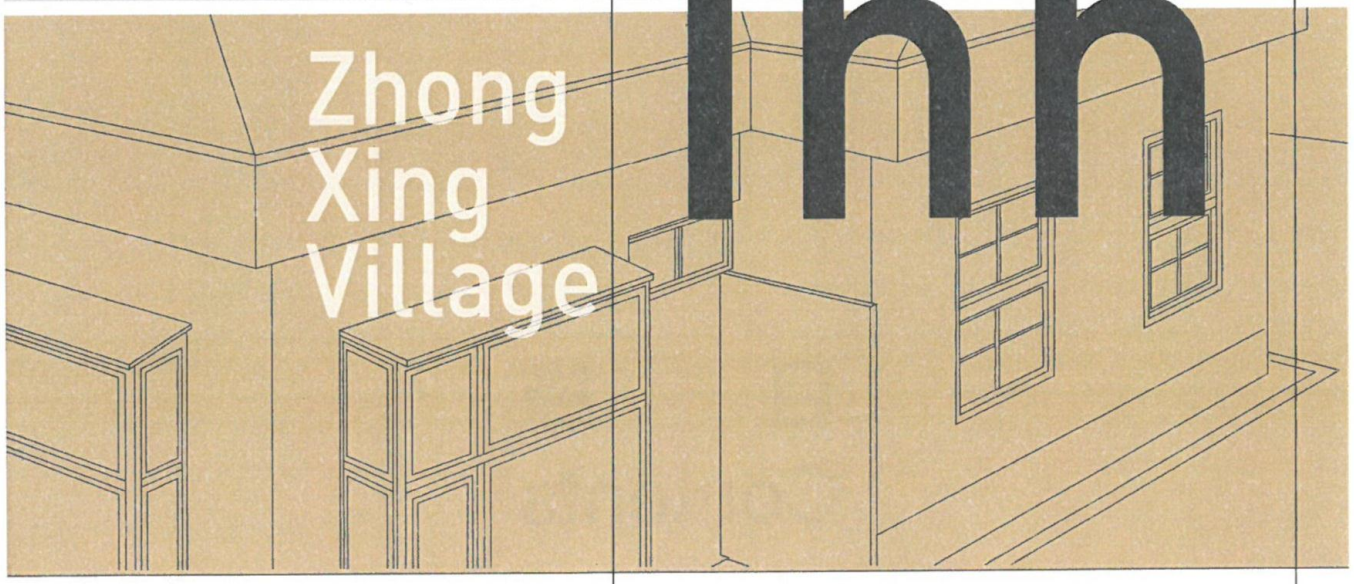
Smart Inn

Zhong Xing Village



中興新村 智慧驛站 36

中興新村智慧驛站

Zhong Xing Village

Smart Inn No.36 Book

36

檔案應用專區

中興新村智慧驛站

目　　錄
Contents

3
改建背景
Background

計畫緣起.....3
Purpose
計畫執行.....5
Execution

7
智慧家居
Smart living

家庭系統.....7
Smart House System
眷舍變遷.....9
House Evolution

11
整建工程
Engineering

設計概念.....11
Design Concept
立面.....13
Elevation
原始平面.....17
Orignal Plan
屋頂結構平面.....18
Roof Structure Plan
平面.....19
Plan
屋頂平面.....20
Roof Plan
工程紀錄.....21
Construction Process
智慧系統.....23
Smart System

25
景觀改造
Landscape

原始基地平面.....25
Orignal Siteplan
基地平面.....26
Siteplan
工程紀錄.....27
Construction Process

29
太陽能車棚
Solar Carport

平面.....29
Plan
屋頂平面.....30
Roof Plan
立面.....31
Elevatio
工程紀錄.....33
Construction process

35
生活情境
Scenario

剖面.....35
Section

整體工程
Engineering

改建背景 計畫緣起
Background Purpose

中興新村為台灣唯一之花園城市規劃，民國 98 年 11 月 19 日核定籌設計畫，將中興新村由行政中樞轉型為研究園區，發展文化創意及高等科技，期望使中興新村風華再現。規劃目標將優先開發南核心區，並在光明里建立示範住宅。

國立交通大學跨領域設計科研究中心(TDIS)著手設計示範住宅，以「永續」最為核心，貫穿三主題「生活與科技」、「文化與景觀」、「場所與建築」。保留中興新村獨特之都市紋理，更將創造文化景觀保存再利用之創新典範。

Zhongxing Village is the only existed Garden City in Taiwan. In 8, November 2009, the government planned to transform the village from Central Administrative to Research Park, and developed Culture Creative and High Technology with the hope of revival. Priority target is the exploitation of South Core and the establishment of Model Residential within Quanming Neighbor.

National Chiao Tung University Transdisciplinary Design Innovation Shop (TDIS) designs the Model Residential with the core concept of Sustainable. Design strategies of refurbishment are illustrated by three main topics- “Lives& Technology”, “Culture& Landscape”, “Place and Architecture”. Maintaining the unique urban context of Zhongxing Village and also creating an innovative example of Culture Preservation and Recycling.

智慧家居概念圖
Smart Living Concept

關於休閒娛樂
About entertainment

燈光控制 Light control

溫度控制 Temperature control

客廳
Living Room

關於休息和更衣
About rest and dress up

臥房
Bed Room

決策協助系統
Decision Support Systems

關於健康與飲食
About health and food

營養管理 Health management

食物資訊服務 Food data server

廚房
Kitchen

家庭農場
Family Farm

植栽健康管理
Plant Health Management

整體工程
Engineering

改建背景
Background

計畫執行
Execution

改建團隊
Team

工程名稱: 中興新村高等研究園區智慧住宅整建工程
主辦單位: 科技部
承辦單位: 中部科學園區管理局
設計單位: 國立交通大學跨領域設計科學研究中心
監造單位: 何東光建築師事務所
承包廠商: 承翰營造有限公司
協助單位: 中華大學/廣達電腦
工程日期: 2015/11-2015/4

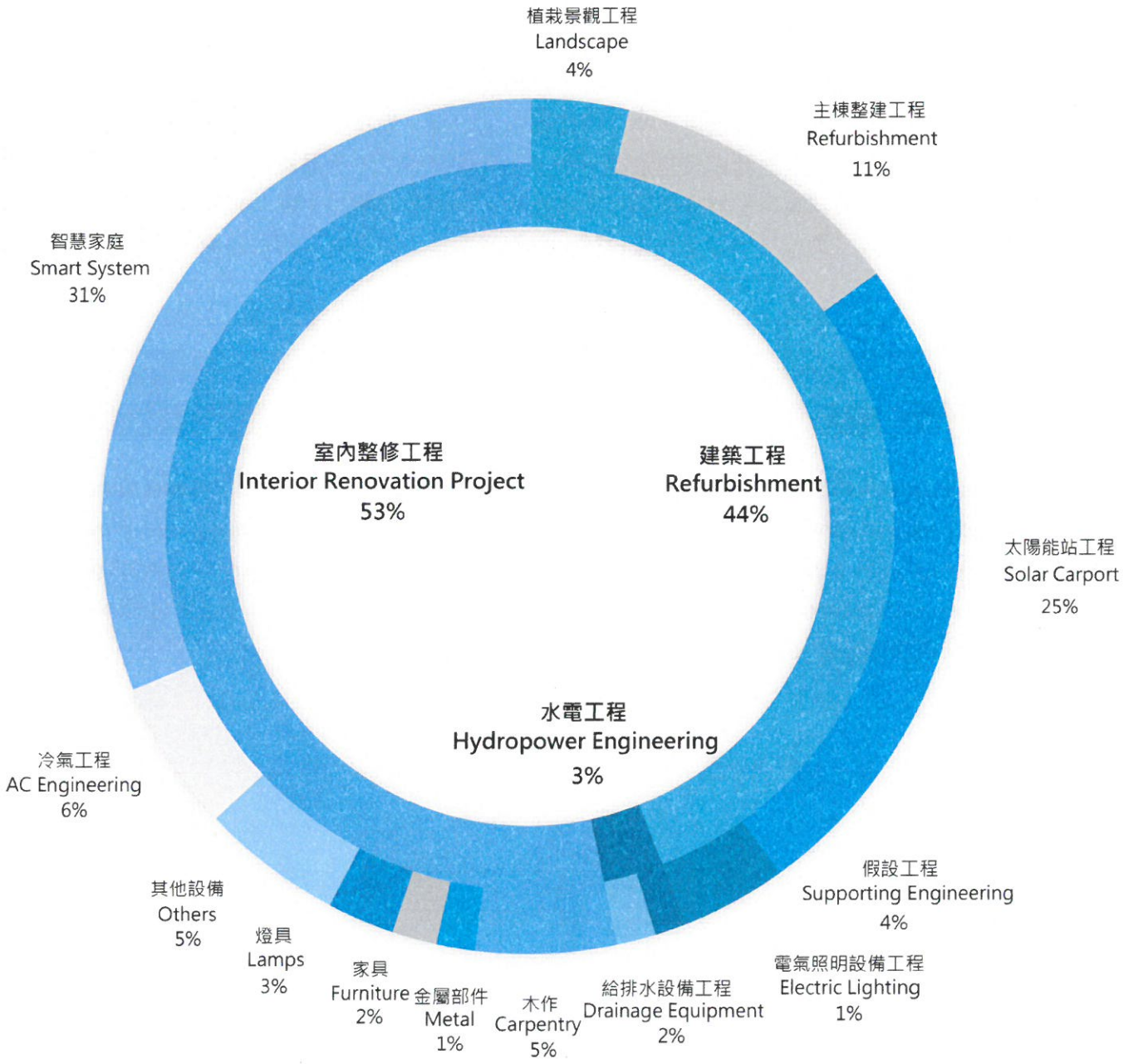
Project name: Smart Residential Refurbishment Project in Zhongxing Village Advance Research Park
Organizer: Ministry of Science and Technology
Executor: Central Taiwan Science Park
Design: National Chiao Tung University Transdisciplinary Design Innovation Shop (TDIS)
Supervision: PCH Architects
Construction: Cheng Han Construction Company Limited
Assistance: Chung Hua University/ Quanta Computer
Construction Date: November 2015- April 2016

建物基本資料
Basic Information

基地面積: 322.9 m2
建物登記日期: 1976.02.15
建築構造: 鋼筋混凝土加強磚造

Site Area: 322.9 m2
Construction Date: 15. February 1976
Structure: RC and Confined Masonry Buildings

改建費用
Cost


植栽景觀工程
Landscape
4%
主棟整建工程
Refurbishment
11%
智慧家庭
Smart System
31%
室內整修工程
Interior Renovation Project
53%
建築工程
Refurbishment
44%
太陽能站工程
Solar Carport
25%
水電工程
Hydropower Engineering
3%
冷氣工程
AC Engineering
6%
假設工程
Supporting Engineering
4%
其他設備
Others
5%
燈具
Lamps
3%
家具
Furniture
2%
金屬部件
Metal
1%
木作
Carpentry
5%
給排水設備工程
Drainage Equipment
2%
電氣照明設備工程
Electric Lighting
1%

