

Press Release

Deliverable #5 / April 30th, 2014

ORCHID HOUSE

Solar Decathlon 2014, by NCTU/TEAM UNICODE, Taiwan



NCTU Architecture
國立交通大學建築研究所

NCTUNICODE


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Project Description

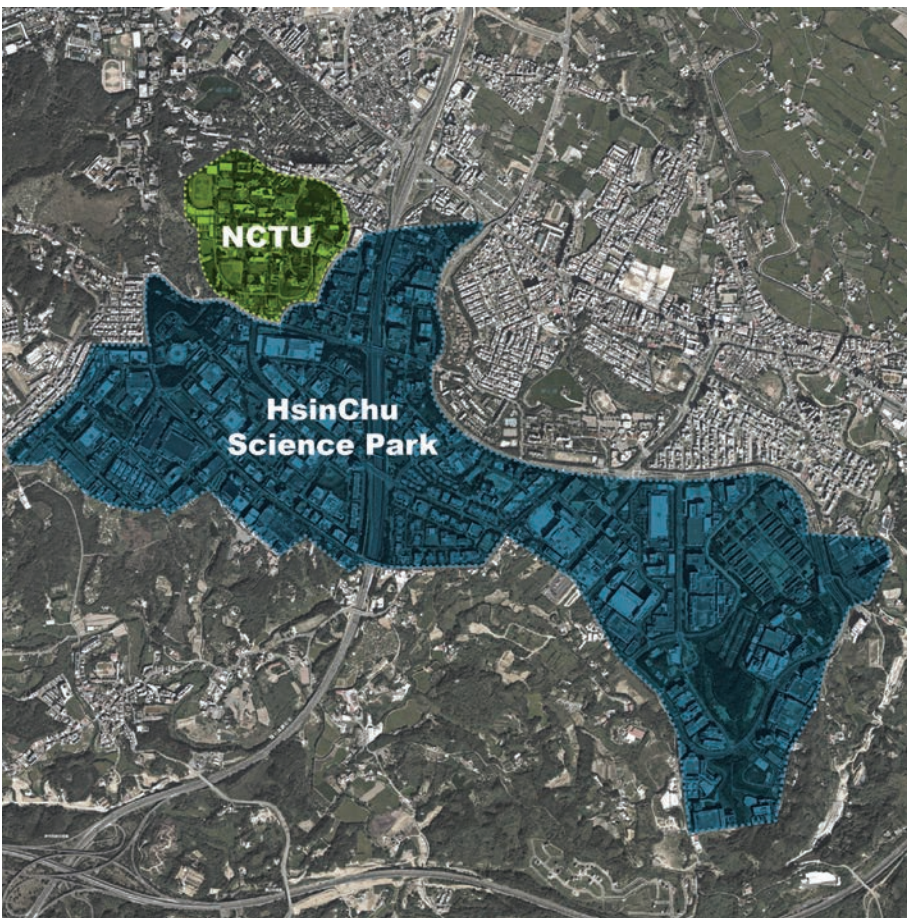
Background

Taiwan is an island situated off the eastern edge of Asian continent with an abundant variety of geological and ecological features. Two-thirds of the island is covered by over two hundred; rugged mountain-ridges while most of the rivers are short and swift before reaching the ocean. Monsoon, typhoons, and earthquakes are frequent and seasonal throughout the year.

Consequently, the ecosystem of Taiwan is fragile and sometimes vulnerable specially when facing rapid industrial growth and increasing urban population. Most of the population concentrated in several metropolitan cities along the west coast. The shear density and limited land supply made Sustainability a pressing priority for rethinking the current urban development and its strategies. Two of the most challenging tasks in this aspect have always been - 1) to optimize the land use, and 2) to

sustainably use, or re-use, of feasible spaces in the already crowded urban areas.

NCTU/TEAM UNICODE is organized and sponsored by Taiwan's National Chiao-Tung University (NCTU), which is the leading academy neighboring the worldly famous HsinChu Science Park, Taiwan's equivalence of Silicon Valley. TEAM UNICODE regards Solar Decathlon Europe 2014 as an excellent opportunity to develop a prototype for urban housing with innovative, sustainable strategy that offers as alternative to solving the above housing issue. The team approaches the design by incorporating very strong backings from local solar-technology resources (Taiwan is ranked the world's second largest solar-equipment manufacturer) and the globally renowned Taiwan orchid agriculture, into the target project - the Orchid House.





The Prototype

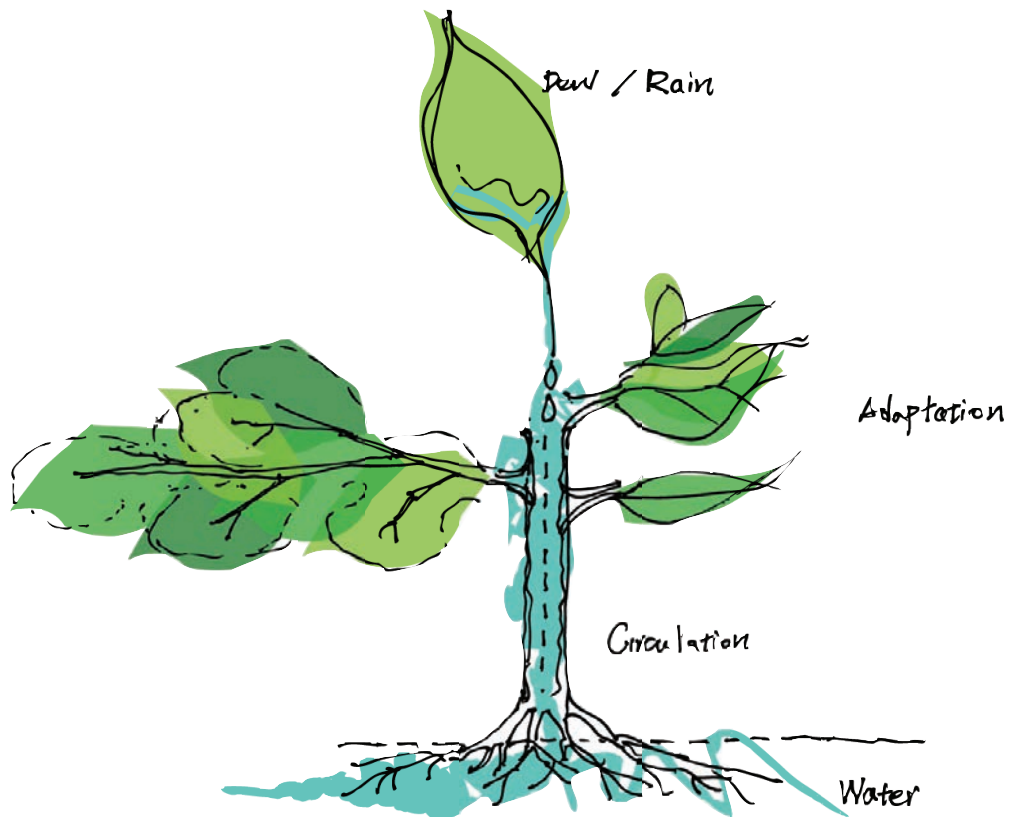
The Orchid House is a manifestation of Sustainability as an urban residential renewal/addition as well as a green mentality for new life style. It is so positioned primarily for future applications in high-density urban areas where land supply is limited and a great percentage of the residential buildings may benefit from a holistic or, at least, partial renewal. The core value of such position is in minimizing potential commuting in order to reduce carbon emission and air pollution. Additionally, the increase of livable space due to such renewal creates possibility of offering social housing to young urban professionals. The current provision of social housing in Taiwan is solely by the government, and the options are quite limited.

Unicode’s prototype of Orchid House is positioned to apply on the rooftops of urban residential housing and is planned to be an option for offering social housing.

The utilization of roof terrace has its socio-cultural root in Taiwan and the Orchid House is designed with a flexible interior plan to be highly adaptive for various functions and configurations. Such additional roof space is readily feasible for the use as housing, social space, or family gathering in daily life. It also serves as an incentive, once endorsed by the government policy, for existing owners to renovate and improve the value of rooftop, which may otherwise remain underutilized, if not abandoned.



The sketch of the project concept



A house is like a plant. The leaves collect dewdrops, and the roots absorb water, which circulate in the stems, and the leaves perform photosynthesis. This cycle creates water and energy, which are then properly stored and supplied to the entire plant. Our house will function similarly, as the solar panels absorb and convert light from the sun, into energy that is stored in the battery then supplied to the rest of the house. We can also harvest, circulate, recycle and reuse our own water.

We draw our first key concept metaphorically from Orchid, which is a family of unique, abundant and beautiful plants in Taiwan. They grow symbiotically on tall trees, nourished by a perfected balance weather of indirect sunlight and supply of rainwater.

Our solar house prototype which is targeted to be developed and implemented in the future on rooftops over a great number of existing urban housing in

Taiwan. The second key concept is "Blue Sky" which carefully concern about both the water and urban issue. To offer such added rooftop space for affordable Youth housing via policy backing, a solution that is aligned with the government's policy. And, Last but not the least, "Power House" is the keyword we envisage a reclaimed civic space on the roof can offer a valuable social and economic engine to a new Taipei.

