generally involve teenage to middle age males; older males who may have just lost their job or younger males that cannot handle the pressures associated with school and adolescence. Japan in recent years has tried to combat the number of suicides among its youth by setting up suicide prevention centers and call lines. However, the efforts related to suicide prevention seem minimal when considering the large numbers on individuals committing suicide daily in Japan.

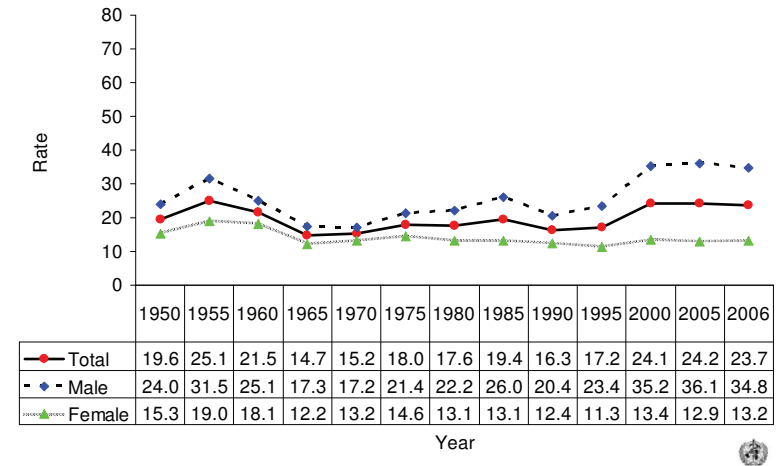
The school system has become a breeding ground for bullying and youth violence. The fierce competition among students to showcase their knowledge leaves the less inept kids prone to bullying and subsequent suicide attempts. Granted, suicide is not viewed with the same negative stereotype as many Westerners tend to believe, but the amount of young people taking their lives is very alarming.

Number of suicides by age group and gender. JAPAN, 2006.

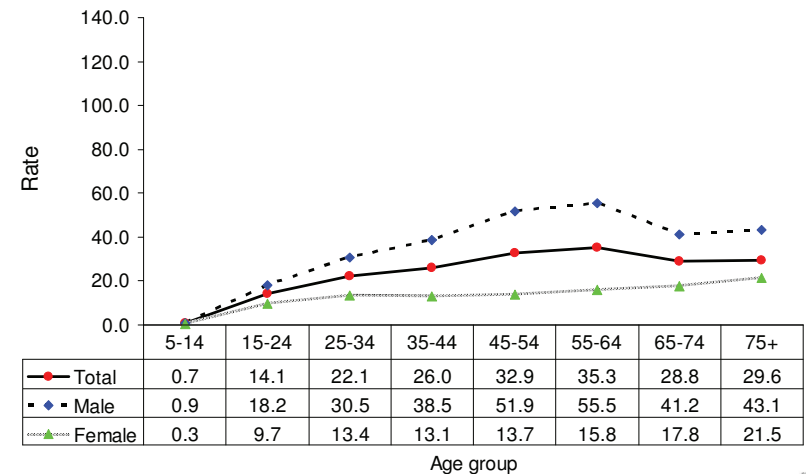
Age (years)	5-14	15-24	25-34	35-44	45-54	55-64	65-74	75+	All
Males	57	1257	2667	3297	4138	5141	2780	1945	21419
Females	20	635	1133	1100	1092	1511	1355	1639	8502
Total	77	1892	3800	4397	5230	6652	4135	3584	29921

© World Health Organization

Suicide rates (per 100,000), by gender, Japan, 1950-2006.



Suicide rates (per 100,000), by gender and age, Japan, 2006.

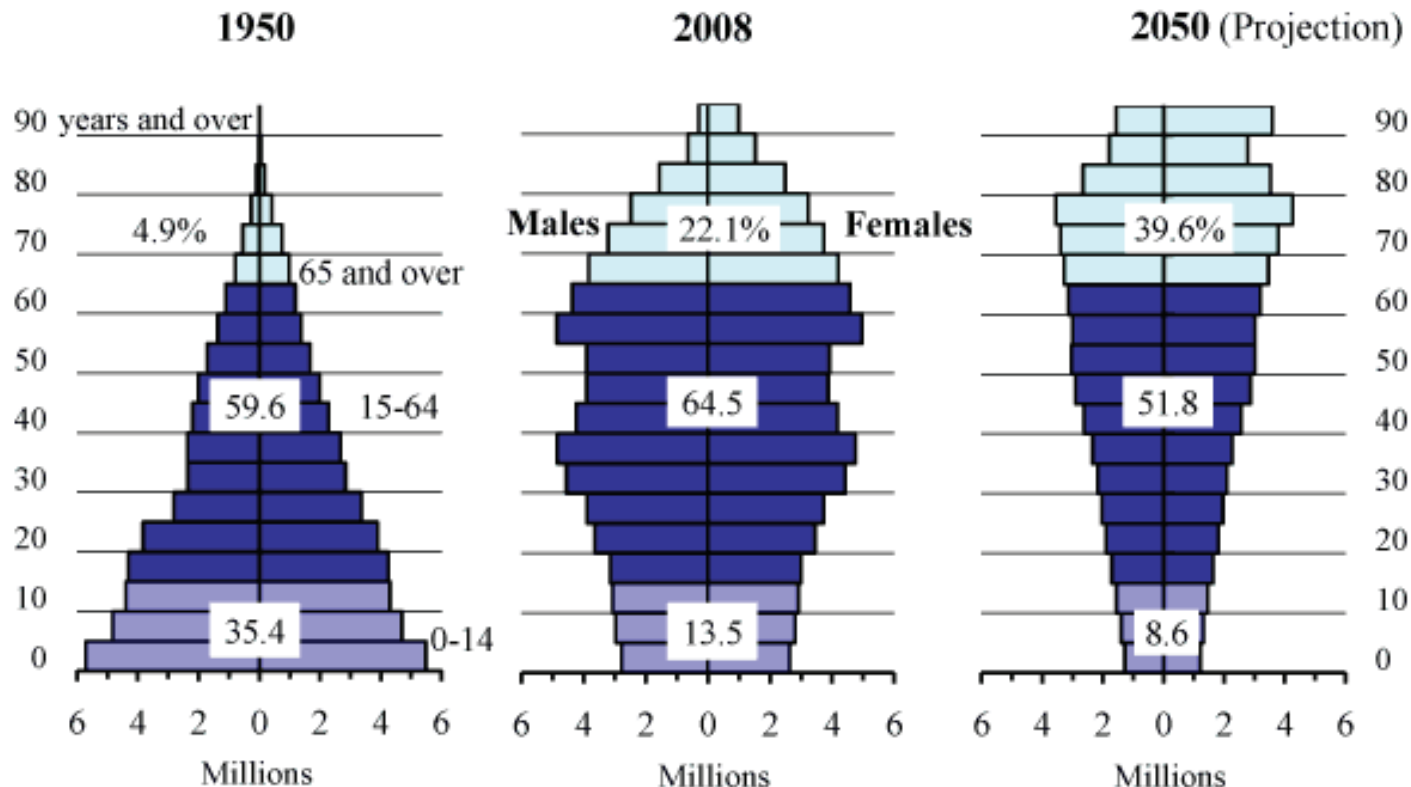




## Declining Birth Rate

Due to the number of parasitic singles and hikikomori many young Japanese are finding it hard to find a partner. Marriage rates and subsequently birth rates are on the decline in Japan. Most couples who do get married are simply not having kids. It appears that the issues associated with the current young generation deters many couples from having and raising their children in the current society. The population pyramid of 1950 shows that Japan had a standard-shaped pyramid marked by a broad base. The shape of the pyramid, however, has changed dramatically as both the birth rate and death rate have declined. In 2008, the population of elderly citizens (65 years and over) was 28.22 million, constituting 22.1 percent of the total population and marking record highs both in terms of number and percentage. The speed of aging of Japan's population is much faster than in advanced Western European countries or the U.S.A. Although the population of the elderly in Japan accounted for only 7.1 percent of the total population in 1970, 24 years later in 1994, it had almost doubled in scale to 14.1 percent. In other countries with an aged population, it took 61 years in Italy, 85 years in Sweden, and 115 years in France for the percentage of the elderly to increase from 7 percent to 14 percent of the population. These comparisons clearly highlight the rapid progress of demographic aging in Japan.<sup>1</sup>

### Changes in the Population Pyramid



Source: Statistics Bureau, MIC; Ministry of Health, Labour and Welfare.

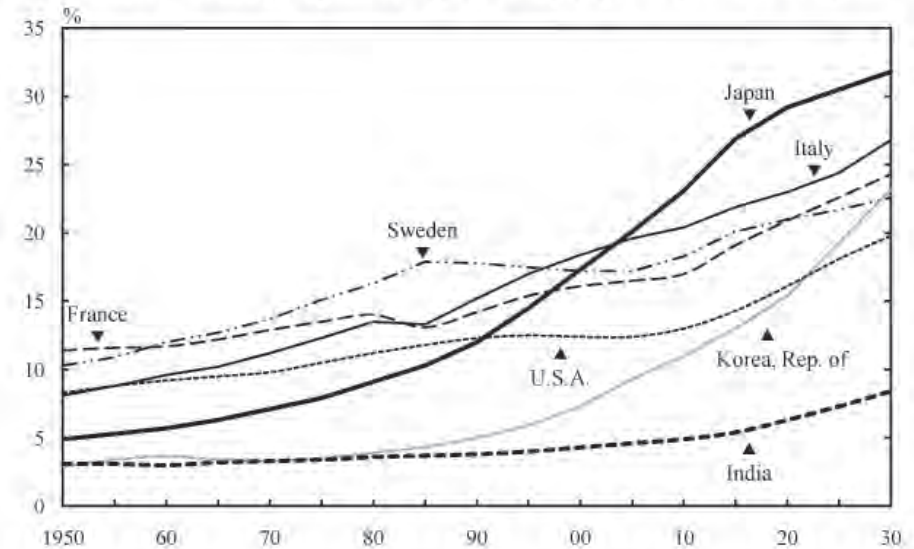
1. <http://www.stat.go.jp/english/data/handbook/c02cont.htm>



# Aging Population

The percentage of young people in Japan (0-14 years) has been shrinking since 1982. In 2008, the population of young people amounted to 17.18 million, accounting for 13.5 percent of the total population, the lowest level on record since the Population Estimates began. The working-age population (15-64 years) totaled 82.30 million, continuing its decline since 1996. In share terms, it accounted for 64.5 percent of the entire population. As a result, the ratio of the dependent population (the sum of the elderly and younger age population divided by the working-age population) was 55.2 percent. In terms of their proportion of the total population, the elderly have surpassed the younger age group since 1997.<sup>1</sup>

**Proportion of Elderly Population by Country (Aged 65 years and over)**



Source: Statistics Bureau, MIC; Ministry of Health, Labour and Welfare; United Nations.

**Age Structure of Population by Country**

Country	2005						2030 (projection)		
	2005			2030 (projection)			2030 (projection)		
	0-14 years	15-64	65 and over	0-14 years	15-64	65 and over	0-14 years	15-64	65 and over
Japan .....	13.7	65.8	20.1	9.7	58.5	31.8	9.7	58.5	31.8
Germany .....	14.3	66.8	18.9	12.5	59.3	28.2	12.5	59.3	28.2
Italy .....	14.2	66.2	19.6	12.3	60.9	26.8	12.3	60.9	26.8
France .....	18.4	65.1	16.5	16.4	59.3	24.3	16.4	59.3	24.3
Switzerland .....	16.1	67.9	16.0	15.1	60.9	24.1	15.1	60.9	24.1
Korea, Rep. of .....	19.1	71.6	9.3	12.6	64.2	23.2	12.6	64.2	23.2
Canada .....	17.6	69.3	13.1	16.1	61.2	22.7	16.1	61.2	22.7
Sweden .....	17.4	65.4	17.2	17.0	60.3	22.6	17.0	60.3	22.6
U.K. ....	18.0	65.9	16.1	17.2	62.0	20.9	17.2	62.0	20.9
Australia .....	19.7	67.3	12.9	17.5	61.7	20.7	17.5	61.7	20.7
U.S.A. ....	20.8	66.8	12.4	18.0	62.3	19.8	18.0	62.3	19.8
China .....	22.0	70.4	7.6	16.9	67.2	15.9	16.9	67.2	15.9
Brazil .....	27.5	66.3	6.2	17.0	69.3	13.7	17.0	69.3	13.7
India .....	33.1	62.3	4.6	22.8	68.8	8.4	22.8	68.8	8.4

Source: Statistics Bureau, MIC; Ministry of Health, Labour and Welfare; United Nations.

1. <http://www.stat.go.jp/english/data/handbook/c02cont.htm>

## Existing Educational Structure

The upper Secondary Schools (our equivalent of high school) consist of three different courses: full-time, part-time, and correspondence. Course duration is three years for full-time, and three or more years for either part-time or correspondence courses. There are two different types of educational content in upper secondary schools: general education and specialized education. General courses mainly provide a general education in response to the needs of students who want to go on to higher education or want to enter the work force, but have yet to select a specific job. Specialized courses concentrate on vocational and other relevant subject areas for students who have a specific occupation in mind as their future career. Agriculture, industry, commerce, fishery, homemaking, nursing, information and welfare, and so on are among these specialized courses.<sup>1</sup>

**TABLE 8.1**  
**Nobel Prize Winners, 1901-82**

Country	Total
United States	126
England	63
Germany (East and West after 1945)	49
France	22
Sweden	15
Soviet Union	10
Holland	9
Switzerland	9
Austria	8
Denmark	7
Italy	5
Belgium	5
Japan	4

Source: *White Paper on Science and Technology* (Kagaku Gijutsu Hakusho) 1982, Kagaku Gijutsu Cho, p. 41.



1. Yoshimoto, Keichi, *Youth Employment and Labour Market Policies in Japan*. Ministry of Education





Junior High School  
First Year Sample Class Schedule

	Day					
Time	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday
8:30-8:45	Homeroom					
8:50-9:40	Class Activity	Mathematics	Japanese	Geography	Science	Morals
9:50-10:40	Mathematics	Calligraphy	Music	Japanese	Physical Education	Mathematics
10:50-11:40	Japanese	Physical Education	Science	English	Home Arts	Music
11:50-12:40	Geography	Japanese	Physical Education	History	Home Arts	Homeroom Cleanup Dismissal
12:40-1:25	Lunchtime					
1:30-2:20	Science	English	Clubs	Art	English	
2:30-3:20	History	Extra Activities	Clubs	Art	Extra Activities	
3:25-3:35	Homeroom					
3:35-3:50	Cleanup					
3:55	Dismissal					

## Uniformity, Standards, Exam Based Learning

The current educational system doesn't promote active engagement between students, or between students and their teachers. Since the educational system focuses on specific standards, all classes, even art and physical education, focus on meeting these standards so that students can advance to the next grade. Classes and material are so standardized that sitting in a class in Fukuoka on any given day might be no different in format and information than sitting in a class in Tokyo or Nagoya. Students stay in their homeroom all day while the teachers rotate to the different classrooms. Students are assigned seats and change seats every 6 weeks. During class time there is virtually no talking by the students. Most are vigorously taking notes and trying to comprehend the Sensei's lecture, while some students, who may have a behavioral problem or just cannot learn through memorization, typically sleep or cause disruptions. The system does not allow teachers to remove disruptive students from the classroom, which leaves many classes chaotic and makes it difficult for other students to learn. Further, there is no attempt to accommodate children with different learning styles. Finally, there is still a cultural stigma surrounding children with learning disabilities, who are often forced to attend separate "special schools." The attitude towards students with special needs is generally they are not trying hard enough, which perpetuates an environment of negativity and eventual failure.<sup>1</sup>

1. Yoshimoto, Keichi, Youth Employment and Labour Market Policies in Japan. Ministry of Education

## Existing Educational Structure

### Lack of Creativity and Engagement

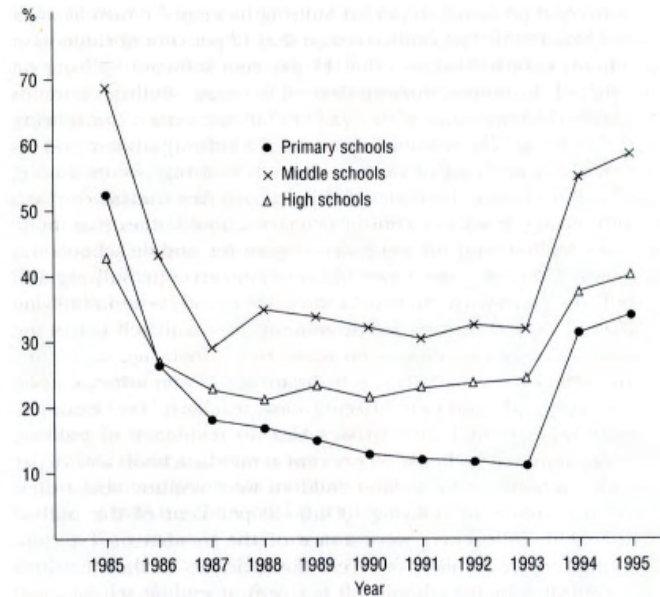
The structure of the education system in Japan promotes conformity, with a larger social expectation that youth will become productive, lifetime workers. This mentality suited the Post War generations and it pushed Japan back onto the global economic and technological stage. However, now that Japan has reached a level of success, this conformity and sacrifice of individualism is obsolete. Japan is living in the 21st century but still clings to a 20th century mentality. The repercussions are starting to show with the younger generations. The “future of Japan” are trying to find a new direction for their country but cannot overcome the oppressive educational system that breeds obedient, productive workers.

### Bullying and Violence

With an education system based on scoring, testing, and personal achievements, bullying and school violence is prevalent throughout Japan. Students who may have a hard time adapting to the rigid educational structure are singled out by other students for being slow or lazy. There is an amazing paradox between the social and communal public world and the fierce competitive nature nurtured within the school system. This fierce competition causes many students to take their own lives or exert their frustrations on other students.

### Cram Schools

Based on Johnson and Johnson's (1996) study, about 60% of Japanese high school students attend extra programs after school in order to prepare for entrance examinations for college. Some students go to cram schools because they do not want to fall behind their classmates. Since the education system is setup in such a way that does not allow for discussion, students who need to ask questions must do so after school hours. Furthermore, many students do not ask questions in the first place, for questioning the ‘sensei’ during a lecture is seen as disrespectful. Crams schools in Japan can be categorized into two types. One is academic-oriented, which is important for the preparation for entrance examinations, and the other is non-academic-oriented, for fostering special talents and skills. In most cases, students go to cram school for extra help understanding a subject or before entrance exams.

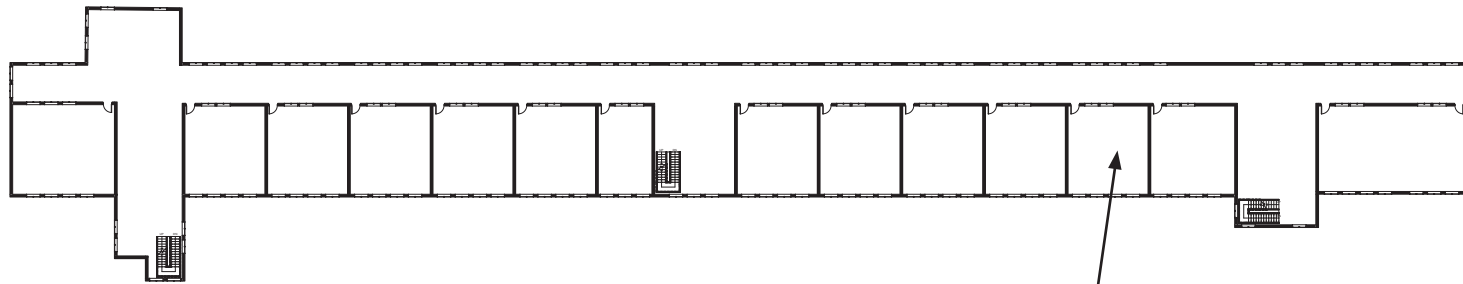


**Figure 6.1** Percentage of schools experiencing bullying, 1985–95  
*Source:* Kanekura (1996:7). Kanekura provides a summary of the report *95-nendo Seitoshidō jō no Shomondai no Genjō to Monbushō no Sesaku (Mondai Kōdō Hakusho)*

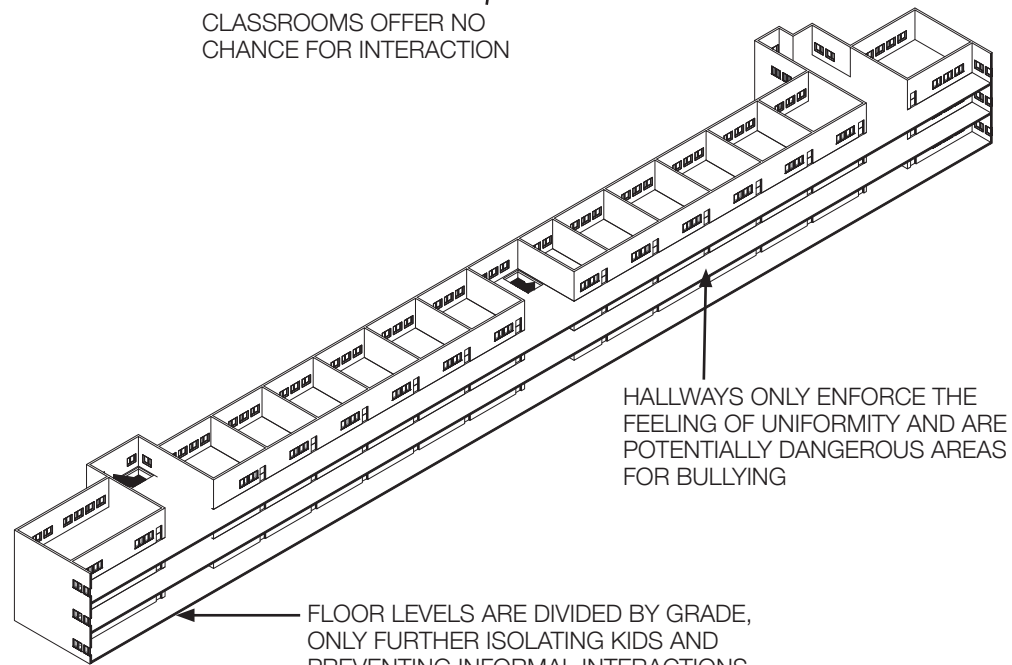
**Table 6.1** The realities of bullying, 1995

	Primary school	Middle school	High school
Percentage of schools that reported incidents of bullying	34.1	58.4	39.6
Average number of bullying incidents at any one school	1.1	2.8	1.0
Three most widespread forms of bullying	1 Teasing 2 Exclusion 3 Verbal threat	1 Teasing 2 Verbal threat 3 Violence	1 Violence 2 Verbal threat 3 Teasing
Main method of identifying cases of bullying	Teachers (31%)	Bullied students report to school (34%)	

*Source:* Kanekura (1996:7–8).



CLASSROOMS OFFER NO  
CHANCE FOR INTERACTION



HALLWAYS ONLY ENFORCE THE  
FEELING OF UNIFORMITY AND ARE  
POTENTIALLY DANGEROUS AREAS  
FOR BULLYING

FLOOR LEVELS ARE DIVIDED BY GRADE,  
ONLY FURTHER ISOLATING KIDS AND  
PREVENTING INFORMAL INTERACTIONS



### Post-War Reconstruction

After the war, and the subsequent American occupation, the Japanese constructed many new schools, all of which were built on a standard module, a long, linear, single loaded corridor building with a series of classrooms that served as libraries, cafeterias, and other functions. In a country that prides themselves on technological innovations, the places of education are dismal, outdated structures that only further inhibit progress within the educational system.





## Thesis Project

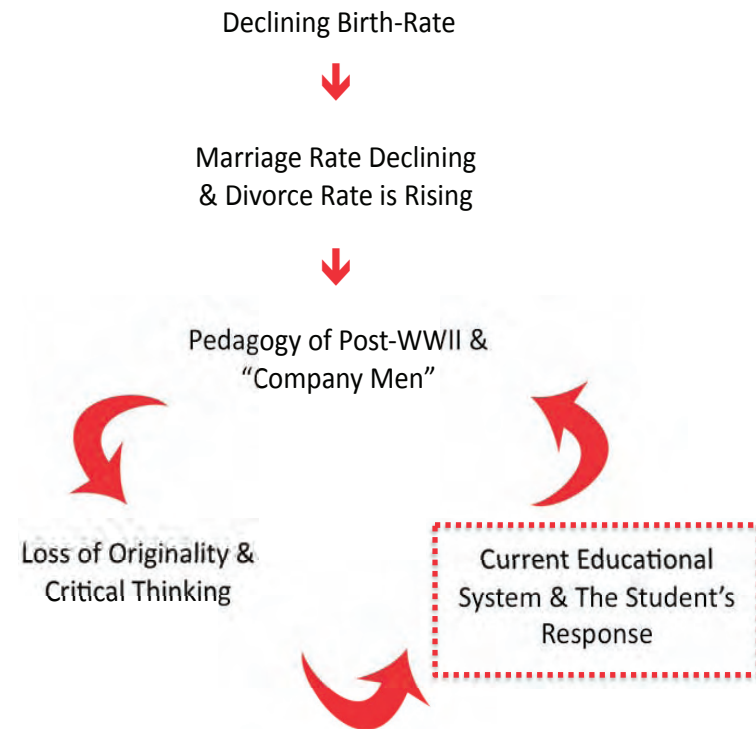
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## Premise

There seems to be a great contradiction within Japan's cultural and educational systems. Japan is a nation based around community. The family, the workplace, the neighborhood; almost every aspect of their life revolves around the idea of the collective, with one blaring exception: the education system. Education in Japan has become a highly isolated and individualized activity. In the most critical stages of self development and maturing, Japanese students are left to fend for themselves in a highly competitive, highly detached educational system. A system that emphasizes one directional learning, where memorization is key and personal achievement is left entirely up to the individual and his/her will to reach the next level. The system has become so highly standardized, so mechanical that it has become counterproductive. Instead of allowing kids to express themselves and utilize their raw creativity, the system suppresses them so they conform to society's expectations. This has created serious tensions among the younger generations of Japan, who are fighting against the society constructed by older generations and who are seeking an outlet to creatively express themselves and find a purpose, an identity, for their own autonomous lives.

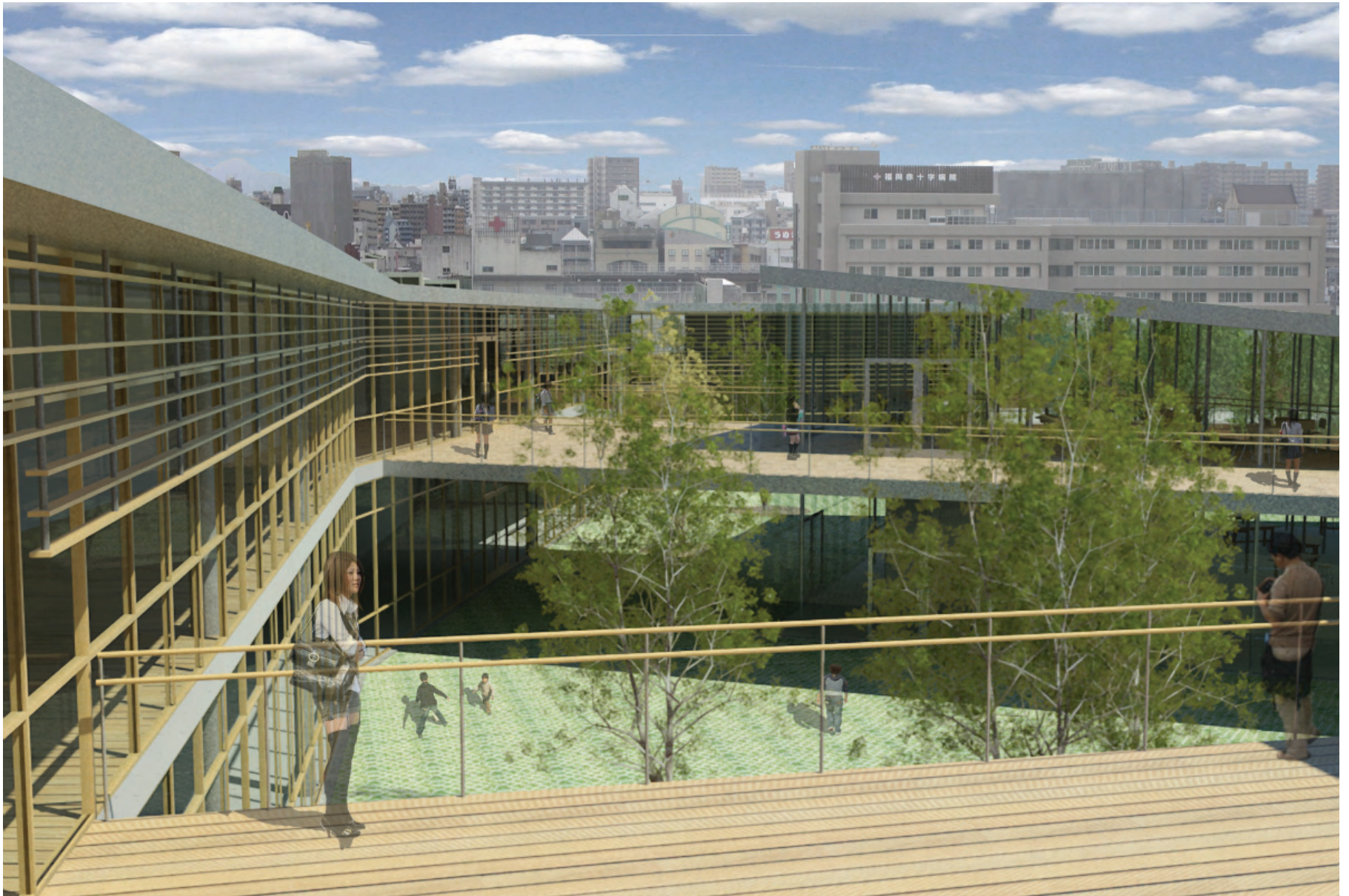
This thesis seeks to address the current social woes affecting Japan by introducing an outlet for the tension between teens and the current societal expectations. The project will create a type of school that emphasizes positive social interaction between students and also between students and teachers. The strategy for introducing this new learning environment will take precedent from the communal mind-set of the larger community. By making spaces that are more conducive to group learning, interaction, and discussion, students will be able to develop their own opinions and freely express their thoughts without fear of ridicule or condemnation.

This new school does not seek to change the curriculum specifically designed for each grade, but rather through the architecture, work to change how the material is learned. A modified educational setting can help students to not only absorb the necessary information but also to develop their own, critical opinions of such work. The school will be geared towards the junior high school level because this is the time in the current Japanese education system where creativity and group learning are abandoned and replaced with individual memorization and regurgitation. Junior high school is also a critical stage of development for young people and the experiences within the new type of school will help the children as they mature. To address the young people outside of school and the community at large the project will work to provide gallery space and a larger public library where students and local artists can display work and where students' parents can gather during the day to discuss and debate current issues. To be clear, this thesis does not seek to prescribe a certain identity to this generation nor does it wish to place an American educational model within Japan. Rather, by capitalizing on certain aspects existing within the society, it seeks to provide a means for the young people in Japan to discover their own identity.



**Current issues in Japan derive from a broken educational system**

## Vision



Believing that architecture can provide a means for social institutions to evolve, this thesis investigates an alternative educational environment, one which, places an emphasis on community, interaction, and the promotion of learning.



# Educational Themes

## Proactive

The proactive section of learning incorporates lectures and critical thinking. Within the proactive section, students are encouraged to question and evaluate the information presented while also forcing the students to be self-reliant and self-motivated. These spaces would contain some classroom structure but would be flexible and adaptable to different teaching styles.

## Interactive

The interactive section of learning involves group projects and collective learning. This type of learning introduces teamwork and group decision making. The interactive section also incorporates the arts and crafts of learning. Within the interactive section students would take part in art, woodshop, theater, and music classes. Science experimentation and computer technology classes all fall under the interactive portion of learning. These spaces would most likely be open and flexible to allow for creative and group activities.



Images of classrooms: Geography lesson at Alma School, London, 1908, and art lesson at King Alfred School, London, 2002



## Active

The active section of learning allows the children to expel excess energy while also promoting fitness and an overall well-being. Aside from the multi-purpose athletic fields, the active spaces would also involve some form of agriculture space. Agriculture and self-sustenance is a common practice for most Japanese citizens. With the introduction of a school garden, students can take pride in the produce they tend to while also learning to be self-sufficient.

## Individual

The individual section of learning provides students with a quiet, peaceful space to study their class material. Since the school system still revolves around examinations, study areas are a critical element of the learning process, however, they are not the only one. These spaces should be well lit and quiet, requiring specific attention to acoustics and daylighting and the appropriate levels for optimum retention and comprehension.





# Fukuoka Power 2009

## Hakata Primary School (2007)

Due to the declining birthrate in Fukuoka, city officials are striving to create an exceptional environment for parents to raise their children. This effort calls for the cooperation of local families, schools, government and the community as a whole. The Fukuoka Child Consultation Center “Egaokan”, offers numerous consultation services for children under the age of 20. The centre also provides comprehensive professional consultation and help concerning health care, social welfare and education. In order to promote the education of the next generation, Fukuoka has set up 6 “Children’s Plazas” in different parts of the city, including Higashi-ku, Hakata-ku, Chuo-ku, Minami-ku, Jonan-ku, and Nishi-ku. These plazas are designed to promote communication and open up a channel for consultation for the benefit of parents and their children. The city has also made use of available classrooms at schools and cultural centers, turning them into “child-raising information and advice forums.”



To the right is the new Hakata Primary School. The school is comprised of 4 local schools that is now combined into one. Opening up the school and allowing a more open line of communication between students and teachers allows students to ask questions and feel more comfortable in the learning process.

Above is an example of the “Children’s Plazas” that gives the young people of Fukuoka the opportunity to play and express themselves.

# Program

## Proactive

9 Lecture Areas (64 m <sup>2</sup> each)	576 m <sup>2</sup>
1 Extended Lecture Area	240 m <sup>2</sup>
1 Computer Lab	140 m <sup>2</sup>
w/ Breakaway Partition	
1 Print-Making Station	64 m <sup>2</sup>
Library	
Book Storage	1000 m <sup>2</sup>
Study Areas	300 m <sup>2</sup>
Reading Areas	500 m <sup>2</sup>

**Sub-Total: 2820 m<sup>2</sup>**

## Interactive

Auditorium	610 m <sup>2</sup>
Foyer/Dining & Cafe	165 m <sup>2</sup>
Student Gallery	410 m <sup>2</sup>
Science Lab Area	450 m <sup>2</sup>
w/ Attached Greenhouse	
Workshop/Art Area	730 m <sup>2</sup>
Music Room	580 m <sup>2</sup>
Performance Space	580 m <sup>2</sup>
Main Dining Area	330 m <sup>2</sup>
Upper Lounge/Dining	70 m <sup>2</sup>
Upper Lounge	75 m <sup>2</sup>
(Above Workshop)	

**Sub-Total: 4000 m<sup>2</sup>**

## Active

Main Exterior Deck	800 m <sup>2</sup>
Ext. Deck Over Lab	150 m <sup>2</sup>
Ext. Deck Over Workshop	130 m <sup>2</sup>
School Garden	100 m <sup>2</sup>
Athletic Field	11,150 m <sup>2</sup>
Athletic Facility	1268 m <sup>2</sup>
(on adjacent field)	

## Individual

Administration	580 m <sup>2</sup>
5 Breakout Spaces	300 m <sup>2</sup>
(60 m <sup>2</sup> each)	
2 Teacher Prep Areas	120 m <sup>2</sup>
(60 m <sup>2</sup> each)	
Kitchen	110 m <sup>2</sup>

**Sub-Total: 1110 m<sup>2</sup>**

**Total Net m<sup>2</sup>: 7930 m<sup>2</sup>**

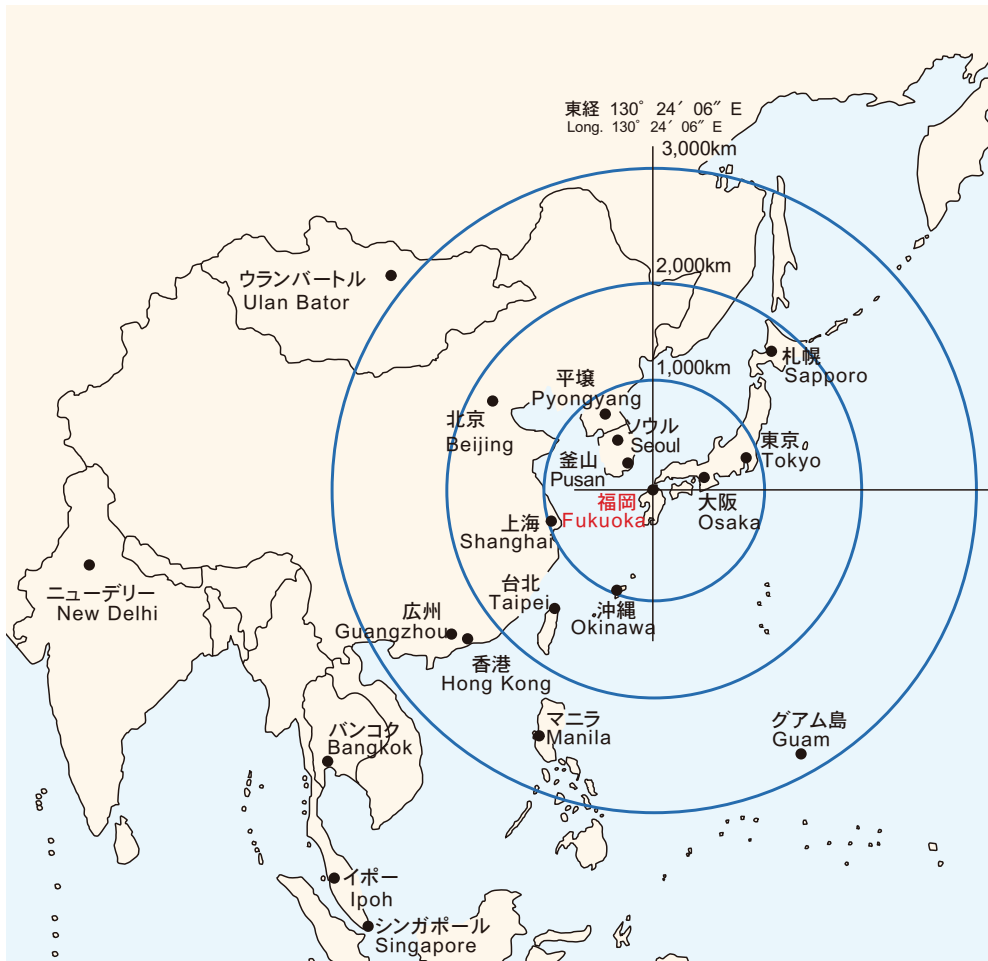
*Net x 1.5 = Gross m<sup>2</sup>*

**Total Gross m<sup>2</sup>: 11895 m<sup>2</sup>**

Building off of the programs already instituted in Fukuoka, this project incorporates the community at several levels. The school library serves as a small community library, while the auditorium also serves as a community lecture hall. The performance space opens up to the street and can serve as a small community center. The program constantly strives to articulate the relationships between the public and private components of the school and the community. Working within the context of Japan and the close relationship of building and nature, the program also introduces communal garden spaces where students can learn about different plants and take pride in maintaining their own garden.

## Site Overview

Fukuoka City is located at 130° 24' 06" E. Longitude and 33° 35' 24" N. Latitude. Standing in the heart of the crescent-shaped Fukuoka Plain, the city faces the Genkai Sea to the north, and Hakata Bay, defined by Uminonakamichi and the Itoshima peninsula. To the south is the Sefuri mountain range, and to the east the Sangun range. There are a number of rivers – the Tatara, Naka and Muromi, for example – flowing into Hakata Bay, but most of them are medium and small-sized rivers.



## Fukuoka City

### Master Plan Goals

#### We aim to become a city where

Policy Goal 1: Children can grow up strong with hopes and dreams.

Policy Goal 2: Individuality, creativity and diversity in human resources are nurtured.

Policy Goal 3: The local community is active and self-governance for both citizens and the region is promoted.

<http://www.city.fukuoka.lg.jp/plan/english/>

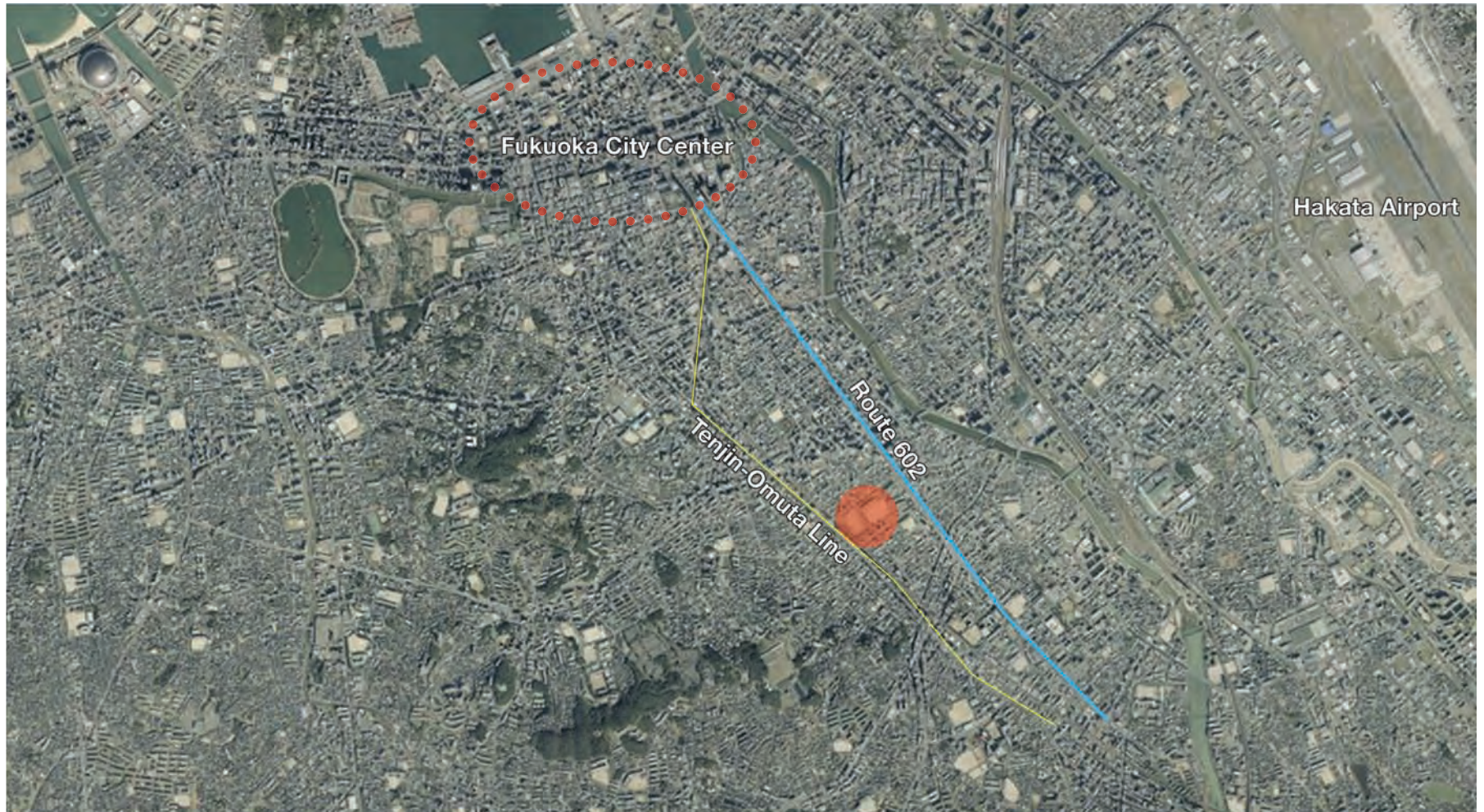
### Why Fukuoka?