整體工程
Engineering

智慧家居
Smart Living

家庭系統
Smart House System

概念
Concept

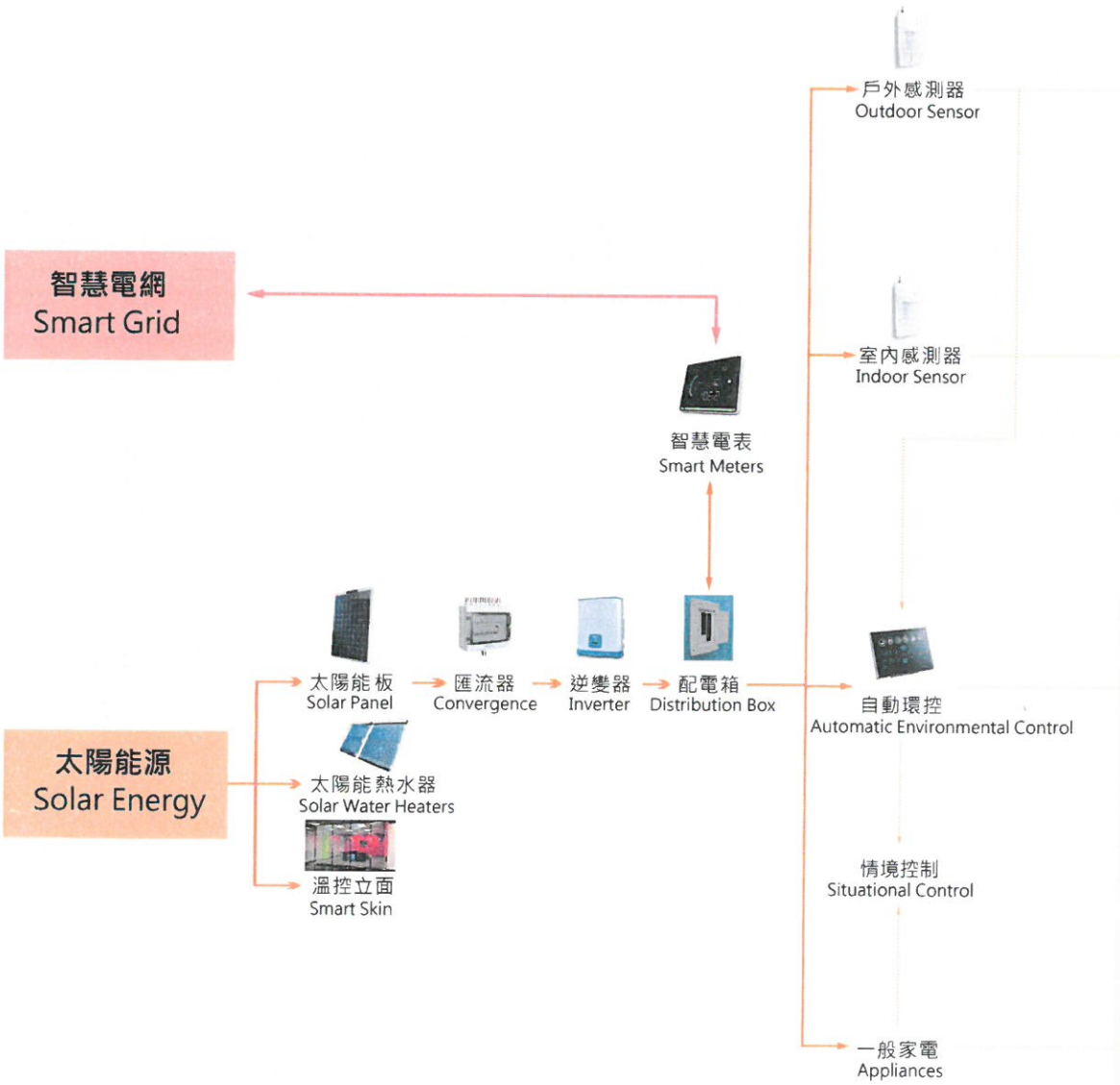
何謂智慧化居住空間?

智慧住宅，乃是將各種家庭自動化設備，利用網路系統之連結，使其發揮整體性高效率之服務功能，以確保居家之安全、居住環境之健康及生活之便利，並提供舒適之生活品質，創造人性化之居住環境。而建構這些功能，則須仰賴各種資通信與新服務技術，透過基礎設施平台，進行整合及妥善管理維運，方能發揮具體功效，達成住宅智慧化之目的。其範疇包括智慧家庭、智慧建築、智慧社區及智慧都市。

What is smart living?

Smart House is a future trend for automation of appliance. By connecting internet system, the entirety house can perform high efficiency of services including safe guard, health and convenience. At the same time, providing cozy life quality and creating humanize living environment. With the help from ICT and new service technology, as well as integration and management of infrastructure platform, these functions could be built. The domain of smart living contains concept of smart house, smart building, smart community and smart city.

智慧家庭系統
Smart House System



落雨感測器
Rain Sensor

風速感測器
Wind Speed Sensor

濕度感測器
Humidity Sensor

溫度感測器
Temperature Sensor

土壤濕度感測器
Soil Moisture Sensor

濕度感測器
Humidity Sensor

溫度感測器
Temperature Sensor

光度感測器
Lighting Sensor

聲音感測器
Sound Sensor

CO_2感測器
CO_2 Sensor

CO 感測器
CO Sensor

煙霧感測器
Smoke Sensor

熱泵空調系統
Heat Pump System

直流風扇組
DC Fan Group

電控薄膜
Electric Film

室內LED燈組
Indoor LED Lamps

室外LED燈組
Outdoor LED Lamps

全熱交換器
Heat Exchanger

智慧系統控制面板
Smart System Control Panel

網路通訊器
Web Communicator

熱泵熱水器
Heat Pump Water Heater

電熱爐
Electrothermal Furnace

冰箱
Refrigerator

電視/投影機
PC/ Projector

個人/中控電腦
Personal/Central Computer

互動多媒體
Interactive Multimedia

整體工程
Engineering

智慧家居
Smart Living

眷舍變遷
House Evolution

中興新村光明一街36號
No.36, Guangming 1st Rd., Zhongxing Village

民國36年，中興新村因為疏遷的緣故而成為台灣第一個公務新市鎮。台灣省政府在這裡建立了戰時體制，當時的規劃者依據英國花園城市理論，規劃了三個鄰里的聚落規模，也是展現台灣現代化聚落的起點。中興新村將於明年(2017年)邁向一甲子，光明一街36號的智慧驛站也落成完工，象徵新的代智慧家居的來臨。

Zhongxing Village was established in the year 1947 due to defense reason. As the first official business town in Taiwan, Taiwan Provincial Government set wartime system up here. Planners at that time planed three main neighborhoods according to Garden City Theory from UK. The village is a start of modernization in Taiwan. Next year, this village will celebrate its sixtieth anniversary, at the same time, the Smart Residential at No.36, Guangming 1st Rd., Zhongxing Village complete, which holds a special meaning to the new era of Smart Living.

基地周圍 Neighboring

入口處 Entrance

後院 Backyard

客廳 Living room

主臥房1 Main bedroom 1

主臥房2 Main bedroom 2

臥房 Bedroom

廁所 Toilet

餐廳 Dining room

廚房 Kitchen

設計概念
Design Concept

中興新村36智慧驛站
Smart Inn No.36 in Zhongxing Village

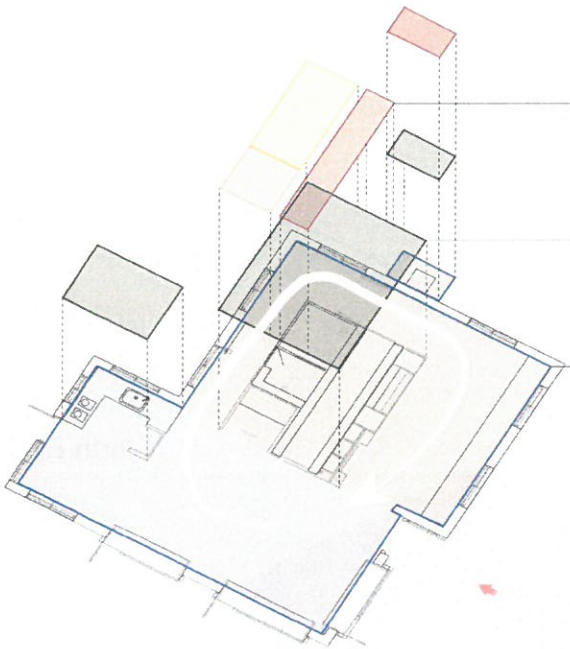
驛站作為一個中繼點，集合了來到中興新村的人們，以及即將離開中興新村的人們。在一個既有的文化資產建築中，保留原始建築的美麗風貌及其承載的歷史與記憶，重新置入新的空間形態，創造建築再發展的可能。舊建築成為了生活的載體，因為置入的空間、裝置、想像而構成不同的生活情境。這些懷舊的、創新的、永續的、節能的、綠意的生活情境將成為中興新村新的地景元素。

這種Hub與Plug-In的關係，使得舊建築得以以一種基本框架存在，因著不同的空間機能而置入不同的空間形態，衍生出環境、建築與生活相互滲透的無限可能。

The house acts as a station as well as a relay point for gathering people in Zhongxing Village. Under the frame of existed cultural assets and building, we try to preserve its original beauty, history, memory. At the same time, re-implanting new type of space for redevelopment possibility. These old building become a carrier of life. With different space, equipment and imagination, scenario of lives will be constructed. These nostalgic, innovative, sustainable, energy efficient, green scenarios are new landscape elements of Zhongxing Village.

The relationship of Hub and Plug-In allows coexistence of old building and new program. The basic frame of the house will hold a variety of new functions inside. As a result, the interpenetration of environment, architecture and lives creates endless possibilities.