The concept of Orchid House is designed according to the Taiwanese local conditions, it offers benefits in energy, urban, and social aspects. We are extremely excited and proud about SDE competition and the opportunity to create this wonderful solution. We wish Orchid House's values help to improve the quality of built environment not only in Taiwan but the entire global community.

Project image 1: Envision the new Taipei rooftop



For the SDE 2014 competition, the Orchid House will be configured in an “L” shape containing a typical one-bedroom family unit with a common terrace and rooftop. Furthermore, a “green-core” consists of strategically placed greeneries will also serves to reduce and helps to regulate the indoor microenvironment as well as functional, indoor planting area.

Primary Beneficiaries - Young Urban Professionals

Young urban professionals were mostly excluded from the possibility of living in the heart of Taipei due to significantly higher housing rent and price. With the Orchid House urban strategy, they will be offered an opportunity for affordable, sustainable life style and be enabled enjoy closer accessibility to their workplace and the urban, social environment. They will also be able to timely establish a stronger socio-economical foundation for a better start-up in their career in addition to the benefit of a greener living environment. Ultimately, the urban social fabric shall be enhanced by having younger generation’s participation and becomes a more comprehensive, integrated community.

Taipei Reference – the Old Ximending District



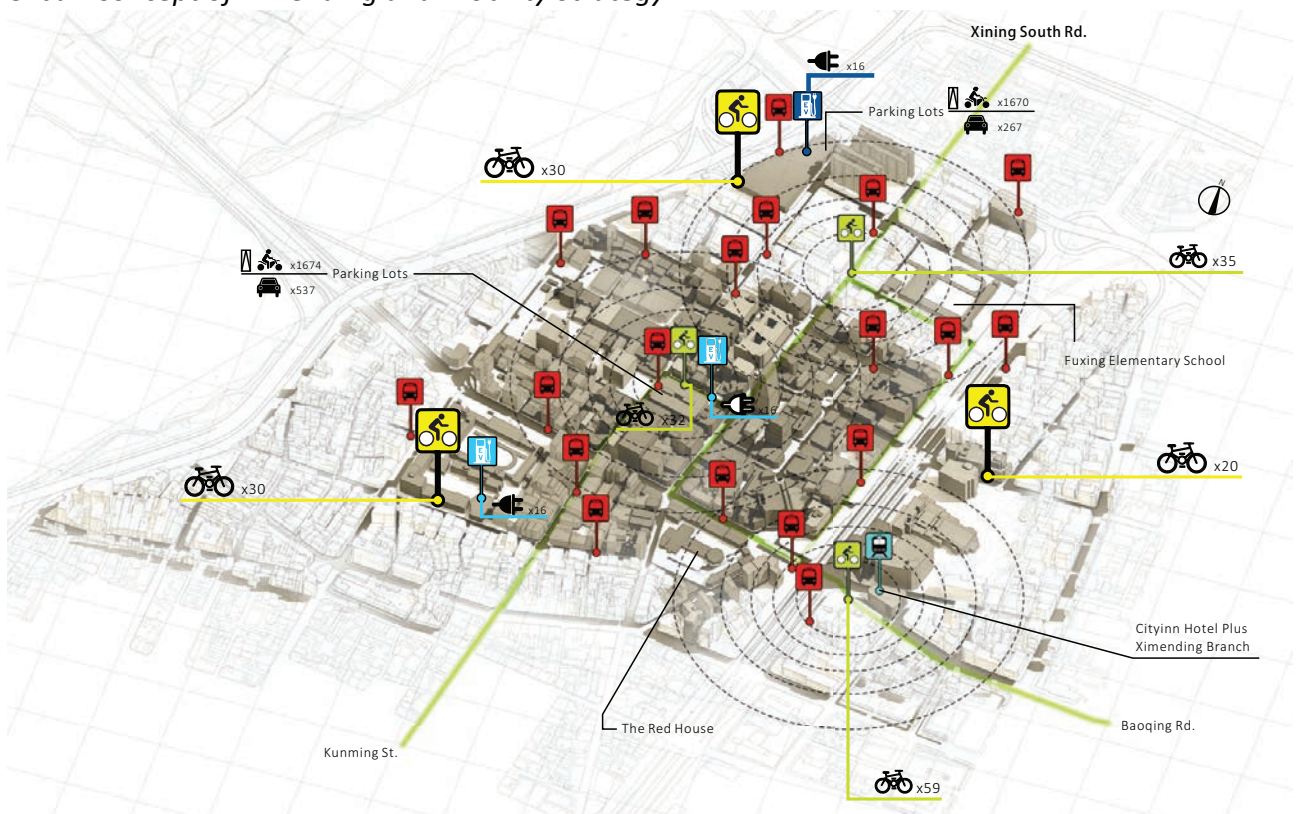
Ximending district was one of the oldest sections when the city of Taipei was first developed. It is situated at the west costal side along the riverside with a bustling harbour. Over the course of more than one hundred years, Ximending District flourished with the location advantages, however, as the city's growth continues towards the more inland, east part of the city after 1980's, Ximending gradually became a quieter, residential area with rather slow business activities. It is only until recent years that the citywide MRT (Taipei Metro Rapid Transit System) reconnected Ximending to the public network and it regained its momentum with infrastructural efficiency. The traditional, cultural vibrancy of Ximending quickly transformed into an attraction to

not only the out-of-town tourists but also the local younger generation, and a lively mix of the old and new starts to develop.

TEAM UNICODE researched extensively throughout Taipei and select Ximending as it most potent target area for future application of the Orchid House prototype. This district consists of mostly 4-5 story buildings with a clear grid network of streets, which was laid as a business district at first during the Japanese colonization. With the cultural attraction, public accessibility, and infrastructural efficient street system, Ximending is considered to possess the most favourable conditions for the application of Orchid House prototype.



Urban Concept of Ximending and Mobility Strategy



Connect to Existing Site - Urban Proposal



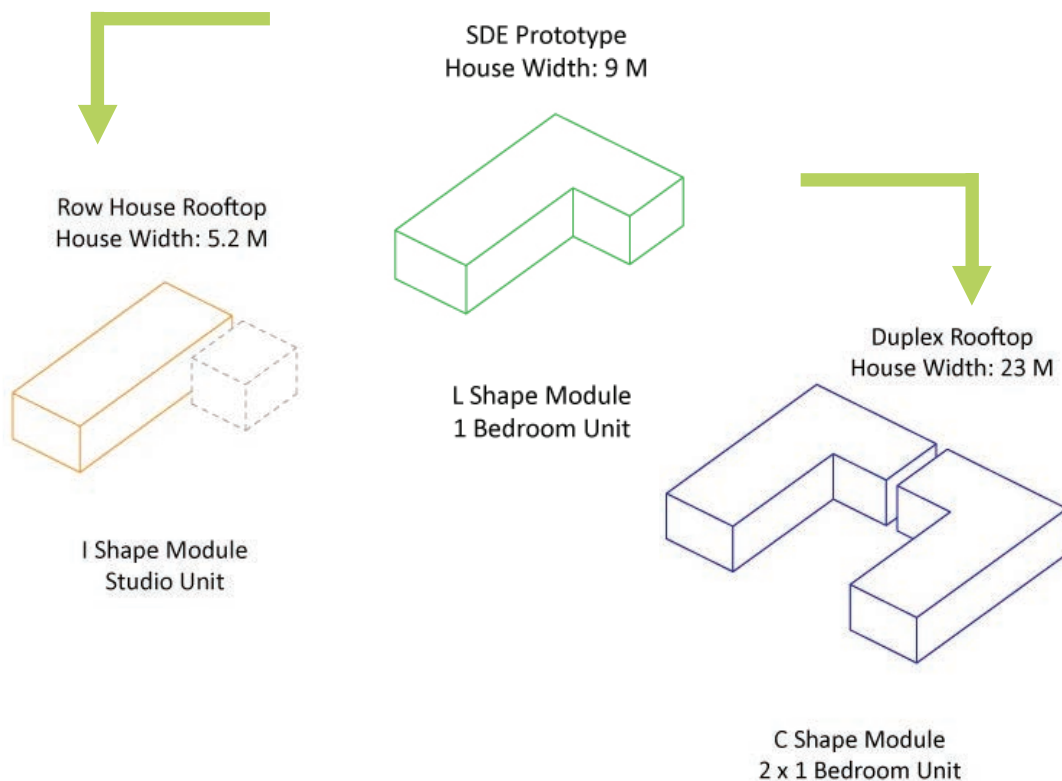
Top-down & Bottom-up Urban Renewal Strategy

Our goal is to bridge the generation gap and integrate more eco-friendly buildings in the process. As one of the aspects of environmental architecture is to disturb the surroundings as little as possible, one of the things we hope to accomplish is to create a design that causes minimal disturbance and even contributes aesthetically to its surroundings. We choose "Urban Regeneration" as our goal because we strive not only to improve the architecture of crowded cities like Taipei, but also to target social issues by addressing the social, economic, and physical needs of the people. Our solution is to build on top of existing buildings – specifically, the row houses and duplex apartments that are extremely common in Taipei.

