Sustainable Urbanism
Killinger China Studio
01 INTRODUCTION: SUSTAINABLE URBANISM

02 RESEARCH: LOCATION

03 MASTER PLAN: DEVELOPMENT

04 ARCHITECTURAL DESIGN

05 STUDIO: EXPERIENCE

CONTENTS
01 INTRODUCTION
The planet is a finite resource inhabited by a dwindling collection of flora and fauna. The rise of homo sapiens has skewed the ecology of this environment in ways that threaten not only the existence of other living things, but of the human race itself. Blinded by the potential of technology and their own sense of entitlement, humankind has developed a dysfunctional relationship between human settlement and the natural world. To find a healthy balance on the planet between all of its inhabitants, one that has the resilience to sustain a dynamic balance, requires the reorientation of planning and design trajectories from their exploitive and self-centered approaches. The framework this studio operates on is an interactive construct between the areas of survival, purpose, ecology and heritage. Survival, to reconnect settlement to water, food and shelter as the foundations of settlement. Purpose, to connect human industry and innovation to the needs of settlement while being mindful of their impacts. Ecology, to integrate systems of urbanism and the systems of the environment in ways that operate through renewable energy and eliminate waste. Heritage, to critically consider the role the past has in defining the present and the future definition of place. This diverse construct serves as the platform from which this studio explores various trajectories in pursuit of a ‘sustainable urbanism’.

Based on this platform, the Sustainable Urbanism Studio focuses on exploring alternative strategies to evolve the nature of the city from its unsustainable present towards a resilient future. The rapid urbanization of the planet has made this a pressing reality for the professions concerned with human settlement and the environment. The Studio pursues this goal through grounded speculation in the present, seeking balanced, inclusive solutions as opposed to singular, biased polemics. Density is embraced, as a response to the need to reserve land to feed the world’s growing population and preserve the important natural habitat necessary to balance the world’s ecosystem. Basic needs are understood as something that must be addressed within development not somewhere else. Growth is a reality pursued strategically where integration and diversity are important as opposed to segregation and singularity. Human industry, as manifest in economics, improvement and occupation, provides the means for civilization and the environment to adapt to the dynamic conditions of our world. Sustainability is not just green. It comes in all colors, requiring a holistic approach where ecological balance is valued over human arrogance. The breadth of sustainability is not its weakness. It is its strength. Humanity’s weakness is its failure to embrace this reality. The Studio embraces the challenge of pursuing balance over polemics, inclusion over exclusion, integration over segregation and the fact that human settlement is a part of the environment not apart from the environment.
Sustainable Planning
Chongqing, China: Urban Re-Development

Sustainability & Urbanism

As society (re)considers growing its future urban environment, it can no longer ignore the social and environmental challenges facing the contemporary world. To address these challenges, cities must start with the (re)integration of natural systems into their urban framework, establishing a greater harmony between settlement and nature. Settlement will need to develop robust and resilient circulation systems that collectively yield a lower carbon footprint and less pollution of the environment. The production, processing and delivery of food will need to give greater emphasis to local sources. Distributed infrastructure systems will need to supplement or replace centralized systems. Waste will need to be (re)considered in the context of a broad system of reuse and recycling. It also means that the heritage landscape of a community should be identified and preserved integrally within the new fabric of the city. The future of the city does not lie in the segregated patterns of modernism, it lies in the integrated patterns of a more sustainable form of urbanism.

Context

The rapid growth of Chinese cities, caused largely by the immigration of rural people, has created extraordinary challenges for these communities.

"By 2030, the nation’s urban population is forecast to grow by an additional 310 million people, the equivalent of the entire population of the United States, to 70 percent of the total population. By this point, more than 1 billion Chinese will live in cities. The new urbanites will require more space, water and food, imposing severe environmental pressures."

