Project Drawing

Deliverable #7
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1. GENERAL
GE-001 Cover Sheet 1
GE-101 Sheet List 1 2
GE-102 Sheet List 2 3
GE-103 Sheet List 3 4
GE-201 General Symbols 5
GE-211 General Abbreviations 6
GE-301 Urban Project Location 7
GE-310 Urban Proposal Explanation 1 8
GE-311 Urban Proposal Explanation 2 9
GE-320 Existing Building Drawings and Analysis 10
GE-330 Competition Dwelling 11
GE-401 Pavilion East Side Rendering 12
GE-402 Pavilion West Side Rendering 13

2. ARCHITECTURAL
AR-001 La Cité du Soleil® Plan 14
AR-002 Site Plan 15
AR-011 Solar Envelope 16
AR-014 Architecture Footprint 17
AR-017 Measurable Area 18
AR-021 Ground Level Plan 19
AR-022 Mezzanine Level Plan 20
AR-031 Roof Level Plan 21
AR-041 Reconfigurable Feature 1 22
AR-042 Reconfigurable Feature 2 23
AR-043 Reconfigurable Feature 3 24
AR-044 Reconfigurable Feature 4 25
AR-051 Site Entrance and Exit 26
AR-101 Site Elevation 27
AR-111 East Elevation 28
AR-112 North Elevation 29
AR-113 South Elevation 30
AR-114 West Elevation 31
AR-201 Longitudinal Section 1 32
AR-202 Longitudinal Section 2 33
AR-203 Longitudinal Section 3 34
AR-204 Longitudinal Section 4 35
AR-211 Transversal Section 1 36
AR-212 Transversal Section 2 37
AR-213 Transversal Section 3 38
AR-214 Window Schedule and Details 1 39
AR-215 Window Schedule and Details 2 40
AR-216 Window Schedule and Details 3 41
AR-217 Window Schedule and Details 4 42
AR-301 Window Schedule and Details 5 43
AR-305 Window Schedule and Details 6 44
AR-306 Window Schedule and Details 7 45
AR-307 Window Schedule and Details 8 46
AR-308 Window Schedule and Details 9 47
AR-309 Window Schedule and Details 10 48
AR-311 Door Schedule and Details 1 49
AR-312 Door Schedule and Details 2 50
AR-313 Door Schedule and Details 3 51
AR-321 Floor Construction Mezzanine Level 52
AR-322 Floor Construction Mezzanine Level 53
AR-323 Floor Construction Mezzanine Level 54
AR-324 Floor Construction Details Ground Level 55
AR-325 Floor Construction Details Ground Level 56
AR-326 Floor Construction Details Ground Level 57
AR-327 Floor Construction Details Ground Level 58
AR-328 Floor Construction Details Mezzanine Level 1 59
AR-329 Floor Construction Details Mezzanine Level 2 60
AR-330 Floor Construction Details Mezzanine Level 3 61
AR-331 Floor Construction Details Mezzanine Level 4 62
AR-332 Ceiling Construction Details Mezzanine Level 5 63
AR-333 Ceiling Construction Details Mezzanine Level 6 64
AR-334 Ceiling Construction Details Mezzanine Level 7 65
AR-335 Plan Details 66
AR-336 Roof Construction Details 67
AR-341 Wall Sections and Construction Details 68
AR-351 Partitions Details 69

3. BIOCLIMATIC ANALYSIS (BA)
BA-001 Taipei Climate Analysis 90
BA-002 Taipei Shading Analysis 91
BA-003 Taipei Wind Rose Analysis 92
BA-004 Versailles Climate Analysis 93
BA-005 Versailles Shading Analysis 94
BA-006 Versailles Wind Rose Analysis 95
BA-011 Bioclimatic Strategies 96
BA-012 Natural Ventilation 97
BA-013 Solar Chemny 98
BA-014 Earth/vegetation cooling 99
BA-015 Evaporative Cooling 100
BA-016 Direct Solar Heating 101
BA-017 Bioclimatic Drawings Heating 102
BA-018 Thermal Wall in Versailles 103
BA-019 Thermal Wall in Taipei 104
BA-020 Heat Exchanger Preheated by Solar Hot Water 105
BA-021 Heat Pump 106

4. INTERIORS (IN)
IN-001 Ground Level Floor 107
IN-002 Mezzanine Level Floor 108
IN-003 Mezzanine Level Floor 109
IN-004 Mezzanine Level Floor 110
IN-005 Mezzanine Level Floor 111
IN-006 Mezzanine Level Floor 112
IN-007 Mezzanine Level Floor 113
IN-008 Mezzanine Level Floor 114
IN-009 Mezzanine Level Floor 115
IN-010 Mezzanine Level Floor 116
IN-011 Mezzanine Level Floor 117
IN-012 Mezzanine Level Floor 118
IN-013 Mezzanine Level Floor 119
IN-014 Mezzanine Level Floor 120
IN-015 Mezzanine Level Floor 121
IN-016 Mezzanine Level Floor 122
IN-017 Mezzanine Level Floor 123
IN-018 Mezzanine Level Floor 124
IN-019 Mezzanine Level Floor 125
IN-020 Mezzanine Level Floor 126
### 5. STRUCTURAL (ST)

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### 11. PHOTOVOLTAIC SYSTEM (PV)

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### 12. TELECOMMUNICATIONS AND BUILDING AUTOMATIZATION SYSTEM (BAS)

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<td>Equipment 1</td>
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### 13. SDE INSTRUMENTATION DRAWINGS (ID)

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###Notes:
- DN 2013/07/01 DDc Submission
- DN 2013/04/01 SD Submission
- ST 2013/11/01 DD Submission
- ST 2014/04/30 CD Submission
- ST 2014/03/03 CD Submission
- ST 2014/11/03 AB Submission
15. HEALTH AND SAFETY (HS)

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<td>Site accessibility Elevation</td>
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<td>House Tour Plan</td>
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### GENERAL ABBREVIATIONS

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<td>EXT, Exterior</td>
<td>Exterior</td>
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<tr>
<td>FD</td>
<td>Floor Drain or Fire Department</td>
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<tr>
<td>FEC</td>
<td>Fire Extinguisher Cabinet</td>
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<tr>
<td>FIXT, Fixture</td>
<td>Fixture</td>
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<tr>
<td>FUR</td>
<td>Floor</td>
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<tr>
<td>FM</td>
<td>Filled Metal</td>
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<tr>
<td>FO</td>
<td>Face Of</td>
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<tr>
<td>FND</td>
<td>Foundation</td>
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<td>GALV</td>
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<td>GWW</td>
<td>Gypsum Wall Board</td>
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<tr>
<td>HC</td>
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<td>HM</td>
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<td>VIF</td>
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<tr>
<td>VP</td>
<td>Vision Panel</td>
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<tr>
<td>W/</td>
<td>With</td>
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<tr>
<td>WD</td>
<td>Wood</td>
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</tbody>
</table>

**PROJECT:**

**INSTITUTION:**

**TEAM NAME:**

**CHECKED BY:**

**SCALE:**

**DWG. TITLE:**

**DWG. NO.:**

**ADDRESS:**

1001 Ta-Hsueh Road
Hsinchu City 30010
Taiwan

**CONTACT:**

www.sde.tw

**CONSULTANTS:**

**DRAWN BY:**

**MARK DATE:**

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

**GENERAL ABBREVIATIONS**
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 up 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
9.332x1.912=17.8 (M2)

Total
120.41+8.05+17.84=146.3 (M2)
NCTU/UNICODE
1001 Ta-Hsueh Road
Hsinchu City 30010
Taiwan
www.sde.tw

Consultants:

Could, Sliding Door, Swing Door, Awning Window

Reconfigurable Features 3

Drawn by

Checked by

Scale

Unit

AR-043 24
WINDOW SCHEDULE AND DETAILS

WIN 1
WIN 2
WIN 3
WIN 4
WIN 5
WIN 6
WIN 7
WIN 8
WIN 9

Dimensions:

WIN 1: 1650 x 2300
WIN 2: 1650 x 1950
WIN 3: 1650 x 1950
WIN 4: 1650 x 1950
WIN 5: 1650 x 1950
WIN 6: 1650 x 1950
WIN 7: 1650 x 1950
WIN 8: 1650 x 1950
WIN 9: 1650 x 1950
FLOOR CONSTRUCTION
GROUNDLEVEL

Thermal conductivity R = 7.7 (m²K/W)
FLOOR CONSTRUCTION
MEZZANINE LEVEL

Thermal conductivity $R = 13.7 \text{ (m}^2\text{K/W)}$
1:50

Project: NCTU/UNICODE
Institution: National Chiao Tung University
Team Name: NCTU/UNICODE
Address: 1001 Ta-Hsueh Road
Hsinchu City 30010
Taiwan
Contact: www.sde.tw

Consultants:

