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Project Description



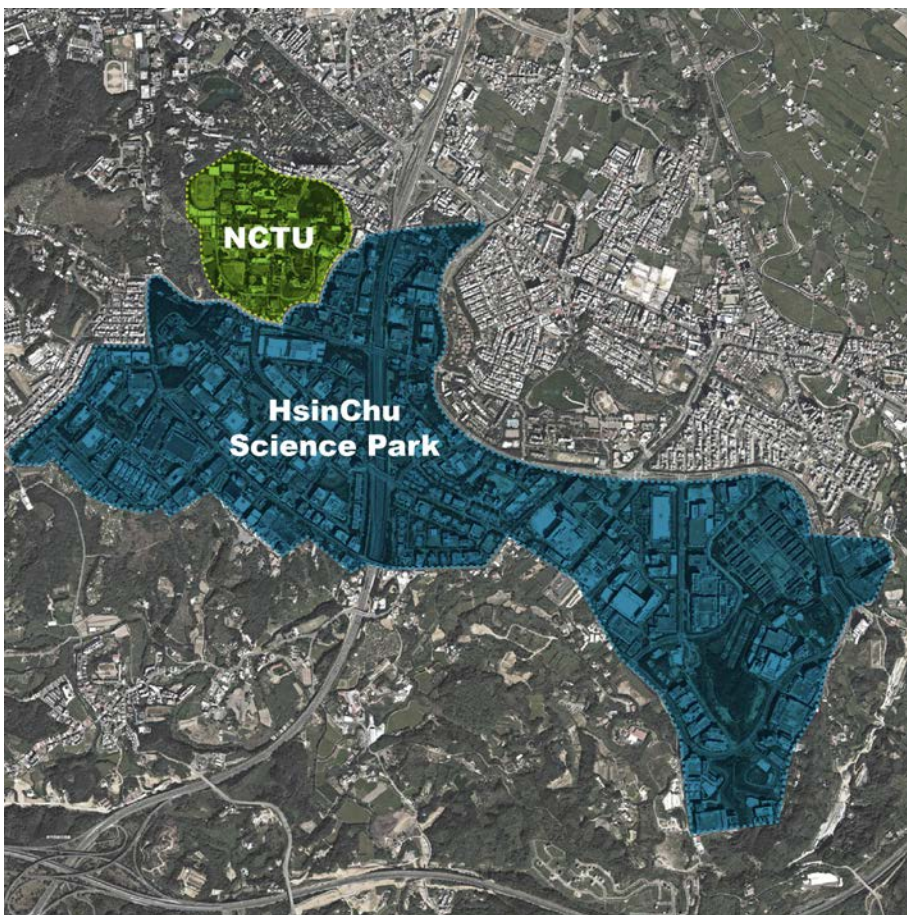
Concept

Taiwan is an island located on the eastern edge of the Asian continental shelf with complex geological and topographical characteristics. The rivers are short and swift and typhoons, floods, and earthquakes are frequent occurrences. In the face of such natural disasters, the ecosystem of Taiwan is quite vulnerable. With its high population density and limited land, Taiwan underwent rapid development that has inflicted much damage on its natural environment. Eco-friendly buildings are essential to conserving the natural habitats of Taiwan's diverse fauna and flora.

Since the lack of feasible land of an island country presents an innate limitation on its development, the most important issue for its sustainable development should be to make optimal use of the land resources it possesses. This is especially true in Taiwan's case, as two thirds of its land area is

mountainous and only one quarter is suitable for agricultural production, which further limits the supply of land that can be used for farming and socio-economic activities apart from forestry, water resources, and mining.

NCTU / UNICODE, a team from National Chiao Tung University (NCTU), views Solar Decathlon Europe as an opportunity to develop a prototype house for coexisting with nature by focusing on the green house technology that has been developed for cultivating orchids in Taiwan combined with the research institute here in NCTU. The university's main campus is located at the center of the Hsinchu Science Park, Taiwan's national research center. The area is referred to as the Silicon Valley of Asia. More than 400 technology companies have been established in the Science Park.





The Orchid House is as much a physical dwelling structure as a mindset for living. Team UNICODE hopes to use the Orchid House to revive Taiwan by focusing on urban centers. Urban areas in Taiwan, particularly the capitol city, Taipei, have high population densities and a random assortment of architecture – many buildings are old with rundown facilities. Furthermore, as in all urban cities but even more so because of the particularly high population density, commuter traffic causes extreme congestion, uses a lot of energy, and creates large amounts of pollution. Reviving the city would include not only renovating buildings and improving the residents’ quality of life, but also promoting creativity and sustainability.

Current attempts in Taiwan for large-scale societal change stem from the government, but not all of its laws and regulations are popular with the people – government attempts at urban regeneration, in particular, have a bad reputation and is associated with government requisitioning and demolition of homes. With this in mind, Team UNICODE plans to revive the community bottom-up, from a grassroots level. Without relying solely on government channels, Team UNICODE will implement the Orchid House on building rooftops in the city to fix the cityscape and to catalyze change in the community.



Team UNICODE drew inspiration from Taiwanese traditions and melded them with technological and design innovations to create the Orchid House. The Orchid House is designed in the studio style with an open floor plan that allows for various types of living styles. Our design is meant to be placed on a rooftop and integrated with the original building, and will update pre-existing building infrastructure in the installation process. The Orchid House will improve the quality of living for all occupants, whether it is through renovated infrastructure, the addition of an elevator, providing a communal space for all occupants to meet and socialize, or general improvement of urban conditions. A vertical green core in the rooftop structure brings the taste of nature to the urban setting and refreshes the city skyline.

One stand-out quality of the Orchid House is its versatility. The Orchid House has a flexible design that allows for three distinct configurations – a

long I shape, a doubled C shape, and the prototype L shape. There is a variety of building-types in Taipei, even within the row-house and duplex categories, and the flexibility of the Orchid House design accounts for that. But the Orchid House is also versatile because it can help form the urban city grid, as an integral part of the transportation system. In the future, a network of Orchid Houses spread around the city will provide charging stations for electric motorcycles, cutting down on traffic pollution and promoting a more sustainable mindset.