Aside from Tokyo, Fukuoka is considered one of the more progressive cities in Japan. Unlike Tokyo, Fukuoka has a well defined city center with many surrounding residential neighborhoods. The site is located just outside the city center. It lies between the city center and what is considered a residential center. Being open to all sides the site provides numerous access points. To the southwest there is the Tenjin-Omuta Rail that runs atop one of several “Green Corridors” that snake through the city. To the northeast is the major roadway Route 602 that links the residential center directly to the city center. Taking into consideration that many students have to travel either by bike or train, the site allows for all students from every part of the city to attend the school.



## Location

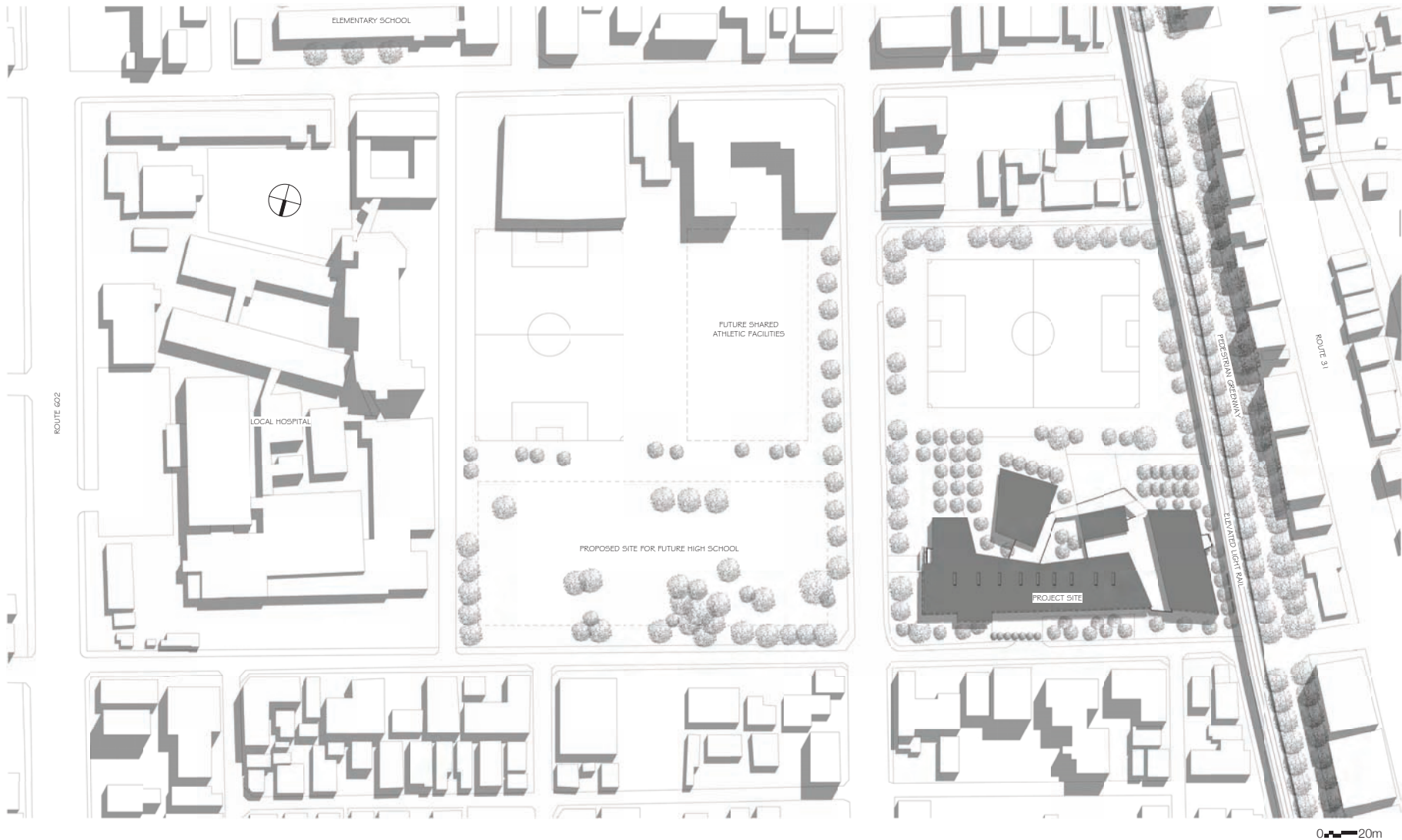
### Larger Context



● Site Location

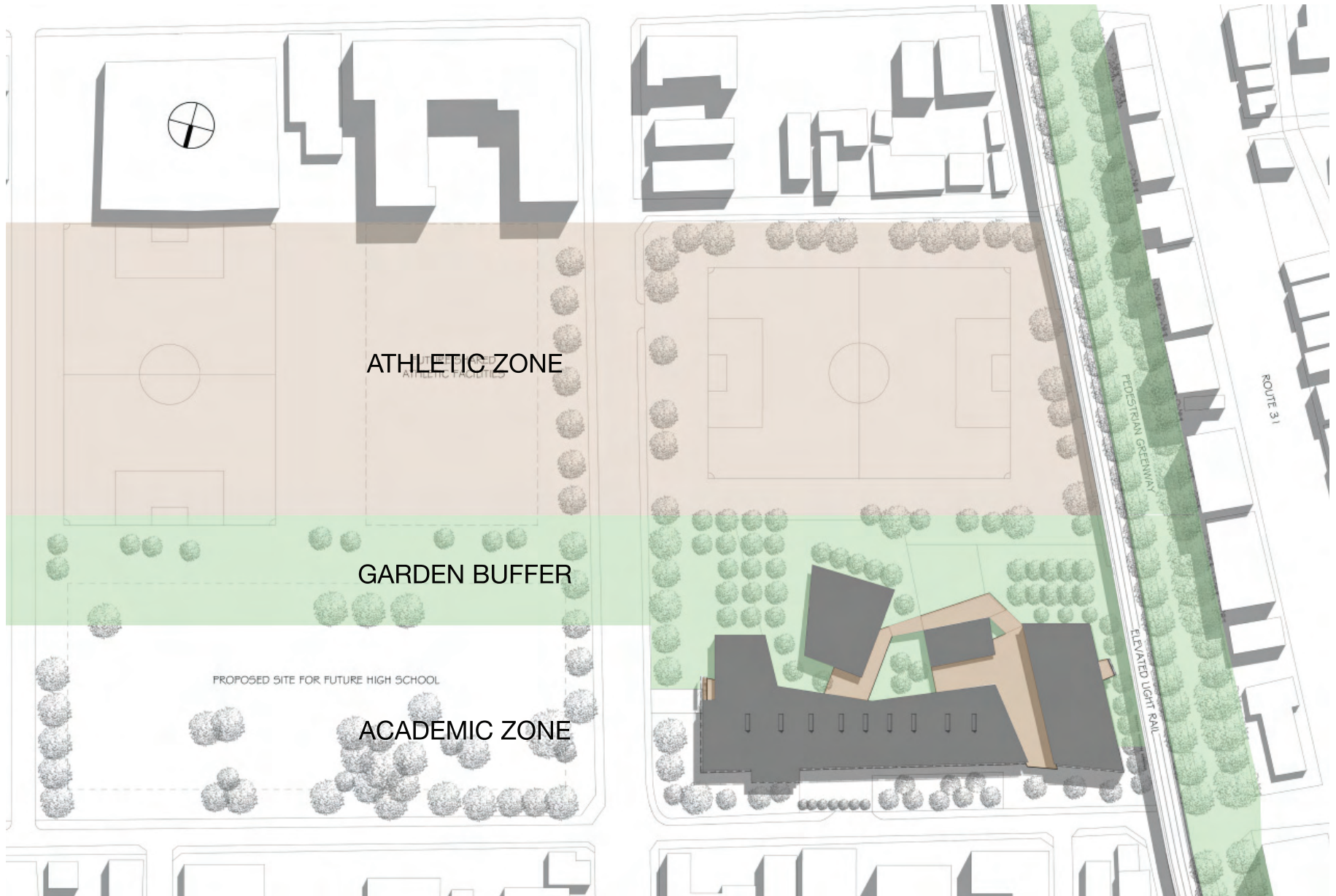


## Site Master Plan

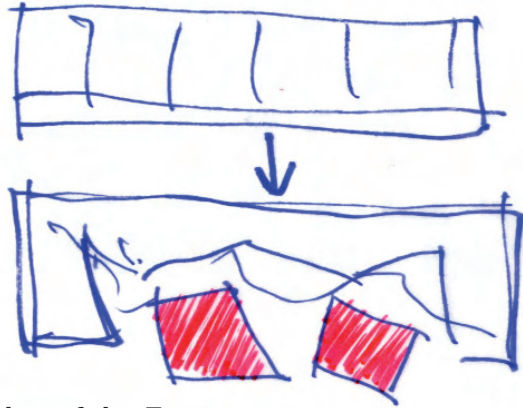


The project takes advantage of two, relatively open, sites. The proposed site for the project held a high school before being demolished several years ago while the site adjacent to the hospital currently possesses a Junior high school. The project seeks to construct the new Junior High School on the vacant site near the rail line. After its completion, construction could begin on a new high school, based on the same pedagogic principles as the junior high school, on the site adjacent to the hospital creating a continuous link from junior high to college based on an open, interactive learning style.

## Site Strategies

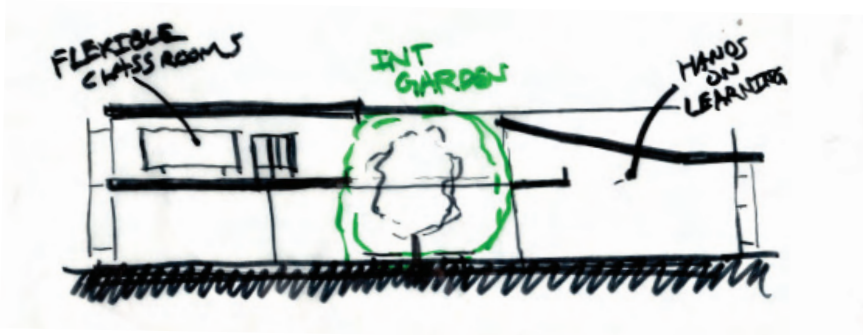


## Concepts



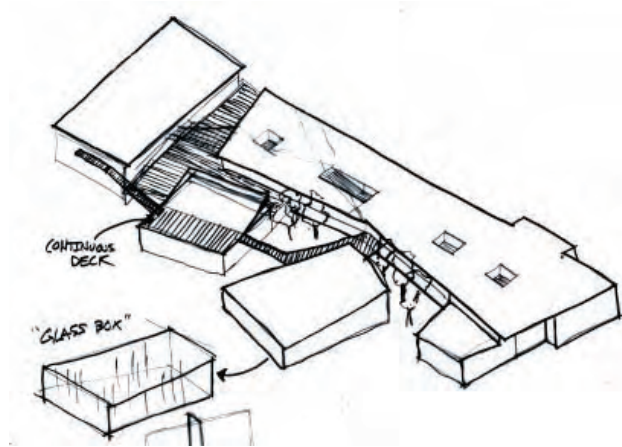
### Breaking of the Form

By breaking up the long, linear bar, the project sheds the traditional educational pedagogy at a fundamentally formal level, an impression that can instantly impact all who view the building. By breaking up the bar, an emphasis is created around the two pieces that detach from the core. These pieces architecturally, represent the essence of the project, openness, transparency, and an informal learning environment.



### Internal Garden

The fractured nature of the form lends itself to a shared, communal space between the independent “gems” and the core of the program. This interstitial space is what the Japanese call “ma” or the space between. This in-between space becomes a communal greenspace linking the programs.



### Materiality

Working with the ideas of openness, transparency, and lightness, the project uses wood and glass to create screens and varying levels of visual clarity. The building can be seen as a progression. The progression starts at the street or city-side with tightly placed vertical louvers. The program within is regulated on a structural grid. As you move through the building and out towards the gardens, the louvers are less frequent and the grid dissolves into distinct glass boxes. Similar to Japanese concepts of space and time and the illusion of space, the levels of visual clarity in the building change with each new move.

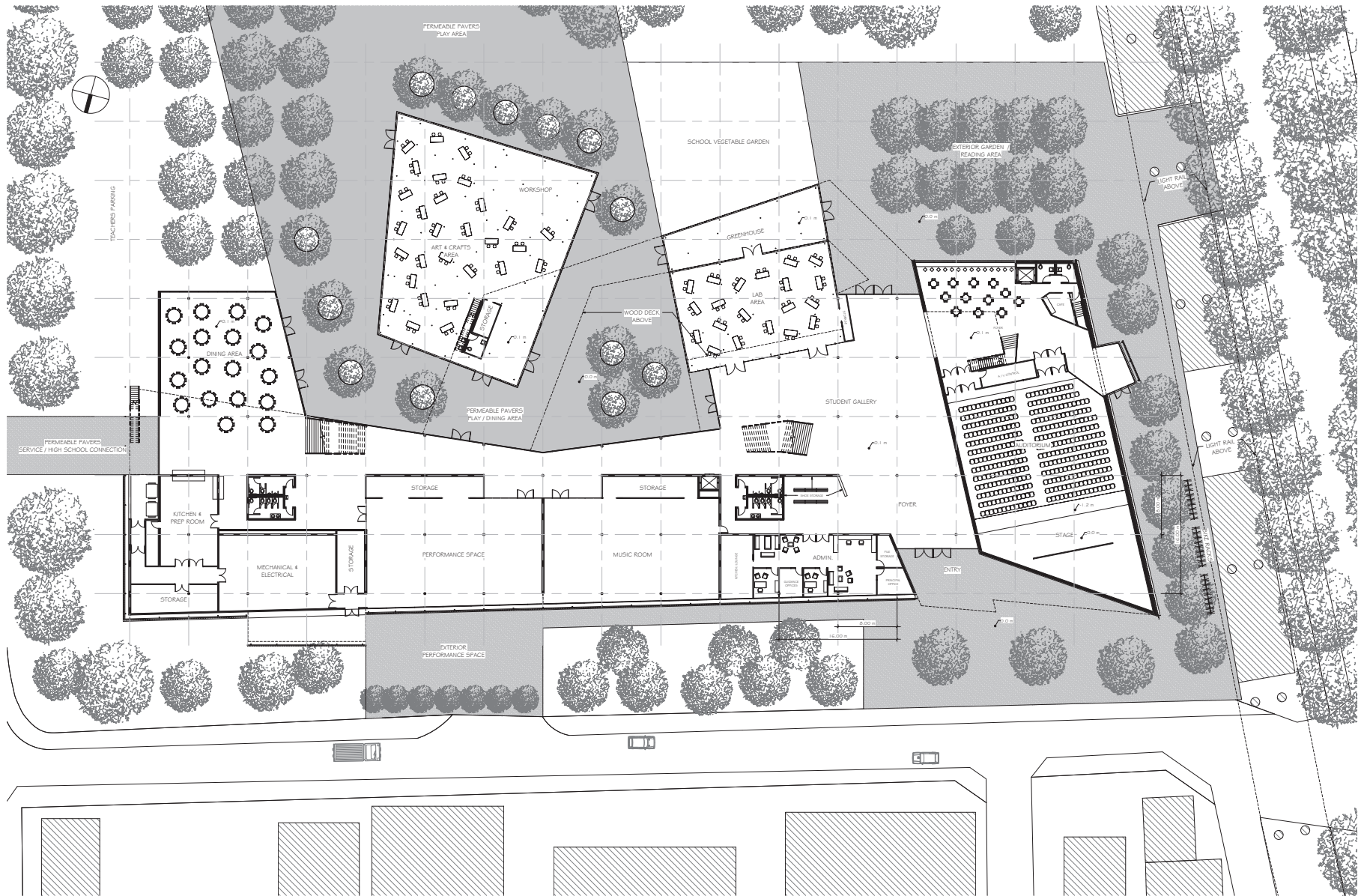


### Continuous Circulation

Breaking from the single loaded corridor found in all post-war schools, the project introduces a continuous circuit which is dictated by a continuous deck. The deck creates a seamless surface on the second floor that blurs the line between the interior and exterior spaces while also linking the “gems” to the core of the building.



# Ground Floor Plan

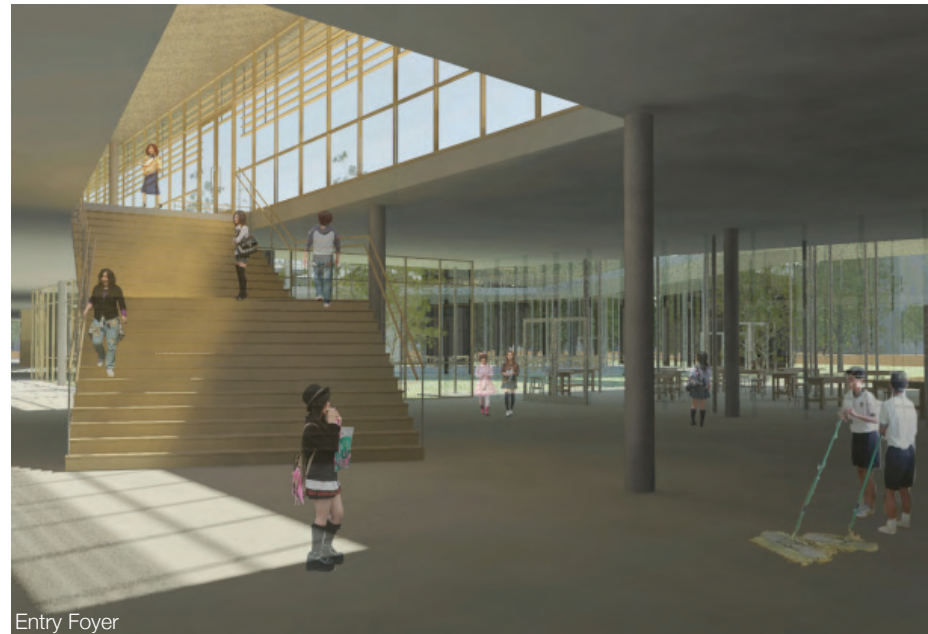
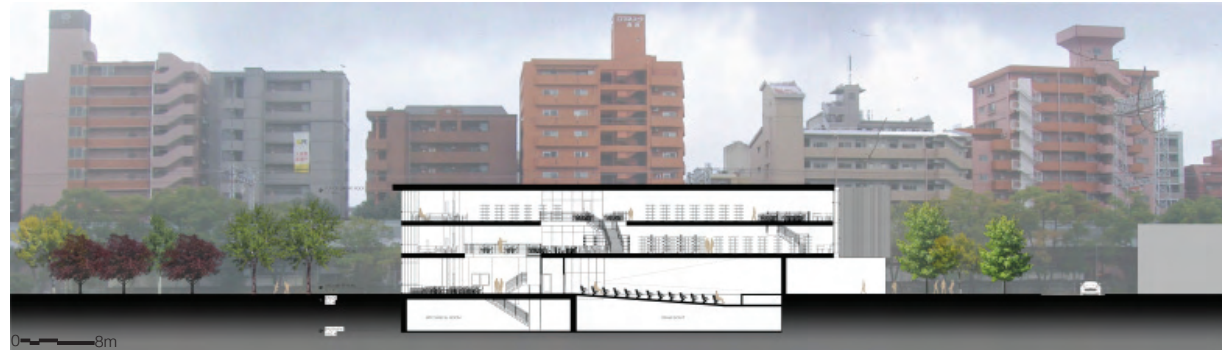


The ground floor of the project holds the programs that require large, open spaces. The auditorium with community library anchors the building along the rail line. The science labs greet visitors as they enter off the street between the auditorium and administration. The performance and music rooms sit street-side, opposite to the workshop with the service and dining services at the far end.

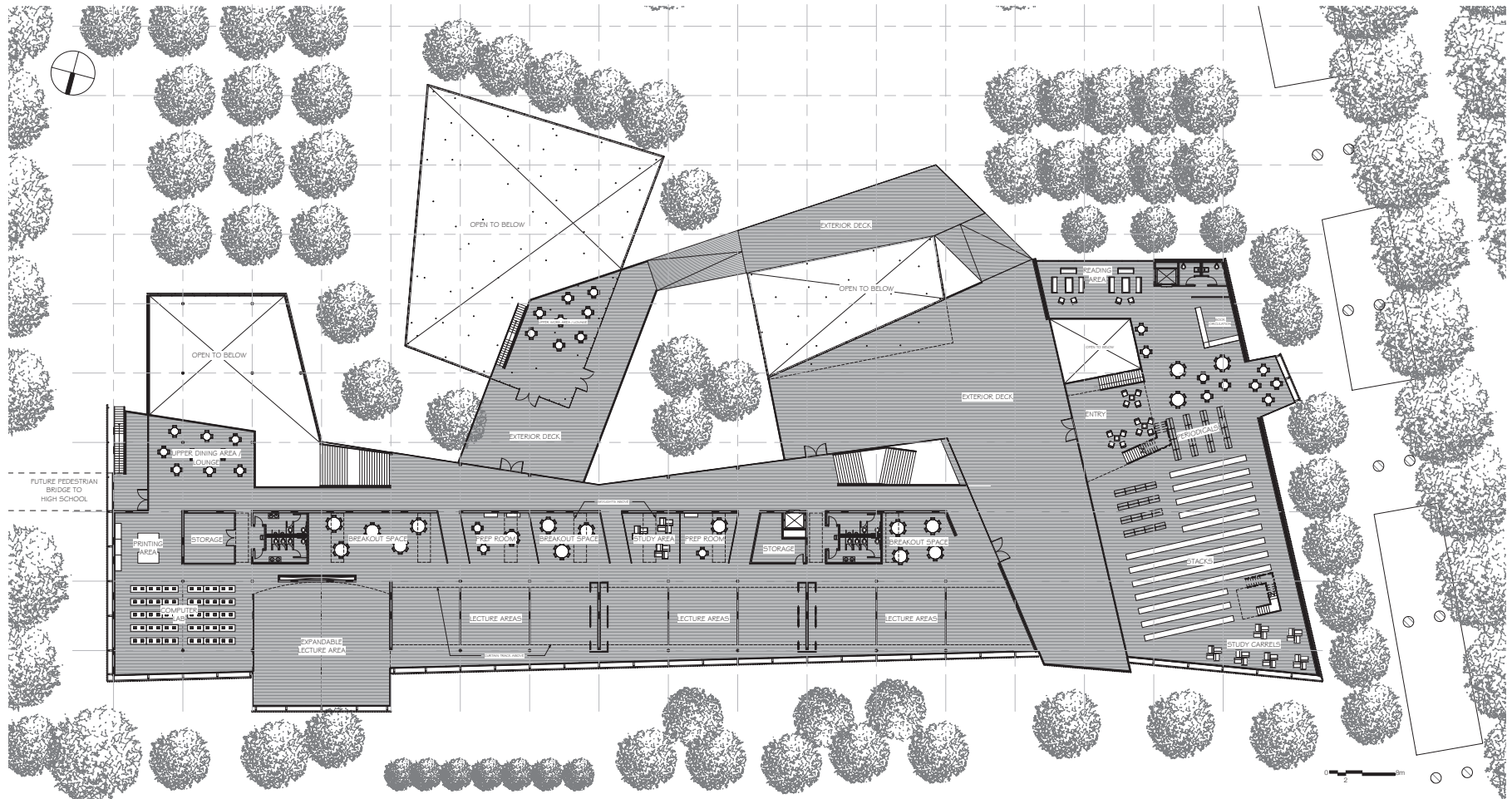


## Spatial Qualities

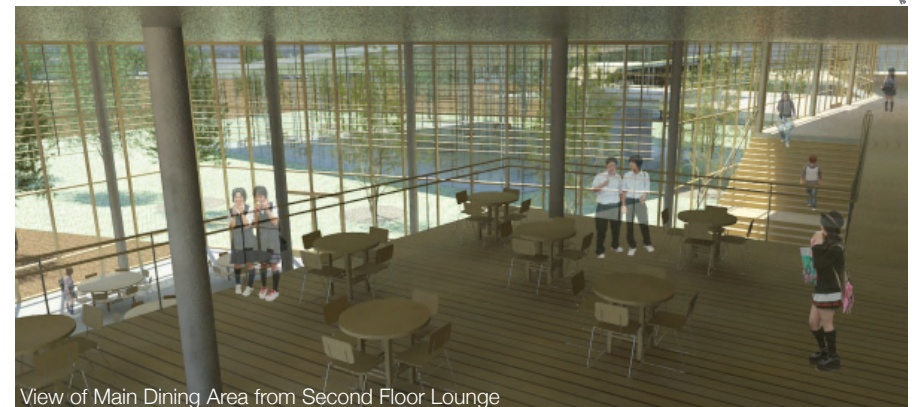
These images show the varying spatial characteristics throughout the building. From the stepped atrium above the auditorium to the mix of interior to exterior spaces in the section at the bottom, the project incorporates a mix of spatial experiences to enhance the character of the learning environment. The traditional Japanese breakdown of space through the perception of thresholds is a concept incorporated at various levels throughout the project.



## Second Floor Plan



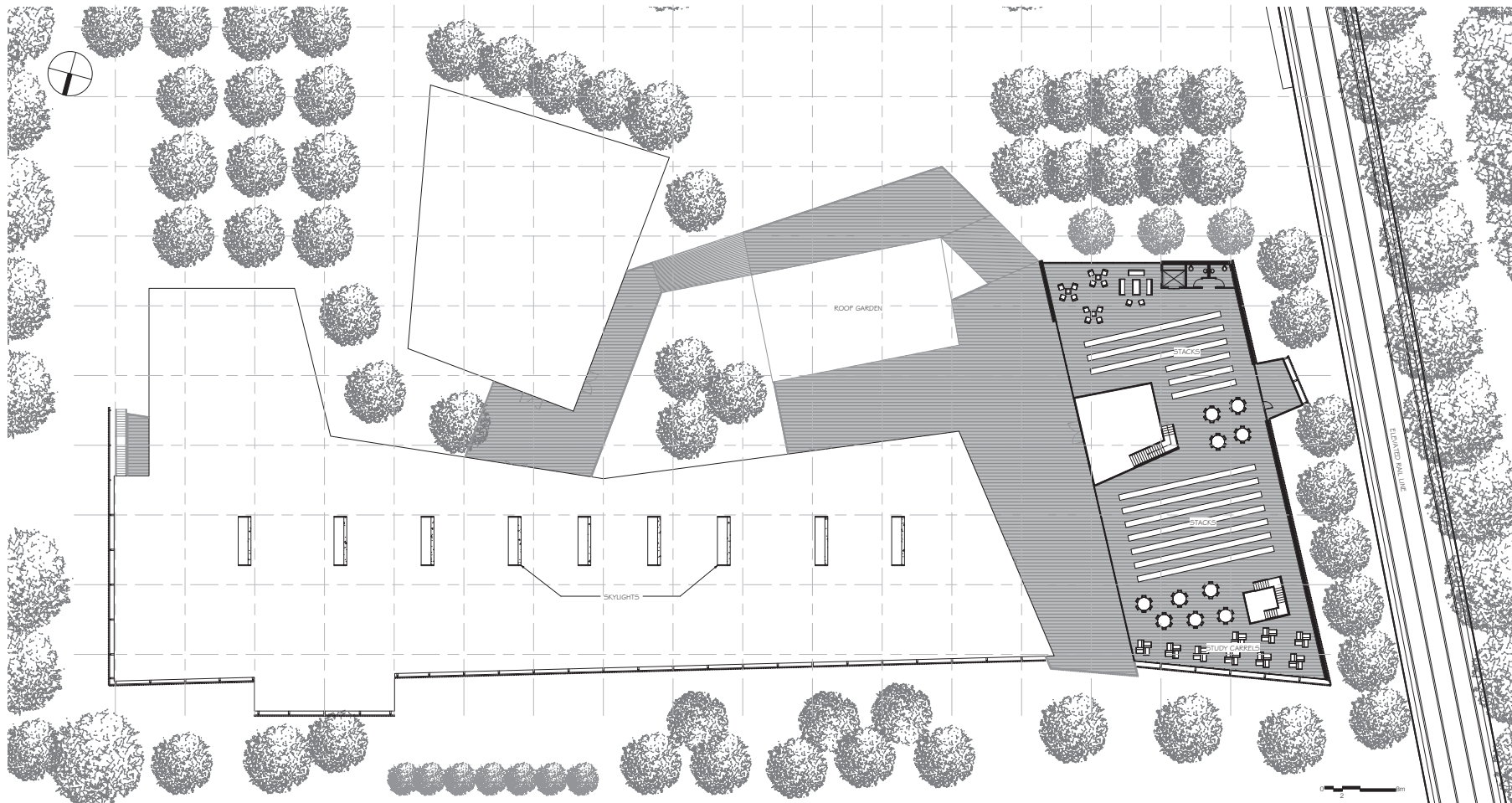
The second floor plan clearly illustrates the effect of the deck as a unifying element. The wood deck not only links programmatic elements but also helps link the interior and exterior spaces. The lecture areas are located to the north with the service bar in the center of the building. The lecture areas are defined from left to right by shear walls every three modular bays and from north to south by a curtain wall to the north and another shear wall to the south. The shear walls help contain seismic forces throughout the length of the building but they also create a definitive transition between spaces. This hard-lined transition begins to dissolve as you move from the lecture areas out towards the garden areas.



View of Main Dining Area from Second Floor Lounge



## Third Floor Plan



Approach from North

The third floor plan helps illustrate the relation of the deck to the rest of the building. Being three stories high, the library not only offers a view of the deck but also provides a view of the green roof over the core of the building (as shown on the facing page). The roof over the core building consists of several skylights that wash light into the study and breakout spaces on the second floor.



Auditorium Foyer





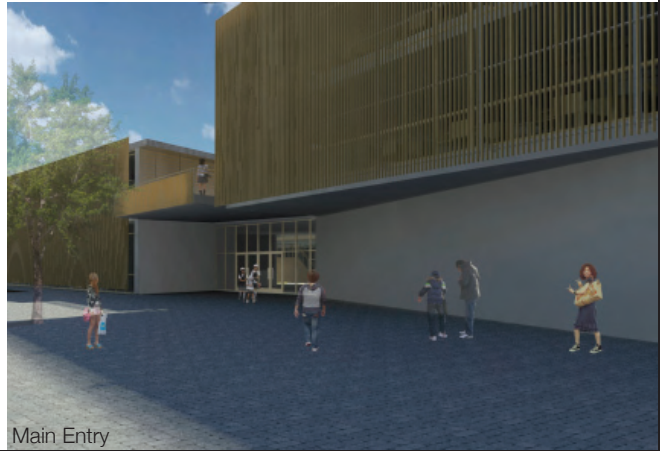
View of Deck from Third Floor of Library



Spatial Qualities



Interior of Workshop

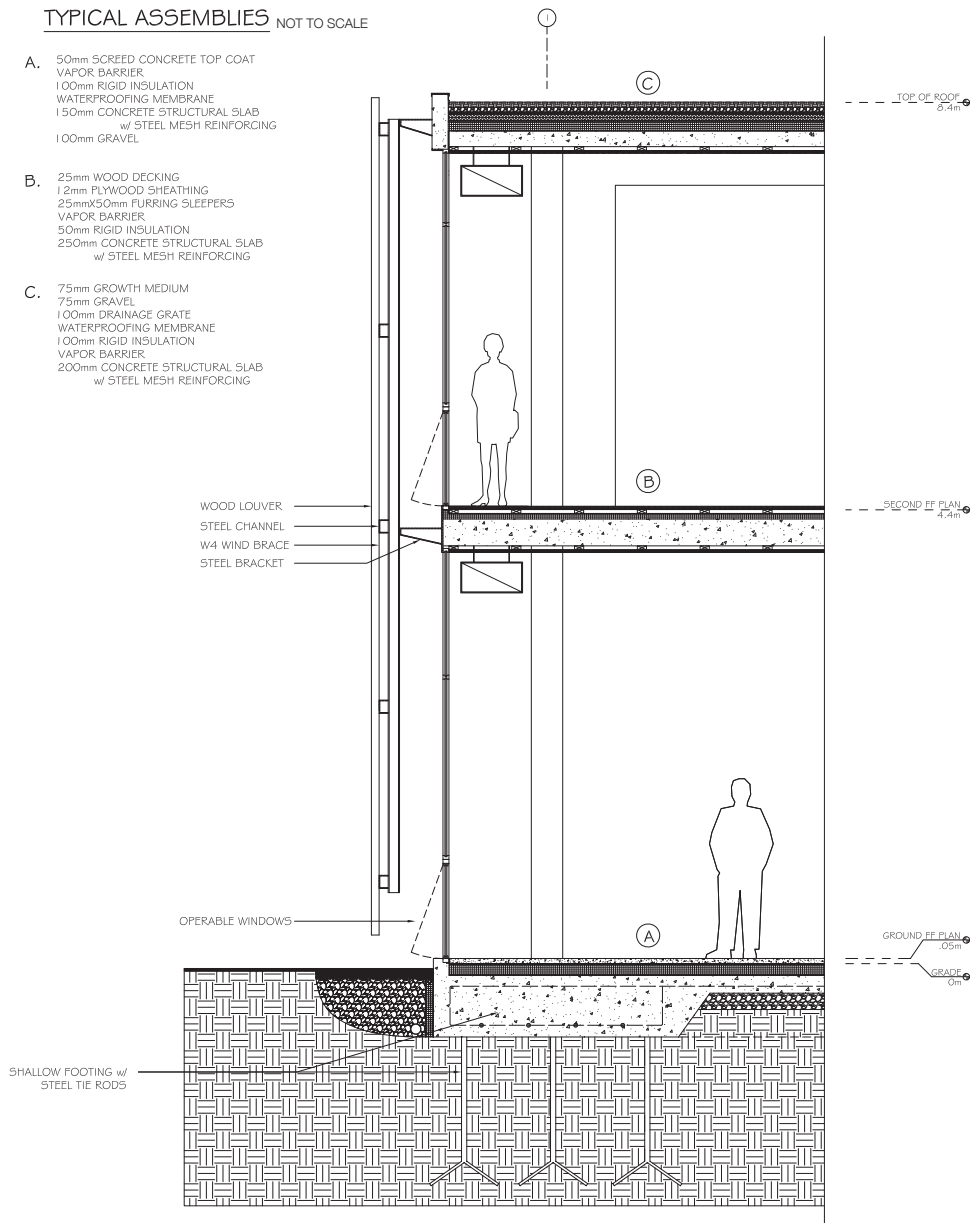


Main Entry

# Systems

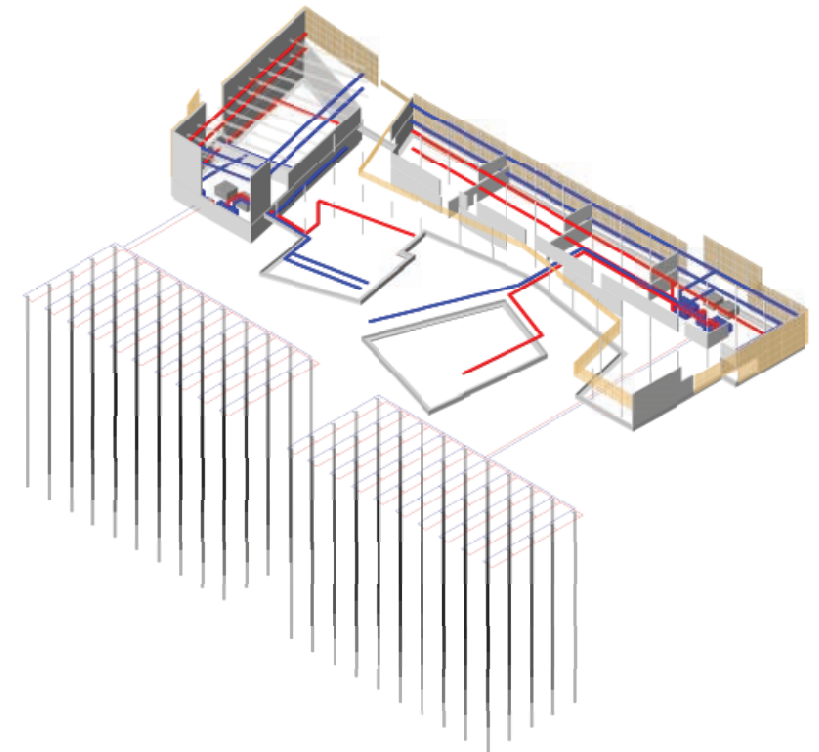
## TYPICAL ASSEMBLIES NOT TO SCALE

- A. 50mm SCREED CONCRETE TOP COAT  
VAPOR BARRIER  
100mm RIGID INSULATION  
WATERPROOFING MEMBRANE  
150mm CONCRETE STRUCTURAL SLAB  
w/ STEEL MESH REINFORCING  
100mm GRAVEL
- B. 25mm WOOD DECKING  
12mm PLYWOOD SHEATHING  
25mmX50mm FURRING SLEEPERS  
VAPOR BARRIER  
50mm RIGID INSULATION  
250mm CONCRETE STRUCTURAL SLAB  
w/ STEEL MESH REINFORCING
- C. 75mm GROWTH MEDIUM  
75mm GRAVEL  
100mm DRAINAGE GRATE  
WATERPROOFING MEMBRANE  
100mm RIGID INSULATION  
VAPOR BARRIER  
200mm CONCRETE STRUCTURAL SLAB  
w/ STEEL MESH REINFORCING



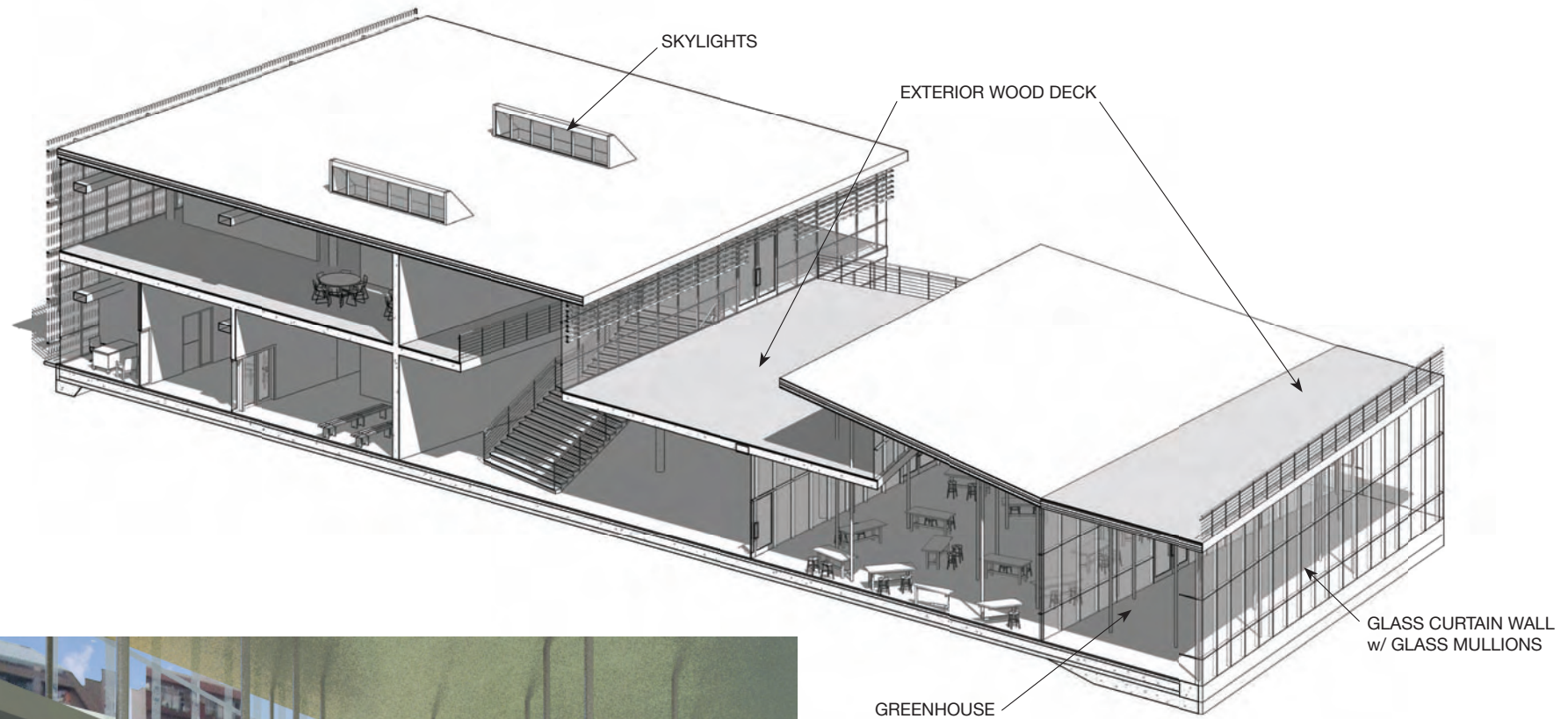
Kengo Kuma - Museum of Ando Hiroshige Tochigi

Source: GA 19: Kengo Kuma, ADA Editors. Tokyo, Japan. October, 2005



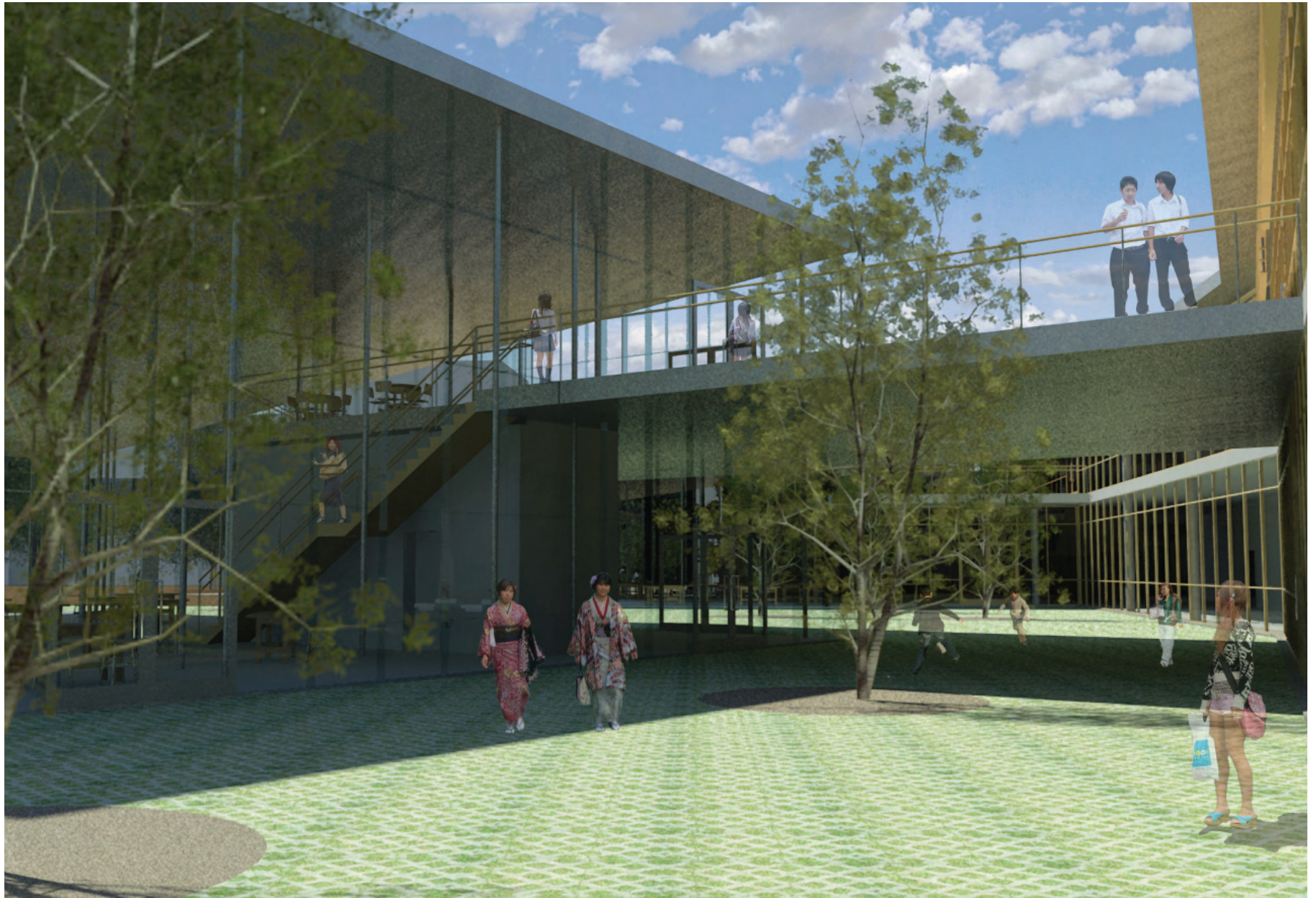


## Spatial Qualities



Junya Ishigami - Kanagawa Institute of Technology  
Source: <http://archide.wordpress.com/2009/02/06/junya-ishigami's-university-project-space-tokyo>









## Appendices

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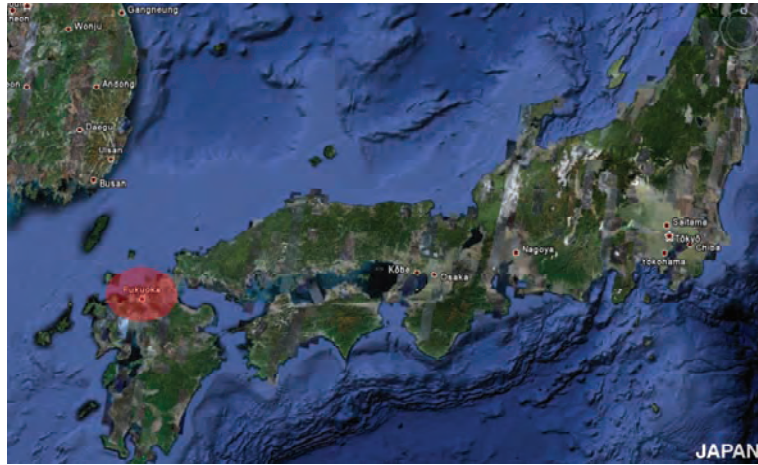




## Site Data

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# Location





## Census Data

As of May 2007, the city had an estimated population of 1,422,836 and a density of 4,184.07 persons per km<sup>2</sup>. The total area is 340.60 km<sup>2</sup>. With an average age of 38.6 years, Fukuoka is Japan's second youngest major city and with a growth rate of 4.4%, is also Japan's second-fastest growing city (based on 2000 census data). According to Fukuoka Now a recent government survey found Fukuoka has over 1200 homeless, the 4th highest number for any city in Japan.