Drawn by
Checked by
Scale 1:50

Unit mm

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

AR-328 PAGE 56
FLOOR CONSTRUCTION DETAILS

Special Module

0 0.5 1 2 METER

2014/11/03 AB Submission
2014/06/02 CD Submission
2014/03/03 CD Submission
2013/11/03 AB Submission
2013/09/20 DD Submission
2013/01/25 DD Submission
2013/07/01 DDc Submission
2013/04/01 SD Submission

AR-331 59
Project: [Project Name]
Institution: [Institution Name]
Team Name: [Team Name]
Checked by: [Checked by]
Scale: [Scale]
DWG. Title: [DWG. Title]
DWG. No.: [DWG. No.]
Address: [Address]
Contact: [Contact]
Consultants: [Consultants]

Note:
- ST 2013/04/01 SD Submission
- ST 2013/07/01 DDc Submission
- ST 2014/03/03 CD Submission
- ST 2014/04/30 CD Submission
- ST 2014/06/02 CD Submission
- ST 2014/11/03 AB Submission

Material List:
- Steel Beam Box 150x150 x4.5
- Steel Column Box 150x150 x6
- Steel Beam Box 150x150 x6
- Steel Beam 7.5x45.0 x4.5
- Steel Beam Box 125x75x4.5
- Clear Glass
- PV Module
- Gutter
- Silicon
- Aluminum Louver
- LED Light
- Steel beam 125x75
- Glass Louver
- Green Core
- Solar Water Heater
- Delta DC Fan VFR25/ALT C

Note:
- [Material Details and Specifications]

Drawing by: [Drawing by]
Checked by: [Checked by]
Scale: [Scale]
Unit: [Unit]

Drawing Title: ROOF CONSTRUCTION DETAILS
Drawing No.: AR-336
Page: 2
Thermal conductivity $R = 13.5$ (m²K/W)

1. Bayer Makrolon Polycarbonate
2. Interlocking Hollow Sheet 1.60mm
3. Plywood 18mm
4. Plywood 12mm
5. Glass foam 72mm
6. Vacuum Insulation 38mm
7. Ceramic board 25mm
8. Waterproofing 1mm
9. Vapor barrier 1mm

WALL SECTION AND CONSTRUCTION DETAILS
Bottom beam fixed with H-beam 150*150mm

Structure H-beam 150*150mm
Bottom beam fixed with H-beam 150*150mm

Structure H-beam 150*75mm
Fixed with 150*75mm H-beam
Height=2SL+3240mm

Diagonal brace 125*75mm t=3.2mm welding at steel plate t=7mm

Angle bar 50*50mm t=4mm welding on 50*50mm square tube

Wood plastic composites t=25mm

U-bar 250*90mm t=8mm

Threaded rod φ 9mm fix on Steel frame

Plywood 18mm*2

Plywood 18mm*2

Bottom beam fixed with 150*150mm H-beam
Steel Mesh With White Painting
Angle Bar With White Painting

Screws
Square tube steel With White Painting
Angle Bar
01- M2 Screw
02- Translucent PVC, Shelter
03- Memory Alloy Spring
04- Normal Spring
05- 10mm Acrylic, Base
06- 2mm Acrylic, Waal
07- Anodized Washer
08- Screw Cap
Steel reinforcement $t = 5 \text{ mm}$
Slotted Angles Bar 70mm
Steel plate $t = 5 \text{ mm}$
Slotted Angles Bar 35mm
Steel plate $t = 9 \text{ mm}$

Steel structure
Steel plate $t = 5 \text{ mm}$
Drill hole
E-foam
Steel plate $t = 9 \text{ mm}$
E-foam
Steel frame \( t = 2 \text{ mm} \)

E-FOAM \( t = 10 \text{ mm} \)

Rain cover \( t = 5 \text{ mm} \)

Steel reinforcement \( t = 10 \text{ mm} \)

Steel plate \( t = 5 \text{ mm} \)

THERMAL WALL DETAILS 7
TEMPERATURE (°C)
LOCATION: TAIPEI TWN

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

HUMIDITY (%)
LOCATION: TAIPEI TWN

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

DEGREE HOURS
(HEATING, COOLING AND SOLAR)
LOCATION: TAIPEI TWN

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<td>NOV</td>
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</tr>
<tr>
<td>DEC</td>
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</table>

PSYCHROMETRIC CHART
LOCATION: TAIPEI TWN
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

TAIPEI CLIMATE ANALYSIS
RADIATION (W/m²)

LOCATION: TAIPEI, TAIW

DAILY SOLAR RADIATION

BASIC CLIMATIC CONDITION

LOCATION: TAIPEI, TAIW

OVERHEATED PERIOD
(JUN.01-SEP.21)

UNDERHEATED PERIOD
(DEC.01-MAR.21)

COMFORTABLE PERIOD
(MAR.21-JUN.01 & SEP.21-DEC.01)

SOLAR PATH DIAGRAM

UNDERHEATED PERIOD
DIRECT SOLAR GAIN

OVERHEATED PERIOD
SHADING

JUN. 22nd

MAR. 21st

SEP. 21st

DEC. 22nd

Date: December 22nd

Date: September 21st

Angle: 65.7°

Date: March 21st

Angle: 68.2°

ST 2014/03/03 CD Submission

ST 2014/04/30 CD Submission

ST 2014/06/02 CD Submission

ST 2014/11/03 AB Submission

DN 2013/07/01 DD Submission

DN 2013/04/01 SD Submission

RADIATION (W/m²)

LOCATION: TAIPEI, TAIW

DAILY SOLAR RADIATION

BASIC CLIMATIC CONDITION

LOCATION: TAIPEI, TAIW

OVERHEATED PERIOD
(JUN.01-SEP.21)

UNDERHEATED PERIOD
(DEC.01-MAR.21)

COMFORTABLE PERIOD
(MAR.21-JUN.01 & SEP.21-DEC.01)

SOLAR PATH DIAGRAM

UNDERHEATED PERIOD
DIRECT SOLAR GAIN

OVERHEATED PERIOD
SHADING

JUN. 22nd

MAR. 21st

SEP. 21st

DEC. 22nd

Date: December 22nd

Date: September 21st

Angle: 65.7°

Date: March 21st

Angle: 68.2°
PREVAILING WINDS

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

Institution:
NCTU/UNICODE

Address:
1001 Ta-Hsueh Road
Hsinchu City 30010
Taiwan

Contact:
www.sde.tw

Drawn by:
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
ST 2014/11/03 AB Submission

DEGREE HOURS

HEATING DEGREE-HOURS
1593

COOLING DEGREE-HOURS
229

LOCATION/PARKS ONLY, FRA

LOCATION/PARKS, ONLY FRA

ANNUAL

TEMPERATURE (°C)

RANGE OF OUTDOOR TEMPERATURE FOR COMFORTABLE INDOOR TEMPERATURE

MAXIMUM TEMPERATURE

MINIMUM TEMPERATURE

HUMIDITY (%)

PSYCHROMETRIC CHART

SELECTED DESIGN TECHNIQUES:
1. Passive solar heating
2. Thermal mass effects
3. Natural ventilation
4. Direct evaporative cooling

DISTILLATION MONTHLY: Mean/Minimum/Maximum
BAROMETRIC PRESSURE: 103.36 in.

DEGREE HOURS

HEATING AND SOLAR

LOCATION/PARKS ONLY, FRA

LOCATION/PARKS, ONLY FRA

DEGREE-HOURS

HUMIDITY (05:00AM)

RELATIVE HUMIDITY (05:00AM)

TEMPERATURE (°C)

PSYCHROMETRIC CHART

SELECTED DESIGN TECHNIQUES:
1. Passive solar heating
2. Thermal mass effects
3. Natural ventilation
4. Direct evaporative cooling

DISTILLATION MONTHLY: Mean/Minimum/Maximum
BAROMETRIC PRESSURE: 103.36 in.

DEGREE HOURS

HEATING AND SOLAR

LOCATION/PARKS ONLY, FRA

LOCATION/PARKS, ONLY FRA

DEGREE-HOURS

HUMIDITY (05:00AM)

RELATIVE HUMIDITY (05:00AM)

TEMPERATURE (°C)

PSYCHROMETRIC CHART

SELECTED DESIGN TECHNIQUES:
1. Passive solar heating
2. Thermal mass effects
3. Natural ventilation
4. Direct evaporative cooling

UNIT

LOCATION/PARKS ONLY, FRA

LOCATION/PARKS, ONLY FRA

DEGREE-HOURS

HUMIDITY (05:00AM)

RELATIVE HUMIDITY (05:00AM)

TEMPERATURE (°C)

PSYCHROMETRIC CHART

SELECTED DESIGN TECHNIQUES:
1. Passive solar heating
2. Thermal mass effects
3. Natural ventilation
4. Direct evaporative cooling

DISTILLATION MONTHLY: Mean/Minimum/Maximum
BAROMETRIC PRESSURE: 103.36 in.