Institute of Urban and Environmental Studies under the Chinese Academy of Social Sciences; China Daily 9/4/2013

China is on the threshold of the next wave of urban growth. Where the first wave was fueled by real estate speculation, rapid growth and little regard for the cultural and ecological landscape of the city. The next wave needs to focus of ‘green’ solutions and the accommodation of new residents migrating into the cities. This policy shift will put greater pressure on cities to change their development trajectories away for the wasteful, segregated, modernist development model towards a more integrated and sustainable model.
Sustainability Challenge

The continuing migration into cities puts greater pressure on cities to grow. This can push the natural environment further and further from the urban dweller, increase the distance food has to travel to get to the table and increase the heat island effect requiring the use of more and more energy. The focus of this studio is to explore ways to create a new urban ecology that blends nature and the needs of human settlement. The vehicle for this exploration was the design of a self-sufficient dense urban environment in Chongqing, China that integrally builds a balanced human and natural habitat.

Design Research

As designers (re)consider previous development patterns with an eye toward more resilient and sustainable forms of urbanism, the management of water, energy, food, and waste will be base line considerations. Understanding the ability of the land to support settlement is becoming an important question to ask. Cities have both natural and human ecologies that need to work in harmony with each other if sustainability is to be achieved. The design of progressive water systems or lower carbon energy usage alone will not establish a development as ‘sustainable’. Community building should also focus of creating a positive ‘open’ environment that is inclusive and offers choice to potential users. The possibility for economic development at various scales is necessary to allow the population to prosper. Circulation systems should focus on the pedestrian as the first and most energy efficient mode of transportation followed by the accommodation of other circulation systems based on their efficiency and carbon impacts. Finally there is a need for cities to recognize the continuity of culture and its role in the definition of place. Sustainable cities will accommodate the requirements for survival, purpose, ecology and heritage.
02 RESEARCH
Chongqing is a sprawling municipality at the junction of the Yangtze and Jialing rivers in southwestern China and administratively, it is one of China’s four municipalities under the direct administration of central government. The total municipal population of Chongqing is 30.17 million.
Location | Site Analysis

- Existing Buildings
- Accessibility
- Circulation
- Transportation
- Topography
- Wind Circulation
- Floodplain
- Sun Path
Climate | Site Analysis
Chongqing is known to be covered in a layer of fog 100 days of the year. According to previous years data the average cloud cover is on average 50% over the month. This coupled with the mountainous region causes a low amount of sun exposure over the year. To compensate the design may have about double the amount of solar panels to reach maximum efficiency. The standard solar panel covers over 1.5M providing about 255 watts of power. The most efficient orientation of a solar panel is to be facing south at an angle perpendicular to the sun, with no obstruction from objects that would block the sun year round.
Climate Water Conservation Potential

Program Usage of Water

<table>
<thead>
<tr>
<th>Activity</th>
<th>Usage (liters per day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Toilet</td>
<td>150</td>
</tr>
<tr>
<td>Shower</td>
<td>200</td>
</tr>
<tr>
<td>Bathtub</td>
<td>500</td>
</tr>
<tr>
<td>Dishwasher</td>
<td>150</td>
</tr>
<tr>
<td>Washing Machine</td>
<td>200</td>
</tr>
<tr>
<td>Drinking</td>
<td>100</td>
</tr>
<tr>
<td>Clothing</td>
<td>50</td>
</tr>
<tr>
<td>Cooking</td>
<td>50</td>
</tr>
<tr>
<td>Laundry</td>
<td>100</td>
</tr>
</tbody>
</table>

World Usage of Water

<table>
<thead>
<tr>
<th>Region</th>
<th>Usage (liters per day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>United States</td>
<td>500</td>
</tr>
<tr>
<td>Europe</td>
<td>250</td>
</tr>
<tr>
<td>Africa</td>
<td>100</td>
</tr>
<tr>
<td>China</td>
<td>50</td>
</tr>
</tbody>
</table>

Water Usage by Individual

<table>
<thead>
<tr>
<th>Activity</th>
<th>Usage (liters per day)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Showers</td>
<td>50</td>
</tr>
<tr>
<td>Bath Tub</td>
<td>100</td>
</tr>
<tr>
<td>Dishwasher</td>
<td>200</td>
</tr>
<tr>
<td>Washing Machine</td>
<td>150</td>
</tr>
<tr>
<td>Toilets</td>
<td>100</td>
</tr>
<tr>
<td>Drinking</td>
<td>50</td>
</tr>
<tr>
<td>Bathing</td>
<td>200</td>
</tr>
<tr>
<td>Laundry</td>
<td>100</td>
</tr>
<tr>
<td>Cooking</td>
<td>50</td>
</tr>
<tr>
<td>Outdoor</td>
<td>50</td>
</tr>
</tbody>
</table>