Fukuoka was selected as one of Newsweek's 10 "Most Dynamic Cities" in its July 2006 issue. Fukuoka has a diverse culture and a wide range of cultural attractions. In its July/August 2008 issue, Monocle selected Fukuoka as number 17 of the "Top 25 Liveable Cities". It was chosen for excellent shopping, outstanding food, good transport links, good museums, "a feeling of openness in its sea air", green spaces and because it's friendly, safe, clean and close to East Asia.

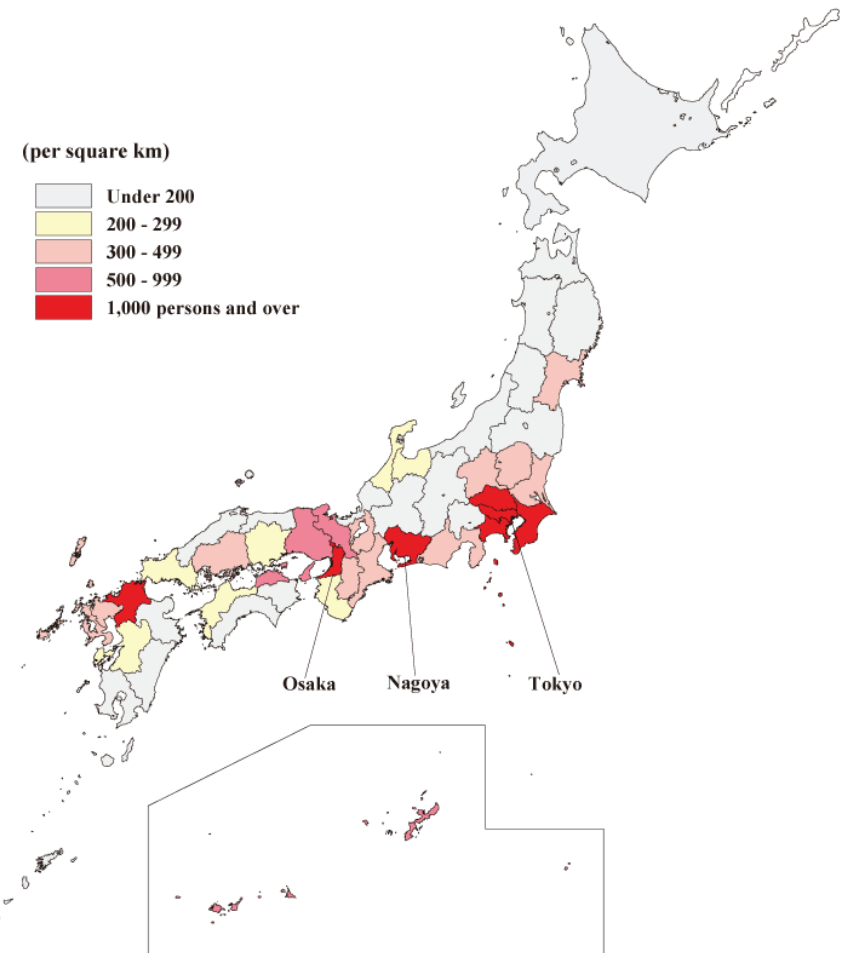
Fukuoka has 7 wards (ku):



Source: [http://en.wikipedia.org/wiki/Fukuoka,\\_Fukuoka](http://en.wikipedia.org/wiki/Fukuoka,_Fukuoka)

Ward	Population as of 2004	Land area km <sup>2</sup>	Pop. density per km <sup>2</sup>
Higashi-ku	275 652	66.68	4 134
Hakata-ku	190 178	31.47	6 043
Chūō-ku	163 975	15.16	10 816
Minami-ku	247 913	30.98	8 002
Jonan-ku	127 952	16.02	7 987
Sawara-ku	207 851	95.88	2 168
Nishi-ku	177 625	83.81	2 119

**Figure 2.9**  
**Population Density by Prefecture (2005)**



Source: Statistics Bureau, MIC.



# History

## Major Historical Events and Radical Paradigm Shifts

### Mongol Invasions

Fukuoka being a port city and the closest of the Japanese cities to China and Korea made it a gateway into Japan. In 1274 Kublai Khan mounted an invasion of the northern part of Kyushu with a fleet of 900 ships and 33,000 troops, which included troops from Goryeo on the Korean peninsula. This first invasion was compromised by a combination of incompetence and storms. After the first invasion of 1274, Japanese samurai built a stone barrier 20 kilometers in length bordering the coast of Hakata Bay in what is now Fukuoka city. The wall, between 2-3 metres in height and having a base width of 3 metres, was constructed between 1276 and 1277 and was excavated in the 1930s.



### Westernization

Under the Emperor Meiji, Japan underwent a major transformation. The emperor transformed Japan from a modest, agrarian society to a modern, industrial power. With Meiji Restoration of the 19th century, Fukuoka-ken entered the modern era and became one of the driving forces in the Japanese industrial revolution. Factories were built in nearby Kita-kyushu, and the rural hinterlands of the Chikuho area became a major source of coal for the burgeoning economy.



### World War II: Reconstruction

During the first half of the 20th century Fukuoka began to grow, opening a large university (Kyushu Imperial University), an international airport and a subway system (that was expanded in 2005). The city was bombed and damaged during the Pacific War and elements of the notorious Unit 731 performed operations on POWs at Kyushu Imperial University. After the surrender of Japan, American Forces occupied Japan for several years to help oversee the reconstruction efforts. At this point in time, the Japanese adopted many of the American social systems, one of these being the educational system. Schools were built in all cities and towns based on a standard plan. Long, linear, single-loaded buildings were constructed to educate the young people in the community. In contemporary Japan, many schools still function in these outdated structures, further inhibiting progress in the school system.



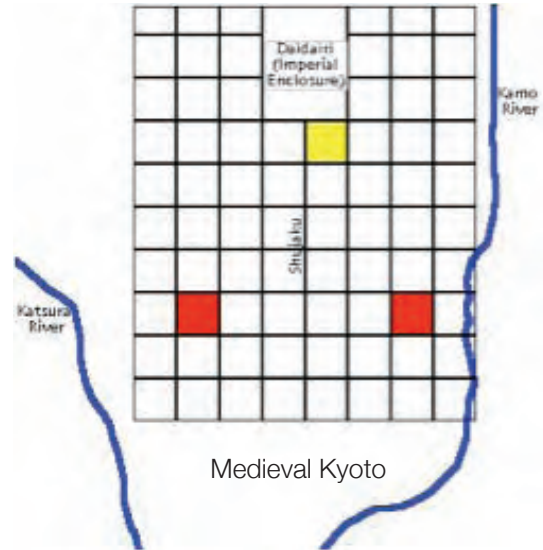
Image 1: [http://www.lssu.edu/faculty/jswedene/World\\_Civilizations\\_1\\_8\\_A.html](http://www.lssu.edu/faculty/jswedene/World_Civilizations_1_8_A.html)

Image 2: [http://www.allenpires.com/article/index.php?q=meiji\\_restoration](http://www.allenpires.com/article/index.php?q=meiji_restoration)

Image 3: <http://www.childlit.com/battledore/shop/index.php>

# History

## Japanese City Growth



Medieval Kyoto



Medieval Tokyo



### Grid

Kyoto is one of the only Japanese cities laid out on a grid system. Kyoto was once the capital of Japan and the city adopted the grid as the governing urban growth system. Within the grid there is no centrality, this ambiguity is a common theme throughout Japanese architecture.

### Linear

Some towns and cities were formed as a result of waterways. These waterways, some natural and some man-made fed the rice fields of the town, hence the city slowly grew along these paths.

### Cellular

The last significant type of urban growth was the cellular growth. Made up of pockets of neighborhoods based on occupation and hereditary lines, the cellular growth pattern was a matter of acquiring neighborhoods over time to slowly form a city. Most Japanese cities are based off of this style of growth, including Tokyo and Fukuoka.



# History

## Fukuoka City Growth

This 1925 map illustrates the slow acquisition of neighboring towns to officially form what we now know as Fukuoka City. The red portion of the map highlights the initial settlement in Fukuoka with the yellow and blue subsequent additions to the city.

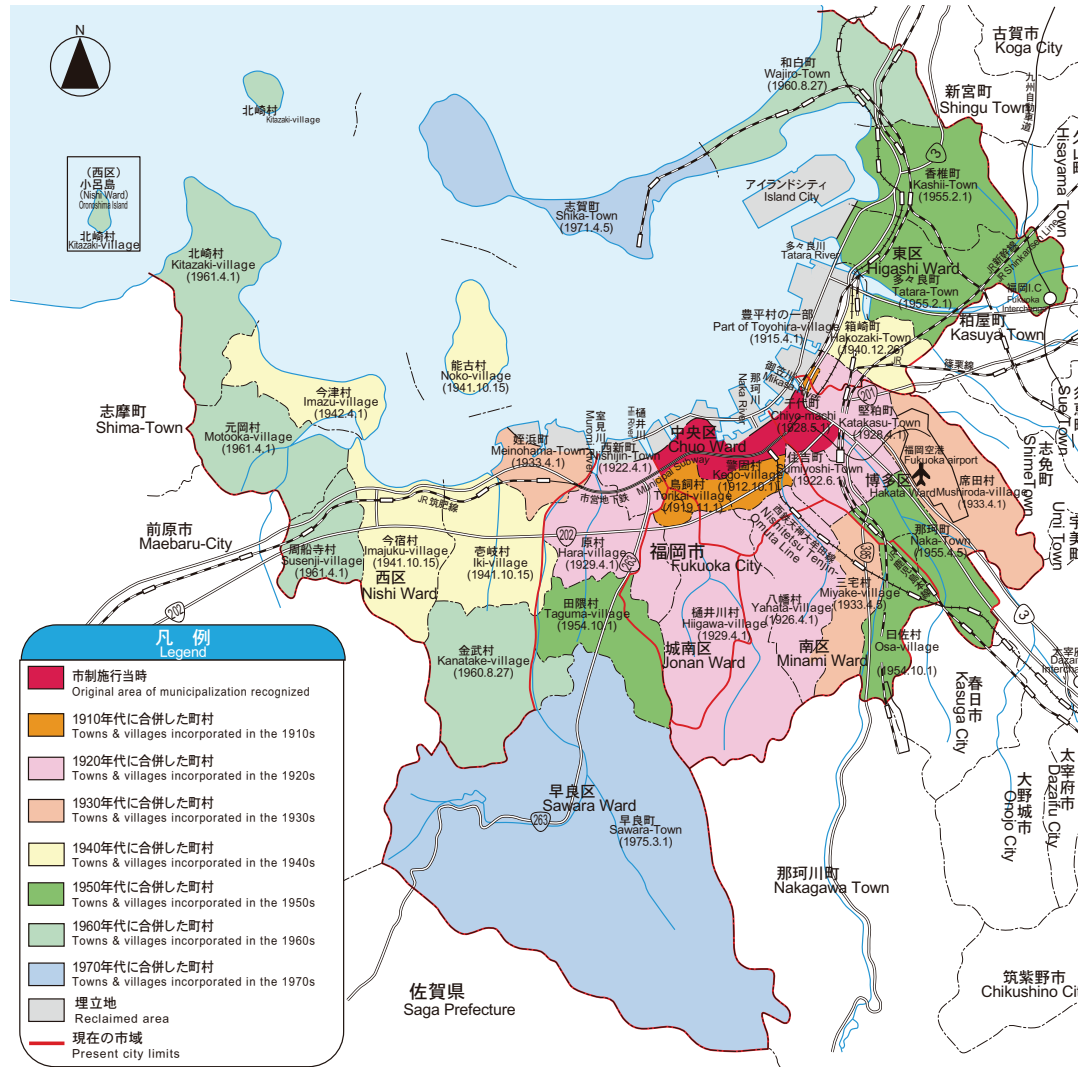


Source: [http://jpimg.digital.archives.go.jp/kouseisai/map/fukuoka\\_e.html](http://jpimg.digital.archives.go.jp/kouseisai/map/fukuoka_e.html)



# History

## Fukuoka Land Acquisition Under Emperor Meiji during the Modernization Effort



Fukuoka became one unified city in 1889 during Emperor Meiji's modernization program. The initial city was comprised of a merger between the port based trading town of Hakata, and Fukuoka, an area where many samurai resided. As time went on, Fukuoka grew from these two centers and acquired several other neighboring towns until 1969 when the Fukuoka city government demarcated the Urban Zones.



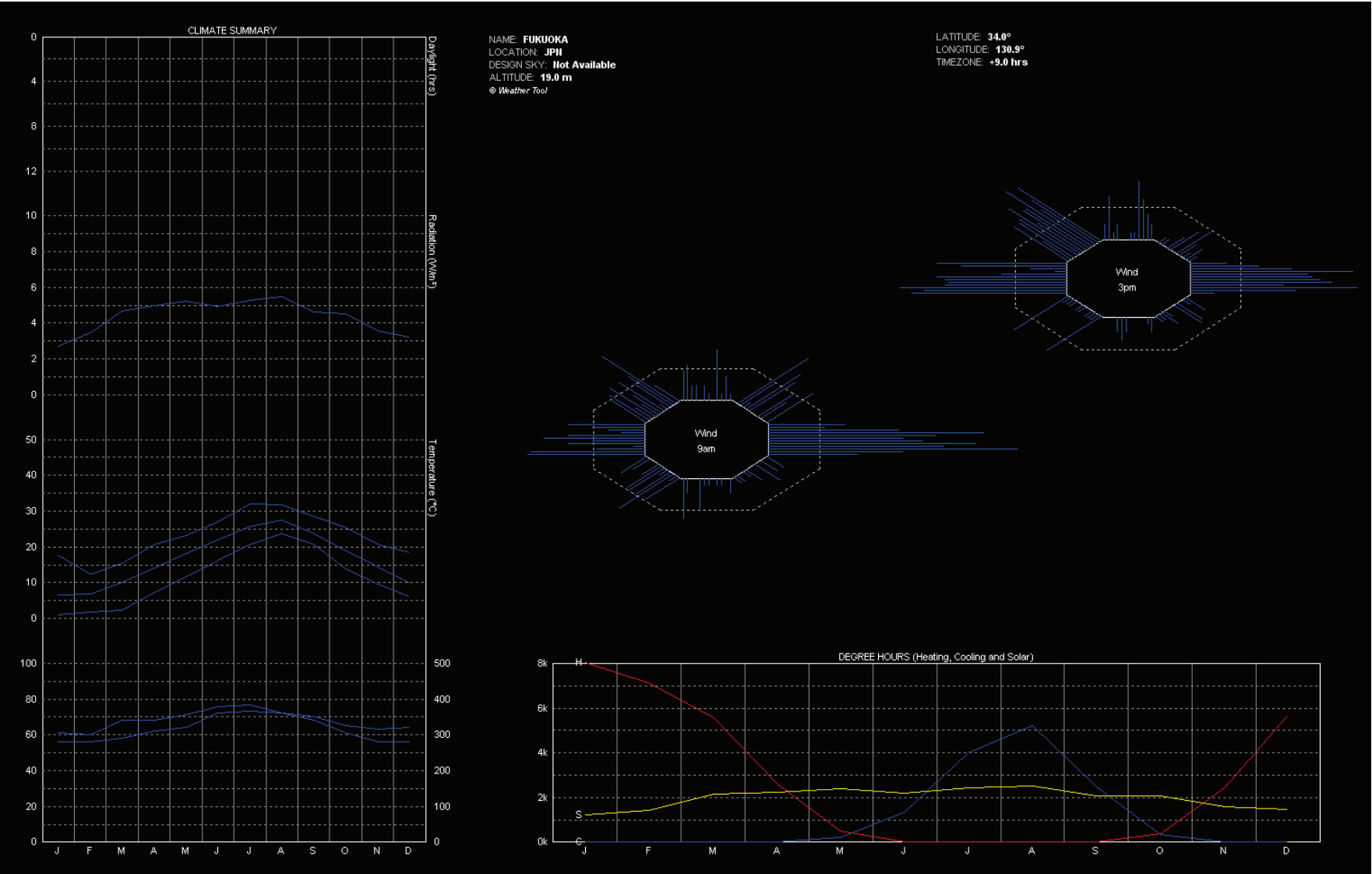
The Kyushu Railway Opened between Hakata and Chitosegawa (Kurume) (1889)  
The photo shows the Hakata Station in 1924.



The City's First Traffic Signal at Tenjin Crossing (1930)

# Climate Data

## Overview

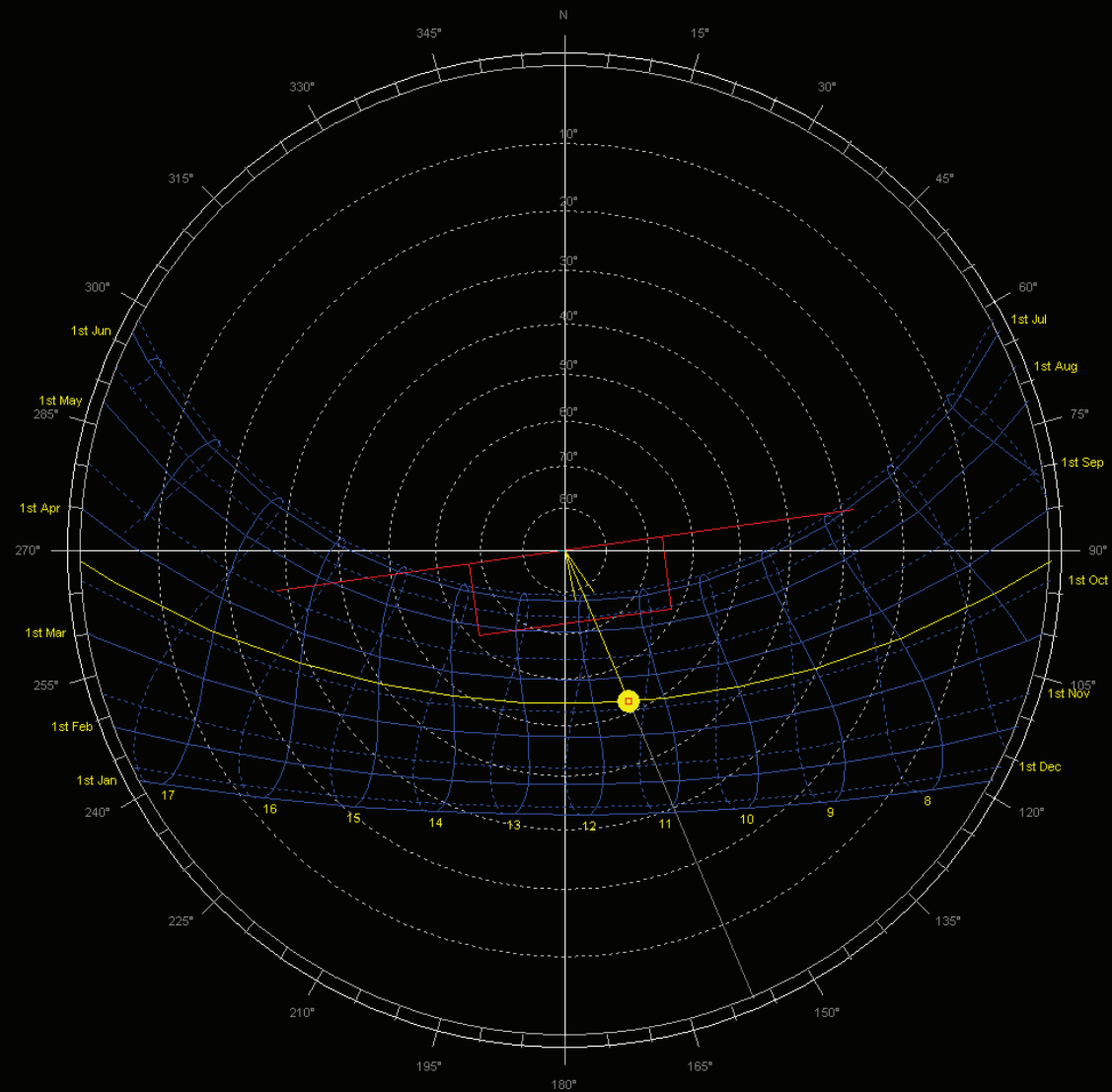


# Climate Data

## Sun Path Diagram

### Stereographic Diagram

Location: FUKUOKA, JPN  
Sun Position: 157.3°, 52.7°  
HSA: -14.7°, VSA: 53.6°  
© Weather Tool



Time: 11:30  
Date: 19th March  
Dotted lines: July-December.

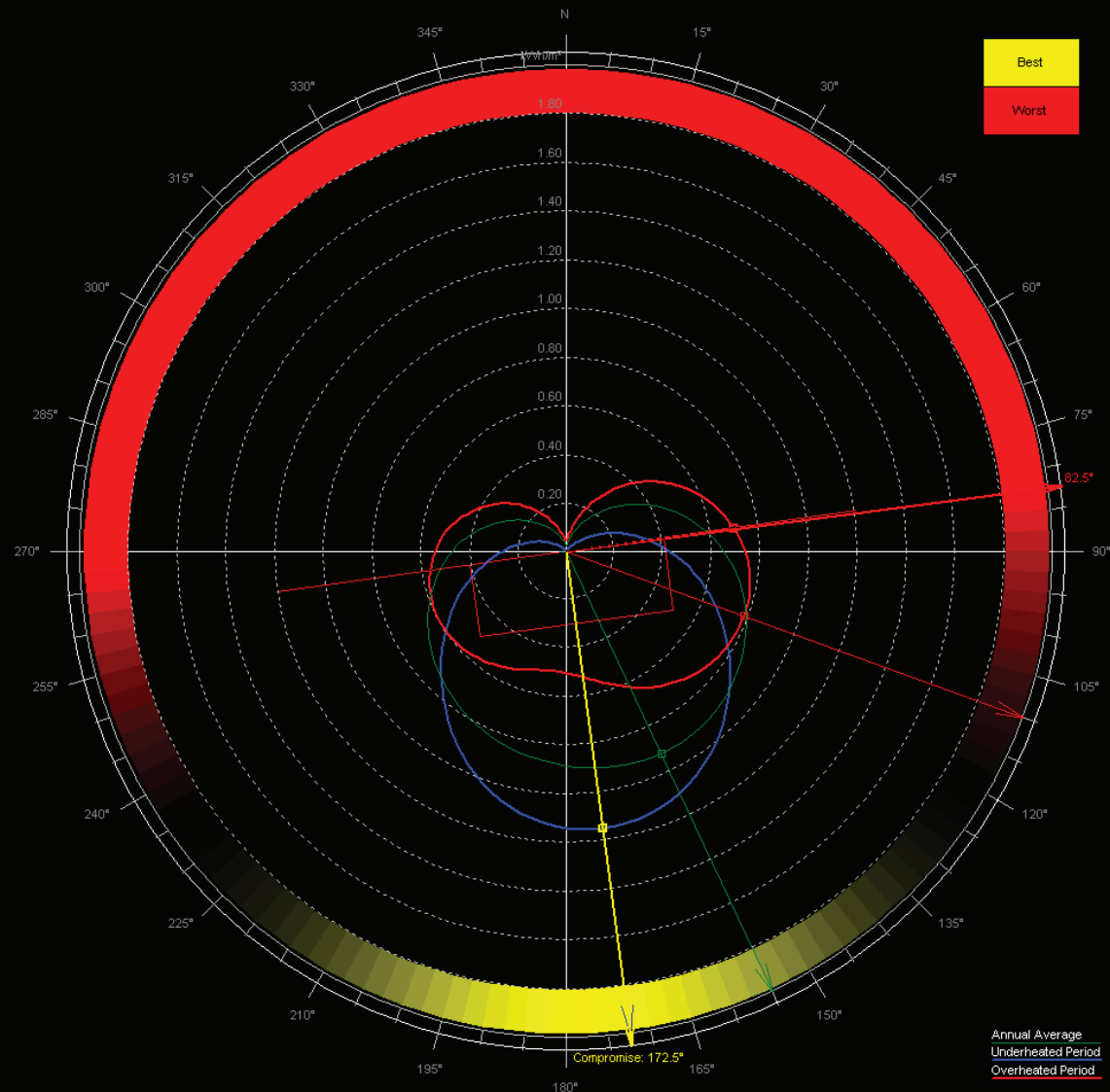


# Climate Data

## Optimum Orientation

### Optimum Orientation

Location: SHIMONOSEKI, JPN  
Orientation based on average daily incident radiation on a vertical surface.  
Underheated Stress: 1117.5  
Overheated Stress: 65.6  
Compromise: 172.5°  
© Weather Tool



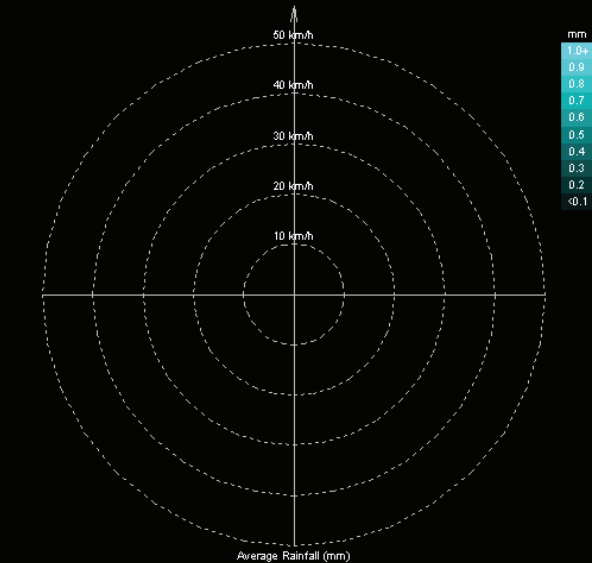
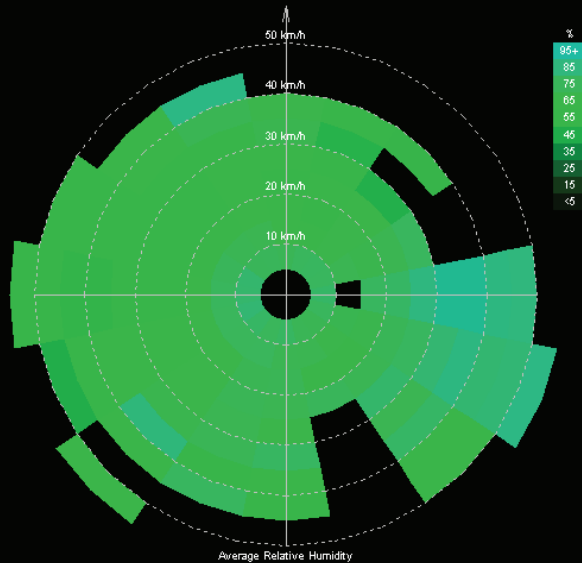
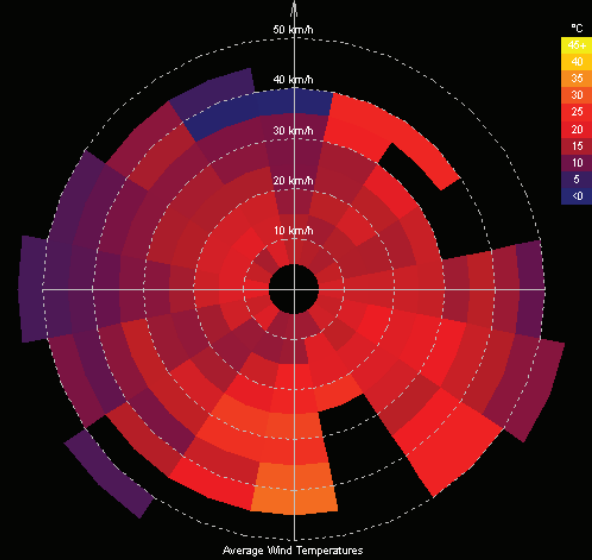
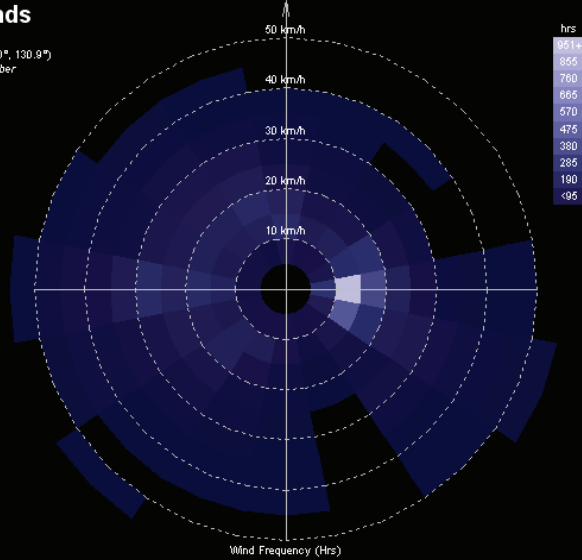
In order to best take advantage of minimum cooling and heating loads, the building should be oriented roughly 8° off of the southern axis. As the chart above illustrates the under-heated period in Fukuoka's climate is fairly short compared to the overheated period (shown in the wider red circle).

# Climate Data

## Prevailing Winds

### Prevailing Winds

Wind Frequency (Hrs)  
Location: FUKUOKA, JPN (34.0°N, 130.9°E)  
Date: 1st January - 31st December  
Time: 00:00 - 24:00  
© Weather Tool



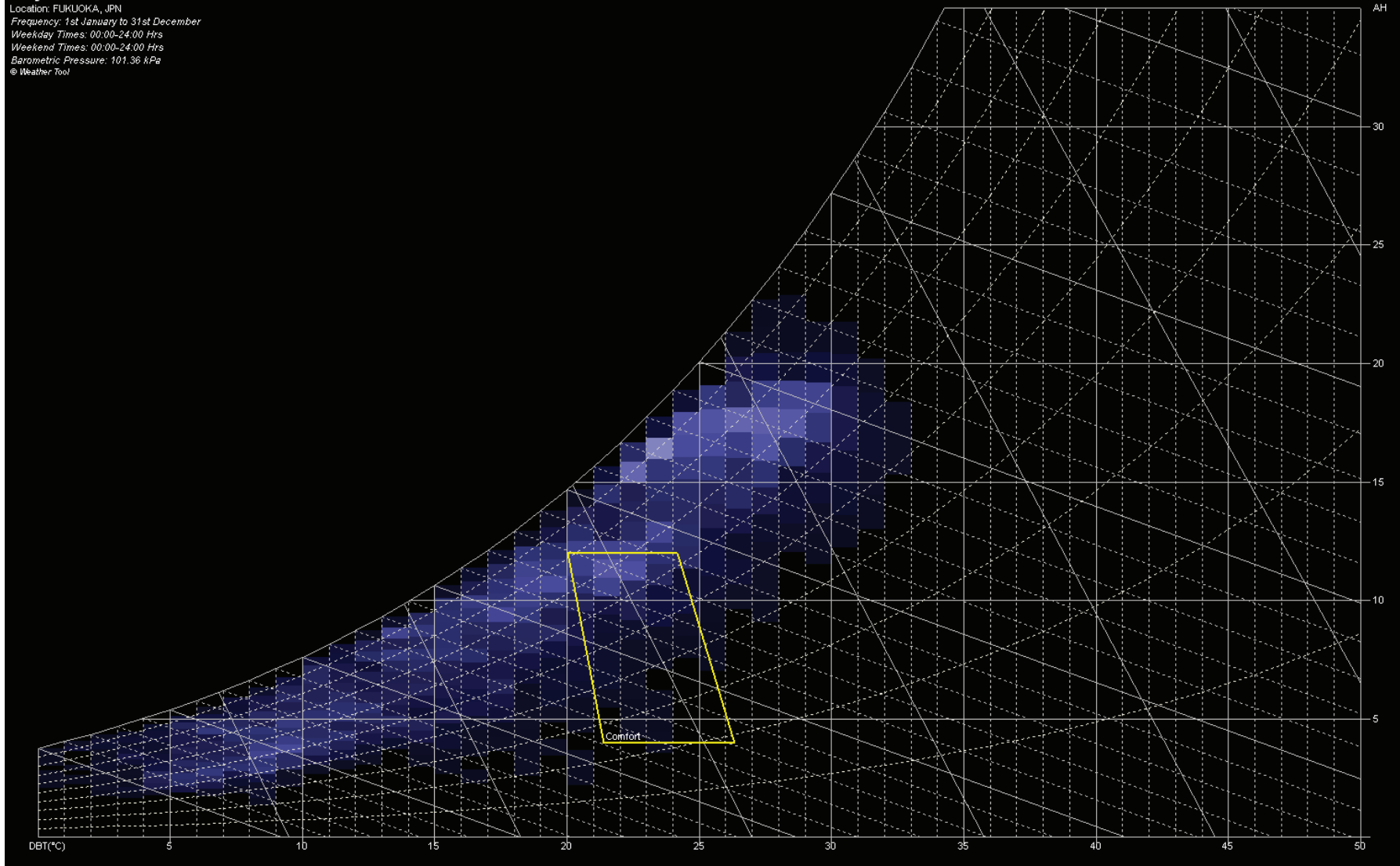
These three graphs illustrate the wind intensity, temperature, and relative humidity of the prevailing winds in Fukuoka. Since Fukuoka sits in a valley, enclosed by mountains with the exception of the side to the sea, Fukuoka does not experience strong gusts of wind. As the graphs illustrate above the winds tend to be warm with average levels of moisture.

# Climate Data

## Relative Humidity

### Psychrometric Chart

Location: FUKUOKA, JPN  
Frequency: 1st January to 31st December  
Weekday Times: 00:00-24:00 Hrs  
Weekend Times: 00:00-24:00 Hrs  
Barometric Pressure: 101.36 kPa  
© Weather Tool



As the chart above illustrates the relative humidity in Fukuoka can be fairly high at times. Located on an island in the south of Japan, Fukuoka is closer to the equator but still experiences high levels of humidity in the spring and summer months.



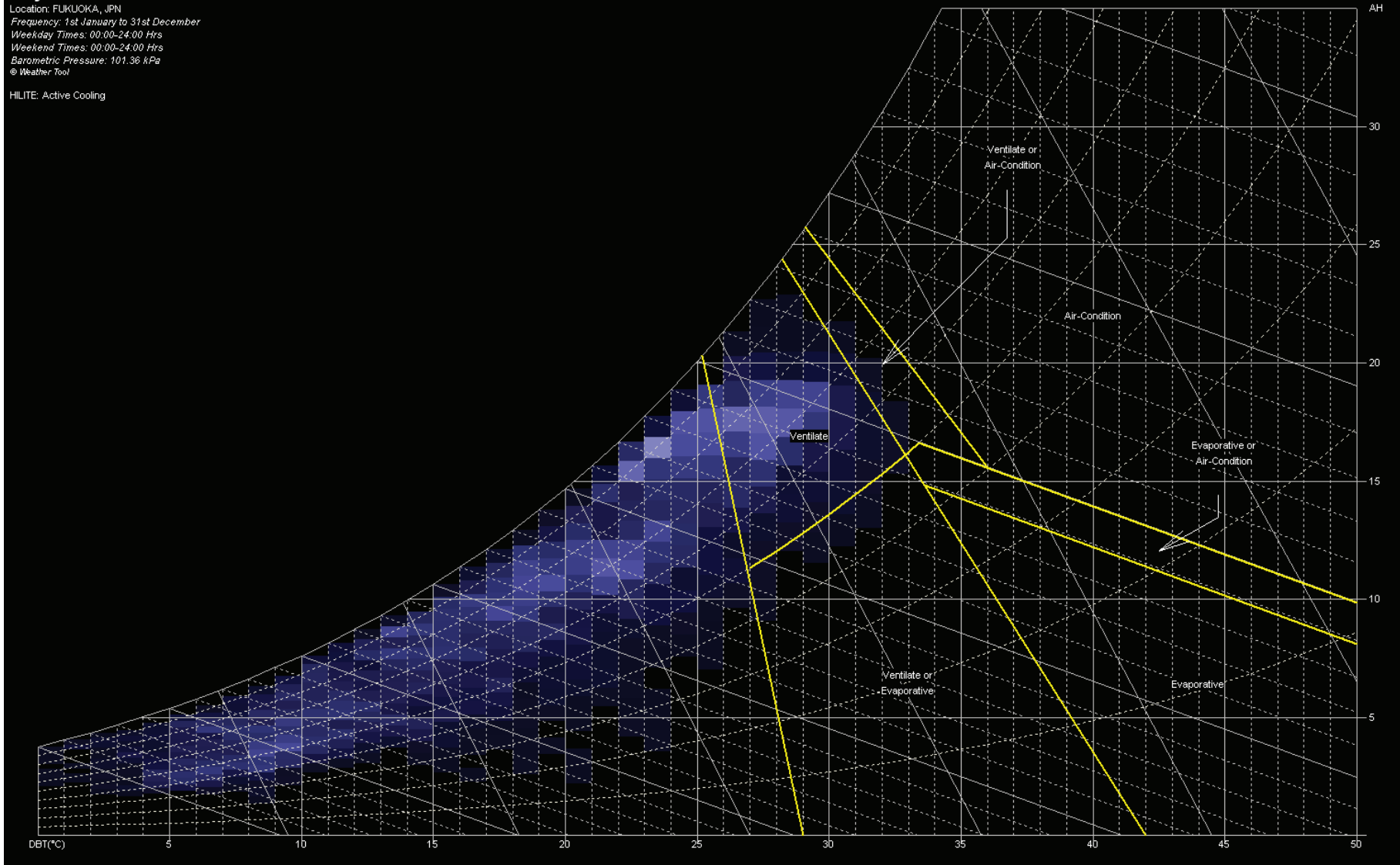
# Climate Data

## Active Cooling Options

### Psychrometric Chart

Location: FUKUOKA, JPN  
Frequency: 1st January to 31st December  
Weekday Times: 00:00-24:00 Hrs  
Weekend Times: 00:00-24:00 Hrs  
Barometric Pressure: 101.36 kPa  
© Weather Tool

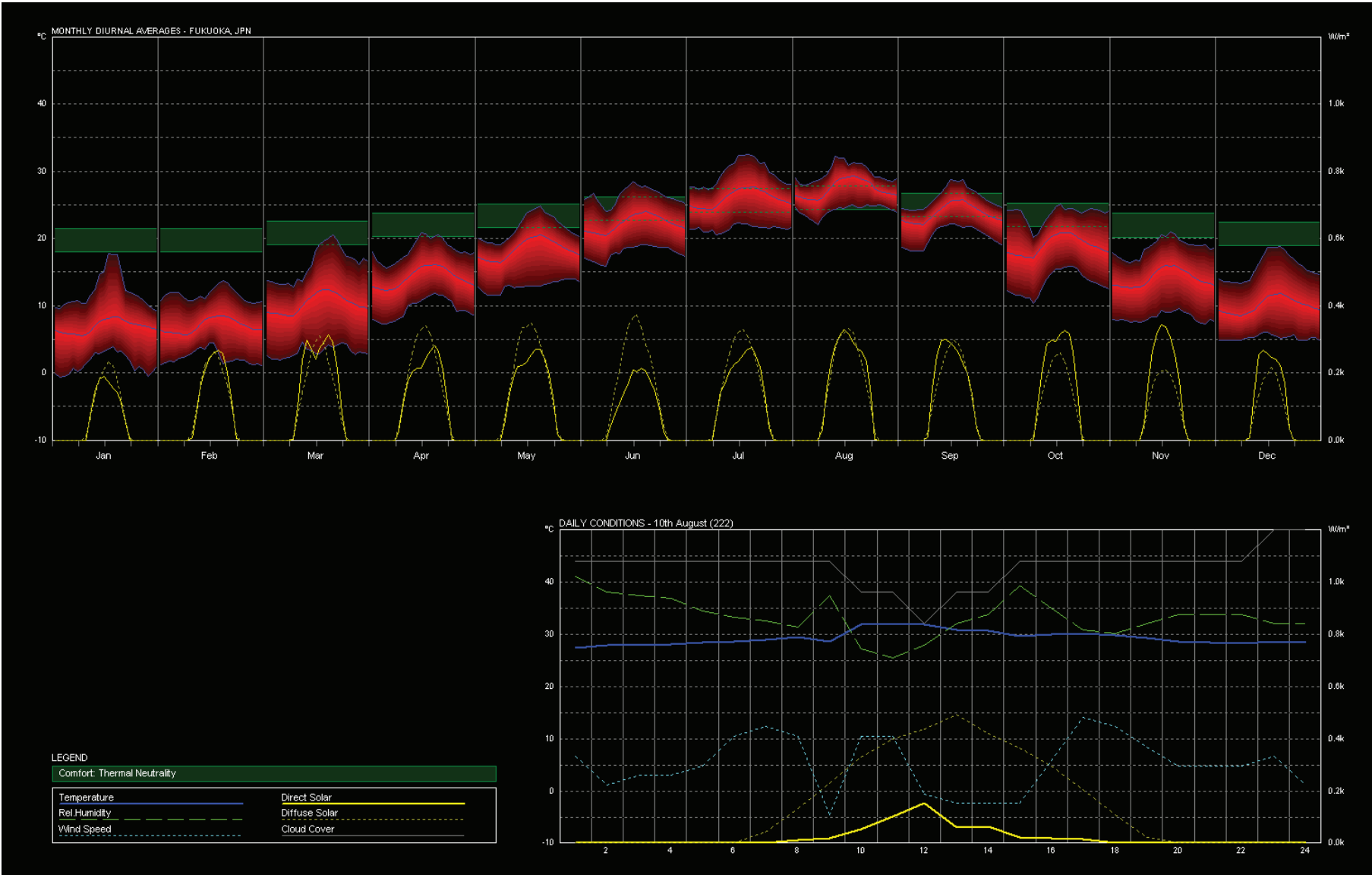
HILITE: Active Cooling



As the chart above illustrates the relative humidity in Fukuoka can be managed mainly through cross ventilation. Being so humid, evaporative cooling is not a feasible sustainable alternative. Throughout the history of Japanese architecture and even in most contemporary buildings, cooling by way of an articulated natural ventilation serves as the main source of temperature control.

# Climate Data

## Solar Radiation



## Climate Data

### Rainfall



Fukuoka's sub-tropical climate experiences generally mild weather with a short rainy season. For the most part there is a steady amount of rain through the winter and spring months with the amount of rain increasing during the summer months. Fukuoka is usually very hot and humid which, during the summer months, makes it an ideal place for sudden, intense thunderstorms that can cause minor flooding. The site design must accommodate for these strong periods of rain with an appropriate water management system, perhaps re-using rainwater within the building or as a cooling effect.

