

智慧型自然空調技術系統

Smart Natural Ventilation Technology

USA
TAIWAN PAT.
CHINA

專業建築悶熱改善 終生免費

Experts At Solving Heat
W/ Free Charge & Maintenance



符合消防排煙法規

Compliance with the regulation
of Smoke Exhaust

善用綠能環保 節能無碳

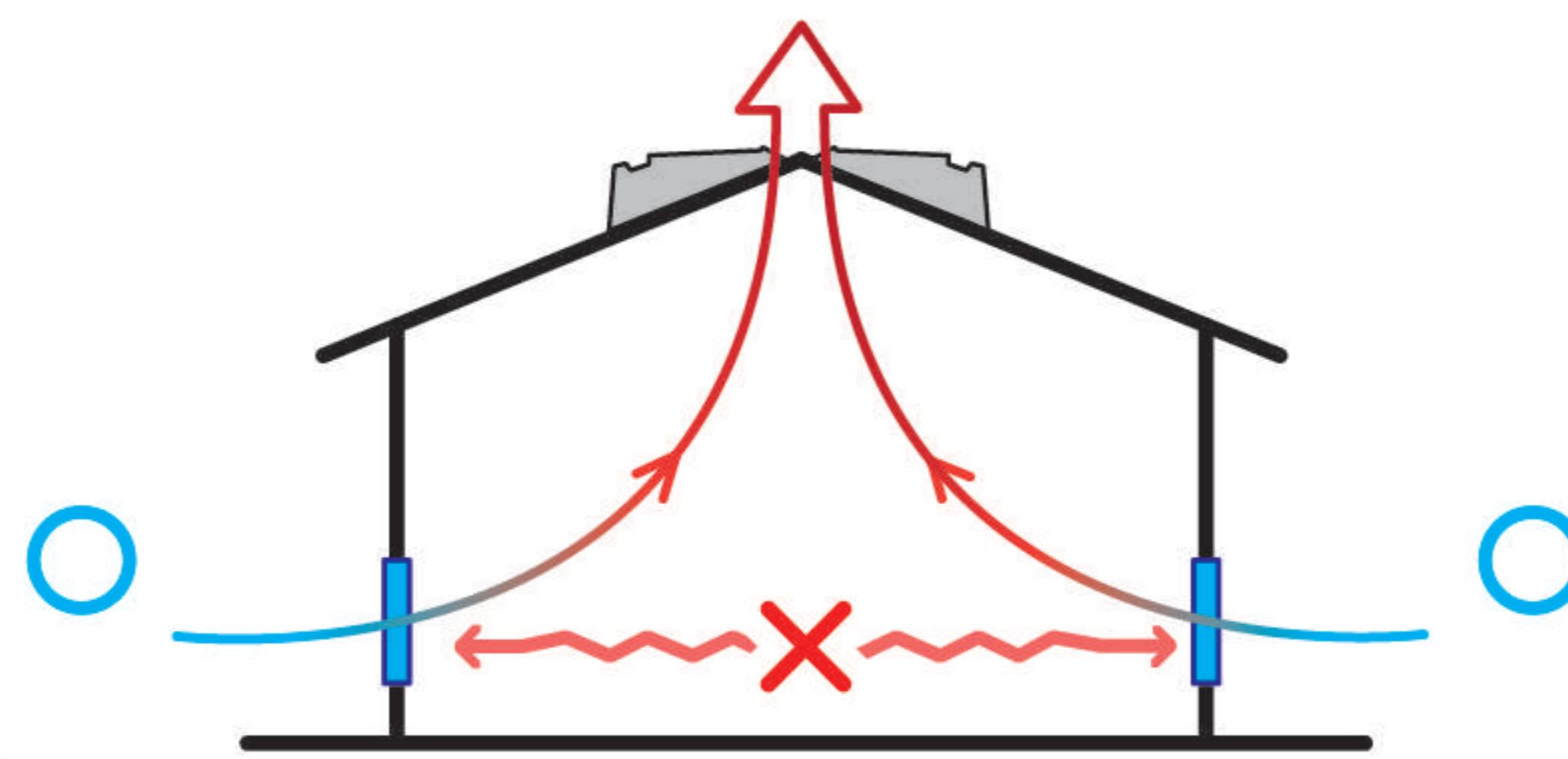
Utilizing Green environmental protection
and Carbon Emission Free

智慧型自然空調技術系統

Smart Natural Ventilation Technology

上下對流 輕而易舉
水平對流 幾無效果

Vertical Convection – Easy-Peasy
Horizontal Convection – Impractical



煙囪效應

Stack Effect

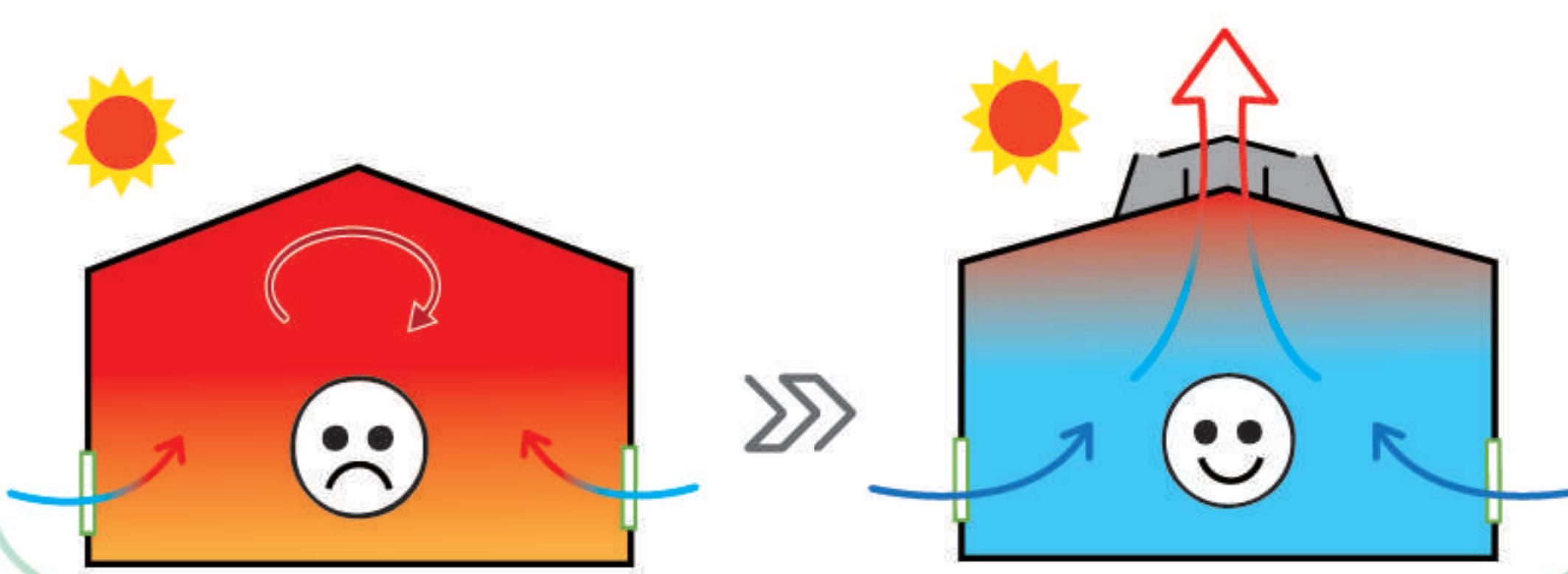
熱空氣往上排放，吸入下方新鮮冷空氣
The fresh air enters in from the lower intake while hot air is vented out from the top.



空氣對流

Natural Air convection

太陽輻射熱 + 室內生成熱
上下對流冷空氣自然來
Solar heat + indoors heat
Vertical Convection = Perfect Air Convection



自然散熱 創造舒適環境 客戶見證

Natural Heat Exhaust Creates Cozy Environment for clients

運用煙囪效應讓空間產生足夠的空氣對流，排出量越大則吸入量就更多
使空間更舒適，別再用無效的水平對流當作自然散熱

Apply Stack Effect to create enough air convection so the more heat is vented out from the top,
the more volume of cold air will enter in from lower intake.
In other words, it would balance both intake and exhaust ventilation.
Horizontal convection is of no help to heat exhaustion.

感謝中國鋼鐵中鋼結構 中國製袖台電 杏輝藥品 清華大學 達新工業 光陽工業 日立
義成聖岱伯鑫銳泰 豐民鐘佳 幸記鉅邦醫材岱山 佰勳勝美 莩信昱龍富成
力厲蒂衛毅豐介明 奇正上輝利程銓歲金品 小金井亞信元旭 模記上溢多惠
啟德電子幸康電子萬客什鍋 康舒蓉大采廚房等客戶採用

榮獲國際競賽肯定

International Certification



建築類 雙銀牌獎
Double Silver Awards

2014美國匹茲堡國際發明競賽
America Pittsburgh International Invention Contest 2014

輻射熱 對空調場所耗能多少？ 節能可達4成！

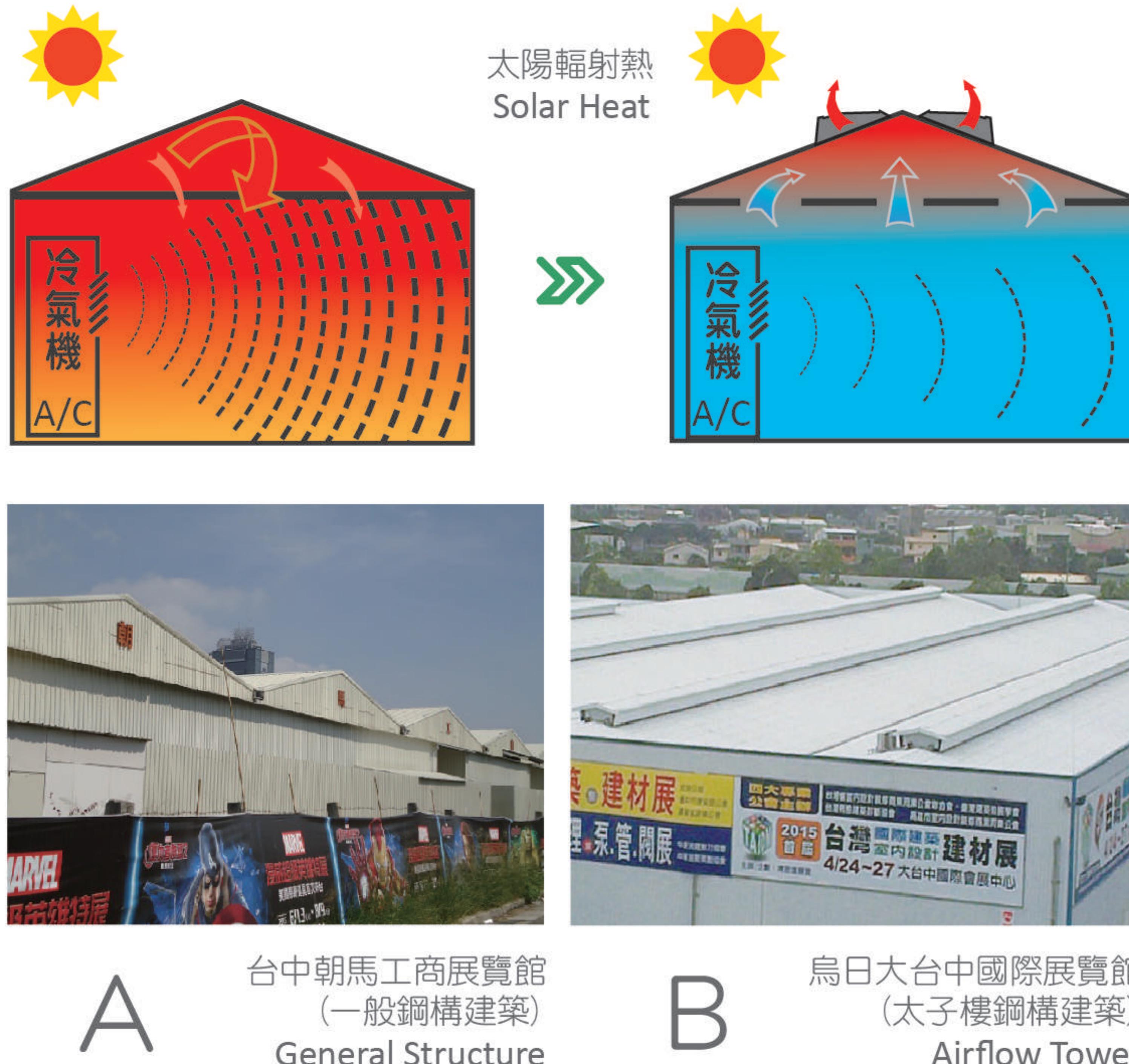
Energy saving up to 44% !