Rainfall

<table>
<thead>
<tr>
<th>Month</th>
<th>Average Rainfall (mm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jan</td>
<td>50</td>
</tr>
<tr>
<td>Feb</td>
<td>30</td>
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<tr>
<td>Mar</td>
<td>80</td>
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<tr>
<td>Apr</td>
<td>120</td>
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<tr>
<td>May</td>
<td>100</td>
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<td>Jun</td>
<td>150</td>
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<td>Jul</td>
<td>200</td>
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<td>Aug</td>
<td>180</td>
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<td>Sep</td>
<td>150</td>
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<tr>
<td>Oct</td>
<td>120</td>
</tr>
<tr>
<td>Nov</td>
<td>80</td>
</tr>
<tr>
<td>Dec</td>
<td>30</td>
</tr>
</tbody>
</table>

Note: Average precipitation varies across different regions.
In a mountainous area receiving the wind speeds to generate maximum energy output is a difficult endeavor. The higher the tower means access to high winds speeds, ergo the more energy can be captured. Spacing the turbines far enough apart to not effect the wind stream of another turbine. A small wind turbine can generate 1-100 kilowatts of power. The diameter of these rotors can be 1.5M-3.5M in diameter. The placement of smaller turbines should be away from up wind obstacles, at least 30M high, and can also be placed on top of buildings. Its important to note tower height is not in relation to power generation.
Urban Design/Master Plan Introduction

The Urban Design phase of the Sustainable Urbanism studio happens in parallel with research into the information and design parameters required to design a sustainable project in China. As noted earlier, sustainable urbanism is not just about energy. It is a holistic effort that involves research into the requirements for survival, issues related cultural identity and heritage, accommodation of platforms of improvement and venues that gives purpose to the residents of the community and creates a positive ecology that includes both human and natural systems. As a group, the students assembled a reference document that identified starting points for the urban design process. Particular emphasis was given to the merging of human and natural ecologies in the framing of the project.

The site, defined for the studio is in Chongqing, China in the Shapingba District of the municipality, bounded by a highway on the southeast, a major storm water creek on the northwest a new arterial road on the south and an existing arterial on the northeast. The site is also bisected equally by a secondary storm water stream. The site is also distinguished by a steep topography. Currently the low lying areas are occupied by local small plot vegetable farmers. The site, as it currently exists, is a somewhat of an isolated enclave. This is changing with the larger residential development to the west and the proposed access improvements. This impending transformation makes the (re)consideration of this site in the city a timely and important opportunity.

The students decided to subdivide the planning effort using the central stream as the boundary between them. The two groups, one called Urban Being and the second Green Being, developed a preliminary program based on a required FAR of 2.6 and a conceptual distribution of this program on the site in the first two weeks of the semester before the group left for three weeks of travel in China. In the final week of this period the group engaged in a design charrette with students in Chongqing University. They started with the initial design efforts in Lincoln, revising and evolving the schemes by incorporating local insight and cultural perspective and finally refining the urban design plan after returning to Lincoln.
URBAN BEING
CONNECT TO NATURE

- Integrate green drainage corridors through the site & make them apart of the pedestrian circulation
- Exposing the natural landforms
- Incorporating urban agriculture by maintaining the urban farms that exist on the site & adding vertical farming

WALKABILITY

- Street sections that prioritize the pedestrian by providing ample sidewalk space for pedestrians
- Placing street trees to provide shade for pedestrians
- Programs are distributed so that people are close in proximity to their destinations

BUILDING COMMUNITIES

- Integrate a range of social spaces in the public domain of the site
- Creating an identity through integration of natural features
- Make energy, water, waste and urban agriculture systems a part of everyday life
Concept | Connect to Nature

GREEN BELT

FOREST

PARK SPACE
Concept | Walkability
Concept | Building Communities
Urban Being | Site Plan