Orchid House Prototype

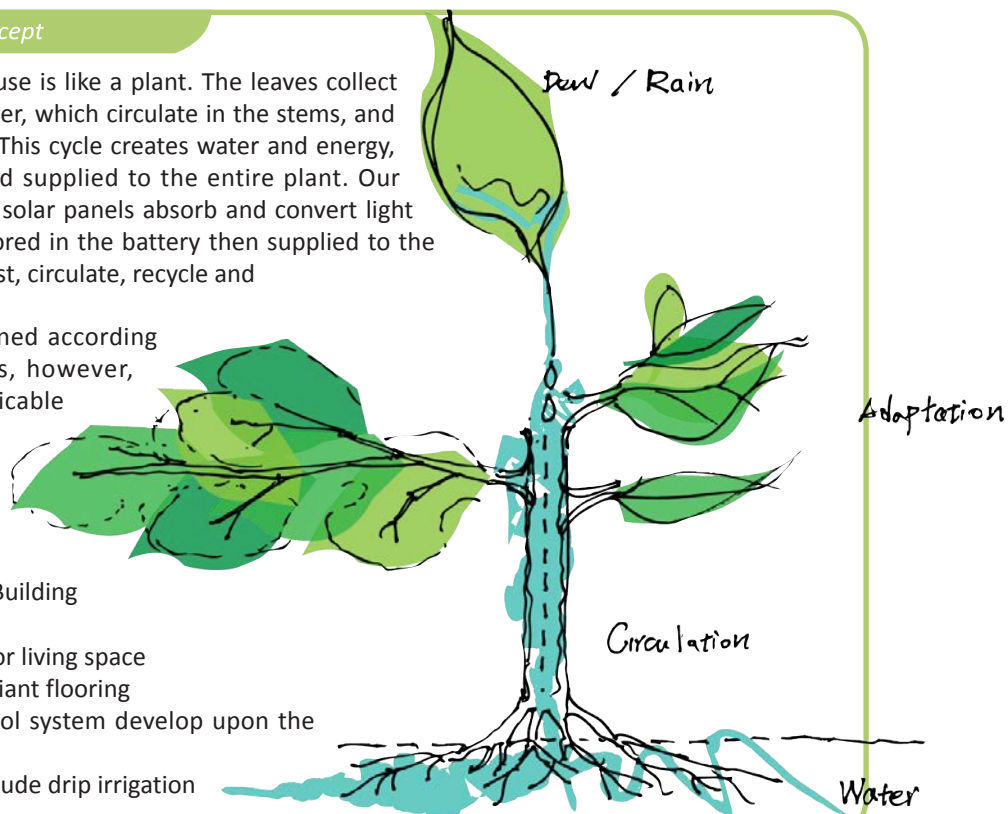
For the SDE 2014 competition in France, team Unicode aims to bring 1 L-shape prototype to Versailles. It has one bedroom with a large common terrace and rooftop space, which is commonly placed on top of a corner block as it is typically square shaped. This prototype will display an improved life style that is suitable for Taiwanese culture and building structure.

The sketch of the project concept

We can all learn from Nature. 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.

The concept of our house is designed according to the Taiwanese local conditions, however, we believe these systems are applicable to many locations around the world. Here are the sustainable approaches to the house, which we have incorporated into the design process:

1. Light weight structure with BIPV (Building Integrated Photovoltaic) system
2. Highly insulated structural panel for living space
3. Solar thermal water device for radiant flooring
4. Humidity and temperature control system develop upon the green house technology.
5. Water circulation systems that include drip irrigation



Design for the Young Professional

With this worrisome urban situation, Team Unicode want to address the issue of sustainability and affordable housing under the extreme urban context. Our proposal is to develop a concept that adapts to the existing environment, envision a new lifestyle, which can link to an ecosystem of itself.

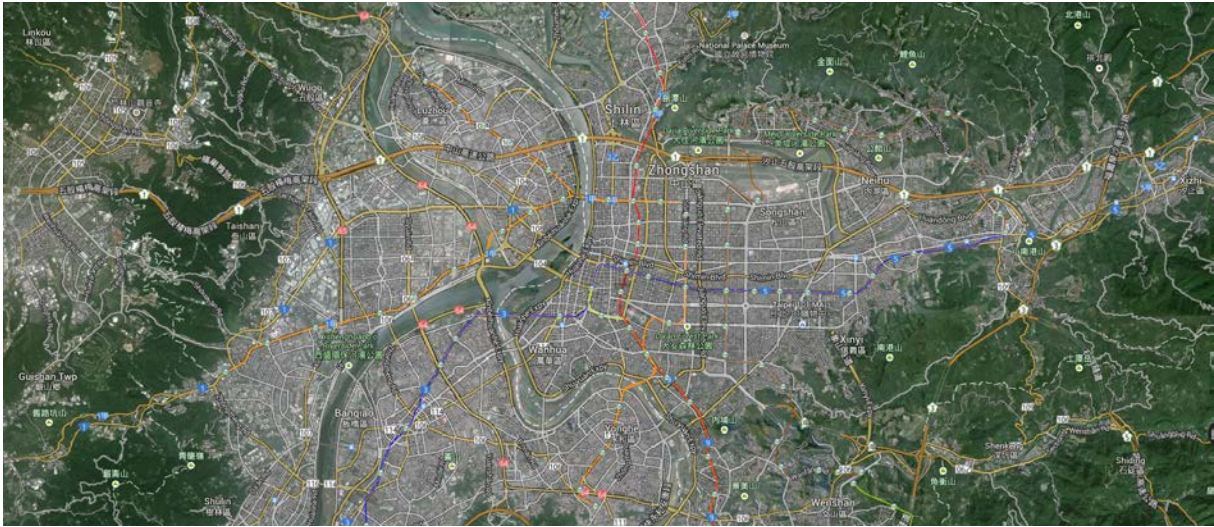
Taipei has face some serious problems such as generation gap, as younger people can not afford the rent and turn to the periphery of city. This has created a social impact, and our goal is to draw the energy back to the city. However, most middle classes living in Taipei have roommates, and the average living space is around 16.8 m² per person. In the Orchid house, the usable area per person has increased to

28 m², including some common space to share. It provides the young professionals a higher quality of living environment, which becomes a platform for them to live and work in the unit.

The young professionals are selective people that went through team Unicode's application to enjoy the benefit of living in the Orchid House. Thus, the Unicode team propose a 5-year program, so the young professionals have their chance to pursue dreams. The selected tenant will also join exposition to share their experience living in a green environment, and pass on the (concept) of sustainability to the next groups of tenants.