案例 1 Energy Saving – Project 1 (Expo)

讓館內熱氣自然排放，不需浪費冷氣來中和當然省電，更不需擔心冷氣往上流逝。

Problem – it would affect the cooling efficiency of air conditioning if the hot air is not easy to vent out.

Result – Vertical convection could solve the blistering problem and save electricity bills about 44 %.



建築物節能比較 Comparison between A & B

	朝馬工商展覽館(A)	烏日大台中國際展覽館 (B)
展場面積 Area	12960m ² /3920坪	11571m ² /3728坪
屋脊高度 Height	8 m (H)	9 m (H)
屋頂排熱裝置 Heat Exhaust Installation	無 None	太子樓 Airflow Tower
每月用電約當量 Electricity Bill/Mth(\$USD)	100萬/月 USD 32,260	50萬/月 USD 16,130
每坪用電	77.16元	43.21元
節能比率 Ratio of Electricity saving	無 None	44%

結電效率分析：依比例計算約節省 30%-40% 用電(數據客戶提供僅供參考)Nov2016

案例 2 Energy Saving – Project 2 (Laboratory)

台北某檢測科技公司，係經濟部國家級實驗室認證檢測中心。該公司全天候溫控，需保持低恆溫。為TAF、UL、TUV各項安規檢測認證。

Problem – the lab requires constant temperature of 61°F to implement high standard certification for TAF、UL and TUV.

Result – After installation, the temperature dropped by 11 °F and electricity cost during summer time were reduced about 42%.



該公司全年開空調不開窗，放置許多檢測儀器

Conditional Requirement: Air conditioning is on 24/7 all year round with window shut.

月份 Month	電費 Electricity Bill	節省電費金額 Electricity Saving
5-6月 May-Jun	12萬 USD 4,000	無 None
7-8月 Jul-Aug	8萬 USD 2,700	約4萬 USD 1,300
9-10月 Sep-Oct	7萬 USD 2,300	約1萬 USD 400
節能省電比例 Ratio of Electricity saving		42%

數據客戶提供僅供參考

排熱強 智慧型自然通風器

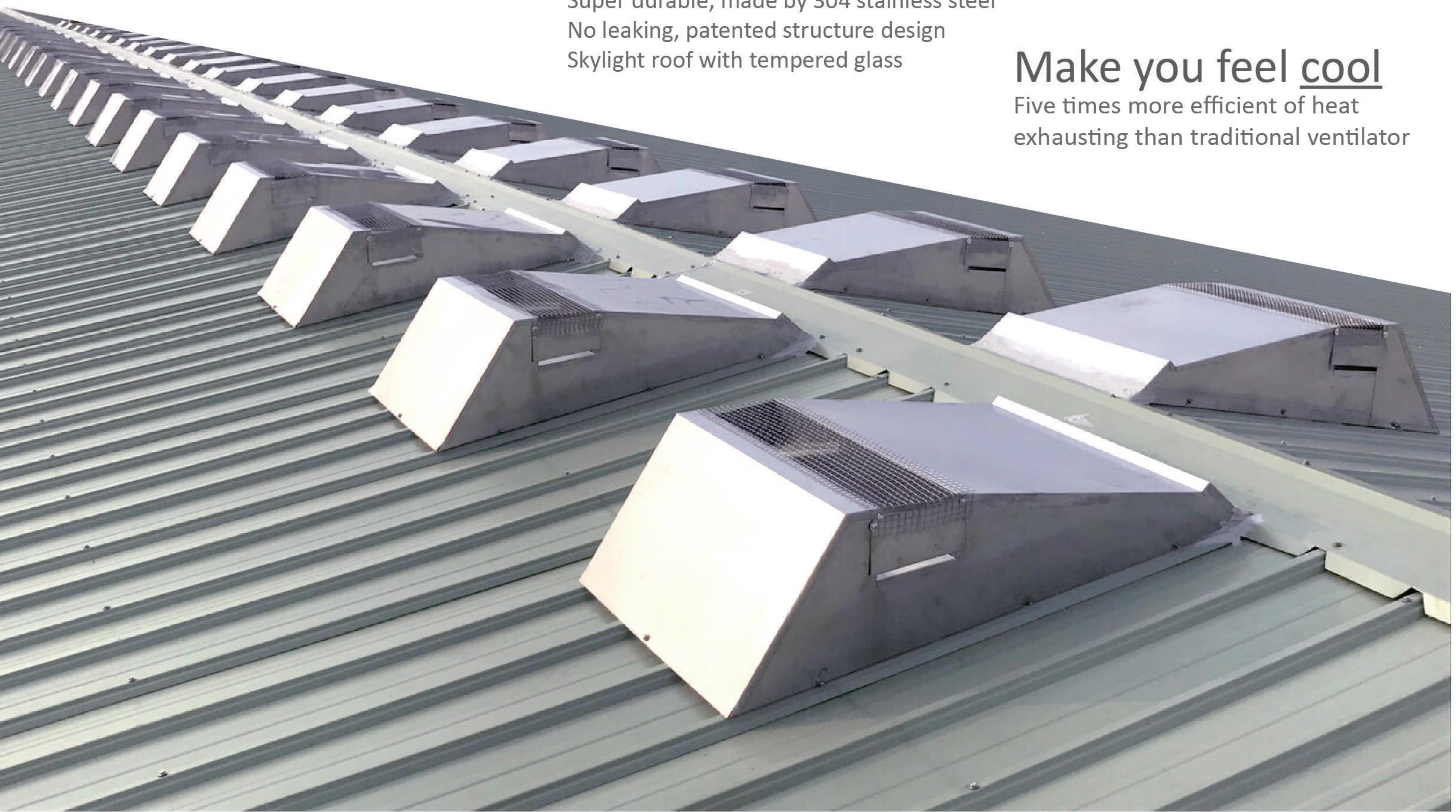
SAVCOOL Ventilator

Smart Natural Convection of Patent Ventilator
For Both Metal & Shingle Roof Use

快速排熱 空調空間 節能省電 不需旋轉不故障 抗強風 易安裝 免維修 各式屋頂適用

Save your time

Easy installation, suitable for both residential and commercial building
No noise, no maintenance required, static roof vent



5倍傳統螺旋風球出風量

5 Times More Exhausting Than That Of Turbine Ventilator

Save your money

Super durable, made by 304 stainless steel
No leaking, patented structure design
Skylight roof with tempered glass

Make you feel cool

Five times more efficient of heat exhausting than traditional ventilator

無動力自然排熱通風 Natural Air Convection without Machinery

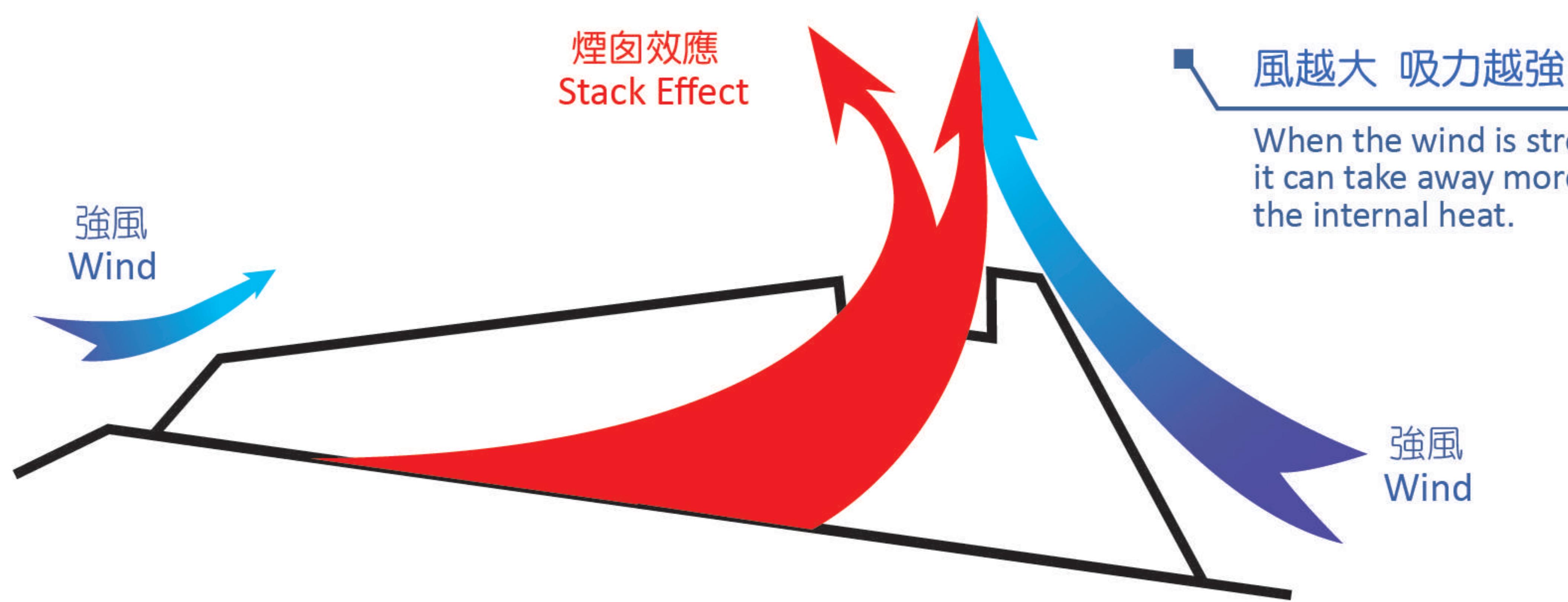
排熱強智慧型自然通風器是運用環境物理原理，無須動力的自然排熱通風器。適用於各種鋼構建築、木造建築、貨櫃屋、鋼亭、管道間等建築物悶熱及空氣流通改善，更可藉熱氣排放讓空調空間節能省電。

Savcool Ventilator utilizes the physical principle of environment and the method of convection without electricity. Moreover, it can be a solution to steel, timber construction, shipping container, cottage, shaft room with sultry issue. Furthermore, it can increase the efficiency of heat exhaust as well as saving electricity cost.

柏努力效應
Bernoulli's Principle



適用於集成輕鋼房屋屋頂空氣對流
Savcool Ventilator can be applied
on the Roof of Light Steel
Structure Building.