### 月別平均気温と降水量（平成19年）

Monthly Average Temperature and Rainfall

年平均温度 18.0℃

年降水量 1,195.0mm

2007 Average Temperature

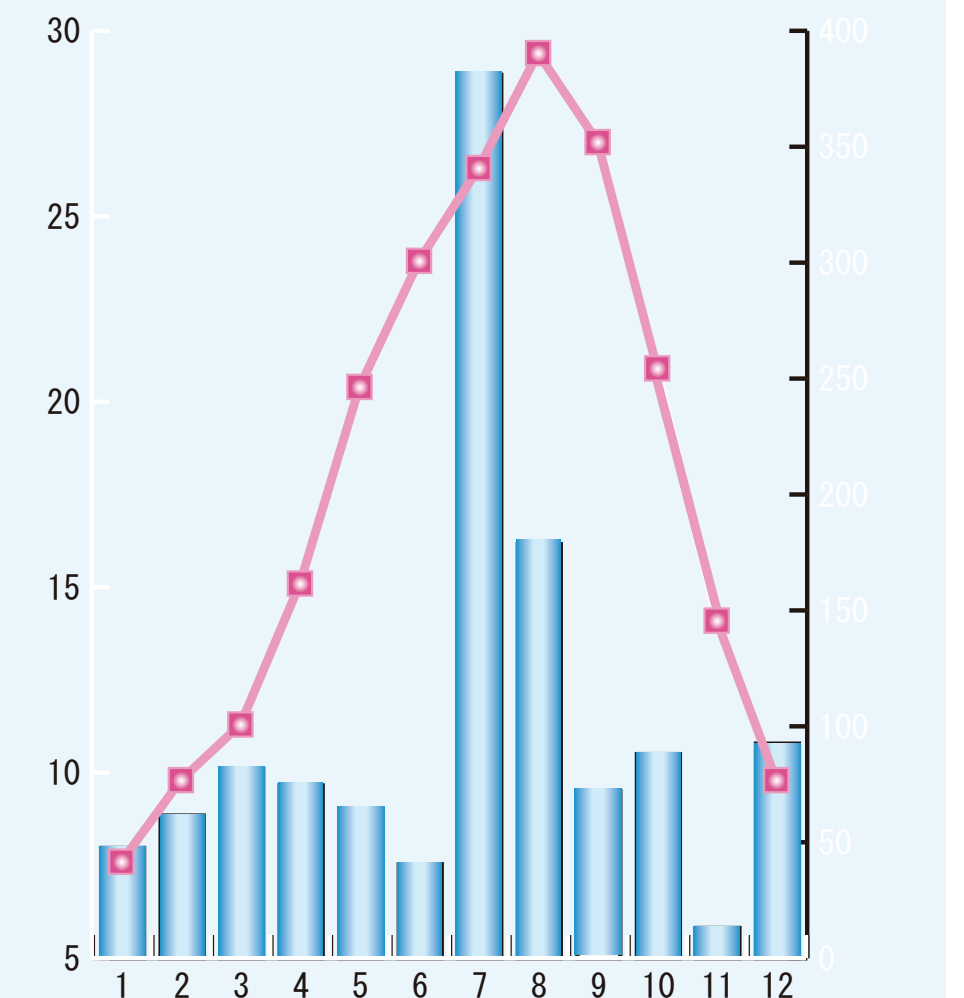
2007 Total Rainfall

気温 (℃)

Temperature

降水量 (mm)

Rainfall



資料：福岡管区气象台

Source: Fukuoka District Meteorological Observatory



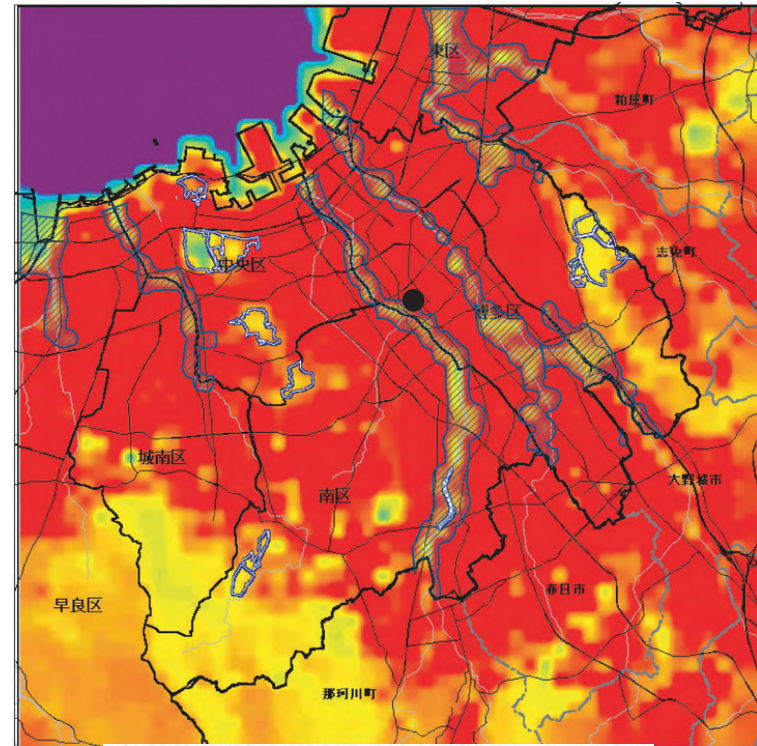
## Climate Data

### Heat Island Effect



Thermal Image of “Heat Island Effect” in Fukuoka Prefecture

Fukuoka currently suffers from the Heat Island Effect caused by the numerous buildings and heat trapping hardscapes within the city. The map on the right illustrates the heat density of the city in a one year period. The site, being located within the center of Fukuoka, responds to these conditions with an active cooling strategy for the building and the site design. Fukuoka has started programs to help cool the city by introducing a large water source on the outskirts of town. The city has also started planting trees along major roadways and rail lines to create several “green” parkways throughout the city. One of these pedestrian greenbelts runs along the west site boundary. The project brings this greenbelt into the site creating a buffer between the academic and athletic activities while also greening the site and ultimately helping reduce the heat island effect.

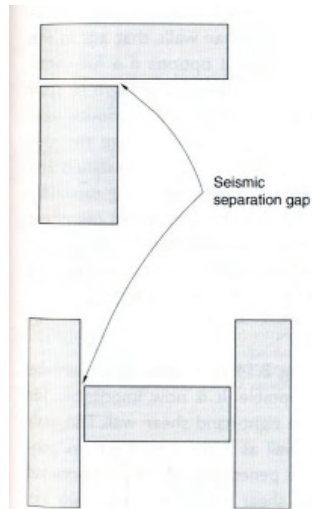




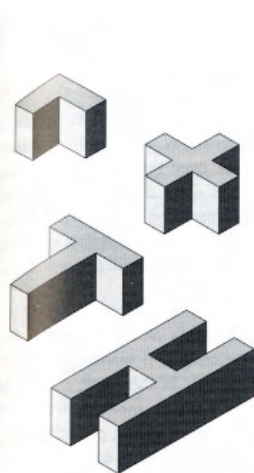
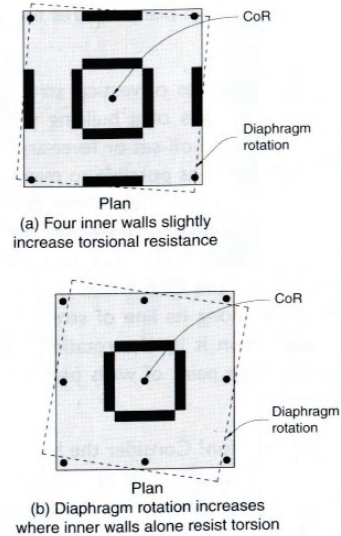
# Climate Data

## Earthquake Hazard

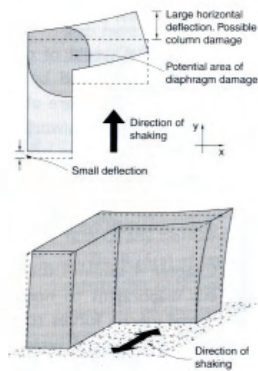
Although earthquakes are not as threatening as other areas of Japan, Fukuoka does have to accommodate for seismic design in any new construction. The diagram on the right shows Fukuoka's seismic activity compared to the rest of Japan, while the other diagrams illustrate some basic design strategies when coping with earthquake-prone areas.



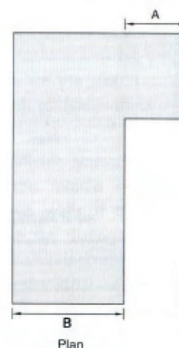
▲ 8.13 Irregular plan configurations improved by seismic separation gaps.



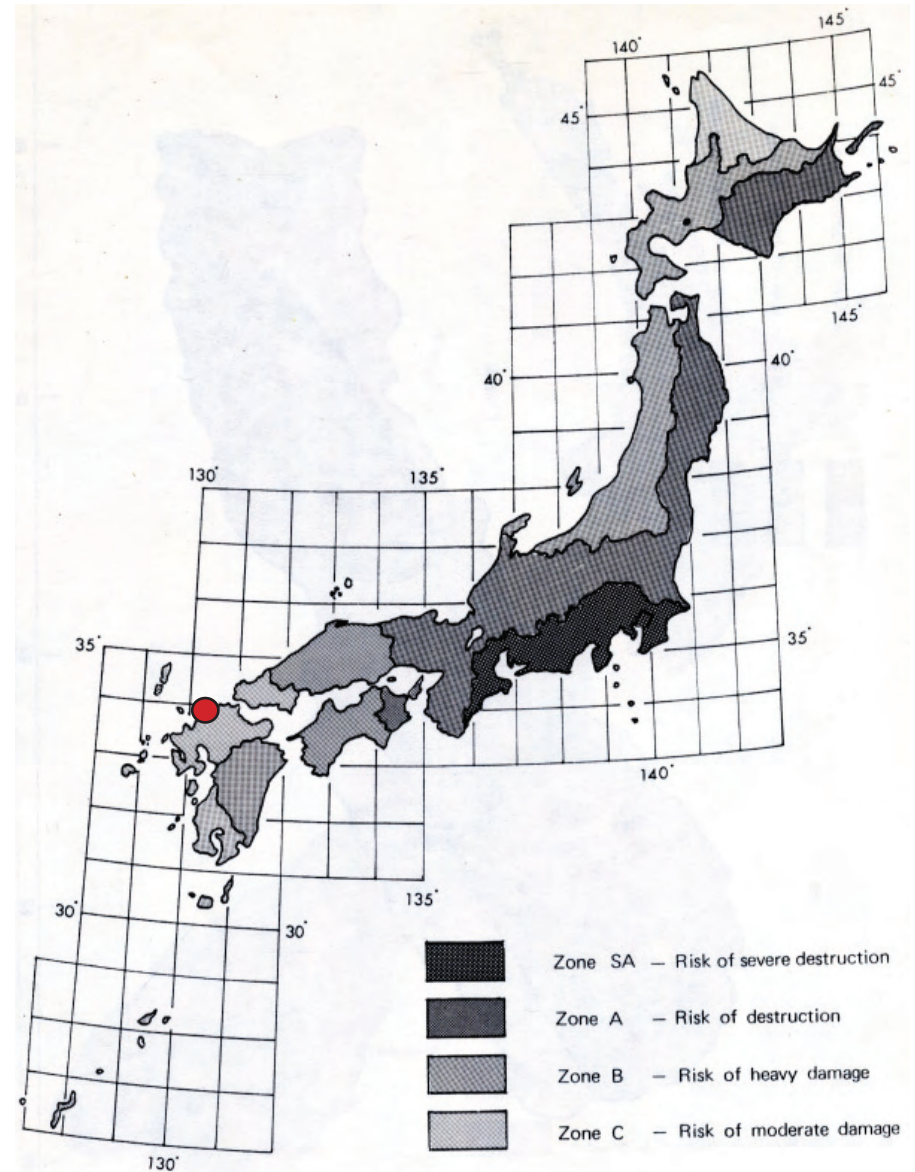
▲ 8.10 Typical re-entrant corner forms.



▲ 8.11 The dynamic response of a re-entrant configuration and potential floor diaphragm damage area.



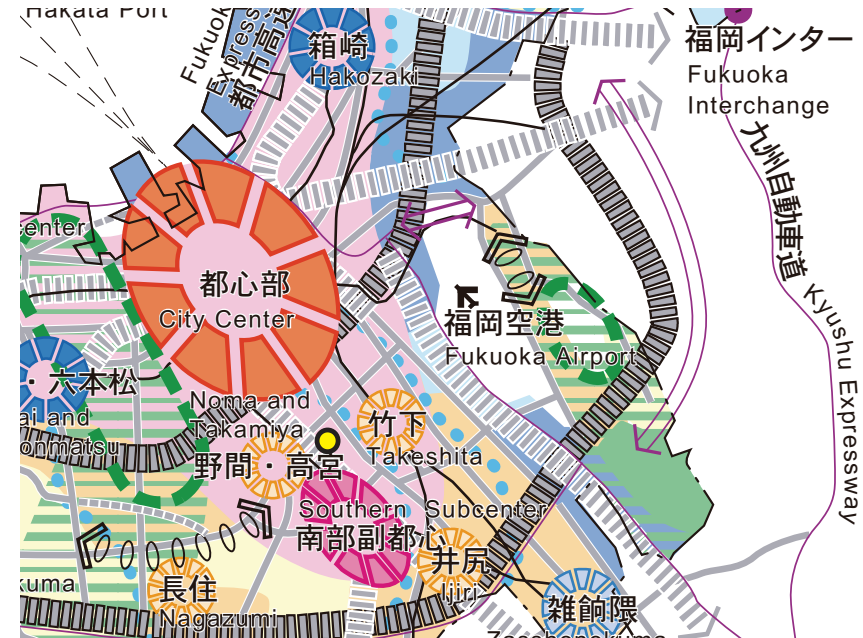
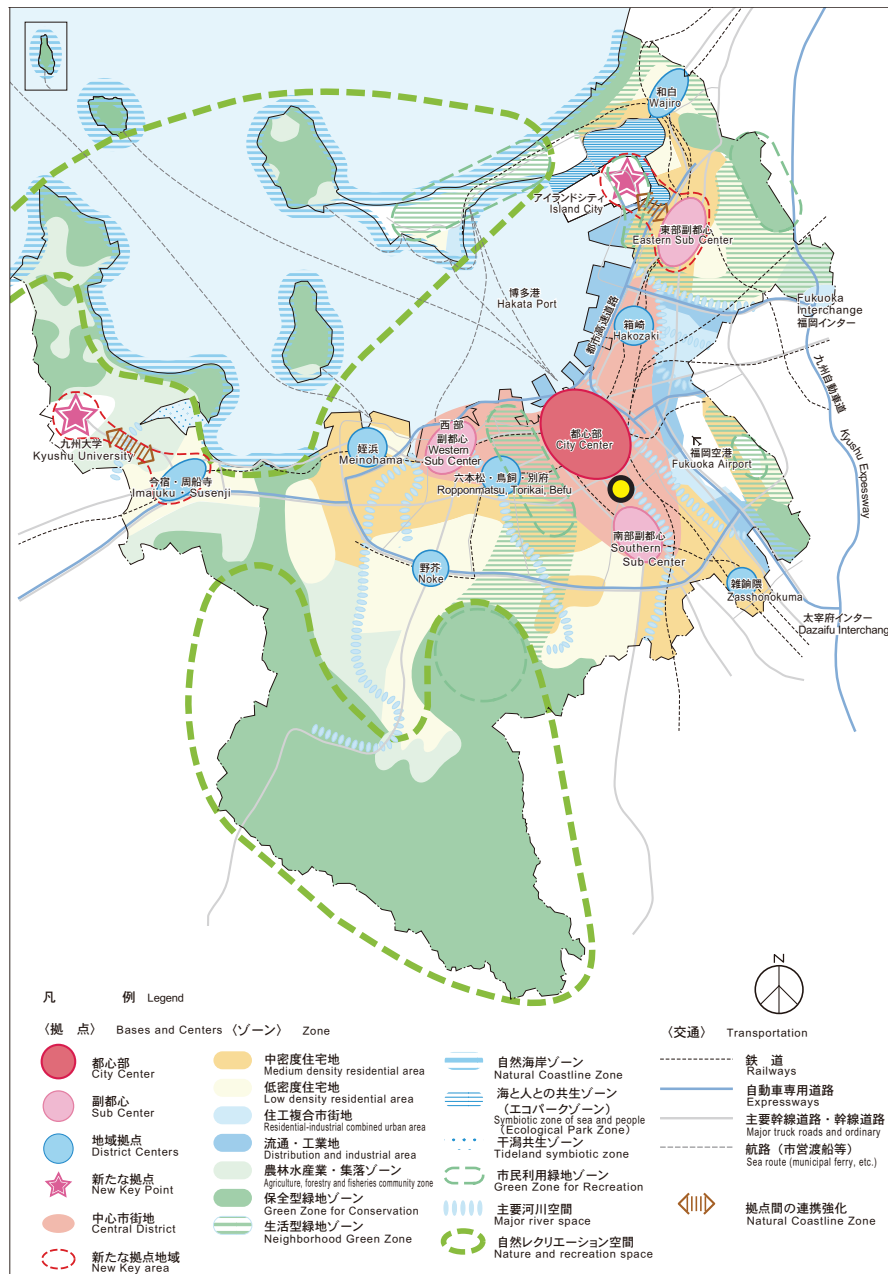
▲ 8.12 A typical definition of an irregular re-entrant configuration is where  $A > 0.15B$ .



SEISMIC ZONE MAP OF JAPAN

Source: Charleson, Andrew, Seismic Design for Architects: Outwitting the Quake. Architectural Press, Boston MA, 2008.

# Land Use and Distribution



The City of Fukuoka has broken down the city into several different land use zones depending on building type, current and anticipated use of the area. Since the city is a conglomeration of many smaller towns and neighborhoods, the city has varying densities and building typologies scattered throughout the city. The main city center is located in the relative center of the city and is comprised of the Chuo Ward. City sub-centers are high density pockets scattered around different parts of the city, which in most cases, were the downtown areas of the previous smaller towns. The district centers are the current centers for the Ward municipalities. Within the map to the left the centers, sub-centers, land-use, designated green space and major access routes are all illustrated.



# Transportation



交通  
Transportation

20.10現在

区 分	箇 所	延長等
道 路	277本	511,710m
自動車専用道路	7本	59,030m
幹線街路	170本	420,230m
区画街路	82本	30,530m
特殊街路	15本	1,340m
交通広場	31ヶ所	124,740m <sup>2</sup>
都市高速鉄道	10本	55.46km
自動車駐車場	8ヶ所	6.19ha
自転車駐車場	12ヶ所	9,520m <sup>2</sup>
自動車ターミナル	6ヶ所	2.99ha

凡 例  
Legend

	自動車専用道路	Expressways
	主要道路（国道）	Major Roads (national highways)
	鉄 道	Railways
	地 下 鉄	Subway Lines
	地下鉄（計画）	Subway Lines (Plan)
	バスターミナル	Bus Terminals
	航 路	Sea Routes

Fortunately, the site is flanked by a heavily utilized rail line, the Tenjin-Omuta Line on the west side and a major vehicular thruway to the east. The project accommodates these dominant traffic patterns while locating the main entrance on the rail side to place a higher emphasis on local transit. The project also designates a significant area near the main entrance for bicycle storage.

## Fukuoka City's Transportation Policy

The basic policies are taken from the City of Fukuoka website and are illustrated below:

Strengthening of public transportation systems including railways and buses.

Improvement of key roads including trunk roads and the Fukuoka Urban Expressway.

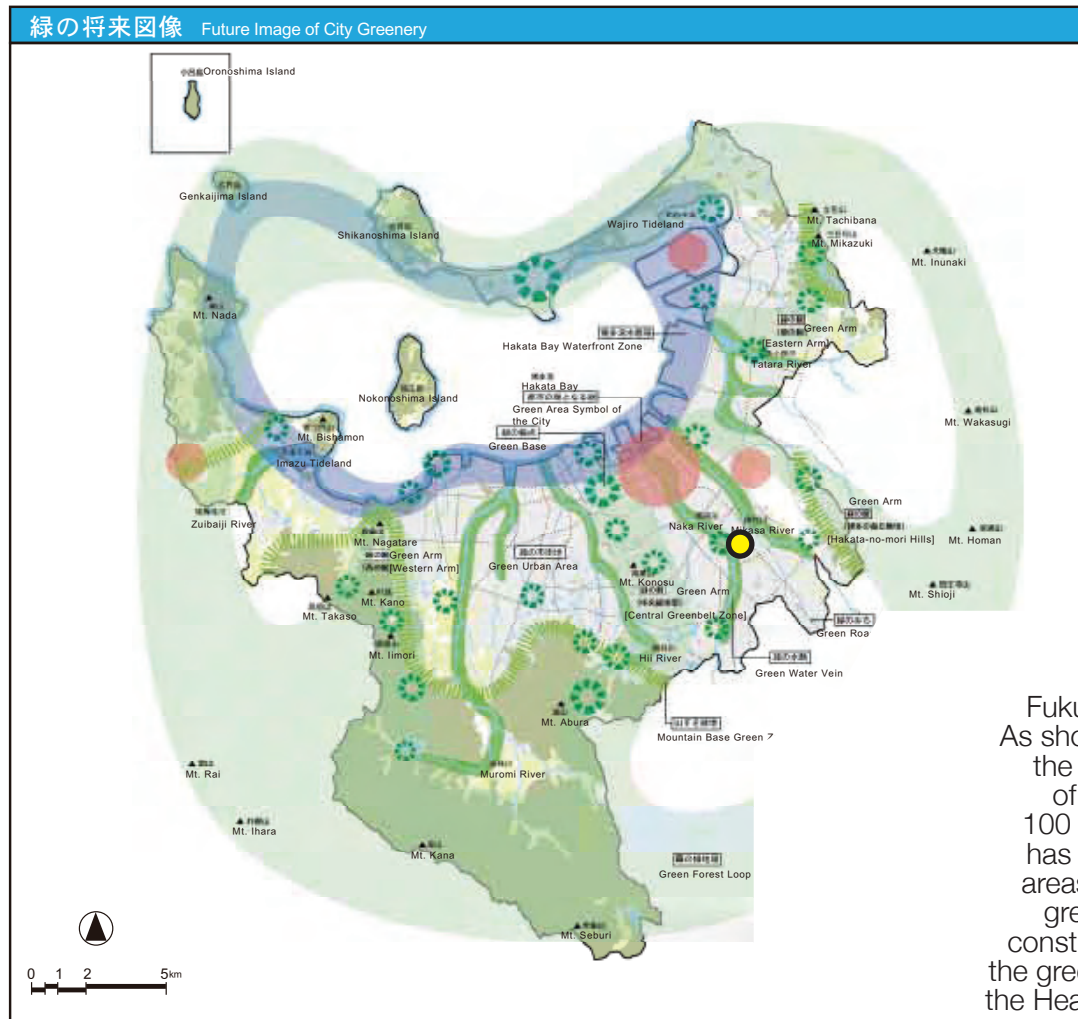
Strengthening of the juncture function at railway stations and bus terminals.

Improved parking lots for vehicles and bicycles.

Improvement of traffic management through the installation of exclusive bus lanes and the enforcement of flexible working hours.

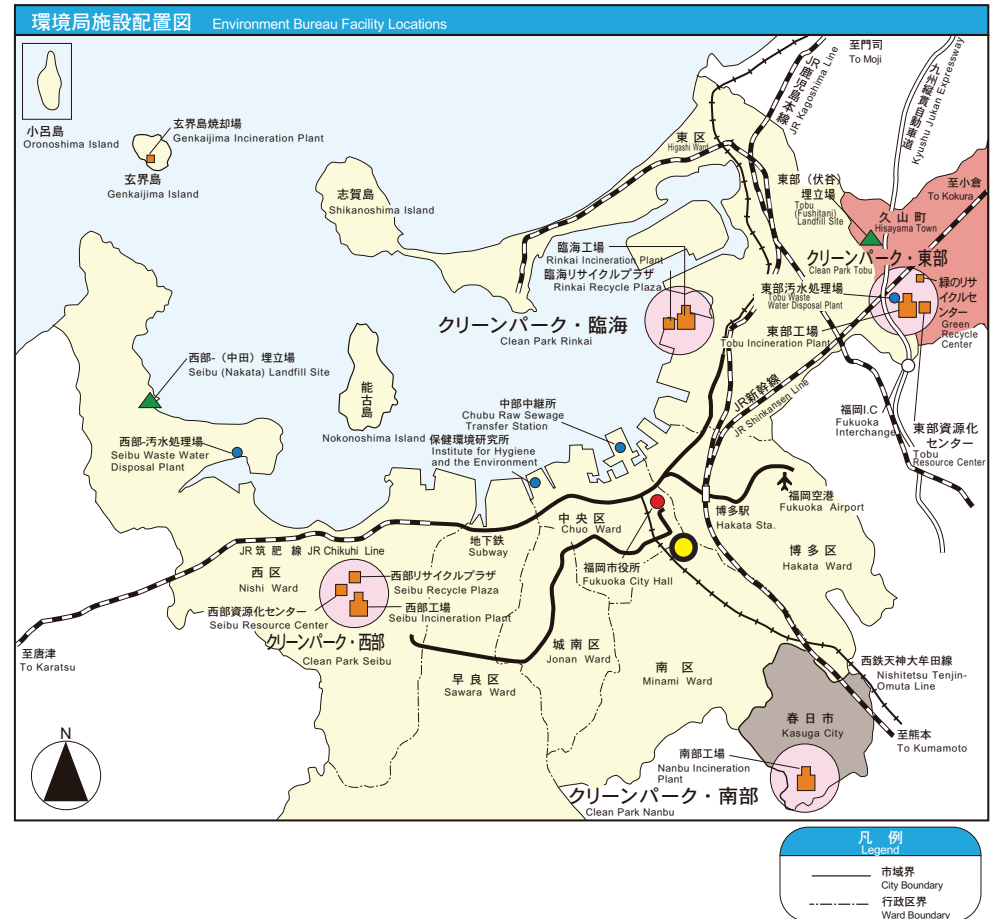
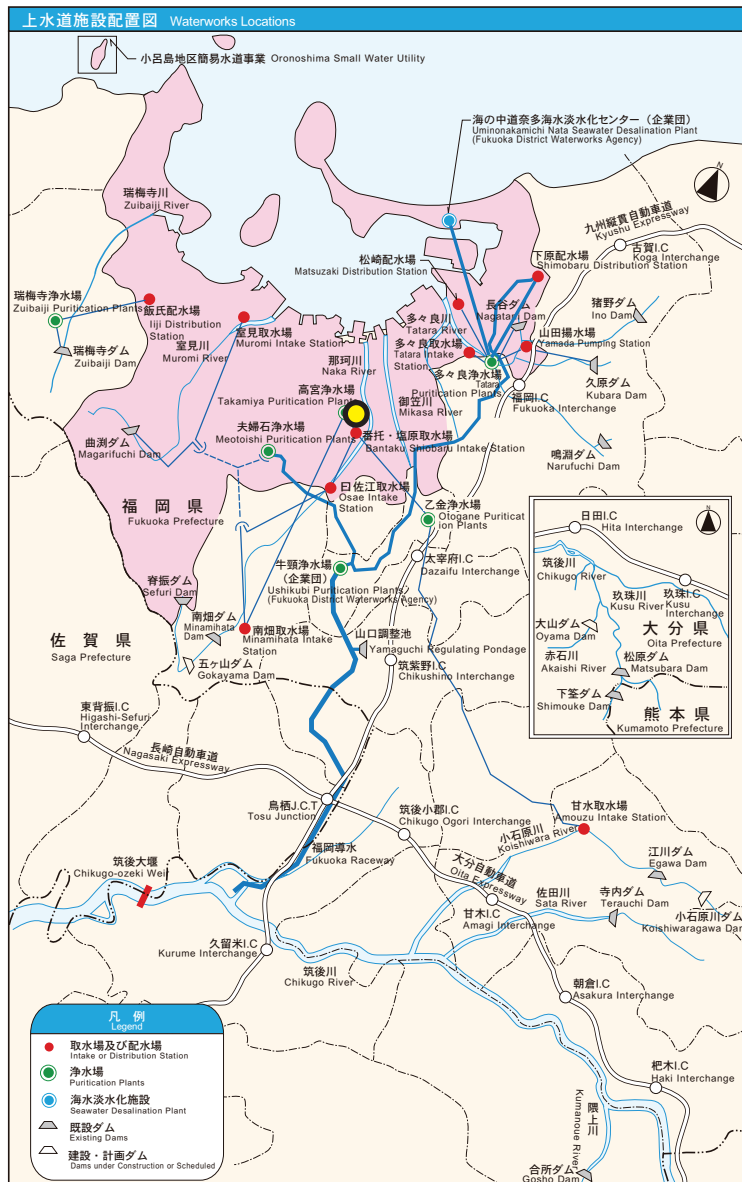
Realization of transportation with less load on the environment that is easy for everyone to use through the elimination of a level difference and a decrease in total vehicle traffic.

# Parks and Green space



Aerial of Designated Green Area on the outskirts of Fukuoka City

Fukuoka has recently introduced a City Greening Initiative. As shown in the previous site analysis, Fukuoka suffers from the Heat Island Effect. During the summer, the inner parts of the city can be unbearable with temperatures nearing 100 F and the humidity levels reaching 90-100%. The city has designated some areas of the city as preserved green areas while also adding green promotion areas with linking green beltways. All are attempts to help cool the densely constructed areas of the city. The site lies right along one of the green beltways that runs through the city. The problem of the Heat Island Effect will definitely play a role in the design of the site.



Being located in a major Japanese city, the site has ample access to wastewater and sewer management opportunities. The site lies right next to a water purification plant and two waterways that flow parallel to the rail lines flank the site. There is also a major waterline that runs adjacent to the site that could provide the necessary water supply for the school complex. The wastewater and other combustible materials could be transferred to the intake center directly south of the site.



## School Locations

Larger Context





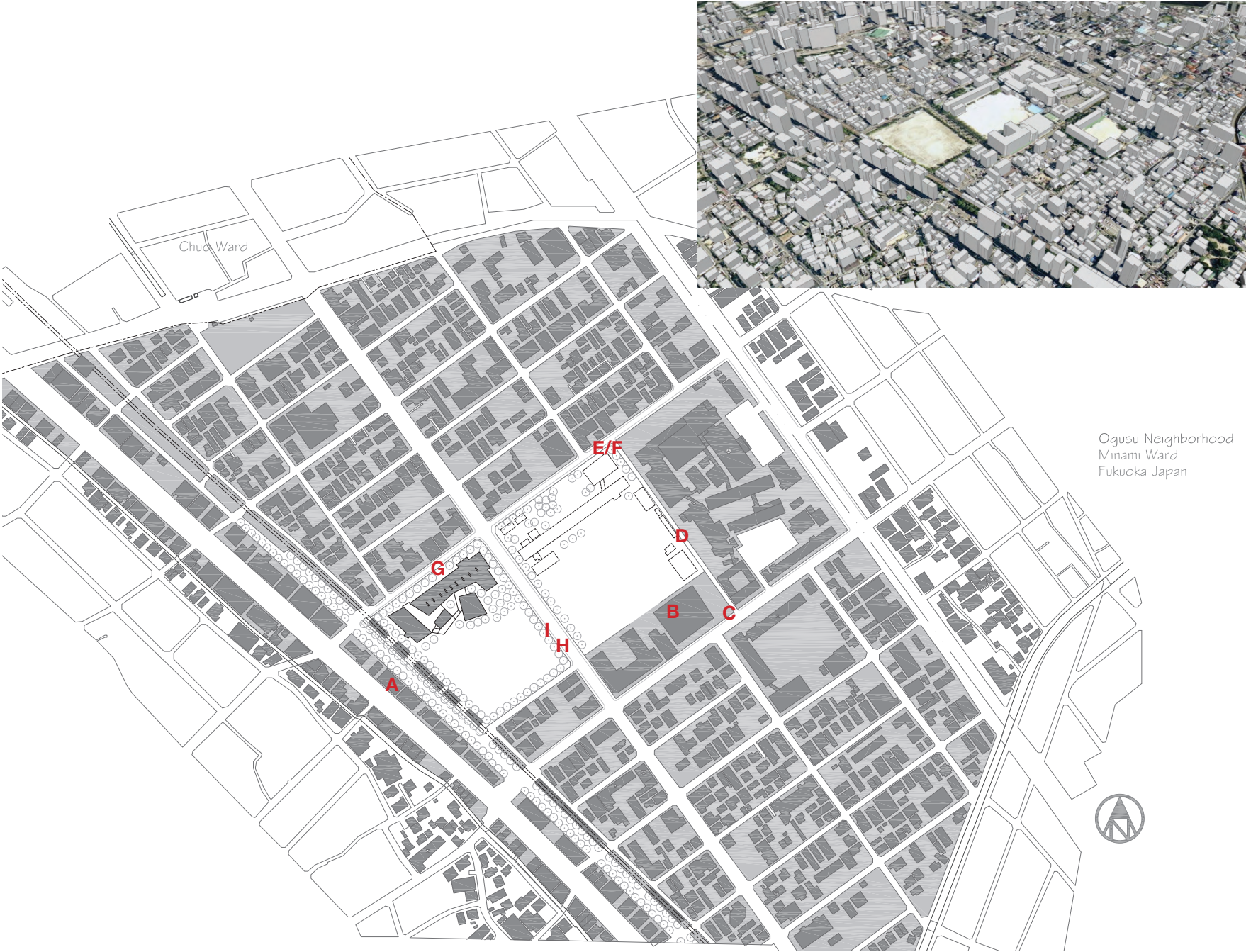
## School Locations

Immediate Context





Site Plan





## Site Images





Site Images





## Site Images







## Site Images







Regulations

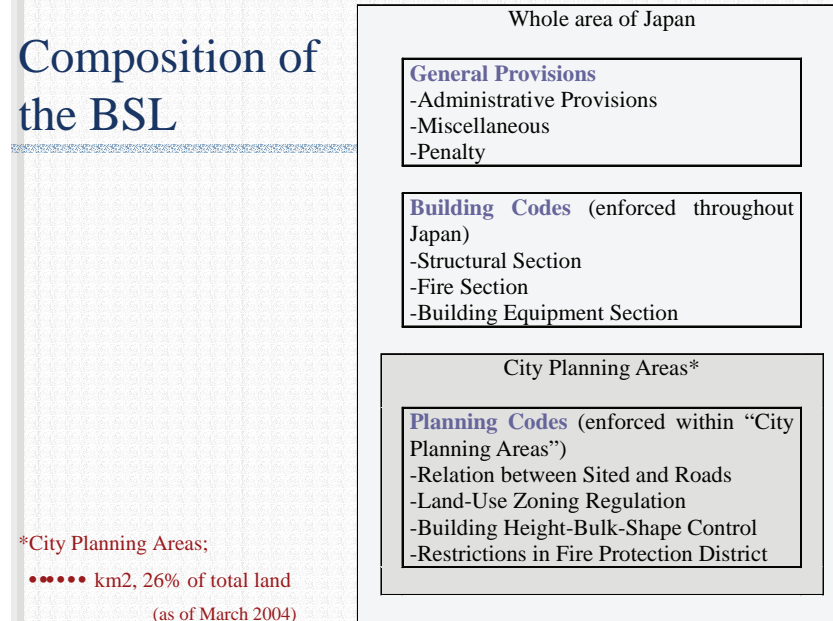
# Regulations - Local

## Building Law

### Principal Laws concerning Building Construction

- **Building Standard Law (BSL)**
  - To safeguard the life, health, and property of people, by providing codes concerning site, structure, equipment, and use of buildings
- **City Planning Law**
  - To support efficient urban activities, achieve a pleasant urban environment, and create townscapes by establishing urban land use planning system and infrastructure development system
- **Fire Service Law**
  - To protect people, people's life, and property from fire and minimize damage caused by fire and other disasters, by providing codes concerning extinguishment facilities, alarm facilities etc.

### Composition of the BSL



Japan breaks its building construction laws into three categories. The Building Standard Law and the Fire Service Law are national standards that deal with basic safety laws and accessibility laws. The third major component is the City Planning Law. This law varies from prefecture to prefecture each being unique to the region's geography and history. The National Building Codes involve structural, fire protection and building equipment standards, while the City Planning Law designates zoning, building heights, setbacks, and building-site relationships.

## Composition of City Planning Law

Table 2: Composition of City Planning Law

City Planning Law (applied to an area designated as the 'city planning area')	Policies on improvement, development and conservation
	Urbanization Promotion Area Urbanization Control Area
	Land Use Control (Land Use Zoning etc.)
	Planning of public facilities (planning and development of roads, parks, sewerage system etc.)
	District plans
	Urban Area Development System (Urban Development Projects - land readjustment system, urban redevelopment system etc.)
	Land Development Permission System
	Project Validation Procedures for City Planning

## Building Restrictions for Urbanization Promotion Area vs. Urbanization Control Area

Table 3: Legal Effects of Area Division

Item	Urbanization Promotion Area	Urbanization Control Area
Land use control	Land use is controlled in accordance to Land Use Districts etc. for orderly use of urban lands.	Land use is regulated by plans from the agricultural side. Land use districts are not determined.
Public investment	Public facilities such as roads, parks, sewerage etc. are approved and public investment will be actively carried out.	Public investment for the promotion of agriculture will be actively carried out.
Urban development project	Will be actively done	Will not be done
Land development permission	For development of more than 1000 m <sup>2</sup> , approval by the prefectural governor is necessary. Technical standards need to be met.	Except for large-scale developments, which are approved in exceptional cases, the development activities are strictly controlled.
Conversion of farmland	Mere report on the conversion is necessary	Approval from the prefectural governor is necessary
City planning tax	City planning taxes may be collected to generate revenue to fund city planning projects.	Cannot be levied.

Source: <http://www.toshikeikaku-city-fukuoka.jp/toshi-panfu.html>



# Regulations - Local Urban Planning Criteria

The Ministry of Land, Infrastructure, Transportation, and Tourism handles all issues concerning urban development and land use. Each prefecture has its own ministry that makes decisions concerning the urban growth of the cities. Fukuoka divides the city into two general zones, the **Urbanization Promotion Zone and the Urbanization Control Zone**. These zones are set up to help control the growth from within the city but also to restrain urban sprawl into the countryside. Within the Urbanization Promotion Zone.

Source: <http://www.toshikeikaku-city-fukuoka.jp/toshi-panfu.html>

## 福岡市新・基本計画（全市編）の体系

## Organization of the Fukuoka City New Master Plan

新しい福岡づくりの基本方向  
Basic direction in the formation of the new Fukuoka

自由かつ達で人輝く自治都市・福岡  
Fukuoka — a free and openhearted autonomous city of energetic people

### 都市経営の基本的考え方

Basic city management concepts

果敢に挑戦する自治と自律の都市  
A self-governing and autonomous city that makes brave challenges

安全で快適な市民生活充実の都市  
A safe and comfortable city where the citizens' lives are fulfilling

豊かな自然環境と歴史風土を大切に  
する都市  
A city where a rich natural environment and historical climate are valued

多彩な人が集い活躍する活気創造の  
都市  
A city to create vitality where a variety of people come together and play active roles

協力と競争によりアジアの中で共生  
する都市  
A city of coexistence in Asia through cooperation and competition

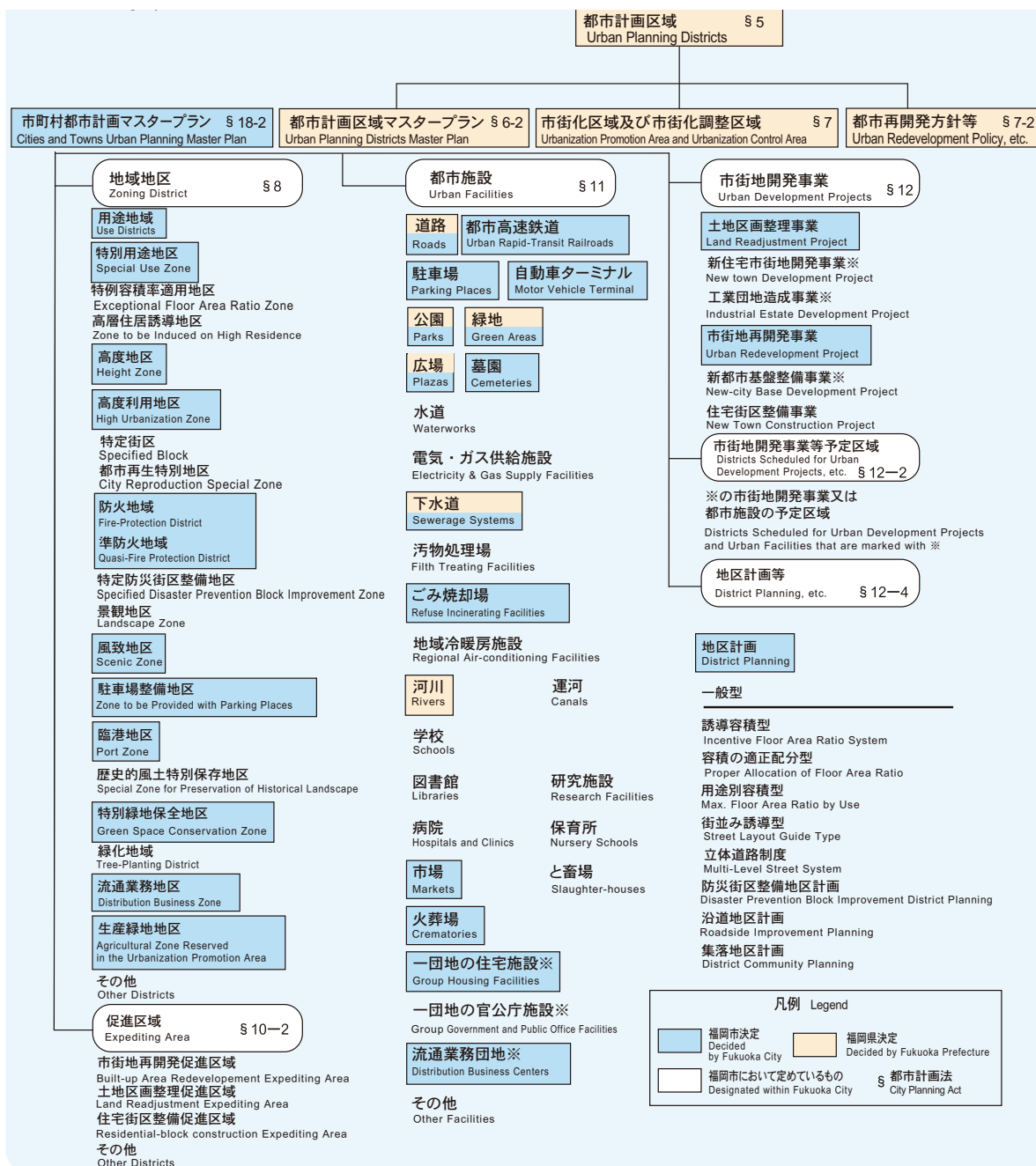
### 行政運営の基本姿勢

Basic stance for administrative management

市民と共働する行政をめざす  
・市民の視点に立った行政をめざす  
・厳しい財政状況下における財政運営  
の基本姿勢  
Aiming to have an administration that collaborates with its citizens  
・Carrying out administration from the viewpoint of the citizens  
・Having a Basic strategy for fiscal management in times of harsh financial circumstance

### [政策目標] Policy objectives

- 子どもがたくましく生きる力、夢や希望をもって育つまちとなる  
1.To be a city where children are raised to face and overcome the difficulties of this modern world while holding on to their dreams and hopes
- 個性と創造性に富んだ多彩な人材が育つまちとなる  
2.To be a city with a variety of human resources that nurture the individuality and creativity of its citizens
- 地域コミュニティを活性化し、住民自治・地域自治を推進する  
3.To vitalize the communities and promote an autonomous administration guided by the residents and communities
- 支え合い助け合い、生き生きと暮らせる健康・福祉のまちとなる  
4.To be a city of exceptional health and welfare where the residents can help and support each other and lead active lives
- 災害に強く、安全で安心して暮らせる都市となる  
5.To be a disaster-resistant city where the residents can live safely
- 人権を尊重し、人の多様性を認め合うまちとなる  
6.To be a city where human rights and diversity are respected and accepted
- 「楽・住・職」の融合した美しい都市となる  
7.To be a beautiful city where work, home and enjoyment are integrated
- 水・交通・住環境などの基盤を整備し、快適な生活環境を確保する  
8.To secure a comfortable living environment by improving the infrastructure including water, transportation and residential environment
- 博多湾や脊振山系などの自然を大切に、緑彩る都市となる  
9.To be a city rich in natural beauty, placing importance on nature such as the Hakata Bay and Sefuri mountains
- ライフスタイルを転換し、環境と共生する都市となる  
10.To be a city that induces and promotes eco-friendly lifestyles of the citizens
- 福岡の魅力と環境を支える農林水産業を振興する  
11.To promote the agriculture, forestry and fishery industries that support Fukuoka's appeal and the environment
- 福岡の知性と感性を活かし、知識創造都市となる  
12.To be a city of knowledge creation utilizing the particular mentality, cultural intellect and sensibilities of Fukuoka
- 起業・創業や企業立地を促進し、多様な雇用場を創造する  
13.To create a variety of employment opportunities by promoting the creation of new businesses as well as relocation of corporations to Fukuoka
- おもてなしの心に満ちた国際集客文化都市となる〜ビジターズ・インダストリー（集客産業）の振興〜  
14.To be a cultural city of hospitality that attracts international visitors through the promotion of the tourist industry
- 協力和競争を通じてアジアの交流拠点都市をめざす  
15.To be a hub city of exchange in Asia through cooperation and competition
- 福岡・九州とアジア・世界を結ぶゲートウェイを形成する  
16.To form a gateway to link Fukuoka and Kyushu with Asia and the world
- 先進的モデル都市・アイランドシティを創造する  
17.To develop Island City, an advanced model city
- 福岡都市圏や九州各地域との広域的連携を強化する  
18.To strengthen wide-area collaboration with Greater Fukuoka and other areas in Kyushu



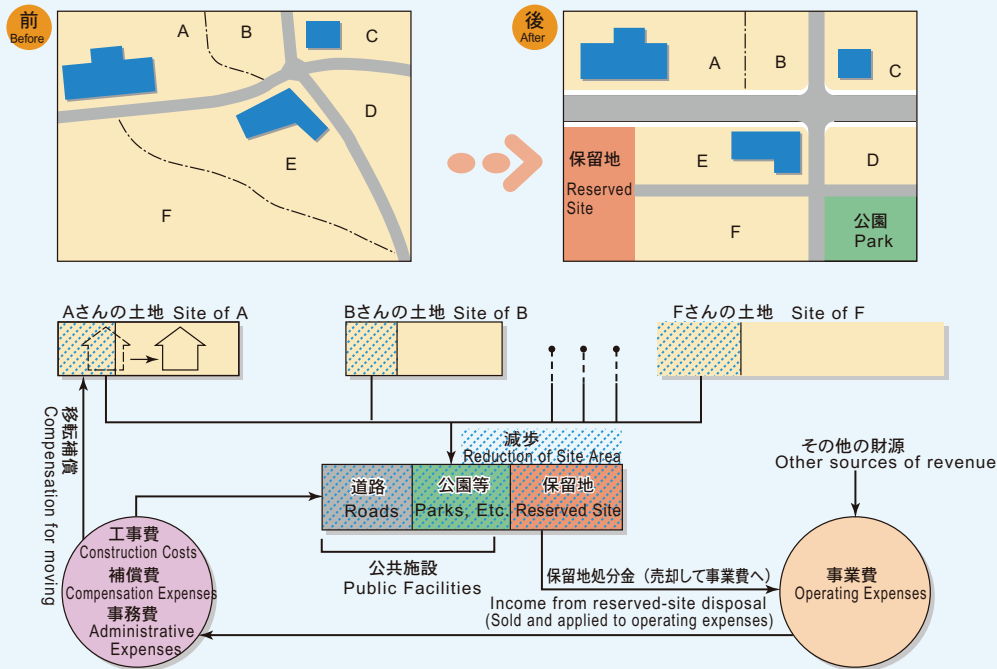
Under the Town Planning and Zoning Act, urban planning establishes plans for land utilization, urban facility improvements and urban development projects. Decisions and implementation are made in conformity with plans established under the Comprehensive National Land Development Law and the National Land Use Planning Law, and pursuant to the Fukuoka City Basic Concept and Master Plan.