Taipei Context - Ximending



The development of Taipei city has begun right outside of the “west gate “ of Taipei city, thus resulted in the city’s unbalanced distribution of old buildings and new construction toward the east. After extensive research of the 5 sites, we have found that Ximending district to be the most potential site of Orchid House.

Before 1980, Ximending was considered one of most fashionable and expansive district of Taipei, but it experienced a short period of decline between 1985 – 2000, as Taipei city development progressed eastward. Fortunately, with the newly planned MRT (subway) system at the year of 2000, Ximending enters the phase of recovery. Under the masterplans of Taipei City Government, all storefronts and street-side benches were renovated, and more economic activities have been added. Furthermore,

the street’s illumination has been improved and more cultural groups and street performers have stationed in the area. The beauty of history and the youth culture interacts here and has become a great mix, resulted an exciting place to be. With young consumer as main target, Ximending becomes the most internationalized zone in Taiwan, and attracts a large number of overseas tourists to experience the real Taiwanese culture.

It is composed of 4-5 story buildings with a chess-board street pattern, planned during the Japanese colonialization as a business district. The historical significance and modern values has formed an interesting cultural blend, and became a perfect place for young adults to gather, exchange information, and share ideas.



www.taiwan.net.tw

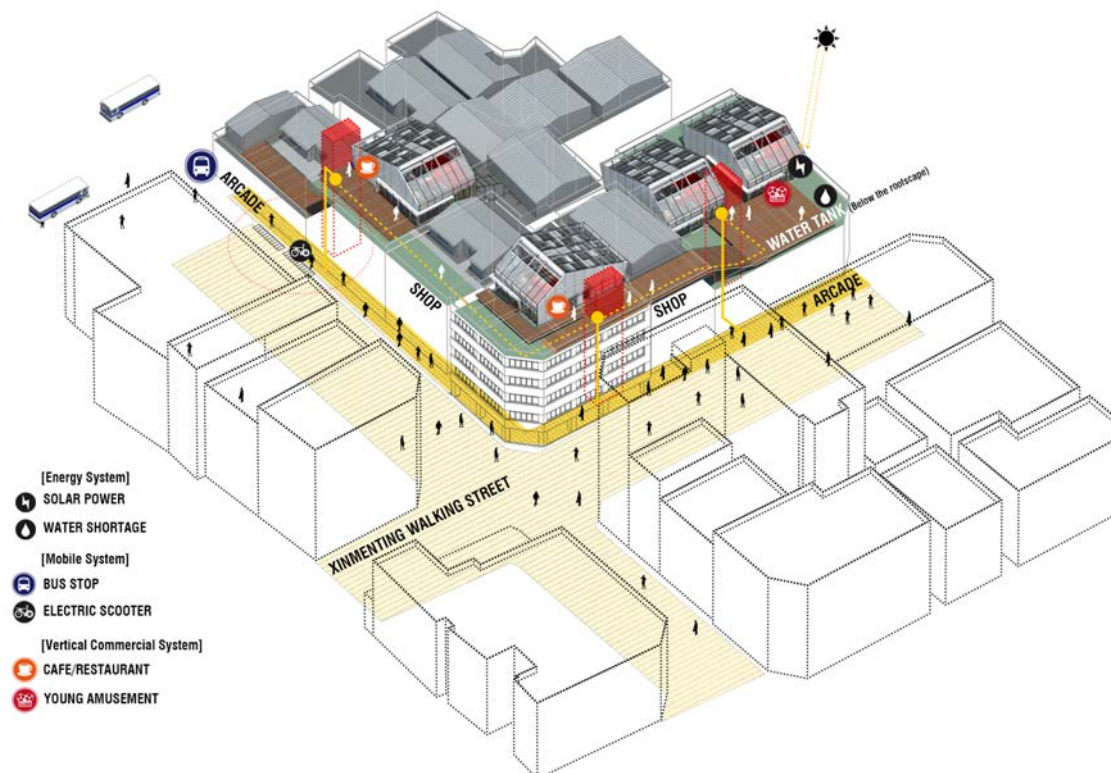


forum.pchome.com.tw

Urban Concept of Ximending and Mobility Strategy

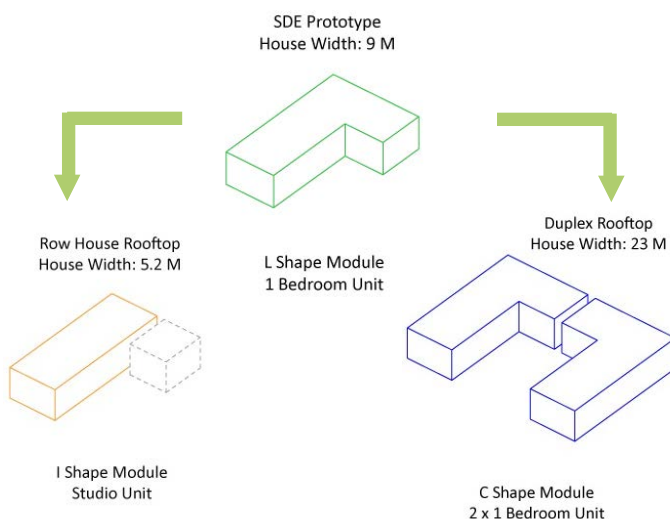


Connect to Existing Site - Urban Proposal



Building Types

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.