DEGREE HOURS

HEATING AND SOLAR

LOCATION/PARKS ONLY, FRA

LOCATION/PARKS, ONLY FRA

DEGREE-HOURS

HUMIDITY (05:00AM)

RELATIVE HUMIDITY (05:00AM)

TEMPERATURE (°C)

PSYCHROMETRIC CHART

SELECTED DESIGN TECHNIQUES:
1. Passive solar heating
2. Thermal mass effects
3. Natural ventilation
4. Direct evaporative cooling

DISTILLATION MONTHLY: Mean/Minimum/Maximum
BAROMETRIC PRESSURE: 103.36 in.

DEGREE HOURS

HEATING AND SOLAR

LOCATION/PARKS ONLY, FRA

LOCATION/PARKS, ONLY FRA

DEGREE-HOURS

HUMIDITY (05:00AM)

RELATIVE HUMIDITY (05:00AM)

TEMPERATURE (°C)

PSYCHROMETRIC CHART

SELECTED DESIGN TECHNIQUES:
1. Passive solar heating
2. Thermal mass effects
3. Natural ventilation
4. Direct evaporative cooling

DISTILLATION MONTHLY: Mean/Minimum/Maximum
BAROMETRIC PRESSURE: 103.36 in.

DEGREE HOURS

HEATING AND SOLAR

LOCATION/PARKS ONLY, FRA

LOCATION/PARKS, ONLY FRA

DEGREE-HOURS

HUMIDITY (05:00AM)

RELATIVE HUMIDITY (05:00AM)

TEMPERATURE (°C)

PSYCHROMETRIC CHART

SELECTED DESIGN TECHNIQUES:
1. Passive solar heating
2. Thermal mass effects
3. Natural ventilation
4. Direct evaporative cooling

DISTILLATION MONTHLY: Mean/Minimum/Maximum
BAROMETRIC PRESSURE: 103.36 in.
RADIATION (W/m²)

BASIC CLIMATIC CONDITION

SOLAR PATH DIAGRAM
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
## BIOCLIMATIC STRATEGIES

### HEATING

- **ACTIVE**
  - Heat Pump Heating
- **SEMI-PASSIVE**
  - Heat Exchanger Preheated by Solar Hot Water
- **PASSIVE**
  - Thermal Wall
  - Green House Effect
  - Direct Solar Gain

### COOLING

- **ACTIVE**
  - Heat Pump Cooling
- **SEMI-PASSIVE**
  - Shading
  - Natural Ventilation
  - Solar Chimney
  - Heat Sink and Vegetation Cooling
  - Evaporative Cooling

### Energy Consumption

- **High Energy Consumption**
- **Low Energy Consumption**
OUTDOOR TEMPERATURE UNDER 19°C WITH WIND
PV PANELS WASTE HEAT

OPEN LOUVERS

HOT AIR GO UP

FANS ON

OPEN DOORS,
WINDOWS AND LOUVERS

OPEN LOUVERS

CLOSE WINDOWS

EXTerior TEMPERATURE UNDER 19°C
NO WIND

- OPEN LOUVERS
- CLOSE WINDOWS
- FANS ON
- HOT AIR GO UP
- PV PANELS WASTE HEAT

N -.
EXTERIOR TEMPERATURE ABOVE 26°C

- CONCRETE SLAB COOLING
- RAIN WATER TANK
- CLOSE WINDOWS AND LOUVERS
- FANS ON

Rain Water Tank
Concrete Slab Cooling
Close Windows and Louvers
FANS ON
EXTERIOR TEMPERATURE ABOVE 26°C

- WATER WALL ON
- FANS ON
- OPEN LOUVERS
- CLOSE WINDOWS

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
- ST 2014/11/03 AB Submission

Consultants:
- NCTU/UNICODE

Address:
1001 Ta-Hsueh Road
Hsinchu City 30010
Taiwan

Contact:
www.sde.tw

Scale:
-
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.
OUTDOOR TEMPERATURE UNDER 19°C
<table>
<thead>
<tr>
<th>TYPE</th>
<th>IMAGE</th>
<th>SIZE (L<em>W</em>H) mm</th>
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</thead>
<tbody>
<tr>
<td>TABORET</td>
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### MEZZANINE FLOOR

#### FURNISHINGS

<table>
<thead>
<tr>
<th>TYPE</th>
<th>IMAGE</th>
<th>SIZE (L<em>W</em>H) mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>TABORET</td>
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APPLIANCE LIST

<table>
<thead>
<tr>
<th>APP. No</th>
<th>TYPE</th>
<th>BRAND</th>
<th>LOCATION</th>
<th>SIZE (W<em>D</em>H)</th>
<th>NOTE</th>
</tr>
</thead>
<tbody>
<tr>
<td>APP. 01</td>
<td>REFRIGERATOR</td>
<td>MIELE</td>
<td>KITCHEN</td>
<td>580x590x1772</td>
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</tr>
<tr>
<td>APP. 02</td>
<td>DISHWASHER</td>
<td>MIELE</td>
<td>KITCHEN</td>
<td>581x570x845-910</td>
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<tr>
<td>APP. 03</td>
<td>SINK</td>
<td>HCG</td>
<td>KITCHEN</td>
<td>850x400x150</td>
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<tr>
<td>APP. 04</td>
<td>CABINET</td>
<td>HCG</td>
<td>KITCHEN</td>
<td>3210x650</td>
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<tr>
<td>APP. 05</td>
<td>HOOD</td>
<td>GLOSS</td>
<td>KITCHEN</td>
<td>455x5830x830-1180</td>
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<tr>
<td>APP. 06</td>
<td>INDUCTION TOP</td>
<td>MIELE</td>
<td>KITCHEN</td>
<td>272x500</td>
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<tr>
<td>APP. 07</td>
<td>OVEN</td>
<td>MIELE</td>
<td>H2161 B CLST</td>
<td>600x800x500</td>
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<td>APP. 08</td>
<td>FAUCET</td>
<td>HCG</td>
<td>KITCHEN</td>
<td>26x215x295</td>
<td></td>
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<tr>
<td>APP. 09</td>
<td>DRAIN</td>
<td>HCG</td>
<td>KITCHEN</td>
<td></td>
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NOTE:

- APP. 01, APP. 02, APP. 03, APP. 04, APP. 05, APP. 06, APP. 07, APP. 08, APP. 09
- KITCHEN PLAN 1
- FINISH FLOOR
- CEILING
- Wood Structure Floor
- WOOD COUNTER TOP
- WOOD TABLE

Project:
Institution:
Team Name:
Checked by:

NCTU Architecture
國立交通大學建築研究所

1001 Ta-Hsueh Road
Hsinchu City 30010
Taiwan

www.sde.tw
### STRUCTURAL FLOOR UNITS

<table>
<thead>
<tr>
<th>UNIT No.</th>
<th>Size (L x W x D)</th>
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<tr>
<td>UNIT 02</td>
<td>3750 x 1690 x 150</td>
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<td>UNIT 03</td>
<td>3750 x 1710 x 150</td>
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<td>UNIT 05</td>
<td>3750 x 2100 x 150</td>
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<tr>
<td>UNIT 06</td>
<td>3750 x 875 x 150</td>
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<tr>
<td>UNIT 07</td>
<td>3750 x 1690 x 150</td>
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<td>UNIT 08</td>
<td>3750 x 1710 x 150</td>
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<td>UNIT 09</td>
<td>3750 x 2100 x 150</td>
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<td>UNIT 10</td>
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<td>UNIT 11</td>
<td>9150 x 2100 x 150</td>
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<td>UNIT 12</td>
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<td>UNIT 13</td>
<td>9150 x 2175 x 150</td>
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<td>UNIT 14</td>
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<td>UNIT 15</td>
<td>4200 x 1690 x 150</td>
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<td>UNIT 16</td>
<td>4200 x 2100 x 150</td>
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<tr>
<td>UNIT 17</td>
<td>4200 x 2175 x 150</td>
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<tr>
<td>UNIT 18</td>
<td>4200 x 2100 x 150</td>
</tr>
<tr>
<td>UNIT 19</td>
<td>4200 x 2175 x 150</td>
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<tr>
<td>UNIT 20</td>
<td>4200 x 1690 x 150</td>
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<tr>
<td>UNIT 21</td>
<td>4200 x 1710 x 150</td>
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<td>UNIT 22</td>
<td>4200 x 2100 x 150</td>
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<td>UNIT 23</td>
<td>4200 x 2175 x 150</td>
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<tr>
<td>UNIT 24</td>
<td>6600 x 1600 x 150</td>
</tr>
<tr>
<td>UNIT 25</td>
<td>6600 x 1600 x 150</td>
</tr>
<tr>
<td>UNIT 26</td>
<td>6600 x 1600 x 150</td>
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**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
- ST 2014/11/03 AB Submission

---

**Scale:** 1:100  
**Unit:** mm  
**Project:**  
**Institution:**  
**Team Name:**  
**Checked by:**  
**Scale:**  
**DWG. Title:**  
**DWG. No.:** ST-002  
**Contact:**
- Phone:  
- Fax:  
- Website: [www.sde.tw](http://www.sde.tw)
Smoke alarm/detector (NQ9S-3) to POWER RECEIVE

9V BATTERY

PVC E20, W/600V 380°C
1.25mm /4C

Smoke alarm/detector (NQ9S-3)

MEZZANINE

BEDROOM

LIVING RM.

