Project Drawing

Deliverable #6
June 2nd 2014

National Chiao Tung University
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twitter.com/NCTU_UNICODE
### 14. SITE OPERATION (SO)

<table>
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### 15. HEALTH AND SAFETY (HS)

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INTRODUCTION

Taiwan is a country spanning only 36,193 km² but with a population of 23.34 million (compare with France’s 674,834 km² and 65.7 million people). The population density is especially high because two-thirds of the island is composed of mountains, and as a result most people live along the coastal areas. It is especially crowded in urban areas, such as the capital city, Taipei, which is one of the top ten densest cities in the world. In addition to the high population density, Taipei also developed rapidly over the years, both of which contribute to a random assortment of architecture in the city that expands horizontally instead of vertically to conserve space.

However, also as a result of the rapid development, many of the residential buildings were not built to last and have infrastructure that is now rundown or outdated. In recent years, new residential buildings are sky scraper apartments, which are usually only affordable by the wealthy upper class because of the luxury design and locations in the city center.

This population growth results in the lack of living space and sufficient public amenity, and cause middle classes moving toward the periphery, even outside of city. The majority of these people are young professionals who just graduated from college whom have worked a few years, and they are not able to afford a house yet. However, most of them works in the city center and commute, and caused major traffic congestions with millions of cars and motorcycle. Consequently, the city is left with a high carbon dioxide pollution, and the decrease living quality.
Urban Acupuncture

Taipei city population reached its 20-year peak and residential building has been constructed in various types. The majorities are a duplex apartment, which is relatively wide and 4 to 5 story building, and a row house that is extremely narrow and deep single family owned. These two types were constructed during the modern democracy period. Most of flat-roof duplex apartment and row house are facing problems: leakage, heat absorption and no public facilities. Therefore, the illegal make-shift metal roofed shelters have been introduced widely in most of the residential buildings and create unregulated cityscape of Taipei.

For Orchid House urban design strategy, NCTU UNICODE focus districts where the most of duplex apartment and row house are located as the most needed area for urban regeneration to vitalize not only the residential building, but also these districts.

Zero Energy District: Ximending

As main focal point of Ximending Zero Energy District plan, NCTU UNICODE proposes not only PV panel implementation to buildings, but also larger scale of renewable energy sources such as CSP (Concentrated Solar Power), Biomass, Wind power and Geothermal. In order for all renewable energy sources to be distributed efficiently, advanced applications of Wide-area-Measurement System (WAMS) is installed one of larger footprint building rooftops, and Data Centre (MDMS) serve all the energy with automation system. Furthermore, AMI (Advanced Metering Infrastructure) is installed to Orchid House Clusters to manage power supply within houses. Please refer Architecture Design Narrative for farther details of AMI integration to housing appliances.

The Orchid House Cluster acts as a pilot project for further development of smart building energy management technology. Eventually, AMI system will be installed to most of buildings in the district to increase 20% energy usage efficiency from conventional grid system.
Orchid Cluster

Orchid House extension on existing building in Taipei city plays not only critical role for Ximending zero energy district urban planning, but also to apply new concept of urban regeneration. Almost 50% of residential building in Taipei city are over 30 years old and typically demolished during the renewal planning. However, NCTU UNICODE points out the problem of city re-development organized by government and executed by private developers. The developer tends to acquire larger number of properties to combine the land FAR (Floor Area Ratio) to build high-rise residential condominium, which is not affordable for average income level and treated as investment target by investors.

Orchid House will proved unique opportunity for not only the building owner, but also the targeted tenants, who needs housing support to pursue their young profession to promote new creative industry in Taipei.
Taipei Residential Type Analysis

DESCRIPTION

Row House and Duplex Apartment are the most number of Taipei residential building Type. These two types are usually 4 to 5 floor high and the oldest building in Taipei, which are about 20 to 30 years old and facing some following problems:

1. Top floor Leaking
2. Top floor is too hot
3. No Public Facility

Presently, most households live in flat-roofed row houses and duplex apartments, but due to a lack of space, people try to expand their living area by building on their roofs.

The illegal make-shift metal-roofed shelters that result are unregulated and displeasing to the eye. Lastly, social housing projects have fallen to the wayside and do not adequately consider the needs of disadvantaged groups, social justice, and the problems of housing for those with low-income.
Footprint Calculation

House: 120.4 M²
Canopy: 8.7 M²
Louvers: 17.8 M²
Total: 146.9 M²

House: 9.332x12.735=0.6375x0.7854x3.14=120.4 (M²)
Canopy: 5.975x0.41+(8.975-0.41)x0.408+6.375x0.335=8.0 (M²)
Louvers: 9.332x9.12=17.8 (M²)
Total: 120.41+8.05+17.84=146.3 (M²)
Solar Envelope

Louvers Open

Louvers Closed

RECONFIGURABLE FEATURES 4

mm
ENTRANCE

Louvres
Aluminum Cover
Bayer Makrolon® Solid Sheet
\text{t= 10 mm}

Bayer Makrolon® Hollow Sheet
\text{t= 16 mm}

Aluminum Cover
Bayer Makrolon® Polycarbonate Hollow Sheet
\text{t= 16 mm}

Canopy

Handrail
Footings

Bayer Makrolon® Hollow Sheet
\text{t= 16 mm}

RF Beam
EL +7510

Mezzanine
EL +2500

2F Beam
EL +3010

1F Beam
EL +2610

Sand Box
EL +3220

GL
EL +3720

NORTH ELEVATION

Scale
1:60

Unit
mm

DN2013/04/01 SD Submission

DN2013/07/01 DD Submission

ST 2013/11/01 DD Submission

ST 2014/03/03 CD Submission

ST 2014/06/02 CD Submission

AR-112  29
Thermal conductivity $R = 7.7$ (m²°K/W)
Thermal conductivity $R = 13.7$ (m²K/W)
Piping Space

FLOOR CONSTRUCTION DETAILS

Special Module
Ceiling Construction Details

- Piping Space
- Dimensions:
  - 1650 x 3450 mm
  - 672 x 900 x 10 x 22

Consultants:

Drawn by: CF
Checked by: ST
Scale: 1:50
Unit: mm

AR-334 62
WALL SECTION AND CONSTRUCTION DETAILS

Thermal conductivity $R = 13.5$ (m²·K/W)

1. Bayer Makrofol Polycarbonate Interlocking Hollow Sheet 140mm
2. Interlocking Sheet supporting 75mm
3. Plywood 18mm
4. Plywood 12mm
5. Glass foam 72mm
6. Vacuum Insulation 30mm
7. Ceramic board 23mm
8. Waterproofing 1mm
9. Vapor barrier 1mm

AR-341

(1:10 scale, mm unit)
Joint Detail 1

1. Bayer Maximat Polycarbonate Inter-locking Hollow Sheet
   thickness=6mm
2. Inter-locking Sheet supporting 75mm
3. Plywood 18mm
4. Plywood 12mm
5. E-foam 70mm
6. Vacuum Insulation 30mm
7. Ceramic board 23mm
8. Steel enclosure 1mm
9. L shape steel J20x30 t=2.2mm
10. L shape steel J20x35 t=5mm
11. Fading
12. Sand
13. Wood frame (sand box)
14. Wood frame (wall)
15. H 150x150 t=10mm
16. Wood Plastic Composites 25mm
17. Vapor barrier 1mm
18. Waterproofing 1mm

Scale 1:10
Unit mm
1. Wood Plastic Composite 40mm
2. Air gap 40mm
3. Waterproofing 1mm
4. Vacuum Insulation 30mm
5. Dust
6. Plywood 18mm
7. Sub-layer <150x75 =7mm
8. Glass from 6mm
9. Plywood 12mm
10. E-foam 8mm
11. C =150x150x30 =22mm (beading system)
12. Ceiling 12mm
13. T5 LED Link Light
14. Soft seat
15. Vapor barrier 1mm
16. Bayer Makrolon Polycarbonate Interlocking Hollow Sheet 3x40mm
17. Bayer Makrolon Polycarbonate Hollow Sheet >16mm

0 0.1 0.2 0.5 METER
1. Wooden Flooring 40mm
2. Framing 60mm / Air gap 44mm
3. Waterproofing 2mm
4. Plywood 18mm
5. Glass foam 6mm
6. Plywood 13mm
7. E-foam 9mm
8. Vacuum Insulation 30mm

9. Ceiling 12mm
   (plywood 9mm + ceiling finish 3mm)
10. T5 LED Link Light
11. Green core
12. barbed wire 4x5mm (for plants supporting)
13. Beam G-160x75 t=9.5mm
14. Waterproofing 1mm
15. Bayer Makrolon Polycarbonate
    Hollow Sheet
    t=16mm

Scale: 1:100

Unit: METER

0 0.1 0.2

0.5 METER
RF Beam
EL +7370

Mezzanine
EL +3600
2F Beam
EL +2540

Sand Box
EL +120
EL 80

Steel Mesh With White Painting
Angle Bar With White Painting

Screws
Square tube steel
With White Painting
Angle Bar

1F Beam
EL +1710

EL +120
EL 80

695 695 820 820 460 2010 820 820

NCTU/UNICODE
1001 Ta-Hsueh Road
Hsinchu City 30010
Taiwan
www.sde.tw

Consultants:

Checked by

Drawn by

Mark Date Description
DN2013/04/01 SD Submission
ST 2013/11/01 DD Submission
DN2013/07/01 DDc Submission
ST 2014/03/03 CD Submission
ST 2014/04/30 CD Submission
ST 2014/06/02 CD Submission

Green by
CF

Checked by
DN

Scale
1:60

Unit
mm

DRAW. No.
PG: 401

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72

GREEN CORE DETAIL 1
WATER WALL DETAILS

Acrylic sheet t=5mm

PVC Pipe ∅=60mm

Water outlet ∅=5mm

Raschig ring ∅=80mm

Acrylic 20mm*1060mm t=5mm

Outlet port

Stainless steel water tray

Waterproofing 1mm

Note:

DN2013/04/01 SD Submission

ST 2013/11/01 DD Submission

ST 2014/03/03 CD Submission

ST 2014/06/02 CD Submission

ST 2014/07/01 DDc Submission

Scale: 1:30

Address:
NCTU/UNICODE
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Hsinchu City 30010
Taiwan
www.sde.tw

Consultants:

Drawn by

Mark Date Description

DN2013/07/01 DDc Submission

NOTE:

2 METER

0.5 METER

0 0.1 0.2 0.5 METER

300

100

300

100

300

100

300

100

300

100
01- M2 Screw
02- Translucent PVC, Shelter
03- Memory Alloy Spring
04- Normal Spring
05- 10mm Acrylic, Base
06- 2mm Acrylic, Wheel
07- Antiskid Washer
08- Screw Cap
Steel reinforcement t = 5 mm
Slotted Angles Bar 70mm
Steel plate t = 5 mm
Slotted Angles Bar 35mm
Steel plate t = 9 mm

Steel structure
Steel plate t = 5 mm
Drill hole
E-foam
Steel plate t = 9 mm
E-foam
Drill hole for T18

Steel plate t = 6 mm

Welding
Steel plate t = 6 mm
Drill hole for T18
Steel plate t = 6 mm

Steel plate t = 6 mm

Steel reinforcement
t = 6 mm

Steel plate t = 6 mm

Steel plate t = 6 mm

Drill hole for T18

Note:
DN2013/04/01 SD Submission
ST 2013/11/01 DD Submission
Unit
ST 2014/03/03 CD Submission
ST 2014/06/02 CD Submission
Note:
DN2013/07/01 DDc Submission

Institution:
NCTU Architecture
National Chiao Tung University

Address:
1001 Ta-Hsueh Road
Hsinchu City 30010
Taiwan

www.sde.tw

Consultants:

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Drawing:
THERMAL WALL
DETAILS 6

Scale:
1:5

Unit:
mm

Checked by:
DN

Drawn by:
JL

PAGE
AR-436

1:5
0 0.05 0.1 0.2 METER

1:5
0 0.05 0.1 0.2 METER

1:5
0 0.05 0.1 0.2 METER

1:5
0 0.05 0.1 0.2 METER

1:5
0 0.05 0.1 0.2 METER
### TEMPERATURE (°C)
**LOCATION: TAIPEI, TWN**

- **RANGE OF OUTDOOR TEMPERATURE FOR COMFORTABLE INDOOR TEMPERATURE**
- **MAXIMUM TEMPERATURE**
- **AVERAGE TEMPERATURE**
- **MINIMUM TEMPERATURE**

### DEGREE HOURS
**LOCATION: TAIPEI, TWN**

- **HEATING DEGREE-HOURS**: 5795
- **SOLAR EXCESS DEGREE-HOURS**: 24511
- **COOLING DEGREE-HOURS**: 34668

### HUMIDITY (%)
**LOCATION: TAIPEI, TWN**

- **RELATIVE HUMIDITY (09:00AM)**
- **RELATIVE HUMIDITY (03:00PM)**

### PSYCHROMETRIC CHART
**LOCATION: TAIPEI TWN**

- **DISPLAY**: Monthly Mean Minimum/Maximum
- **BARMETRIC PRESSURE**: 101.36 kPa

**SELECTED DESIGN TECHNIQUES:**
1. passive solar heating
2. thermal mass effects
3. natural ventilation
4. direct evaporative cooling