建築整建等角透視
Refurbishment Isometric Perspective

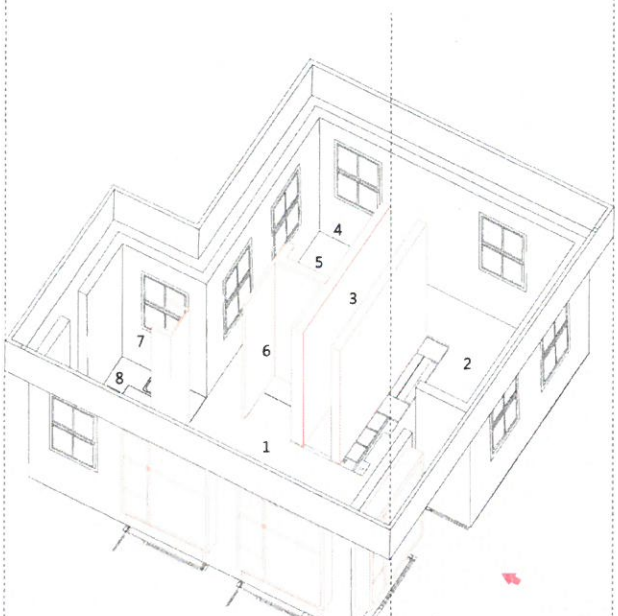


走廊 Corridor
浴室/廁所 Bathroom/ Toilet
工作區 Studio

服務空間 Service Space

私人空間 Private Area
公共空間 Public Area

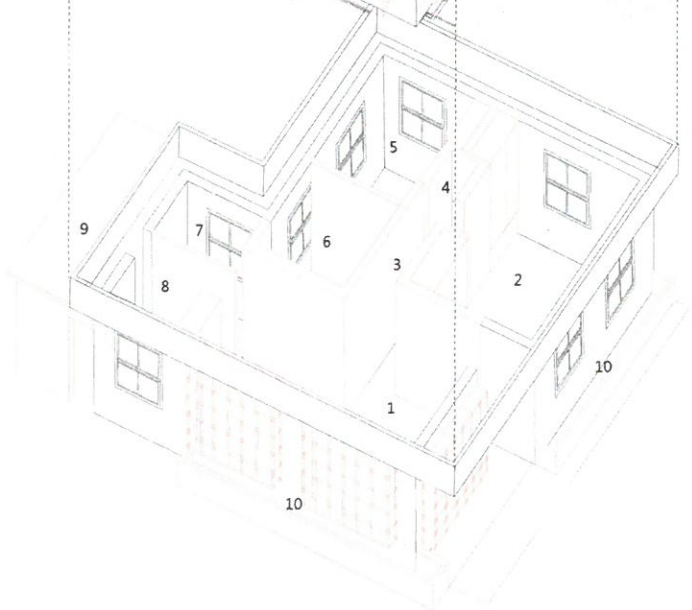
空間計畫
Program



原始建築 Origin
拆除 Demolition

1 客廳 Living room
2 臥室 Bedroom
3 走廊 Corridor
4 廁所 Toilet
5 浴室 Bathroom
6 工作區 Studio
7 廚房 Kitchen
8 餐廳 Dining room

改建後空間
Refurbishment



原始建築 Origin
拆除 Demolition

1 客廳 Living room
2 主臥室 Main Bedroom
3 走廊 Corridor
4 廁所 Toilet
5 臥室 I Bedroom I
6 臥室 II Bedroom II
7 浴室 Bathroom
8 廚房 Kitchen
9 餐廳(加建) Dining room
10 花台 Blumenbeet