Augmenting Pre-existing Architecture

Not only will our design support a sustainable system that increases energy conservation and cuts down on house utility costs, but it will also improve the visual landscape of the Taipei skyline. At the present, most of the roofs are either concrete with metal water tanks placed in the most convenient position or covered by metal roofs to prevent rainwater leakage. Our plan is to place the aesthetically-pleasing solar house on the rooftops of existing buildings, creating a place to live and socialize, as well as to put the necessary mechanical features.

With urban regeneration, we plan to expand existing structures with as little disruption to the original architecture and its occupants as possible. This is why we made sure to modularize the Orchid House. This reduces not only the costs, but also construction time. Additionally, the house is designed to fit on pre-existing buildings. Because the two building types we plan to target -- row



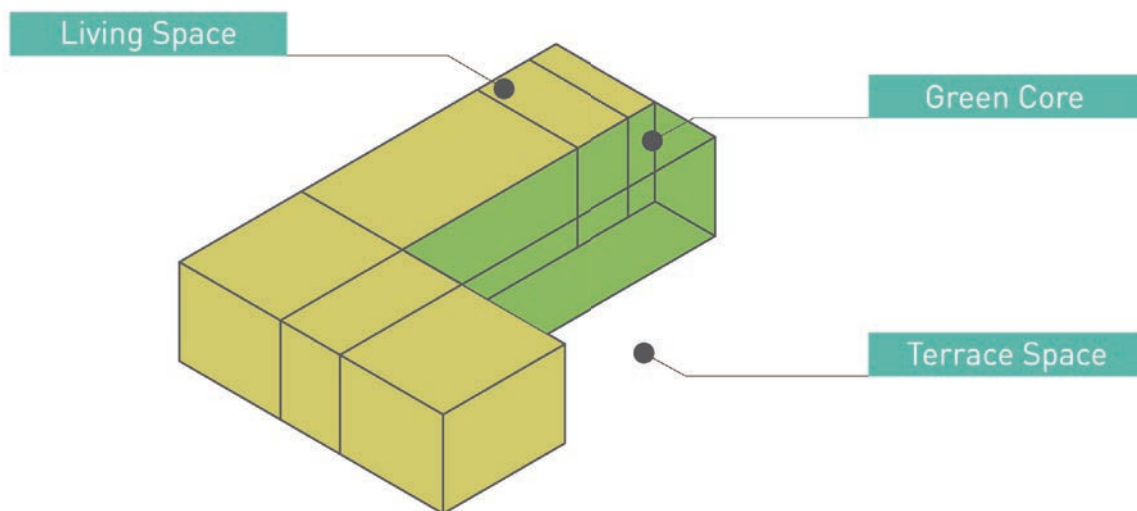


houses and duplex apartments -- have different rooftop shapes, the Orchid House is designed in an "L" shape, in which the short arm of the "L", the bedroom, can be detached to make an "I" shaped studio. This "I" shaped structure fits perfectly on the long, narrow rooftops of row houses; the stairs of the Orchid House can be connected to the original stairs of the row house, and the mezzanine level can become an open socializing space for all the tenants of the building.

Moreover, when applied to the wider duplex apartment buildings, the "L" shaped Orchid House can be mirrored to form a sideways "C". Not only does this form efficiently increase the number of social houses, but it also contributes to the lives of the original occupants of the apartment. The terrace space within the "C" can have multiple purposes. For example, it can be used as an area to gather and hold social events; people can cultivate plants for aesthetics or for food which idea we'll use in Dinner Party in competition, and for improved air

quality; the apartment can also utilize the terrace as space to extend its pre-existing elevator. In the last case, the Orchid House can contribute even more by sharing some of the electricity harvested by its solar panels and using it to power the elevator.

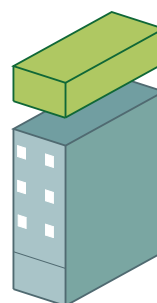
Essentially, the best and primary intention of Team Unicode is to create a single dwelling prototype that focuses on environmental and social issues. Our design will reduce the heat island effect of Taipei and encourage households to conserve resources and use less destructive forms of energy. In addition to our "green rooftop system" we also intend to create passive wind ventilation systems that will save energy in the naturally hot and humid Taiwan environment. Furthermore, our design will also contribute greatly to improving the collective Youth housing program of Taiwan and provide better living conditions for the population.



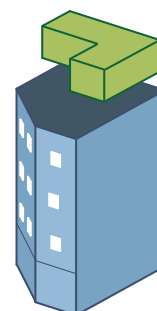
Building Integration

The collective housing system of the Orchid House does not only add a new addition to the house, but also creates a chance to revamp the old building equipment, extend the building's life time. During the 1990s, Taiwanese economy is quite prosperous and it encouraged investors to develop the city. However, it was done under the pressure of time and money, thus, a lot of construction was rushed and done poorly. Most of the 15 to 20-year old building already have the problems of rusted pipes and insufficient electrical wires, that leads to clogging the sewage pipes, and dangerous electric overload condition. Therefore, it is recommended to change the water and electric equipment every 20 years.

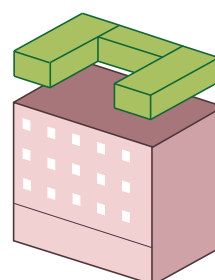
Furthermore, leaking rooftop is another major reason that shortens building life cycle. Being an island, Taiwan has a lot of rainfall with high salt content in the air. Before placing the Orchid House, we must first improve the waterproofing on the rooftop to prevent leakage.