---

**TAIPEI CLIMATE ANALYSIS**

**Project:**

**Institution:**

**Team Name:**

**Checked by:**

**Scale:**

**DWG. Title:**

**DWG. No.:**

**Address:**

**Contact:**

**Consultants:**

**Drawn by:**

**Mark Date Description:**

**Note:**

**PAGE:**

**BA-001**
PREVAILING WINDS
Wind Frequency (Hrs)
Location: TAIPEI, TWN
Date: January 1st - December 31st
Time: 00:00 - 24:00
VERSAILLES CLIMATE ANALYSIS

TEMPERATURE (°C)
LOCATION: PARIS, ORLY, FRA

- MAXIMUM TEMPERATURE
- AVERAGE TEMPERATURE
- MINIMUM TEMPERATURE

RANGE OF OUTDOOR TEMPERATURE FOR COMFORTABLE INDOOR TEMPERATURE

DEGREE HOURS
(HEATING, COOLING AND SOLAR)
LOCATION: PARIS, ORLY, FRA

- HEATING DEGREE-HOURS: 64193
- SOLAR EXCESS DEGREE-HOURS: 19993
- COOLING DEGREE-HOURS: 2929

PSYCHROMETRIC CHART
LOCATION: PARIS, ORLY, FRA
DISPLAY: Monthly Mean Minimum/Maximum
BAROMETRIC PRESSURE: 101.36 kPa

SELECTED DESIGN TECHNIQUES:
1. passive solar heating
2. thermal mass effects
3. natural ventilation
4. direct evaporative cooling

HUMIDITY (%)
LOCATION: PARIS, ORLY, FRA

RELATIVE HUMIDITY (09:00AM)
RELATIVE HUMIDITY (03:00PM)
RADIATION (W/m²)

DAILY SOLAR RADIATION

BASIC CLIMATIC CONDITION

LOCATION: PARIS, ORLY, FRA

OVERHEATED PERIOD
UNDERHEATED PERIOD
COMFORTABLE PERIOD

SOLAR PATH DIAGRAM

JUN. 22nd
AUG. 22nd
MAY. 02nd
DEC. 22nd

VERSAILLES SHADING ANALYSIS

DRAWN: TST
CHECKED: DN
DATE: 2014/06/02
UNIT: -
PREVAILING WINDS
Wind Frequency (Hrs)
Location: PARIS, ORLY, FRA
Date: 1st January - 31st December
Time: 00:00 - 24:00

January
February
March
April
May
June
July
August
September
October
November
December

50 km/h
40 km/h
30 km/h
20 km/h
10 km/h
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<td>ACTIVE</td>
<td>HEAT PUMP COOLING</td>
<td>BA014</td>
</tr>
</tbody>
</table>
OUTDOOR TEMPERATURE UNDER 19°C
WITH WIND
PV PANELS WASTE HEAT

OPEN LOUVERS

FANS ON

HOT AIR GO UP

OPEN DOORS, WINDOWS AND LOUVERS

CLOSE WINDOWS

EXTERIOR TEMPERATURE UNDER 19°C
NO WIND
EXTerior Temperature Above 26°C
EXTerior temperature above 26°C

- Fans on
- Water wall on
- Open louvers
- Close windows
OVERHEATED PERIOD
THE DESIGN OF BUILDING GEOMETRY PROVIDES SHADING

UNDERHEATED PERIOD
BUILDING GEOMETRY ALLOW SUNLIGHT ENTERING LIVING SPACE

THE HIGHEST ANGLE OF THE SUN
SEP.21/MAR.21
OVERHEAT/UNDERHEAT TRANSITION DATE ANGLE OF THE SUN

THE LOWEST ANGLE OF THE SUN

88°  66°  41.4°
OUTDOOR TEMPERATURE BELOW 26°C
A 30cm water thermal wall is built on the west side of the house. Each bottle contains 6 liters of water. The bottles are piled to 2 meter height-wise and 3 meter length-wise. The bottles are held together and fixed to a transparent acrylic sheet on their exterior side.

The water in the thermal wall absorbs solar radiation during the day and releases heat to the interior space at night.
FILLED WITH WATER

INDOOR TEMPERATURE ABOVE 29°C

THERMAL WALL IN TAIPEI
OUTDOOR TEMPERATURE UNDER 19°C

HEAT EXCHANGER

SOLAR HOT WATER HEATER

SOLAR HOT WATER COIL PREHEAT INLET COLD AIR

EXHAUST WARM AIR

CLEAN OUTDOOR COLD AIR

EXHAUST COOL AIR

WARM AIR IN

OUTDOOR TEMPERATURE UNDER 19°C

HEAT EXCHANGER PREHEATED BY SOLAR HOT WATER
HEAT PUMP HEATING

HEAT PUMP COOLING

INCREASED PRESSURE

COMPRESSOR

VALVE

ABSORB HEAT

DECOMPRESSION

RELEASE HEAT

INCREASED PRESSURE

COMPRESSOR

VALVE

ABSORB HEAT

DECOMPRESSION

RELEASE HEAT
<table>
<thead>
<tr>
<th>HATCH TYP</th>
<th>FLOOR TYPE</th>
<th>AREA</th>
<th>LOCATION</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Modern Tree</td>
<td>96 ft²</td>
<td>Interior Space</td>
</tr>
<tr>
<td></td>
<td>Laminate Flooring</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Wood Plastic</td>
<td>47 ft²</td>
<td>Terrace, Mech. RM.</td>
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<tr>
<td></td>
<td>Composites</td>
<td></td>
<td>Shower RM.</td>
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</table>

**Symbol & Legend**

**Hatch Type**
- Modern Tree
- Laminate Flooring
- Wood Plastic

**Floor Type**
- Laminate Flooring
- Wood Plastic

**Area**
- 96 ft²
- 47 ft²

**Location**
- Interior Space
- Terrace, Mech. RM.
- Shower RM.

**Location**
- Terrace
- Mech. RM.
- Shower RM.

**Hatch Type**
- Wood Plastic
- Laminate Flooring

**Symbol & Legend**
- Modern Tree
- Laminate Flooring
- Wood Plastic

**Area**
- Laminate Flooring: 96 ft²
- Wood Plastic: 47 ft²

**Location**
- Interior Space
- Terrace, Mech. RM.
- Shower RM.
FINISH CEILING
EL +3259

DROP CEILING
EL +3098

Polyc bricks wall
Steel frame
Wooden sliding door
CEILING: Wood panel
VIP

Wood panel + Fire retardant paint
Fixed Window

LED Indirect lighting
Ceiling: Wood panel

Wood panel + Fire retardant paint

Couch
Humidifier
Indoor unit

Piping Shaft
MECH.RM.
Inverter & Battery
Delta

1F Panel
PLC Panel

NCTU Architecture
National Chiao Tung University

Project:
Institution:
Team Name:
Checked by:
Scale:
DWG. Title:
DWG. No.
Address:
Contact:
Consultants:

NCTU/UNICODE
1001 Ta-Hsueh Road
Hsinchu City 30010
Taiwan

www.sde.tw

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ST 2014/03/03 CD Submission
ST 2014/04/30 CD Submission
ST 2014/06/02 CD Submission

TW

1:50
Unit mm

INTERIOR ELEVATIONS 1

IN-201
PAGE 2
## FIXED FURNITURE LIST

<table>
<thead>
<tr>
<th>FIXT. No</th>
<th>TYPE</th>
<th>BRAND</th>
<th>LOCATION</th>
<th>SIZE (W<em>D</em>H)</th>
<th>TYPE</th>
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<tbody>
<tr>
<td>FIXT. 01</td>
<td>TOILET PAPER HOLDER</td>
<td>HCG</td>
<td>BATHROOM</td>
<td>170x16x135</td>
<td>BA08</td>
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<td>WASHHANDS FOUNTAIN</td>
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<td>HCG</td>
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<td>LF3167PT(AW)</td>
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<td>SHOWER TRACK</td>
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<td>SHOWER CURTAIN</td>
<td>HCG</td>
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<td>HCG</td>
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<td>DOUBLE TOWEL RACK</td>
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### Drawings Reference

- **BATHROOM PLAN**: IN-501

### Notes

- **Project**: FURNITURE LIST
- **Institution**: NCTU UNICODE
- **Team Name**: NCTU Architecture
- **Checked by**: TW
- **Drawn by**: TW

### Dimensions

- **Scale**: 1:20
- **Unit**: mm

### Technical Details

- **Unit**: mm

---

**BATHROOM PLAN**

---

**IN-501**

---
UNIT No. | SIZE (L x W x D) |
---|---|
RU 01 | 5216 x 3750 x 150 |
RU 02 | 4264 x 3750 x 150 |
RU 03 | 4418 x 3750 x 150 |
RU 04 | 1885 x 3750 x 190 |
RU 01 | 5216 x 1650 x 150 |
RU 01 | 4264 x 1650 x 150 |
RU 01 | 4418 x 1650 x 190 |
RU 01 | 1885 x 1650 x 190 |
RU 01 | 5216 x 3750 x 150 |
RU 01 | 4264 x 3750 x 150 |
RU 01 | 4418 x 3750 x 150 |
RU 01 | 1885 x 3750 x 190 |

Consultants: NCTU/UNICODE
Address: 1001 Ta-Hsueh Road
Hsinchu City 30010
Taiwan
Contact: www.sde.tw

Mark Date Description
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ST 2013/11/01 DD Submission
ST 2014/03/03 CD Submission
ST 2014/04/30 CD Submission
ST 2014/06/02 CD Submission

Note:
DN2013/07/01 DDc Submission

Scale: 1:100

STRUCTURAL ROOF UNITS

UNITS | MILLIMETERS |
---|---|
RU 01 | 5216 x 3750 x 150 |
RU 02 | 4264 x 3750 x 150 |
RU 03 | 4418 x 3750 x 150 |
RU 04 | 1885 x 3750 x 190 |
RU 01 | 5216 x 1650 x 150 |
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RU 01 | 5216 x 3750 x 150 |
RU 01 | 4264 x 3750 x 150 |
RU 01 | 4418 x 3750 x 150 |
RU 01 | 1885 x 3750 x 190 |
9V BATTERY

POWER RECEIVE

Smoke alarm/detector (NQ9S-3)

MEZZANINE

Smoke alarm/detector (NQ9S-3)

BEDROOM

Smoke alarm/detector (NQ9S-3)

LIVING RM.

BAS

PVC E20, W/600V 380°C 1.25mm /4C

PVC E20, W/600V 380°C 1.25mm /2C
General circuit breaking

Inverters circuit breaking

MECH. RM.

BATHROOM

KITCHEN

WORKSTATION

LIVING RM.

BEDROOM

TEA TERRACE

Up to Mezzanine Level

FE

Note:

- PVC E20, W600V, 380°C
  1.25mm/4C, 1.25mm/2C

Smoke Alarm/Detector
NQRS-3:
- DC 9V Battery
- Alarm Contacts
- Interlock with all detectors when alarm of any detector
- AC 220V

Fire Extinguisher
ABC-EN3-4K:
21A/113B/C efficiency

Power cut ON/OFF
General circuit breaking

Power cut ON/OFF
Inverters circuit breaking
1. [NQ9S-3:
   - DC 9V Battery
   - Alarm Contacts
   - Interlock with all detectors when alarm of any detector
   - AC 220V]

2. [Fire Extinguisher
   ABC-EN3-4K
   21A/113B/C efficiency]

- Evacuation Route
- Evacuation Origin

- Rain Water Collection Surface
- Laundry Hanger Area
- Mezzanine

Down TO Ground Level
OPEN TO BELOW

FIRE PROTECTION
EVACUATION PATH
GROUND LEVEL

- Evacuation Route
- Evacuation Origin

Project:
Institution:
Team Name:
Checked by
Scale
DWG. Title
DWG. No.
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Contact:
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Hsinchu City 30010
Taiwan
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Consultants:
Drawn by
Mark Date Description
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ST 2014/06/02 CD Submission

PAGE
FP-004

UNIT
mm

Stc

361

1

FU

CHESTER

NCTU UNICODE

1:60

Ground Level

Living Room

Bedroom

Workstation

Kitchen

Bathroom

Mech. RM.

Entrance

Tea Terrace

827x1176

162

114x151

186x151

273x151

408x151

265x151

134x151

225x151

132x33

90x128

79x121

233x151

183x31

90x128

79x121

233x151

183x31
Laundry Hanging Area

Mezzanine

Rain Water Collection Surface

Evacuation Route

Evacuation Origin

Fire Extinguisher

ABC-EN3-4K: 21A/113B/C efficiency

NQRS-3:
- DC 9V Battery
- Alarm Contacts
- Interlock with all detectors when alarm of any detector
- AC 220V

Notes:
1. 25mm dia. 1. 25mm dia.