Restrictions are provided to encourage land use as set forth in urban planning, and to facilitate efficient urban facility improvements and urban development projects. The restrictions, enforced to create desirable urban areas in conformity with urban planning, include a permit system for development and construction, and a building conformity check system under the Building Standards Act.

# Regulations - Local

## Land Readjustment and Urban Development

土地区画整理事業のしくみ System of Land Readjustment Project



商店街など  
現在の様子 Present



にぎわいのある商店街なのですが、最近自動車が増えたのに、道路に歩道もなく危険で安心して買い物できません。

In this lively shopping street there are no sidewalks despite recent growth of car traffic, and therefore shoppers cannot enjoy safe shopping.

ルールを決めていると・・・  
If rules are laid out



歩行者用道路などをルール化することにより、ゆとりある歩行者空間の確保が図れます。また1階部分を店舗にするなどのルール化により、商店街の維持活性化も図れます。

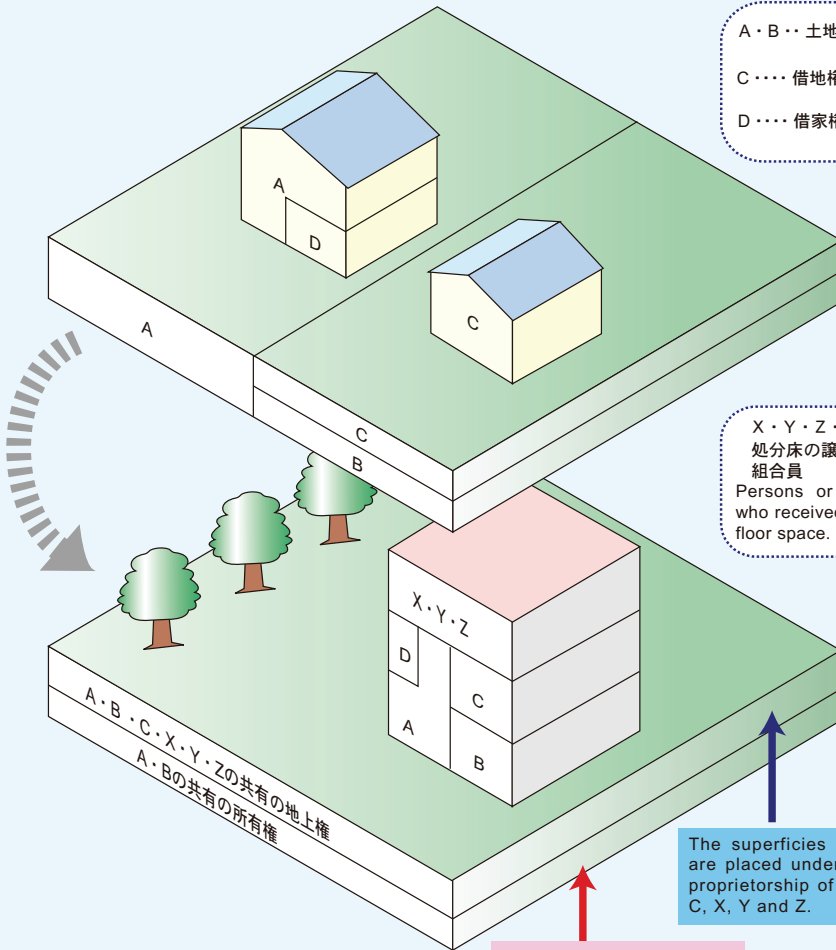
Ample space can be secured for pedestrians through regulations which provide for pedestrian roads, etc., and the business of the shopping street can be maintained or further vitalized through rules that stipulates commercial use for the first floor space.

Fukuoka is currently moving towards new urban street-front regulations that introduce new layers to the street's edge.



# 再開発事業のしくみ（第1種市街地再開発事業） Procedures of Class I Urban Redevelopment Project

都市再開発法による権利変換手続き  
Property rights conversion process in accordance with the Urban Redevelopment Law



A・B・・・土地所有者 Property owners  
C・・・借地権者 Land tenant  
D・・・借家権者 House tenant

X・Y・Z・・・  
処分床の譲渡を受けた者又は参加組合員  
Persons or participating partners who received a transfer of disposed floor space.

## 市街地再開発事業

Urban Redevelopment Project

20.3末現在

区 分				箇 所	面 積 (ha)
市街地改造事業				1ヶ所	0.58ha
清川一丁目				0.58	
市街地再開発事業				8ヶ所	12.2ha
渡辺通	2.2	西天	1.1	高宮	1.9
千代	1.3	天神	1.2	下川端	3.3
下川端東	0.8	薬院大通り西	0.4		

Fukuoka is also restructuring land parcels to increase density and introduce more green space.

# Regulations - Local

## City Zoning



**第一種低層住居専用地域**  
低層住宅の良好な環境を守るための地域です。小規模なお店や事務所をかねた住宅や小中学校などが建てられます。

**Class One Exclusive Zone for Low-Rise Residences**  
A zone for maintaining a comfortable environment for non-high rise housing. Permitted construction includes small-scale stores, houses with offices, and elementary and junior high schools.



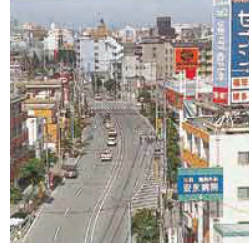
**第二種低層住居専用地域**  
主に低層住宅の良好な環境を守るための地域です。小中学校などのほか、150mまでの一定のお店などが建てられます。

**Class Two Exclusive Zone for Low-Rise Residences**  
A zone for maintaining a comfortable environment mainly for non-high rise housing. Permitted construction includes elementary and junior high schools, and stores with 150 square meters or less of floor space.



**第一種中高層住居専用地域**  
中高層住宅の良好な環境を守るための地域です。病院、大学、500mまでの一定のお店などは建てられます。

**Class One Exclusive Zone for Medium and High-Rise Residences**  
A zone for maintaining a comfortable environment for medium and high-rise housing. Permitted construction includes hospitals, colleges, and stores with 500 square meters or less of floor space.



**準住居地域**  
道路の沿道において、自動車関連施設などの立地と、これと調和した住居の環境を保護するための地域です。

**Semi-Residential Zone**  
A roadside zone to allow a residential environment to exist in harmony with the establishment of vehicular facilities.



**近隣商業地域**  
近隣の住民が日用品の買物をする店舗等の業務の利便の増進を図る地域です。住宅や店舗のほかに小規模の工場も建てられます。

**Neighborhood Commercial Zone**  
A zone to provide commercial convenience for local residents. In addition to houses and stores, construction is permitted for small factories.



**商業地域**  
銀行、映画館、飲食店、百貨店、事務所などの商業等の業務の利便の増進を図る地域です。住宅や小規模の工場も建てられます。

**Commercial Zone**  
A zone to promote general commercial convenience, allowing banks, movie theaters, restaurants, department stores, and offices. Houses and small factories are also permitted.



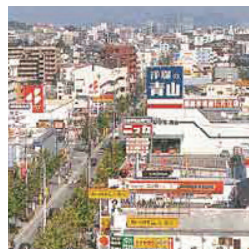
**第二種中高層住居専用地域**  
主に中高層住宅の良好な環境を守るための地域です。病院、大学などのほか、1,500mまでの一定のお店や事務所などが建てられます。

**Class Two Exclusive Zone for Medium and High-Rise Residences**  
A zone for maintaining a comfortable environment mainly for medium and high-rise housing. Permitted construction includes hospitals, colleges, and stores or offices with 1500 square meters or less of floor space.



**第一種住居地域**  
住居の環境を守るための地域です。3,000mまでの店舗、事務所、ホテルなどは建てられます。

**Class One Residential Zone**  
A zone to protect a comfortable residential environment. Permitted construction includes stores, offices and hotels that are with 3,000 square meters or less of floor space.



**第二種住居地域**  
主に住居の環境を守るための地域です。店舗、事務所、ホテル、カラオケボックスなどが建てられます。

**Class Two Residential Zone**  
A zone to protect a comfortable environment mainly as a residential area. Permitted construction includes stores, offices, hotels, and karaoke establishments.



**準工業地域**  
主に軽工業の工場等の環境悪化の恐れのない工業の業務の利便を図る地域です。危険性、環境悪化が大きい工場のほかは、ほとんど建てられます。

**Semi-Industrial Zone**  
A zone to promote commercial convenience for clean industries, such as light-industry factories. Factories can be built, except those that are dangerous or environmentally harmful.



**工業地域**  
主として工業の業務の利便の増進を図る地域で、どんな工場でも建てられます。住宅やお店は建てられますが、学校、病院、ホテルなどは建てられません。

**Industrial Zone**  
A zone exclusively to promote industrial convenience in which any type of factory can be built. Houses and stores are permitted, but schools, hospitals, hotels, etc. are not.



**工業専用地域**  
専ら工業の業務の利便の増進を図る地域です。どんな工場でも建てられますが、住宅、お店、学校、病院、ホテルなどは建てられません。

**Exclusive Industry Zone**  
A zone exclusively to promote industrial convenience. Any type of factory can be built, but houses, stores, schools, hospitals, hotels, etc. cannot.

In accordance with the features of individual districts, plans for land use and construction of facilities such as roads, parks and buildings are determined in the city planning incorporating the local residents' opinions. Based on these plans, development and construction are given regulated guidelines to ensure and maintain a desirable urban district environment. For smooth promotion of the conversion of under-utilized or unused land to fair and reasonable land use districts, designation of redevelopment promoting districts is made in the city planning also, to provide integrated and comprehensive guidelines for sound development projects regarding public facilities and structures. Fukuoka City has designated 101 districts such districts totaling roughly 1,240.1 hectares (3,210.5 acres).

# Regulations - Local

## Height Restrictions and Setbacks

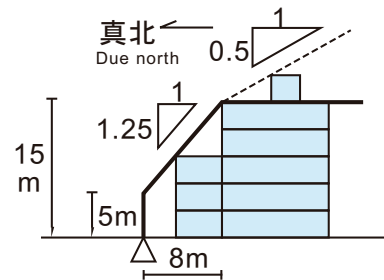
### 高度地区の制限概要図

Schematic Diagrams on Restrictions in Height Zone

#### 第一種15メートル 高度地区

Class One 15m  
Height Zone

敷地北側境界又は  
北側の道路の  
反対側の境界線  
North property line  
or opposite side property line of the north road

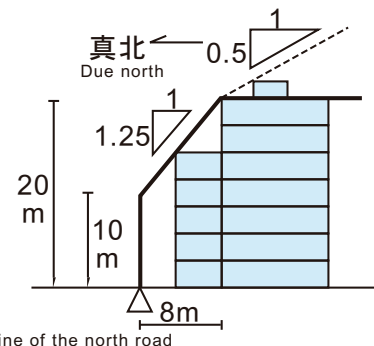


- ・軒の高さが7メートル未満かつ、地階を除く階数が2以下の建築物には適用されません。
- ・一団の住宅団地などの建築物や塔屋などの建築物の部分については第二種15メートル高度地区の範囲で緩和されることがあります。
- ・Not applicable to structures of less than seven meters eaves-height and two stories or less above the ground.
- ・Restrictions on structures in housing complexes or structural segments such as towers may be alleviated within the range of the class two 15m height zone.

#### 第一種20メートル 高度地区

Class One 20m  
Height Zone

敷地北側境界又は  
北側の道路の  
反対側の境界線  
North property line  
or opposite side property line of the north road

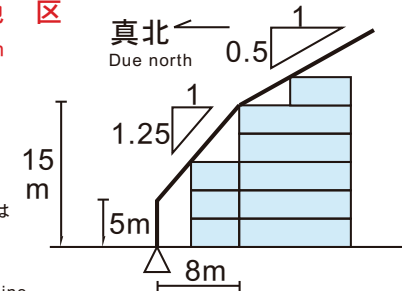


- ・一団の住宅団地などの建築物や塔屋などの建築物の部分については第二種20メートル高度地区の範囲で緩和されることがあります。
- ・Restrictions on structures in housing complexes or structural segments such as towers may be alleviated within the range of the class two 20m height zone.

#### 第二種15メートル 高度地区

Class Two 15m  
Height Zone

敷地北側境界又は  
北側の道路の  
反対側の境界線  
North property line  
or opposite side property line of the north road

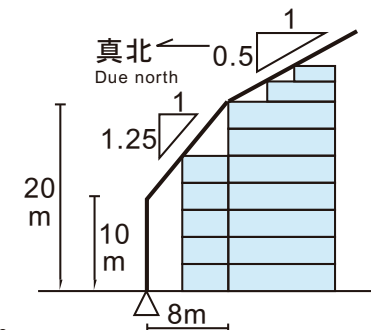


- ・軒の高さが7メートル未満かつ、地階を除く階数が2以下の建築物には適用されません。
- ・Not applicable to structures of less than seven meters eaves-height and two stories or less above the ground.

#### 第二種20メートル 高度地区

Class Two 20m  
Height Zone

敷地北側境界又は  
北側の道路の  
反対側の境界線  
North property line  
or opposite side property line of the north road

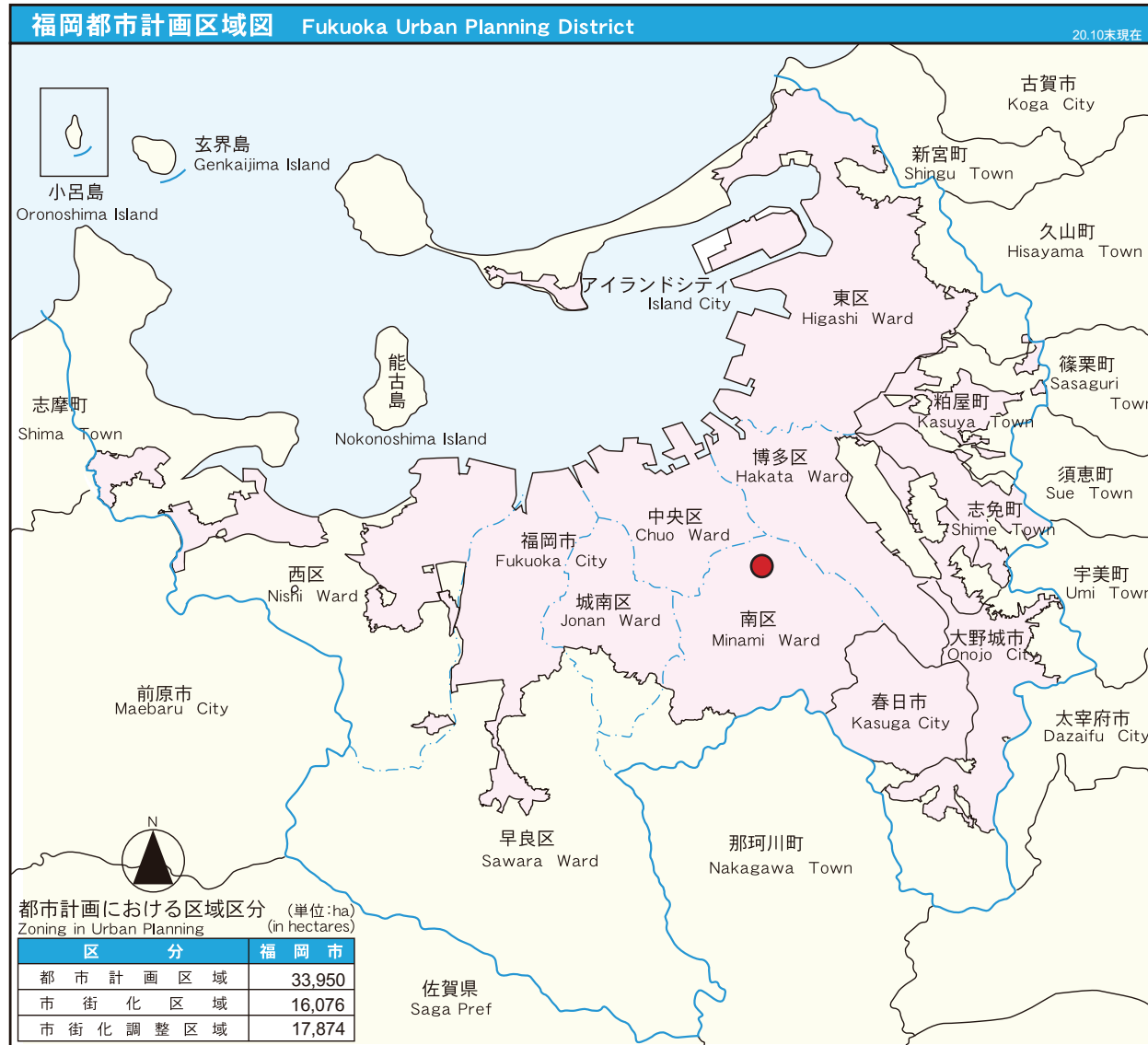






# Regulations - Local

## Urban Planning Zones



The site for the project lies within the Urbanization Promotion Zone.

Source: <http://www.toshikeikaku-city-fukuoka.jp/toshi-panfu.html>





## Precedents

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# Traditional Architectural Themes

## Built Environment & Nature

All traditional Japanese architecture has a strong relationship with the natural environment. The Japanese view nature as permanent and the built environment as temporary. This attitude is reflected in their architecture. The lightness of the timber construction and the transparency of enclosure creates a harmonious balance with the site. The buildings are almost always elevated from the ground as to touch the earth in the most minimal way, emphasizing the fragility of the built environment.





# Traditional Architectural Themes

## Lightness & Temporal

Many associate sleek, minimalist, and modern as attributes inherent with traditional Japanese design. The Japanese have always worked in ways which westerners view as hip or modern. The design aesthetic comes from the use of the local materials accessible on the island nation. It also reflects a deeper philosophy that regards the earth and nature as a permanent force where human existence and influence is all temporary. Their design aesthetic reflects this mentality. Even within the timber structures the sliding walls made of rice paper (fusuma) can open to create one continuous flow of space, making the interiors of buildings flexible and temporary.

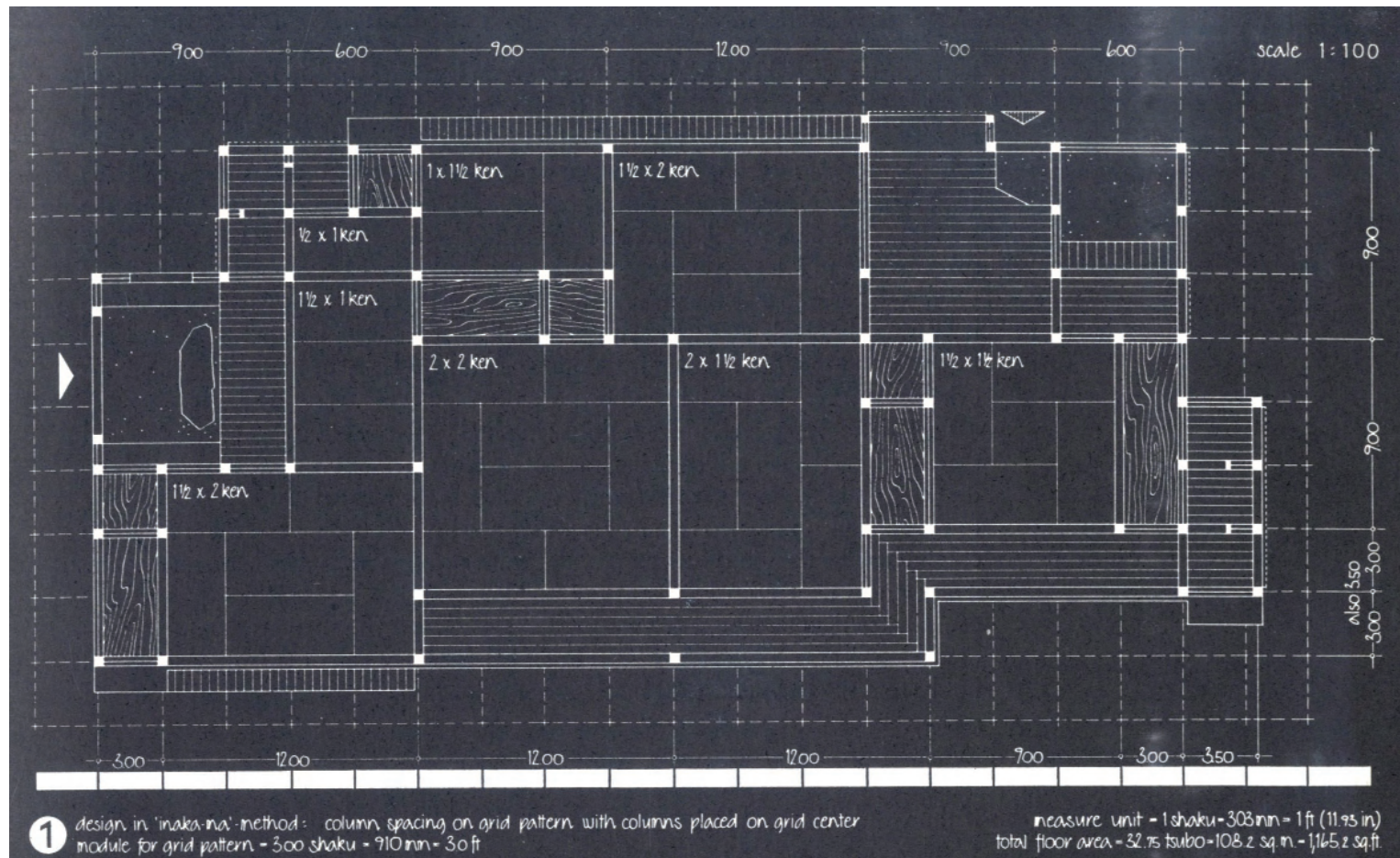




# Traditional Architectural Themes

## Spatial Flow

The plan to the below reflects a traditional Japanese home. One can see the only fixed portions of the building are the structural elements that ground the building to the site. The rest of the infill is covered by using the fusuma sliding walls. This structural system is common even in the contemporary buildings of Japan. Many structures are based off of a multiple of the tatami mat and infilled with lighter, more transparent structure. Below are examples of the sliding doors creating different sequences of space.



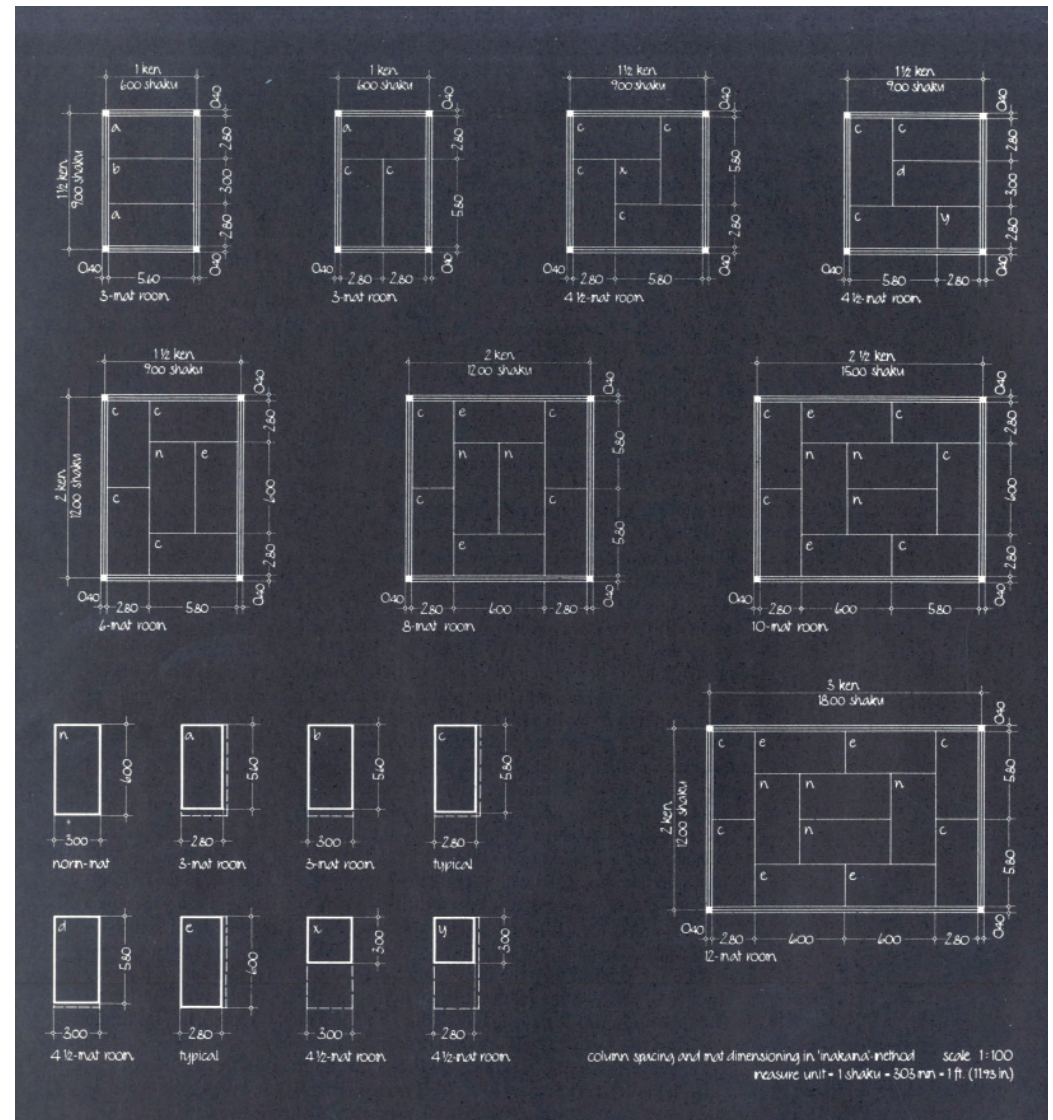
Source: Engel, Heinrich. *The Japanese House: A Tradition for Contemporary Architecture*. Tuttle Publishing. Tokyo, Japan. 1977



# Traditional Architectural Themes

## Vernacular Qualities

Japanese construction is all based on proportions. The tatami mat is a traditional Japanese flooring system made from the tatami reed. These mats are generally made according the human proportions (most sizes are around 3'x6'). Modern day homes and traditional buildings are based on the proportions of the mats and the various configurations that can be used to articulate rooms.



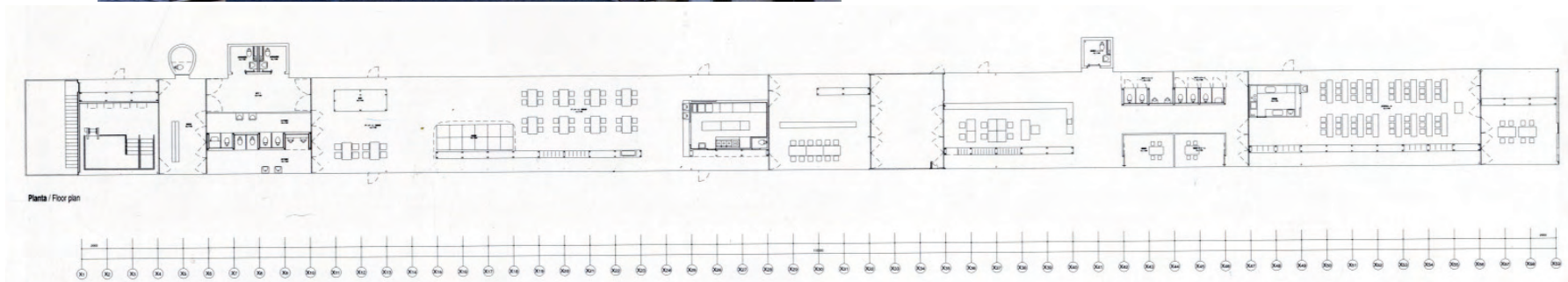
Source: Engel, Heinrich. *The Japanese House: A Tradition for Contemporary Architecture*. Tuttle Publishing. Tokyo, Japan. 1977



# Contemporary Japanese Architecture

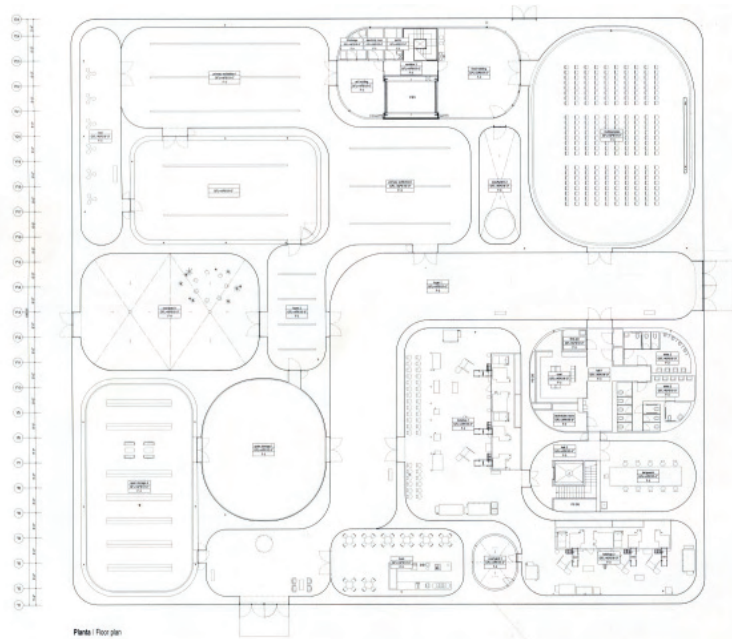
Kazuyo Sejima / SANAA

Kazuyo Sejima and her collaborative firm SANAA is the epitome of contemporary Japanese architecture. The style contains all the aspects one would attribute to traditional Japanese design but their work speaks to the contemporary design strategies. They combine a minimalist form with a light and transparent aesthetic.



Source: El Croquis. Sanaa 1983-2004: Sejima Nishizawa. Madrid, Spain. 2004



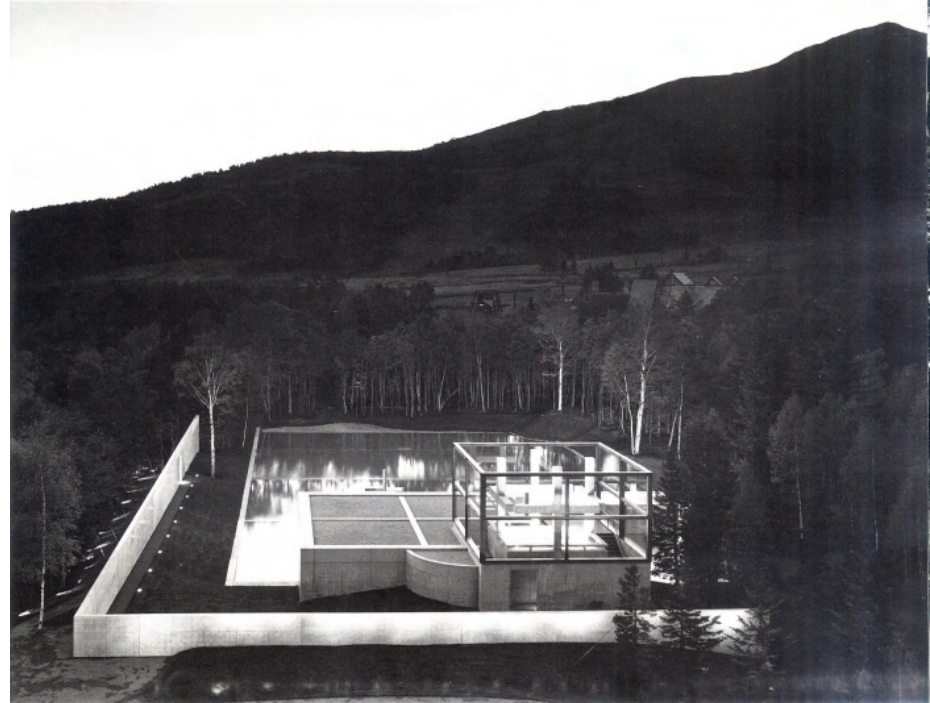




# Contemporary Japanese Architecture

## Tadao Ando

Tadao Ando's work is an interesting blend of Japanese philosophy and modern technology. His abstract forms sit like sculptures, integrated into the landscape. His buildings unlike, SANAA, sit within the earth and emphasize the strong connection of the building and nature.



Source: El Croquis. Tadao Ando 1983-2000. Madrid, Spain. 2000







# Contemporary Japanese Architecture

## Kengo Kuma

Kengo Kuma is well-respected around the world for his skill at manipulating space. Kuma has experienced all of the major, modern architectural movements in Japan and it is reflected through his architecture. His early architecture reflects attempts to compete with the flashy, fast-paced lifestyle of Japan. However, after the economic bubble and eventual collapse of the early 90's, Kuma simplified his architecture into one continuous gesture. His articulation of numerous small elements creates one seamless facade that blends into the chaotic lifestyle that is contemporary Japan.



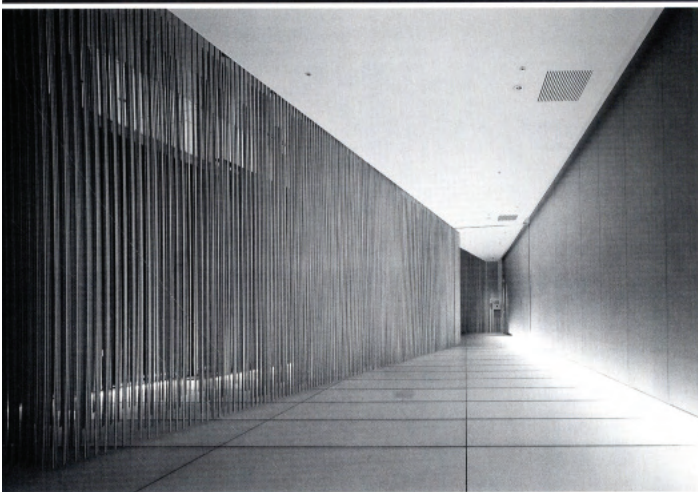
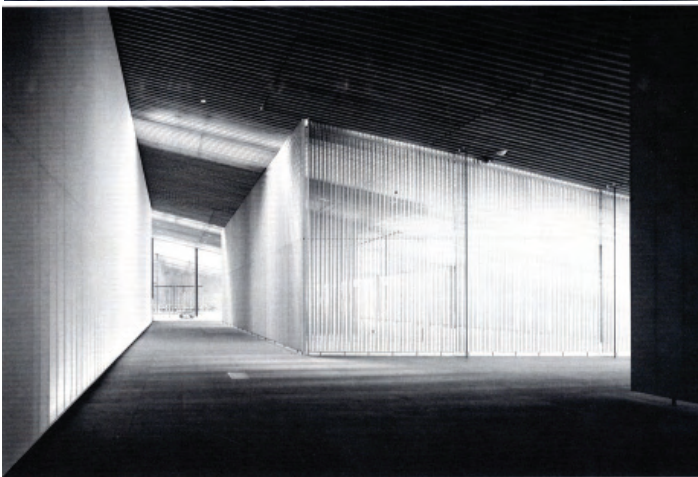
reception of restaurant



Restaurant, view from second floor toward east









# Contemporary Japanese Architecture

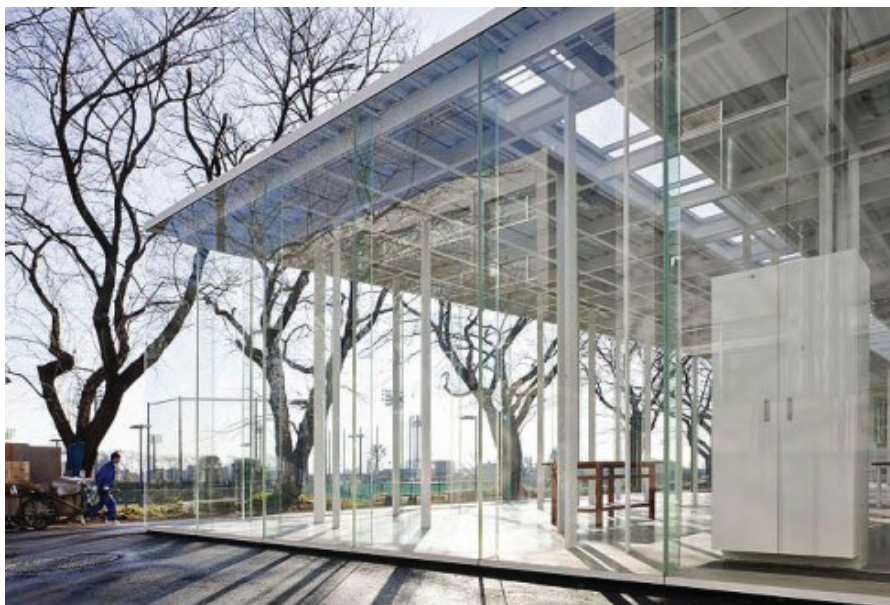
## Junya Ishigami

Junya Ishigami is a young Japanese architect, who like many of his Japanese contemporaries, has mastered an understanding of space. His work at the Kanagawa Technology Institute illustrates not only an intuitive spatial experience but the project itself represents an educational model that is refreshing and interesting. As Ishigami describes, "I wanted to make a space with very ambiguous borderlines, which has a fluctuation between local spaces and the overall space, rather than a universal space like that of Mies. This allows a new flexibility to emerge, revealing reality rather than shaping it."



All Images from: <http://archide.wordpress.com/2009/02/06/junya-ishigami's-university-project-space-tokyo>

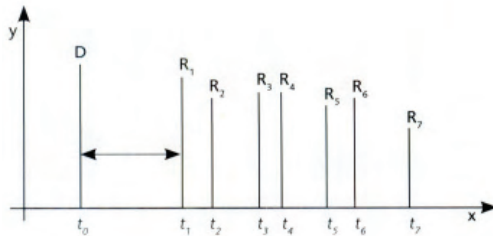




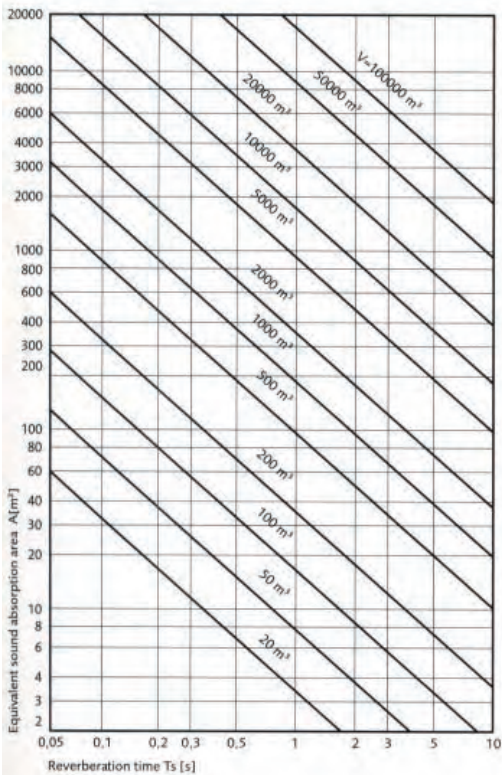


# School Design

## Acoustics

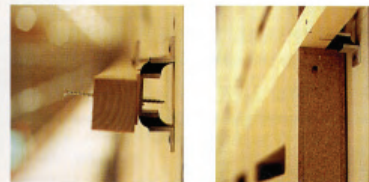


$x$  = time (in milliseconds)  
 $y$  = volume (in decibel)  
 $D$  = direct sound  
 $R_1, R_2, R_3$  = reflections from walls, ceiling, rear wall and other surfaces



Relation between sound absorption and reverberation time

Proper acoustics is a critical part of any school. Schools have varying degrees of noise levels and varying levels needed for noise control. Noise associated with young children and adolescence must be controlled to allow the specific activities within the program to function without disruption, especially the programs like music rooms, dining areas, auditoriums, and any kind of woodshop or craft areas. The images below and to the right illustrate sample design solutions to control sound reverberations.