改建前空間
Origin

建築整建
House

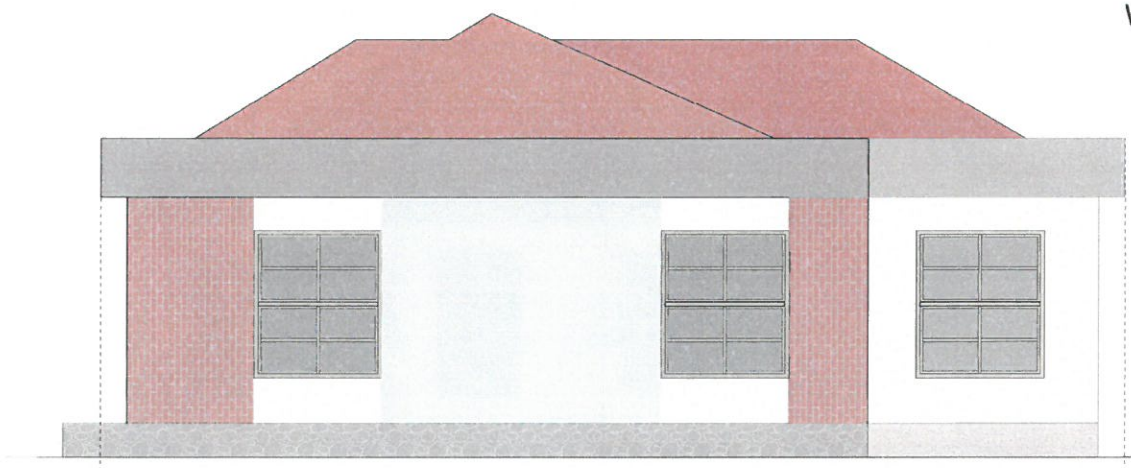
立面
Elevation

北向立面圖
North Elevation

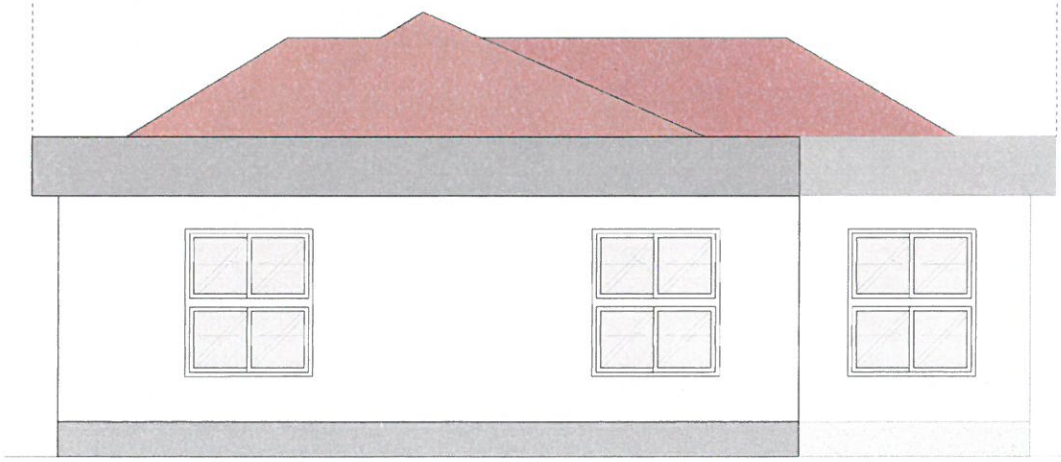
m

0 0.35 0.7 1.4

西向立面圖
West Elevation



原始
Original



整建
Refurbishment

建築整建
House

立面
Elevation

南向立面圖
South Elevation

m

0 0.35 0.7 1.4

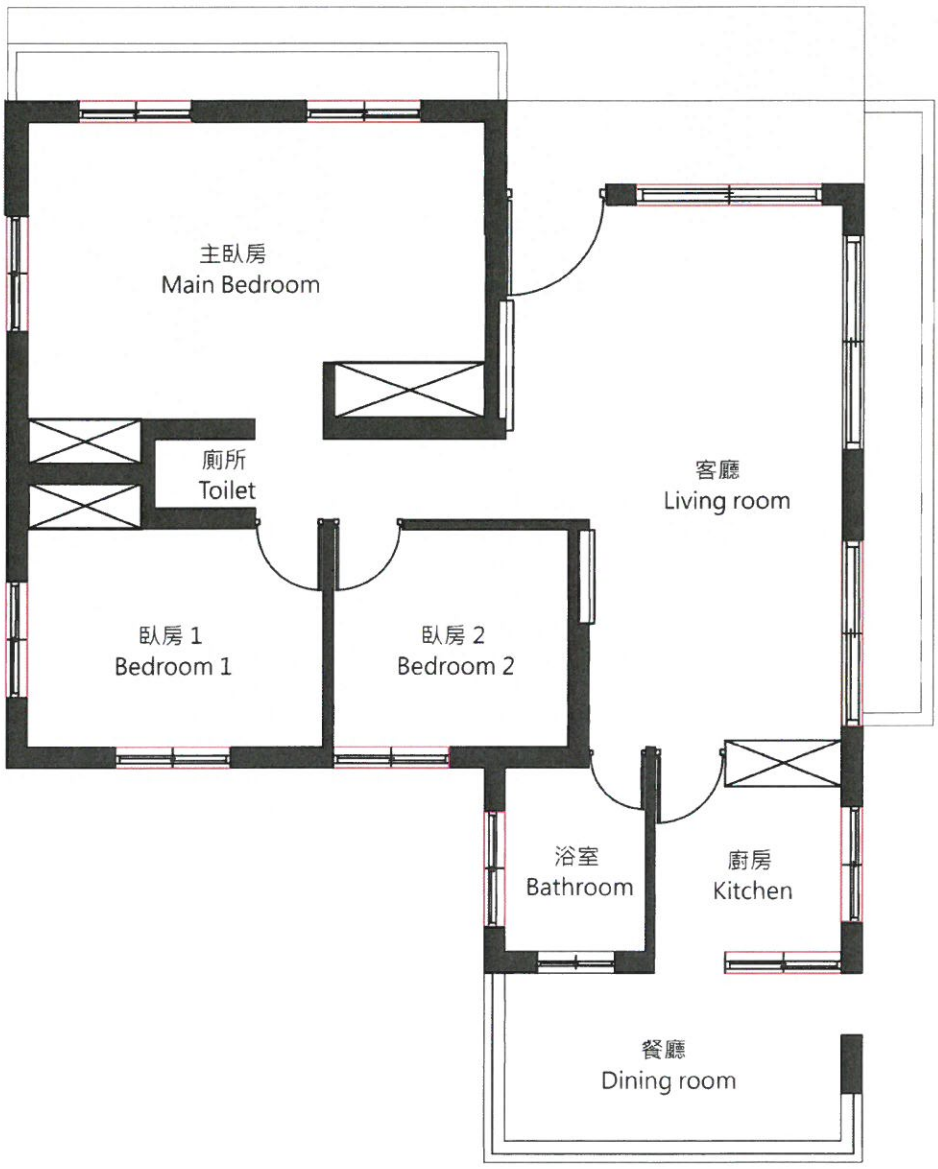
東向立面圖
Eest Elevation

原始
Original

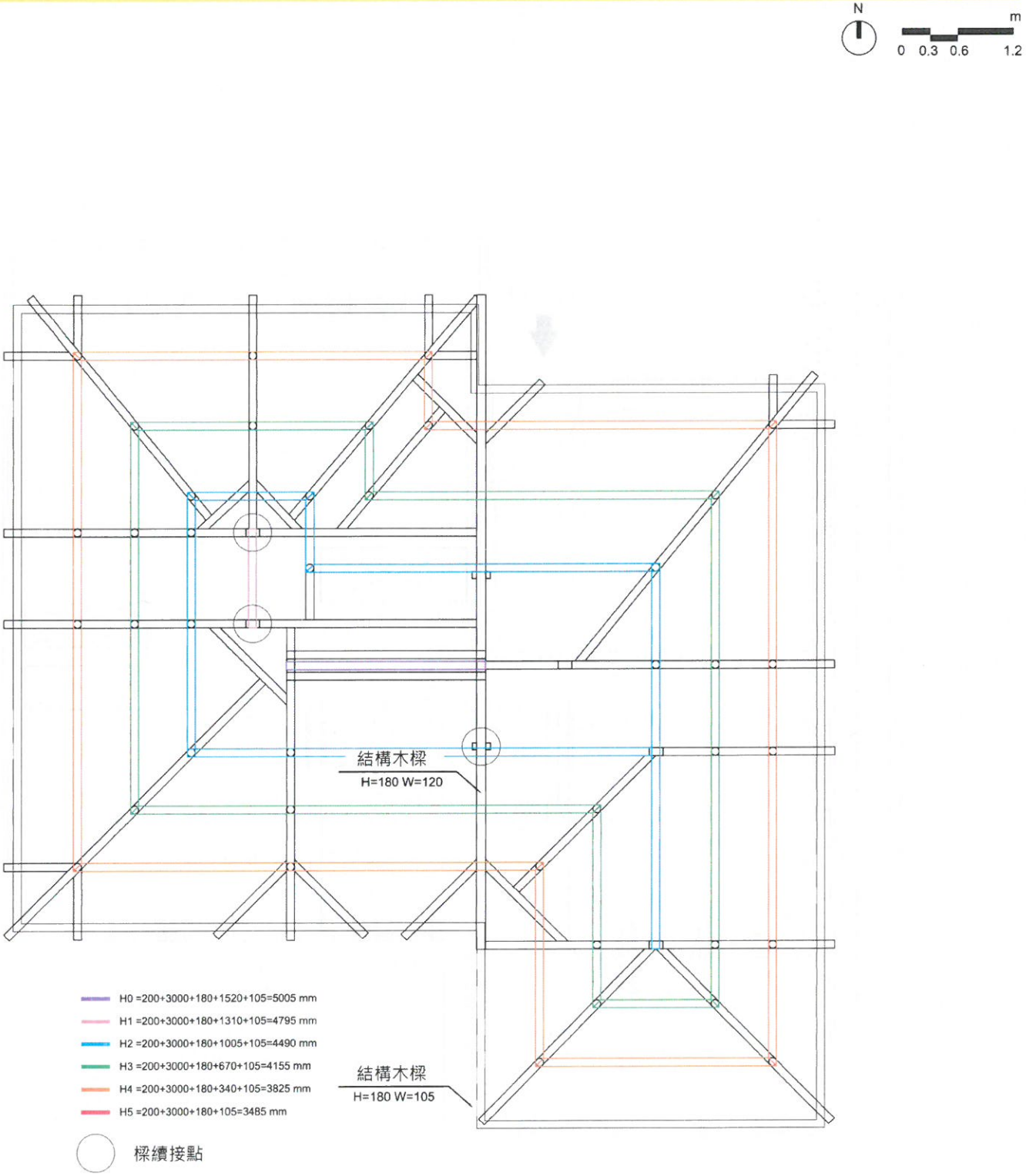
整建
Refurbishment

建築整建
House

原始平面
Original Plan



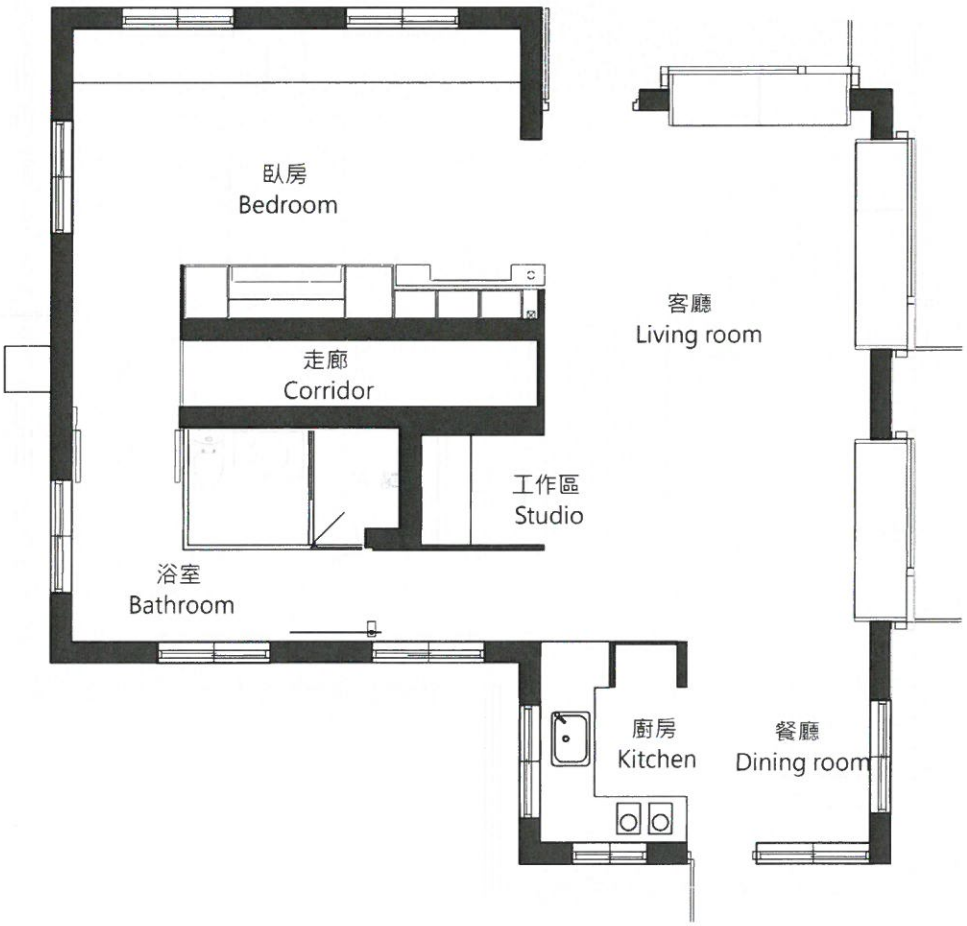
屋頂結構平面
Roof Structure Plan



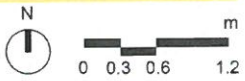
整體工程
Engineering

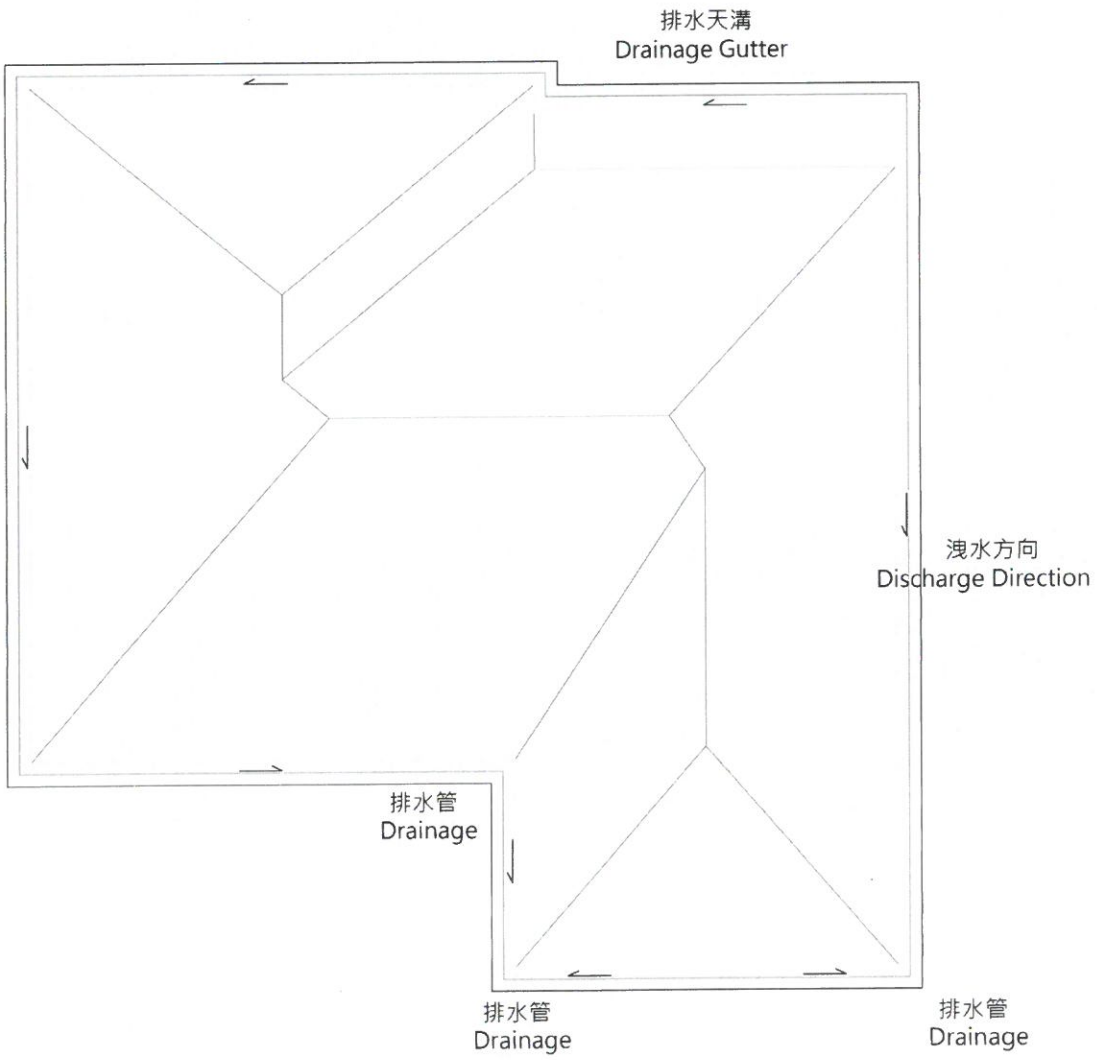
建築整建
House

平面
Plan



屋頂平面
Roof Plan





整體工程
Engineering

建築整建
House

工程紀錄
Construction process

假設工程
Suppose supporting

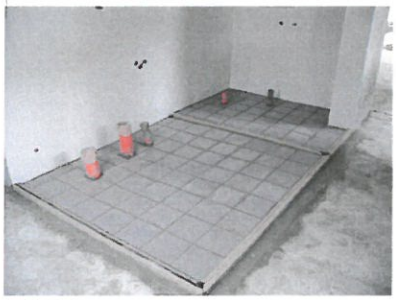
屋頂椽木更換修補
Replacing wooden roof rafters

外牆整理
Facade Engeneering

2015/11 2015/11 2015/11 2015/12 2015/12 2016/1

舊宅拆除整理
Old house demolition

結構內牆拆除
Interior structure demolition



泥作進場
Cement Engeneering

室內外粉刷
Indoor and outdoor painting

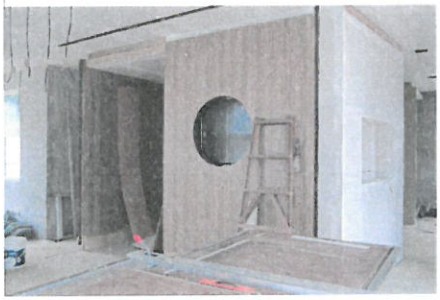
設備進場
Equipment installation

魔鏡裝設/軟體設定
Digital mirror/ Software

2016/2 2016/3 2016/4

2016/2 2016/3 2016/4

封天花板
Ceiling installation



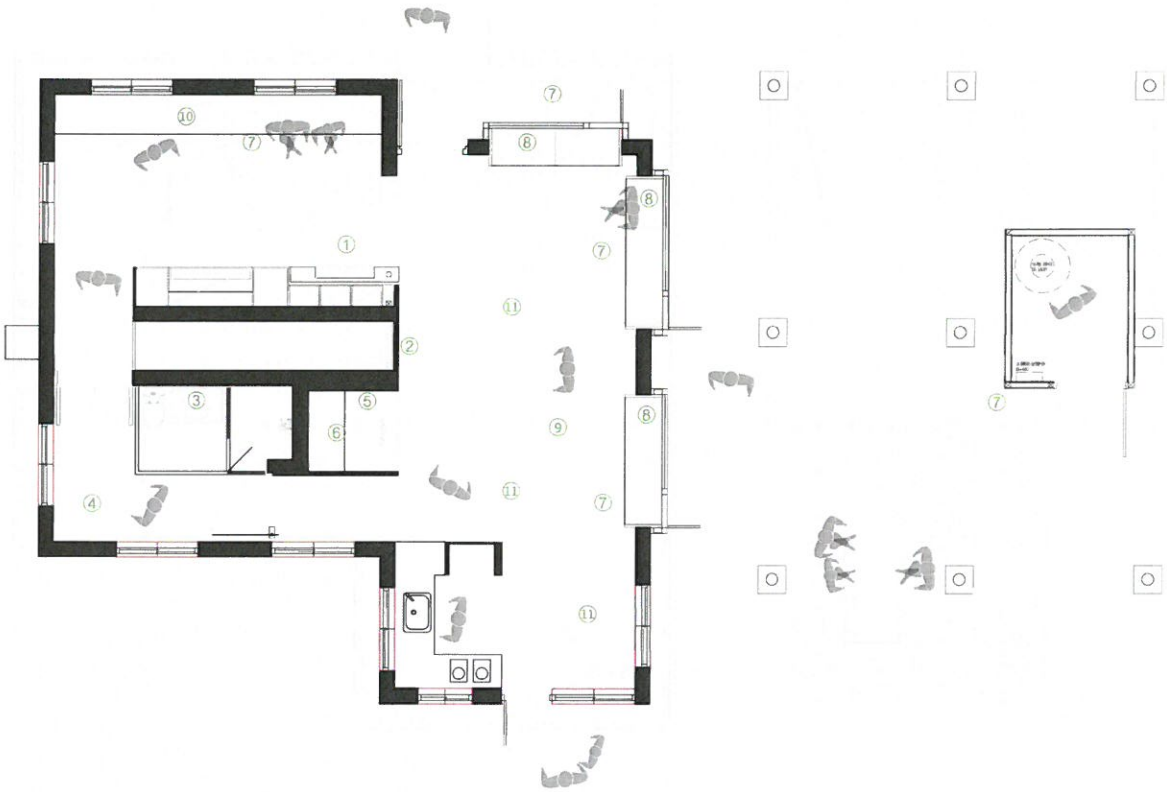
室內裝修進場
Interior decoration

電控玻璃貼膜
Electronically controlled glass film

整體工程
Engineering

建築整建
House

智慧系統
Smart system



Smart Living System

① 42吋互動螢幕

42’’ Monitor

在42’’ 互動螢幕中分成導覽、智慧控制、參數設定、警報查詢等功能，導覽中包含中興新村簡介、中興新村漫遊兩大主題，讓參觀者理解村落發展的始末，提供旅遊資源，智慧控制讓參觀者可以體驗調控室內和車棚環境，並從監測器回傳資料獲得物理環境資訊，太陽能發電量曲線，

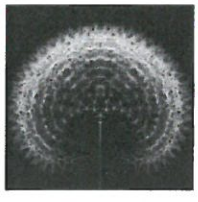
The content of 42’’ Monitor can be divided into Tour, Smart control, Preferences, Alert queries. Tour contains two main themes: Introduction of Village, Roaming around Village. Visitor can understand the history of the village wan get necessary travel information through touching the screen. Besides, smart control helps visitor experience remote control indoor and in carport.

② 種子鏡像

Dandelion Mirror

種子鏡像是一項結合非接觸式生物資訊感測技術，發展的智慧生活設計品，從使用者日常梳洗的規律模式中，進行簡易的體溫、呼吸、脈搏等訊息的量測，並視覺化以衍生式的（蒲公英）動畫，呈現使用者的健康狀況，或回饋警示的訊息。

Dandelion Mirror is an interactive product combines with real time generative animation and physiological measurements device by using non-contact sensor technology. The bio-sensor based Dandelion Mirror is able to measure user’s temperature, pulse, respiration, and blood-pressure through a webcam, and the result of user’s health condition will represent as a virtual plant on the surface of the mirror.

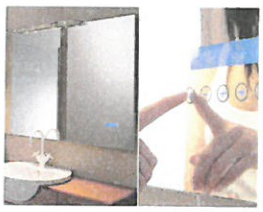


③ 魔鏡系統

Digital Mirror

42’’ 的魔鏡有24’’ 的全鏡面觸控介面，配備全平面防水鏡面、觸控功能，結合準系統intel i5電腦，一體成形。介面上會不時跳出基礎資訊，提升使用者照鏡子的體驗。

42’’ Digital Mirror equips with 24’’ full mirror touch interface, which is made of water-proof, touch function. It combines intel i5 computer inside as one piece. In the process of using, it will show basic information and give a better user experience.



④ 有生松子

Pinecone

本件創作詮釋人工生命的知覺意識，能透過行為模式的調適變化，與周遭環境達成交互共存的關係。有生松子是一由眾多微小毛細孔單元組織而成的量體，能藉由各毛細孔單元的呼吸，反應參觀者的存在，並以此衍生形態變化。作品亦試圖帶給觀賞者進一步的想像，未來空間中的照明物件具備了人工生命的意識，能主動觀察居住者的心境。