Scale 1:60

FIRE PROTECTION EVACUATION PATH MEZZANINE LEVEL

FP-005
1. Cold Water Tank
   Size: 1.00x7.00x0.30 m,
   Volume: 2100l.

2. Greywater Tank
   Size: 1.00x6.00x0.30 m,
   Volume: 1800l.

3. Black Water Tank
   Size: 2.00x1.00x0.30 m,
   Volume: 600l.

4. Rainwater Tank
   Size: 1.50x0.70x0.30 m,
   Volume: 300l.

5. Rainwater Pump
   Flow: 15 lpm
   Head: 15 m

6. Cold Water Pump
   Flow: 20 lpm
   Head: 18 m
1. Cold Water Tank
   Size: 1.00x7.00x0.30 m,
   Volume: 2100l.

2. Greywater Tank
   Size: 1.00x6.00x0.30 m,
   Volume: 1800l.

3. Black Water Tank
   Size: 1.20x1.80x0.30 m,
   Volume: 600l.

4. Rainwater Tank
   Size: 0.70x1.50x0.30 m,
   Volume: 300l.

5. Rainwater Pump
   Flow: 15 lpm
   Head: 15 m

6. Cold Water Pump
   Flow: 25 lpm
   Head: 20 m
1. Cold Water Tank
   Size: 1.00x7.00x0.30 m,
   Volume: 2100l.

2. Greywater tank
   Size: 1.00x6.00x0.30 m,
   Volume: 1800l.

3. Black Water Tank
   Size: 1.20x1.80x0.30 m,
   Volume: 600l.

4. Rainwater Tank
   Size: 0.70x1.50x0.30 m,
   Volume: 300l.

5. Rainwater Pump
   Flow: 15 lpm
   Head: 15 m

6. Cold Water Pump
   Flow: 25 lpm
   Head: 20 m
Solar thermal and heat pump system

Rain Water

Fist Flush
To Building's Rainwater Tank

Heat Exchanger

Washing Machine

Clean Cold Water
Clean Hot Water
Graywater
Overflow

City Water

Cold Water Tank
Cap.: 2.1M
Flow: 20 LPM
Head: 18 M

Shower

Progressive depth filtration

Buffering combining active sludge and foam separation

The organic sediments which are produced during the active sludge process obtain further sediment in this tank

Matala progressive biofiltration efficient 3-D biofiltration. The biofiltration process is very resilient to shock loads with additional fixed biofilter skimmers

After biological treatment, the water flows through a stainless steel chamber UV-C system for disinfection

Heat Exchanger
-Cold Side:
Water (°C, Ewt / Lwt): 15 / 23
Flow (Lpm): 18.75

-Hot Side:
Water (°C, Ewt / Lwt): 33 / 23
Flow (Lpm): 15

Urban Integrated Services

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Scheematic Diagram
In Taiwan

MH

Unit

Layout

Scale

Checked by

Mark

Unit

Drawn by

Note:

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DN2013/07/01 DDc Submission

ST 2013/11/01 DD Submission

ST 2014/03/03 CD Submission

ST 2014/04/30 CD Submission

ST 2014/06/02 CD Submission
The water closet is not connected to the sewage disposal system (black water tank) during the event.

Heat Exchanger
- Cold Side:
  Water (°C, Ewt / Lwt): 15 / 23
  Flow (Lpm): 18.75
- Hot Side:
  Water (°C, Ewt / Lwt): 33 / 23
  Flow (Lpm): 15

Solar thermal and heat pump system

First Flush

Rain Water

Air Condition

Lavatory

Washing Machine

Shower

Water Closet

Heat Exchanger

Greywater Tank

Cap.: 0.3M³

Heat Exchanger - Cold Side:
Flow (Lpm): 18.75
Water (°C, Ewt / Lwt): 15 / 23

Heat Exchanger - Hot Side:
Flow (Lpm): 15
Water (°C, Ewt / Lwt): 33 / 23

Rainwater collection

Char.: 0.3M³

Black Water Tank

Cap.: 0.6M³

City Water

Cap.: 2.1M³

Flow: 20 Lpm
Head: 18 m

Cold Water Tank

Dish Washer

Cap.: 0.6M³

Flow: 20 Lpm
Head: 18 m

Kitchen

Potted Vegetation

Clean Cold Water

Clean Hot Water

Graywater

Rain Water

Air Condition

Lavatory

Washing Machine

Shower

Water Closet

Heat Exchanger

Greywater Tank

Rainwater collection

Char.: 0.3M³

Heat Exchanger - Cold Side:
Flow (Lpm): 18.75
Water (°C, Ewt / Lwt): 15 / 23

Heat Exchanger - Hot Side:
Flow (Lpm): 15
Water (°C, Ewt / Lwt): 33 / 23

Rainwater collection

Char.: 0.3M³

Black Water Tank

Cap.: 0.6M³

City Water

Cap.: 2.1M³

Flow: 20 Lpm
Head: 18 m

Cold Water Tank

Dish Washer

Cap.: 0.6M³

Flow: 20 Lpm
Head: 18 m

Kitchen

Potted Vegetation

Clean Cold Water

Clean Hot Water

Graywater

Rain Water

Air Condition

Lavatory

Washing Machine

Shower

Water Closet

Heat Exchanger

Greywater Tank

Rainwater collection

Char.: 0.3M³

Black Water Tank

Cap.: 0.6M³

City Water

Cap.: 2.1M³

Flow: 20 Lpm
Head: 18 m

Cold Water Tank

Dish Washer

Cap.: 0.6M³

Flow: 20 Lpm
Head: 18 m

Kitchen

Potted Vegetation

Clean Cold Water

Clean Hot Water

Graywater
1. Clothes Washer
2. Clothes Dryer
3. Shower Head
4. Lavatory
5. Kitchen Sink
1 Black Water Tank
2 Water Closet
3 Kitchen Sink
4 Dish Washer
1. Use screws to secure the pipes on this structure
2. Pipe link with irrigation system at 620 cm high
3. Pipe cross-sectional area (4.7cm²) x length (13553 cm) = 61226 ML (irrigation)
1. Use screws to secure the pipes on this structure
2. Pipe link with irrigation system at 620 cm high
3. Pipe cross-sectional area (4.7 cm²) x length (13027 cm) = 61226 ML (irrigation)
HVAC DISTRIBUTION PLAN
GROUND LEVEL

1:60

1 Indoor Unit of Heat Pump
2 Ultrasonic Humidifier

Refrigerant Supply
Refrigerant Return
Duct
Outdoor Unit of Cooling/Heating Heat Pump

<table>
<thead>
<tr>
<th>Name</th>
<th>Outdoor Unit of Cooling/Heating Heat Pump</th>
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<tbody>
<tr>
<td>Service</td>
<td>HVAC Cooling and Heating</td>
</tr>
<tr>
<td>Type</td>
<td>Heat Pump</td>
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<tr>
<td>Cooling Capacity</td>
<td>11.2 KW</td>
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<tr>
<td>Heating Capacity</td>
<td>12.5 KW</td>
</tr>
<tr>
<td>COP</td>
<td>Cooling = 3.8 Heating = 3.82</td>
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<tr>
<td>EER</td>
<td>Cooling = 4.4 Heating = 4.4</td>
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<td>Frequency</td>
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<tr>
<td>Power Consumption</td>
<td>KW Cooling = 2.95 Heating = 3.27</td>
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<tr>
<td>Refrigerant</td>
<td>R-410A</td>
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Test condition for outdoor unit:
1. Cooling Condition: Indoor Temperature 27°C DB / 19°C WB
   Outdoor Temperature 35°C DB
2. Heating Condition: Indoor Temperature 20°C DB
   Outdoor Temperature 7°C DB / 6°C WB

Indoor Unit of Heat Pump

<table>
<thead>
<tr>
<th>Name</th>
<th>Indoor Unit of Heat Pump</th>
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<tbody>
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<td>Service</td>
<td>Room Heating and Cooling</td>
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<td>Type</td>
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<td>Quantity</td>
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<tr>
<td>Cooling Capacity</td>
<td>4.2 KW</td>
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<tr>
<td>Heating Capacity</td>
<td>5 KW</td>
</tr>
<tr>
<td>Fan Flow (High/Low)</td>
<td>12 / 9 m³/min</td>
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<tr>
<td>Air Filter</td>
<td>Washable Resin Net</td>
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Outdoor Unit of Cooling/Heating Heat Pump

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Indoor Unit of Heat Pump

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<tr>
<td>Cooling Capacity</td>
<td>4.2 KW</td>
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<tr>
<td>Heating Capacity</td>
<td>5 KW</td>
</tr>
<tr>
<td>Fan Flow (High/Low)</td>
<td>12 / 9 m³/min</td>
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<td>11.2 KW</td>
</tr>
<tr>
<td>Heating Capacity</td>
<td>12.5 KW</td>
</tr>
<tr>
<td>COP</td>
<td>Cooling = 3.8 Heating = 3.82</td>
</tr>
<tr>
<td>EER</td>
<td>Cooling = 4.4 Heating = 4.4</td>
</tr>
<tr>
<td>Electrical Power Supply</td>
<td>230 V</td>
</tr>
<tr>
<td>Frequency</td>
<td>50 HZ</td>
</tr>
<tr>
<td>Power Consumption</td>
<td>KW Cooling = 2.95 Heating = 3.27</td>
</tr>
<tr>
<td>Refrigerant</td>
<td>R-410A</td>
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</table>
Heat Reclaim Ventilator

<table>
<thead>
<tr>
<th>Name</th>
<th>Heat Reclaim Ventilator</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service</td>
<td>Room Active Ventilation</td>
</tr>
<tr>
<td>Temperature Exchange Efficiency</td>
<td>79%</td>
</tr>
<tr>
<td>Enthalpy Exchange Efficiency</td>
<td>66%</td>
</tr>
<tr>
<td>Cooling</td>
<td>66%</td>
</tr>
<tr>
<td>Heating</td>
<td>72%</td>
</tr>
<tr>
<td>Fan Air Flow Rate</td>
<td>150 m³/h</td>
</tr>
<tr>
<td>Electrical Power Supply</td>
<td>230 V</td>
</tr>
<tr>
<td>Frequency</td>
<td>50 Hz</td>
</tr>
<tr>
<td>Power Consumption</td>
<td>30 W x 2</td>
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Test condition for exchange efficiency:

<table>
<thead>
<tr>
<th>Condition</th>
<th>Indoor</th>
<th>Outdoor</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>°Cdb</td>
<td>%h</td>
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<tr>
<td>Cooling</td>
<td>27</td>
<td>50</td>
</tr>
<tr>
<td>Heating</td>
<td>20</td>
<td>40</td>
</tr>
</tbody>
</table>

Heat Reclaim Ventilator

- Supply air to room
- Return air from room
- E.A. Exchanger air to external
- OA Fresh air from outdoor (outside air)
Winter - Night
- In cold-stream winter night.
- Space heating is required.
- Both heating coil and heat pump are operating.
- HRV is in HX mode.

Winter
- Winter of freezing temperature.
- Space heating is required.
- Only heating coil is operating.
- HRV is in HX mode.
### Summer - Day
- Typical of summer day.
- Space cooling is required.
- Heat pump is operating.
- HRV is in HX mode.

### Spring - Night
- Outdoor temperature is much less than room temperature.
- Space cooling is still required.
- HRV is in bypass mode.

### Summer - Early Morning
- Outdoor temperature is less than room temperature.
- Space cooling is required.
- Heat pump is operating.
- HRV is in bypass mode.

### Spring - Day
- Outdoor temperature is higher than room temperature.
- Space cooling is required.
- Heat pump is operating.
- HRV is in HX mode.

---

**Legend:**
- Exhaust Air
- Indoor Air
- Supply Air
- Hot Air
- Warm Air
- Cool Air
- Cold Air
- Refrigerant Pipe
- HRV - Heat Exchange Mode
- HRV - Bypass Mode
Summer - Day
- Outdoor temperature is much higher than room temperature.
- HRV is in HX mode.

Spring - Day
- Outdoor temperature is higher than room temperature.
- Space cooling is required.
- HRV is in HX mode.

Winter - Night
- Outdoor temperature is much less than room temperature.
- HRV is in HX mode.
- Humidifier is operating.

Spring - Night
- Outdoor temperature is less than room temperature.
- Space cooling is required.
- HRV is in bypass mode.