Details of elastic suspension of walls and ceiling in Aula Magna at Gastner Upper School Bolzano, South Tyrol, V. Andriolo, 2001

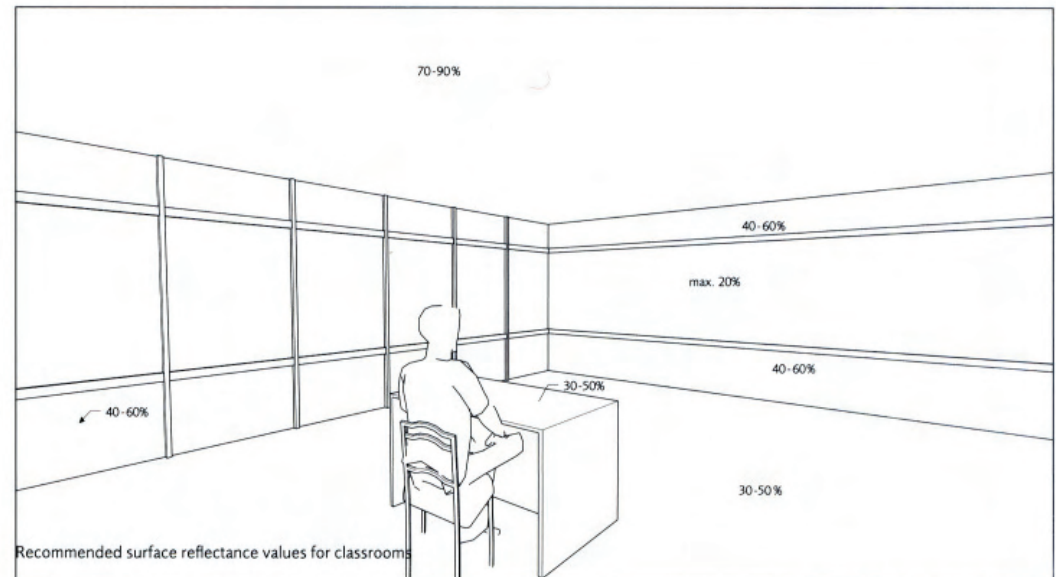


# School Design

## Daylighting

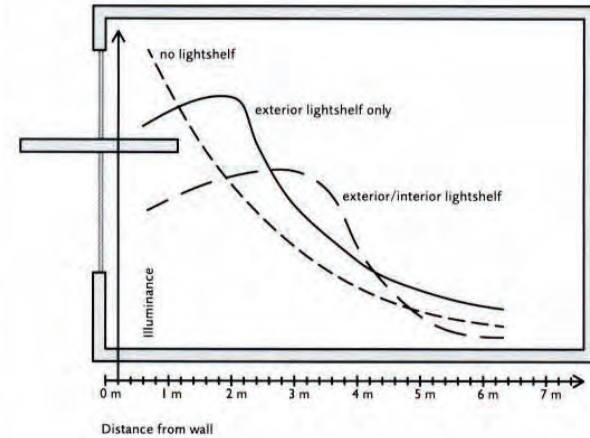
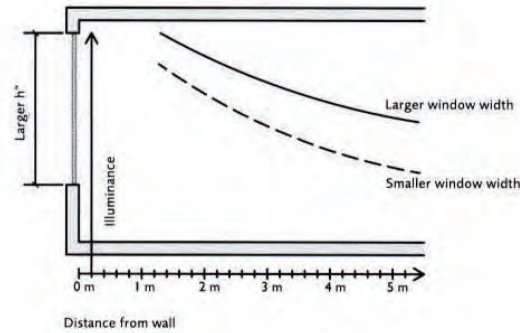
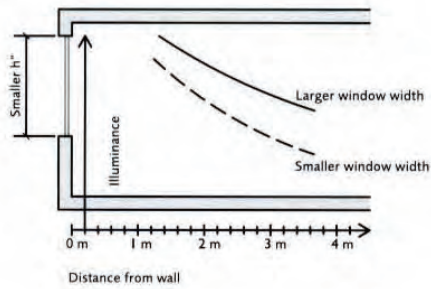
Area			Footcandle	Lux
Tasks	Reading printed material		30	300
	Reading pencil material		70	700
	Duplicated material	Good	30	300
		Poor	100	1000
	Drafting, benchwork		100	1000
Classrooms	Up reading, chalkboards, sewing		150	1500
	Art room		70	700
	Drafting room		100	1000
	Home economics room	Sewing	150	1500
		Cooking	50	500
		Ironing	50	500
		Sink activities	70	700
		Note-taking areas	70	700
	Laboratories		100	1000
	Lecture room	Audience area	70	700
		Demonstration area	150	1500
	Music room	Simple scores	30	300
		Advanced scores	70	700
	Shops		100	1000
	Sight-saving room		150	1500
	Study halls		70	700
	Typing		70	700
Corridors and stairways			20	200
Dormitories	General		10	100
	Reading books, magazines newspapers		30	300
	Study desk		70	700

Daylighting has a great impact on the success of an educational setting. The chart on the left illustrates the proper amount of light for each task associated with learning. The diagram below shows a classroom and the suggested amount of daylight for each activity within the classroom. These charts give a solid precedent for lighting in learning environments, however, there are other factors to be considered when factoring in daylight, for example, color. The reflection of daylight on certain colors and textures creates different atmospheres, some more conducive to learning than others.

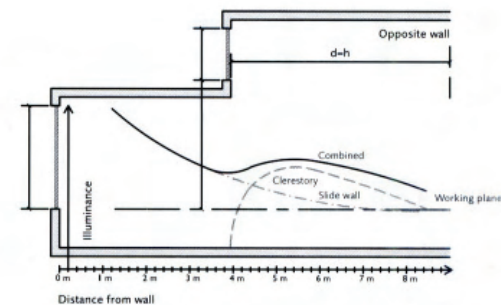
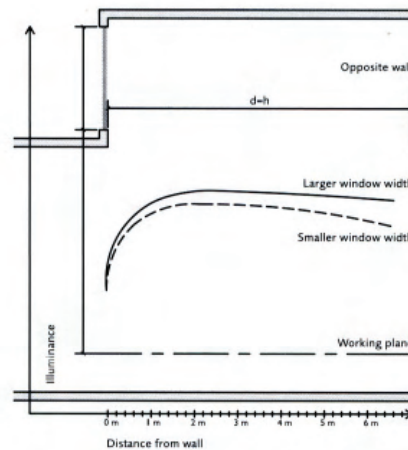
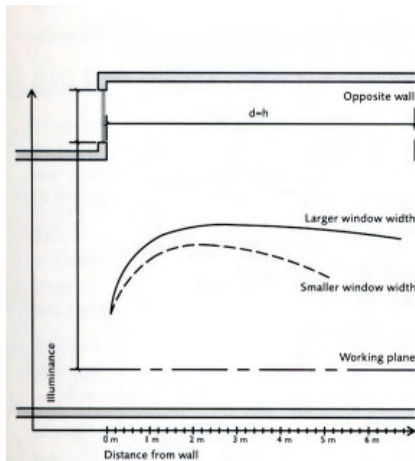
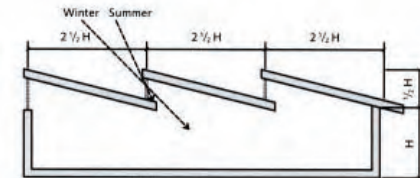
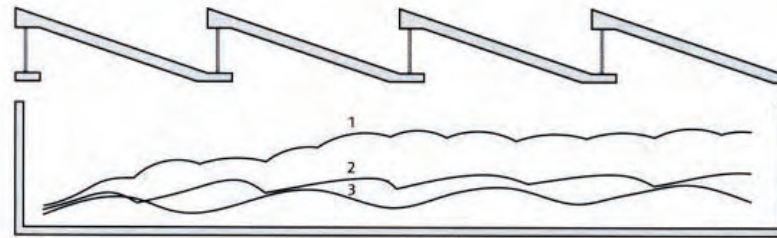


# School Design

## Daylighting



These diagrams show various daylighting strategies for different room layouts and roof schemes.

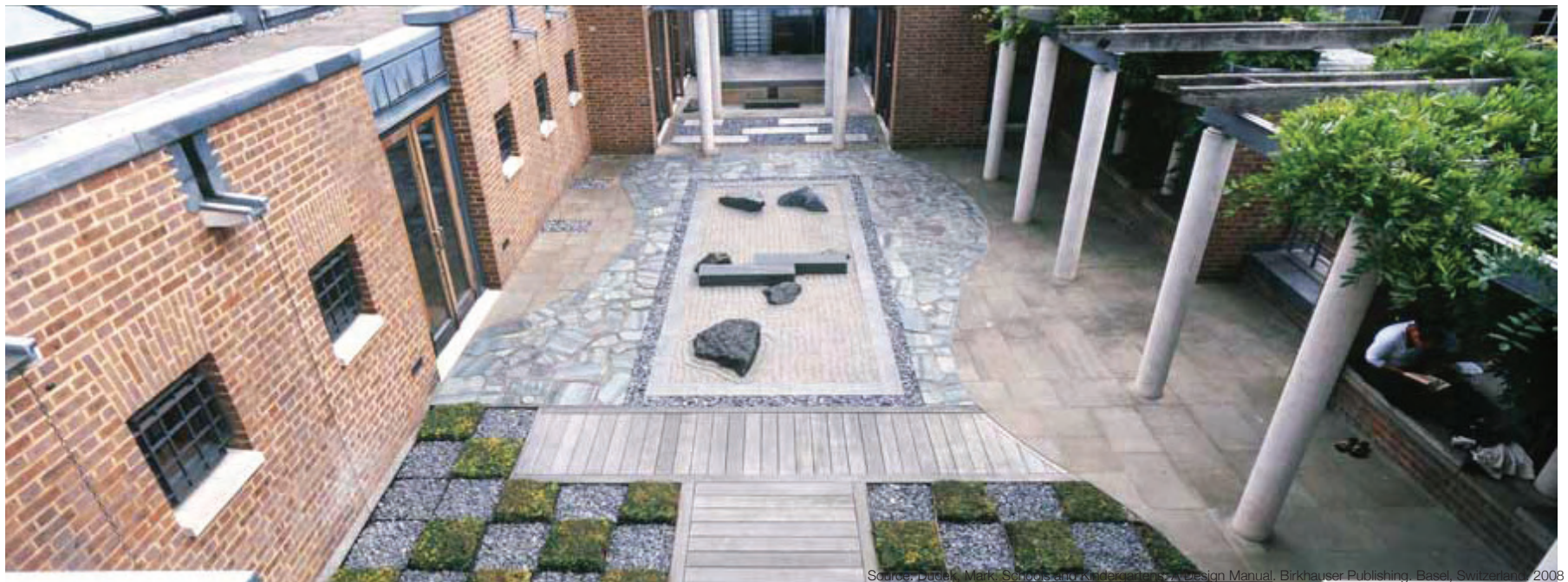
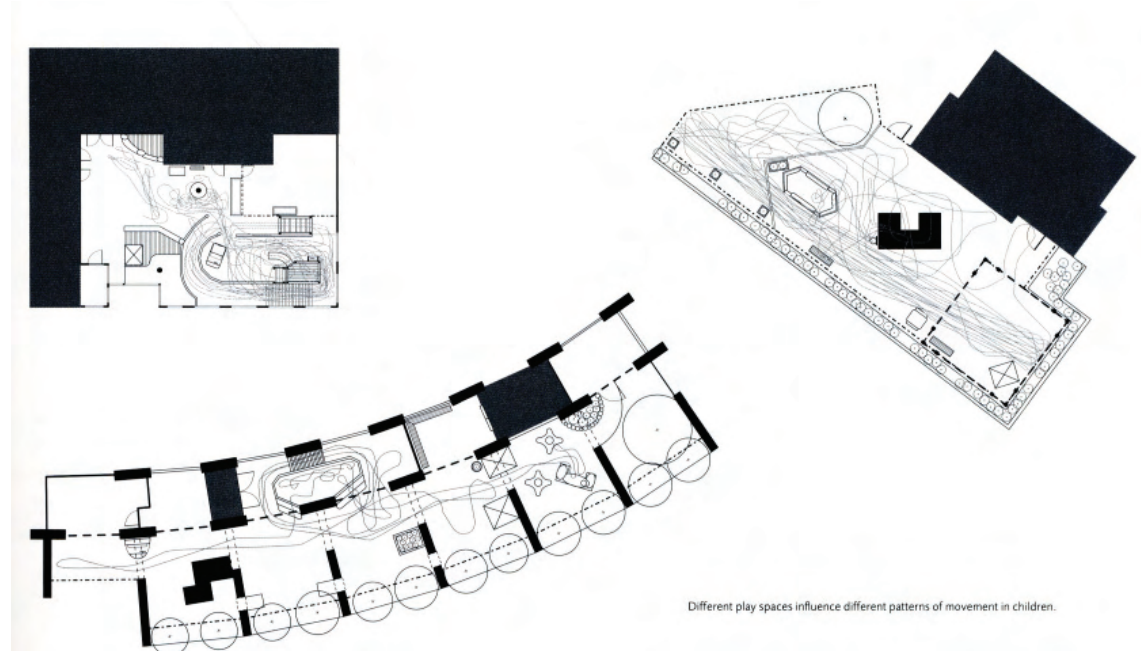




# School Design

## Exteriors

The articulation of exterior spaces within a school is just as important to the design of the interior spaces. Well designed exterior spaces can influence the activities within the building. They also can provide exterior places of learning and interaction. Furthermore, exterior spaces are critical for growing children to exercise and interact with each other. Exterior spaces not only provide the opportunity to learn but also can provide a peaceful retreat from the demands of the classroom.



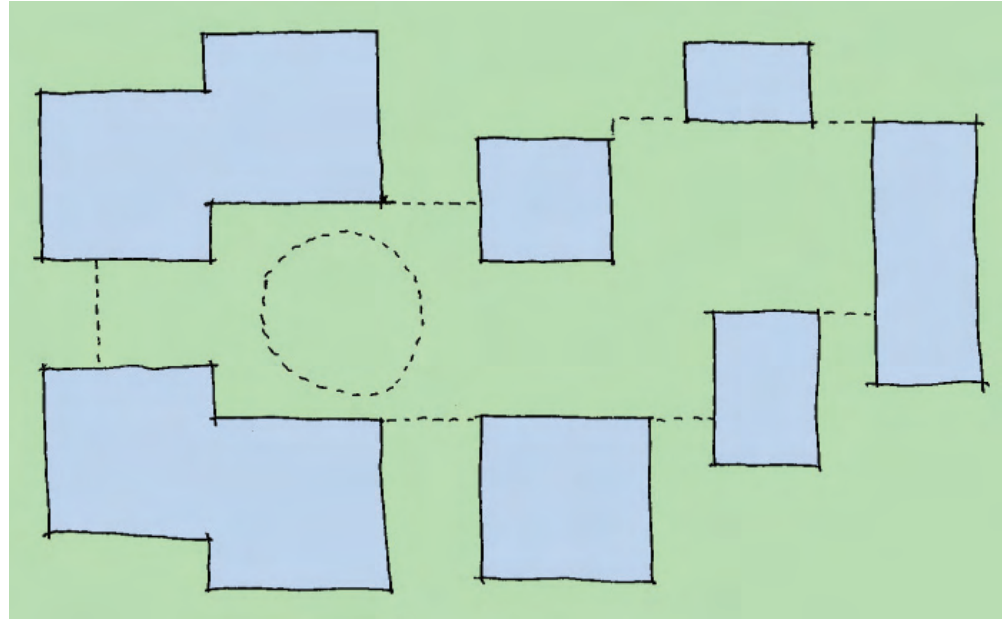
Source: Dieck, Mark. *Schools and Kids: A Design Manual*. Birkhäuser Publishing, Basel, Switzerland, 2008.

# School Design

## Organizational Strategies

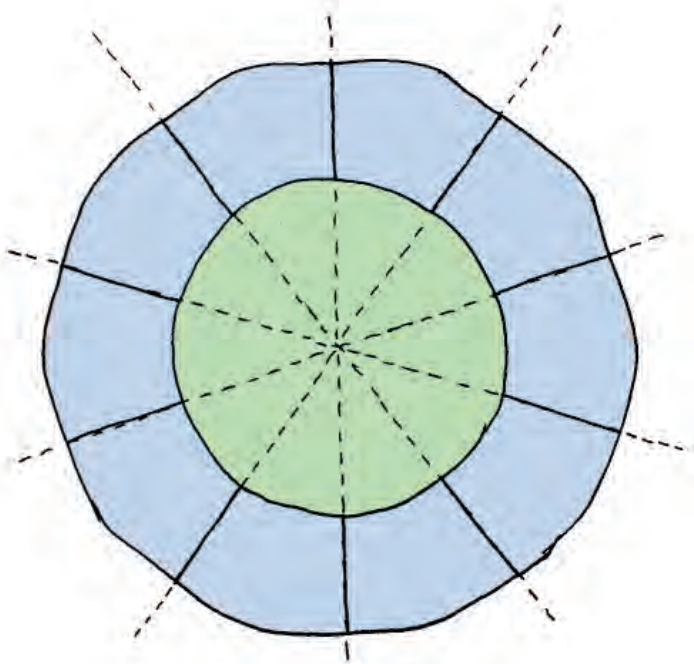
### Scattered Plan

The Scattered Plan separates the program pieces into individual entities. This plan is a form of the clustered plan but taken one step further. Instead of being linked by one exterior skin, these program pavilions are linked by a larger landscaping strategy. The scattered pavilions draw some precedence from the traditional Japanese teahouse, garden experience where a visitor moves from teahouse to teahouse through an articulated garden landscape.

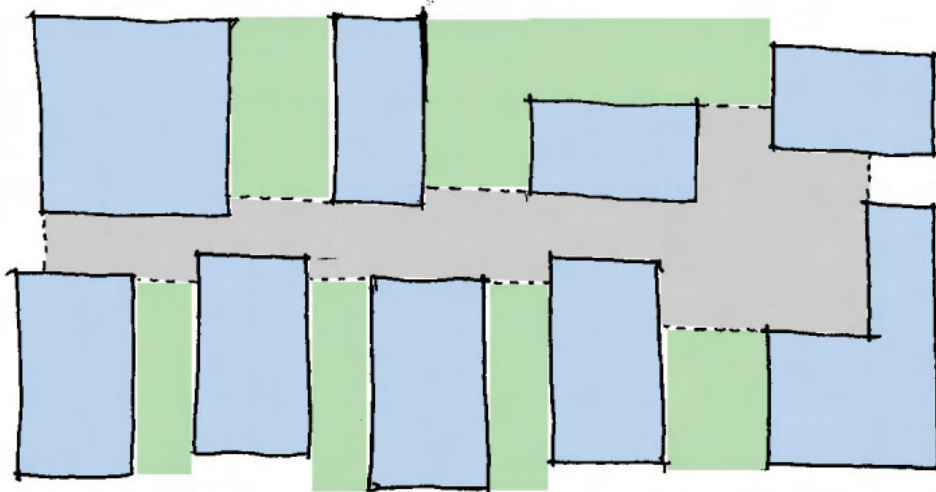


### Radial Plan

The Radial plan breaks down the traditional school building typology and creates a seamless flow of space with an emphasis on the internal courtyard. With the courtyard surrounded by program there is an articulated sequence of privacy from the external world through the school program and finally to the private, inner courtyard. There is also the opportunity to allow the internalized courtyard and the exterior to have a dialogue through a transparent building envelope. The radial plan presents a space with no corners which provides a certain level of transparency and an ambiguous flow of space that can be found in traditional Japanese homes.





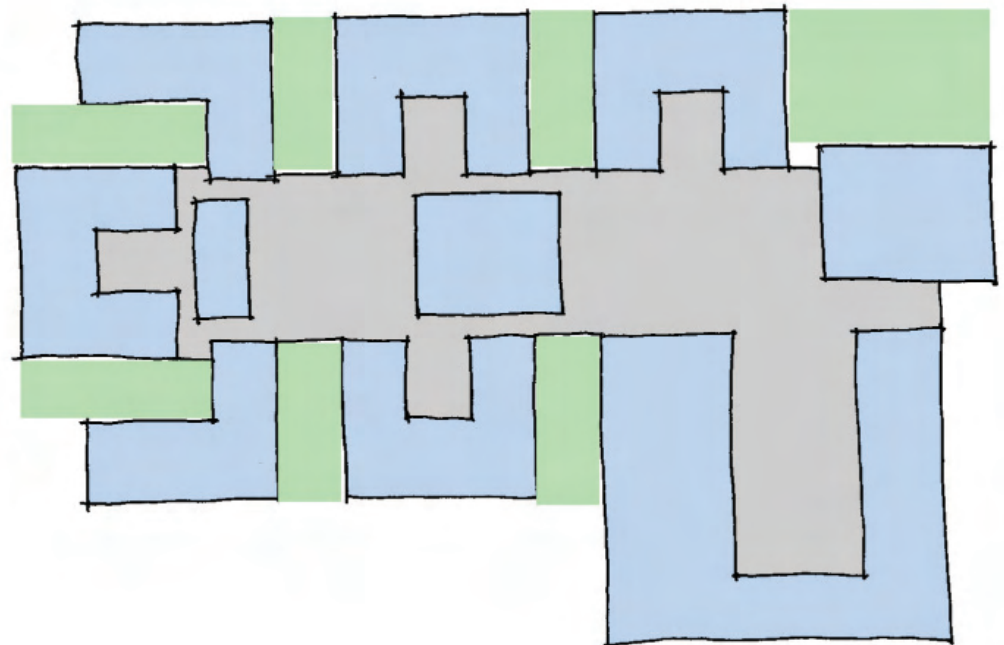


## Street Plan

The Street Plan layout offers a dynamic interior experience for students and faculty alike. This layout breaks down the traditional typology of the school into a more familiar, a more casual environment. The environment created within the building promotes interaction and casual conversation by providing many break-away spaces from the major circulation artery. The fragmented plan can also emphasize the sequence from the exterior and the interior with spaces that allow nature to enter into the building.

## Clustered Plan

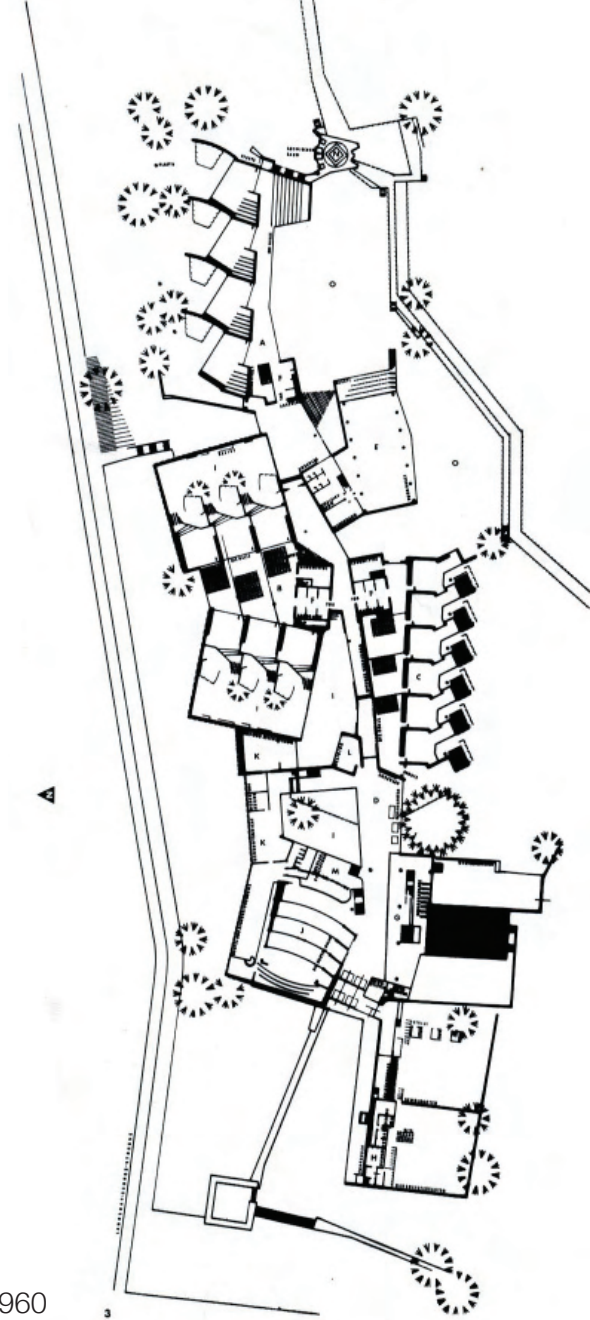
The Clustered Plan provides specific groupings of program with allotted breakout spaces, emphasizing the sequence of the private classroom setting with the more public circulation and gathering spaces. Whether grouped by grade level or by a particular subject, these clustered program pieces help give identity to the spaces within the building. The clusters allow for group gathering spaces while also providing green spaces to permeate the built environment.



# Hans Scharoun

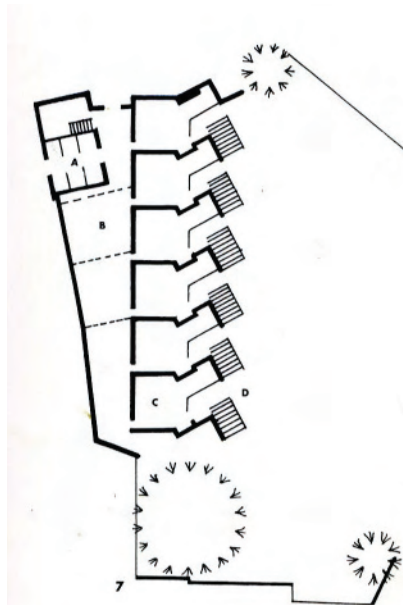
## School Design Philosophy

Hans Scharoun was an architect in post-war Germany. He designed many public buildings all of which had one intent, to break with the Nazi Fascism and create buildings that encouraged individualism and diversity. His school designs were somewhat radical at the time. His plans for schools came from a belief about children and education, how at the certain stages of development, children require different sized, varied colors and certain orientations to achieve the maximum learning potential.

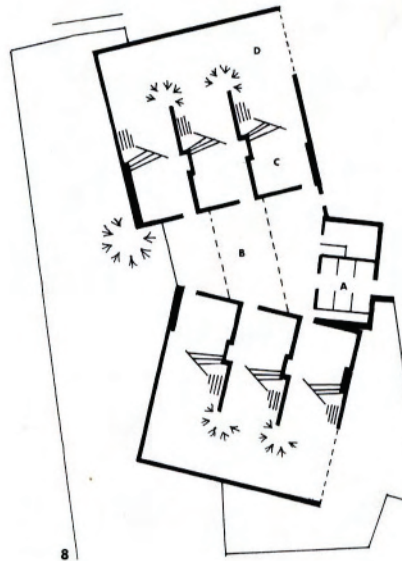


Geschwister Scholl 1960

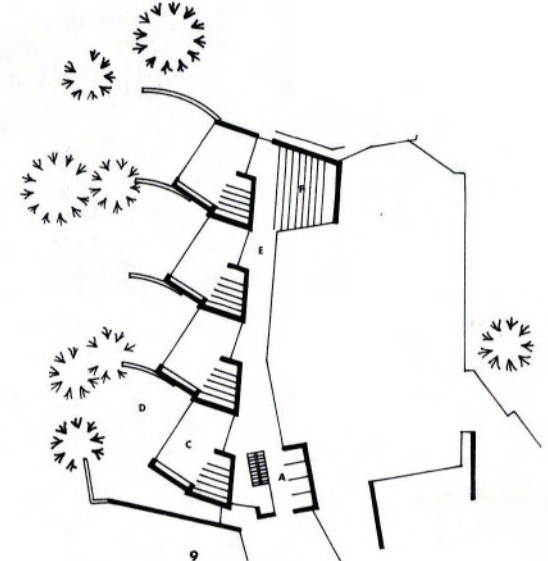




7-9 Part plans of lower, middle and upper schools



A 'gatehouse tower' with cloakrooms,  
B communal space, C classroom,



D external teaching space, E corridor,  
F shared seminar space

# Tezuka Architects

## Fuji Kindergarten - Tokyo, Japan



The Fuji Kindergarten in the outskirts of Tokyo offers a contemporary vision of Japan's eagerness to revolutionize the education system. The kindergarten was commissioned by the local elementary school principal and his wife. They wanted a school that focused on the children's development and adopted a more interactive learning environment. The school is an oval shape that surrounds an interior play area. There are no fixed walls within the oval shape. The classroom spaces are completely flexible and create a subtle transition from the neighboring context, the classrooms and the interior play area. The roof is an accessible deck that acts as an extra play surface for the children.

Source: <http://www.tezuka-arch.com/english/index.html>









## Mary Ann Thompson

Stamford Children's School - Stamford, CT



The program for the Children's School was a school for 60 children 2-8, designed as a "one room schoolhouse". Roof planes subtly tilt against one another to let in light from above as they also define the classroom spaces below, without the use of walls. The scheme has multiple relationships to the exterior play areas with doors out from every classroom. The shifting plan allows for a fragmented reading of the building that reduces the scale of the mass to be more in keeping with the scale of the child. This precedent offers interesting ways of dealing with issues of scale according to age groups.









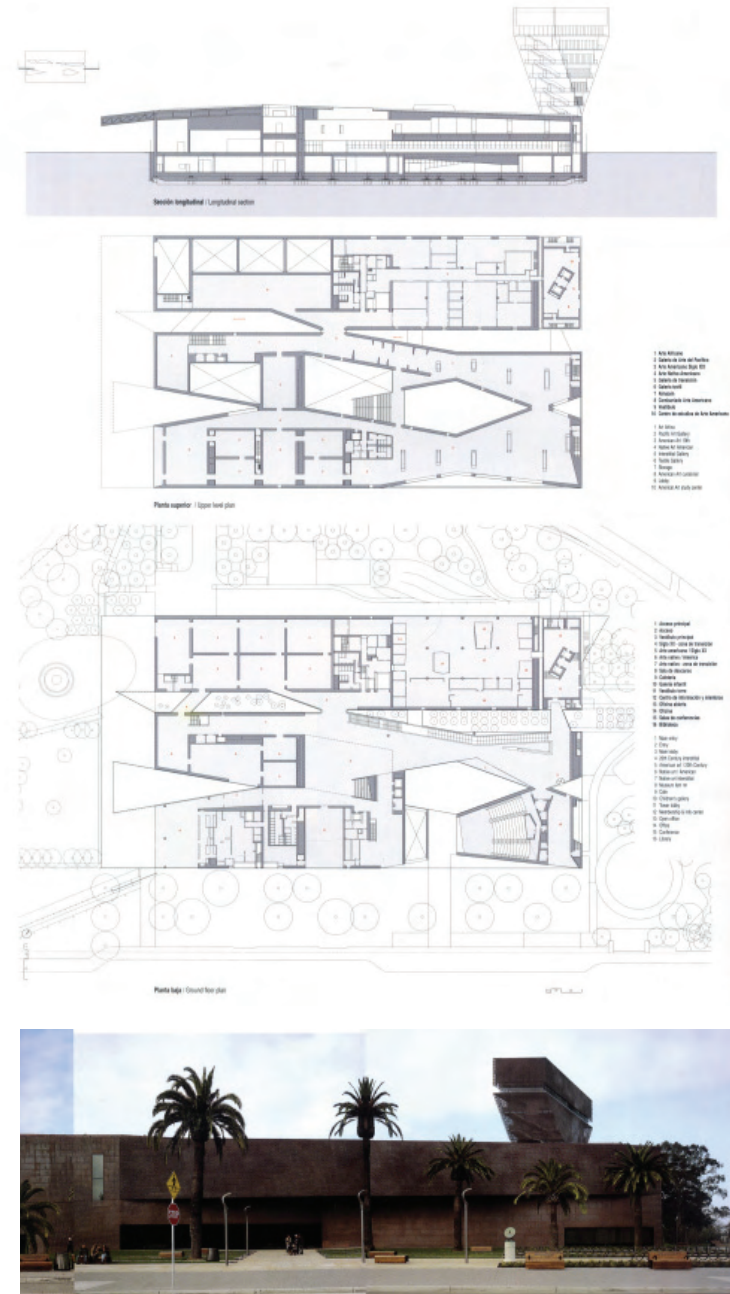
# Herzog & De Meuron

## Facade Systems & Visual Aesthetics

Herzog & De Meuron are masters of articulation both of space and of the fine architectural details. Their extensive work in facade design and treatments are a source of inspiration, especially in the development of screening devices. The two works shown here (DeYoung Museum and the Rehabilitation Center in Basel, England *opposite page*) are interesting examples of facade screens. The quality of the courtyard spaces also inform the project of different qualities of communal space.



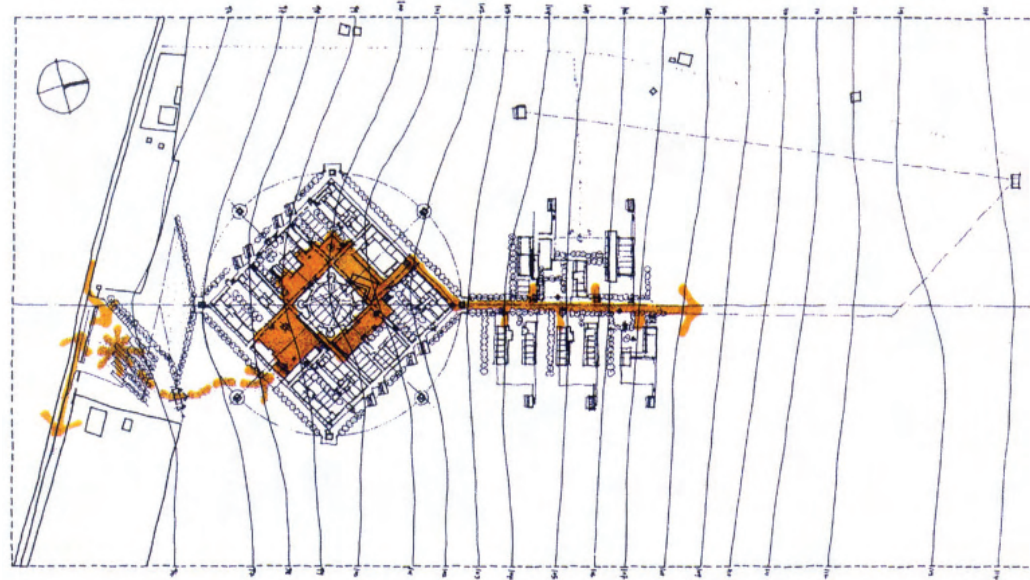
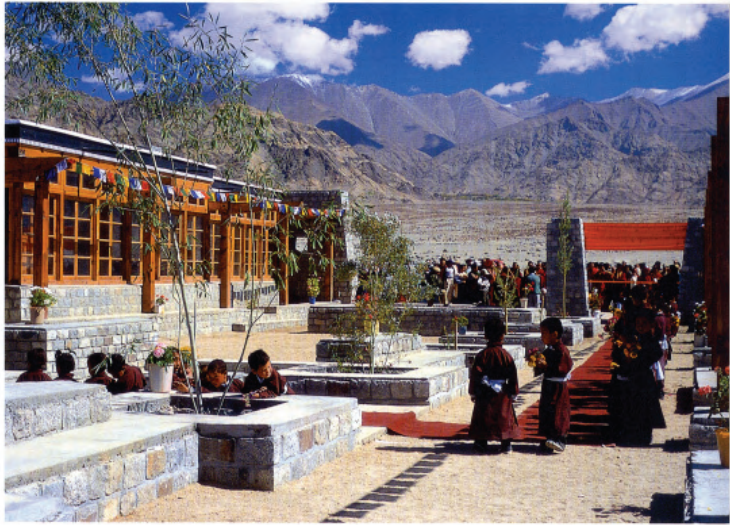
Source: El Croquis. Herzog & DeMeuron, 1998-2002 (El Croquis 109/110). Madrid, Spain. 2004







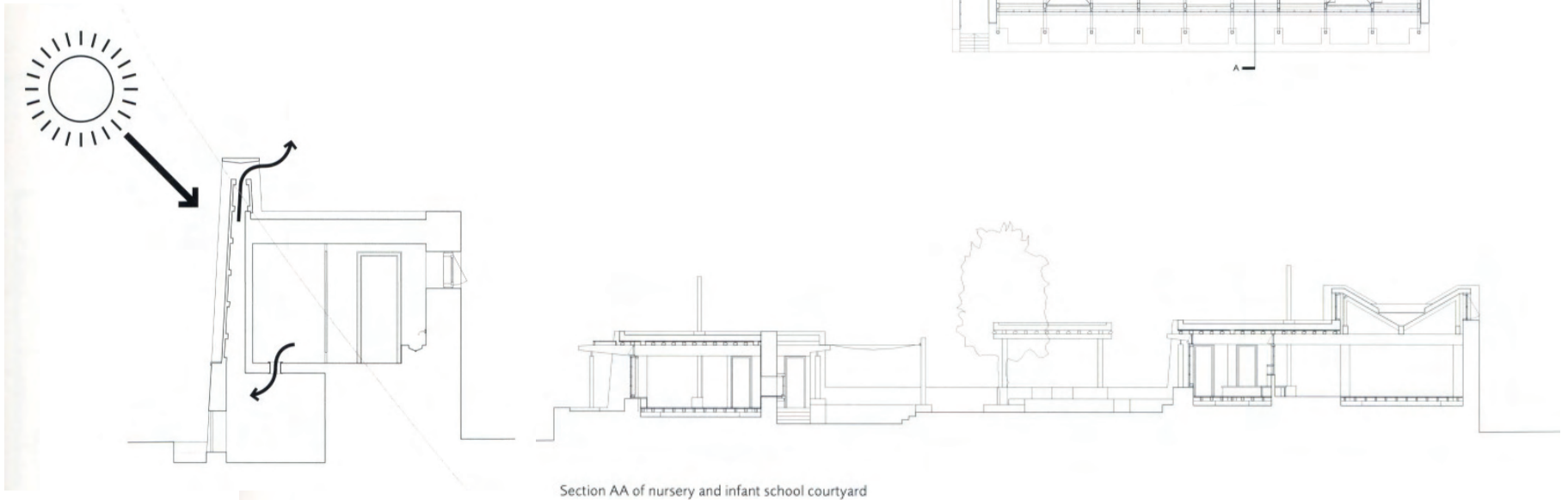
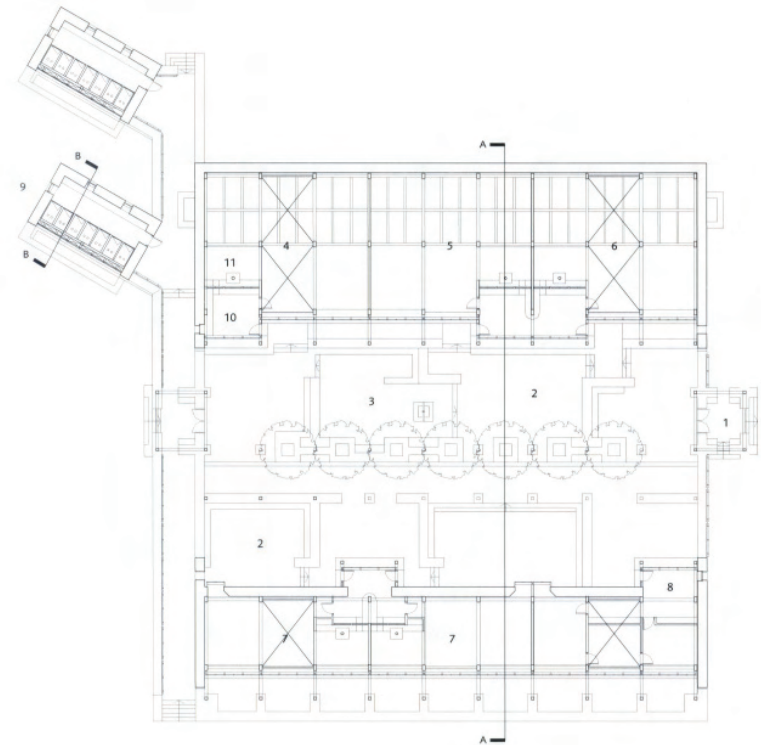
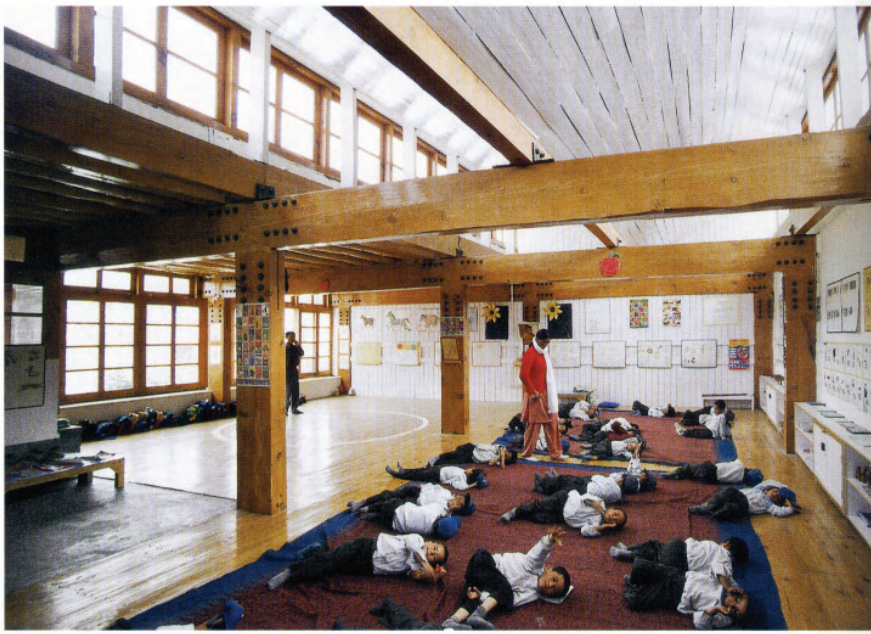




The Lotus School in Ladakh, India works very well at resolving environmental issues while also creating a successful school. The school orients itself to maximize cross-ventilation. The school's program creates an inner courtyard with several sunken levels that respond to the slope but also provide a "cold sink" that provides a cooler area for children to play outside. The classroom designs make use of local materials and maximize indirect lighting to diffuse the strong Indian sun and create a pleasant learning environment.