SCALE = 1 : 2000
Master Plan I Programmatic Breakdown

- **Agriculture**: 31,353 m²
- **Office**: 17,946 m²
- **Housing**: 241,891 m²
- **Commercial**: 80,335 m²
- **Community**: 93,563 m²

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Performance Goals | Water

Average Volume of Rain water per Year:
1,155 L/m²/year (3 L/day)

Storm Water Collection:
Conventional Roof:
3 L/m²/day x 26,323 m² x 0.95 = 75,021 L/day
Permeable Surfaces:
3 L/m²/day x 52,796 m² x 0.40 = 66,355 L/day
Semi Permeable Surfaces:
3 L/m²/day x 86,537 m² x 0.75 = 194,708 L/day
Impermeable Surfaces (Roads):
3 L/m²/day x 47,116 m² x 0.95 = 44,760 L/day
Total Storm Water Collection: 377,844 L/day

Grey Water Reuse:
(65% of water used on site becomes grey water)
0.65 x 2,661,078 L/day = 1,729,700 L/day

Re-mediated Blackwater Reuse:
(32% of water used on site is black water)
0.32 x 2,661,078 L/day = 851,545 L/day

Total Water Collection: 2,959,089 L/day

Total Water Collected / Total Water Required
2,959,089 L/day / 2,661,078 L/day = 1.11
We are producing 11% more water than required daily

[Diagram of water collection and usage]
Performance Goals | Solar

Solar Photovoltaic Panel Power

- High end solar Panel: LG365 NeON R = 365 Watts (3.65 kW); Area: 1.72 m²
- Total Roof Area: 26,323 m²
  - Area of PV Panel: 1.72 m²
  - 15,304 Panels possible on building's roofs.
  - Horizontal PV produces 365 watts (0.365 kW) with one hour of full sun
  - 15,304 panels x 0.365 KWh = 5,586 KWh
  - Avg. Hours of Sunlight per year in Chongqing: 955 hours
  - 5,586 KWh x 955 hours = 5,334,630 KWh/year generated
  - (14,618.42 KWh/daily)

Energy Required Yearly: 11,998,712 KWh/year

- PV Energy Generated Yearly: 5,334,630 KWh/year
  - (5,334,630 / 11,998,712) x 100 = 44.46%
  - 44.46% of required energy generated

This panel generates 12.18% more power than the average PV Solar Panel

6,664,082 KWh/year still needed.

- 6,664,082 / 955 hours of sunlight per year = 6,978 KWh per panel needed.

6,978 KWh / 0.365 KWh = 19,118 panels needed
19,118 panels x 1.72 m² = 32,863 m² of South Façade Area needed.


Performance Goals | Water System

This diagram illustrates the closed loop water system employed in the Urban Being development. Using this flow of systems enables Urban Being to be net zero water.
GREEN BEING
HERITAGE

- Vertical farming shares associated with residential units
- Public exchange of fresh food
- High-tech agriculture training center
- Public interaction with the growing process
- Community center for traditional village culture to congregate

ECOLOGY

- Connect waste flows to growing system nutrient inputs
- Remove agriculture & waste stream pollution to Jialing River
- Recycle the flow of existing city sewage on site
- Celebrate a clean ecosystem service within the site
- Gardens ranging from riverscape to personal

SURVIVAL

- Increase productive output of the land by growing vertically
- Provide safe source of vegetable to residents & visitors
- Deposit only clean water to the city’s river drinking water source

PURPOSE

- Rehouse existing farming village community
- Retain & employ existing farming workers
- Improving living conditions, income & respect to farmers
- Provide outlet for purpose to residents who farm as a hobby
Concept I Heritage
Concept | Ecology
Concept | Purpose

11,000 / YEAR

67,500 / YEAR

87% RURAL

13% URBAN

1950

55% RURAL

45% URBAN

2010

40% RURAL

60% URBAN

2030
Performance Goals | Water

-RESIDENTIAL BUILDINGS
- Categories
- Affordable: 74,811 sqm
- Market: 67,026 sqm
- Elderly: 29,872 sqm
- Light Industry: 24,315 sqm
- Agricultural: 21,000 sqm
- Hotel: 6,012 sqm
- Total Area: 292,128 sqm
- Total Population: 6372 People
- Unit Water Use: 130 L per person per day
- Water Consumption: 828,385 L