Legend:
- Exhaust Air
- Indoor Air
- Outdoor Air
- Supply Air
- HRV - Heat Exchange Mode
- HRV - Bypass Mode
- Hot Air
- Warm Air
- Cold Air
- Exhaust Air

Comfort
Kitchen
Living Room / Bed Room
Bathroom
HRV
PCM
Resultant
Exhaust Air
Outdoor Air
Supply Air
HC
Hot
Warm
Cold
Cool
Indoor Air
Ultrasonic Humidifier
Ventilation 2
When the heat pump is operating in heating mode and the outdoor temperature is lower than the room temperature, the energy recovery ventilator is automatically switched to the heat recovery mode.
When the heat pump is operating in heating mode and the outdoor temperature is higher than the room temperature, the energy recovery ventilator is automatically switched to the bypass mode.
When the heat pump is operating in cooling mode and the outdoor temperature is higher than the room temperature, the energy recovery ventilator is automatically switched to the heat recovery mode.
When the heat pump is operating in cooling mode and the outdoor temperature is lower than the room temperature, the energy recovery ventilator is automatically switched to the bypass mode.
Remote Controller Function:
1. Cooling
2. Heating
3. Automatic Heating / Cooling Changeover
4. Program Dry Mode
5. Fan Mode
6. Program Timer
7. Program The Start/Stop Time

Operation Mode Of HRV Unit

1. In case of cooling operation
   - Zone 1: Free cooling (cooling by outdoor air) in bypass mode.
   - Zone 2: Room temperature to be achieved set temperature by heat exchange mode.
   - Zone 3: Room temperature to be achieved set temperature in bypass mode.
   - Zone 4: Fresh air supply is cooled down by indoor air in heat exchange mode (energy saving).

2. In case of heating operation
   - Zone 1: Free heating (heating by outdoor air) in bypass mode.
   - Zone 2: Room temperature to be achieved set temperature by heat exchange.
   - Zone 3: Room temperature to be achieved set temperature in bypass mode.
   - Zone 4: Fresh air supply is heated up by indoor air in heat exchange mode (energy saving).

3. In case of fan operation only
   - Zone 1: Ventilation mode is individually determined by the original formula of HRV with the temperature sensors.

Ventilation mode is individually determined by the original formula of HRV with the temperature sensors.
On the front of all junction boxes, insert a label: “Attention, cables courant continu sous tension”

Labels for pv installations:

ON DC SIDE

All the junction boxes and DC electrical cabling must indicate live conductors or the internal parts of the boxes can remain live even after the opening of the DC switch.

ATTENTION: Cábles courant continu

RISQUE DE PRESENCE DE DEUX SOURCES DE TENSION

ISOLER LES SOURCES AVANT TOUTE INTERVENTION

Ne pas manoeuvrer en charge

In all the junction boxes and in all the DC disconnect boxes, insert a label: “Ne pas manoeuvrer en charge”

ON THE INVERTERS

All the inverters shall have clear markings specifying that before all work, all the voltage sources must be electrically isolated.

Insert this label on the inverter front.

Voltage Calculations:

Voc @ coldest expected operating Temp.: Low ambient Temp. = -20 °C
VOc(-20°C)=Voc(STC)+(-20°C-25°C)*(ΔVoc/°C)=37.33-45*(-0.117) = 42.595V

Max. modules of string:

Vmax=Vdc(input max)/(Voc(-20°C)=600/42.595=14.086 choose 14pcs

Min. modules of string:

Vmin=Vdc(min)/Vmp(75°C)=150/23.99=6.25 choose 7pcs

Selection modules of string = 10 pcs

Voc(-20°C)_string = Modules*Voc(-20°C) = 10*42.595V = 425.95V < 600V

Vmp(75°C)_string = Modules*(75°C) = 10*23.99V = 239.9V > 150V

String in parallel:

Max. DC power of Charge Controller / Selection modules of string / Module Max. DC power = 5,000W / 10pcs / 250W = 2.0 ≤ 2parallel

DC array conductor:

1.56 * Isc * 2 = 1.56 * 8.69A * 2 = 27.11A

Selected conductor: solar cable 4mm²
SYMBOL & LEGEND

- Tons LSP-3106 / 7.2W / Warm White AC 100~240V, Wall mounted / 4000k
- Tons T8 LED / 1270mm 20W/4000k AC 100~240V, Wall mounted
- Tons T8 LED /995mm 20W/4000k AC 100~240V, Wall mounted
- Tons KA-112R / 3.6W Warm White AC 100~240V, Wall mounted / 4000k
- Tons DA-504AD / 1.2W / Warm White AC 100~240V, Recess mounted / 4000k
- Tons DG-913C / 12.6W / Warm White AC 100~240V, Recess mounted / 4000k
- Tons ODL-005 / 1.2W / Warm White AC 100~240V, Recess mounted / 4000k
- Delta A60 / DF 10W AC 100~240V / E27 / 4000k

Sa Lighting Switch, single-cut
S3a Lighting Switch, double-cut

230V Electrical Panelboard

Branch Circuit (concealed in Ceiling or Wall)
Branch Circuit (Exposed on Wall)

LOOP NUMBER
01-03 CIRCUIT NUMBER
01-45 PANEL NUMBER
01-01 1F 230V Panelboard
02- 2F 230V Panelboard
SYMBOL & LEGEND

- **Tons LSP-3106** / 7.2W / Warm White AC 100~240V, Wall mounted
- **Tons T8 LED / 1270mm** 20W/4000k AC 100~240V, Wall mounted
- **Tons T8 LED / 995mm** 20W/4000k AC 100~240V, Wall mounted
- **Tons KA-112R / 3.6W Warm White AC 100~240V, Wall mounted / 4000k**
- **Tons DG-913C / 12.6W / Warm White AC 100~240V, Recess mounted / 4000k**
- **Tons ODL-005 / 1.2W / Warm White AC 100~240V, Recess mounted / 4000k**
- **Delta A60 / DF 10W AC 100~240V / E27 / 4000k**
- **Lighting Switch, single-cut**
- **Lighting Switch, double-cut**
- **230V Electrical Panelboard**
- **Branch Circuit (concealed in Ceiling or Wall)**
- **Branch Circuit (Exposed on Wall)**

**MEZZANINE LEVEL**

**LIGHTING PLAN**

**CODE: EL-403**

**Drawn by:** RAYS

**Scale:** 1:60

**Unit:** mm

**Page:** 206
1F 230V Panelboard
IC: 10 kA Symm

From AC Switch Panel
1Φ2W 230V 50Hz

16mm2/2C+G-16mm2 XLPE-LSFH CABLE
IN PVC PIPE 40mm

63A/2P

60/5

CIRCUIT NO. | DESCRIPTION | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 | 14 | 15
---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---
LOAD(W) | Refrigeration | 308W | 3500W | 2110W | 1800W | 1400W | 1000W | 260W | 651W | 360W | 96W | 8.4W | 510W | - | - | -
CURRENT (A) | - | - | - | - | - | - | - | - | - | - | - | - | - | - | - | -
**ONE-LINE DIAGRAM**

<table>
<thead>
<tr>
<th>CIRCUIT NO.</th>
<th>DESCRIPTION</th>
<th>LOAD (W)</th>
<th>CURRENT (A)</th>
<th>VOLTAGE (V)</th>
</tr>
</thead>
<tbody>
<tr>
<td>16</td>
<td>Clean Water Pump</td>
<td>540W</td>
<td>-</td>
<td>230V</td>
</tr>
<tr>
<td>17</td>
<td>Rain Water Pump &amp; Level relay</td>
<td>270W</td>
<td>-</td>
<td>230V</td>
</tr>
<tr>
<td>18</td>
<td>BathRoom &amp; Tea Terrace Receptacle (General Use)</td>
<td>-</td>
<td>-</td>
<td>230V</td>
</tr>
<tr>
<td>19</td>
<td>Tea Terrace &amp; Mech. RM Lighting</td>
<td>-</td>
<td>-</td>
<td>230V</td>
</tr>
<tr>
<td>20</td>
<td>Control Valve (For irrigation)</td>
<td>-</td>
<td>-</td>
<td>230V</td>
</tr>
<tr>
<td>21</td>
<td>Surge Protection Device</td>
<td>-</td>
<td>-</td>
<td>230V</td>
</tr>
<tr>
<td>22</td>
<td>SPARE</td>
<td>-</td>
<td>-</td>
<td>230V</td>
</tr>
</tbody>
</table>
2F 230V Panelboard
IC: 10 kA Symm

From AC Switch Panel
1Φ2W 230V 50Hz

6mm2/2C+G/6mm2 XLPE-LSFH
IN PVC PIPE 28mm

32A/2P

1Φ2W 230V 32A

ELB 300mA 0.15sec

30/5

POWER METER

CU BUS BAR 1Φ2W 230V 32A

6.0mm2/2C+G/6.0mm2 XLPE-LSFH
IN PVC PIPE 28mm

2.5mm2/2C+G/2.5mm2 XLPE-LSFH
IN PVC PIPE 20mm

CIRCUIT NO. 1 2 3 4 5 6 7 8 9 10
DESCRIPTION VRV HRV CO2 Head Pump Mezzanine Area Receptacle Pump Station 01 Pump Station 02 Circulation Fanx12 Water wall Pump Spare Spare
LOAD (W) 2760W 100W 1340W - 560W 550W 480W 550W - -
CURRENT (A) - - - - - - - - - -

ELECTRICAL SYMBOLS
- LOW VOLTAGE MOLDED CASE CIRCUIT BREAKER
- LOW VOLTAGE MOLDED CASE CIRCUIT BREAKER WITH GROUND FAULT CIRCUIT INTERRUPTER (GFCI)
- GROUNDING
- CURRENT TRANSFORMER
- TRANSFORMER
- LOW VOLTAGE FUSE
- LOW SMOKE FREE CABLE
- SURGE PROTECTION DEVICE

NOTE
- DN 2013/04/01 SD Submission
- ST 2013/11/01 DD Submission
- ST 2014/03/03 CD Submission
- ST 2014/04/30 CD Submission
- ST 2014/06/02 CD Submission

UNIT
- RAYS
AC Circuit Layout

Inverter AC side overcurrent Calculations:

- Output max. current: 27.2 A
- Overcurrent protection: 27.2 A * 1.25 = 34 A
- Selection 40AT ELCB

Inverter AC output conductor:

- Output Max. current = 27.2 Aac
- Selected conductor: XLPE-LSHF 4 mm²

Labels for pv installations:

- On AC side, insert this label near the main AC photovoltaic circuit breaker or near the main AC photovoltaic switch.
- On AC side, insert this label near the main circuit breaker if a main circuit breaker cut off simultaneously photovoltaic and electrical loads.
<table>
<thead>
<tr>
<th>Tag</th>
<th>Components</th>
<th>Manufacturer</th>
<th>Model</th>
<th>Q'ty</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>SDE Grid</td>
<td>Archmeter</td>
<td>PA33</td>
<td>1</td>
<td>Organization Supplied Grid Power</td>
</tr>
<tr>
<td>2</td>
<td>Power Meter</td>
<td>Archmeter</td>
<td>PA33</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>PV array</td>
<td>NSP</td>
<td>D6P250B3A</td>
<td>20</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>DC Panel</td>
<td>Delta</td>
<td>Solivia 5.0</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>Inverter</td>
<td>Delta</td>
<td>PA33</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Power Meter</td>
<td>Delta</td>
<td>RenE-ES 6120</td>
<td>1</td>
<td>Battery Energy Storage System</td>
</tr>
</tbody>
</table>

**Diagram:**
- **SDE Grid**: 230V 50Hz
- **PV array**: Earth cable
- **DC Panel**:
- **Inverter**: Delta Solivia 5.0
- **Power Meter**: Delta PA33
- **BESS**: Delta RenE-ES 6120
Photovoltaic Module:
NSP D6P250B3A
Max. DC power = 250Wp
Voc = 37.33 V
Vmp = 30.34 V
Isc = 8.69 A
Temp. Coeff. of Voc = -0.117 V/°C
Temp. Coeff. of Isc = 0.004 A/°C
Temp. Coeff. of Vmp = -0.127 V/°C
Module Efficiency = 15.3%

Inverter:
Delta Solivia 5.0
Max. input power = 6,000Wp
Input Voltage range = 125 ~ 600V
Full power MPP range = 150 ~ 480V
Max. current = 36.6A
DC connector = 2 pairs
Nominal apparent power = 5,000VA
Voltage range = 184~264Vac
AC output frequency = 50 Hz
Max. current = 27.2 Aac
Max. efficiency = 96.1%
EU efficiency = 94.6%

Voltage Calculations:
Voc @ coldest expected operating Temp.:
Voc(-20°C) = Voc(STC) + (-20°C - 25°C) * (ΔVoc/°C) = 37.33 - 45 * (-0.117) = 42.595V
Max. modules of string:
nmax = Vdc(input max) / Voc(-20°C) = 600 / 42.595 = 14.086 choose 14pcs

Vmp @ highest expected operating Temp.:
Vmp(75°C) = Vmp(STC) + (75°C - 25°C) * (ΔVmp/°C) = 30.34 + 50 * (-0.127) = 23.99V
Min. modules of string:
nmin = Vmp(min) / Vmp(75°C) = 150 / 23.99 = 6.25 choose 7pcs
Selection modules of string = 10 pcs