煙囗效應
柏努力效應 Double Effects

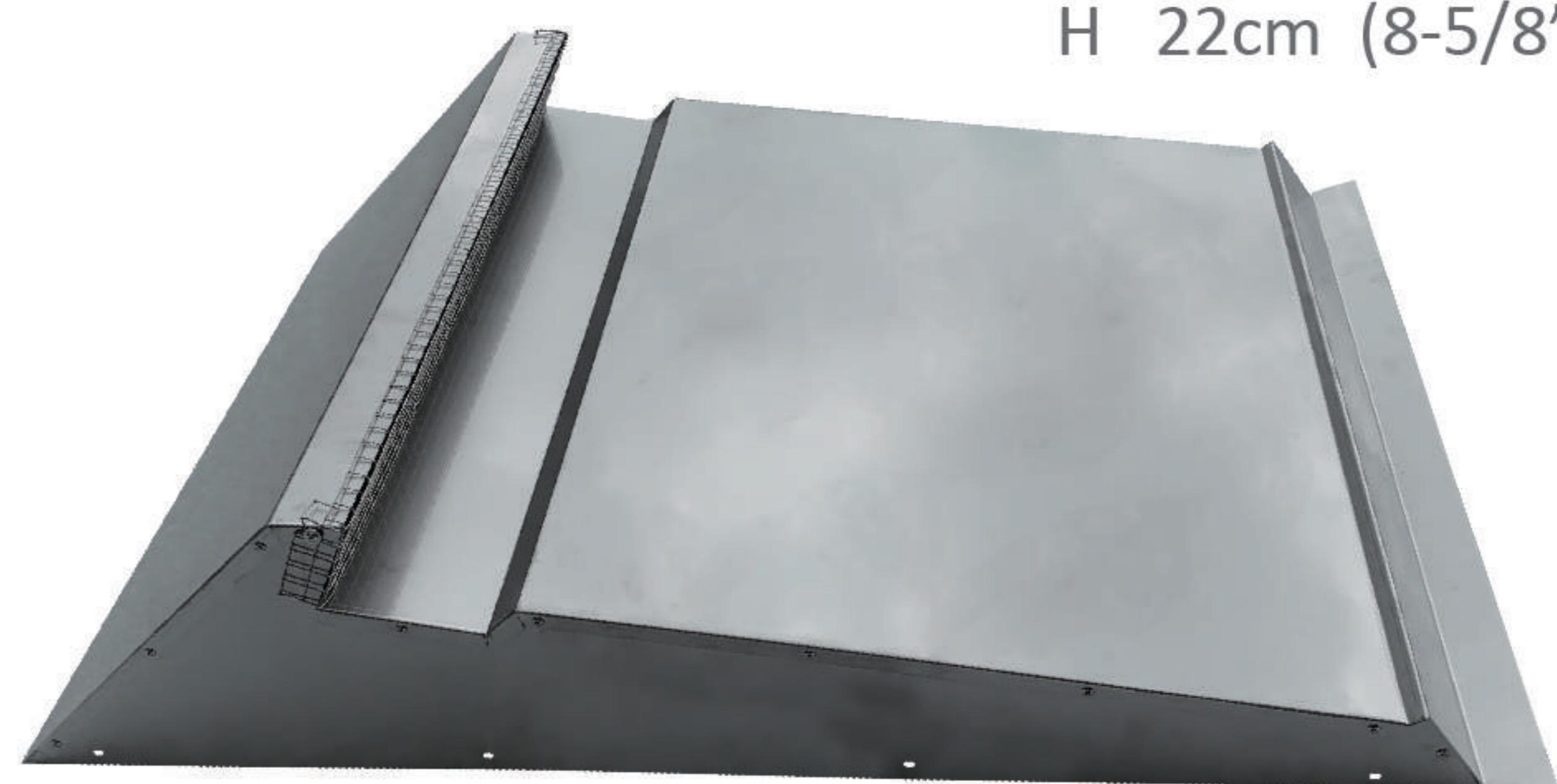
採光型 SAL

Glass L 40cm (1' 5-3/4")
W 50cm (1' 7-5/8")