Row house



Corner building



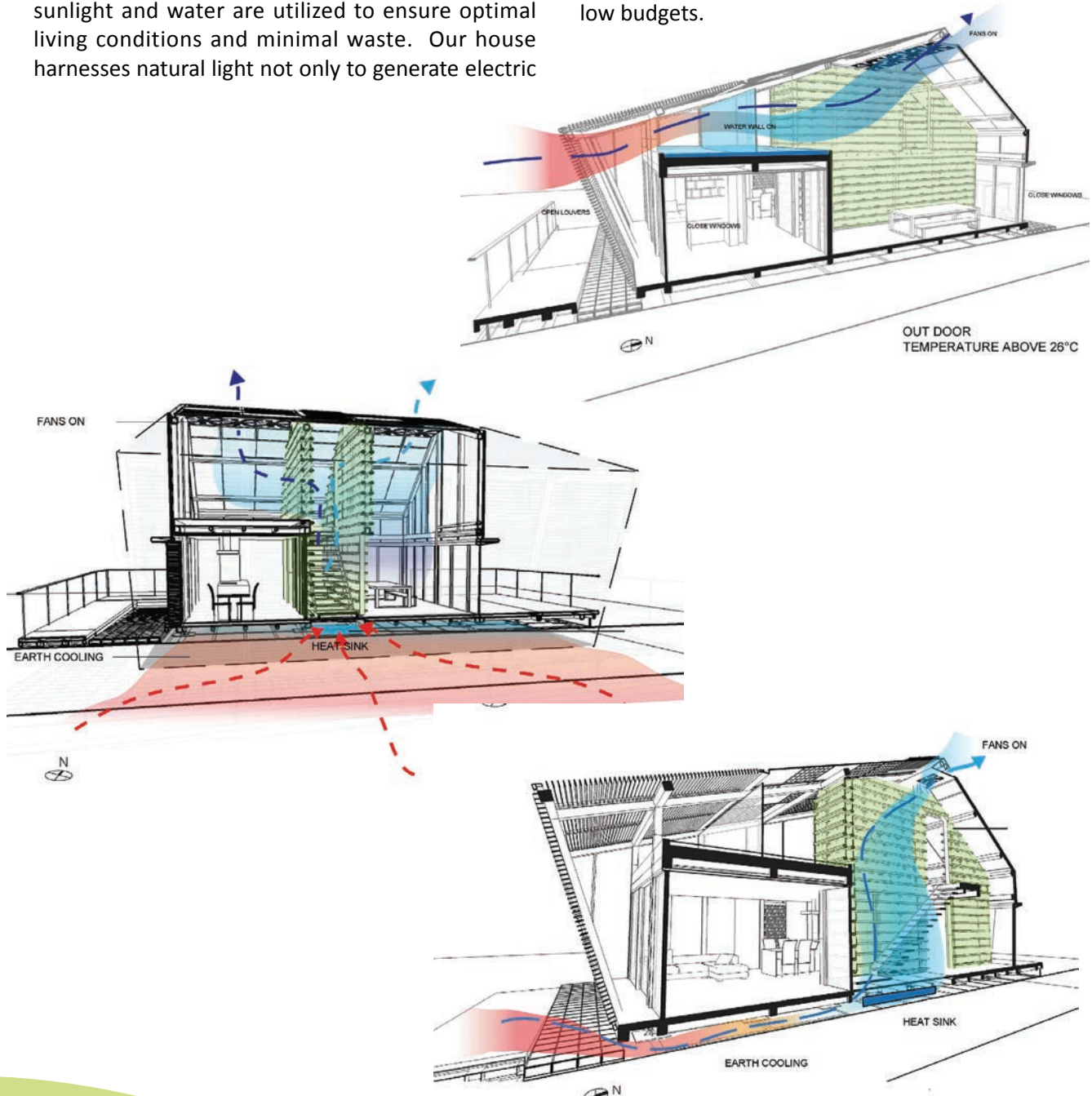
Duplex house

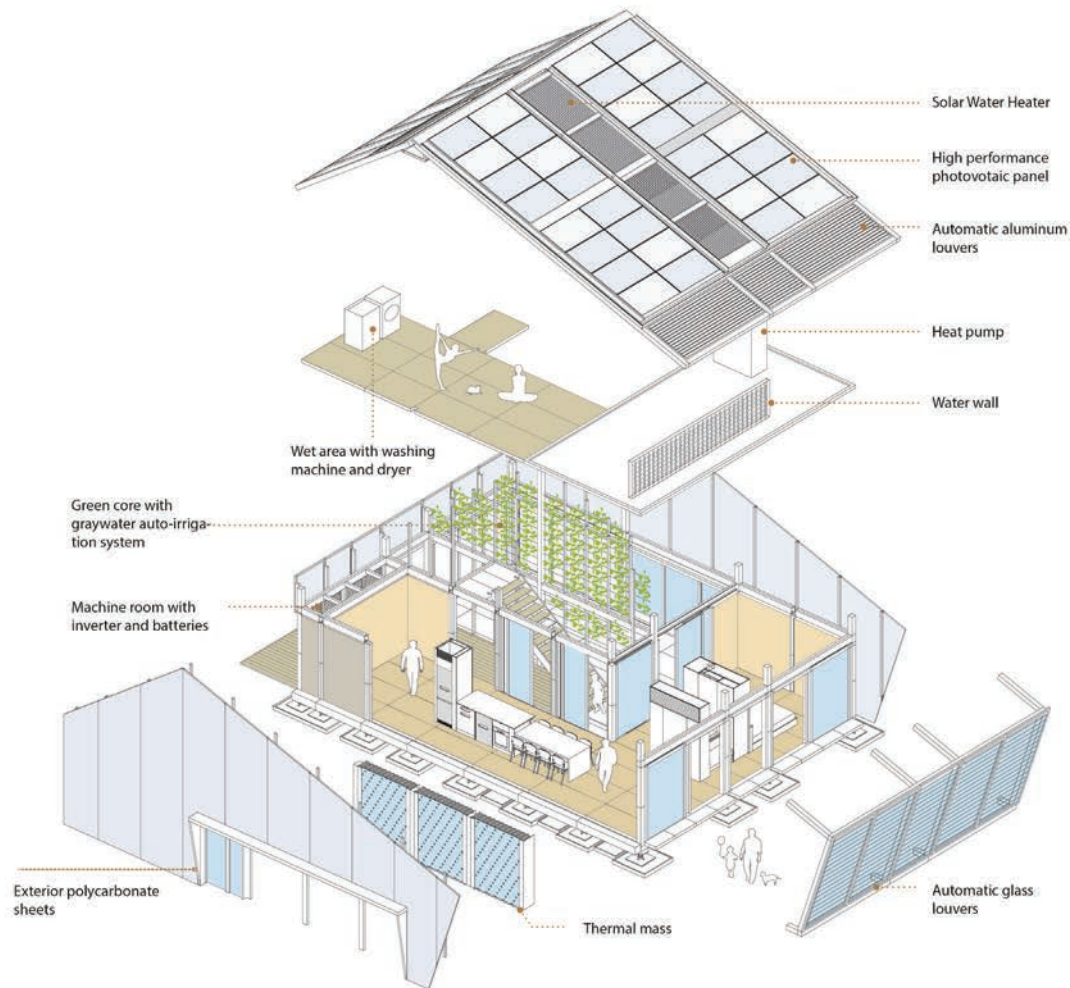
Design Approach

The concept of our house is based on local conditions, but we are confident that these systems are applicable around the globe. We are expecting much drier climate conditions during the Solar Decathlon Europe 2014 in Versailles, France. The challenge is to design a house that functions well in the both dry and humid conditions. However, this will provide us with valuable experience that will contribute to our plans of marketing the house in different cities and countries.

We have designed the house so that both sunlight and water are utilized to ensure optimal living conditions and minimal waste. Our house harnesses natural light not only to generate electric

energy through the photovoltaic panels integrated on the roof, but also to regulate the internal temperatures of the house through a thermal mass wall. We also maximize water efficacy by using greenhouse evaporative cooling and drip irrigation systems. Lastly, the functions of sunlight and water intersect to provide heated water that can be used domestically as well as to regulate indoor temperatures when it is cold outside. The implementation of such systems will provide great benefit at little cost, as the lightweight structure of the house will allow for efficient construction and low budgets.





Exploded Axon of Orchid House Prototype

House Design

Given the premises of the SDE competition is targeted to design and build a single house, however, our aspiration is to develop a potential prototype of urban housing for the young start-ups in the city. For achieving such goal with affordability, we conceived a rather flexible, modularized structural system which is expandable for multi-storey urban buildings. We further facilitate the prototyping with sustainable principle by utilize recycled steel, sponsored by Tung-Ho Steel Company - the leading ship-recycling corporation in Taiwan. The urban youth housing is aimed to reach maximum self-sufficiency in many ways such as the utilization of solar energy, recycling rainwater for drip-irrigation for the local agriculture of vegetation as one of the food sources.

Team Unicode's "Orchid House" will incorporate all

of the progressive technology that is available in the NCTU research lab, Hsinchu Science and Technology Industrial park, as well as all over Taiwan, including greenhouse technologies, digital environmental control interfaces, solar thermal collectors, and high efficiency photovoltaic panels. However, if we only rely on those technologies, the construction costs will likely exceed the limit of market availability. We aim to make the Orchid House available at a low cost by distributing and mixing those technologies with other passive methods and think about what is the real sustainability. For example, we will incorporate an active and passive solar system, and recycle and harvest water for radiant flooring, drip irrigation, and the greenhouse evaporative cooling technology. In order to achieve our goal, we have focused our technological research on the following topics.

Building envelope and passive solar system

In order to utilize the passive solar system, which uses 90% less energy for heating and cooling compared to existing building and archives 75% overall energy savings, we have carefully considered the layout of the house. The west side of the house is composed of a long POLLI-Brick™ wall that will act as a thermal mass, which will absorb heat during the day that will be released at night when it is colder. We deal with issues of overheating with strategies such as careful placement of windows.

**Temperature controlling space
Green Core**

Team Unicode creates three keywords of the Orchid House Project, the first one is “Green Core.” The green core serves as the heart of the house, where it moderates the temperature, exchange fresh air and using recycling system for irrigation of plants. Besides, it will minimize the energy consumption for cooling and heating the living space. Using evaporative cooling strategy which is inspired by the orchid growers and green plants of Taiwan, the house will remain cool on the inside even during

hot summer days. Hot air will enter the house through louvers that cover the indoor water sub-unit, called “water wall”, which collects and uses rain water to cool down the air with evaporation. The cool air is then drawn through the house by several large, silent fans stationed at the opposite end of the house. On the other hand, during the winter, the louvers will be closed to prevent frigid air from entering the Orchid House. Additionally, the main water unit, which is heated using solar energy, will provide hot water that will circulate under the floorboards to radiate heat. Our choice of POLLI-Brick™, which is made by the recycled plastic bottles, is filled with water and act as thermal mass, which absorbs heat during the day, and release radiant heat at night. It will also be invaluable to providing heat through passive solar methods.

Water Harvesting and Usage

Taiwan is hit by an average of 3.7 typhoons per year and these storms can produce heavy rainfall and strong winds, leading to severe damage to agriculture and industry, and serious loss of human life. In order to conserve resources and act environmentally, we will harvest rain water in a subunit water tank close to the roof. This reservoir will be used



Project image 2



Project image 3

not only as part of the cooling system as mentioned above, but also as a source of water for the various plants in the house. We have looked into drip irrigation as the most efficient use of our resources for watering the vegetation. Not only is drip irrigation 20-40% more efficient than traditional sprinkler methods, but also it maintains a more suitable balance of air and water in the soil for optimal plant growth.

The Strategy of Blue

Large cosmopolitan urban areas such as the nation's capital city, Taipei, have limited usable land, and extremely high population densities when comparing with others. The majority of the Taipei population live in 4-5 story apartments and row houses, which compose nearly 48.29% of the rooftops in Taipei. These rooftops are our opportunity to establish urban regeneration, with solar power. Therefore, we target to use Orchid House not only for regenerating the new urban skyline but also recycling the water for irrigation system. We aim to improve the current Taipei roof aesthetic and create a new social space for living.