Voc(-20°C)_string = Modules * Voc(-20°C) = 10 * 42.595V = 425.95V < 600V
Vmp(75°C)_string = Modules * Vmp(75°C) = 10 * 23.99V = 239.9V > 150V

SPD selection of Calculations:
Buildings in cities so use TYPE 2-class II
Min. current = 20kA(8/20us)
Max continuous operating voltage Uc: 426V * 1.1 = 468.6V choose 670Vdc
Insulation voltage of the equipment: 1.2~2kV choose Up: 1.4kV
### Components

<table>
<thead>
<tr>
<th>Tag</th>
<th>Components</th>
<th>Manufacturer</th>
<th>Model</th>
<th>Qty</th>
<th>Notes</th>
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<tbody>
<tr>
<td>1</td>
<td>PV Module</td>
<td>MIP</td>
<td>UMP25DB3A</td>
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<td>2</td>
<td>DC Protections</td>
<td>Delta</td>
<td>Solara 5.0</td>
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<td>3</td>
<td>Inverter</td>
<td>Delta</td>
<td></td>
<td>1</td>
<td></td>
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<td>4</td>
<td>ELCB</td>
<td>Hitachi</td>
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<td>1</td>
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<td>5</td>
<td>Surge Protection Device</td>
<td>Shihlin</td>
<td>MPF40, 2P</td>
<td>1</td>
<td>Uc:275V, Up: 1.4kV in 20µs, 250A</td>
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<tr>
<td>6</td>
<td>BESS</td>
<td>Delta</td>
<td>RenE-ES 6120</td>
<td>1</td>
<td>Battery Energy Storage System</td>
</tr>
</tbody>
</table>

### Inverter AC side overcurrent Calculations:

- **Input PV power**: 5,000W
- **Output current**: 5,000W / 230V = 21.74Aac
- **Overcurrent protection**: 21.74A * 1.25 = 27.18Aac
- **Selection** 32AT ELCB

### Inverter AC output conductor:

- **Output Max. current**: 1.56 * 21.74 A = 33.91 A
- **Selected conductor**: XLPE-LSHF 4mm²

### SPD selection of Calculations:

- **Buildings in cities**: Use TYPE 2-class II
- **In:20kA (8x20us)**
- **Max continuous operating voltage Uc**: 230V * 1.1 = 253V
- **Choose Uc: 275Vac**
- **Insulation voltage of the equipment**: 1.2~2kV
- **Choose Up: 1.4kV**

---

### Labels for pv installations:

**ON AC SIDE**

- On AC side, insert this label near the main AC photovoltaic circuit breaker or near the main AC photovoltaic switch.
- On AC side, insert this label (near the main circuit breaker) if a main circuit breaker cut off simultaneously photovoltaic and electrical loads.

---

**Diagram Details**

- **Inverter**: Delta Electronics, Inc.
- **PV Array**: Delta Electronics, Inc.
- **DC Panel**: Delta Electronics, Inc.
- **Inverter**: Delta Electronics, Inc.
- **AC Switch Panel**: Delta Electronics, Inc.
- **BESS**: Delta Electronics, Inc.

---

**Note:**

- **From SDE General Connection BOX**: 10Φ2W 230V 50Hz

---

**Architectural Details**

- **Project:**
- **Institution:**
- **Team Name:**
- **Checked by:**
- **Scale:**
- **DWG. Title:**
- **DWG. No.:**
- **Address:** 1001 Ta-Hsueh Road, Hsinchu City 30010, Taiwan
- **Contact:** www.sde.tw

---

**Drawn by:**

- **GK**
- **Mark Date Description**
- **DN2013/04/01 SD Submission**
- **ST 2013/11/01 DD Submission**
- **Unit:**
- **ST 2014/03/03 CD Submission**
- **ST 2014/04/30 CD Submission**

---

**Design**

- **PHOTOVOLTAIC SYSTEM:**
  - **AC CIRCUITS**

---

**Diagram No.**: PV-021
On AC side, insert the label near the main AC photovoltaic circuit breaker or near the main AC photovoltaic switch.

On AC side, insert this label near the main circuit breaker if a main circuit breaker cut off simultaneously photovoltaic and electrical loads.

### Labels for pv installations:

**ON AC SIDE**

**Production photovoltaïque**

**Coupure réseau de distribution**

**Coupure photovoltaïque**

**or**

**Coupure réseau de distribution et photovoltaïque**

### Components

<table>
<thead>
<tr>
<th>Tag</th>
<th>Components</th>
<th>Manufacturer</th>
<th>Model</th>
<th>Q'ty</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>PV Module</td>
<td>NSP</td>
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<td>DC Protections</td>
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<td>Inverter</td>
<td>Delta</td>
<td>Solvia 5.0</td>
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<td>4</td>
<td>Box</td>
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<tr>
<td>5</td>
<td>Power Meter</td>
<td>Archimater</td>
<td>PA33</td>
<td>3</td>
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</tr>
<tr>
<td>6</td>
<td>ELCB</td>
<td>Schneider</td>
<td></td>
<td>5</td>
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<tr>
<td>7</td>
<td>Surge Protection Device</td>
<td>SHP40, 2P</td>
<td></td>
<td>1</td>
<td>Uc:275V, Up:1.4kV, In:20kA(20us)</td>
</tr>
<tr>
<td>8</td>
<td>BESS</td>
<td>Delta</td>
<td>RenE-ES 6120</td>
<td>1</td>
<td>Battery Energy Storage System</td>
</tr>
</tbody>
</table>

### Inverter AC side overcurrent Calculations:

Input PV power: 5,000W

Output current: 5,000W / 230V = 21.74Aac

Overcurrent protection: 21.74A * 1.25 = 27.18Aac

Selection 32AT ELCB

Inverter AC output conductor:

Output Max. current = 21.74 Aac

1.56 * 21.74A = 33.91A

Selected conductor: XLPE-LSHF 4mm²

SPD selection of Calculations:

Buildings in cities so use TYPE 2-class II choose In:20kA(20us)

Max continuous operating voltage Uc: 230V*1.1=253V choose 275Vac

Insulation voltage of the equipment: 1.2~2kV choose Up:1.4kV
Temperature & Humidity

Smoke Detector

Air Quality-CO2

Soil Moisture Sensor

Smart Weather Station
1. Temperature & Humidity
2. Wind Speed
3. Raining
4. Air Quality-CO2
5. Solar

Light Level Sensor

Door / Windows Position Sensor
Home Automation System

- PAD/Smartphone
- Wireless AP
- Weather Station
- ASUS AIO Server
- HMI (Control Panel)
- PLC
- GATEWAY
- BESS
- GATEWAY
- Power Meter
- HRV/VRV

Ethernet

- RS-232
- RS-485
- Ethernet

Consultants:
- DELTA ELECTRONICS, INC.

Clients:
- NCTU/UNICODE

Address:
1001 Ta-Hsueh Road
Hsinchu City 30010
Taiwan

www.sde.tw

Drawn by: Aaron Chen

Checked by: Steven Yu

DI/DO/AI/AO

RS-485
### Legend / Brand / Model

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
<th>Brand/Model</th>
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<tbody>
<tr>
<td>Temperature &amp; Humidity</td>
<td>T : -60<del>50 : or 0</del>100 H : 0~100%RH</td>
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<tr>
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<td>Action concentration : 15% Alarm : 90db / fm</td>
<td>Horing Lih / NQ95</td>
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<tr>
<td>Soil Moisture Sensor</td>
<td>0-100% ; ±3%(m3/m3)</td>
<td>Jetec / JSH-100</td>
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<td>T/H ; Rainfall ; Wind ; BP</td>
<td>Vaisala WXT520</td>
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<tr>
<td>Light Level Sensor</td>
<td>0-400 lux</td>
<td>Schneider / SLR320</td>
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<tr>
<td>Motion Detector</td>
<td>Infrared /</td>
<td>Panasonic / WTKF2311</td>
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<tr>
<td>Access Point</td>
<td></td>
<td></td>
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<tr>
<td>Touch Panel</td>
<td>Android 4.2 ; DDR3 1G ; Wi-Fi</td>
<td>Asus / Nexus 7</td>
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### Equipment

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<td>Smart Weather Station</td>
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<td>Asus/Nexus</td>
<td>Touch Panel</td>
<td>Android 4.2 ; DDR3 1G ; Wi-Fi</td>
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<td>Motion Detector</td>
<td>Infrared /</td>
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<tr>
<td>Panasonic</td>
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<td>Jetec</td>
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<td>Horng Lih</td>
<td>Smoke Detector</td>
<td>Action concentration : 15% Alarm : 90db / fm</td>
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<td>Temperature &amp; Humidity</td>
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<tr>
<td>Airtek</td>
<td>Air Quality (CO2)</td>
<td>±30 ppm ±2% of Reading</td>
</tr>
</tbody>
</table>
Front View

Monitoring Panel
Dimensions: 50x40x15 cm
Free Space Left For The Monitoring Panel: 100x60x20 cm

5.1 Living Room
5.2 Living Room
5.3 Living Room
5.4 Bed Room
5.5 Kitchen Room
6.1 Fridge
6.2 Freezer
6.3 Clothes Washer
6.4 Dish Washer
6.5 Oven
6.6 Oven

Monitoring Power Line
Monitoring Ethernet 1
Monitoring Ethernet 2
<table>
<thead>
<tr>
<th>Tag</th>
<th>Components</th>
<th>Manufacturer</th>
<th>Model/Type</th>
<th>Qty</th>
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<td>Delta</td>
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<td>4</td>
<td>Box</td>
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<td>PA33</td>
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<td>Shihlin</td>
<td>BPH40, 2P</td>
<td>1</td>
<td>2U/275V, Up: 1.4kV, In:20kA (50/60Hz)</td>
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<td>8</td>
<td>BESS</td>
<td>Delta</td>
<td>Rem-E:ES920</td>
<td>1</td>
<td>Battery Energy Storage System</td>
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Inverter AC side overcurrent Calculations:

Input PV power: 5,000W
Output current: 5,000W / 230V = 21.74Aac
Overcurrent protection:  
21.74A * 1.25 = 27.18Aac
Selection 32AT ELCB

Inverter AC output conductor:
Output Max. current = 21.74 Aac
1.56 * 21.74A = 33.91A
Selected conductor: XLPE-LSHF 4mm²

SPD selection of Calculations:
Buildings in cities use TYPE 2-class II choose In:20kA (50/60Hz)
Max continuous operating voltage Uc: 230V*1.1=253V choose SPD
Insulation voltage of the equipment 1.2~2kV choose Up:1.4kV

From SDE General Connection BOX
1Φ230V 50Hz

DELTA ELECTRONICS, INC.
Tag | Components             | Manufacturer | Model       | Qty | Notes                                     
--- |------------------------|--------------|-------------|-----|-------------------------------------------
①  | SDE Grid               |              |             |     |                                           
②  | Smart Meter           | Schneider    | PM3200      |     |                                           
③  | PV array               | DelSolar     | D6P250B3A   | 24  |                                           
④  | DC Protections         | HI BOX       |             |     |                                           
⑤  | Inverter               | Delta        | Solivia 5.0 |     |                                           
⑥  | Power Meter            | Schneider    | PM3200      |     |                                           
⑦  | BESS                   | Delta        |             |     | Battery Energy Storage System             

① SDE Grid 230V 50Hz
② Smart Meter
③ PV array
④ DC Protections
⑤ Inverter
⑥ Power Meter
⑦ BESS
RS485
AC Load
Legend / Brand / Model

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<th>Brand</th>
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<td>KFN 37452</td>
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<td>Dish Washer</td>
<td>MIELE</td>
<td>G6995 SCVI K20</td>
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<tr>
<td>Oven</td>
<td>MIELE</td>
<td>H2161 B CLST</td>
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<tr>
<td>TV</td>
<td>Samsung</td>
<td>F4000 Series 4</td>
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<tr>
<td>PC</td>
<td>Asus</td>
<td>Transformer AO P1901</td>
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Refrigeration
Dish Washer
Oven
TV
PC

Couch
Piping
Shaft
Indoor unit
Humidifier
UP
Indoor unit

Note:
- DN2013/04/01 SD Submission
- ST 2013/11/01 DD Submission
- ST 2014/03/03 CD Submission
- ST 2014/04/30 CD Submission
- ST 2014/06/02 CD Submission
### Phase | Port | Arrival | Departure
--- | --- | --- | ---
1 | KAOHSIUNG | 2014/4/29 10:00 | 2014/4/30 08:00
2 | YANTIAN | 2014/5/1 08:00 | 2014/5/2 08:00
3 | SINGAPORE | 2014/5/5 16:00 | 2014/5/6 22:00
4 | ROTTERDAM | 2014/5/26 01:00 | 2014/5/27 10:00
5 | LE HAVRE | 2014/6/1 06:00 | 2014/6/2 06:00

### Shipping, Freight, Demand, Process Timetable

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<td>Declaration process guidance</td>
<td>Customs detail, customs declaration</td>
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<td>Packaging and protective materials to provide</td>
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<td>France</td>
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<td>Transportation back to Taiwan</td>
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### ASSEMBLY TRUCKS