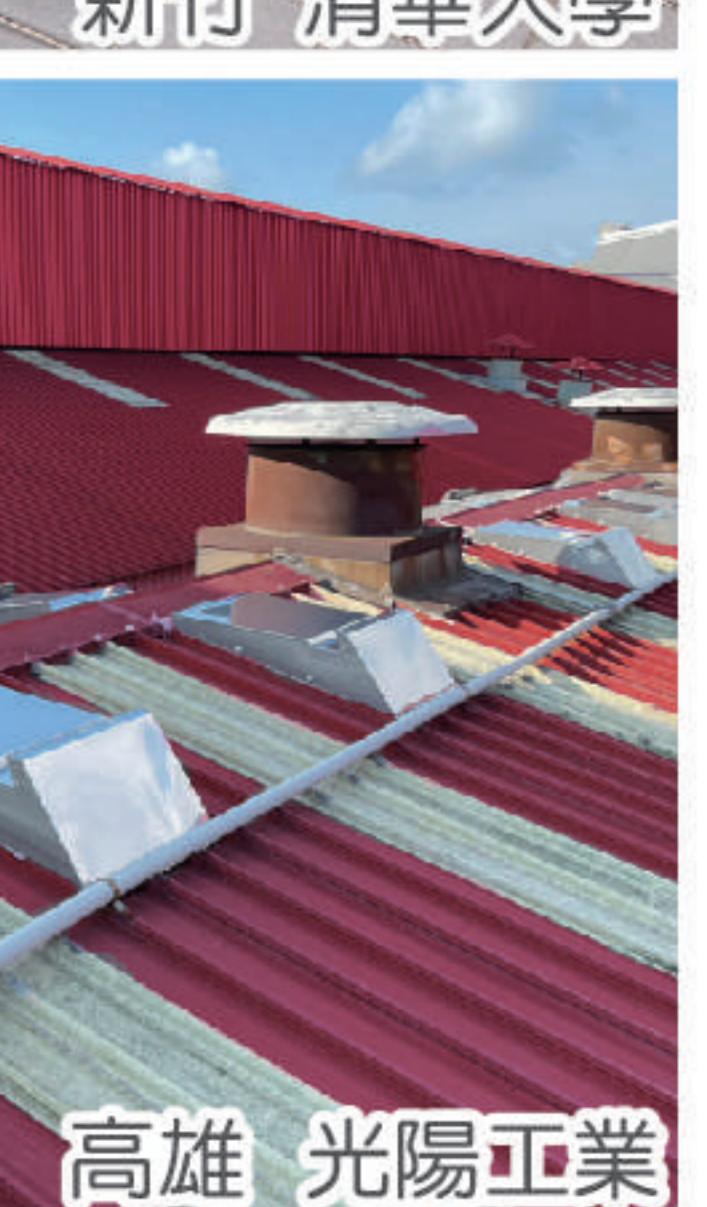
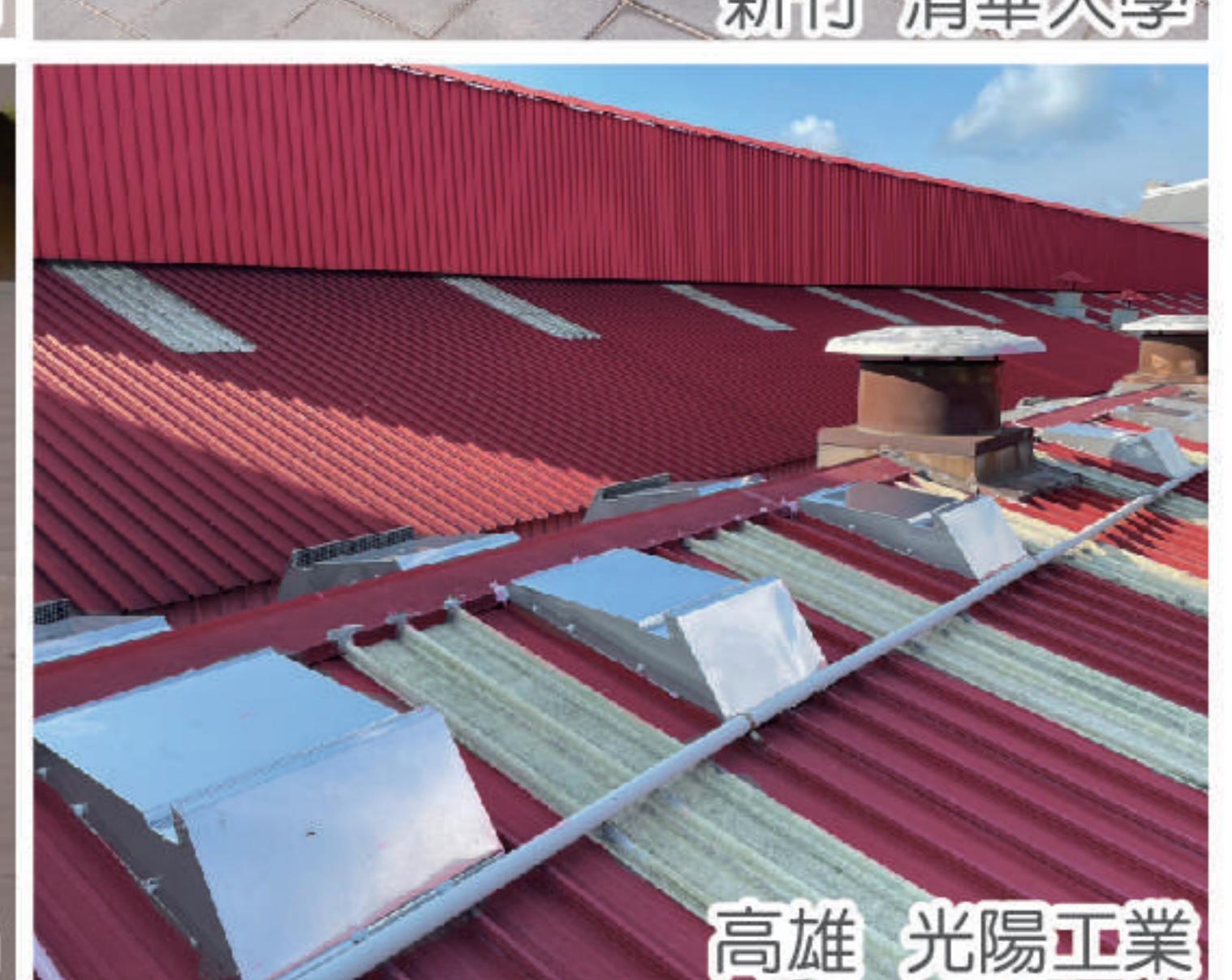
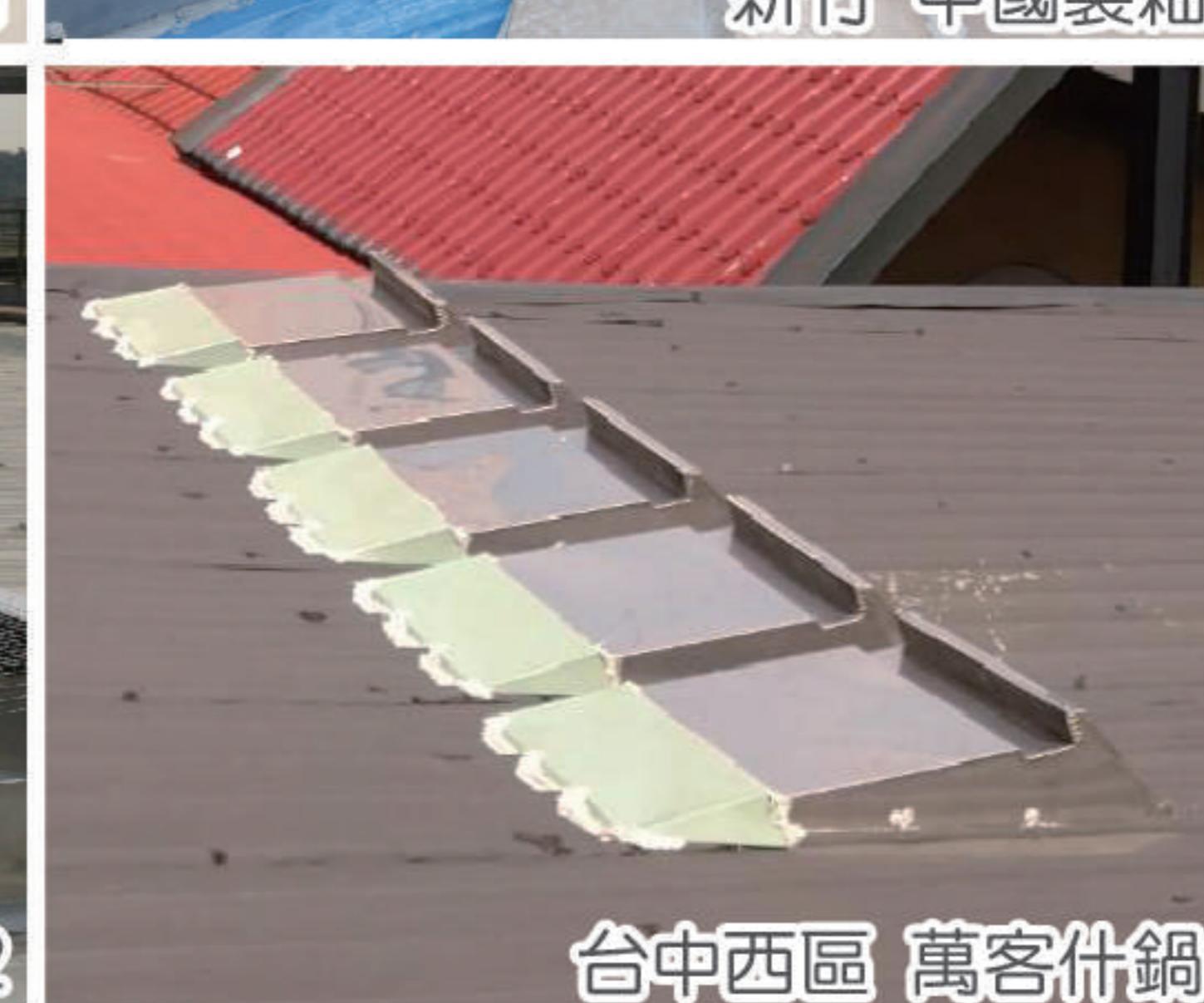
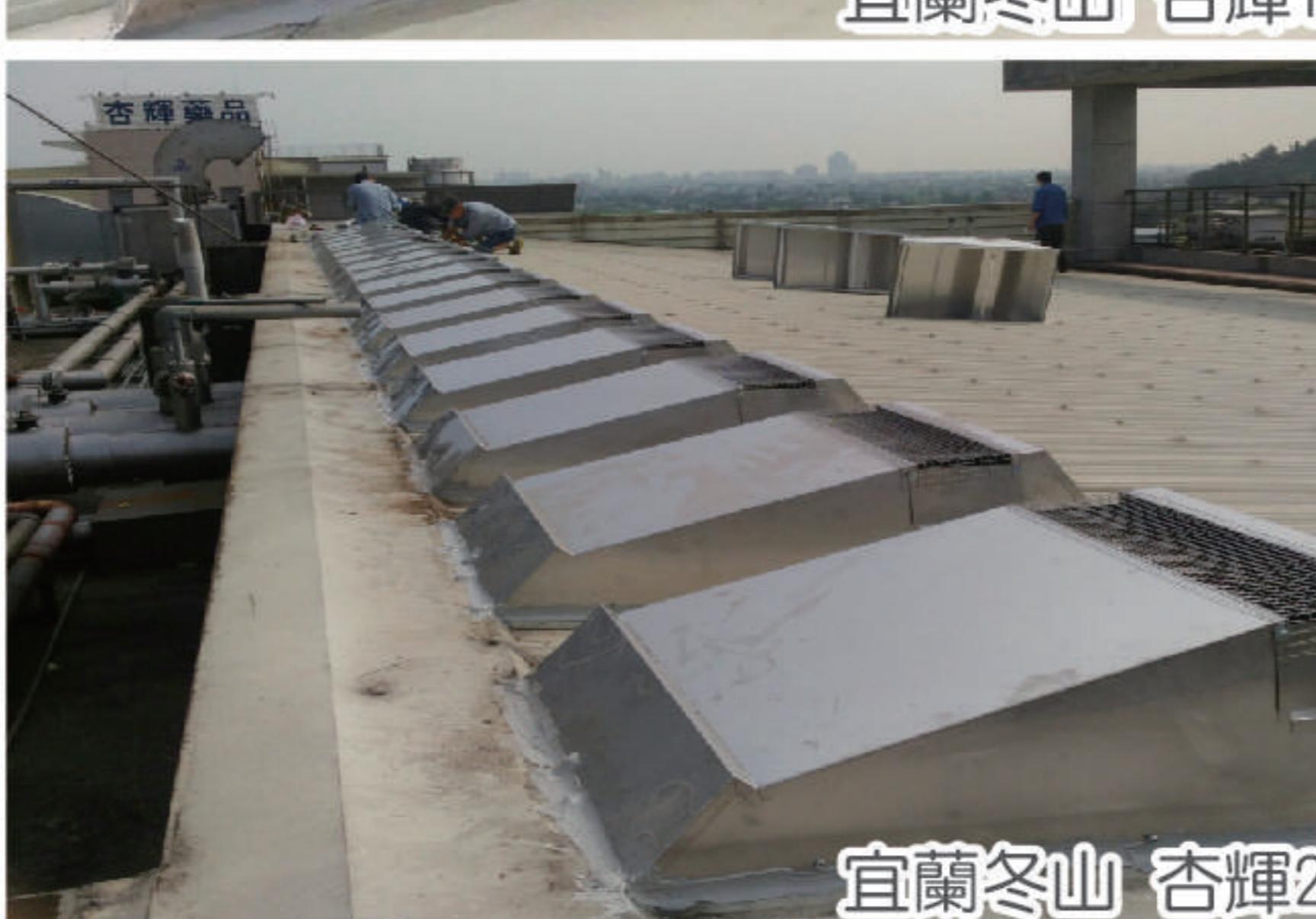
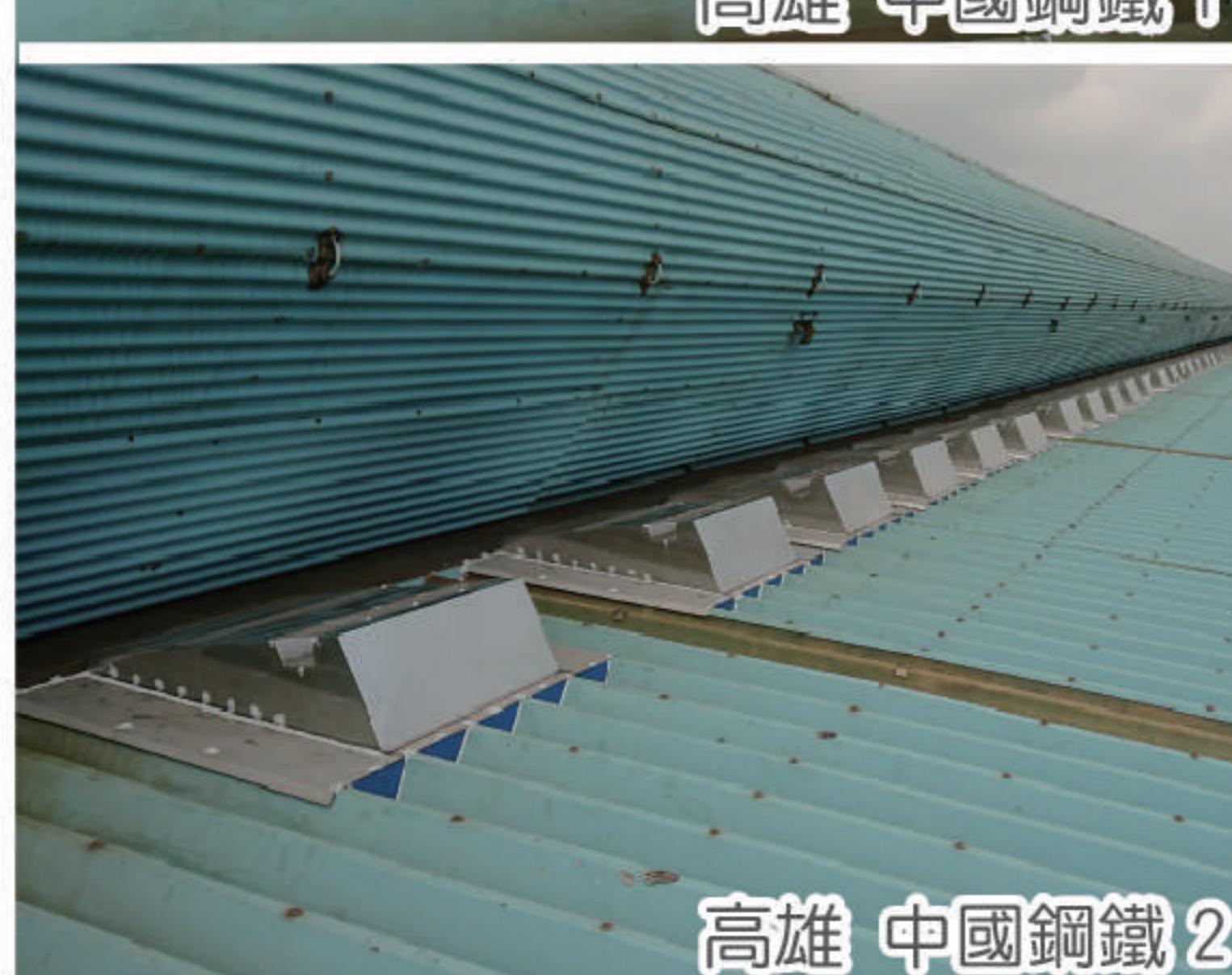
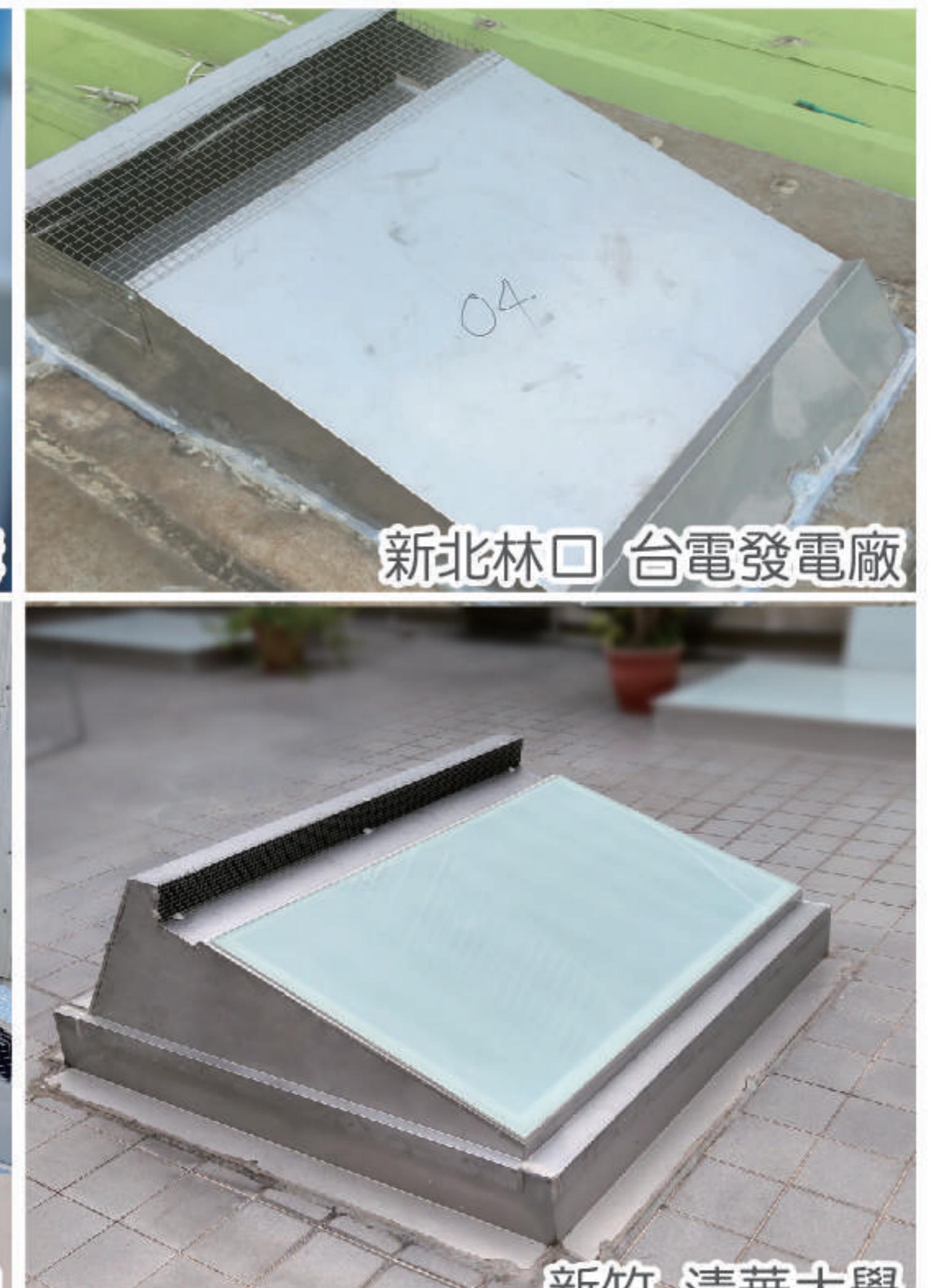