The Power House

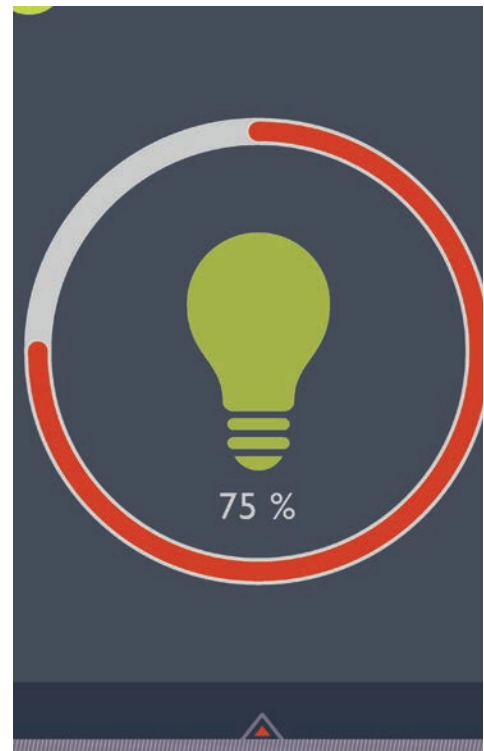
We consider our scheme towards developing an engine for initiating social influences in several aspects - a network of social spaces, housing renewal, housing issues for the younger generation, and an overall green approach for such execution. Therefore, the Orchid House choose to tackle SDE's sustainability agenda by embracing the mission to revitalize not merely the housing supply strategy but also a sustainable social impacts by offering the future generation a new possibility. In other words, we aspires to offer an innovative strategy that provides the hard ware as well as the vital momentum for continuing social changes.

Lighting system

Lighting design will be an integral element of the house and its energy system. Taiwan is currently one of the largest manufacturers of LED in the world and NCTU's research institute is also taking part of the industry. We will use the most efficient light source on the market and integrate all lighting with the house sensor system to monitor the room for brightness, comfort, and temperature. Our electrical lighting will work with the mechanical system to increase system efficiency. All the heat generated by the light source will be paired with the performance of air delivery systems to avoid wasting heat by lighting source.

PV system

Among many companies we have researched, we have noticed the innovative work of a Taiwanese company called the Delta Group. An offshoot company, Delta, is a leading PV manufacturer in the global industry, products have cell efficiencies ranging from 18% to 20%, which allows the Orchid House to harvest more energy using less material. Our design team is working closely with their research team to develop the most efficient PV system for the house. We plan not only to use the PV system as a power generator, but also as a key element for the architectural aesthetic.



Project image 4



Slogan

GREEN CORE
BLUE SKY
POWER HOUSE

2014



Dissemination Activities

In the past few months, the NCTU Unicode team has attended several conferences, organized several field trips, and introduced itself and the Solar Decathlon Competition in several presentations

*One day internship in Ruentex Group –
MARCH 20 2013, TAIPEI*



The NCTU/Unicode team participated in Ruentex Group's internal "Innovation and Technology Committee Meeting", hosted by the chairman Dr. Samuel Yin. As a result, we had a better understanding of on-going projects, cross-functional operations and innovative construction/material development.



Field trip in Grand Biotechnology

MARCH 21 2013, HSINCHU



To gain knowledge of orchid nursery industry, NCTU/Unicode organized a field trip to Grand Biotechnology, a professional orchid grower company, which is involved in the research and development of orchid tissue culture, through the adoption of biotechnology and high tech bio-processes.

Study Tour of Green Factory

MARCH 20 2013, TAINAN



The NCTU/Unicode team arranged a study tour to visit Green house as well as the Taiwan International Orchid Show 2013 in Tainan. In this tour, we observed the architectural elements of green house, such as shelter, waterproof system, cooling system, fans, artificial lake, and more.



Pecha Kucha

MARCH 25 2013, HSINCHU

In 20 seconds per slide, for a total of 20 slides, one of the members of NCTU/UNICODE presented her experience of traveling to France for a Solar Decathlon Europe 2014 meeting. This event was held in the Graduate Institute of Architecture of National Chaio Tung University, open to all the architecture students.



Signing the Memorandum of Understanding

APRIL 26 2013, HSINCHU

A representative of Centre Scientifique et Technique du Bâtiment (CSTB), Mr. Bruno Mesureu, traveled to National Chaio Tung University to sign the Memorandum of Understanding. The Graduate Institute of Architecture held a reception after the ceremony



Excursion to Living 3.0

MAY 16 2013, TAIPEI

Looking for the most recent advances made in modern living, NCTU/UNICODE made a trip to Living 3.0 to tour its modern house. Living 3.0 strives to develop an efficient intelligent living space, making use of present technological advances in electrical engineering, electronics, materials, information, communication, automation, and control industry.



Meeting with Schneider Electric's

MAY 16 2013, TAIPEI

NCTU/UNICODE seeks to implement only the most efficient and affordable technology in our Orchid House. The search led us to the Schneider Electric's branch in Taiwan, where we witnessed their conviction to constantly increase the safety, reliability, efficiency and productivity of their products.



Guided Tour of Mega House (EAG)

MAY 16 2013, TAIPEI

NCTU/UNICODE was given a guided tour around the innovative Mega House, which is also known as the EAG House. "E" stands for the electronic management of the entrance and exit of personnel and the sensors that reduce energy consumption. "A" is for automatic, and the "G" stands for green building, in which the building panels can be reused and recycled after disassembly.



Introduction to Delta Products

JUNE 6 2013, HSINCHU

In a meeting with representatives of Delta Electronics Inc., NCTU/UNICODE learned about the long-term goals of the Delta Groups, which includes a focus on smarter and greener living such as renewable energy and energy efficient architecture.



*Final NCTU/UNICODE
Studio Presentation
JUNE 19 2013, HSINCHU*

NCTU/UNICODE gave its last presentation on the finalized design to the university professors involved in the project. The presentation, which included a slideshow, a 1:25 model, and several large posters, received favorable responses.



*NCTU/UNICODE SDE Tea
Party
JUNE 19 2013, HSINCHU*

NCTU/UNICODE held a tea party to present its final project design and results to all the professors and students of the Graduate Institute of Architecture at National Chaio Tung University. This was the first time the project was announced to the public, and many current students expressed interest in joining the team.



*Delta ELC. Meeting
JULY 17 2013, TAIPEI*

This week, the NCTU/UNICODE team has meeting with our sponsor, Delta etc., to look for the best way of PV technique, communication plan and social awareness.



Ruentex Meeting

JULY 24 2013, TAIPEI

This week, the NCTU/UNICODE team has been very busy gathering support for the Orchid House! We had meetings with our main sponsor, Ruentex Group, to look for the best materials and technologies for our sustainable solar house.



YKK ap Meeting

AUGUST 29 2013, TAIPEI

This week, our team has frequent discussions that focus on the facade and framework detail design with our technical support vendors : YKK AP. We will have a great partnership with YKK AP until the end of this project. Our goals are the same: do the best design proposal. In the YKK AP exhibition room, there are a lot of great cases and material samples. We hope we can combine these materials with our orchid house in the future!



Bayer Meeting

AUGUST 29 2013, HSINCHU

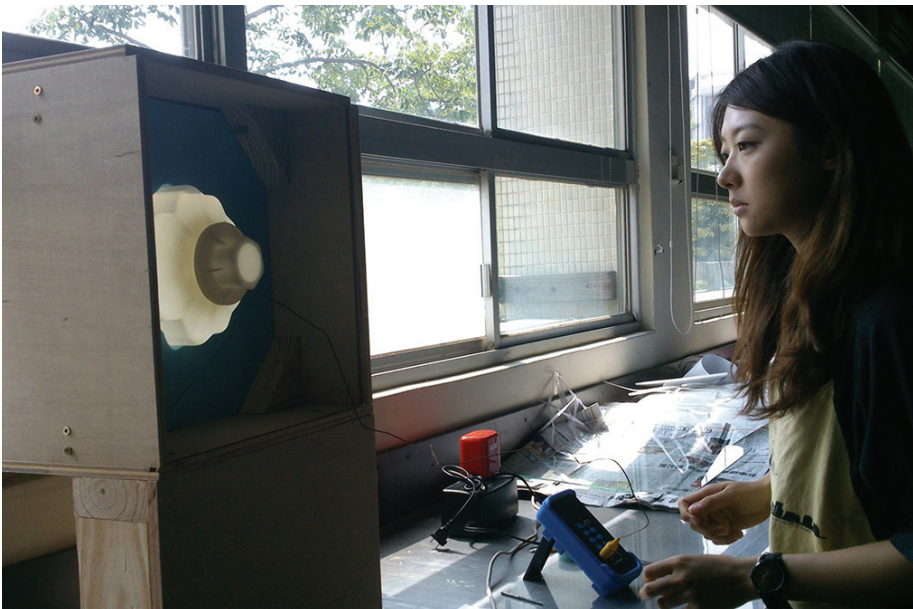
Bayer PC board (polycarbonate) not only allows light to penetrate in but also isolates the heat. It's a good choice of building façade because it makes indoor space bright as well as reduces the energy consumption. Our Orchid House replaces the original glass with Bayer PC Board.