#### TRUCK-1 FLATBED
- **Type:** Flat
- **Model:** Tool
- **Package No.:** N80
- **Assembly No.:** 1
- **QTY:** 1
- **Weight(kg):** 150
- **Dimensions (mm):**
  - **L:** 1500
  - **W:** 1500
  - **H:** 1500
- **Arrival:** 6/16 08:00

#### TRUCK-2 LOW LOADER
- **Type:** Flat
- **Model:** Tool
- **Package No.:** N93
- **Assembly No.:** 1
- **QTY:** 1
- **Weight(kg):** 10
- **Dimensions (mm):**
  - **L:** 1500
  - **W:** 900
  - **H:** 800
- **Arrival:** 6/16 12:00

#### TRUCK-3 LOW LOADER
- **Type:** Flat
- **Model:** Wooden Sandbox
- **Package No.:** P27
- **Assembly No.:** 4
- **QTY:** 1
- **Weight(kg):** 150
- **Dimensions (mm):**
  - **L:** 2100
  - **W:** 1300
  - **H:** 1090
- **Arrival:** 6/16 14:00

### Dimensions (mm)

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<th>Type</th>
<th>Designation</th>
<th>Package No.</th>
<th>Assembly No.</th>
<th>QTY</th>
<th>Weight(kg)</th>
<th>L</th>
<th>W</th>
<th>H</th>
<th>Arrival</th>
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### Dimensions (mm)

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<th>Weight(kg)</th>
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<th>W</th>
<th>H</th>
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- **ST 2013/11/01 DD Submission**
- **Unit**
- **Consulting Engineer**
- **Mark Date**
- www.sde.tw
- **Checked by**

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### TRUCK-4 LOW LOADER
7/16 01:00

### TRUCK-6 LOW LOADER
7/16 06:00

### TRUCK-6 FLATBAD
7/16 12:00

### Table: Disassembly of Trucks for Shipment 2

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### Table: Disassembly of Trucks for Shipment 2 (continued)

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<th>L (mm)</th>
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### Table: Disassembly of Trucks for Shipment 2 (continued)

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### DISASSEMBLY TRUCKS

#### SHIPMENT 3

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- ST 2013/11/01 DD Submission
- ST 2014/03/03 CD Submission
- ST 2014/04/30 CD Submission
- ST 2014/06/02 CD Submission

#### Truck Specifications:
- **TRUCK-7 FLATBED**
  - 7/16 23:00

- **TRUCK-8 FLATBED**
  - 7/17 09:00

- **TRUCK-9 FLATBED**
  - 7/17 15:00

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**Project:**

**Institution:**

**Team Name:**

**Checked by:**

**Drawn by:**

**Scale:**

**DWG. Title:**

**DWG. No.:**

**Address:**

**Contact:**

**Consultants:**

**Consultants:**

**Website:** www.sde.tw
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### DISASSEMBLY TRUCKS

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**TRUCK–16 FLATBED** 7/19 12:00

**TRUCK–14 FLATBED** 7/19 04:00

**TRUCK–15 FLATBED** 7/19 08:00
Site Preparation

<table>
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<tr>
<th>Step</th>
<th>1</th>
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<tbody>
<tr>
<td>Work Detail</td>
<td>Datum Point</td>
<td>Spacing</td>
<td>Sand Box</td>
<td>Footing Set</td>
<td>Coordinate positioning</td>
<td>Horizontal correction</td>
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<tr>
<td>Water</td>
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<td>4</td>
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</tbody>
</table>

Note:
- Datum Point
- Spacing
- Sand Box
- Footing Set
- Coordinate positioning
- Horizontal correction
- Assembly Phase 1

Scale: DWG. Title: DWG. No.
Assembly Phase 2

<table>
<thead>
<tr>
<th>Step</th>
<th>Work Detail</th>
<th>Modular Unit 1~5</th>
<th>Modular Unit 11~12</th>
<th>M.E.P System</th>
<th>Unit combination</th>
<th>Building positioning correction</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Work Detail</td>
<td>Modular Unit</td>
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<td>M.E.P System</td>
<td>Unit combination</td>
<td>Building positioning correction</td>
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<tr>
<td>2</td>
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<td>Modular Unit</td>
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<td>Modular Unit</td>
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Note:
- Worker: 8
- Unit: 4

Assembly Phase 2

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## Assembly Phase 6

### Work Detail

<table>
<thead>
<tr>
<th>Step</th>
<th>Work Detail</th>
<th>数量</th>
<th>1</th>
<th>2</th>
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<th>8</th>
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<tbody>
<tr>
<td>1</td>
<td>Solar Panel &amp; Solar Panel Electricity System</td>
<td>8</td>
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<td></td>
<td></td>
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</tr>
<tr>
<td>2</td>
<td>Bayer Roof Panel</td>
<td>4</td>
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<td>3</td>
<td>Louver Panel</td>
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</tbody>
</table>

### Note

- Step: 1, 2, 3, 4, 5, 6, 7, 8, 9

**Scale:** 1/50

**Date:** 2013/04/01 SD Submission

**Mark Date Description:** DN2013/04/01 SD Submission

**Check by:** DN

**Drawn by:** MS

**Unit:** -

**Assembly Phase 6:**

**Note:**

- Worker: 1, 4, 8

**Dwg. No.:** SO-206

**Page:** 254
### Note

- **Woker:**
- **Work Deatail:**
- **Step:**
- **Waterproof:**

<table>
<thead>
<tr>
<th>Step</th>
<th>1</th>
<th>2</th>
<th>3</th>
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<th>7</th>
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<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work Detail</td>
<td>Roof Waterproof</td>
<td>Equipment &amp; Lighting Test</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>Worker</td>
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<td>6</td>
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**Assembly Phase 9**
### Assembly Phase 10

<table>
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<tr>
<th>Step</th>
<th>Work Detail</th>
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<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Furnishing and Planting</td>
<td>Outdoor Terrace Structure &amp; Handrail Lighting</td>
<td><strong>8</strong></td>
<td><strong>8</strong></td>
<td><strong>8</strong></td>
<td><strong>8</strong></td>
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<tr>
<td></td>
<td>Home Detail</td>
<td>Outdoor Planting &amp; Green Core Planting</td>
<td>Furniture</td>
<td>Appliances</td>
<td>System Test</td>
<td>Lot Clean</td>
<td></td>
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</tr>
<tr>
<td></td>
<td>Note</td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>
Furnishing and Planting

<table>
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<tr>
<th>Step</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work detail</td>
<td>Plants removing</td>
<td>accessory removing</td>
<td>Furniture removing</td>
<td>Kitchen/Appliance/Lamp equipment</td>
<td>Machinery room</td>
<td>Outside pipeline/Lamps</td>
<td>Outside handrail</td>
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<tr>
<td>Worker</td>
<td>8</td>
<td>4</td>
<td>6</td>
<td>4</td>
<td>2</td>
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Note: Disassembly Phase 1
Outdoor Deck Units

<table>
<thead>
<tr>
<th>Step</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work detail</td>
<td>Outside WPC/Deck</td>
<td>Outside footing</td>
<td>East/West Bayer board</td>
<td>South Electric Blinds</td>
</tr>
<tr>
<td>Worker</td>
<td>8</td>
<td>2</td>
<td>5</td>
<td>3</td>
</tr>
</tbody>
</table>

Note: Disassembly Phase 2
Ground Floor

Step | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9
---|---|---|---|---|---|---|---|---|---
Work detail | 1F Interior floor | Aluminium window | Sensor removing | 1F Ceiling | 1F Wooden wall | Bathroom | Kitchen Island | Work Station removing | Thermal wall removing
Worker | 4 | 2 | 2 | 4 | 6 | 4 | 3 | 4 | 4
Note | | | | | | | | | |

Disassembly Phase 3
<table>
<thead>
<tr>
<th>Step</th>
<th>Work detail</th>
<th>Worker</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>2F WPC</td>
<td>3</td>
</tr>
<tr>
<td>2</td>
<td>2F Equipment/Appliance</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>Water wall removing</td>
<td>8</td>
</tr>
<tr>
<td>4</td>
<td>2F pipeline</td>
<td>4</td>
</tr>
<tr>
<td>5</td>
<td>Green core</td>
<td>4</td>
</tr>
<tr>
<td>6</td>
<td>1F Upper wooden box</td>
<td>8</td>
</tr>
<tr>
<td>7</td>
<td>2F Upper wooden box</td>
<td>8</td>
</tr>
<tr>
<td>8</td>
<td>Window/Door disassembly</td>
<td>4</td>
</tr>
<tr>
<td>9</td>
<td>Tea terrace/Entrance WPC</td>
<td>8</td>
</tr>
</tbody>
</table>

Mezzanine Floor

Disassembly Phase 4
Roof Panels

Step | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8
--- | --- | --- | --- | --- | --- | --- | --- | ---
Work detail | Roof cover board | North Bayer board | Roof ridge Fans | Smart skin | Solar panel | North Electric Blinds | Solar water heater | Water tank
Worker | 4 | 3 | 4 | 3 | 3 | 4 | 2 | 6
Note

Disassembly Phase 5

Worker

Smart skin

Solar panel

North Electric Blinds

Solar water heater

Water tank

Roof cover board

North Bayer board

Roof ridge Fans

Step 5

Worker

Note
<table>
<thead>
<tr>
<th>Step</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work detail</td>
<td>E1,E2,E3,E4 unit disassembly</td>
<td>Roof Unit 5~7 disassembly</td>
<td>Roof Unit 9~11 disassembly</td>
<td>East column</td>
</tr>
<tr>
<td>Worker</td>
<td>5</td>
<td>3</td>
<td>4</td>
<td>3</td>
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</table>

Note: Worker detail per Step.

Disassembly Phase 6
Disassembly Phase 7

West Roof Structure

Step	1	2	3	4	5

Work detail	Roof Unit 1~3 removing	2F unit disassembly	Roof Unit 9~11 disassembly	West column	East/North canopy

Worker	4	6	4	3	6

Note:
Disassembly Phase 8

Tea Terrace Units

<table>
<thead>
<tr>
<th>Step</th>
<th>1</th>
<th>2</th>
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</thead>
<tbody>
<tr>
<td>Work detail</td>
<td>Unit 6~10 disassembly</td>
<td>Tea terrace footing</td>
</tr>
<tr>
<td>Worker</td>
<td>4</td>
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</table>

Note: Worker Work detail Step Unit
Disassembly Phase 9

<table>
<thead>
<tr>
<th>Step</th>
<th>Work detail</th>
<th>Worker</th>
<th>Note</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>Unit 1~5 disassembly</td>
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</tr>
<tr>
<td>2</td>
<td>Unit 1~5 removing</td>
<td>4</td>
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</tbody>
</table>
**Note**

- **Worker**
  - Step 1: 6
  - Step 2: 4
  - Step 3: 8
  - Step 4: 10

- **Work detail**
  - Step 1: Unit 11~12 disassembly
  - Step 2: Unit 11~12 removing
  - Step 3: Footing removing
  - Step 4: Site cleaning

- **Unit**
  - Step 1: 11~12
  - Step 2: 11~12
  - Step 3: Footing
  - Step 4: Site

**Disassembly Phase 10**
VEHICLE ACCESS TO LOT

SITE DESCRIPTION
Lot number: R
Lot size: 20 x 20 m (400m²)
Elements around the lot:
- Our lot situated near the main path export
- The track route overlaps with our loading/unloading area

ROUTE TO THE NEAREST HOSPITAL

A: La Cite du Soleil
Head south on "Allée des Matelots"
- Turn right to stay on "Allée des Matelots"
- Turn left onto "Rue de l'Indépendance Américaine"
- Continue onto "Rue Saint-Julien"
- Turn right onto "Av. Neveu Sud"
- Slight left onto "Av. Rockefeller"
- Continue onto "Rue Hoche/D186"
- Continue onto "Rue Carnot"
- Slight right onto "Rue des Réservoirs"
- At the roundabout, take the 2nd exit onto "Bd du Roi/D186"
- At the roundabout, take the 4th exit onto "Rue de Versailles"
- Keep left to stay on "Rue de Versailles"
- At the roundabout, take the 4th exit

Distance: 6 km, 15 mins

B: 177 Rue de Versailles
Address: 177 Rue de Versailles, 78150 Le Chesnay, France
Tel.: 01.39.63.91.33

HEALTH AND SAFETY IN THE LOT AND SURROUNDINGS

1. A: La Cite du Soleil
2. B: 177 Rue de Versailles

UNIT

ST 2013/04/01 SD Submission
ST 2013/11/01 DD Submission
ST 2014/03/03 CD Submission
ST 2014/04/30 CD Submission
ST 2014/06/02 CD Submission

DN -

NCTU Architecture
National Chiao Tung University
Project:
Institution:
Team Name:
Checked by:
Scale
DWG. Title
DWG. No.
Address:
Contact:
www.sde.tw