BAS

PVC E20, W/600V 380°C
1.25mm /2C

MEZZANINE

GROUND
General circuit breaking
Inverters circuit breaking

Up to Mezzanine Level

WEAP NA.

RAN BATHROOM

KITCHEN

WORKSTATION

LIVING RM.

BEDROOM

TEA TERRACE

FE

PVC E20, W/600V 380°C
1.25mm²/4C, 1.25mm²/2C

Smoke Alarm/Detector
NO95-3:
- 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

FP-002
**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
- **ST 2014/11/03**: AB Submission

---

**Observe the following details:**

- **Fire Extinguisher**
  - ABC-EN0.4K:
  - 21A/13B/C efficiency

---

**Legend:**

- **Evacuation Route**
- **Evacuation Origin**

---

**Drawing Details:**

- **Scale**: 1:60
- **Unit**: mm

---

**Consultants:**

**Drawn by**: CHESTER

**Checked by**: HU

**Mark Date Description**: 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, ST 2014/11/03 AB Submission
1. Cold Water Tank
   Size: 1.00x7.00x0.30 m,
   Volume: 2100 l.

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

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

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

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

6. Cold Water Pump
   Flow: 25 lpm,
   Head: 20 m

---

- **Size:** 1.00x7.00x0.30 m
- **Volume:** 2100 l.
- **Size:** 1.00x6.00x0.30 m
- **Volume:** 1800 l.
- **Size:** 1.20x1.80x0.30 m
- **Volume:** 600 l.
- **Size:** 0.70x1.50x0.30 m
- **Volume:** 300 l.

---

- **Flow:** 15 lpm
- **Head:** 15 m
- **Flow:** 25 lpm
- **Head:** 20 m

---

- **Black Water Tank:**
  - Size: 1.20x1.80x0.30 m
  - Volume: 600 l.

- **Rainwater Tank:**
  - Size: 0.70x1.50x0.30 m
  - Volume: 300 l.

---

- **Rainwater Pump:**
  - Flow: 15 lpm
  - Head: 15 m

- **Cold Water Pump:**
  - Flow: 25 lpm
  - Head: 20 m

---

**Note:**

- **Size:**
  - 1.00x7.00x0.30 m
  - 1.00x6.00x0.30 m
  - 1.20x1.80x0.30 m
  - 0.70x1.50x0.30 m

- **Flow:**
  - 15 lpm
  - 25 lpm

- **Head:**
  - 15 m
  - 20 m
1. Cold Water Tank
   Size: 1.00x7.00x0.30 m
   Volume: 2100l.

2. Grey Water 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
Solar thermal and heat pump system

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

- City Water

- Heat Exchanger
  - Flow: 20 Lpm
  - Head: 18 M

- Fist Flush
  - To Building's Rainwater Tank

- Washing Machine

- Shower

- Air Condition

- Lavatory

- Kitchen

- Dish Washer

- Water Closet

- Potted Vegetation

- To Building's Rainwater Tank

- City Drain

- Dirty Water

- Rain Water

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

- Clean Hot Water

- Graywater

- Overflow

- Buffer Chamber

- Biological Treatment

- Sedimentation Process

- UV Disinfection

- Pre-Filtration

- Greywater Tank

- 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

- Matalla 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

- Overflow Buffer Chamber

- Buffering combining active sludge and foam separation

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

- Matalla 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

- 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
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

Note:
1. Heat Exchanger
2. Cold Water Tank

City Water
Flow: 20 Lpm
Head: 18 m

Cold Water Tank
Cap.: 2.1M³

Dish Washer

Potted Vegetation

Washing Machine

Shower

Lavatory

Water Closet

Heat Exchanger
Cap.: 1.8M³

Black Water Tank
Cap.: 0.6M³

Rainwater collection
Cap.: 0.3M³

Rain Water

Air Condition

Solar thermal and heat pump system

City Water
Flow: 20 Lpm
Head: 18 m

Clean Cold Water

Clean Hot Water

Graywater
1. Clothes Washer
2. Clothes Dryer
3. Lavatory
4. Water Closet
5. Shower Head
6. Clean Water Tank
7. Rainwater Collection
8. Clean Water Booster Pump
9. Kitchen Sink
10. Dishwasher
11. Heat Exchanger

SUPPLY AND REMOVAL
CLEAN WATER ISOMETRIC
1. Clothes Washer
2. Clothes Dryer
3. Shower Head
4. Lavatory
5. Kitchen Sink
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 (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)
Solar Thermal Collector

Expansion Tank 01
Make up Water
20A-GIP
20A-GIP
Pump station 01
Heating Coil CV1
Extension Tank 02
Make up Water
20A-GIP
Pump station 02

Hot Water Storage Tank
CO2 Heat Pump Package

Domestic Hot Water
City Water

Refrigerant Supply
Refrigerant Return
Hot Water Supply
Hot Water Return
City Water

Safety Valve
Auto Air Vent
Thermometer
Ball Valve
Check Valve
Pressure Gauge
3-Way
2-Way
Thermostatic Mixing Valve

Domestic Hot Water
City Water

20A-SUS304
20A-GIP

181
HVAC DISTRIBUTION PLAN
GROUND LEVEL
HVAC DISTRIBUTION PLAN
MEZZANINE LEVEL

1. Hot Water Storage Tank
2. Heat Pump
3. CO2 Heat Pump Package
4. Expansion Tank 1
5. Expansion Tank 2
6. CO2 Heat Pump Package 2
7. Pump Station
8. Heating Coil
9. Heat Reclaim Ventilator

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
- ST 2014/11/03 AB Submission

Scale: 1:60

Unit: mm
Outdoor Unit of Cooling/Heating Heat Pump

Test condition for outdoor unit:
1. Cooling Condition: Indoor Temperature 27°C DB / 19°C WB
2. Heating Condition: Indoor Temperature 20°C DB

<table>
<thead>
<tr>
<th>Name</th>
<th>Outdoor Unit of Cooling/Heating Heat Pump</th>
</tr>
</thead>
<tbody>
<tr>
<td>Service</td>
<td>HVAC Cooling and Heating</td>
</tr>
<tr>
<td>Type</td>
<td>Heat Pump</td>
</tr>
<tr>
<td>Cooling Capacity</td>
<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>185 kW Cooling = 2.95 Heating = 3.27</td>
</tr>
<tr>
<td>Refrigerant</td>
<td>R-410A</td>
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</tbody>
</table>

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
- ST 2014/11/03 AB Submission

---

Indoor Unit of Heat Pump

<table>
<thead>
<tr>
<th>Name</th>
<th>Indoor Unit of Heat Pump</th>
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<tbody>
<tr>
<td>Service</td>
<td>Room Heating and Cooling</td>
</tr>
<tr>
<td>Type</td>
<td>Wall Mounted</td>
</tr>
<tr>
<td>Quantity</td>
<td>2</td>
</tr>
<tr>
<td>Cooling Capacity</td>
<td>4.5 kW</td>
</tr>
<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>
</tr>
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</table>

---

Note:
- CHUNG
- CHUNG

---

Technical Specifications:
- Unit: HVAC EQUIPMENTS 1
- Reference: ME-011
- Page: 184
Heat Reclaim Ventilator

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

<table>
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<th>Condition</th>
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<th>Outdoor</th>
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<tr>
<td></td>
<td>*Cdb</td>
<td>rh%</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>
**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.

---

Legend:

- Exhaust Air
- Indoor Air
- Outdoor Air
- HRV - Heat Exchange Mode
- HRV - Bypass Mode
- Hot Air
- Warm Air
- Cool Air
- Cold Air
- Refrigerant Pipe
**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.
- HRV is in HX mode.

---

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

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

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

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
- Hot Air
- Warm Air
- Cool Air
- Cold Air
- HRV - Heat Exchange Mode
- HRV - Bypass Mode
Mechanical Room Elevation (East)

Mechanical Room Elevation (North)

1. Hot Water Storage Tank
2. Heat Pump
3. CO2 Heat Pump Package
4. Expansion Tank I
5. CO2 Heat Pump Package 2
6. Pump Station

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
ST 2014/11/03 AB Submission

Consultants:
NCTU/UNICODE
1011 Ta-Hsueh Road
Hsinchu City 30010
Taiwan
www.sde.tw
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.