SGS Meeting

OCTOBER 01 2013, TAIPEI

NCTU UNICODE visited SGS Taiwan branch to share the Orchid House project and Solar Decathlon Europe to discuss further collaboration. NCTU Professor Ms. Jan gave an impressive presentation to the professionals in sustainable building industry and amazed them with team UNICODE's vision of the Orchid House!



Thermal Mass Testing

OCTOBER 02 2013, HSINCHU

We speculated that the thermal mass can mitigate the dramatic change in outdoor temperature. So we had measured for three days and finally we had the summary that the heat could be stored in PET bottles bricks but not in a cumulative way. So the temperature could be maintained stably. 72 hours continuously measurement really made us crazy.



Fatton Company Meeting

OCTOBER 07 2013, TAIPEI

This week, Transportation Management Team specially went north to visit Fatton Company to discuss the transportation process from Taiwan to France. How much volume the container can afford and what materials we need in the transportation process are both big challenges for us.



*UIS_Smartliving Meeting
OCTOBER 07 2013, HSINCHU*

we have a meeting with UIS to integrate electronic design. The engineers come to NCTU to give us assistance and suggestions about electronic as well as explain how and where the sensors can be set. They also sorted out the distribution graph for us.



*Emergency First Aid Training
OCTOBER 10 2013, HSINCHU*

The NCTU/UNICODE team has trained the emergency first aid care by professional training course. This is a necessary technical skill for the team members. Ultimately, we all get the certificate for emergency first aid.



*Tung Ho Steel Meeting
DECEMBER 04 2013, TAIPEI*

This week we meet an important sponsor, Tung Ho Steel Co., not only sponsors Team Unicode all the steel materials, but also technical design supports as well as providing us the warehouse to pre-assembly.

ORCHID HOUSE



Winter Camp Recruitment- Presentation and Interview in senior high school

DECEMBER 24 2013, HSINCHU

This week, our team has recruited 35 high schoolers representing our solar seeds, who will participate in the Winter Camp and be green volunteers to ignite the sustainable awareness.



Mockup

JANUARY 17 2014, HSINCHU

This week, the first part of structure arrives NCTU. Team Unicode starts the construction phase and it might be considered as an impossible mission. Because of everyone's determination and perseverance, we successfully make it!



Architect Bar

JANUARY 23 2014, TAIPEI

The NCTU/UNICODE team has invited to present our project in front of the famous architects salon. They really appreciate the Orchid House Project and encourage us to do our best.



Orchid House Winter Camp

FEBRUARY 07~09 2014, TAIPEI

Team NCTU/UNICODE regards education as the most important outreach way since it directly reaches our next generation-the foundation of our future. In addition, these high schoolers are highly involving and using their imagination as well as innovative ideas to enjoy this activity.



Orchid House Press Conference

FEBRUARY 07 2014, TAIPEI

This week, NCTU hold a press conference as the kick-off of Orchid House project to general public. The design, construction, fundraising and activities are all done by students, which is the eye-catching idea for education.



the Exhibition

FEBRUARY 09 2014, TAIPEI

After the winter camp, we are invited by the architecture department to join the exhibition in Taipei which aims to introduce the idea of architectural education for the general public.

ORCHID HOUSE



Pre-Assembly Period, Go!

FEBRUARY 20 2014, Hsinchu

Our team is ready for pre-assembly period at NCTU, all of us follow the H&S regulation and well-trained before on site. The students have the mouse on our right hand and carry the equipment on the other hand. Team Unicode's Orchid House go!



VIP comes to NCTU

FEBRUARY 25 2014, HSINCHU

The NCTU/UNICODE team invited the VIP from the University System of Taiwan, Delta Foundation and President Wu of NCTU. They appreciated what we students did and encouraged us to keep working hard.



Meet with Bureau de France in Taipei

FEBRUARY 26 2014, HSINCHU

This week, the director of La France à Taiwan (Bureau de France in Taipei) come to NCTU to see our Orchid House, and give us a lot of cheering.



Broadcasting online

MARCH 03 2014, TAIPEI

This week we meet an important host in UNI FM 96.7 which has the same abbreviation as our Team name. We talk about our Orchid House project and the interesting stories behind the scene.



Tung Ho Steel Sponsor

MARCH 04 2014, TAIPEI

This week, one of the most important sponsors signed the MoU with Team Unicode. Tung Ho Steel recycled ships to make steel and it is truly a sustainable action.



Training for Boom Lift

MARCH 31 2014, HSINCHU

This week we receive training of Boom Lift by the professionals. It will be a handy skill when go to Versailles.



We are almost there
MARCH 31 2014, HSINCHU

This week, we have a photo to celebrate the day we finish our pre-assembly in Hsinchu. After today, we are going to the next phase of the Orchid House project. We hope to see the prototype soon in June.



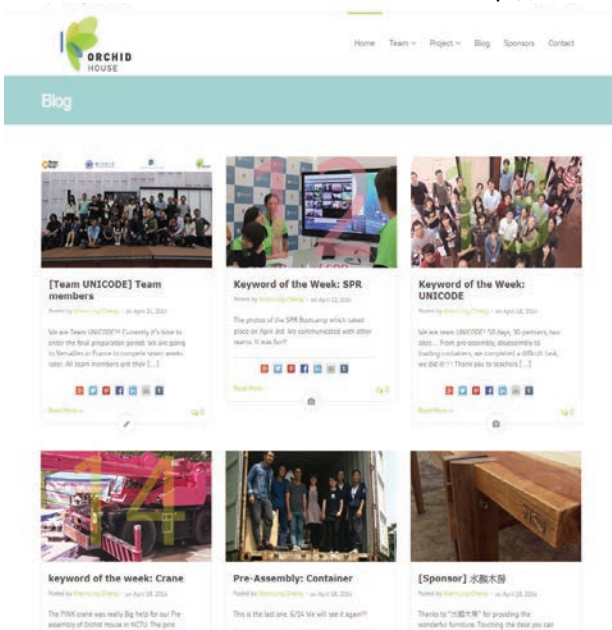
Speed Peer Review
APRIL 03 2014, Hsinchu

The online Speed Peer Review is a lot of fun for us. We are thrilled to share our efforts with the other 19 teams. See you guys in Versailles in June!



Communication Info

<http://sde.tw>



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NCTU UNICODE

Solar Decathlon Europe

Follow us on Twitter at [@NCTU_UNICODE](https://twitter.com/NCTU_UNICODE)



We set up our Official Web Site in English and Mandarin, please scan the flash code or link to <http://sde.tw> to check out our latest updates. We also have a Facebook fan page to attract more interest in our project.

For more information, please contact with us at:

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NCTU UNICODE TEAM

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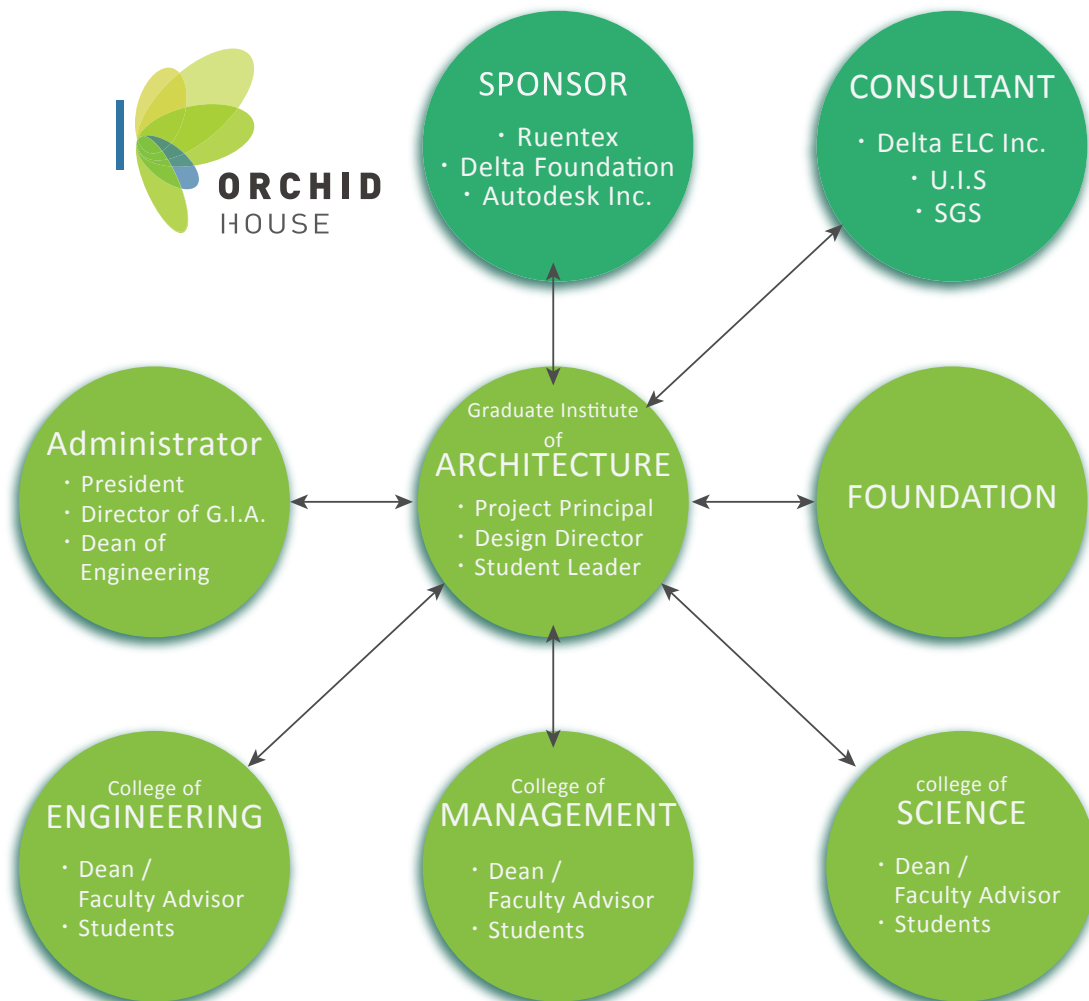
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Team Members

Organization

Since NCTU/UNICODE will be the first Taiwanese team to enter the Solar Decathlon, we have gathered a team with the best and most knowledgeable among the fields of architecture, engineering, science, and management in Taiwan.