通用型 SBL

L 86cm (2'10-1/4")
W 57cm (1'10-1/2")
H 22cm (8-5/8")



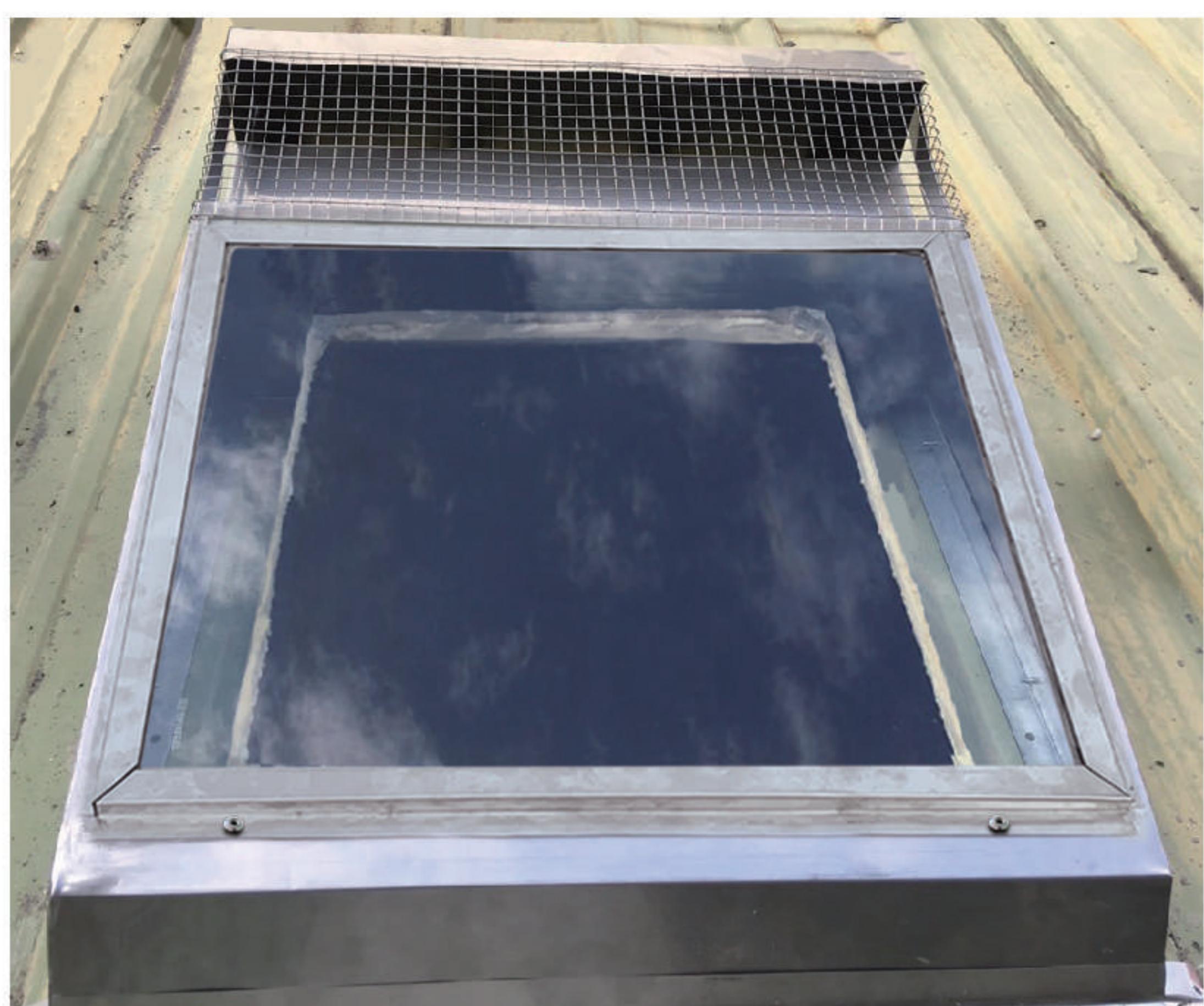
中鋼 中鋼構 台電 杏輝 清華大學等客戶見證 Case Study



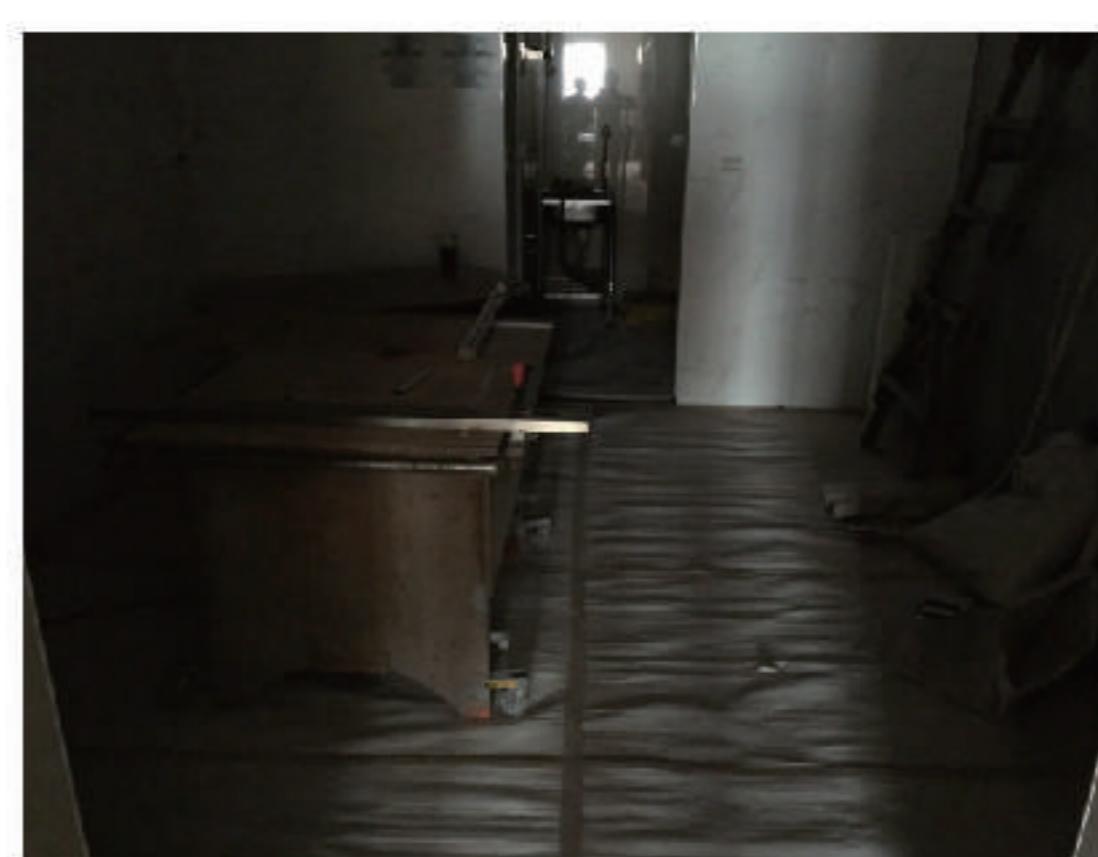
自然光亮 智在舒適

Embrace Natural Light & Enjoy Cozy Ambience

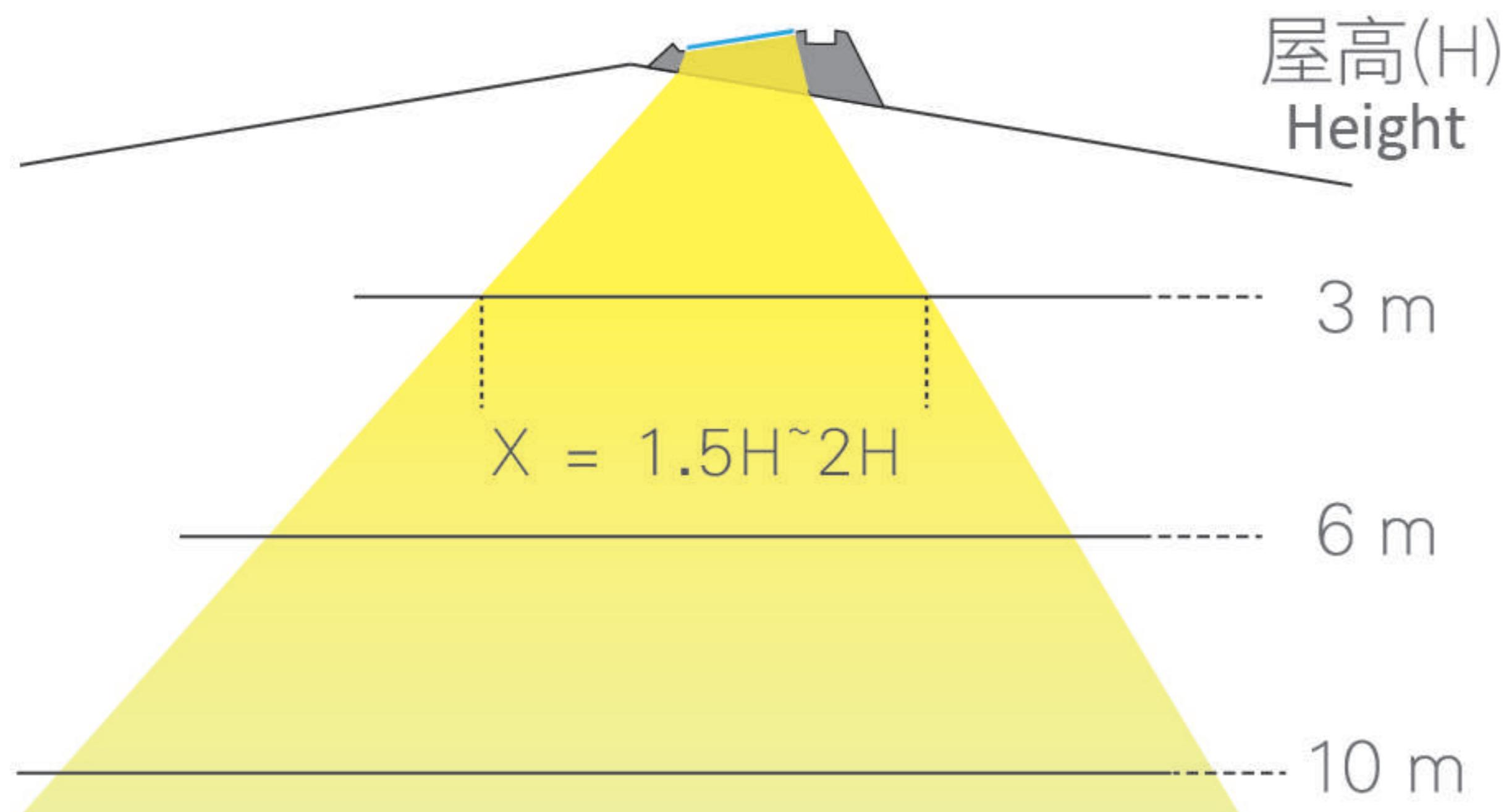
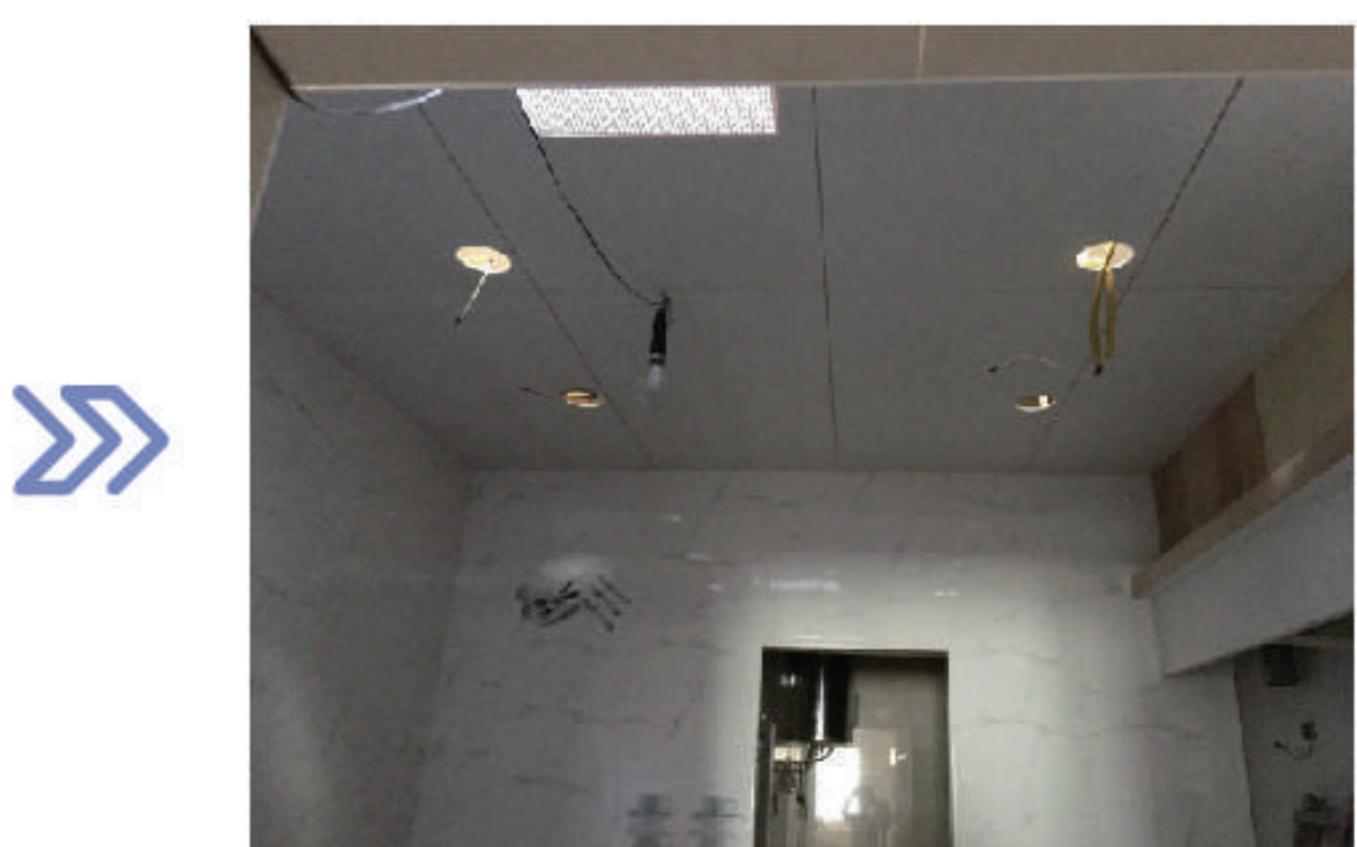
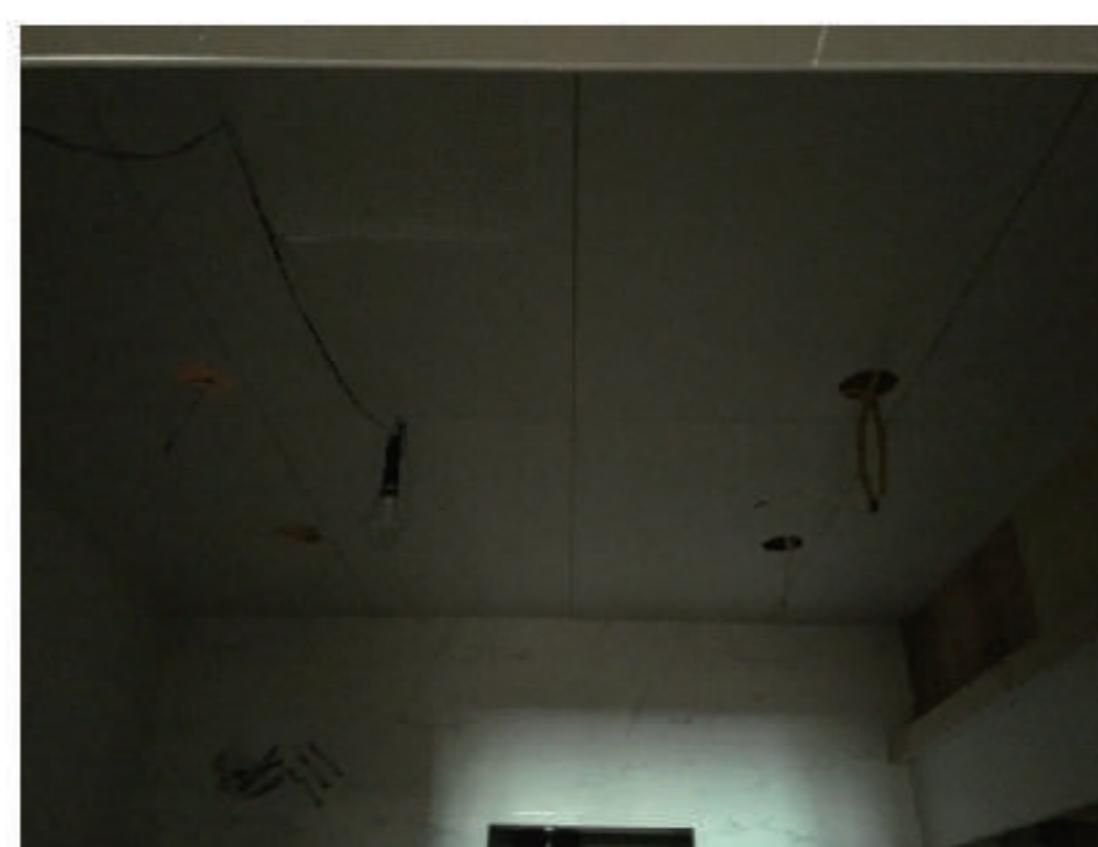
安裝外觀 Exterior



Before



After



超大採光面積 Maximum Of Light Coverage