Heat Pump
Outdoor Unit
Cap. 11.2 kw

Expansion Valve

Expansion Valve

Heat Exchanger

Accumulator

Compressor

Heat Reclaim Ventilator

Exhaust Air Fan
Flow Rate: 95cmh

Supply Air Fan
Flow Rate: 150cmh

Filter

Electric Mixing Valve

Hot Water Return

Hot Water Supply

Outside Air

Exhaust Air

100Ø Duct

Round Air Return Grille (Typical of 2)

Round Ceiling Diffuser

Bedroom
Living Room
Work Station
Kitchen
Bathroom
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

Ventilation mode is individually determined by the original formula of HRV with the temperature sensors.

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
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
1. Heat Reclain Ventilator
2. Hot Water Storage Tank
3. Heat Pump
4. Expansion Tank 1
5. Indoor Unit of Heat Pump
6. Heating Coil
7. Pump Station
8. Ultrasonic Humidifier
NCTU Architecture
國立交通大學建築研究所

Consultants:

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
St. 2014/11/03 AB Submission

Mechanical Room Elevation (East North)

Mechanical Room Elevation (West South)
**ONE-LINE DIAGRAM**

**CIRCUIT NO.**

<table>
<thead>
<tr>
<th>No.</th>
<th>16</th>
<th>17</th>
<th>18</th>
<th>19</th>
<th>20</th>
<th>21</th>
<th>22</th>
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<tbody>
<tr>
<td><strong>DESCRIPTION</strong></td>
<td>Clean Water Pump</td>
<td>Rain Water Pump &amp; Level relay</td>
<td>BathRoom &amp; Tea Terrace Receptacle</td>
<td>Floor Receptacle (General Use)</td>
<td>Tea Terrance &amp; Mech. RM Lighting</td>
<td>Control Valve (For irrigation)</td>
<td>SPARE</td>
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<tr>
<td><strong>LOAD(W)</strong></td>
<td>540W</td>
<td>270W</td>
<td>-</td>
<td>-</td>
<td>8.4W</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td><strong>CURRENT (A)</strong></td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

**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
- LSFH Cable
- 0.6/1KV Low Smoke Free Cable
- Halogen Cable
- Surge Protection Device

---

**NOTE:**

- Load: 540W
- Current: 270A
- Voltage: 230V

---

**CONSULTANTS:**

- NCTU/UNICODE

**ADDITIONAL INFORMATION:**

- Address: 1001 Ta-Hsueh Road, Hsinchu City 30010, Taiwan
- Contact: www.sde.tw
**CIRCUIT NO.** | **1** | **2** | **3** | **4** | **5** | **6** | **7** | **8** | **9** | **10**
---|---|---|---|---|---|---|---|---|---|---
**DESCRIPTION** | VVR | HRV | CO₂ Heat Pump | Mezzanine Area | Pump Station | Pump Station | Circulation Pump 01 | Water wall Pump | Spare | Spare | Spare
**LOAD(W)** | 2760 | 100 | 1340 | - | 550 | 550 | 480 | 550 | - | - | -
**CURRENT (A)** | - | - | - | - | - | - | - | - | - | - | -

**ELB**
- 30mA
- 0.1Sec
- 16A/2P

**Cable:**
- 6.0mm²/2C+G-6.0mm² XLPE-LSFH IN PVC PIPE 28mm
- 2.5mm²/2C+G-2.5mm² XLPE-LSFH IN PVC PIPE 20mm
- 2.5mm²/2C+G-2.5mm² XLPE-LSFH IN PVC PIPE 20mm

**Transformer**
- 1Φ2W 230V 50Hz

**Spare**
- 550W
- 100W
- -

**Electric 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

**Surge Protection Device**
## PV Components

<table>
<thead>
<tr>
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<th>Qty</th>
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<tr>
<td>0</td>
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<td>NSP</td>
<td>DIP250/63A</td>
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<td>2</td>
<td>Inverter</td>
<td>Delta</td>
<td>Solite 5.0</td>
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<tr>
<td>3</td>
<td>Box</td>
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<td>1</td>
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<td>4</td>
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<td>Schneider</td>
<td>PM3200</td>
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<td>5</td>
<td>Surge Protection Device</td>
<td>Shihlin  BHP-S16P 1PN</td>
<td>2</td>
<td>L:275V, U:1kV, I:15kA, 18/20us</td>
<td>Battery Energy Storage System</td>
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<tr>
<td>6</td>
<td>BESS</td>
<td>Delta</td>
<td>RenI-ES 8120</td>
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</tbody>
</table>

## 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.
Inverter AC side overcurrent Calculations:

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

Inverter AC output conductor:

Output Max. current = 27.18 A
1.56 * 27.18A = 33.91A
Selected conductor: XLPE-LSHF 4mm²

SPD selection of Calculations:

Buildings in cities so use Type II (Class II) SPD

Max continuous operating voltage Uc: 20kA(8/20us)
Max continuous operating voltage: 230V
 insulation voltage of equipment: 1.2~2kV
choose Up: 1.4kV
<table>
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<th>Tag</th>
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<th>Model</th>
<th>Q'ty</th>
<th>Notes</th>
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<td>Power Meter</td>
<td>Archmeter</td>
<td>PA33</td>
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<td>3</td>
<td>PV array</td>
<td>NSP</td>
<td>D6P250B3A</td>
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<tr>
<td>4</td>
<td>DC Panel</td>
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<td></td>
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<td></td>
</tr>
<tr>
<td>5</td>
<td>Inverter</td>
<td>Delta</td>
<td>Solivia 5.0</td>
<td>1</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>Power Meter</td>
<td>Archmeter</td>
<td>PA33</td>
<td>2</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>BESS</td>
<td>Delta</td>
<td>RenE-ES 6120</td>
<td>1</td>
<td>Battery Energy Storage System</td>
</tr>
</tbody>
</table>

![Diagram](Delta.jpg)
### 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.

- **On the front of all junction boxes.** Insert a label:
  - "Attention, cables contain continuous voltage!"

- **In all the junction boxes and in all the DC disconnect boxes.** Insert a label:
  - "No live manual on charge"

**ON THE INVERTERS**

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

- Insert this label on the Inverter front.

**SPD selection of Calculations:**

Buildings in cities so use TYPE 2-class II choose In 20kA/8/20uA

Max continuous operating voltage Uc:

- 426V/1.1 x 488.6V choose 670Vdc

Insulation voltage of the equipment 1.2-2kV choose Up:1.4kV

---

### Photovoltaic Module:

**NSP D6P2505B3A**
- **Max. DC power = 250Wp**
- **Voc = 37.33 V**
- **Vmp = 30.34 V**
- **Isc = 6.95 A**
- **Temp. Coeff. of Voc = -0.116 V/°C**
- **Temp. Coeff. of Vmp = -0.127 V/°C**
- **Module Efficiency = 15.3%**

**Inverter:**
- **Dolsi S.0**
- **Max. Input power = 6,000Wp**
- **Input Voltage range = 125 – 600Vp**
- **Full power MPP range = 150 – 480Vp**
- **Max. current = 38.8A**
- **DC connector = 2 pairs**
- **Nominal apparent power = 5,000VA**
- **Voltage range = 184 – 264Vac**
- **AC output frequency = 50 Hz**
- **Max. current = 27.2 A**
- **Max. efficiency = 96.1%**
- **EU efficiency = 94.8%**

### Voltage Calculations:

- **For coldest expected operating Temp.:**
  - Low ambient Temp. = -20°C
  - Voc(-20°C) = Voc(STC) x (1-0.0065 x (-20°C)) = 37.33 x (1-0.0065 x (-20)) = 37.40V
  - Voc(-20°C)+Voc(STC) = Voc(STC) x (1+0.0065 x (-20°C)) = 37.33 x (1+0.0065 x (-20)) = 37.40V

- **For highest expected operating Temp.:**
  - High ambient Temp. = 75°C
  - Voc(75°C) = Voc(STC) x (1+0.0065 x (75°C)) = 37.33 x (1+0.0065 x (75)) = 42.59V

- **Max module string:**
  - nmax = Voc/1/200 = 600/200 = 3
  - choose 4pcs

- **Max module string:**
  - nmax = 1/200 = 14
  - choose 14pcs

- **Max module string:**
  - nmax = 1/200 = 15
  - choose 15pcs

### 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 conductors:**
  - 1.56 x Isc x 2 = 1.56 x 6.95 x 2 = 27.16A
  - Selected conductor: solar cable 4mm²
Home Automation System

- PAD/Smartphone
- Wireless AP
- Weather Station
- ASUS AIO Server
- HMI (Control Panel)
- PLC
- GATEWAY
- BESS
- Power Meter
- RS-485
- Ethernet
- HRV/VRV
- DI / DO / AI / AO