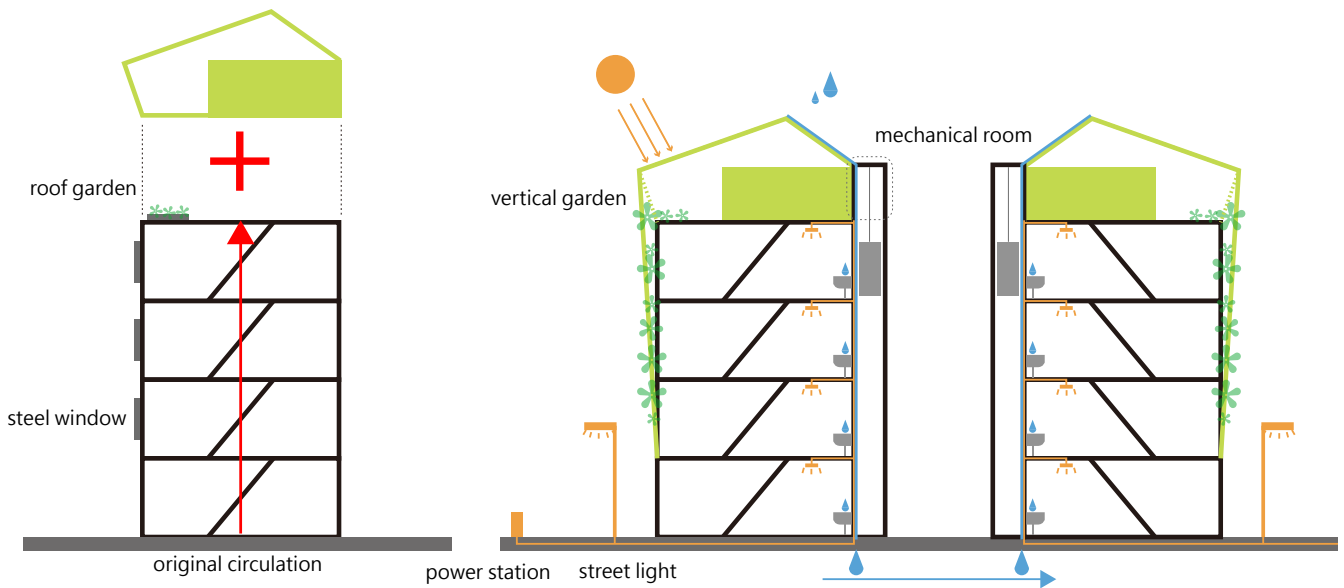
Augmenting Pre-existing Architecture

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, 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.

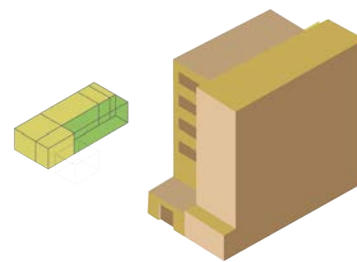
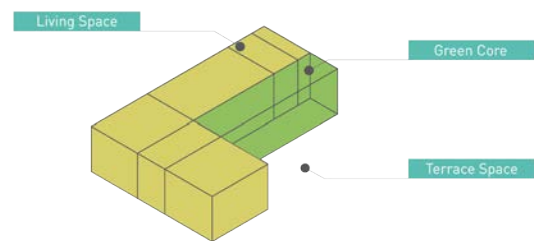
Essentially, the best and primary intention of NCTU Unicode is to create a single dwelling prototype that focuses on environmental and social issues. Our design will reduce the heat island effect of Taipei and encourage households to conserve resources and use less destructive forms of energy. In addition 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 social housing program of Taiwan and provide better living conditions for the population.



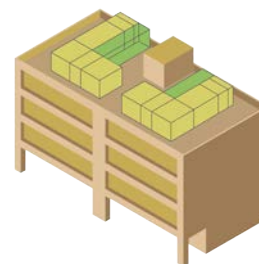
Building Integration

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



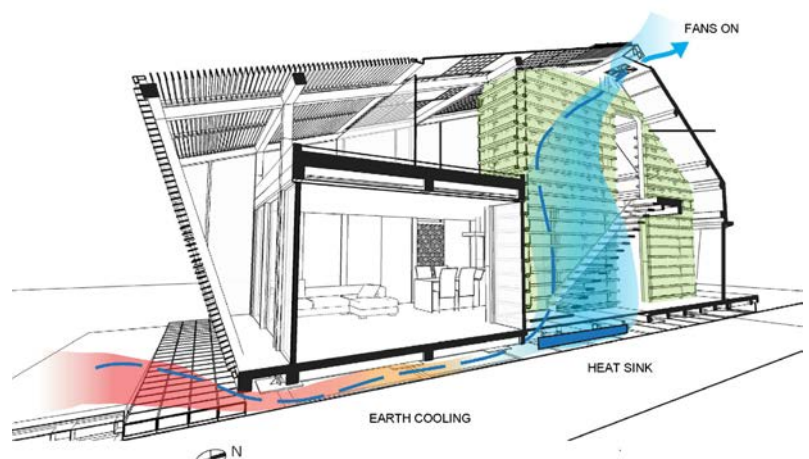
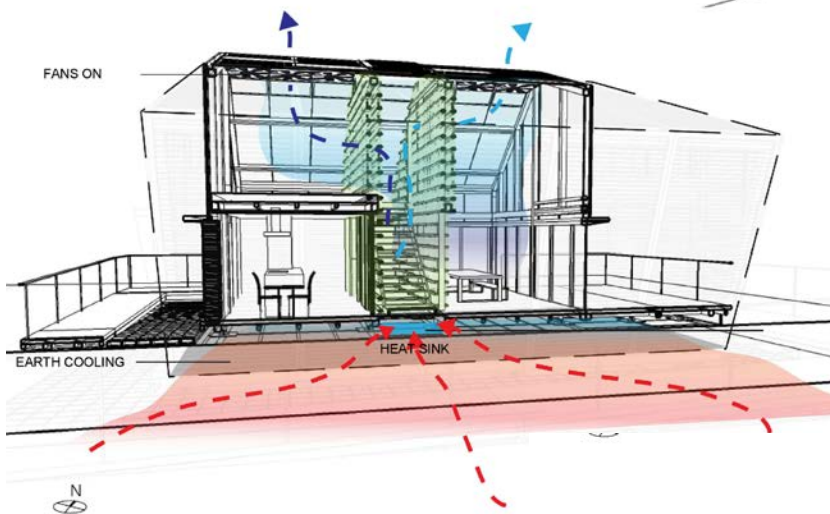
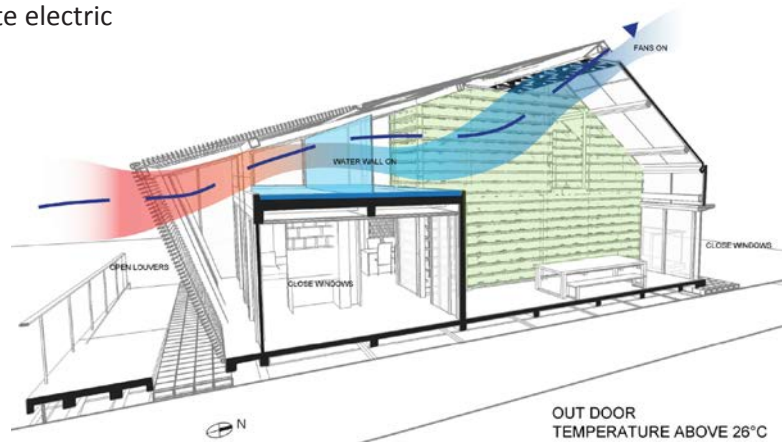
Duplex house