採光板面積 50x40cm，位於屋頂切口(50x50cm) 正上方
照亮面積超廣，約屋高1.5H~2H

Area of Glass = 50 x 40 cm
Area of the Cutting hole in the roof = 50 x 50 cm
Area of Light Coverage = 1.5H ~ 2H
Optimizing your home or office with bright natural light.
Expanding and brightening up your rooms and space.

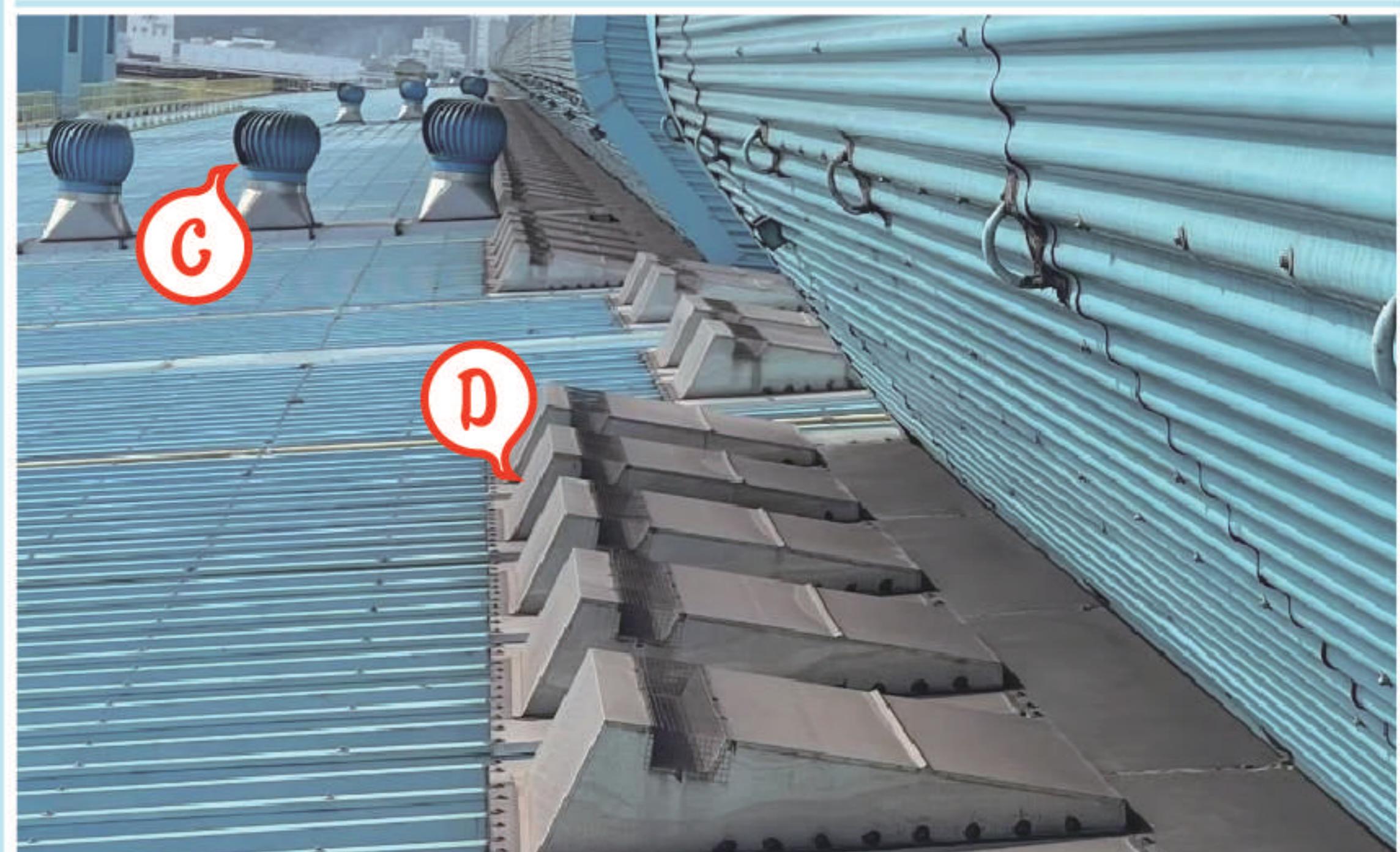
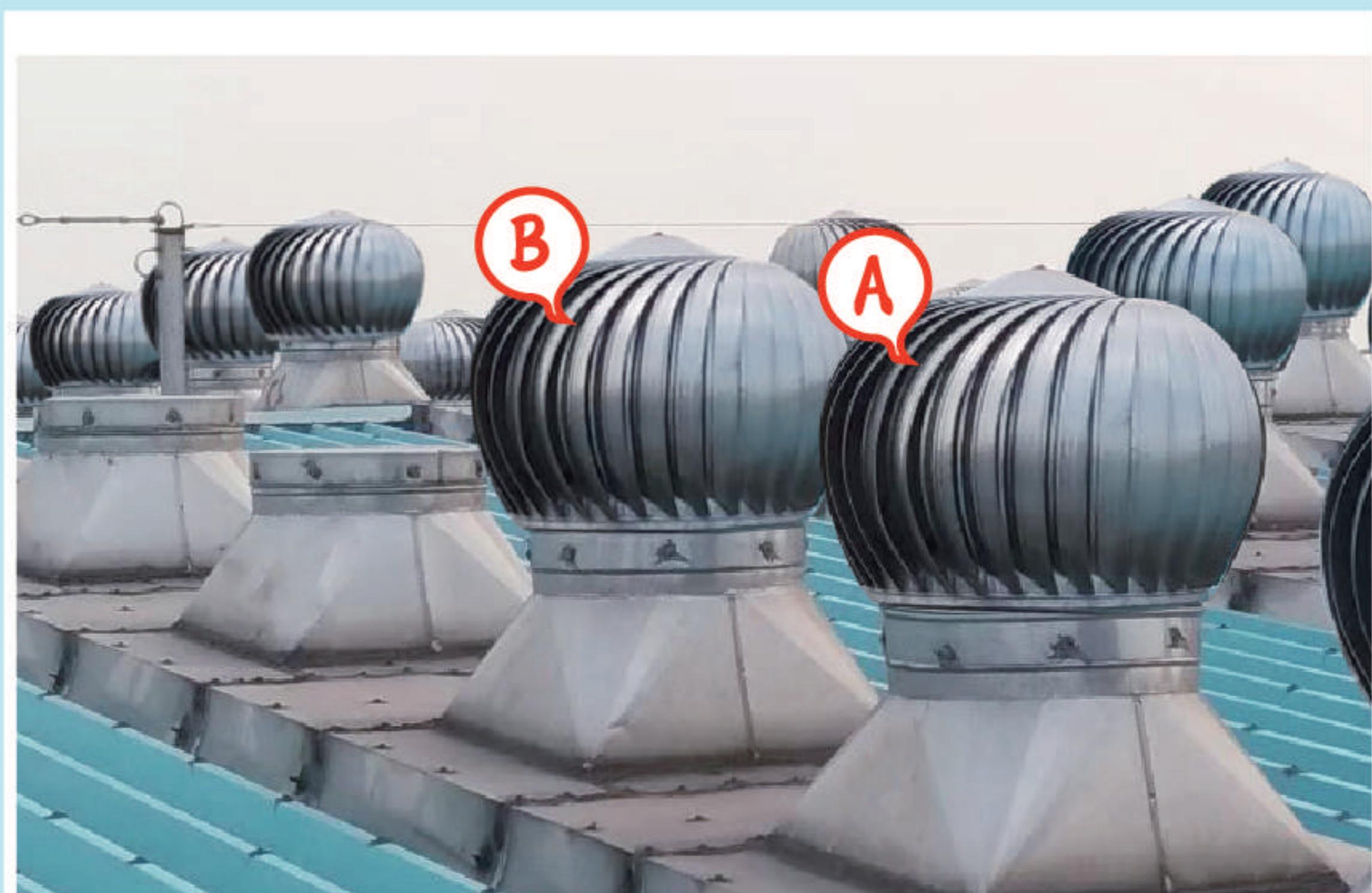
功能比較 SAVCOOL Ventilator VS. Turbine Ventilator