-COMMERCIAL BUILDINGS
- Categories
- Light Industry: 16,609 sqm
- Office: 63,291 sqm
- Retail (Street): 75,835 sqm

-COMMUNITY BUILDINGS
- Categories
- Health care, Learning Center, Police Station, Training Center, Kindergarten, Community Center, Library, Rec. Center
- Total Area: 28,519 sqm
- Unit Water Use: 3 L per person per day
- Water Consumption: 85,557 L

-DAILY WATER CONSUMPTION: 1,822,828 L

-TOTAL WATER NEEDED
- Daily Water Consumption: 1,822,828 L

-WASTE WATER PRODUCED
- Daily Water Consumption: 1,822,828 L
- 80% of Water Supply Turns to Waste Water: 1,458,262 L

-RECYCLABLE WASTE WATER
- 85% Waste Water Reuse: 1,458,262 L * 85% = 1,239,523 L

-TOTAL RAIN WATER COLLECTED
- Annual Rainfall: 1095 mm per sqm
- Site Area: 214,730 sqm
- Annual Rain Water: 235,733,540 L
- Daily Rain Water (Average): 645,955 L
- Daily Rain Water Collected (Average): 193,787 L

-DAILY PURCHASE WATER
- Need: 389,518 L
### Performance Goals | Solar

#### Residential Buildings
- **Affordable Housing**
  - Area: 74,811 sqm
  - Kilowatts per Hour/ sqm: 0.06 kWh
  - Required Energy: 4,489 kWh/Day, 1,638,361 kWh/Year
- **Market, Elderly, Others**
  - Area: 217,317 sqm
  - Kilowatts per Hour/ sqm: 0.07 kWh
  - Required Energy: 15,212 kWh/Day, 5,552,449 kWh/Year

#### Commercial Buildings
- **Light, Industry (Industrial Electricity)**
  - Area: 16,630 sqm
  - Others: 148,145 sqm
  - Kilowatts per Hour/ sqm: 0.12 kWh
  - Required Energy: 17,777 kWh/Day, 6,488,751 kWh/Year

#### Community Buildings
- Total Area: 26,619 sqm
  - Kilowatts per Hour/ sqm: 0.1 kWh
  - Required Energy: 2,852 kWh/Day, 1,049,943 kWh/Year

#### Total Energy Consumption
- 40,330 kWh/Day
- 14,720,604 kWh/Year

#### Roof Area
- Total Area: 27,806 sqm

#### Solar Energy
- Fog in Chongqing: 100 Days per Year
- Average Cloud Cover: 50%
- Standard Solar Panel: 157 Watts per sqm per day
- Daily Solar Electricity (Average): 4,868 kWh

#### Percentage of Electricity Consumption
- 10.82%
Performance Goals | Water System

WATER CYCLE

Potable Water: water that is safe to drink or to use for food preparation, without risk of health problems.

Rain Water: water that is falling or has fallen as rain, and is soft, containing relatively little soluble mineral matter.

Storm Water: water that originates during precipitation events and snow/melt. Stormwater can soak into the soil (infiltrate), be held on the surface and evaporate, or run off and end up in nearby streams, rivers, or other water bodies (surface water).

Grey Water: all wastewater generated in households or office buildings from streams without fecal contamination, i.e. all streams except for the wastewater from toilets. Sources of greywater include, sinks, showers, baths, clothes washing machines or dishwashers.

Black Water: any water that has been adversely affected in quality by anthropogenic influence. Wastewater can originate from a combination of domestic, industrial, commercial or agricultural activities, surface runoff or stormwater, and from sewer inlfow or infiltration.
04 ARCHITECTURAL DESIGN
Located directly across the Chongqing University, the program and shape of this project creates a direct relationship with the campus. The notion of the use becomes about being not only a research center, but also serving to the student population and the larger population as a conference center.