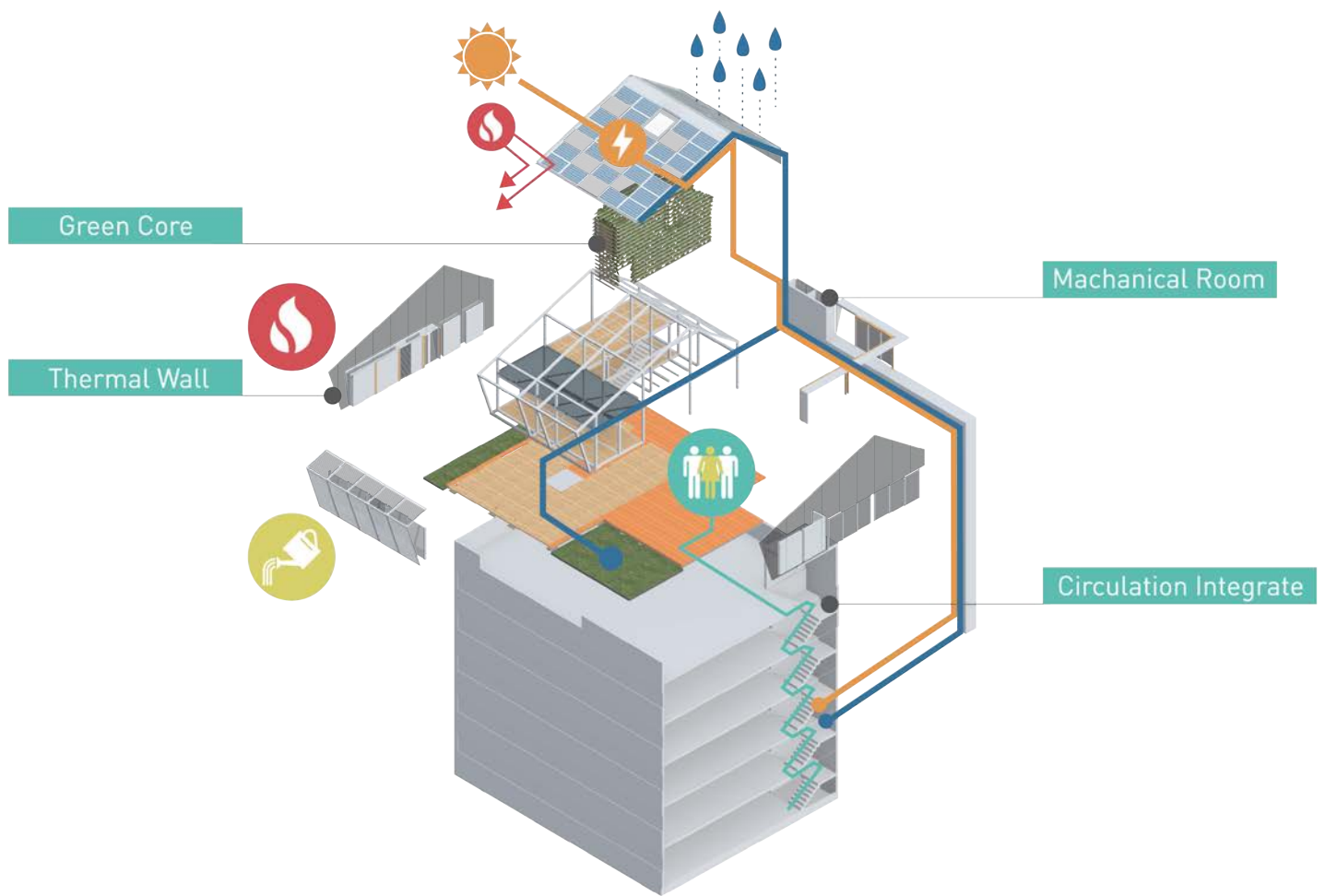
Design Approach

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 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.





House Design

Although our house will be designed as a single dwelling for Solar Decathlon Europe, our final goal is to adopt the housing structure as an element of collective social housing. In order to achieve it, the structural system has to be extendable to multi-floor buildings and configured in certain modular units. We will utilize BIM (Building Information Modeling) software for the complex building system and create an efficient but strong structure system. The social housing will be self-sufficient not only in terms of the energy supply, but also in that the occupants can consume the food they grow in the areas in and around the house that are watered via drip irrigation

NCTU / 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. 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 cement 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

The air temperature will be controlled through the green house space to minimize the energy consumption for cooling and heating the living space. Using technology inspired by the orchid growers 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 subunit, 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. The thermal mass wall will also be invaluable to providing heat through passive solar methods. The house will be analyzed in the early developmental stage using solar access calculation software, such as Ecotect, to generate environmental feedback.

Water Harvesting and Usage

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 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.





Lighting system

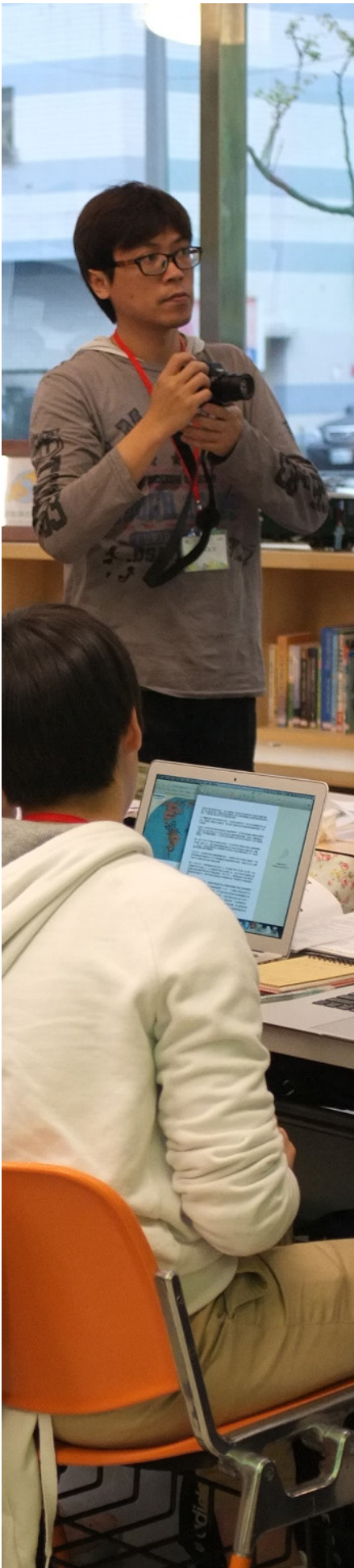
Lighting design will be an integral element of the house and its energy system. Taiwan is currently one of the largest manufacturers of LED in the world and NCTU's research institute is also taking part of the industry. We will use the most efficient light source on the market and integrate all lighting 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, DelSolar, is a leading PV manufacturer in the global industry. DelSolar 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 the DelSolar 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.