NCTU/UNICODE includes architects, engineers, scientists, graphic designers, interior designers, product designers, and representatives of many other disciplines, all extremely knowledgeable and skillful in their respective fields. This wide range of experience and expertise provides NCTU/UNICODE great opportunity to explore our unlimited possibility of collaborative environment to complete our first Solar House in Taiwan.

management, fabrication, and design-building. Professor Tseng, the project principal, has over 15 years of professional experience at all stage of design and construction with high profile award winning projects. Professor Nagatomo and Jan, the design director, are specialized in translating digital design to fabrications. In addition, the architecture team also includes professionals in business development, interactive mechanism, interior design and furniture design.

The architecture team has experience in designing,



TEAM UNICODE

Student Leader



Chih-Ming Chien is a Ph.D student at the National Chiao Tung University. He had received his bachelor degree from the National Taipei University of Technology, and master degree from National Taiwan University of Science and Technology. Chien is the founder of “Volunteer Architect” program, which is a special group that gathers student volunteers to build projects at remote locations.



Sheng-Kai Sky Tseng is a research assistant at the National Chiao Tung University. Tseng received his master degree in architecture and bachelor degree in Civil Engineering from NCTU. Tseng is the founding member of Archicake Design and worked as designer, film editor, and reporter in multi-disciplinary projects. While at Graduate Institute of Architecture, Tseng managed several exhibitions including Taipei Pavilion at 2011 Hong Kong/Shenzhen Bi-City Biennale of Urbanism and Architecture.



Ya-Ting Wu is a research assistant at the National Chiao Tung University. Wu graduated from NCTU with master degree in architecture as well as bachelor degree in foreign languages and literatures. Prior to pursue career as an architect, Wu served as flight attendant in one of major air flight companies in Taiwan. Wu also has worked with Kengo Kuma architects and associates in Tokyo, Japan.



Chia-Hao Lin is a research assistant at the National Chiao Tung University. Lin received his master degree in digital architectural media from NCTU and bachelor degree from Tamkang University in Taipei. Lin’s research focuses on parametric and interactive design application in architecture. Lin recently completed his installation “Teagloo”, which utilizes digital fabrication technologies.

Student Community



Decathlete



Yu-hsien Lin, Jeff



Yiting Chen



Yung-Yen Teng



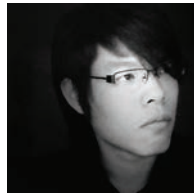
Yu-Ming Su



Trista Wang



Wan-Ling Cheng



Chester Hu

U
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D
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Ching-Ju Chen



Sophie Chen



Chin Yuan Fan



Sunny Chou



Ruby Tu



Ming-Hung She



Andrew Su



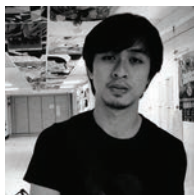
Cheng-Wei Wang



Jason Huang



Leslie Yen



Oswald Ho



Pei-Ling Wu



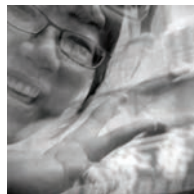
Summer Lee



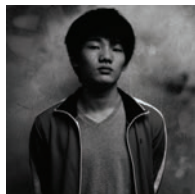
Vicky Lai



Mandy Wu



Rui Lin



Shao-yi Lu



I-Chih Chen



Tze-chun Chen

Faculty Member

*DIRECTOR OF ARCHITECTURE*

Shu-Chang Kung is the Director of the Graduate Institute of Architecture at NCTU as well as a vice professor. Mr. Kung graduated from the Architecture Department of Tunghai University, Taiwan in 1986, and received a Master of Architecture and Master of Design from the Harvard Graduate School of Design, U.S.A. He is also a licensed architect in Taiwan.

*PROJECT PRINCIPAL*

C. David Tseng is a Professor of the Graduate Institute of Architecture as well as the Dean of the College of Humanity and Social Science at NCTU. Mr Tseng received his Master degree from Graduate School of Design, Harvard University. He was formerly the Dean of the Architecture Department of Tunghai University in Taiwan and also an Architecture/Landscape Architecture Evaluation Board member of Ministry of Education.

*MECHANICAL ELECTRICAL & PLUMBING CONSULTANT*

Chenwu Chung holds Mater of Architecture as well as Master of Science in Mechanical Engineering from University of Arizona. He is a member of International Facility Management Association (IFMA), Mr. Chung won the first Diamond Award of Taiwan Intelligent Building. He is doing research on integrating Building Information Modeling (BIM) and Facility Management.

*DESIGN ADVISOR*

Chi-Yi Chang is a Professor of G.I.A. at NCTU. He has received Master in Design Studies from Harvard University and the Ohio State University. Mr. Chang has won many design awards and competition projects, and has made major contributions to the academic field. He is a member of Council at Urban Design Institute of Taiwan.

*TECHNOLOGY ADVISOR*

June-Hao Hou Ph.D is an Assistant Professor of the Graduate Institute of Architecture at NCTU and also the program director of Master of Science and PhD program. Dr. Hou received Doctor of Design and Master of Design Studies from Graduate School of Design, Harvard University. He is the Director of A Learning and Design Environment for Parametric Modeling in VR CAVE, National Science Council of Taiwan.

*TECHNOLOGY ADVISOR*

Pei-Hsien Hsu Ph.D is an Assistant Professor of Graduate Institute of Architecture at NCTU. Dr.Hsu holds a Ph.D in Architecture, Digital Research Studio, from the University of Cambridge. His research was funded by National Science Council and is aimed to investigate the use and the design of mobile augmented reality system to assist collaborative urban design.

Faculty Member



ENVIRONMENTAL CONTROL ADVISOR

Shaw-Bing Chen is an Assistant Professor of the Graduate Institute of Architecture at NCTU. He received his Master of Science in Architecture at the Massachusetts Institute of Technology and his Bachelor of Architecture from the University of Southern California. He also is a licensed architect in the state of California.



BUSINESS DEVELOPMENT ADVISOR

Eric Chuang AIA is an Assistant Professor of G.I.A.. Mr. Chuang received his Master of Architecture degree from University of Pennsylvania (USA) in 1988 and a Bachelor of Architecture from Tunghai University (Taiwan) in 1985. He is registered in the State of Massachusetts.



MANAGING DIRECTOR

Benjamin Tang is an assistant research fellow at the National Chiao Tung University. Mr. Tang received his master degree in architecture from Tunghai University, Taichung. Mr. Tang is a registered architect/interior designer in Taiwan and also certified specialist for construction and inspector for public accessibility.



MANAGING DIRECTOR

Wei Tseng is an Assistant Professor at the National Chiao Tung University. Mr. Tang received his master degree in architecture from Tunghai University, Taichung. He had earned a Master's degree at Architectural Association in England.



DESIGN DIRECTORS

Daisuke Nagatomo is an Assistant Professor at the NCTU Graduate Institute of Architecture. Mr Nagatomo has received his master degree in architecture from Columbia University and bachelor degree from Meiji University. He also holds a research diploma from Institute for Advanced Architecture of Catalonia specialized in Solar House development program. Mr Nagatomo is also an USGBC LEED Accredited Professional.



DESIGN DIRECTORS

Minnie Jan is an Assistant Professor at the NCTU Graduate Institute of Architecture. Ms. Jan graduated from the Columbia University Graduate School of Architecture, Planning and Preservation. She is the selected researcher for Solar Decathlon Europe 2010 of Institute for Advanced Architecture of Catalonia. Ms. Jan is also an USGBC LEED Accredited Professional.



URBAN DEVELOPEMENT ADVISOR

Chin-hua Huang is an Assistant Professor at the NCTU Graduate Institute of Architecture. Mr. Huang graduated from the Columbia University Graduate School of Architecture, Planning and Preservation. He is the founder of PLAN architecture | design | strategy.