This work is an interpretation of the consciousness of artificial life. Through adjustments and changes in its behavioral pattern, based on the surrounding environment, a mutually coexisting relationship can be obtained. They breathe through each of these pores as well as derive morphological changes in response to the existence of the viewer.

⑤ QOCA遠端照護系統

QOCA™ home

QOCA™ home為遠距健康照護系統，為銀髮族、慢性病患可在家中進行自我健康管理，並讓健康照護人員與社工在遠端進行即時健康狀況觀察或諮詢協助，透過雲端技術緊密連結被照護者、照護團隊與親友家人，讓長者享受在宅的養老並且減少危險和長期的醫護花費。

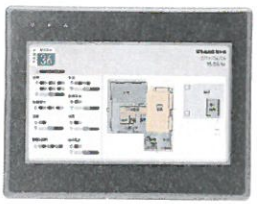
QOCA™ home is a cloud-based solution designed to enable remote home care services primarily for the elder populations, which would in turn empower the individuals to be better connected with care providers and families to enjoy aging in place and to reduce the risks and costs of long- term conditions.

⑥ 10吋人機介面

10’’ Human-Machine Interface (HMI)

人機介面是一種可以讓使用者與機器或自動化系統進行溝通的裝置或軟體。除了將複雜的資料轉化為有用的資訊外，人機介面還可以轉發用戶的命令。本機主要作為燈控系統。

Human-Machine Interface is an equipment or program for communication between users and machine or automation system. Besides the transformation of complex data, HMI also allows forwarding user’s command. This 10’’ HMI acts as light control system.



⑦ 無線網路攝影訂閱展示系統

Wireless Webcam Subscription Display System

網路攝影機產品除了居家監控功能外，新一代內建無線網路功能的網路攝影機，更靈活應用在許多不同情境之中。設備輕巧可攜並搭配 App 雲端平台的處移動性，增加許多便利性，在42’’ 的螢幕中，可以做監控畫面的瀏覽。

Webcam is not only used as home monitoring, but equipped with wi-fi to apply in many different situation. The device is portable in cooperation with App Cloud Platform, which is more convenient than before. In 42’’ monitor, visitors are free to browse monitor screen any time they want.

⑧ 電控液晶玻璃

Electronically Controlled Liquid Crystal Glass

電控液晶調光玻璃結合電子科技和玻璃專業技術能力，將新型液晶材料附著於玻璃、薄膜等基材基礎上，運用電路控制技術，通過的電流大小使得玻璃在白霧狀和透明狀之間瞬間地切換，達到光線穿透或被阻隔的效果。此外，還可透過電流變化來控制玻璃顏色深淺以調節陽光照入室內的強度，使室內光線柔和舒適。

Electronically Controlled Liquid Crystal Glass combines electronic technology with glass technique, attaching new liquid crystal on glass and film. By application of circuit control technology, glass will change between white mist and transparent with a simple switch. As a result, light could have several penetrate effects by changing electric current.

⑨ 實體桌面展示

Paper Exhibition

紙上展覽可以分為書籍和冊子兩部分。前者以「空間再生」為主題介紹整建工程的設計、過程和圖面，後者聚焦於智慧家居的概念和住宅導覽，讓參觀者藉由書面的閱讀，更了解智慧設備融入空間的趨勢，也發揮驛站作為示範宅的意義。

The Paper Exhibition can devided into two parts- book and booklet. The former introduces refurbished design, process and drawing under the topic of smart living. The latter focuses on smart living concept and guidance. After reading these material, readers can understand more about the trend of smart equiments that assimilate into space.

⑩ 影片

Film

位於臥房的投影機循環播放現代和早期中興新村相關影片，分別是公視我們的島所拍的「中興新村三部曲」和台灣電影資料中心的紀錄片「欣欣向榮的中興新村」。兩部片的內容承先啟後讓我們了解村落的展脈絡和問題，也進一步在大架構下思考未來的發展。

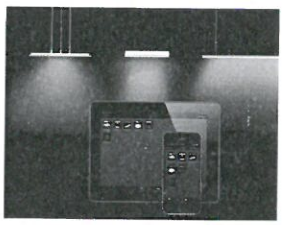
The projector in the bedroom takes turn broadcasts films about modern and early period Zhongxing Village. They are “Three series of Zhongxing Village” as well as “Thriving Zhongxing Village”. The two film makes us understand the context and problem the village faced. At the same time rethinking the future development of the place.

⑪ 燈光控制

Light Control System

智慧燈控系統中所有的功能模組均內置微處理器和存儲單元，由電力線（家用電器供電電源線）連接成家電控制網路，為使用者提供家用電器的網路化應用，實現家電器網路中所有家用電器的集中控制、照明控制、遠端控制、報警聯動、場景控制功能。