Control system and Digital fabrication

As part of the NCTU Graduate Institute of Architecture, we are especially knowledgeable about advanced digital technologies, such as interactive mechanisms and CAD/CAM fabrication, which we will apply to the house's components. The interactive technology will possibly be a sunshade device of the house or sensory device for the human activities in the house integrated in the house control system. We will be able to monitor the system through a wireless network within the house that will be visible in web format to be checked through personal computers and smart phone devices. Also digital fabrication gives the house interior space to be very unique construction with minimal waste of material.



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*



潤泰集團

RUENTEX GROUP

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.



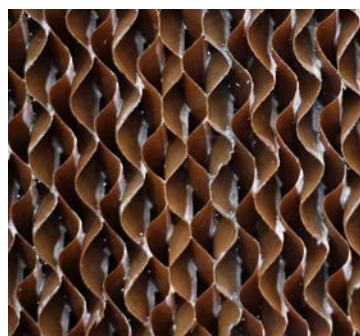
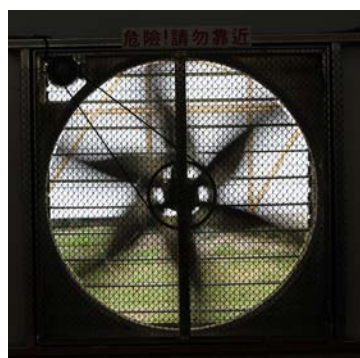
Field trip in Grand Biotechnology – MARCH 21 2013, HSINCHU

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.



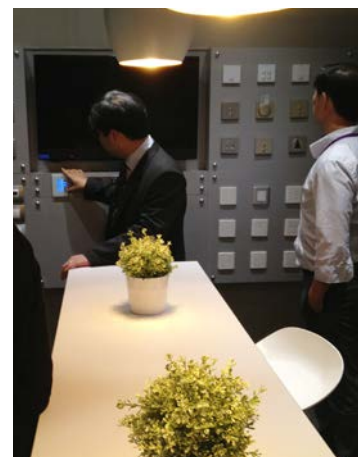
Excursion to Living 3.0 – MAY 16 2013, TAIPEI

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 – 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 branch in Taiwan, where we witnessed their conviction to constantly increase the safety, reliability, efficiency and productivity of their products.





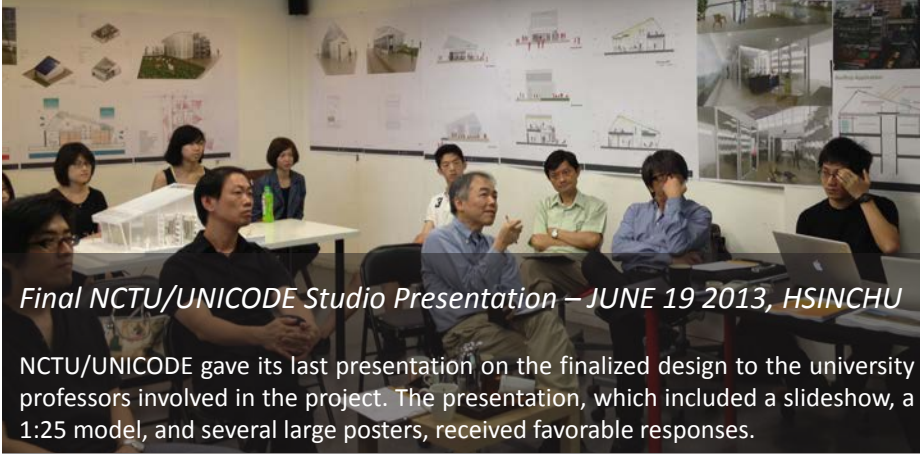
Guided Tour of Mega House (EAG) – MAY 16 2013, TAIPEI

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

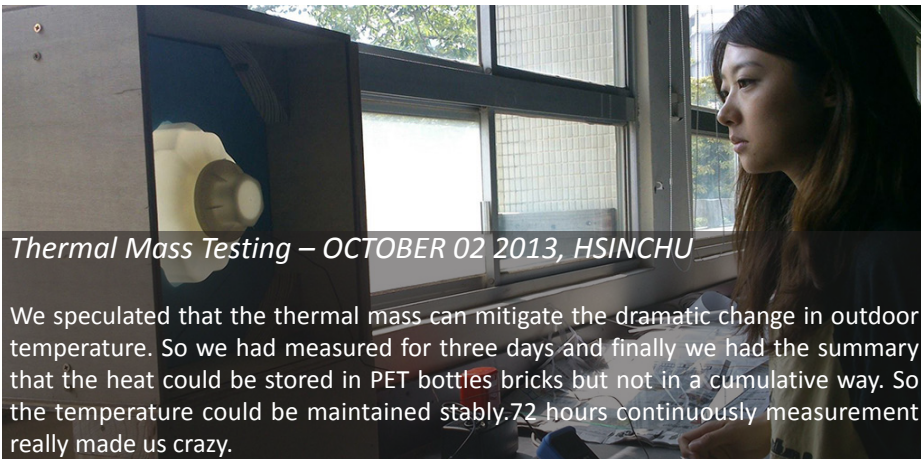
Bayer PC board (polycarbonate) not only allows light to penetrate in but also isolates the heat. It's a good choice of building façade because it makes indoor space bright as well as reduces the energy consumption. Our Orchid House replaces the original glass with Bayer PC Board.





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.