NCTU Support



PRESIDENT OF NCTU

Yan-Hwa Wu Lee Ph.D is the president of NCTU. Dr. Lee received her doctoral degree in biochemistry from the University of Tennessee and her master and bachelor degrees from the National Taiwan University. She has been member of The Academy of Sciences for the Developing World since 2007 and was also awarded Taiwan Outstanding Women in 2010. Dr. Lee Wu was elected to become an academican of Academia Sinica at Taiwan in 2000, a prestigious position for her scientific achievement.



PROJECT CO-DIRECTOR/IT SYSTEM DIRECTOR

Dr. Jason Yi-Bing Lin is the Chair Professor of the Department of Computer Science and Information Engineering (CSIE) at National Chiao Tung University (NCTU) since 1995. Lin is the co-author of three books *Wireless and Mobile Network Architecture* (co-authored with Imrich Chlamtac; published by John Wiley, 2001) *Wireless and Mobile All-IP Networks* (John Wiley, 2005), and *Charging for Mobile All-IP Telecommunications* (John Wiley, 2008). He now serves as Vice President of NCTU.



DEAN OF ENGINEERING

Chiun-Hsun Chen Ph.D is the Dean and a professor of the College of Engineering at National Chiao Tung University. Dr. Chen received his Ph.D and Master degrees in Mechanical & Aerospace Engineering from Case Western Reserve University. His area of research is Energy-Thermofluids Engineering / Micro / Nano Engineering.



PV SYSTEM DIRECTOR

Chain-Shoo Hsu Ph.D is a vice president of National Chiao Tung University and also a chair professor of the College of Science, Department of Applied Chemistry. Dr. Hsu's research area is focused on the synthesis of organic materials for optoelectronic applications. Particular examples refer to liquid crystals, liquid crystalline polymers and conjugated polymers.



PROJECT MANAGEMENT DIRECTOR

Hsin-Li Chang Ph.D is the Dean of the College of Management and a professor in the Department of Transportation Technology and Management. Dr. Chang received his Ph.D from Northwestern University in Transportation System Engineering. He specialized in Transportation Safety, Traffic Engineering and Control, Travel Demand and Behaviour, and Railway Engineering and Operation.



TRANSPORTATION ADVISOR

Professor Hsun-Jung Cho graduated from the University of Pennsylvania with a Ph.D in Transportation Management and Planning, Urban and Regional Planning in 1989. He is currently a professor in National Chiao Tung University in the Department of Transportation Technology and Management. His areas of interest include Intelligent Transportation Systems, Logistics Management, Network Analysis, Game Theory, and Bi-level Optimization.



Collaborating Institutions and Sponsoring Companies

Organizer*Institution***University System of Taiwan**

Taiwan's National Chiao Tung University (NCTU) Team Unicode is a highly integrated task force of experts in architecture, engineering, visual design, construction, communication as well as many interdisciplinary professionals. It represents the highest-quality team ever assembled in this renowned institution.

**University System of Taiwan**

NCU, NCTU, NTHU and NYMU are all outstanding educational and research institutions in Taiwan. The aim was simple: academic excellence and the creation of a true world-class university, as the University System of Taiwan (UST).

**Bureau Français de Taipei**

La France a Taiwan's mission is to facilitate and promote the exchange between France and Taiwan, especially in the economic, cultural, educational and scientific fields. Associations including the Department of Journalism, Public Relations Academic Cooperation, Cultural Office, Economic Department, the Administrative Department and Commerce Department.

SDE Partner**Ruentex Engineering & Construction Co.**

Ruentex Engineering & Construction Co. is mainly engaged in construction operations, civil engineering contracting, equipment installation and project planning and consulting business. The company also manufactures and sells building materials.

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Tung Ho Steel's base on the needs of the customers, Tung Ho aims for the 100% customer satisfaction. Since incorporated, their products have been widely accepted by the market and have earned the largest market shares in the Taiwan construction steel industry. Besides numerous awards for excellent quality in Taiwan, Tung Ho has also been certified by JIS, ISO, UL, DQS, and BS for the quality and environmental management systems. The laboratories of works all have been certified by CNLA, which assure of the highest product quality.

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The E-O department of United Integrated Service Co. Ltd (UIS), originally merged from the Telesis Technologies Co., in July 2003, The vice president of UIS, Dr. O Chang, has exerted his professional experience in military Infrared science accumulated from his academic work in Chung-Shang Institute of Technology (CSIST) and the Industrial Technology Research Institute. Most technologies of E-O achievement are integrated with special hardware and software specialists in electronics, optics and image processing for the medical instrument of the DITI Thermograph and IR security systems applied in commercial areas.

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SGS is the world's leading inspection, verification, testing and certification company. It is recognized as the global benchmark for quality and integrity. With more than 75,000 employees, it operates a network of more than 1,500 offices and laboratories around the world.

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Bayer is a global enterprise with core competencies in the fields of health care, agriculture and high-tech materials. As an innovation company, it sets trends in research-intensive areas. At the same time, the Group aims to create value through innovation, growth and high earning power. Bayer is committed to the principles of sustainable development and acts as a socially and ethically responsible corporate citizen.

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ASUS is a worldwide top-three consumer notebook vendor and maker of the world's best-selling, most award-winning, motherboards. A leading enterprise in the new digital era, ASUS designs and manufactures products that perfectly meet the needs of today's digital home and office. Driven by innovation and committed to quality, ASUS won 4,168 awards in 2012 and is widely credited with revolutionizing the PC industry with its Eee PC™. ASUS has more than 12,500 employees around the globe with a world-class R&D team of 3,800 engineers. Company revenue for 2012 was approximately US\$14 billion.

**MINIWIZ Sustainable Energy Development Co.**

MINIWIZ is a global innovator, dedicated to sustainable solutions through Reuse, Reduce and Recycle. We believe great design and performance in sustainable technology can intersect with and enhance important niches in today's consumer lifestyles. MINIWIZ is an all-in-one design / engineering / manufacturing / product marketing company that creates value through innovative applications of existing and future green technology, translating state-of-the-art sustainable technology into real world practices and delivering well-designed green products at competitive prices.

Silver Sponsors**Autodesk Inc.**

Autodesk, Inc., is a leader in 3D design, engineering and entertainment software. Customers across the manufacturing, architecture, building, construction, and media and entertainment industries. From blockbuster visual effects and buildings that create their own energy to electric cars and the batteries that power them, the work of our 3D software customers is everywhere.

**Fuh Shan co.,Ltd.**

Fuh Shan co.,Ltd. was established in December 1999, focus on the future environmental protection and construction industry in Taiwan, especially in fire protection engineering, smoke control equipment, metal building materials.

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Berlin has long been active in the latest technology from abroad, research institutions abroad to improve the level of research and development of technology; continuous research and improvement, the products can better meet the needs of Taiwan's environment and serve their reach customers the quality of perfection. The innovation of the next challenge is presenting to people a better future.



Grand Biotechnology Co., Ltd

Grand Biotechnology concentrates on research and development of orchid plant tissue. It relates to plant biotechnology, seeding and flower import and export to foreign countries.



Spring Pool Glass Industrial CO., Ltd.

Spring Pool Glass Industrial CO., Ltd. started in Hsinchu since 1970, and contributes to recycling waste-glass and reforms it into glass art. Nowadays, the products with highly sustainable added value export to all over the world.



ORCHIDS4ALL

Orchid4all is started since 1939, when J.B.J Meeuwissen started his first nursery in Aalsmeer. Through the success in Meeuwissen's growing methods, he was capable to invest in more and better nurseries. From September 1967 the company started with orchids. Through culture, breeding and selection we have been able to give our customers the latest trends in orchids.

Bronze Sponsors



Mason Universal Enterprise Ltd.

Mason Universal Enterprise Ltd. focus on the prevention and treatment of noise-induced hearing loss, products and materials.



EVA AIR

EVA Air established in March 1989, quickly catching the attention of the global aviation industry. In June 2013, EVA became a Star Alliance member, giving passengers access to a vast network of nearly 1,400 destinations in more than 190 countries and providing seamless global services. EVA also offers the added benefits of geographic advantages as Taiwan steadily gains status as the Asia-Pacific's transportation hub.

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Team Logo



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Screen Saver 2



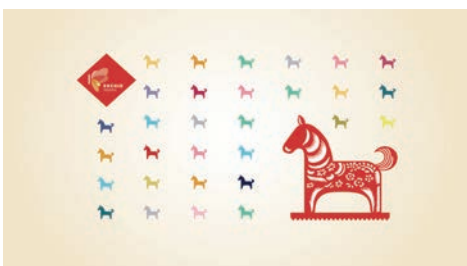
Screen Saver 3



New Year Special Screen



New Year Special Screen



Card Design

For the 2014 Chinese New Year Festival, team UNICODE has presented a greeting card, specially designed with redish background for our sponsors and supporters. As the symbol of the year - horse, we will work hard and run fast!



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|-------------------------------------|---------------------|---|
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