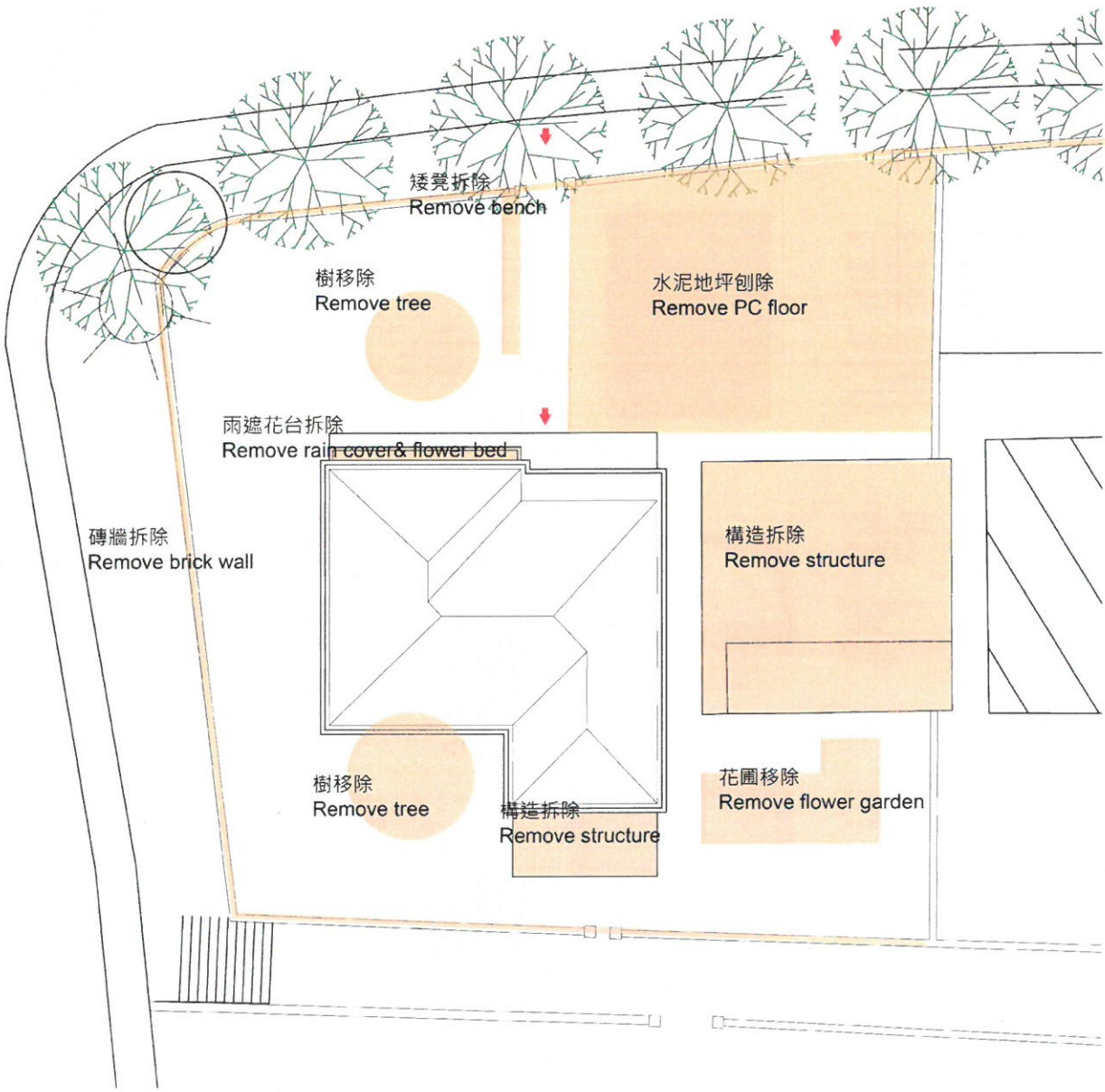
In Smart light control system, all function modules are built into a microprocessor and memory unit. By connecting power line, all electronic devices are connected in a network, providing household electric web application. Thus, home appliances are under centralized control, lighting control, remote control, alarm linkage and scene control function.