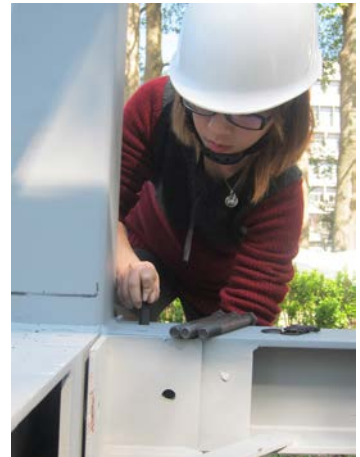
Winter Camp Recruitment-Presentation and Interview in senior high school – DECEMBER 24 2013, Hsinchu

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!





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.



Pre-Assembly Period, Go! – FEBRUARY 20 2014, Hsinchu

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



Meet with Bureau France in Taipei – FEBRUARY 26 2014, HSINCHU

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





Communication Info

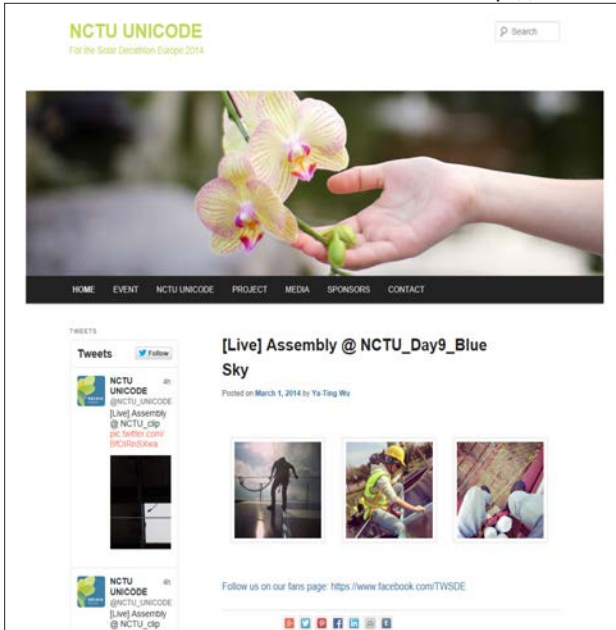


Dear Organiz

Many thanks for t
UNICODE. Your ki
the growth of our
far without them.
blossoming to its
Decathlon-Orchid
gratitude and wist



<http://sde.tw>



<http://www.facebook.com/TWSDE>



推文 74 正在跟隨 39 跟隨者 60

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:

National Chiao Tung University
Graduate Institute of Architecture
NCTU UNICODE TEAM

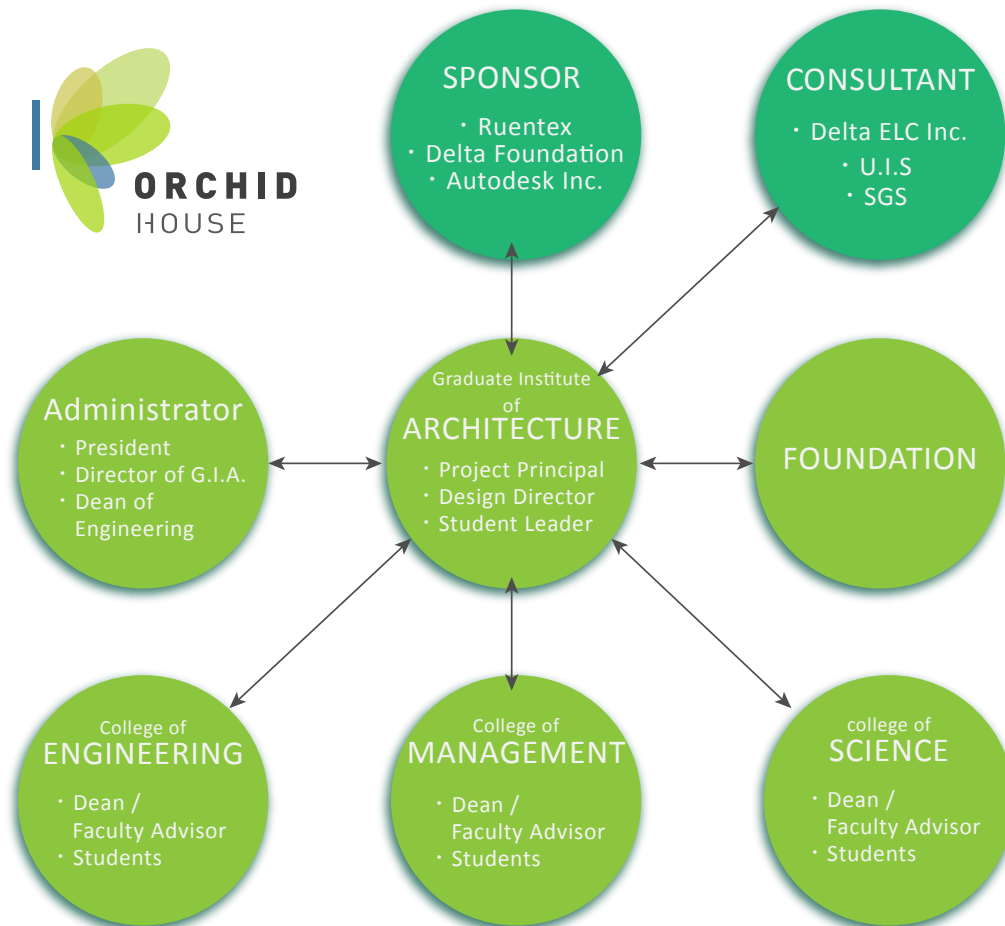
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Fax: +886.3.575.2308
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Team Members

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.

The architecture team has experience in designing, management, fabrication, and design-building. Professor Tseng, the project principal, has over 15 years of professional experience at all stages 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 engineering team includes experts on a variety of interdisciplinary projects in solar cell applications, renewable energy, and solar energy applications. Professor Chang, project research director, is considered a pioneer of the III-V industry in Taiwan and has developed many important research in various projects including III-V triple junction solar cell applications. The team also includes experts in structural, civil, materials, and construction engineering.