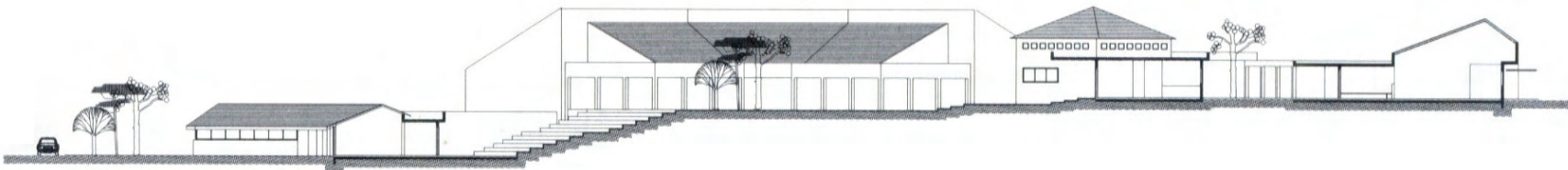




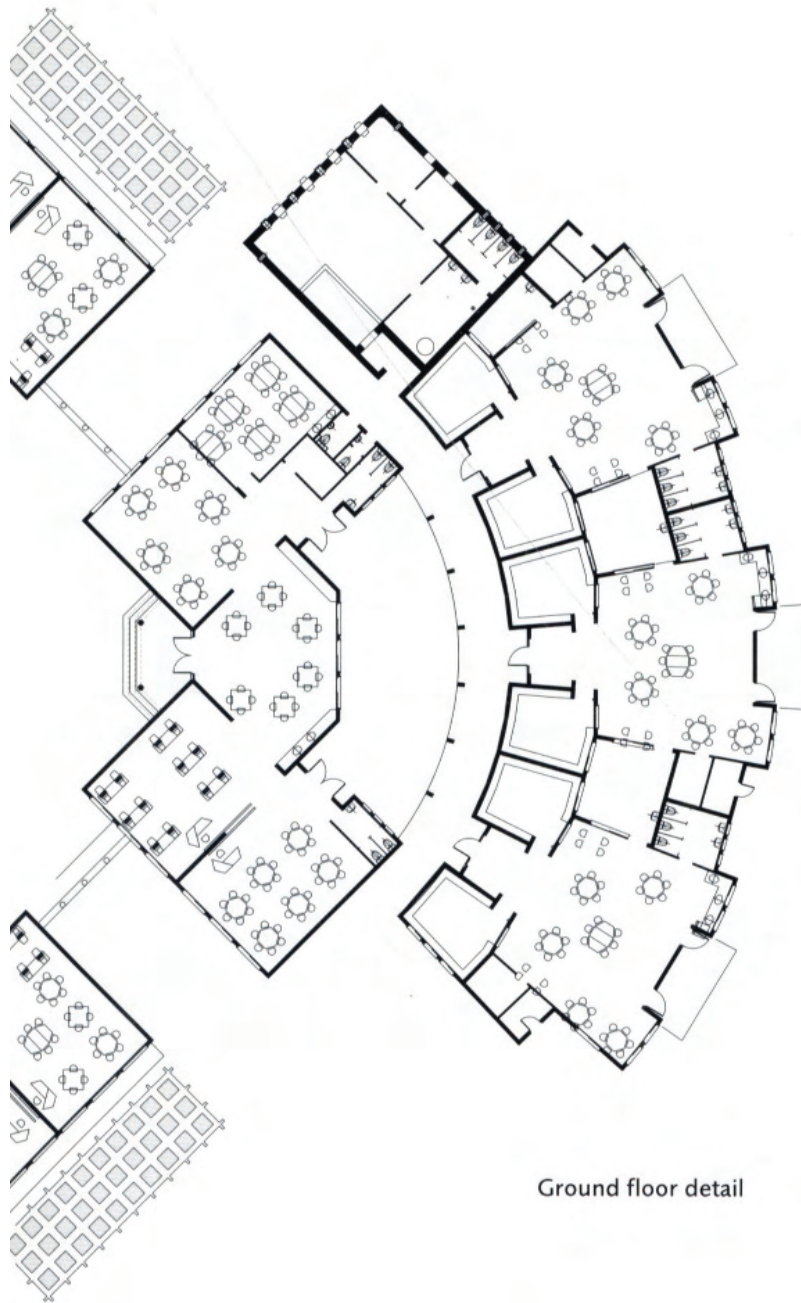
## Shimon & Gideon Powsner

### Hachores School - Zicron Yaacov, Israel

The Hachores School in Israel relates well to the site context. The concept of the building came from the ravine where the site sits. The plan is laid out as a series of linking courtyards between the classroom buildings. These courtyards provide great secondary spaces off of the circulation avenue that allow for casual conversation and student and teacher interaction.







Ground floor detail

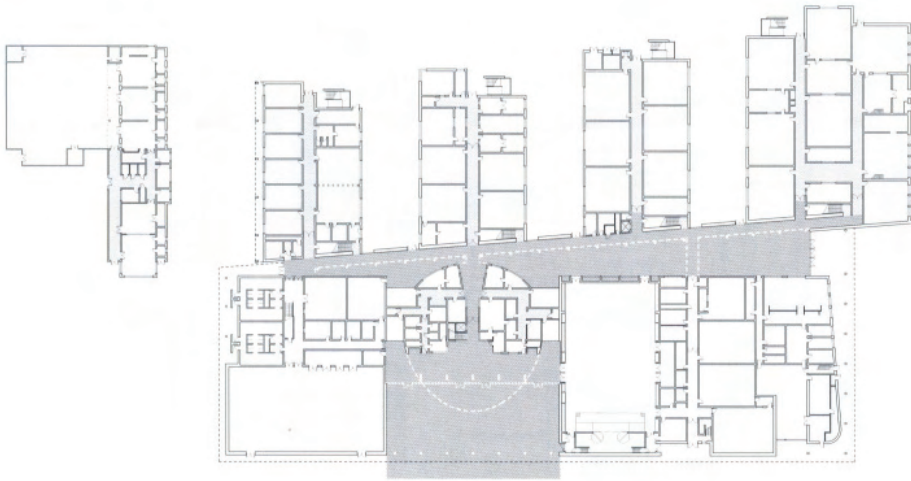
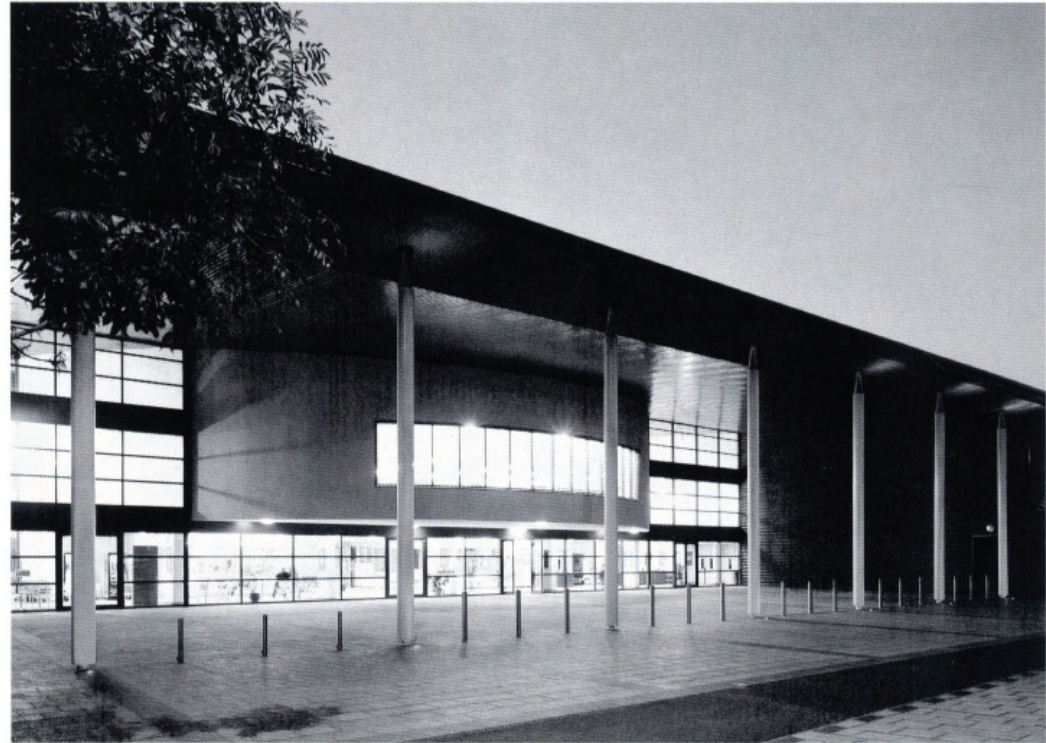




# Architecture PLB

## Jo Richardson Community School - Dagenham, UK

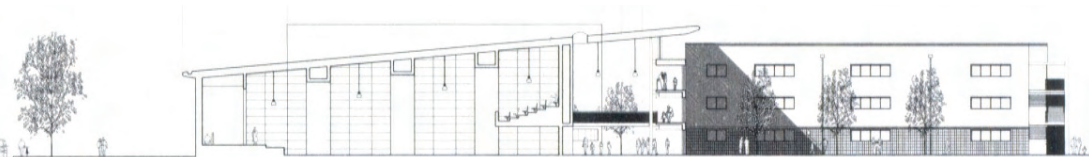
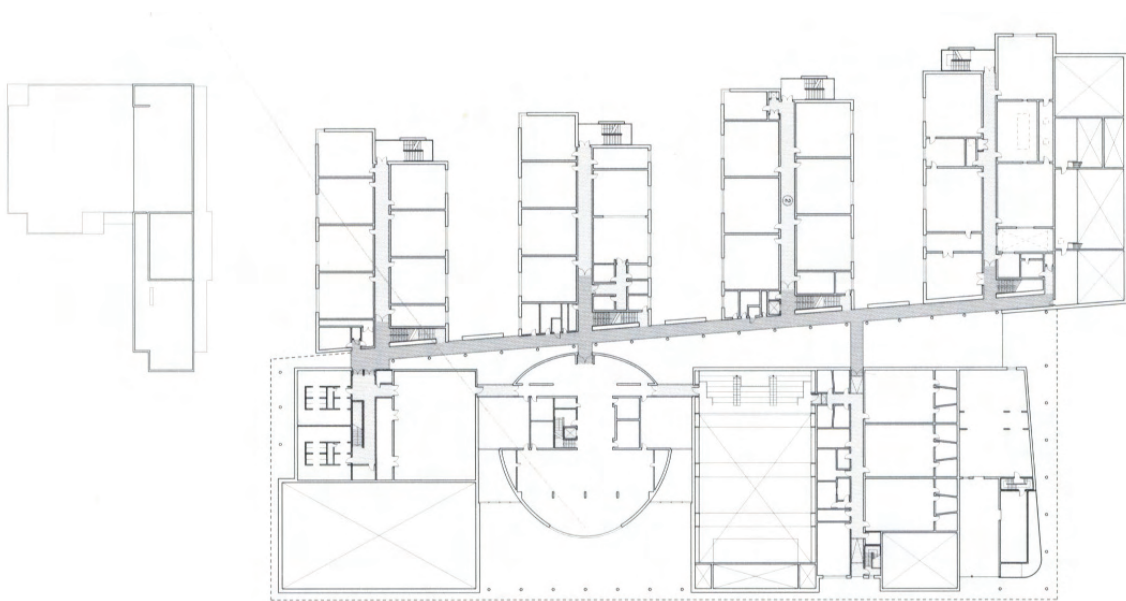
The Jo Richardson School in the United Kingdom is a great example of the “street layout” plan. The parti is fairly simple. The more public functions are located to the forefront of the street axis. Behind the entry and public program there is the two story atrium that cuts the space and creates an intriguing spatial dynamic through the main circulation axis. The classroom wings then come off of the street with intermediate green spaces between each wing. This school is an interesting way of organizing a program of similar size and scope.



Ground floor plan





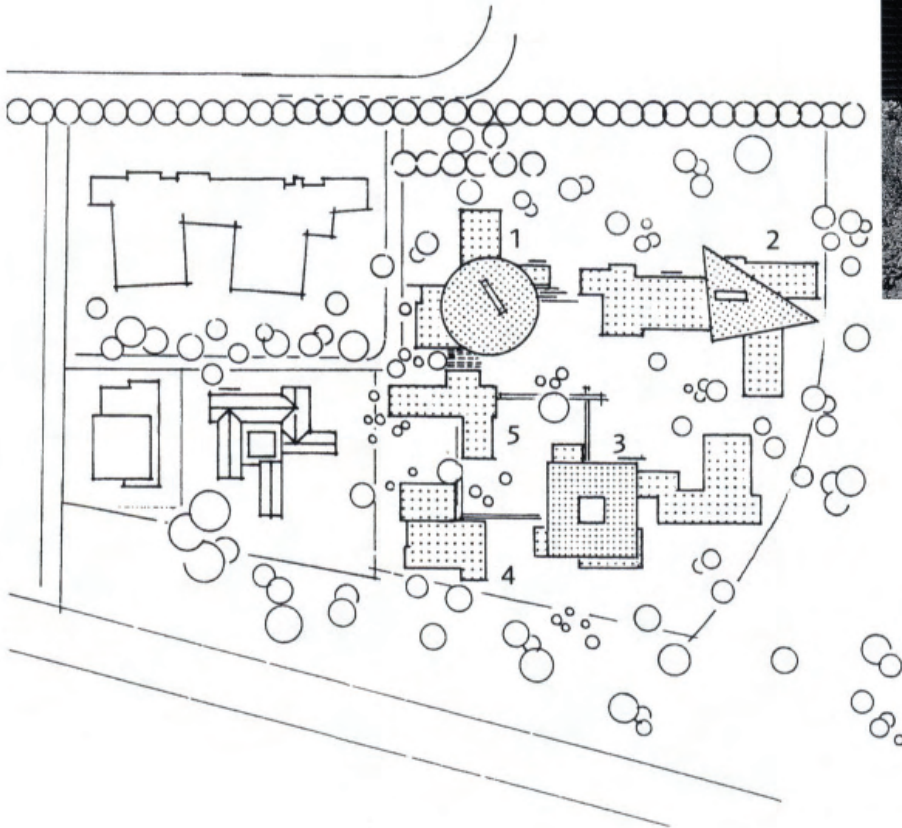




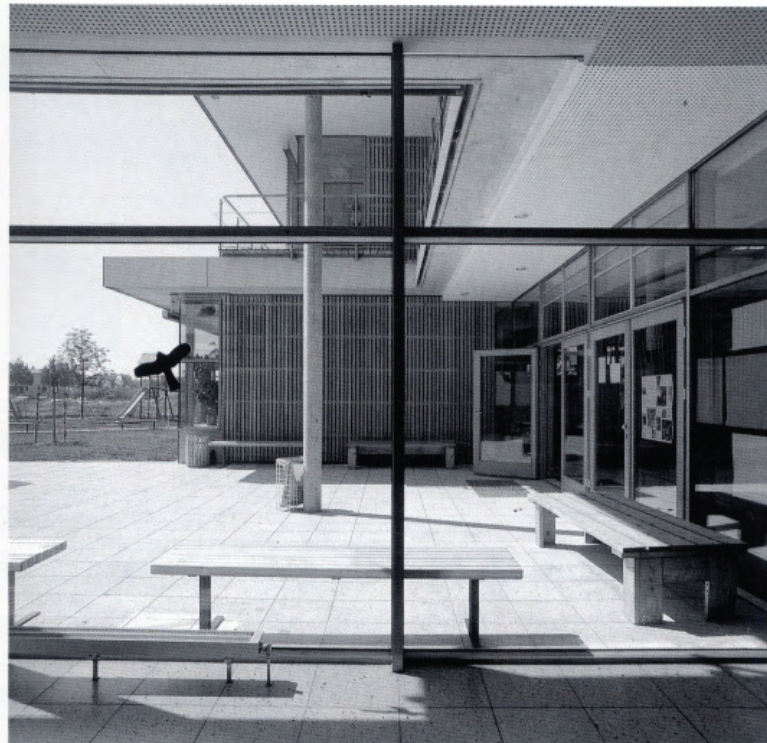
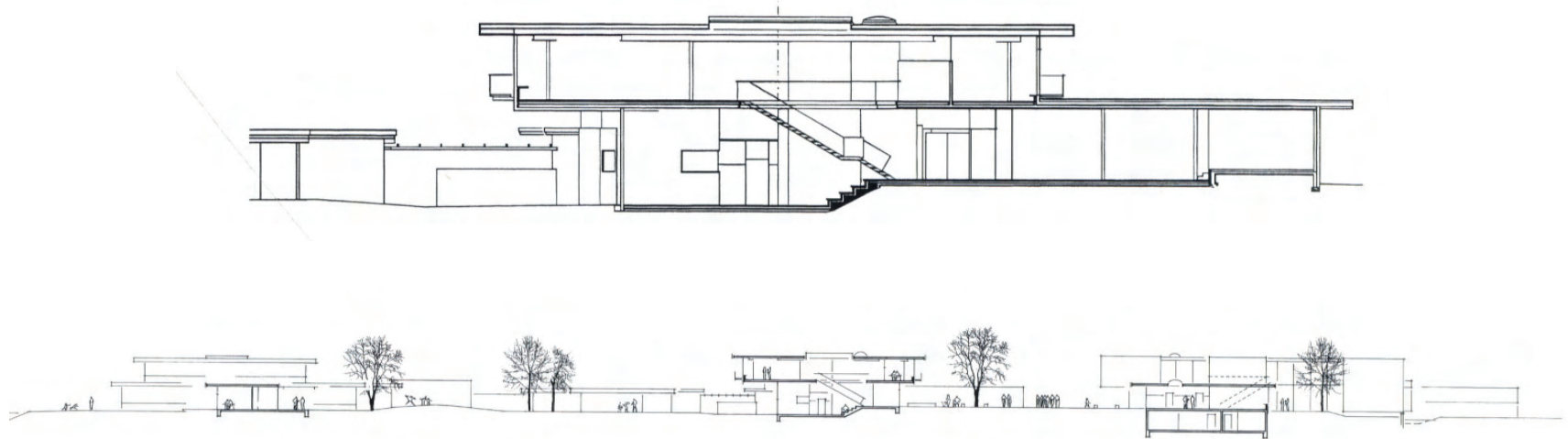
## Benisch Architekten

### Montessori School - Ingolstadt, Germany

From the outset, the Montessori School in Ingolstadt, Germany set out to break the institutional feel that is instantly associated with educational buildings. Benisch achieved this by articulating different architectural styles for the different programs within the school. The varied architectural forms were then scattered around the site, creating a small campus with the relatively small, school program. The location of the buildings helps articulate linkages and exterior green space that works with the overall strategy of the school design.





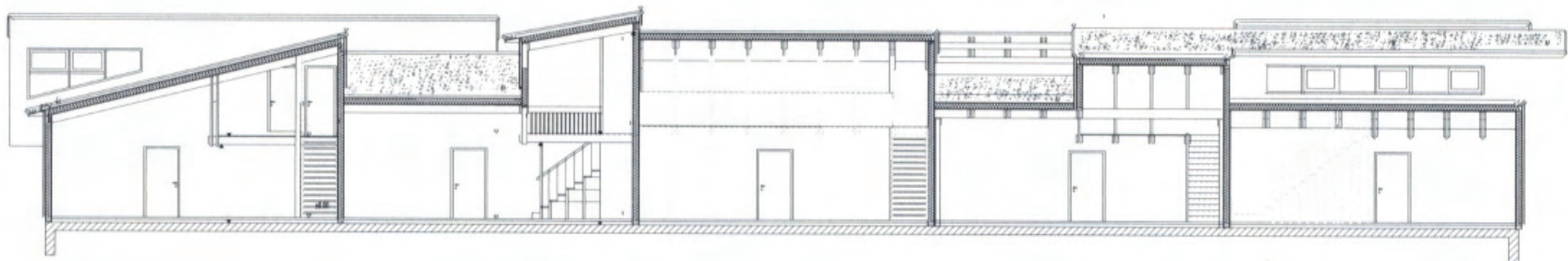




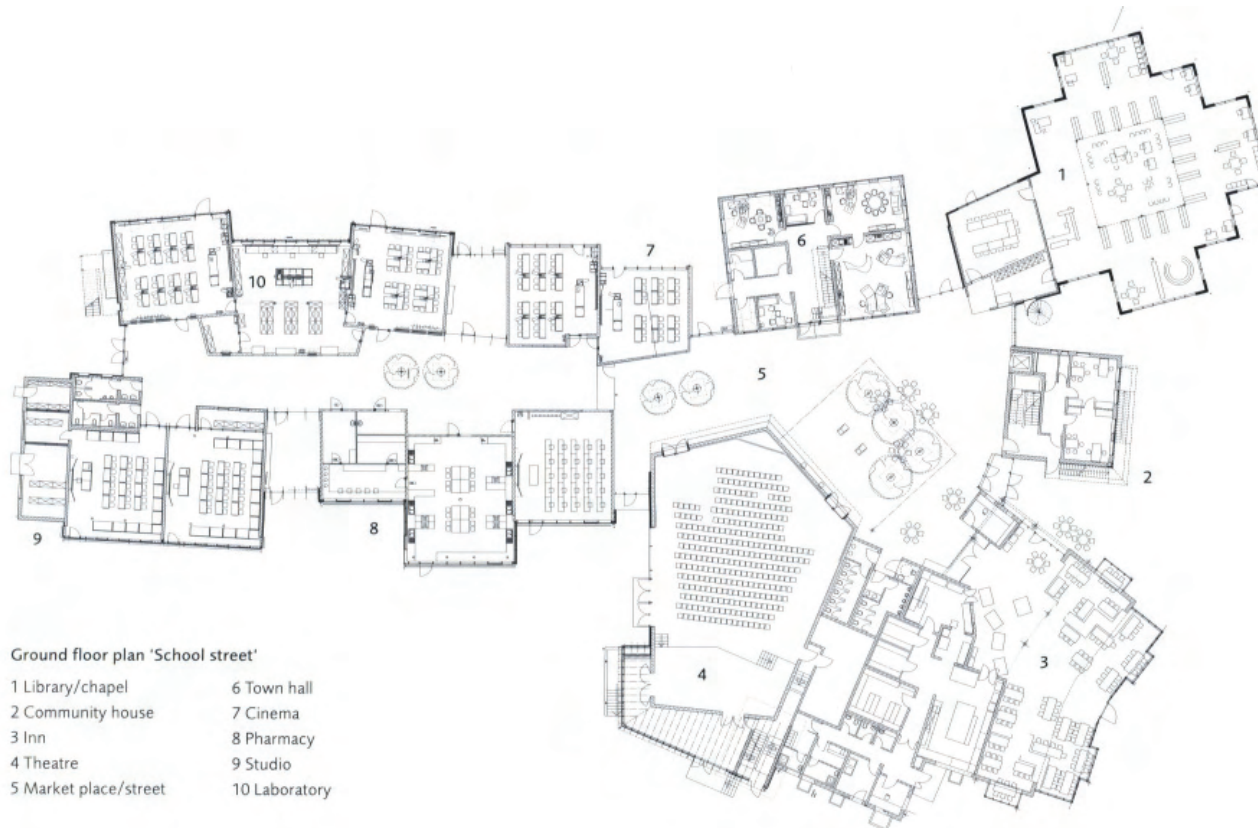
## Plus + Bauplanung

### Protestant Comprehensive School - Gelsenkirchen, Germany

The Protestant Comprehensive School works in a similar fashion to the school by Benisch. The school consists of several buildings that do not look or feel like “a school” in the traditional sense, rather the buildings work like a small community to enhance the learning process. The scale of these buildings also fit the user as they suit the function without becoming an overwhelming architectural statement.







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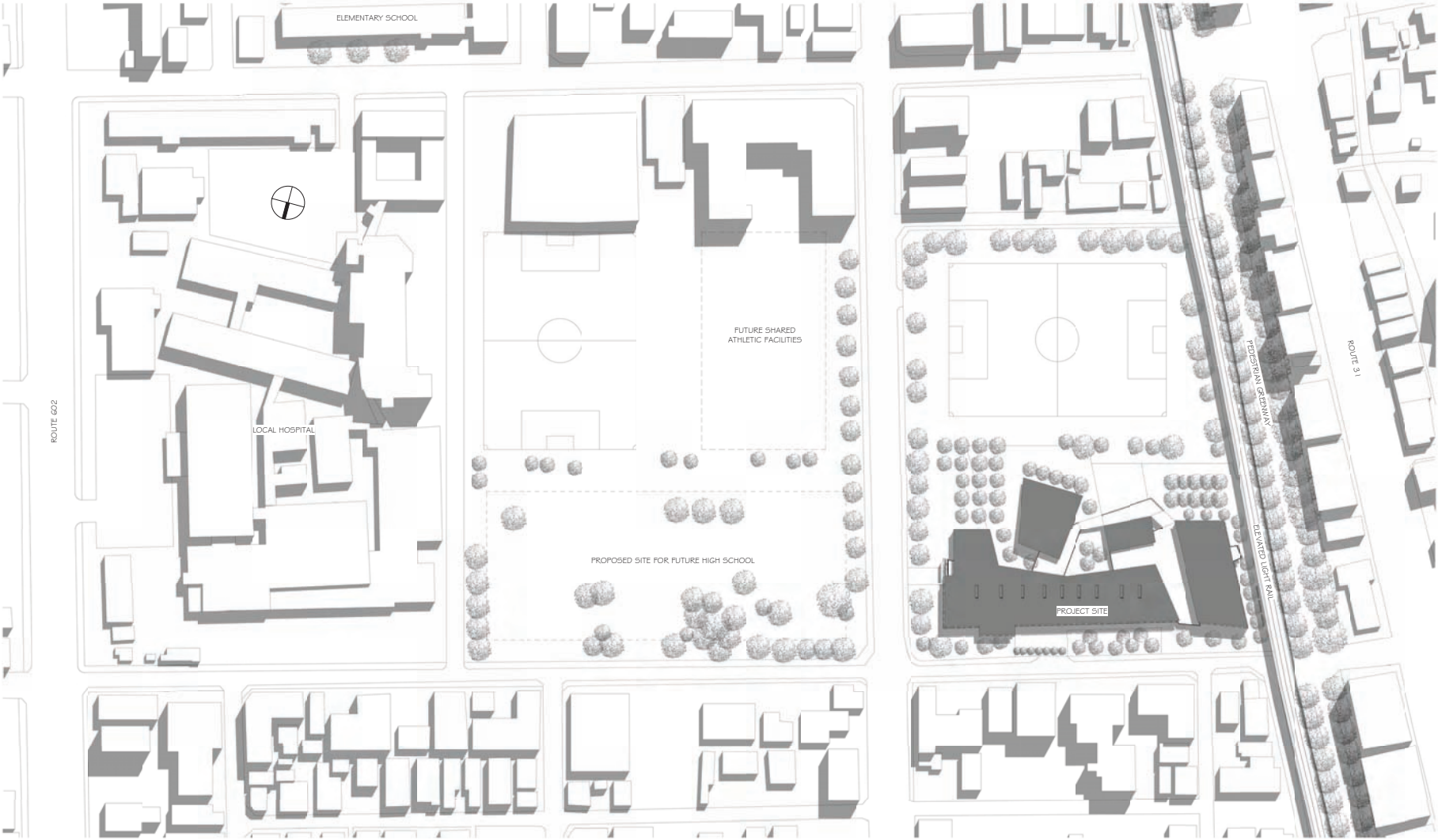




## Project Documentation

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Site Plan  
DRAWING NOT TO SCALE



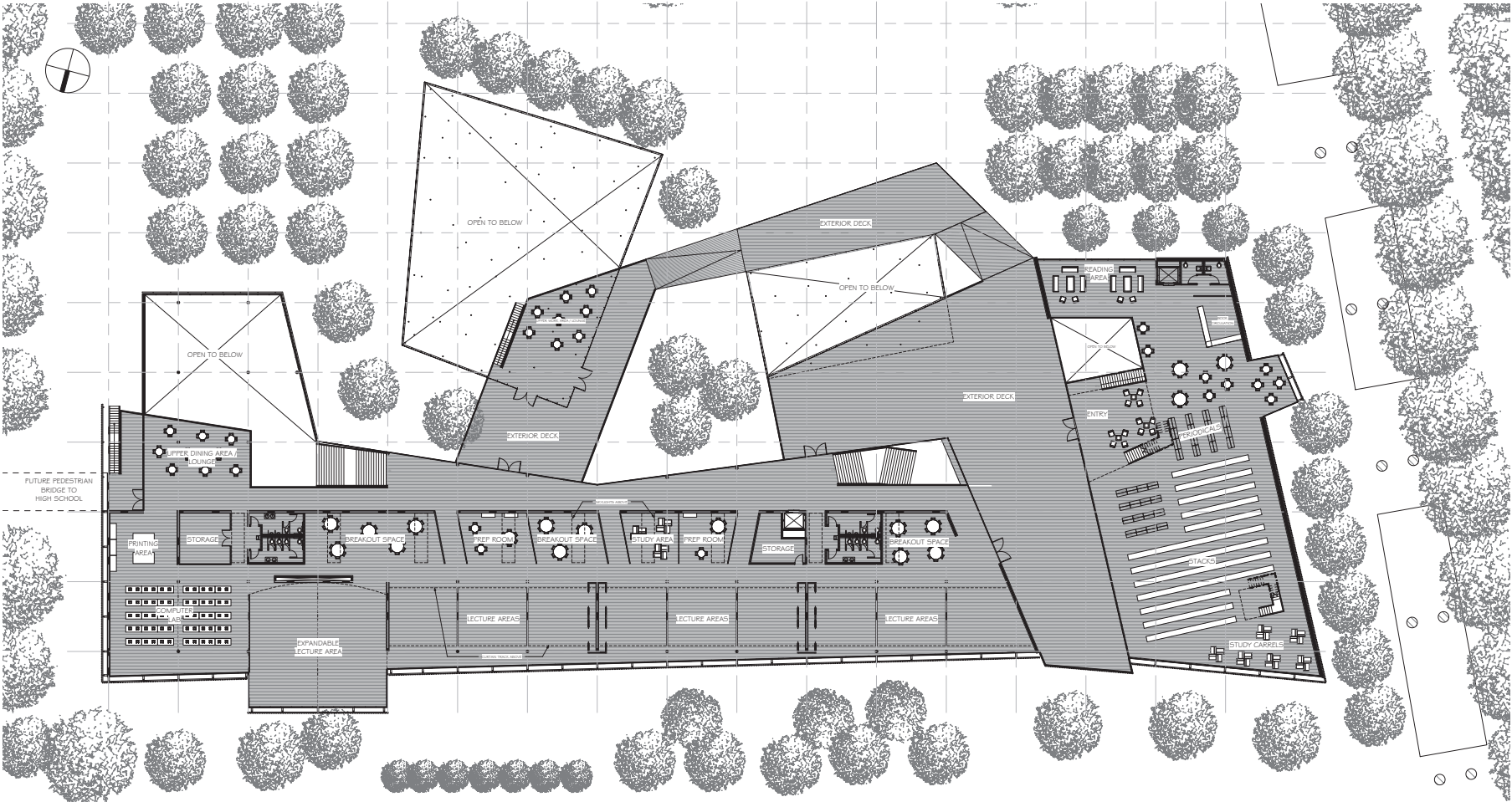


# Ground Floor Plan

DRAWING NOT TO SCALE



Second Floor Plan  
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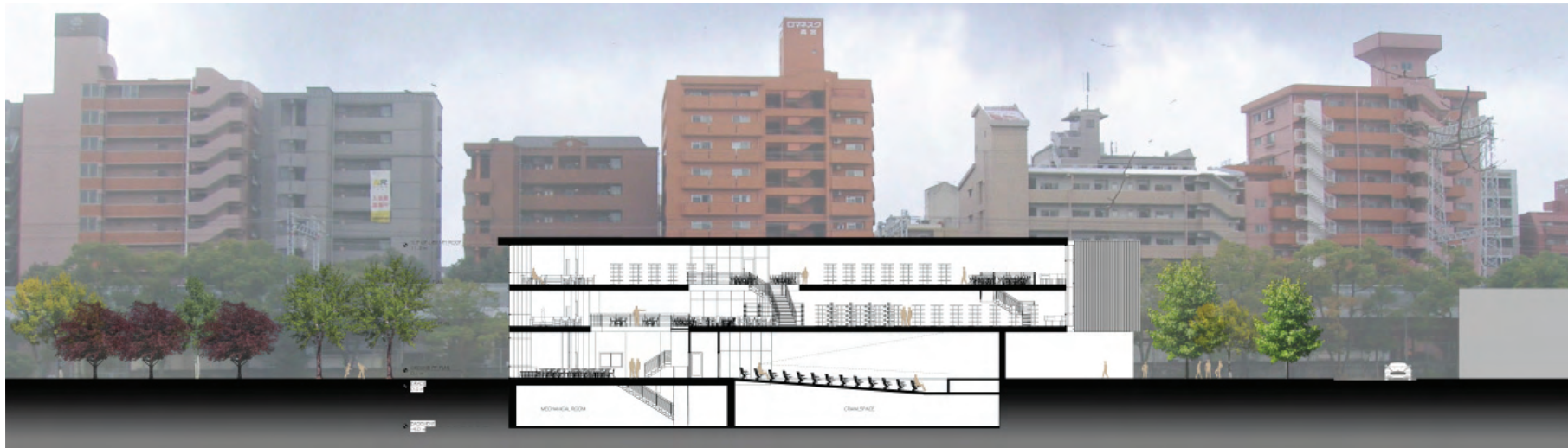




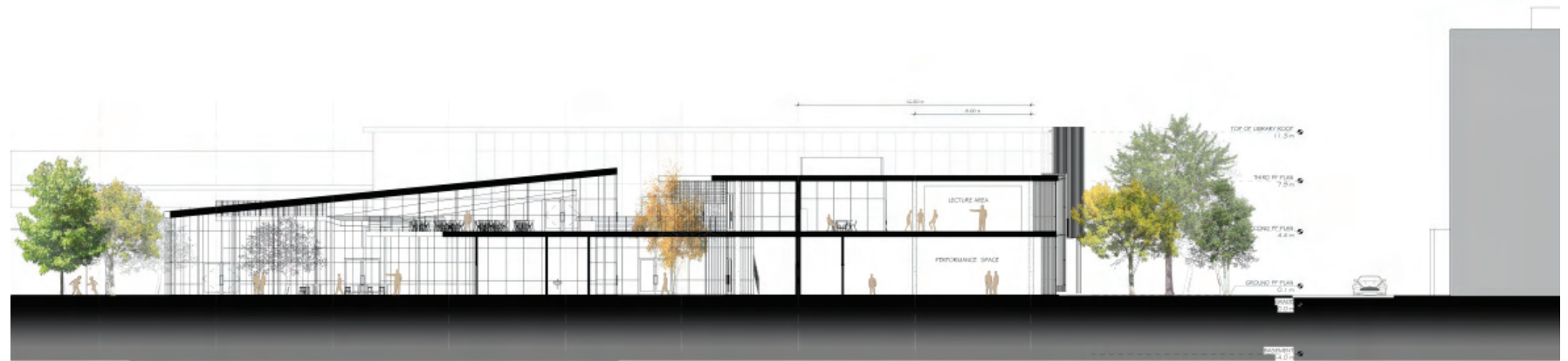
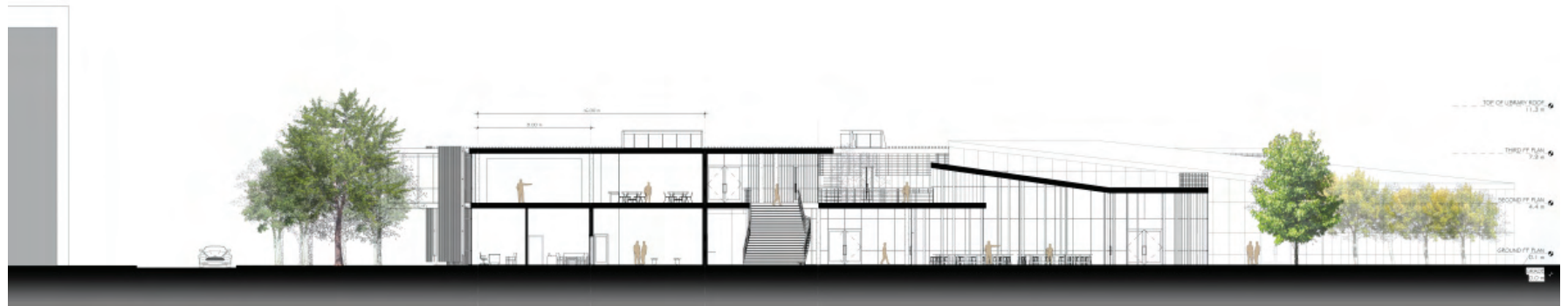
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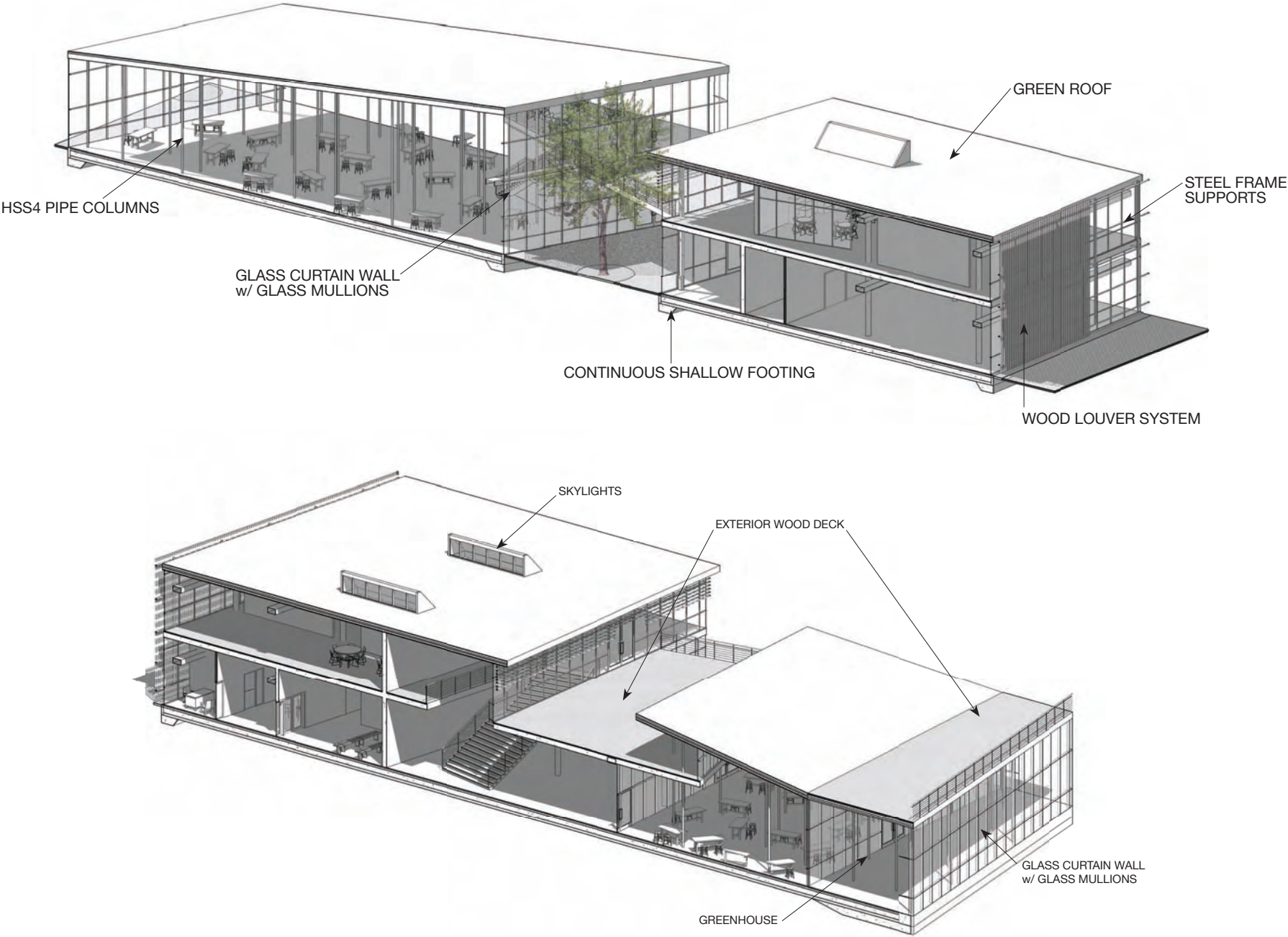
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**Building Systems**  
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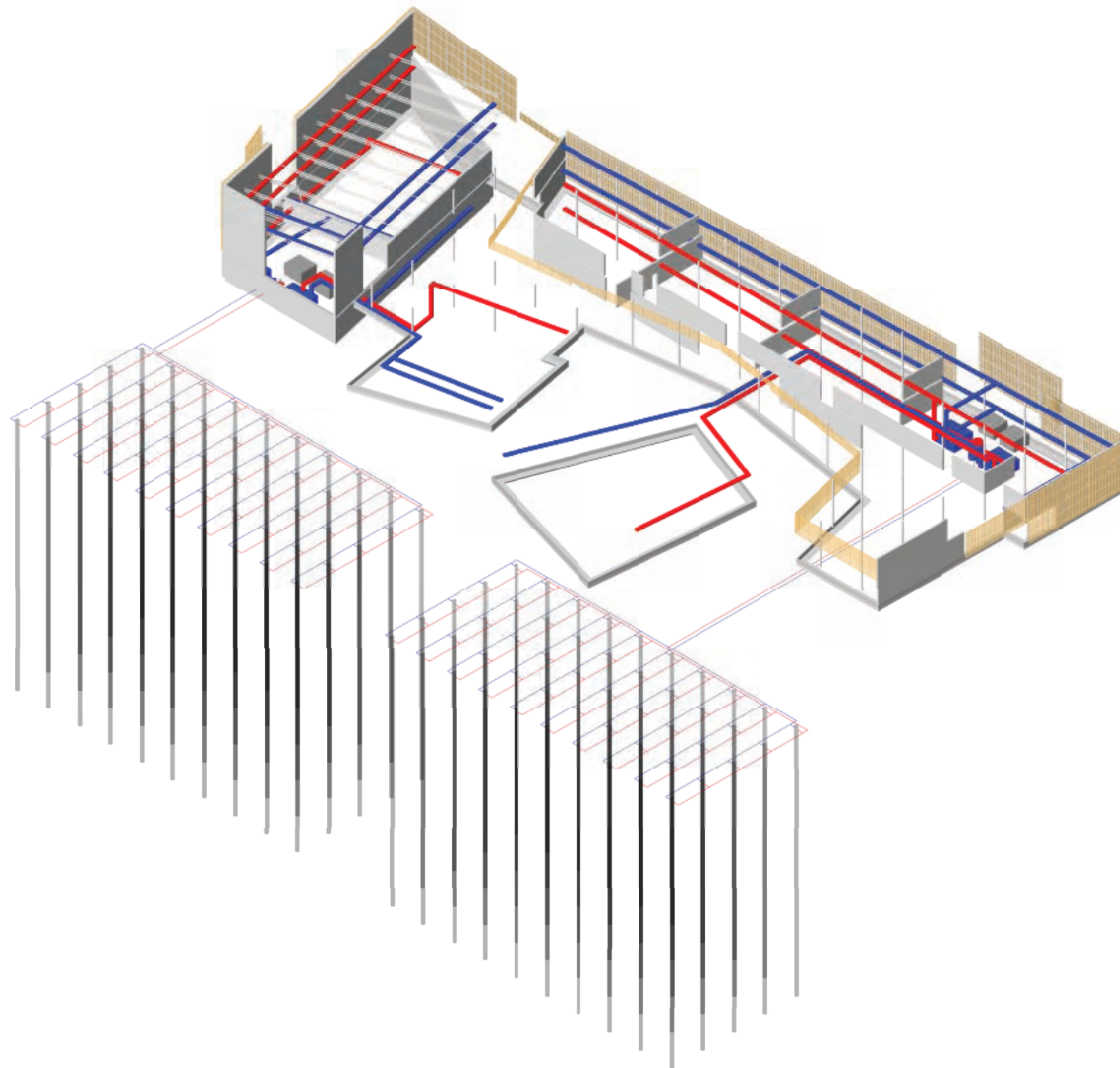