The project is broken down into three parts: the conference center, the student public, and the research labs. A large atrium space creates a vertical and horizontal connection between these parts creating a more unified and holistic space.
"Traditionally, homes in China had been multigenerational households. Grandparents would live with their children and their children's children would live with them, creating a family structure that is dependent on each other. However, as we move toward present day, the multigenerational family home is becoming obsolete. The children move away and into one of the smaller apartments that flood the Chinese cities, leaving their parents behind or sending them into assisted living facilities because they could not care for them by themselves anymore. This design works to create separate living situations for elderly housing and nuclear family housing, but still allows for them to have a multigenerational living style, which has benefits for all of the generations of residents."
China is a leading country of supplying renewable energy and creating sustainable cities. One of the fastest growing nations in the world, with the rural population decreasing by nearly 30% in the last 50 years, they are slowly losing their identity as a nation of farmers. In this project, we looked at ways to create a completely sustainable city, looking towards agriculture as the center of the cycle. Our goal was to keep current farmers and bring future farmers into one community to be able to continue their trade. As a team we developed a master plan that merged vertical farming with the residents, while creating an awareness of the country's heritage in farming. Once the master plan was completed, we chose a building to further develop. The portion I selected was a mixture of market housing and vertical farming, near the southwest portion of our site, creating a pocket community. I used aquaponics as a method of cleaning water as well as providing fish and vegetables to eat or sell. The materials were used as a contrast each other. The use of 3mm thick translucent stone that would disappear into the sky, and at night it would activate...
Chinese culture is known to be inclusive, diverse, and filled with various items, spaces, and shared activities that serve multiple functions; this shared functionality includes enjoying meals with friends, conversing with strangers that share similar hobbies, group Tai Chi in the park, and even with living in an apartment filled with family spanning three generations. In China, the idea of the individual begins to fade. Chinese culture is about the whole and the greater good of all. This project serves as an expression of Chinese values, and the values society should put in the foreground. These values include the following: Nature Touches Everything - the Earth’s natural ecology should always be taken into account; humanmade structures should reflect Earth’s cycle and reduce waste by using reclaimed material, bringing life to spaces by using nature. The inclusion of Community Space - shared spaces are used to encourage human interaction and promote the general welfare of the people. Walkability - when the pedestrian is the priority, their carbon footprint is reduced, therefore, creating cleaner air, reducing vehicular traffic, and creating a safer urban environment.
This sustainable urban development project is located in the center of Chongqing China. The project team consisted of six members. Each member was responsible for a different portion of the redevelopment site. This portion was a market rate housing development. It consists of four residential towers linked together by a sky park. The park is programmed to house a variety of resident activities ranging from a high active badminton court to a low active Chinese literature and tea house.
As population grows, urban development becomes more important. Social and environmental challenges cannot be ignored. The mixed tower in Guangzhou, China addresses these challenges by integrating natural lighting systems, active community space, commercial space, and affordable housing units within a unique tower.
My plot is located in the center of the entire team project, and it serves to connect the design of other students’ block. In the design of the residence, my design is stepped because my position is in a low position. This is to get a landscape architectural design. In order to reflect the design concept of green building, and also in line with the sustainable design concept, I used a lot of plant coverage in the appearance of the building. This is the biggest project I have ever participated in. It’s fun to work back and forth. My studio partners. Design decisions are not like them vacuum. In a student atmosphere, working in a large team seems difficult, but for us. It makes our studio more powerful. We can make design decisions in the form of a team. Project considerations for all departments. We also converted some of these decisions into interesting events, like our tree beauty page, determine the final model tree.
The Future Farmers Institute Headquarters is proposed as the anchor tower of a new redevelopment of a 40 hectare site in Chongqing, China. Integrated in the development is a new high tech vertical farming and urine recycling system that farmers will be trained on. The Headquarters takes advantage of this proximity and is focused on the development of further urban farming technologies. The 30 floor Headquarters incorporates several programs. Above the lobby are the company’s R & D labs. Above the labs is a business incubator meant to spur supporting industries and speculative office space above for growing companies to move into. At the top of the tower is the company’s headquarters office. Connected by a direct elevator, the observation deck and tasting venue exhibit the culinary results of the vertical farming and shows the technology at work in the development below. Through the center of the tower an atrium allows for communications between floors as well as natural ventilation and cooling. On the exterior, a double skin facade helps ventilate the building and keeps the building sufficiently warm in Chongqing’s mild cool season.
VENTILATION: Natural air is brought in along the corridor, driven through a cooling trench and exhausted up through the atrium.