ROUTE TO THE NEAREST POLICE OFFICE

A: La Cite du Soleil
- Head northeast on Allée des Matelots toward D10
- Turn left onto D10
- Slight right onto Av. de la Division Leclerc/D10
- At the roundabout, take the 1st exit onto the Av. des Frères Lumière/D127 ramp
- Keep left at the fork, follow signs for D127/Guyancourt/Quartier saint-quentin
- Turn left onto Av. des Frères Lumière/D127
- Turn right onto Rue de la Division Leclerc

B: Commissariat de Police
Address: 1 Rue de la Division Leclerc
8280 Guyancourt, France

ROUTE TO THE FIRE STATION

A: La Cite du Soleil
- Head northeast on Allée des Matelots toward D10
- Turn left onto D10
- Slight right onto Av. de la Division Leclerc/D10
- Turn right onto Av. Jean Jaurès/D11
Continue to follow D11
- At the roundabout, take the 2nd exit onto Rue Jules Massenet/D98
- Turn left onto D98

B: Sapeurs Pompiers des Yvelines
Address: Avenue de Pépinière
78450 Villepreux, France

Distance: 11.3km, 18 mins
Distance: 5.8km, 9 mins
**TRUCKS ROUTE FROM "Le Havre" TO "La Cite du Soleil"**

**A: LE HAVRE**
- Head west on Av. du Général Leclerc toward Pl. de l'Hôtel de ville
- Take the 1st left onto Pl. de l'Hôtel de ville
- Turn right onto Bd de Strasbourg
- Continue onto Cours Lafayette
- Continue onto Quai Colbert
- Slight left onto D6015
- Keep left to stay on D6015
- Continue onto N82
- Continue onto A131
- At the roundabout, take the 3rd exit onto N182
- Slight left onto E5
- Continue onto A131/E5
- Merge onto A13/E5
- Take the exit onto A12 toward Saint-Quentin-en-Yvelines
- Take the exit toward Evry/Lyon/Dreux/Saint-Quentin-en-Yvelines/Bois-D'Arcy/Versailles-Satory

**B: La Cite du Soleil**
- Keep right at the fork, follow signs for Saint-Cyr-l'École
- Turn left onto D129
- Slight right onto Volta/D129
- Continue to follow D129
- At the roundabout, take the 3rd exit onto Rue Emile Zola
- Slight right to stay on Av. Pierre Curie/D10
- Turn right onto Allée des Matelots

**PROBLEM** | **RISKS** | **ADOPTED MEASURES**
---|---|---
Dangers caused by weather | Heavy rain due to slippery floors | Drive slowly
Traffic problem during shipping | Traffic jam due to spent more time | To do another preparation during waiting for trucks
Road contraction | Road blocked | Plan B (other route)
Complex traffic system | Get lost | Arrange the route clearly before departure

Distance: 191 km, 1 hour 56 mins
### HEALTH AND SAFETY DURING THE INSIDE LOGISTIC SITE VIEW

<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>RISKS</th>
<th>ADOPTED MEASURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dangers caused by weather</td>
<td>Ground subsidence</td>
<td>Provision of lifting devices</td>
</tr>
<tr>
<td></td>
<td>Getting stuck of heavy equipment</td>
<td>Support plates for heavy vehicles' legs</td>
</tr>
<tr>
<td></td>
<td>Getting stuck of heavy components</td>
<td></td>
</tr>
<tr>
<td>Dangers due to the great number of people on</td>
<td>Unclear arrangement danger of injury increases</td>
<td>No access for unauthorized persons</td>
</tr>
<tr>
<td>shipping to the site</td>
<td></td>
<td>Access only in coordination with construction/shift supervisor</td>
</tr>
<tr>
<td></td>
<td></td>
<td>High visibility vest in compliance with the color scheme required by site</td>
</tr>
<tr>
<td></td>
<td></td>
<td>operations for every person entering construction site</td>
</tr>
<tr>
<td>Too many access possibilities to the lot</td>
<td>Unclear arrangement danger of unauthorized</td>
<td>Security officers for control</td>
</tr>
<tr>
<td></td>
<td>access</td>
<td>Site fence</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Clearly marked pedestrian access to construction site</td>
</tr>
<tr>
<td>Too small distances from lot and trees/plants</td>
<td>Obstruction of vehicle’s movements</td>
<td>No changes possible</td>
</tr>
<tr>
<td></td>
<td>Obstructions due to small distances between</td>
<td>- steady crane</td>
</tr>
<tr>
<td></td>
<td>construction grounds</td>
<td>- site fence</td>
</tr>
<tr>
<td></td>
<td>Obstruction of vehicle’s movements</td>
<td>- unloading/loading materials in the storage area inside the lot</td>
</tr>
<tr>
<td>Ground limitations</td>
<td>Obstruction / limitations through on-site</td>
<td>- unauthorized and external persons who invade the lot</td>
</tr>
<tr>
<td></td>
<td>security installations</td>
<td></td>
</tr>
</tbody>
</table>

- steady crane
- site fence
- unloading/loading materials in the storage area inside the lot
- unauthorized and external persons who invade the lot
- securing existing escape routes
- no dangerous works close to this area
THE SAFETY PLAN AND COORDINATION PHASE

Plan of site

<table>
<thead>
<tr>
<th>PROBLEM</th>
<th>RISKS</th>
<th>ADOPTED MEASURES</th>
</tr>
</thead>
<tbody>
<tr>
<td>Too small property lines</td>
<td>Collision with other people</td>
<td>Marking dangerous parts stored</td>
</tr>
<tr>
<td></td>
<td>Collision with parts stored</td>
<td>High visibility vests</td>
</tr>
<tr>
<td></td>
<td>Discomfort to the maneuvers</td>
<td>Guiding gear during maneuvers with two pedestrians</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Designing a delivery zone</td>
</tr>
<tr>
<td>Dangers due to the great number of people in the site</td>
<td>Increased dangers of injury muddle</td>
<td>High visibility vest</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Denial of access to other people</td>
</tr>
<tr>
<td>Trucks passway</td>
<td>Pass by operation area</td>
<td>Arrange signpostings</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Heavy rain or rain of long-term</td>
<td>Degradation of the land</td>
<td>Use anti-slide mats on slipping surfaces</td>
</tr>
<tr>
<td></td>
<td>Electric shock due to humidity</td>
<td>Regularly remove water from the floor with scrapers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Replacement of defective cables</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Waterproof plugs</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Protective clothes</td>
</tr>
<tr>
<td>Ground limitations</td>
<td>Obstruction / limitations through on-site security installations</td>
<td>Securing existing escape routes</td>
</tr>
<tr>
<td></td>
<td></td>
<td>No dangerous works close to this area</td>
</tr>
<tr>
<td>Traffic and parking of the crane or a truck</td>
<td>Shock, collisions with</td>
<td>Respect the rules of the road</td>
</tr>
<tr>
<td></td>
<td>pedestrians, existing equipment or vehicle</td>
<td>Parking places reserved for this purpose</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Lash with appropriate means and in sufficient number</td>
</tr>
</tbody>
</table>

HEALTH AND SAFETY DURING LOAD / UNLOAD

DN2013/04/01 SD Submission
DN2013/07/01 DD Submission
ST 2013/11/01 DD Submission
ST 2014/03/03 CD Submission
ST 2014/04/30 CD Submission
ST 2014/06/02 CD Submission
PPE MUST BE WORN ON THIS SITE
WHERE THE WORKER ARE:
On the ground

ALL SAFETY RULES MUST BE FOLLOWED

Necessities for Work:

- Security helmet
- Safety vest
- Boots
- Gloves
- Safety glasses
- Mask
- Hard hat

Steps:

<table>
<thead>
<tr>
<th>Step</th>
<th>Work Detail</th>
<th>Datum Point</th>
<th>Spacing</th>
<th>Sand Box</th>
<th>Coordinate positioning</th>
<th>Horizontal correction</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
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<td></td>
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</tr>
</tbody>
</table>

Note:

- All safety rules must be followed.
- Where the worker are on the ground.
### Modular Unit Phase

#### Work Detail

<table>
<thead>
<tr>
<th>Step</th>
<th>Work Detail</th>
<th>Modular Unit</th>
<th>M.E.P System</th>
<th>Unit Combination</th>
<th>Modular Unit 11~12</th>
<th>Unit</th>
<th>Building Positioning correction</th>
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<tbody>
<tr>
<td>1</td>
<td>Modular Unit 1-5</td>
<td>Modular Unit</td>
<td>M.E.P System</td>
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<td></td>
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</tr>
<tr>
<td>2</td>
<td>Modular Unit 11~12</td>
<td>Under Unit</td>
<td></td>
<td></td>
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<td></td>
</tr>
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<td>3</td>
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</tr>
</tbody>
</table>

#### Note

- **Where the worker are:**
  - On the ground
  - On the mezzanine floor

- **ALL SAFETY RULES MUST BE FOLLOWED**

- **Worker:**
  - 8
  - 4
  - 4
  - 8
Main Structure & Interior Insulation & M.E.P System Phase

Where the worker are:
On the ground
On the Floor
ALL SAFETY RULES MUST BE FOLLOWED

Note
ALL SAFETY RULES MUST BE FOLLOWED

Worker
Stair Unit and Terrace Unit Assembly and Lifting 5
Interior Insulation Assembly 4
M.E.P System Tube and trunking 4
Interior Upper Floor Insulation 8

Step
1 2 3 4 5 6 7 8 9

Work Detail
Stair Unit and Terrace Unit Assembly and Lifting
Interior Insulation Assembly
M.E.P System Tube and trunking
Interior Upper Floor Insulation

DN2013/04/01 SD Submission
DN2013/07/01 DD Submission
ST 2013/11/01 DD Submission
ST 2014/03/03 CD Submission
ST 2014/04/30 CD Submission
ST 2014/06/02 CD Submission

ASSEMBLY PHASE 3
Where the worker are:
On the ground
On the mezzanine floor
On the Floor

ALL SAFETY RULES MUST BE FOLLOWED

Additional components & M.E.P System Shaft Phase

Step | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9
--- | --- | --- | --- | --- | --- | --- | --- | --- | ---
Work Detail | Additional components | M.E.P System Shaft

Worker | 8 | 4

Note: All safety rules must be followed where the worker are:
- On the ground
- On the mezzanine floor
- On the floor

ALL SAFETY RULES MUST BE FOLLOWED.
Main Structure & Roof Unit Phase

<table>
<thead>
<tr>
<th>Step</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work Detail</td>
<td>2F Main Structure</td>
<td>Roof Unit</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note:
Worker

Where the worker are:
On the ground
On the mezzanine floor
On the Floor
On the roof

ALL SAFETY RULES MUST BE FOLLOWED

- Wear hard hat
- Wear protective glasses
- Wear gloves
- Wear safety shoes
- Use lifting equipment properly
- Follow crane operators' instructions

ASSEMBLY PHASE 5
Solar Panel & Bayer Roof Panel & Louver Panel Phase

Where the worker are:
On the ground      On the mezzanine floor
On the Floor       On the roof

ALL SAFETY RULES MUST BE FOLLOWED

Where the worker are:
On the ground
On the Floor
On the roof

Worker
Work Detail  Solar Panel & Solar Panel Electricity System  Bayer Roof Panel  Louver Panel

Note

Step

1  2  3  4  5  6  7  8  9

1  2  3  4  5  6  7  8  9

1  2  3  4  5  6  7  8  9

1  2  3  4  5  6  7  8  9

Worker 8  4  8

Work Deatail  Solar Panel & Solar Panel Electricity System  Bayer Roof Panel  Louver Panel

Note
Where the worker are:
On the ground
On the Floor

ALL SAFETY RULES MUST BE FOLLOWED

Green Core & M.E.P Wire & Water System Phase

Step | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9
--- | --- | --- | --- | --- | --- | --- | --- | --- | ---
Work Detail | Green Core Structure & Panel & Water System | M.E.P Wiring & Piping System
Worker | 8 | 4

Note

Green Core & M.E.P Wire & Water System Phase
Where the worker are:

- On the ground
- On the Floor
- On the mezzanine floor
- On the roof

ALL SAFETY RULES MUST BE FOLLOWED
Where the worker are:
On the ground  On the mezzanine floor
On the Floor  On the roof
ALL SAFETY RULES MUST BE FOLLOWED
Outdoor Terrace & Planting & Furniture Phase

<table>
<thead>
<tr>
<th>Step</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work Detail</td>
<td>Outdoor Terrace Structure &amp; Handrail &amp; Lighting</td>
<td>Outdoor Planting &amp; Green Core Planting</td>
<td>Furniture</td>
<td>Appliances</td>
<td>System Test</td>
<td>Lot Clean</td>
<td></td>
<td></td>
<td></td>
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</tbody>
</table>