熱氣特性 Features of Hot Air

1. 熱氣係低密度物質具有浮力 Low density and buoyancy.
2. 滯頂後左右位移困難 Stagnant and difficultly moving around.
3. 排放量不足會造成向下累積 俗稱熱氣逼人 Causing sultry issue if heat exhaust capacity is insufficiently enough.

臺灣知名鋼鐵廠實測

Taiwan well-known steel manufactory real test



轉越快出風越少



損壞風速越快？



更換排熱強效果更好



逐步更換
Gradually replaced



流道路徑分析

流道長度 流道路徑 流道設計 切口面積

Analysis for internal paths design

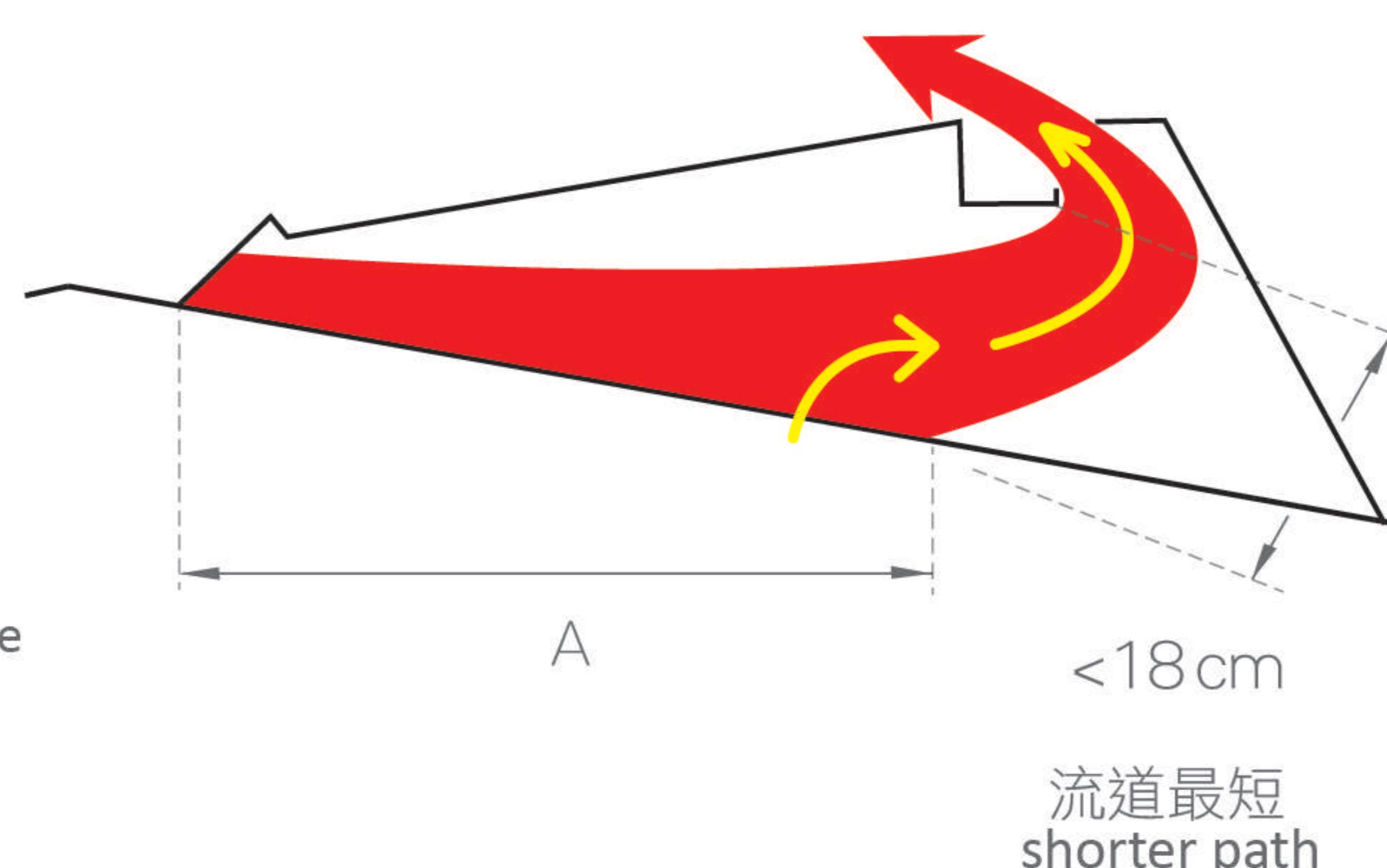
排熱強自然通風器
SAVCOOL Ventilator

順勢尚好
Upwards Buoyancy

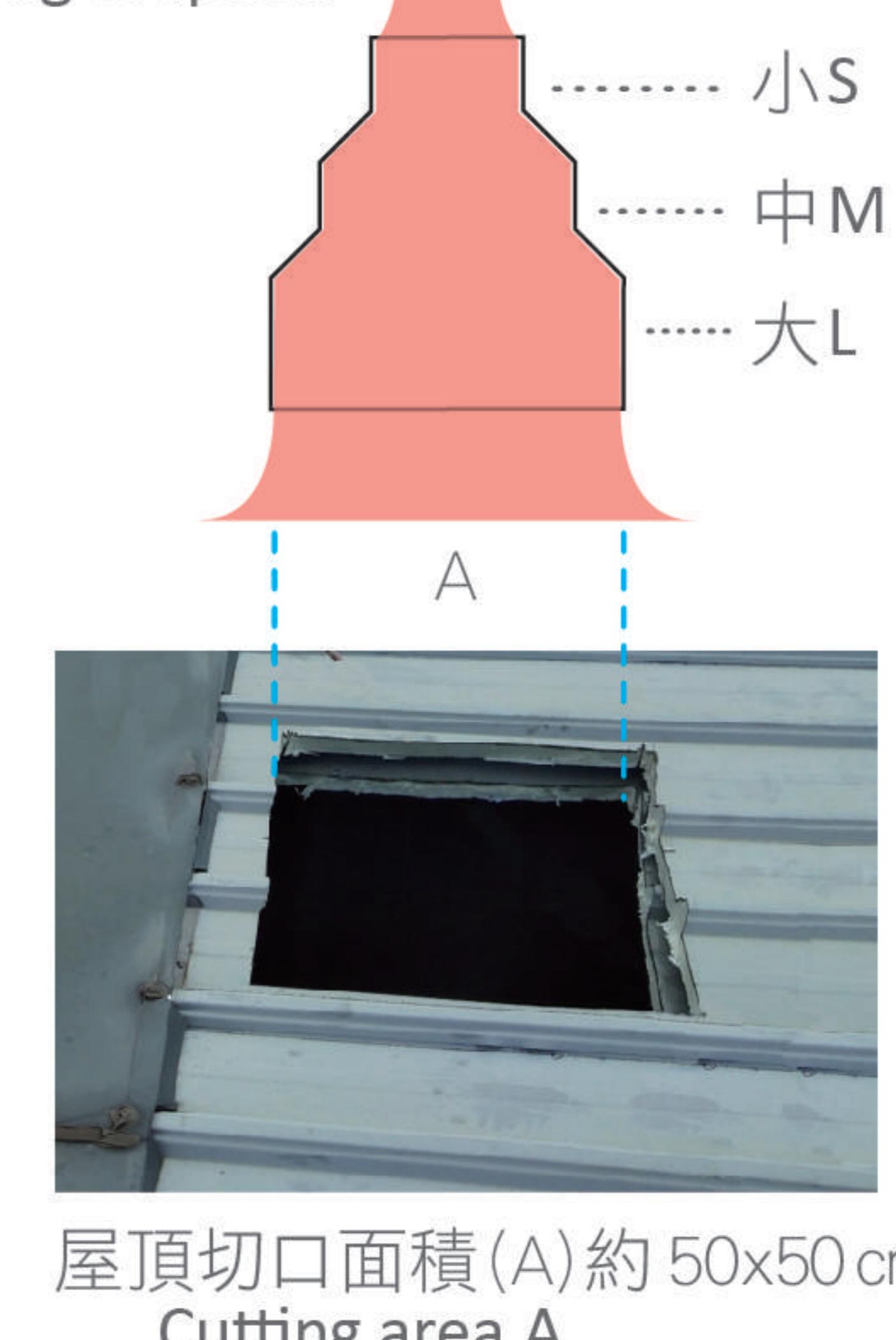
專利設計利用熱氣浮力順向往上流動路徑最短只有18公分。運用屋頂大切口面積大流量，流經順向出口造成噴流排放。

The hot air is upwards buoyant.
Shorter internal path is the quickest way for exhausting heat and therefore the design of internal path would maximize the capacity of eruption.