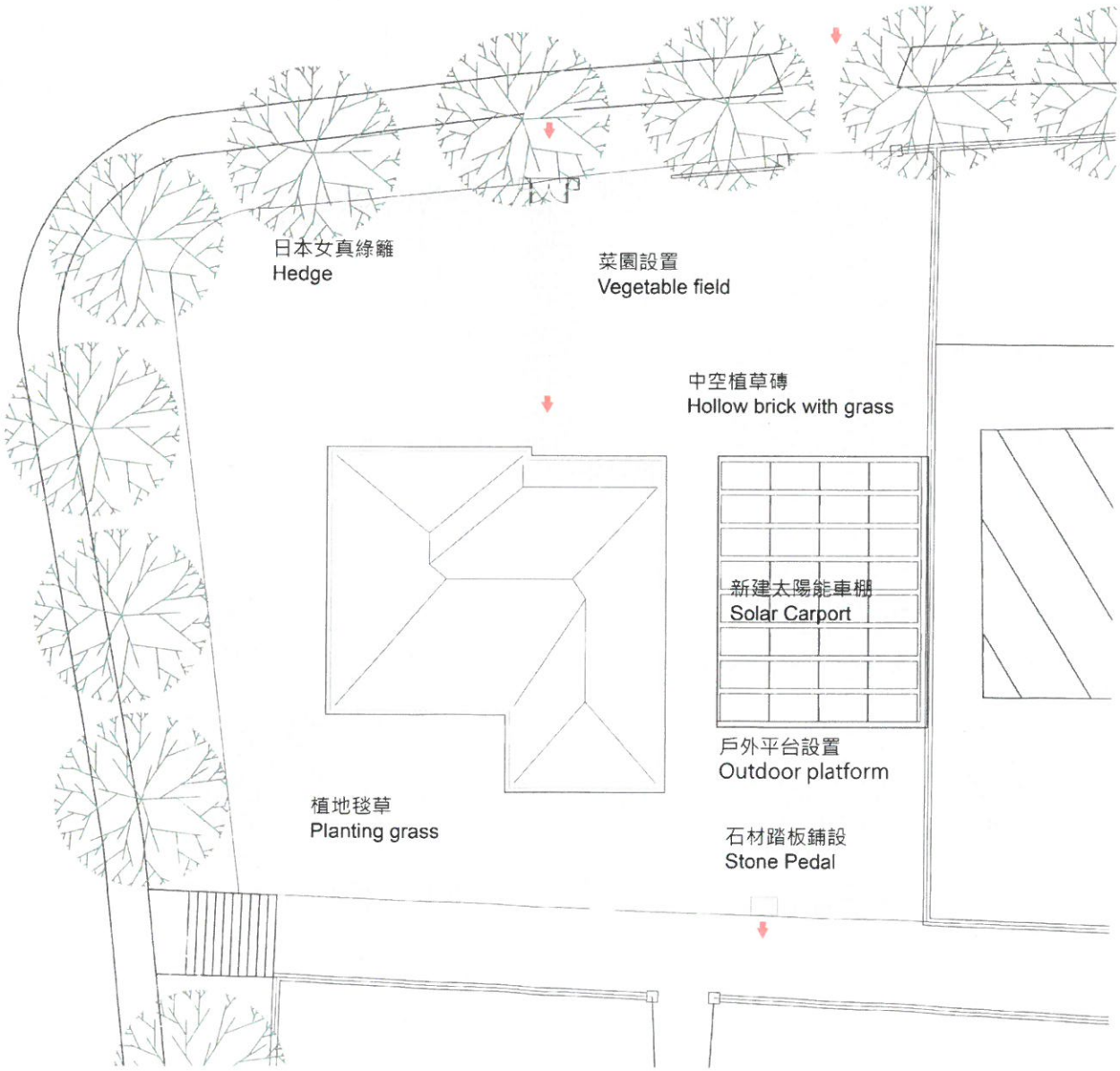
整體工程
Engineering

景觀改造
Landscape

原始基地平面
Original Siteplan



基地平面
Siteplan



整體工程
Engineering

景觀改造
Landscape

工程紀錄
Construction process

戶外環境整理
Outdoor environment finishing

2016/2

2016/3

2016/3

圍牆修復/塗抹沙漿
Brick wall repair/ Mortar smear

陰井埋設
Pit buried

石材踏板鋪設
Stone pedal layout

入口步道抿石子
Trail entrance sip stones

2016/4

2016/4

2016/4

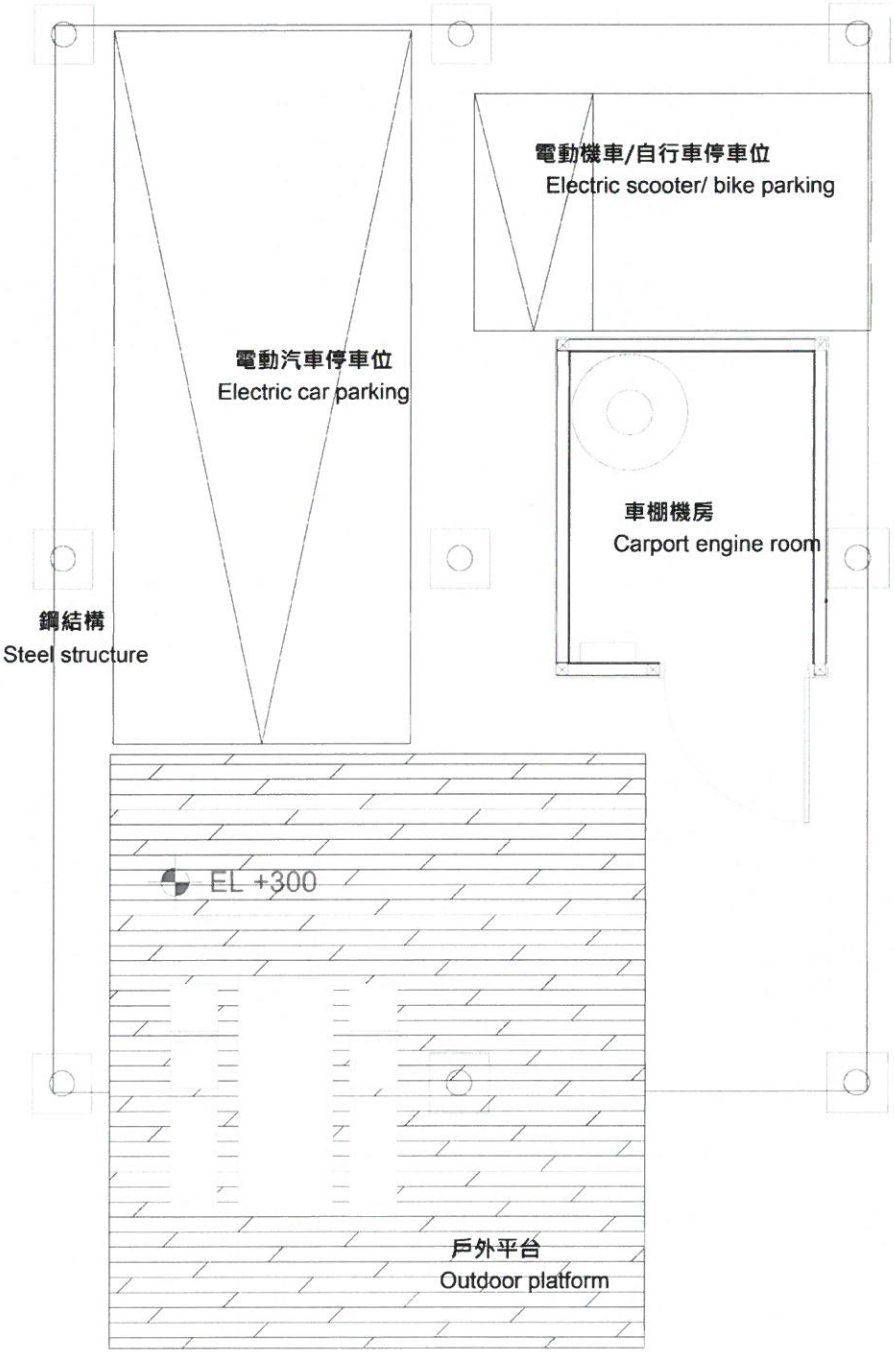
2016/4

植栽進場
Planting

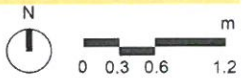
空心植草磚鋪設
Hollow brick with grass layout

整體工程
Engineering

太陽能車棚 Solar Carport 平面 Plan



屋頂平面
Roof Plan

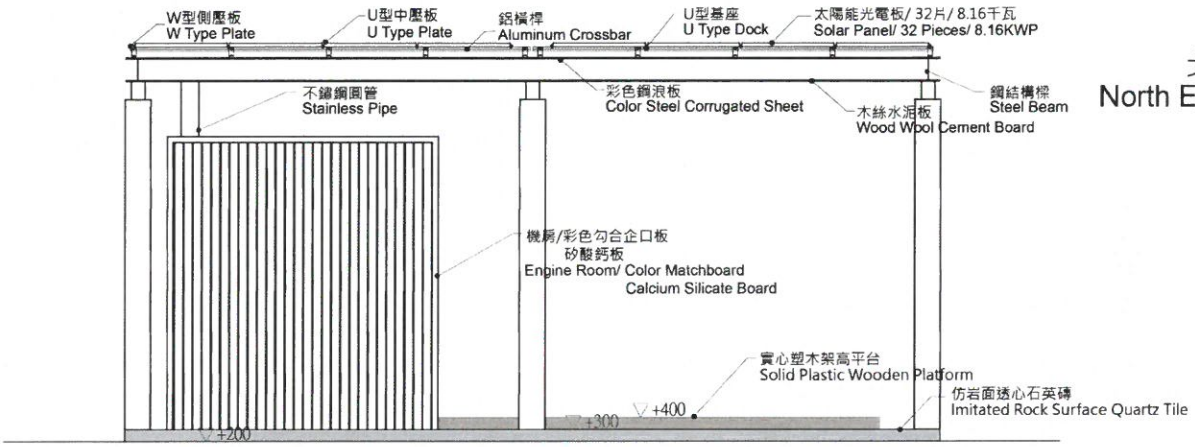


不鏽鋼天溝
Stainless Gutter

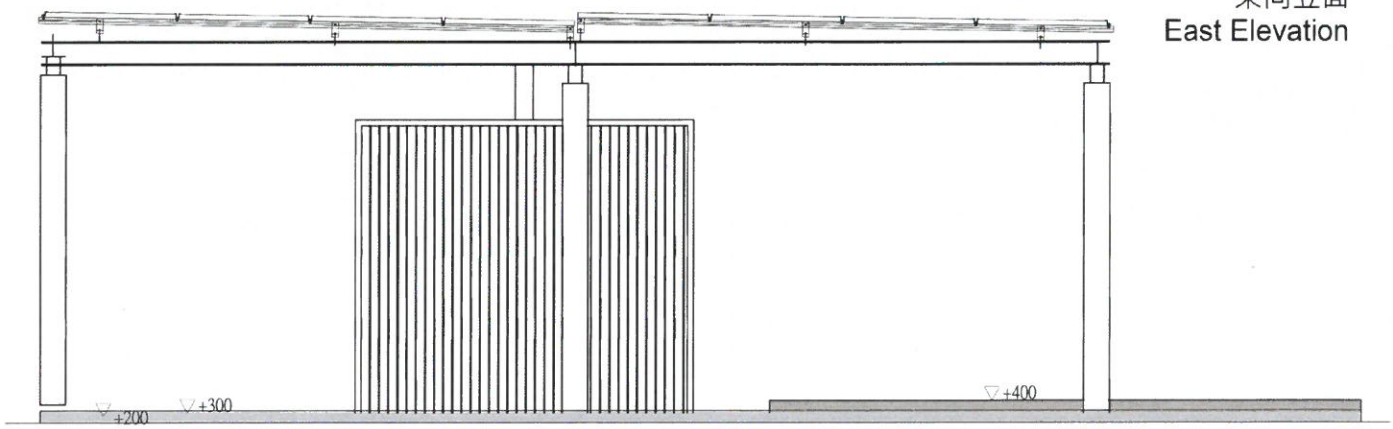
不鏽鋼排水管
Stainless Drainage

整體工程
Engineering

太陽能車棚 立面
Solar Carport Elevation



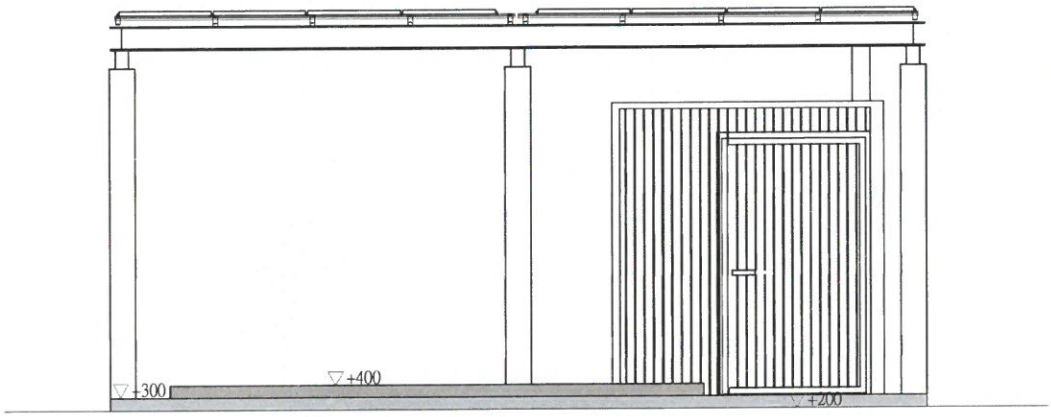
北向立面
North Elevation



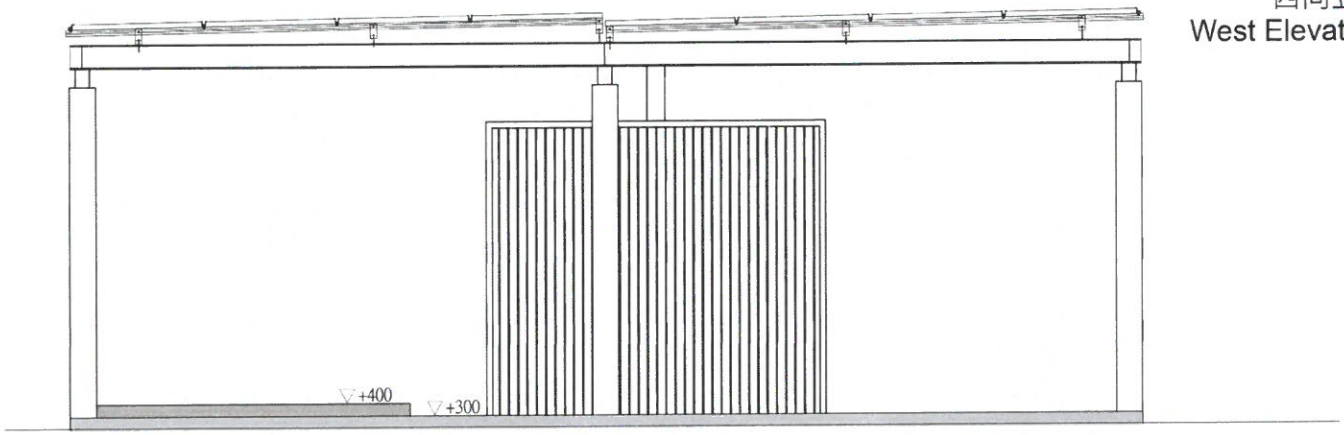
東向立面
East Elevation

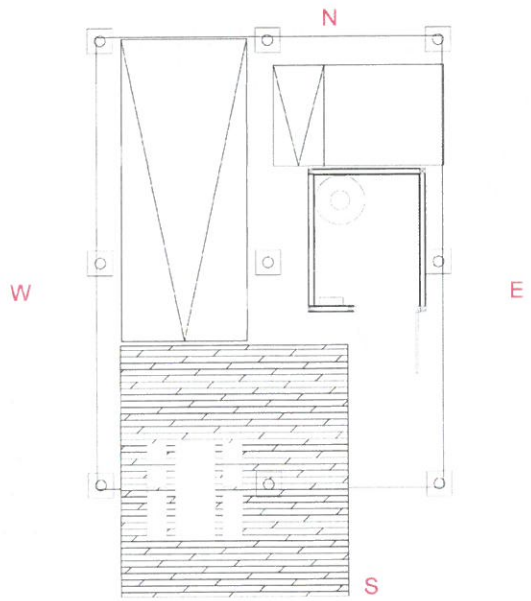
m
0 0.3 0.6 1.2

南向立面
South Elevation



西向立面
West Elevation





整體工程
Engineering

太陽能車棚
Solar Carport

工程紀錄
Construction process

預留蓄水池維修孔
Reserve reservoir service hole