Consultants:
- Aaron Chen
- Steven Yu

Delphi: DELTA ELECTRONICS, INC.
### Legend / Brand / Model

<table>
<thead>
<tr>
<th>Item</th>
<th>Specification</th>
<th>Brand/Model</th>
</tr>
</thead>
</table>
| Temperature & Humidity | T: -50~50°C; or 0~100°C  
H: 0~100%RH | Airtek / AR1000          |
| Air Quality (CO2)   | ≤30 ppm ±2% of Reading             | Airtek / VC1008T                   |
| Smoke Detector      | Action concentration: 15% Alarm: 96dB / 1m | Horng Lih / NQ95                 |
| Soil Moisture Sensor| 0-100% ; ±3%(m3/m3)             | Jetec / JSH-100                    |
| Smart Weather Station | T/H ; Rainfall ; Wind ; BP       | Vaisala WXT520                     |
| Light Level Sensor  | 0-400 lux                           | Schneider / SLR320                 |
| Motion Detector     | Infrared                            | Panasonic / WTKF2311               |
| Access Point        |                                   |                                   |
| Touch Panel         | Android 4.2 ; DDR3 1G ; Wi-Fi      | Asus / Nexus 7                     |

### Equipment

<table>
<thead>
<tr>
<th>Brand/Model</th>
<th>Item Specification</th>
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<tbody>
<tr>
<td>Vaisala WXT520</td>
<td>T/H ; Rainfall ; Wind ; BP</td>
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<tr>
<td>Asus / Nexus 7</td>
<td>Android 4.2 ; DDR3 1G ; Wi-Fi</td>
</tr>
<tr>
<td>Etek / AR1000</td>
<td>Action concentration: 15% Alarm: 96dB / 1m</td>
</tr>
<tr>
<td>Horng Lih / NQ95</td>
<td>0-100% ; ±3%(m3/m3)</td>
</tr>
<tr>
<td>Jetec / JSH-100</td>
<td>0-100% ; ±3%(m3/m3)</td>
</tr>
<tr>
<td>Schneider / SLR320</td>
<td>0-400 lux</td>
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<tr>
<td>Panasonic / WTKF2311</td>
<td>Infrared</td>
</tr>
<tr>
<td>Asus / Nexus 7</td>
<td>Android 4.2 ; DDR3 1G ; Wi-Fi</td>
</tr>
<tr>
<td>Vaisala WXT520</td>
<td>T/H ; Rainfall ; Wind ; BP</td>
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<tr>
<td>Asus / Nexus 7</td>
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<tr>
<td>Jetec / JSH-100</td>
<td>0-100% ; ±3%(m3/m3)</td>
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<td>Schneider / SLR320</td>
<td>0-400 lux</td>
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<tr>
<td>Panasonic / WTKF2311</td>
<td>Infrared</td>
</tr>
</tbody>
</table>

### Notes

- **Temperature & Humidity**
  - T: -50~50°C; or 0~100°C
  - H: 0~100%RH
- **Air Quality (CO2)**
  - ≤30 ppm ±2% of Reading
- **Smoke Detector**
  - Action concentration: 15%
  - Alarm: 96dB / 1m
- **Soil Moisture Sensor**
  - 0-100%; ±3%(m3/m3)
- **Smart Weather Station**
  - T/H; Rainfall; Wind; BP
- **Light Level Sensor**
  - 0-400 lux
- **Motion Detector**
  - Infrared
- **Access Point**
- **Touch Panel**
  - Android 4.2; DDR3 1G; Wi-Fi
### Tag | Component | Manufacturer | Model | Qty | Notes
--- | --- | --- | --- | --- | ---
1 | PV Module | DSP | DSP2506/8A | 1 | 
2 | DC Protections | NSP | D6P250B3A | 1 | 
3 | Inverter | Delta | SNNV 5.0 | 1 | 
4 | Box | | | 1 | 
5 | Power Meter | Arclight | PA33 | 3 | 
6 | ELCB | Schneider | | 5 | 
7 | Surge Protection Device | Shihlin | BMI40, 2P | 1 | DC/275V, Up: 1.4kV, In: 20KA/300mA | 
8 | BESS | Delta | Rem-ES 6120 | 1 | Battery Energy Storage System | 

---

### Inverter AC side overcurrent Calculations:
- **Input PV power**: 5,000W
- **Output current**: \( \frac{5,000W}{230V} = 21.74A_{ac} \)
- **Overcurrent protection**: \( 21.74A \times 1.25 = 27.18A_{ac} \)
- **Selection**: 32AT ELCB

### Inverter AC output conductor:
- **Output Max. current**: \( 21.74A_{ac} \)
- **1.56 * 21.74A = 33.91A**
- **Selected conductor**: XLPE-LSHF 4mm²

### SPD selection of Calculations:
- **Buildings in cities so use TYPE 2-class II**
- **Max continuous operating voltage Uc**: 230V
- **Insulation voltage of the equipment**: 1.2~2kV
- **Choose Uc**: 275 Vac

---

### Diagram Details:
- **From SDE General Connection BOX**
- **1020W 230V 50Hz**
- **2P 20KA ELCB**
- **2P 63AT 30mA 0.1S ELCB**
- **2P 32AT 30mA 0.1S ELCB**
- **2P 63AT 300mA 0.1S ELCB**
- **2P 32AT 300mA 0.1S ELCB**
- **1F 230V Panelboard**
- **2F 230V Panelboard**

---

**Consultant:** DELTA ELECTRONICS, INC.

---

**Scale**: 1:50

---

**Mark Date**: 2013/04/01

**Description**: SD Submission

---

**Mark Date**: 2013/04/30

**Description**: DD Submission

---

**Mark Date**: 2013/11/03

**Description**: AB Submission

---

**Mark Date**: 2014/03/03

**Description**: CD Submission

---

**Mark Date**: 2014/04/30

**Description**: CD Submission

---

**Mark Date**: 2014/06/02

**Description**: CD Submission

---

**Mark Date**: 2014/11/03

**Description**: AB Submission

---

**Drawn by**: Steven Yu

**Checked by**: Aaron Chen

---

**DWG. No.**: ID-003-1

---

**Title**: ELECTRICITY METERS

---

**TOPOLOGY**: 1

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**Status**: Draft
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<th>Model</th>
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<td>BESS</td>
<td>Delta</td>
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<td>1</td>
<td>Battery Energy Storage System</td>
</tr>
</tbody>
</table>

Diagram:
- SDE Grid 230V 50Hz
- PV array
- DC Protections
- Inverter
- Power Meter
- BESS
- RS485
- AC Load
### Phase 1: KAOHSIUNG
- **Arrival:** 2014/4/29 10:00
- **Departure:** 2014/4/30 08:00

### Phase 2: YANTIAN
- **Arrival:** 2014/5/1 08:00
- **Departure:** 2014/5/2 08:00

### Phase 3: SINGAPORE
- **Arrival:** 2014/5/5 16:00
- **Departure:** 2014/5/6 22:00

### Phase 4: ROTTERDAM
- **Arrival:** 2014/5/26 01:00
- **Departure:** 2014/5/27 10:00

### Phase 5: LE HAVRE
- **Arrival:** 2014/6/1 06:00
- **Departure:** 2014/6/2 06:00

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### Table: TRUCKS SHIPMENT 1

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<td>Taiwan</td>
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<td>4/13</td>
<td>Taiwan</td>
<td>Component packaging and protection</td>
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<td>4/12</td>
<td>Taiwan</td>
<td>Component transport (Container *14)</td>
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<td>Taiwan</td>
<td>Component Loading(Container *14)</td>
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<td>Ship</td>
<td>Transport</td>
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<td>Heavy equipment rental</td>
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<td>Transport sequence</td>
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## Truck Assembly Shipment 2

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**Notes:**
- 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
- ST 2014/11/03 AB Submission

**Contact:**
NCTU/UNICODE
1001 Ta-Hsueh Road
Hsinchu City 30010
Taiwan
www.sde.tw
### Truck No.(A) Type Designation Package No. Assembly No. QTY Weight(kg) Dimensions(mm) L W H Arrival

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### Footnotes:
- **SO-014**: ASSEMBLY TRUCKS SHIPMENT 4
- **DN**: 2013/04/01 SD Submission
- **ST**: 2013/11/01 DD Submission
- **DN**: 2013/07/01 DDc Submission
- **ST**: 2014/03/03 CD Submission
- **ST**: 2014/04/30 CD Submission
- **ST**: 2014/06/02 CD Submission
- **ST**: 2014/11/03 AB Submission

### Diagrams:
- TRUCK-10 FLATBED (6/19 02:00)
- TRUCK-11 FLATBED (6/19 14:00)
- TRUCK-12 FLATBED (6/20 18:00)
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7/15 15:00

TRUCK-3 LOW LAODER
7/15 20:00

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TRUCK-8 FLATBED 7/17 09:00

TRUCK-9 FLATBED 7/17 15:00

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### Disassembly Trucks Shipment 5