Worker

8
6
6
6
6
6

Note

Where the worker are:
On the ground
On the Floor

ALL SAFETY RULES MUST BE FOLLOWED

Where the worker are:
On the mezzanine floor
Where the worker are:
- On the ground
- On the mezzanine floor
- On the Floor
- On the roof

ALL SAFETY RULES MUST BE FOLLOWED

Health and Safety During Maintenance

Where the worker are:
- On the ground
- On the mezzanine floor
- On the Floor
- On the roof

ALL SAFETY RULES MUST BE FOLLOWED
### Disassembly Phase 1

Where the worker are:
- On the ground
- On the mezzanine floor

ALL SAFETY RULES MUST BE FOLLOWED

<table>
<thead>
<tr>
<th>Step</th>
<th>Work detail</th>
<th>Worker</th>
<th>Work detail</th>
<th>Worker</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Plants removing</td>
<td>6</td>
<td>accessory removing</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>Furniture removing</td>
<td>8</td>
<td>Kitchen/Appliance/Lamp equipment</td>
<td>6</td>
</tr>
<tr>
<td>3</td>
<td>Machinery room</td>
<td>4</td>
<td>Outside pipeline/Lamps</td>
<td>2</td>
</tr>
<tr>
<td>4</td>
<td>Outside handrail</td>
<td>4</td>
<td></td>
<td></td>
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</tbody>
</table>

**Note:**
- Where the worker are:
  - On the ground
  - On the mezzanine floor

- ALL SAFETY RULES MUST BE FOLLOWED

**Worker Details:**
- Step 1: Plants removing, Worker 6
- Step 2: Accessory removing, Worker 4
- Step 3: Furniture removing, Worker 8
- Step 4: Kitchen/Appliance/Lamp equipment, Worker 6
- Step 5: Machinery room, Worker 4
- Step 6: Outside pipeline/Lamps, Worker 2
- Step 7: Outside handrail, Worker 4
Outside disassembly

<table>
<thead>
<tr>
<th>Step</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
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</thead>
<tbody>
<tr>
<td>Work detail</td>
<td>Outside WPC/Deck</td>
<td>Outside footing</td>
<td>East/West Bayer board</td>
<td>South Electric Blinds</td>
</tr>
<tr>
<td>Worker</td>
<td>8</td>
<td>2</td>
<td>5</td>
<td>3</td>
</tr>
</tbody>
</table>

Note:

Where the worker are:
On the ground
On the Floor

ALL SAFETY RULES MUST BE FOLLOWED

Worker

ALL SAFETY RULES MUST BE FOLLOWED

Worker

Where the worker are:
On the ground
On the Floor

ALL SAFETY RULES MUST BE FOLLOWED

Worker

WHERE THE WORKER ARE:
ON THE GROUND
ON THE FLOOR

ALL SAFETY RULES MUST BE FOLLOWED

Worker

WHERE THE WORKER ARE:
ON THE GROUND
ON THE FLOOR

ALL SAFETY RULES MUST BE FOLLOWED

Worker

WHERE THE WORKER ARE:
ON THE GROUND
ON THE FLOOR

ALL SAFETY RULES MUST BE FOLLOWED

Worker

WHERE THE WORKER ARE:
ON THE GROUND
ON THE FLOOR

ALL SAFETY RULES MUST BE FOLLOWED

Worker

WHERE THE WORKER ARE:
ON THE GROUND
ON THE FLOOR

ALL SAFETY RULES MUST BE FOLLOWED

Worker
Disassembly Phase 3

First Floor disassembly

<table>
<thead>
<tr>
<th>Step</th>
<th>Work detail</th>
<th>Worker</th>
<th>Note</th>
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</thead>
<tbody>
<tr>
<td>1</td>
<td>1F Interior floor</td>
<td>4</td>
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</tr>
<tr>
<td>2</td>
<td>Aluminium window</td>
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<td>3</td>
<td>Sensor removing</td>
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</tr>
<tr>
<td>4</td>
<td>1F Ceiling</td>
<td>4</td>
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</tr>
<tr>
<td>5</td>
<td>1F Wooden wall</td>
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<td>6</td>
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<td>4</td>
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<td>7</td>
<td>Kitchen Island</td>
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<tr>
<td>8</td>
<td>Work Station removing</td>
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</tr>
<tr>
<td>9</td>
<td>Thermal wall removing</td>
<td>4</td>
<td></td>
</tr>
</tbody>
</table>

Where the worker are:
On the ground
On the Floor

ALL SAFETY RULES MUST BE FOLLOWED

WHERE THE WORKER ARE:

- On the ground
- On the Floor

ALL SAFETY RULES MUST BE FOLLOWED

- Wear protective clothing
- Wear protective gloves
- Use appropriate tools
- Follow all safety regulations

Note:

Worker's location:
- On the ground
- On the Floor

ALL SAFETY RULES MUST BE FOLLOWED
Second Floor disassembly

<table>
<thead>
<tr>
<th>Step</th>
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<th>3</th>
<th>4</th>
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<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
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</thead>
<tbody>
<tr>
<td>Work detail</td>
<td>2F WPC</td>
<td>2F Equipment/Appliance</td>
<td>Water wall removing</td>
<td>2F pipeline</td>
<td>Green core</td>
<td>1F Upper wooden box</td>
<td>2F Upper wooden box</td>
<td>Window/Door disassembly</td>
<td>Tea terrace/Entrance WPC</td>
</tr>
<tr>
<td>Worker</td>
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<td>8</td>
<td>8</td>
<td>4</td>
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</table>

Note:

Where the worker are:
On the ground
On the mezzanine floor
On the Floor

ALL SAFETY RULES MUST BE FOLLOWED

Where the worker are:

- On the ground
- On the mezzanine floor
- On the Floor

ALL SAFETY RULES MUST BE FOLLOWED.
Roof disassembly

Table:

<table>
<thead>
<tr>
<th>Step</th>
<th>Work detail</th>
<th>Worker</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Roof cover board</td>
<td>4</td>
</tr>
<tr>
<td>2</td>
<td>North Bayer board</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>Roof ridge Fans</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>Smart skin</td>
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<tr>
<td>5</td>
<td>Solar panel</td>
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</tr>
<tr>
<td>6</td>
<td>North Electric Blinds</td>
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</tr>
<tr>
<td>7</td>
<td>Solar water heater</td>
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<tr>
<td>8</td>
<td>Water tank</td>
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</tbody>
</table>

Note:

Where the worker are:
On the ground     On the mezzanine floor
On the Floor      On the roof

ALL SAFETY RULES MUST BE FOLLOWED

Worker locations:
- On the ground
- On the mezzanine floor
- On the floor
- On the roof

ALL SAFETY RULES MUST BE FOLLOWED
### East Roof construction disassembly

<table>
<thead>
<tr>
<th>Step</th>
<th>Work detail</th>
<th>Worker</th>
<th>Note</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>E1,E2,E3,E4 unit disassembly</td>
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<tr>
<td>2</td>
<td>Roof Unit 5~7 disassembly</td>
<td>3</td>
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<tr>
<td>3</td>
<td>Roof Unit 9~11 disassembly</td>
<td>4</td>
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</tr>
<tr>
<td>4</td>
<td>East column</td>
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<td></td>
</tr>
</tbody>
</table>

**Note:**
- Where the worker are:
  - On the ground
  - On the Floor
  - On the mezzanine floor
  - On the roof

**ALL SAFETY RULES MUST BE FOLLOWED**

- Where the worker are:
  - On the ground
  - On the Floor
  - On the mezzanine floor
  - On the roof

**ALL SAFETY RULES MUST BE FOLLOWED**

Worker: [Worker's name]
Step: [Step number]
Note: [Note]
Unit: [Unit name]

**Disassembly Phase 6**

**SC**

**Project:**
- **Institution:** NCTU/UNICODE
- **Address:** 1001 Ta-Hsueh Road, Hsinchu City 30010, Taiwan
- **Contact:** www.sde.tw

**Consultants:**

**Drawn by:**

**Checked by:**

**Unit:**

**Scale:**

**DWG. Title:**

**DWG. No.:**

**PAGE:** HS-606
### Disassembly Phase 7

**Where the worker are:**
- On the ground
- On the mezzanine floor
- On the Floor

**ALL SAFETY RULES MUST BE FOLLOWED**

<table>
<thead>
<tr>
<th>Step</th>
<th>Work detail</th>
<th>2F unit disassembly</th>
<th>Roof Unit 9-11 disassembly</th>
<th>West column</th>
<th>East/North canopy</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Roof Unit 1-3 removing</td>
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</tr>
<tr>
<td>2</td>
<td>2F unit disassembly</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Roof Unit 9-11 disassembly</td>
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<td>5</td>
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</tbody>
</table>

**Note:**
- Where the worker are:
  - On the ground
  - On the mezzanine floor

**Tea terrance construction disassembly**
West Roof construction disassembly

Where the worker are:
On the ground
On the Floor
On the mezzanine floor
ALL SAFETY RULES MUST BE FOLLOWED

Disassembly Phase 8
Unit 6~10 disassembly Tea terrace footing

Worker 4 4
Note

Where the worker are:
On the ground
On the Floor
On the mezzanine floor
ALL SAFETY RULES MUST BE FOLLOWED

Disassembly Phase 8
Unit 6~10 disassembly Tea terrace footing

Worker 4 4
Note

Where the worker are:
On the ground
On the Floor
On the mezzanine floor
ALL SAFETY RULES MUST BE FOLLOWED

Disassembly Phase 8
Unit 6~10 disassembly Tea terrace footing

Worker 4 4
Note
Unit 1~5 construction disassembly

<table>
<thead>
<tr>
<th>Step</th>
<th>1</th>
<th>2</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work detail</td>
<td>Unit 1~5 disassembly</td>
<td>Unit 1~5 removing</td>
</tr>
</tbody>
</table>

Worker

Note

Where the worker are:
On the ground
On the mezzanine floor
All safety rules must be followed

Worker are:
On the ground
On the mezzanine floor

All safety rules must be followed
Unit 11~12 construction disassembly, clean site

<table>
<thead>
<tr>
<th>Step</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Work detail</td>
<td>Unit 11~12 disassembly</td>
<td>Unit 11~12 removing</td>
<td>Footing removing</td>
<td>Site cleaning</td>
</tr>
<tr>
<td>Worker</td>
<td>8</td>
<td>4</td>
<td>8</td>
<td>10</td>
</tr>
</tbody>
</table>

Note

WHERE THE WORKER ARE:
On the ground
On the Floor
ALL SAFETY RULES MUST BE FOLLOWED

Worker

Unit

Note
FIRST IMPRESSION (depends on the visitors in queue)
1. We will offer a tour brochure to each visitor.
2. We will ask visitors to connect to our tour website from mobile devices.

PHOTOSHOT (1 MIN)
Experience the northwest side of Orchid House.
1. 10 visitors will be assigned a guide from Unicode Team.
2. Guide will explain the conceptual design and background knowledge of Orchid House and the city issue in Taipei. Friendly guides will start the tour from this spot, introducing the concept of Orchid House.

BATHROOM & KITCHEN (2 MIN)
Taiwanese people are hospitable and kind. The kitchen serves a multifunctional task - the center piece is an island that can be converted into a dining table for formal occasions.

LIVING ROOM & THERMAL MASS (3 MIN)
1. The Living Room features abundant natural light and can be filtered and adjusted by louvers.
2. Taiwan is a recycle kingdom. Thermal mass is made by recycled bottles.
3. Explain how the thermal wall conserves energy and maintains comfortable temperatures both day and night.

FEEDBACK & GET THE VOTE CARD (30 SECS)
Get more Q&A before finishing the tour and get a vote card.

MECHANICAL ROOM (1 MIN)
Guide will explain the mechanical system including:

ENTRANCE & GREEN CORE (5 MIN)
Guide will introduce the concept of "The Green Core of Orchid House", "The Green Core of City-Orchid House" and Taiwanese orchid.

TEA TERRACE & PHOTOSHOT (5 MIN)
The space offers visitors shading comfort while they play chess and appreciate the conceptual model from the winter camp made by the senior high schoolers.

PHOTOSHOT 2 (5 MIN)
After experiencing the tea terrace, guide will make a conclusion for visitors. Also give them our three keywords: "Green Core", "Blue Sky" and "Power House".

BEDROOM & WORKSTATION (1 MIN)
Guide will explain how we conceived the L-shape house and how it serves as a prototypical solution to Taipei rooftop. Some general description of city issues will be provided.

PHOTOSHOT 3 (2 MIN)
Experience the southeast side of the house, seeing the well-designed garden.
FIRST IMPRESSION (depends on the visitors in queue)
FIRST Glimpse (10 secs)

Photos 1 (1 min)
Mechanical Room (1 min)
Entrance & Green Core (5 mins)
Bathroom & Kitchen (2 mins)
Living Room & Thermal Mass (3 mins)
Bedroom & Workstation (1 min)
Tea Terrace (5 mins)
Photos 2 (5 mins)
Photos 3 (2 mins)
Feedback & Get the Vote Card (30 secs)