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 Tapei Univeristy 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



Student Member



Yu-hsien Lin, Jeff



Yiting Chen



Yung-Yen Teng



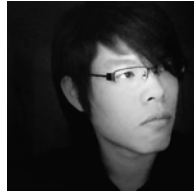
Yu-Ming Su



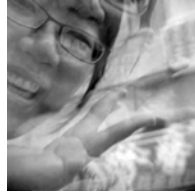
Trista Wang



Wan-Ling Cheng



Chester Hu



Rui Lin



Ching-Ju Chen



Sophie Chen



Chin Yuan Fan



Sunny Chou

U
N
I
C
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D
E



Ruby Tu



Ming-Hung She



Andrew Su



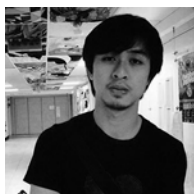
Cheng-Wei Wang



Jason Huang



Leslie Yen



Oswald Ho



Pei-Ling Wu



Summer Lee



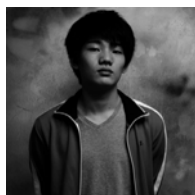
Bernard Yang



Andrew Lu



Kelly Chen



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



Sponsors



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.



Delta Electronics Inc.

Delta Group strives to provide innovative, clean, and energy-efficient solutions for a better future. The company has long implemented green manufacturing processes, recycling, and waste management programs. In recent years, the company has developed high-density and high-efficiency telecommunication power systems, UPS's with advanced interfaces, computer networking components and products with high software content, microdisplay PTV's, and much more.



Delta Electronics Foundation

The Delta Electronics Foundation was established in 1990 to facilitate local and global action among a wide range of philanthropists, nonprofit partners, and even private corporations or public policymakers. The foundation focuses primarily in the fields of scientific development, education, and the environment – specifically, the challenges of global warming and international energy deficits.

Sponsors



United Integrated Service Co. Ltd

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.



Société Générale de Surveillance

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.



Tung Ho Steel Enterprise Corporation

Tung Ho Steel's basic quality policies are quality-first, credit-first, and customer-first. Through their continuous effort in improving our quality each year, Tung Ho Steel manufactures construction steel products with the highest quality and safety standards. 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.



Bayer Taiwan Co.

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. Bayer's products and services are designed to benefit people and improve the quality of life. 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. In fiscal year 2012, Bayer employed 110,000 people and had sales of €39.7 billion. Capital expenditures amounted to €1,9 billion, R&D expenses to €3 billion.



ASUSTeK Computer Inc.

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, with a broad portfolio that includes motherboards, graphics cards, optical drives, displays, desktop and all-in-one PCs, notebooks, netbooks, servers, multimedia devices, wireless solutions, networking devices, tablets and smartphones. 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.

Sponsors



HOCHENG Corporation

HCG specializes in manufacturing bathroom facilities in Taiwan since 1931. It provides services in kitchen equipment, precision ceramics and other building products.



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.



University System of Taiwan

NCU, NCTU, NTHU and NYMU are all outstanding educational and research institutions in Taiwan. Each of the four schools is unique, and each offers an exceptional record. In comparison with world-class schools, the four universities may seem a bit small in scale or lack certain disciplines. They see the advantage of establishing a university system which would combine the energy of the four universities in teaching and research, integrating their resources and playing up complementary strengths to enhance the quality of education in each of the four universities. The aim was simple: academic excellence and the creation of a true world-class university, as the University System of Taiwan (UST).



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.

Taiwan Cultural-Creative Development Co. Ltd



In 2007 the Taiwan Cultural-Creative Development Co. Ltd assumed responsibility for the renovation and operation of the Park and renamed it Huashan 1914. An organically creative environment has been growing ever since. Huashan 1914 now serves as Taipei's primary creative arts center and a hosting ground for Taiwan's most significant cultural activities. Examples include the Simple Life music festival and the BiBo student design expo. Today Huashan 1914 is not only the heart of Taiwan's creative pulse, but also a bridge to a unique architectural past.

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.

La France à Taiwan



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.

Sponsors



Mason Universal Enterprise Ltd.

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



Mega Master Technology Inc.

Mega Master Technology Inc., advanced Clean Production technologies - including the raw material, manufacturing processes, and to the final green products - follow the Kyoto Protocol in spirit and meet the European RoHS requirements.



Berlin Co., Ltd.

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.



EVERGREEN MARINE COAP.

Since its establishment by Dr Yung-Fa Chang on 1 September 1968, Evergreen Marine Corp (EMC) has secured its place in shipping history. Since those early days, it has not only survived, but positively thrived on hard-work and perseverance, until today it boasts a fleet of over 160 container vessels. Both in terms of the magnitude of its fleet and its cargo loading capacity, EMC ranks among the world's leading international shipping companies.



A STAR ALLIANCE MEMBER 

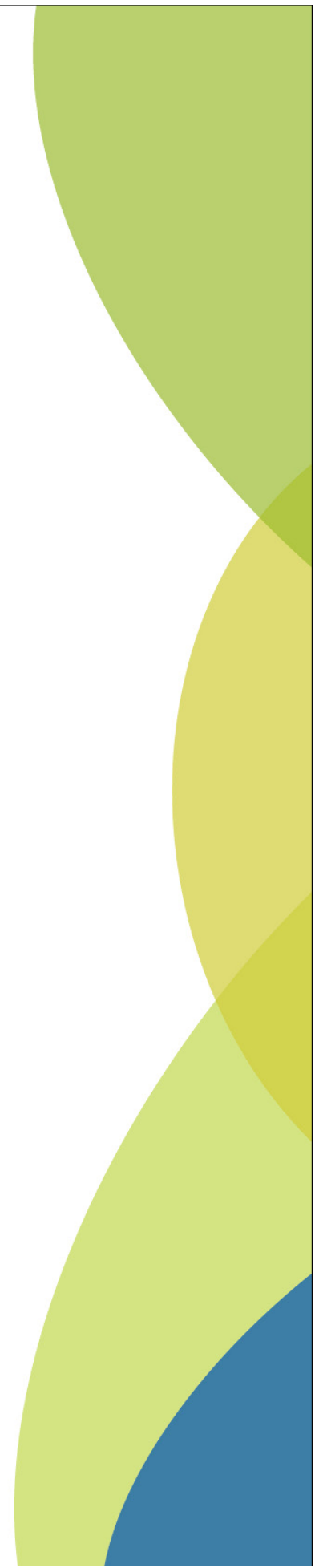
EVA AIR

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.

Slogan

**GREEN CORE
BLUE SKY
POWER HOUSE
2014**

Project Logo
Team Logo &
Brand Presence



Project Logo



Team Logo



Project Logo



Team Logo



Project Logo Variation



Team Logo Variation



Letter Format



Envelope Design



Business Card



Title block and Stickers



Screen Saver 1



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!



Team Officers & Contact Information

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