**Project:**

**Institution:**

**Team Name:**

**Checked by:**

**Scale:**

**Address:**

1001 Ta-Hsueh Road
Hsinchu City 30010
Taiwan

**Consultants:**

**Drawn by:**

**Mark Date**

**Description**

**Note:**

---

**TRUCK-13 FLATBED**

7/19 03:00

**TRUCK-15 FLATBED**

7/19 05:00

**TRUCK-14 FLATBED**

7/19 04:00

**TRUCK-16 FLATBED**

7/19 12:00

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**Insulation**

- 2
- 1
- 3
- 4
- 5
- 6
- 7
- 8
- 9
 MEP System

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Note:
- Worker 6
- Worker 4

Assembly Phase 4
### Step Details

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### Notes
- **Note:**
  - Work Detail
  - 2F Main Structure
  - Roof Unit

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**Diagrams**

- **Assembly Phase 5**
- **Scale:** -
- **Unit:** -
### Assembly Phase 8

#### Step

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#### Note

- Worker: 6
- Worker: 6

---

**Scale:**
- DN

**Drawn by:** MS

**Checked by:** DN

---

**Project:**
- NCTU/UNICODE

**Institution:**
- NCTU

**Team Name:**
- NCTU/UNICODE

**Address:**
- 1001 Ta-Hsueh Road
  - Hsinchu City 30010
  - Taiwan

**Contact:**
- www.sde.tw

---

**Mark Date:**
- 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
- ST 2014/11/03 AB Submission

---

**Unit:**
- MS

**Scale:**
- DN

**Drawn No.:**
- SO-208

**Page:**
- 256
### Assembly Phase 10

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**Note:**
- The diagram represents Assembly Phase 10 with various work details and work orders.
Furnishing and Planting

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Note:
- Worker
- Step
Outdoor Deck Units

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Note: Worker Work detail Step

Disassembly Phase 2

Worker No. SO-302 260
### Disassembly Phase 5

**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**
- [Note]
Disassembly Phase 6

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Note:

- Worker:
  - 1 to 3 workers
  - 4 workers
  - 3 workers
  - 8 workers
Disassembly Phase 8

Tea Terrance Units

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<td>8</td>
<td>4</td>
</tr>
<tr>
<td>Step</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>------</td>
<td>---</td>
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</tr>
<tr>
<td>Work detail</td>
<td>Unit 11~12 disassembly</td>
<td>Unit 11~12 removing</td>
</tr>
<tr>
<td>Worker</td>
<td>6</td>
<td>4</td>
</tr>
</tbody>
</table>

Note: Worker 6, 4, 8, 10

Disassembly Phase 10

**Footing**

**Note:**
- Worker 6, 4, 8, 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 right onto "D10"
- Turn left onto "Rue de l'Indépendance Américaine"
- Continue onto "Rue Saint-Julien"
- Turn left onto "Rue des Récollets"
- 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

B: 177 Rue de Versailles
Address: 177 Rue de Versailles,
78150 Le Chesnay, France
Tel.: 01.39.63.91.33
ROUTE TO THE NEAREST POLICE OFFICE

A: La Cite du Soleil
- Head northeast on Allée des Matelot 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 Matelot 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 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: Sapeurs Pompiers des Yvelines
Address: Avenue de Pépinière
78450 Villepreux, France

Distance: 11.3km, 18 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 Quai Colbert
- Slight left onto D6015
- Keep left to stay on D6015
- Continue onto N282
- 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 Eurs/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 Av. Volta/D129
- Continue to follow D129
- At the roundabout, take the 3rd exit onto Rue Emile Zola
- Turn right onto Av. Pierre Curie/D10
- 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 construction | 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

### PROBLEM

<table>
<thead>
<tr>
<th>Dangers caused by weather</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ground subsidence</td>
</tr>
<tr>
<td>Getting stuck of heavy equipment</td>
</tr>
<tr>
<td>Getting stuck of heavy components</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dangers due to the great number of people on shipping to the site</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unclear arrangement danger of injury increases</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Too many access possibilities to the lot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Unclear arrangement danger of unauthorized access</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Too small distances from lot and trees/ plants</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obstruction of vehicle’s movements</td>
</tr>
<tr>
<td>Obstructions due to small distances between construction grounds</td>
</tr>
<tr>
<td>Obstruction of vehicle’s movements</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ground limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Obstruction / limitations through on-site security installations</td>
</tr>
</tbody>
</table>

### RISKS

<table>
<thead>
<tr>
<th>Dangers caused by weather</th>
</tr>
</thead>
<tbody>
<tr>
<td>Provision of lifting devices</td>
</tr>
<tr>
<td>Support plates for heavy vehicles’ legs</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Dangers due to the great number of people on shipping to the site</th>
</tr>
</thead>
<tbody>
<tr>
<td>No access for unauthorized persons</td>
</tr>
<tr>
<td>Access only in coordination with construction/shift supervisor</td>
</tr>
<tr>
<td>High visibility vest in compliance with the color scheme required by site operations for every person entering construction site</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Too many access possibilities to the lot</th>
</tr>
</thead>
<tbody>
<tr>
<td>Security officers for control</td>
</tr>
<tr>
<td>Site fence</td>
</tr>
<tr>
<td>Clearly marked pedestrian access to construction site</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Too small distances from lot and trees/ plants</th>
</tr>
</thead>
<tbody>
<tr>
<td>No changes possible</td>
</tr>
<tr>
<td>- steady crane</td>
</tr>
<tr>
<td>- site fence</td>
</tr>
<tr>
<td>- unloading/loading materials in the storage area inside the lot</td>
</tr>
<tr>
<td>- unauthorized and external persons who invade the lot</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Ground limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Securing existing escape routes</td>
</tr>
<tr>
<td>No dangerous works close to this area</td>
</tr>
</tbody>
</table>

### ADOPTED MEASURES
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</td>
</tr>
<tr>
<td></td>
<td></td>
<td>pedestrians</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Designing a delivery zone</td>
</tr>
<tr>
<td>Dangers due to the great number</td>
<td>Increased dangers of injury muddle</td>
<td>High visibility vest</td>
</tr>
<tr>
<td>of people in the site</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>Heavy rain or rain of long-term</td>
<td>Degradation of the land</td>
<td>Use anti-slide mats on slippings surfaces</td>
</tr>
<tr>
<td></td>
<td>Electric shock due to humidity</td>
<td>Regularly remove water from the floor with</td>
</tr>
<tr>
<td></td>
<td></td>
<td>scrapers</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Replacement of defective cables</td>
</tr>
<tr>
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<td>Waterproof plugs</td>
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<td></td>
<td>Protective clothes</td>
</tr>
<tr>
<td>Ground limitations</td>
<td>Obstruction / limitations through on-site</td>
<td>Securing existing escape routes</td>
</tr>
<tr>
<td></td>
<td>security installations</td>
<td>No dangerous works close to this area</td>
</tr>
<tr>
<td>Traffic and parking of the</td>
<td>Shock, collisions with pedestrians, existing</td>
<td>Respect the rules of the road</td>
</tr>
<tr>
<td>crane or a truck</td>
<td>equipment or vehicle</td>
<td>Parking places reserved for this purpose</td>
</tr>
<tr>
<td></td>
<td>Falling objects transported</td>
<td>Lash with appropriate means and in</td>
</tr>
<tr>
<td></td>
<td></td>
<td>sufficient number</td>
</tr>
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</table>
PPE MUST BE WORN ON THIS SITE
### Note:

Where the worker are:
On the ground

**ALL SAFETY RULES MUST BE FOLLOWED**

---

<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>
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<tbody>
<tr>
<td>1</td>
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</table>

---

Worker

8 4 4 6 4

---

**ASSEMBLY PHASE 1**

---

Scale:
Unit:

--

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
ST 2014/11/03 AB Submission

---

**ALL SAFETY RULES MUST BE FOLLOWED**

Where the worker are:
On the ground
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

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

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

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

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

ALL SAFETY RULES MUST BE FOLLOWED
Main Structure & Interior Insulation & M.E.P System Phase

<table>
<thead>
<tr>
<th>Step</th>
<th>Detail</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Work Detail: Stair Unit and Terrace Unit Assembly and Lifting</td>
</tr>
<tr>
<td>2</td>
<td>Interior Insulation Assembly</td>
</tr>
<tr>
<td>3</td>
<td>M.E.P System Tube and trunking</td>
</tr>
<tr>
<td>4</td>
<td>Interior Upper Floor Insulation</td>
</tr>
<tr>
<td>5</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
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<tr>
<td>7</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
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<tr>
<td>9</td>
<td></td>
</tr>
</tbody>
</table>