2016/1

2016/2

2016/2

基礎開挖/鋼結構組立
Foundation excavation / Steel structure assembling

地坪灌漿
Floor grounting

鋪設太陽能板
Solar panel layout

鋪塑木戶外平台
Plastic wood platform layout

2016/3

2016/3

2016/4

2016/4

封車棚天花
Ceiling installation

車棚機房建置
Engine room building

剖面
Section

南北向剖面圖 2
N-S Section 2

m

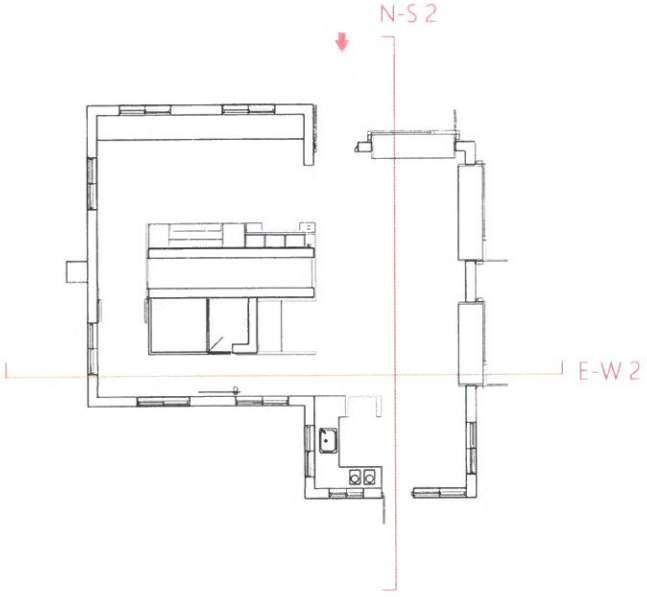
0 0.35 0.7 1.4

東西向剖面圖 2
E-W Section 2

走廊
Corridor

浴廁
Toilet & Bathroom

客廳
Living Room



剖面
Section

南北向剖面圖 1
N-S Section 1

m

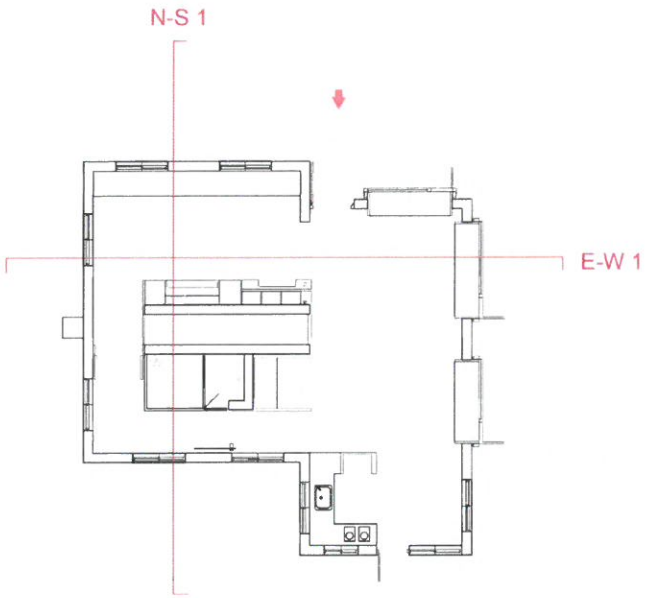
0 0.35 0.7 1.4

東西向剖面圖 1
E-W Section 1

餐廳
Dining room

臥房
Bedroom

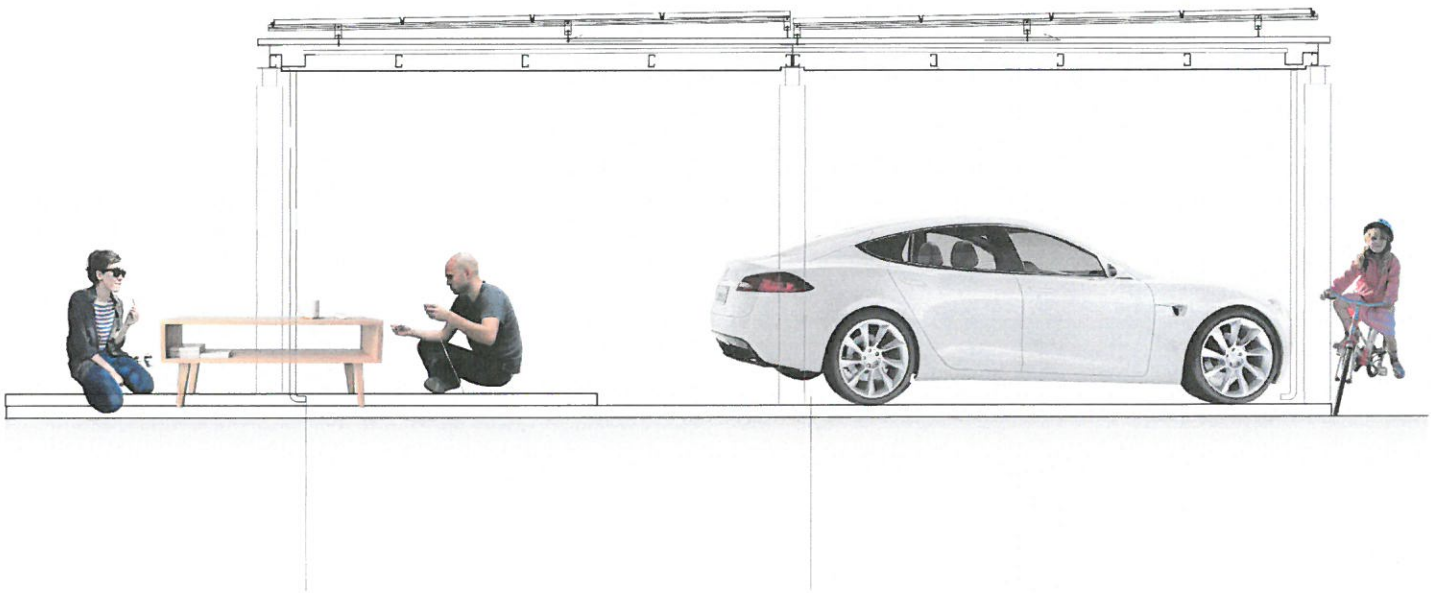
走廊
Corridor



生活情境
Scenario

太陽能車棚 剖面
Solar Carport Section

南北向剖面圖
N-S Section



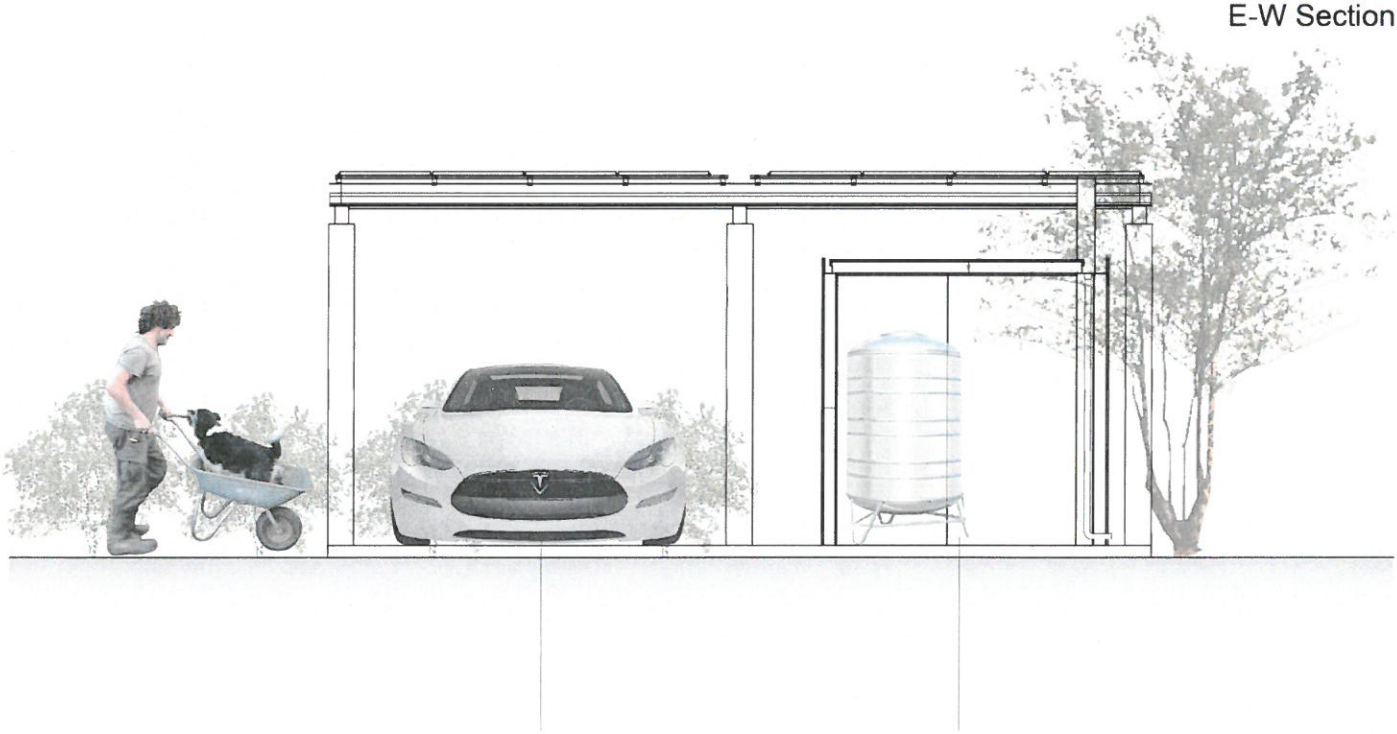
戶外平台
Outdoor Platform

停車空間
Parking

m

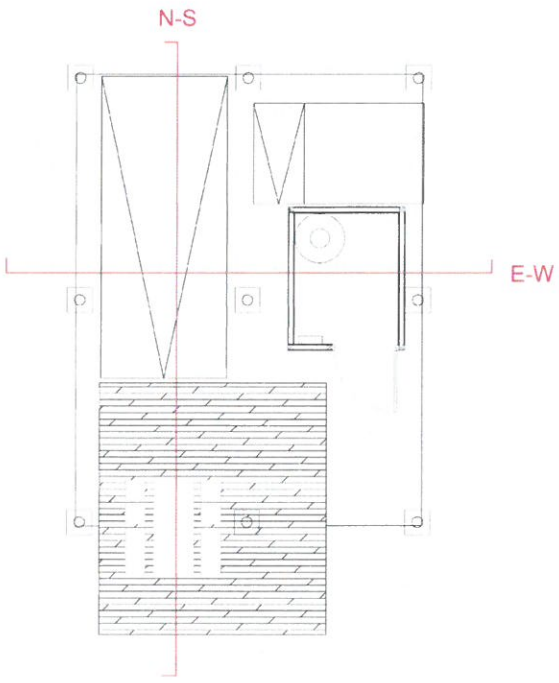
0 0.3 0.6 1.2

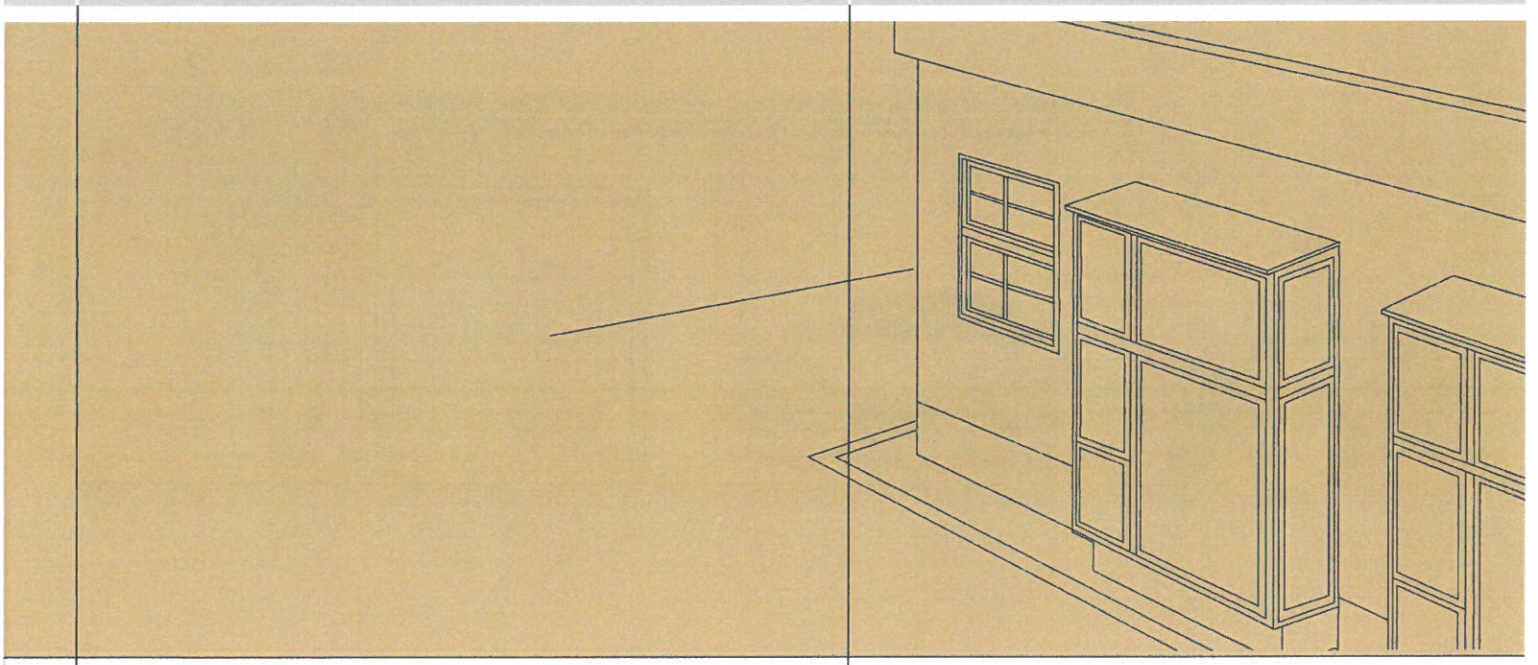
東西向剖面圖
E-W Section



停車空間
Parking

車棚機房
Engine Room





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Ministry of Science and Technology

中部科學工業園區
Central Taiwan Science Park

TDIS transdisciplinary design innovation shop