- TOP OF ROOF --- 8.4m



- SECOND FF PLAN --- 4.4m

GROUND FF PLAN





# Renderings

NOT TO SCALE









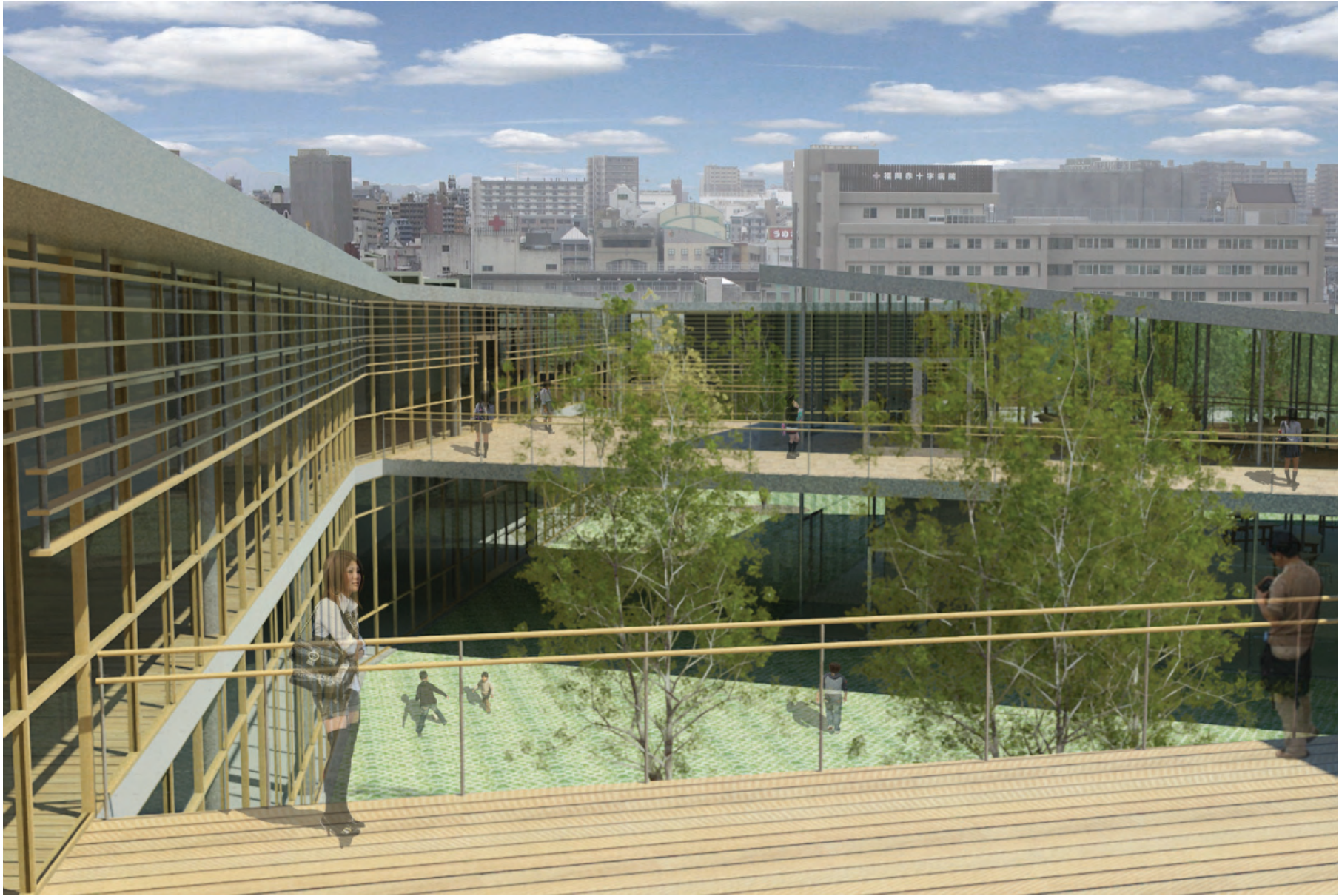


















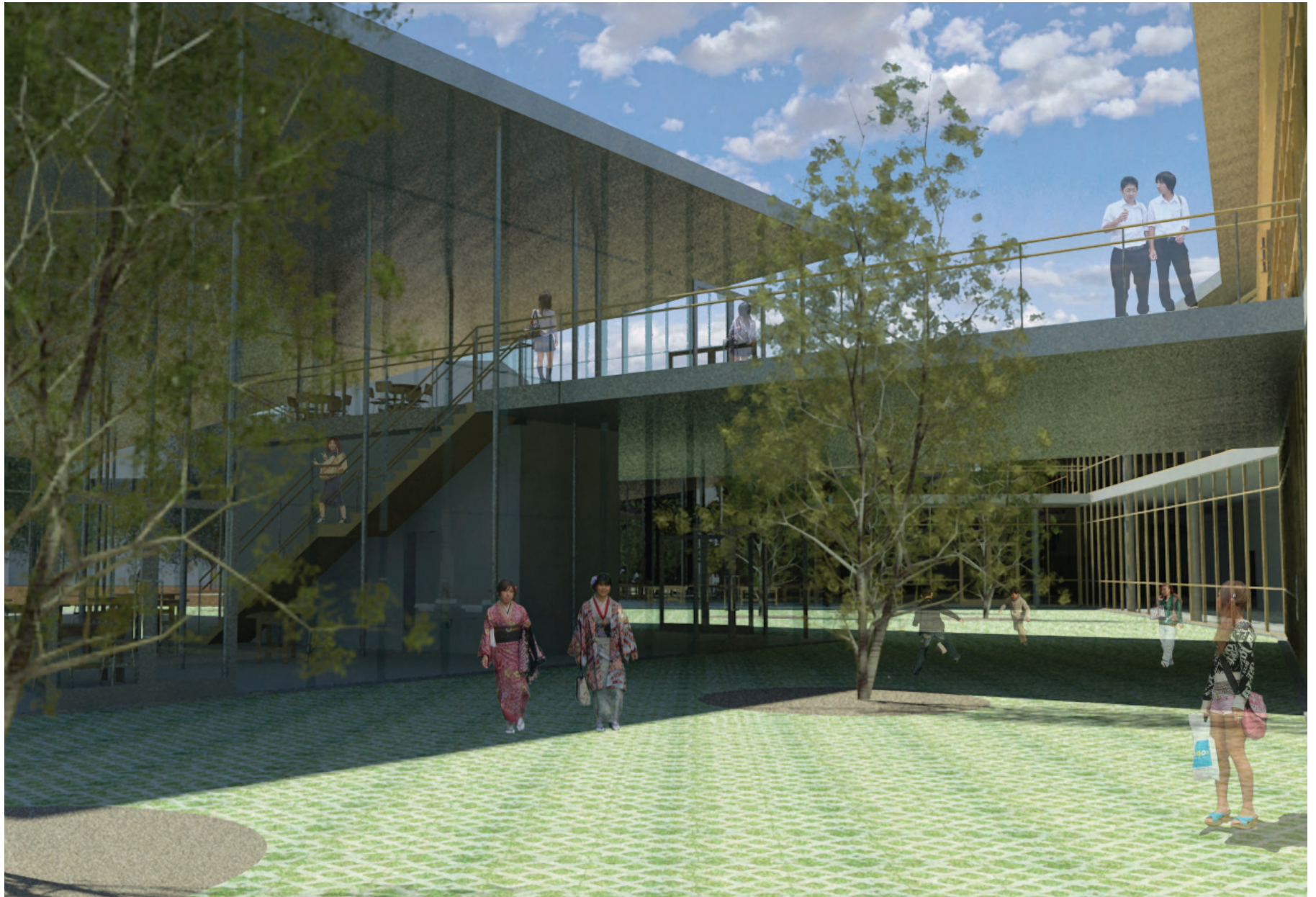






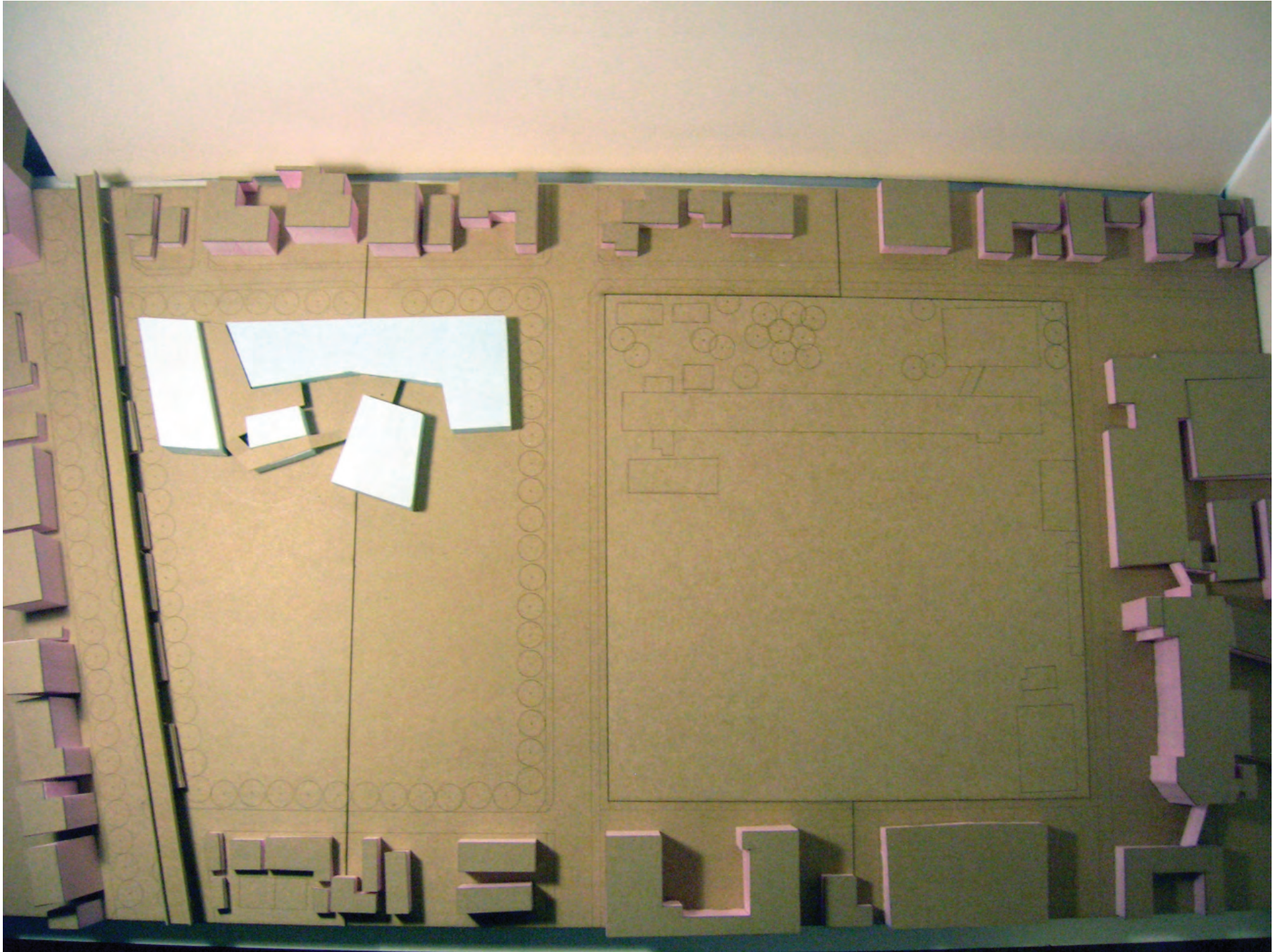




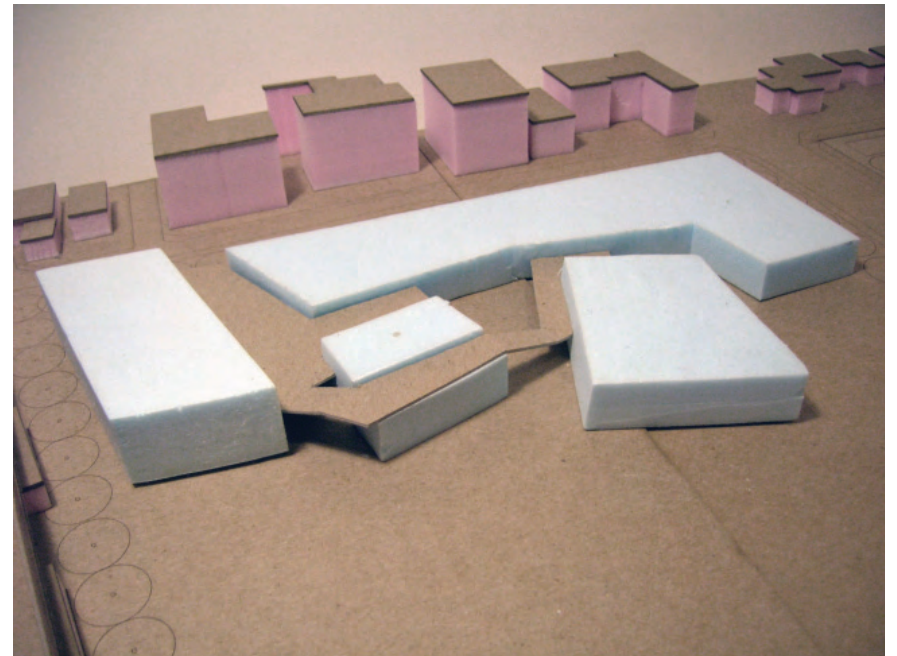
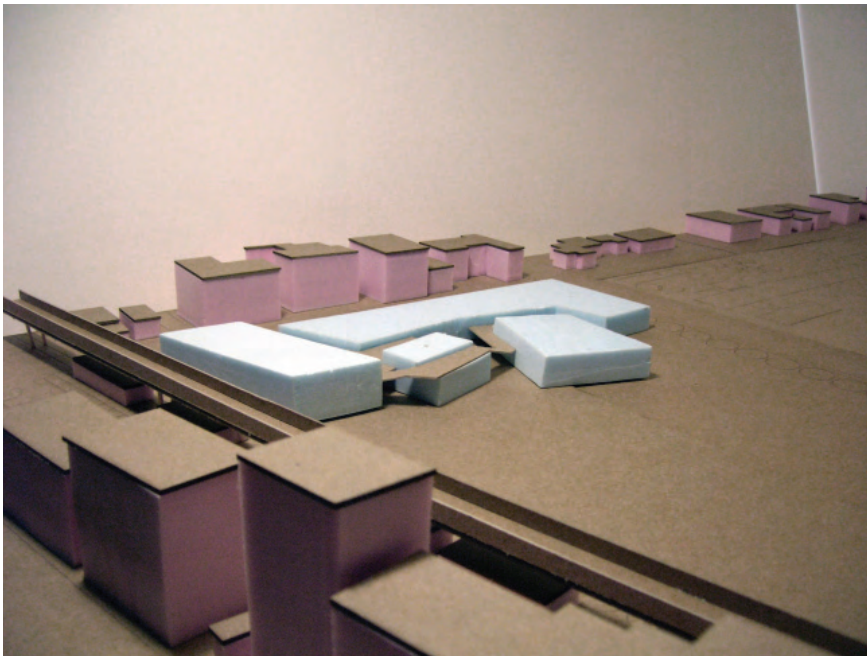
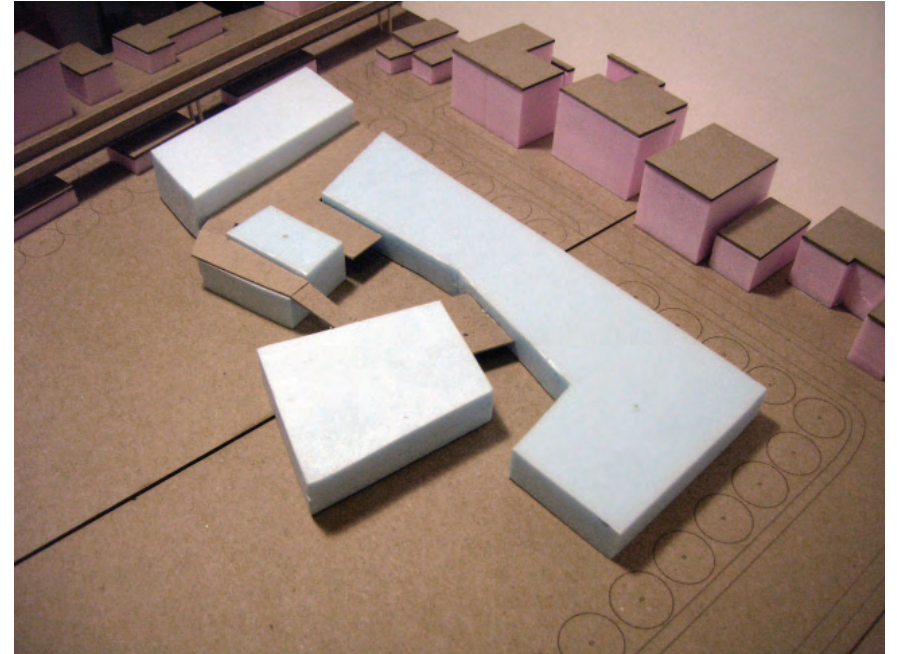
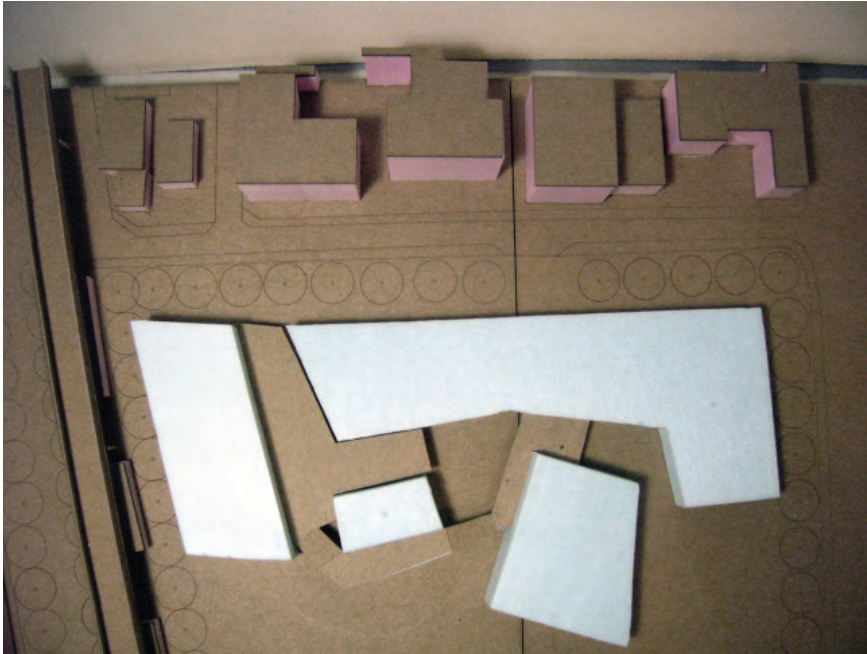




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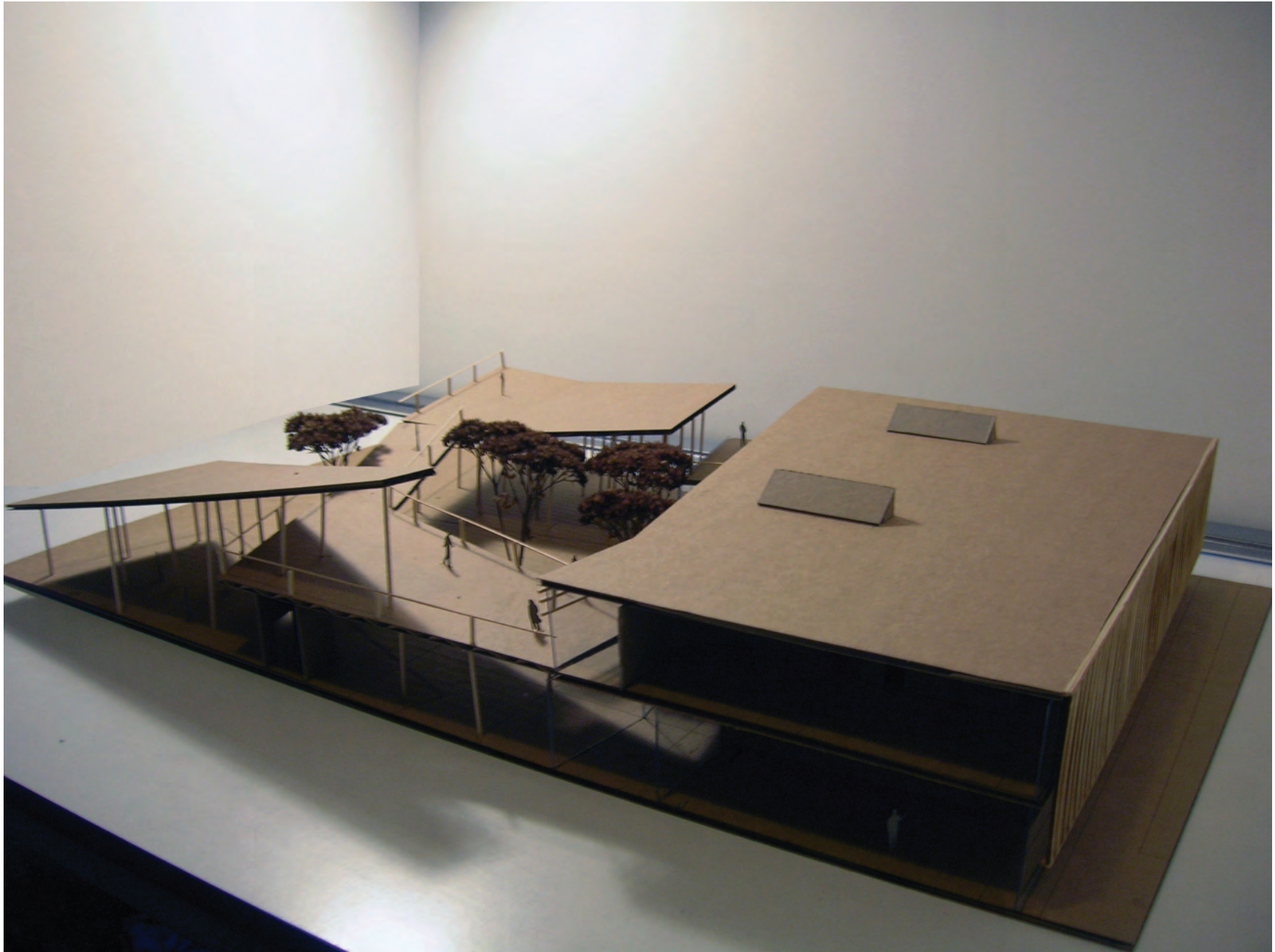




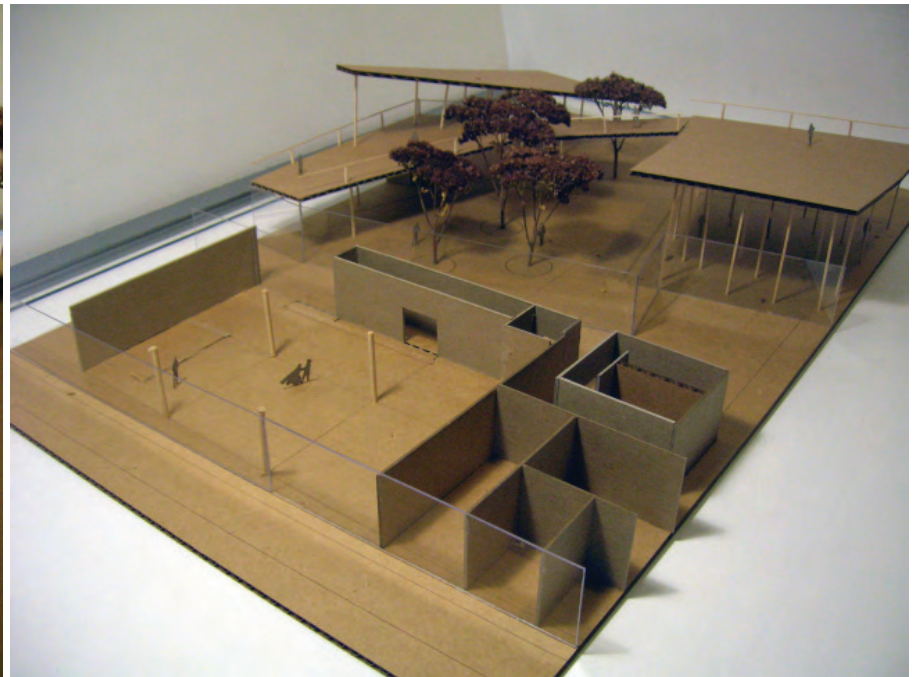
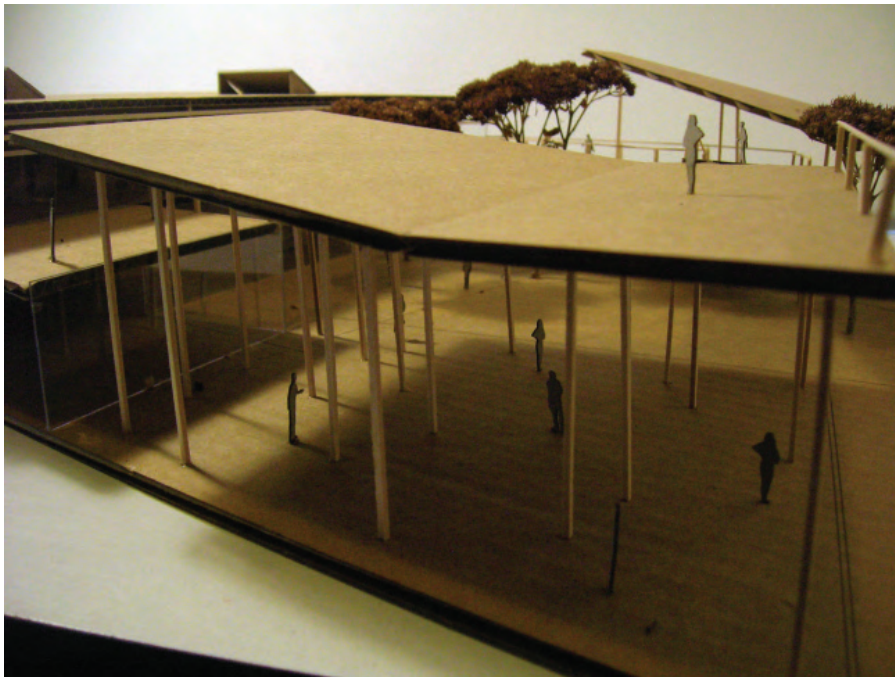
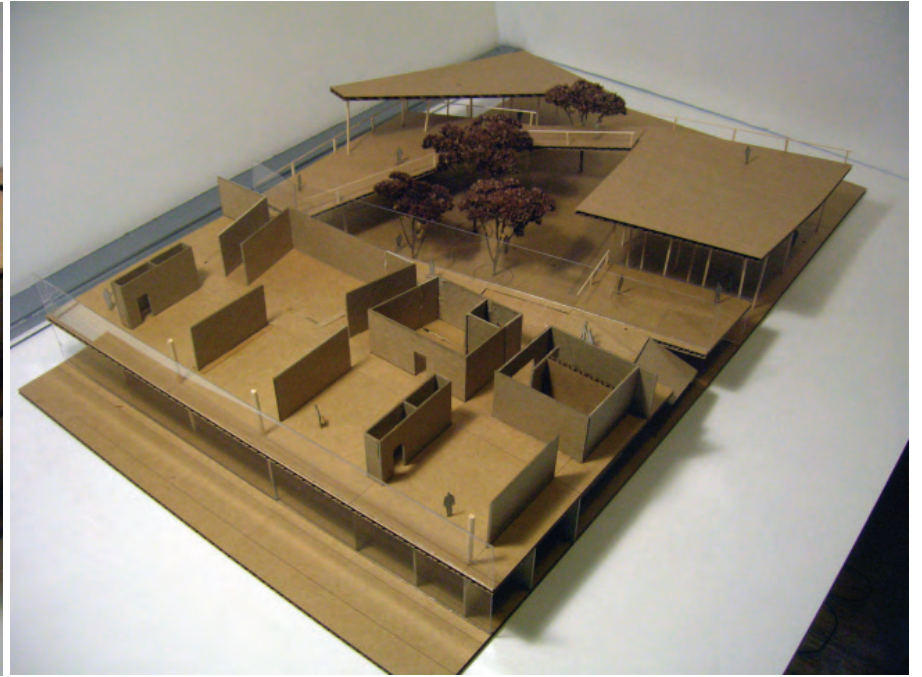
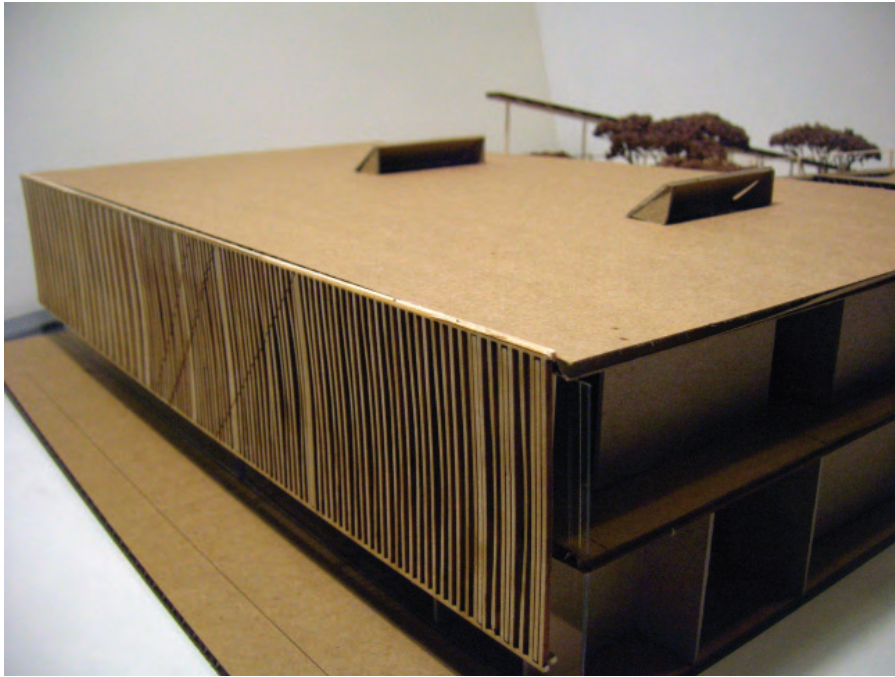




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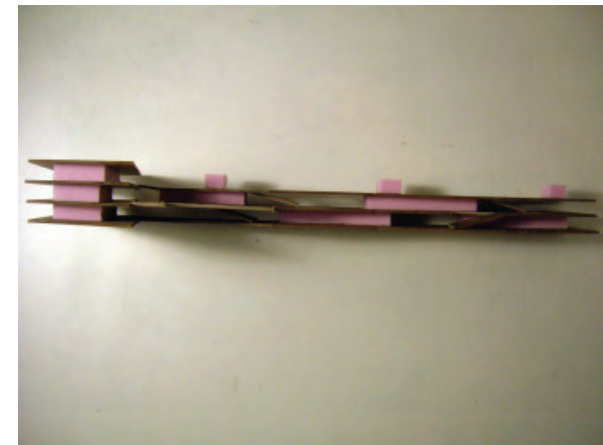
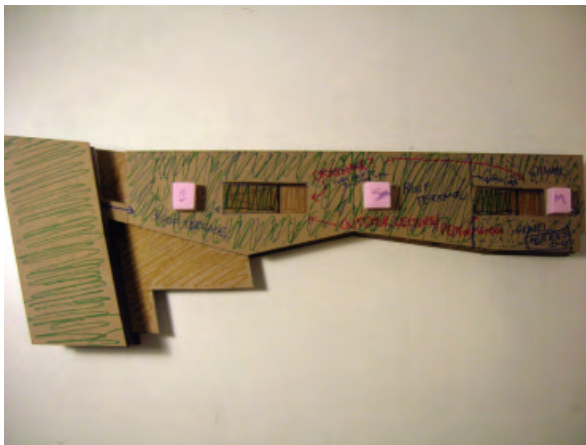
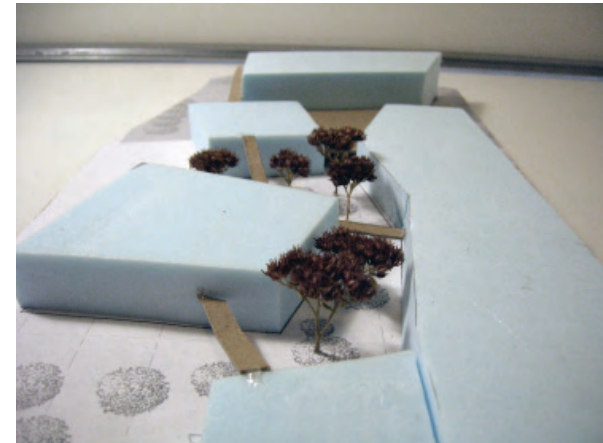
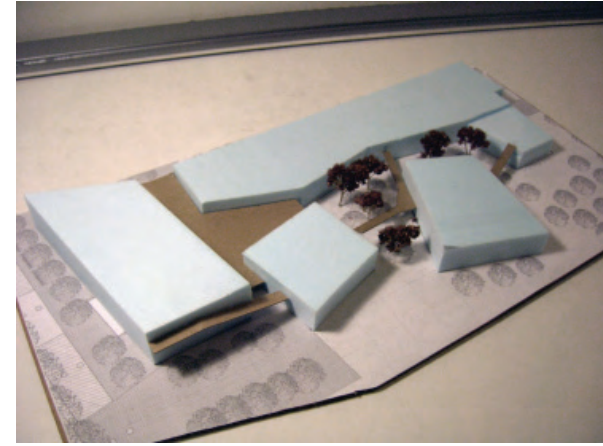
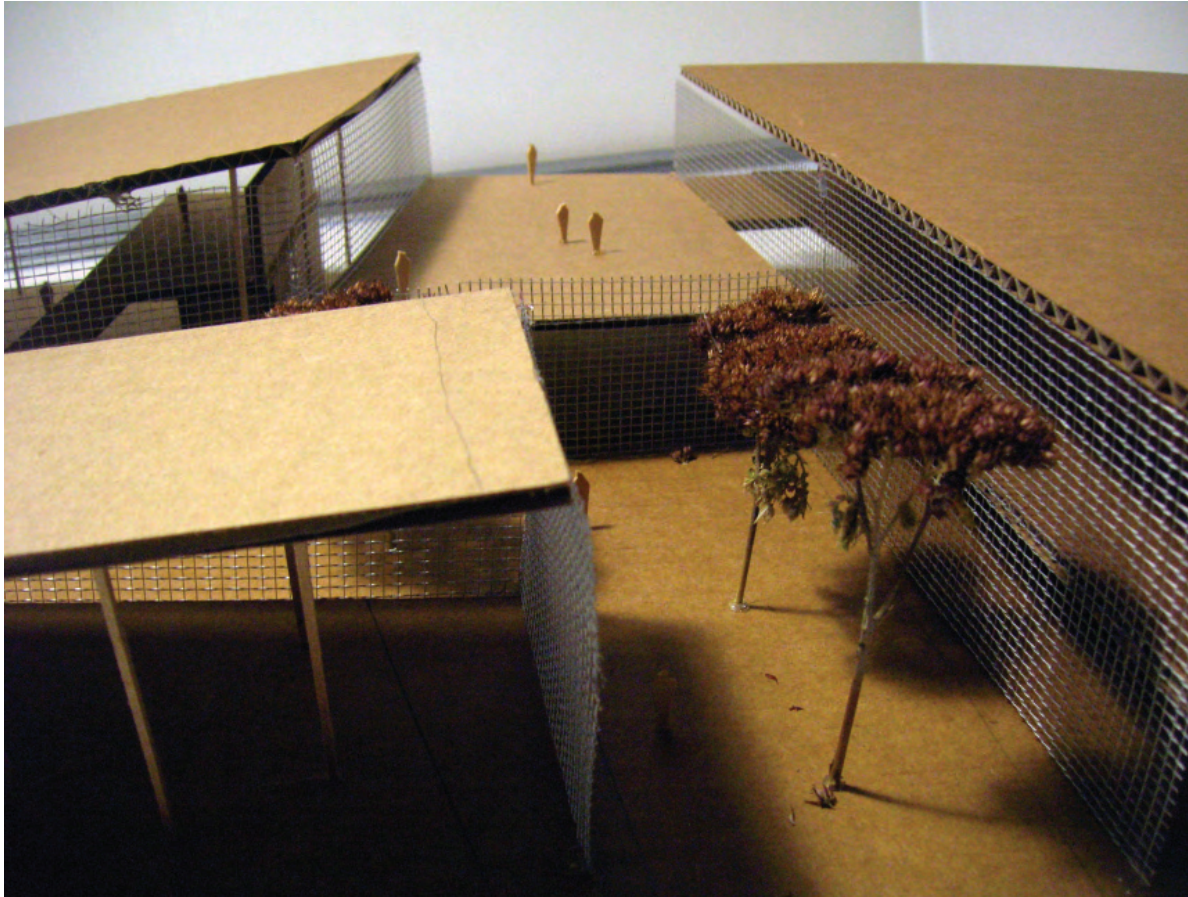




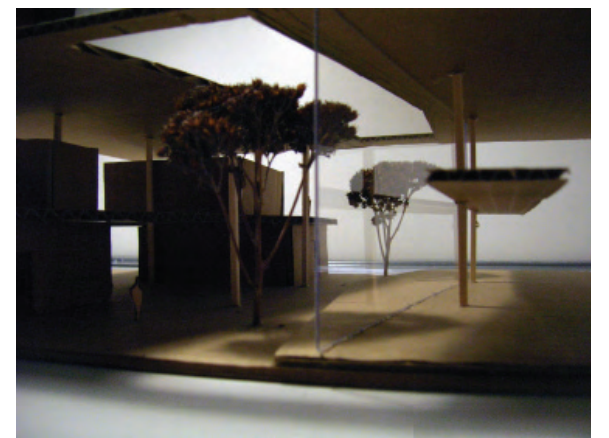
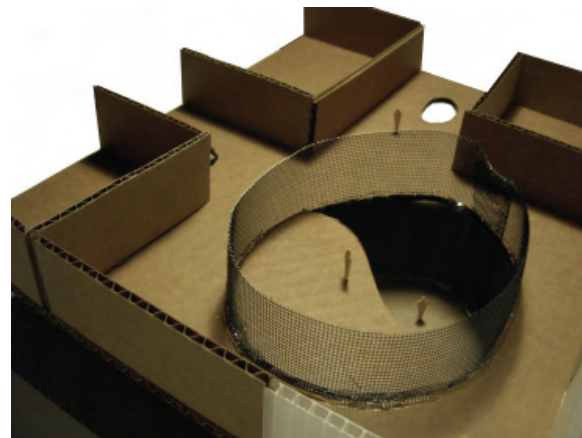
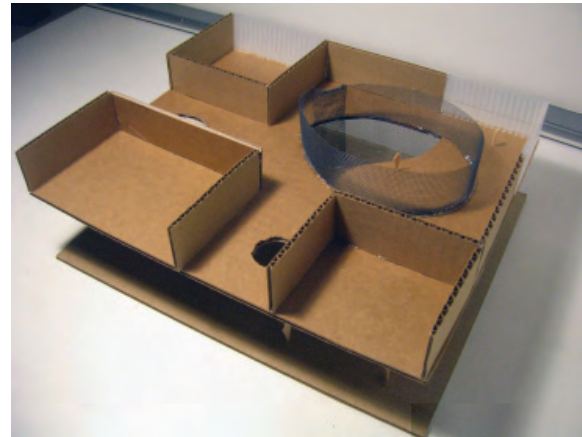
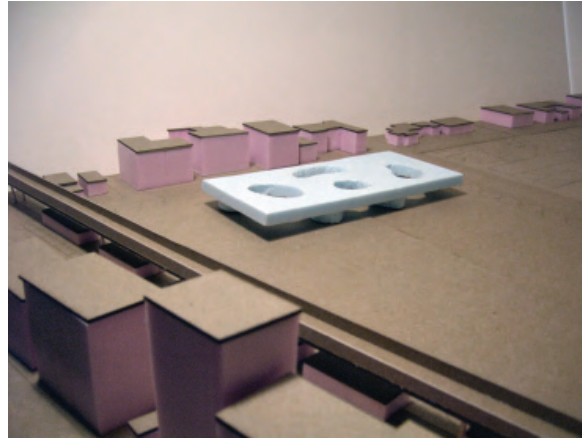




## Process Models

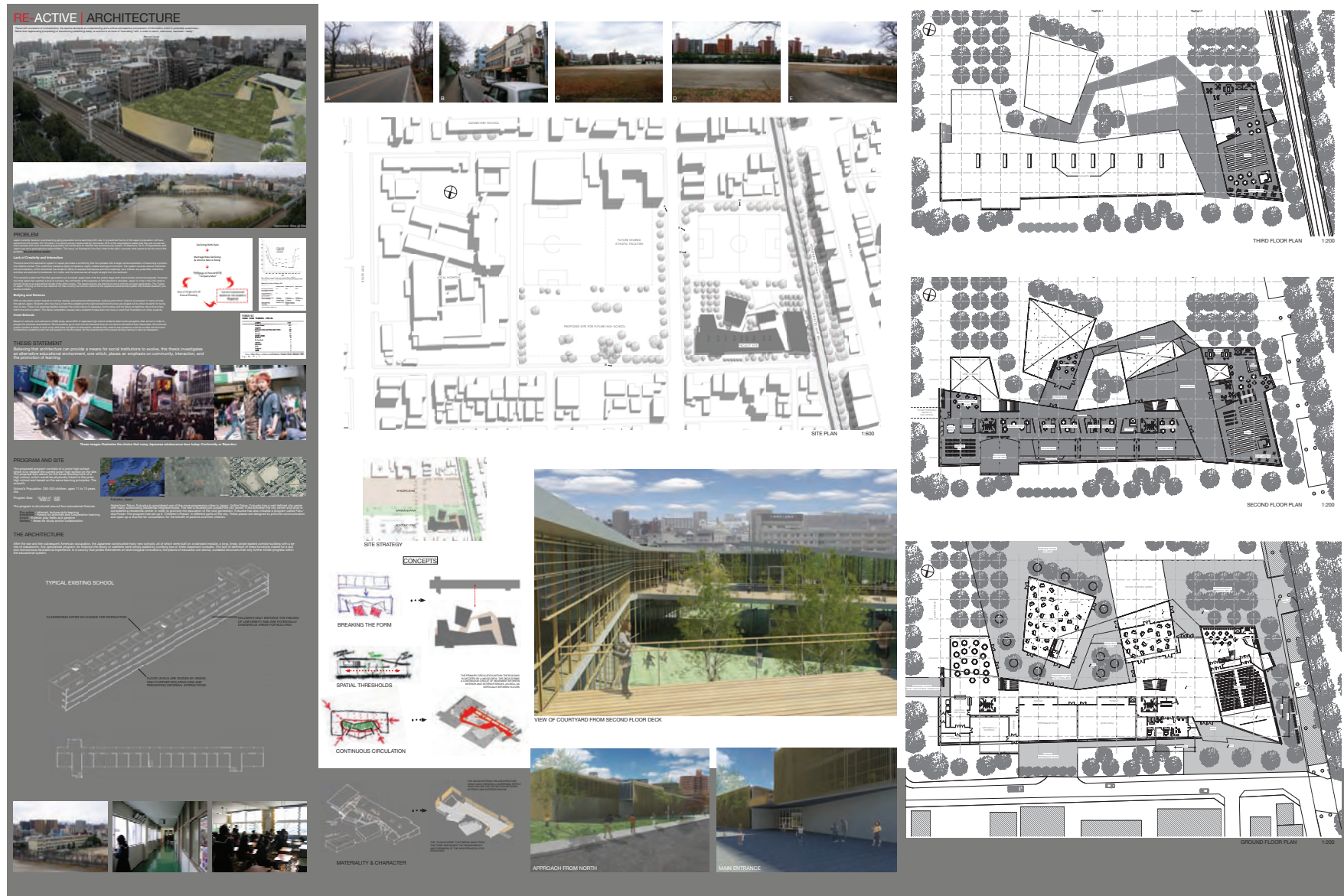




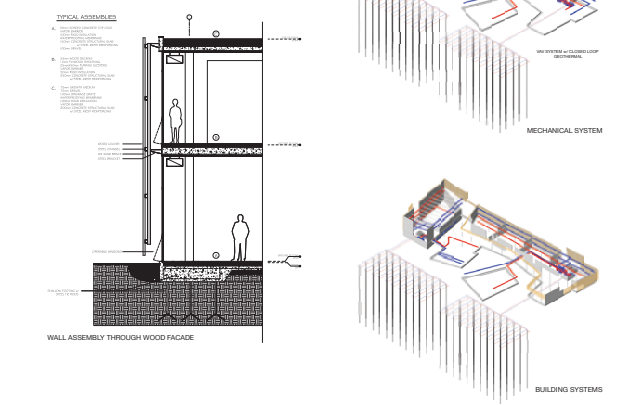
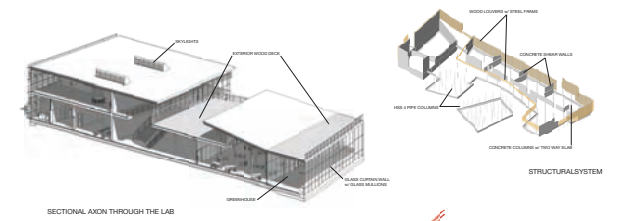
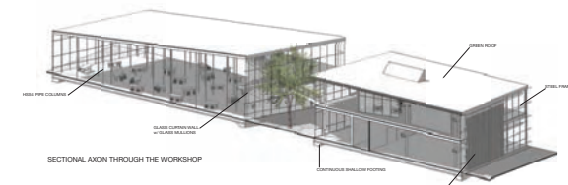
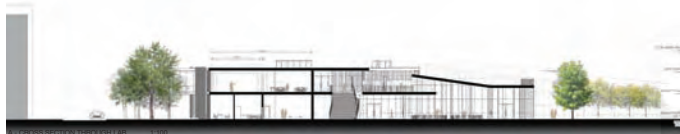




# Presentation Boards







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PROFESSOR JULIAN BONNER  
ROGER WILLIAMS UNIVERSITY FALL 2009