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

<table>
<thead>
<tr>
<th>Step</th>
<th>Work Detail</th>
<th>Additional components</th>
<th>M.E.P System Shaft</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Work Detail</td>
<td>Additional components</td>
<td>M.E.P System Shaft</td>
</tr>
<tr>
<td>2</td>
<td>Work Detail</td>
<td>Additional components</td>
<td>M.E.P System Shaft</td>
</tr>
<tr>
<td>3</td>
<td>Work Detail</td>
<td>Additional components</td>
<td>M.E.P System Shaft</td>
</tr>
<tr>
<td>4</td>
<td>Work Detail</td>
<td>Additional components</td>
<td>M.E.P System Shaft</td>
</tr>
<tr>
<td>5</td>
<td>Work Detail</td>
<td>Additional components</td>
<td>M.E.P System Shaft</td>
</tr>
<tr>
<td>6</td>
<td>Work Detail</td>
<td>Additional components</td>
<td>M.E.P System Shaft</td>
</tr>
<tr>
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<td>Work Detail</td>
<td>Additional components</td>
<td>M.E.P System Shaft</td>
</tr>
<tr>
<td>8</td>
<td>Work Detail</td>
<td>Additional components</td>
<td>M.E.P System Shaft</td>
</tr>
<tr>
<td>9</td>
<td>Work Detail</td>
<td>Additional components</td>
<td>M.E.P System Shaft</td>
</tr>
</tbody>
</table>

Note: ALL SAFETY RULES MUST BE FOLLOWED

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

Worker: 8 & 4

Mark Date Description
- 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
- ST 2014/11/03 AB Submission

Unit: ASSEMBLY PHASE 4
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>

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

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

ALL SAFETY RULES MUST BE FOLLOWED
Solar Panel & Bayer Roof Panel & Louver Panel 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>Solar Panel &amp; Solar Panel Electricity System</td>
<td>Bayer Roof Panel</td>
<td>Louver Panel</td>
<td></td>
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<td>Waker</td>
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<td></td>
<td></td>
<td></td>
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</tbody>
</table>

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 mezzanine floor
On the Floor

ALL SAFETY RULES MUST BE FOLLOWED

ASSEMBLY PHASE 7

Green Core & M.E.P Wire & Water System 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>Green Core Structure &amp; Panel &amp; Water System</td>
<td>M.E.P Wiring &amp; Piping System</td>
<td></td>
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</tr>
<tr>
<td>Worker</td>
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<td>4</td>
<td></td>
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</tr>
</tbody>
</table>

Note:

ALL SAFETY RULES MUST BE FOLLOWED
Bayer Wall System & Roof Cover System Phase

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

ALL SAFETY RULES MUST BE FOLLOWED

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

ALL SAFETY RULES MUST BE FOLLOWED
### Note

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

ALL SAFETY RULES MUST BE FOLLOWED

### Work Deatail

<table>
<thead>
<tr>
<th>Step</th>
<th>Roof Waterproof</th>
<th>Equipment &amp; Lighting Test</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
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<tr>
<td>9</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Step

- 1: Roof Waterproof
- 2: Equipment & Lighting Test

### Where the worker are:

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

ALL SAFETY RULES MUST BE FOLLOWED

### Diagram Description

- ASSEMBLY PHASE 9
- Roof Waterproof & Equipment & Lighting Test Phase
- Step 1 to 9
- 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 Details</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>
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</tr>
<tr>
<td>Worker</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td>6</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

ALL SAFETY RULES MUST BE FOLLOWED

Note:
Worker
Work Detail
System Test
Lot Clean

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

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

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 mezzanine floor
On the 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

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 mezzanine floor
On the Floor                    On the roof
ALL SAFETY RULES MUST BE FOLLOWED

Where the worker are:
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ALL SAFETY RULES MUST BE FOLLOWED

Where the worker are:
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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

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:
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On the Floor                    On the roof
ALL SAFETY RULES MUST BE FOLLOWED

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

Where the worker are:
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On the 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

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 MEZZANINE FLOOR
ON THE FLOOR                    ON THE ROOF
ALL SAFETY RULES MUST BE FOLLOWED
Where the worker are:
On the ground
On the Floor

ALL SAFETY RULES MUST BE FOLLOWED

Note:
Worker

Disassembly Phase 1

<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>
</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>
</tr>
<tr>
<td>Worker</td>
<td>6</td>
<td>4</td>
<td>6</td>
<td>4</td>
<td>2</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

Where the worker are:
On the ground
On the Floor

ALL SAFETY RULES MUST BE FOLLOWED

Note:
Worker

Disassembly Phase 1

<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>
</tr>
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<td>Furniture removing</td>
<td>Kitchen/Appliance/Lamp equipment</td>
<td>Machinery room</td>
<td>Outside pipeline/Lamps</td>
<td>Outside handrail</td>
</tr>
<tr>
<td>Worker</td>
<td>6</td>
<td>4</td>
<td>6</td>
<td>4</td>
<td>2</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>
Where the worker are:
On the ground  On the Floor

ALL SAFETY RULES MUST BE FOLLOWED

<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>6</td>
<td>2</td>
<td>5</td>
<td>3</td>
</tr>
</tbody>
</table>

Disassembly Phase 2

Note:
Worker

Where the worker are:
On the ground  On the Floor

ALL SAFETY RULES MUST BE FOLLOWED
Disassembly Phase 3

First Floor disassembly

<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>1F Interior floor</td>
<td>Aluminium window</td>
<td>Sensor removing</td>
<td>1F Ceiling</td>
<td>1F Wooden wall</td>
<td>Bathroom</td>
<td>Kitchen Island</td>
<td>Work Station removing</td>
<td>Thermal wall removing</td>
</tr>
<tr>
<td>Worker</td>
<td>4</td>
<td>2</td>
<td>2</td>
<td>4</td>
<td>8</td>
<td>4</td>
<td>3</td>
<td>4</td>
<td>4</td>
</tr>
</tbody>
</table>

Note

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

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
Second Floor disassembly

Step | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9
--- | --- | --- | --- | --- | --- | --- | --- | --- | ---
Work detail | 2F WPC | 2F Equipment/Appliance | Water wall removing | 2F pipeline | Green core | 1F Upper wooden box | 2F Upper wooden box | Window/Door disassembly | Tea terrace/Entrance WPC
Worker | 3 | 5 | 8 | 4 | 4 | 6 | 8 | 4 | 8

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

ALL SAFETY RULES MUST BE FOLLOWED

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

- All safety rules must be followed
Roof disassembly

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

ALL SAFETY RULES MUST BE FOLLOWED

Roof disassembly

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:

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

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

<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>
</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**

### Directions:
- 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

ALL SAFETY RULES MUST BE FOLLOWED

Tea terrance construcnre 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>Roof Unit 1~3 removing</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td>2F unit disassembly</td>
<td>6</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>Roof Unit 9~11 disassembly</td>
<td>4</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>West column</td>
<td>3</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>East/North canopy</td>
<td>8</td>
<td></td>
</tr>
</tbody>
</table>

Disassembly Phase 7
West Roof structure disassembly

<table>
<thead>
<tr>
<th>Step</th>
<th>1</th>
<th>2</th>
</tr>
</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>
<td>4</td>
</tr>
</tbody>
</table>

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

On the Floor

ALL SAFETY RULES MUST BE FOLLOWED

Where the worker are:
On the Floor
Unit 1~5 structure 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>
<tr>
<td>Worker</td>
<td>6</td>
<td>4</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 mezzanine floor

Unit 1~5 disassembly

Disassembly Phase 9

SC

Worker

Note

Worker
Where the worker are:
- On the ground
- On the 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>6</td>
<td>4</td>
<td>8</td>
<td>10</td>
</tr>
</tbody>
</table>

Note: Worker work detail

Worker:
- Unit 11~12 disassembly
- Unit 11~12 removing
- Footing removing
- Site cleaning

Disassembly Phase 10

SC

Note:
Worker on the ground
Worker on the Floor
ALL SAFETY RULES MUST BE FOLLOWED
FIRST IMPRESSION (Depends on the visitors in queue)
At the beginning of the west ramp
1. We will offer a tour brochure to each visitor.
2. We will ask visitors connect to our tour website from mobile devices

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

BATHROOM & KITCHEN (2 MINS)
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 MINS)
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 MINS)
Guide will introduce the concept of "The Green Core of Orchid House", "The Green Core of City-Orchid House" and Taiwanese arch.

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

PHOTOSHOT 2 (5 MINS)
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 MINS)
Experience the southeast side of the house, arsing the well-designed garden.

Note:
- The plan shows the general layout and functional areas of the Orchid House.
- The mechanical system includes the inverter and battery for photovoltaic power.
- The indoor unit includes the humidifier and controls the indoor climate.
- The piping and shafts are essential for directing water and ventilation systems.
- The waiting line indicates the flow of visitors during the tour.
FIRST IMPRESSION (depends on the visitors in queue)
FIRST GLIMPSE (10 secs)
PHOTOSHOT 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)
PHOTOSHOT 2 (5 mins)
PHOTOSHOT 3 (2 mins)
FEEDBACK & GET THE VOTE CARD (30 secs)