RAINWATER CAPTURE: Run water is captured off the roof and stored for use when the atmosphere is dry.

SOLAR DESTRUCTION: Solar radiation is reflected inside the corridor wall by piano finish, reducing glare. Solar, electricity, and ventilation down heat gain on the interior but air is exhausted out of the wall cavity.
Individual Design | Jiaji Li

My chunk is located in the center of the Northern half of the site, and it serves to connect the design of other students' blocks through a porosity openings and view corridors. Throughout the design, the building’s façade is stepped in order to increase the overall view of the residents receding within. Through the alignment of our team’s conceptual framework(s), the building skeleton is composed of engineered lumber (CLT) to help reinforce the idea of sustainable design. Working with a large group in coordination with a second team was difficult at times but in the end made the project more powerful.
Individual Design  | Grant Moehlenhoff

This mixed-use building development is a part of an overall sustainable masterplan established by fellow classmates. Three main goals were set for each building in the masterplan: strong connection to nature by keeping the existing conventional farms, increasing walkability by prioritizing the pedestrian in the street section, and building community through the implementation of large public spaces. The program consists of affordable housing, retail, commercial, community recreation, market, and urban farming. Half of the total program is affordable housing which rests above the retail/commercial-community recreation plinth. On the lowest level adjacent to the retail/commercial is the market which will be a discoverable destination for consumers to buy local goods and produce that is harvested on site in the fertile river valley. Retail is located on the public side (west) and the community recreation is located on the private side (east). Due to the extreme change in elevation between the topography and road, the space underneath the road is reused as a cultural destination that evokes the identities of this community and masterplan.
Individual Design | Tyler Howell

Parkview is a mixed use high rise that provides a live-work environment for the people of Chongqing. With a focus on forming a space that not only brings nature to the forefront, Parkview also creates an array of social spaces for all users, that in return provide for a healthier, more sustainable community. Due to its location, being positioned along the most accessible edge of the site, Parkview holds the responsibility of acting like that of gateway by bridging the surrounding communities to its own. Parkview in itself is unique due to its structural composition. Close to the entire design is crafted from forms of engineered timber. This composition not only creates a more biophilic environment for the users within, it also holds stunning aesthetic qualities as well as reduces harmful impacts on the environment.
The integration of human and natural ecologies is an effort in finding the opportunities presented by the site in relation to the requirements of human settlement and visa versa. This dialogue between the two domains needs to transcend this divide if the project is to realize this goal. It is not simply an overlay activity, rather it is more of a blending and merging activity, where each participates and supports each other. Unlike the modernist city where the transportation system is the dominant form giver. The urban design plans responded to both the site topography and the circulation equally. The integration of both these site flows can be seen in the spatial development of the site. Further this blending and merging activity was not limited to the plan. It was also integrated into the section with the integration of green space into the architecture. Finally, the strategic placement of uses and resources creates an interdependent environment where their location was a reflection of the ‘rightness’ of their situation relative to both the human and natural system in the site.

The challenge of making this merged and blended reality essential and evident to the identity of the ‘new’ city is important to its survival, purpose, ecology and local identity. The creation of the opportunity for a community to embrace this new reality must extend through the various scales of design in the ‘place making’ effort. To this end, the research of the studio defined performance parameters, managed a rich and diverse program, articulated its systems, both natural and human, and extended the definition of the environment down into the architectural scale to test different ways a sustainable urban environment can be created in the future. Out of this research, it is becoming clear that cities need to be pursued as an ecological environment, giving equal consideration for both human settlement and the natural environment as an interdependent community.
Experience
Student Comments

"With such large group sizes, students from various backgrounds, we were forced to adapt and collaborate in an efficient and effective manner in order to develop a successful master plan. After weeks of hard work, not only were we successful in our development, but our personal and professional relationships grew into something new."
- Tyler Howell

The studio helped me by allowing me to explore opportunities beyond the realm of my current context. Being that the project was not only to be sustainable, but also situated in place I have not been familiar with, it allowed me to be more empathetic and curious than I have been in previous projects. The main takeaway from this studio was the ability to look at projects with a new culture and context in mind. China was an amazing experience and really opened my eyes to not only the architecture, but the culture. I feel I am more empathetic in my designs and also more empathetic in the way I think or talk about people from other cultures. Although our styles or methods of working may be different, I found the Chinese students to be some of the friendliest people I have ever met.

Kylie Miller

The sustainable studio allowed me to work on a large scale which provided insight on how to manage many elements that happen on an urban scale; for the most challenging aspect of the studio was working with a large group to develop a cohesive master plan. In the end we overcame this challenge and it helped develop my collaboration skills. My biggest takeaway would be understanding how master planning is a combination of many parts which need to work together along with working with an interesting site and assigned programs.

Grant Moehlenhoff

A first glance, this is a different way from traditional architecture design. Sustainable architecture holds the key to an environmentally positive future. Only by living more economically with our resources can we hope to protect our environment and climate. For me this was the biggest project I have ever participated in. It’s fun to work back and forth with my studio partners. Design decisions are not like them vacuum; In a student atmosphere, working in a large team seems difficult, but for us it makes our studio more powerful. The background between each classmate is different, some are 6-year-old architecture students, some are inter-professional graduate students, and there are certain differences in design ideas. With that in mind my favorite part is teamwork.

Qingyuan Han

The studio helped open my eyes to what practical architecture is. Most of my education, the architecture has been more theoretical than practical and Marks studio helped break that trend. The most interesting and aspect of the studio was the collaboration. Never before have I had to work so closely with a team of designers to develop a working master plan. Traveling to China had a profound impact on my education as a designer – being able to see and live within a completely separate culture from our own with different architectural styles and methods was a priceless experience. At the same time, working with students from another country with such different values, compared to our own, was as much eye opening as much as it was a learning experience.

Tyler Howell
Having the site in a completely different culture from our own was really a strong aspect. The ability to be able to learn from the culture and have a design based on that was really beneficial to me. The most interesting thing about the studio was the fact that there were so many project types that came out of it. It was a good studio culture; the ability to have other people to ask questions to and voice concerns with was very beneficial. By traveling to China and seeing the dense architecture and the traditional architecture gave me a deeper knowledge of architecture. Overall, the trip and design charrette was fun, but it was also a great way to see how the other students worked. They worked in a different manner from us and it was interesting to be able to learn from them that way.

From taking the sustainable studio I feel I got a valuable real-world experience outside of Nebraska and mid-western design, I learned a lot about working within a different culture. I learned about all the intricacies of designing a larger scale development. Sustainability is more than introducing new architectural elements. The level of collaboration within the studio is highly integrated in the development and design of everything on the site. I worked with everyone from the creation of the site to the design of my own project buildings. It was hard working with designers from a foreign country, but we found a way to work together and engage each other's knowledge/ideas.

The sustainable studio helped me better understand and grapple with scale due to the overall scope of the project. With sustainability becoming more and more vital in today's society, China has become an extreme example of possible sustainable systems. When traveling to China, I was taken away by the wider world and new possibilities in the field of architecture. Overall, I'd say that my experience throughout the studio, when working with designers from a foreign country was great. It was amazing to see the language of drawing/sketching not bounded by the English/Mandarin divide. In the end, the one thing I'd take away from my time in China was how interesting and paradigm shifting non-European cultures can be.

The sustainable studio helped look at existing technologies that are used to create a sustainable design, as well as seeing what is currently being done in a different country. I also enjoyed the challenge of working with the existing topography to create high rises in a mountainous terrain as well as working in an area that has a different cultural landscape than the Western upbringings. Traveling to China helped reveal another way a culture may implement design, such as the density of China, favored vehicular traffic over pedestrian even though the latter outnumbered the other 4 to 1. In all I enjoyed the studio. I loved creating a detailed model and collaborating with others.