順浮力路徑短
Upwards buoyancy & short paths



噴流強
Strong eruption



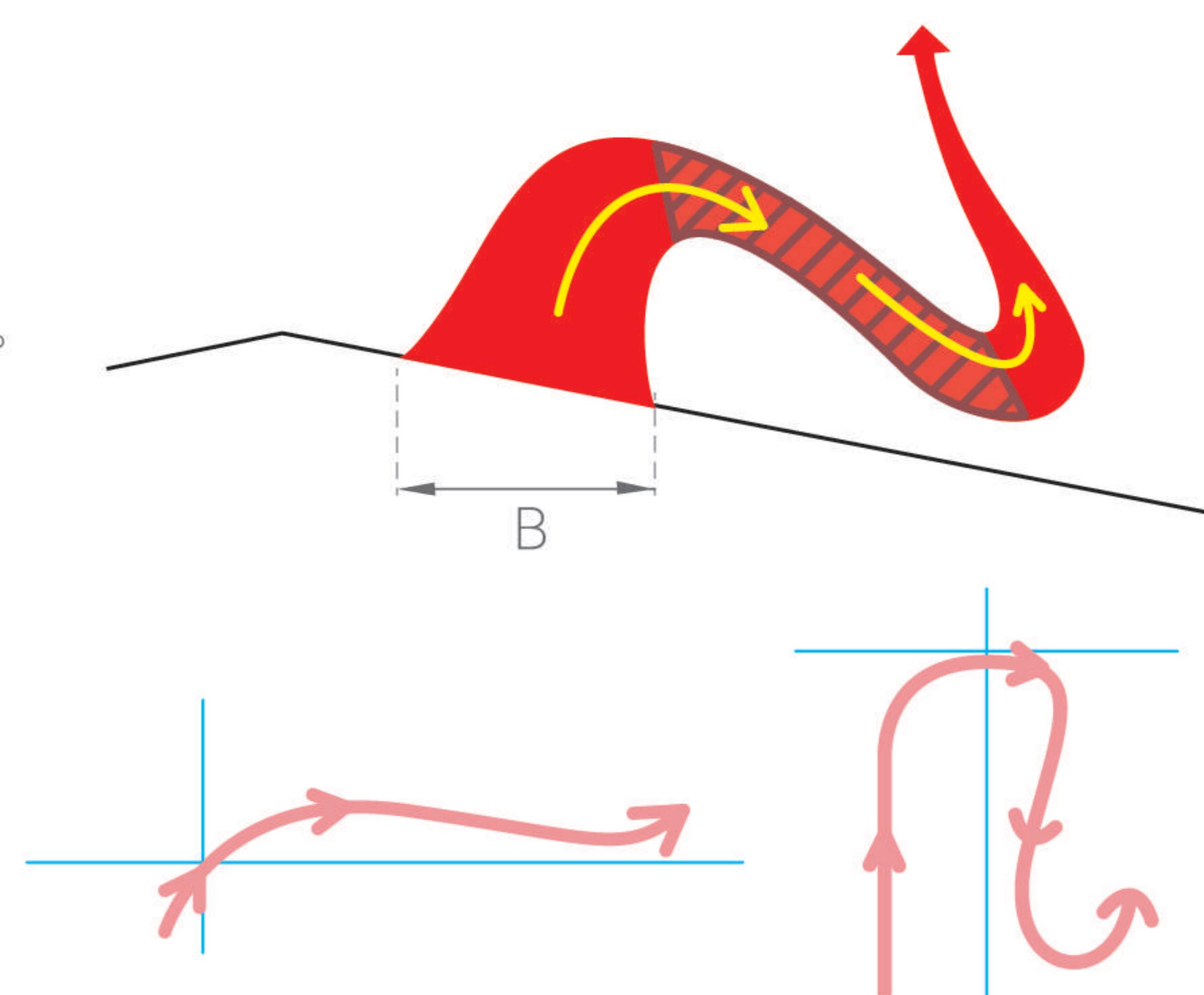
屋頂切口面積(A)約 50x50 cm
Cutting area A

他牌通風器
Other Ventilators

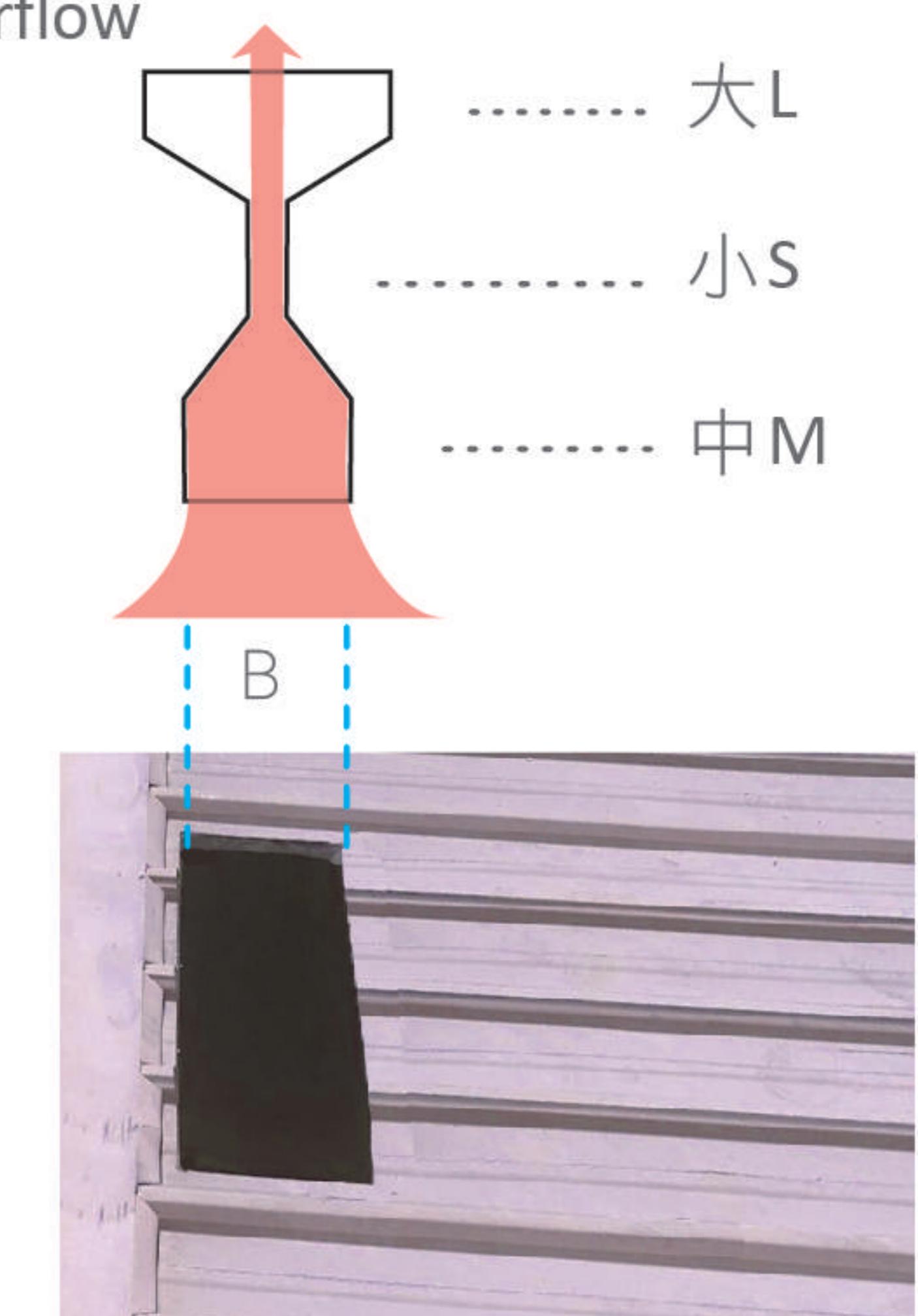
屋頂切口面積小流量少，流動路徑逆浮力向下，或橫向路徑長易造成流動緩慢遲滯。流動路徑髮夾彎或口徑不順，造成熱氣在屋內快速往下嚴重累積。

Too many internal sharp turns and downwards paths would slow down hot air to be exhausted out and therefore, the design of internal path would minimize the capacity of airflow.

逆浮力髮夾彎路徑長
Downwards buoyancy & sharp turns



氣流弱
Weak airflow



屋頂切口面積(B)約 20x60 cm
Cutting area B

散熱效率僅 10-15%
Only 10-15 % of Heat Exhaust



圖文數據引用自大同大學網站論文

The thesis is done and collected by postgraduates from Tatung University, Taiwan.

研究乃針對"自然風力通風球"設計元件中之可變因素加以設計修正，以期改進研發出效率顯著之嶄新風力通風球(目前通用20型之排熱效率僅10-15%)。

研究先進行客觀意願調查，第二階段則對磁推力、葉片開度、及環境排放口尺寸等三個重要設計要素分析研究，以評估風球轉速及溫度變化。結果顯示，消費者對通風球之消費意願頗高。磁推力 N to N，葉片開度33mm，環境狀排放口尺寸20x35 之設計有較佳之排熱效率，其中以磁推力為最顯著因素，降溫效率達15-20%，此研究結果對自然風力通風球之設計將有很大助益。

螺旋通風球 Turbine Ventilator

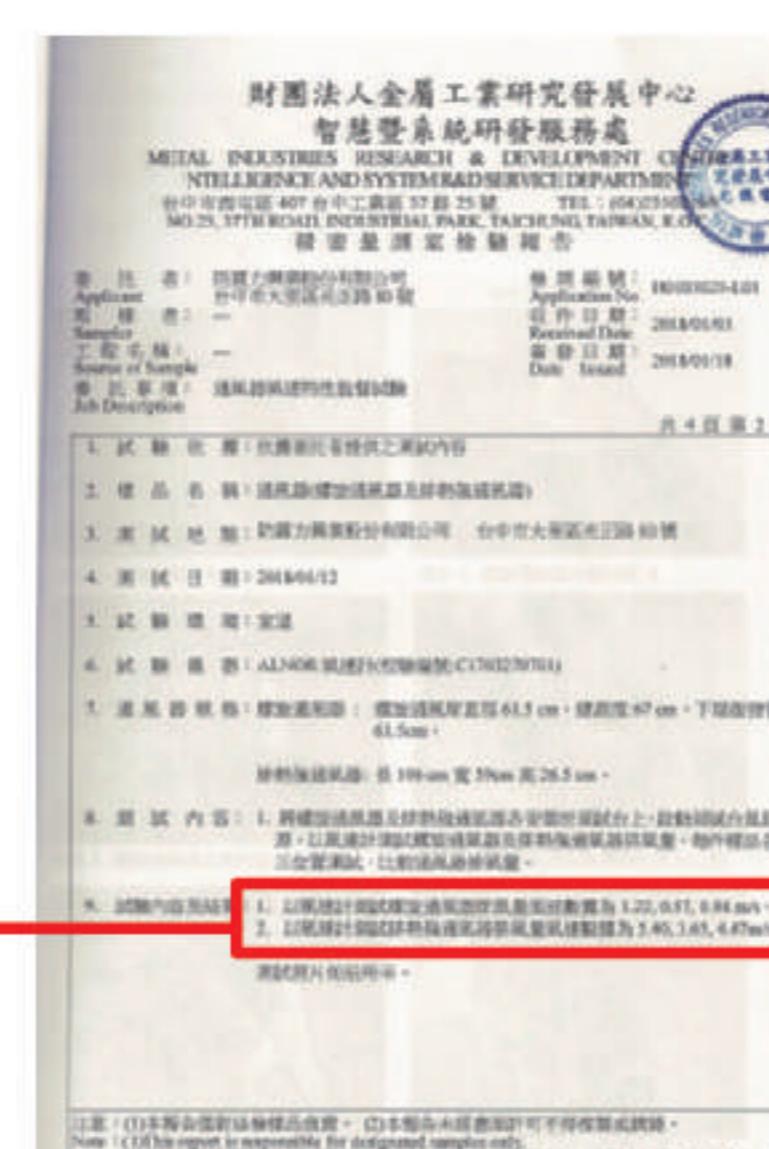


五倍 散熱效果
5 times more efficient than Turbine Vent

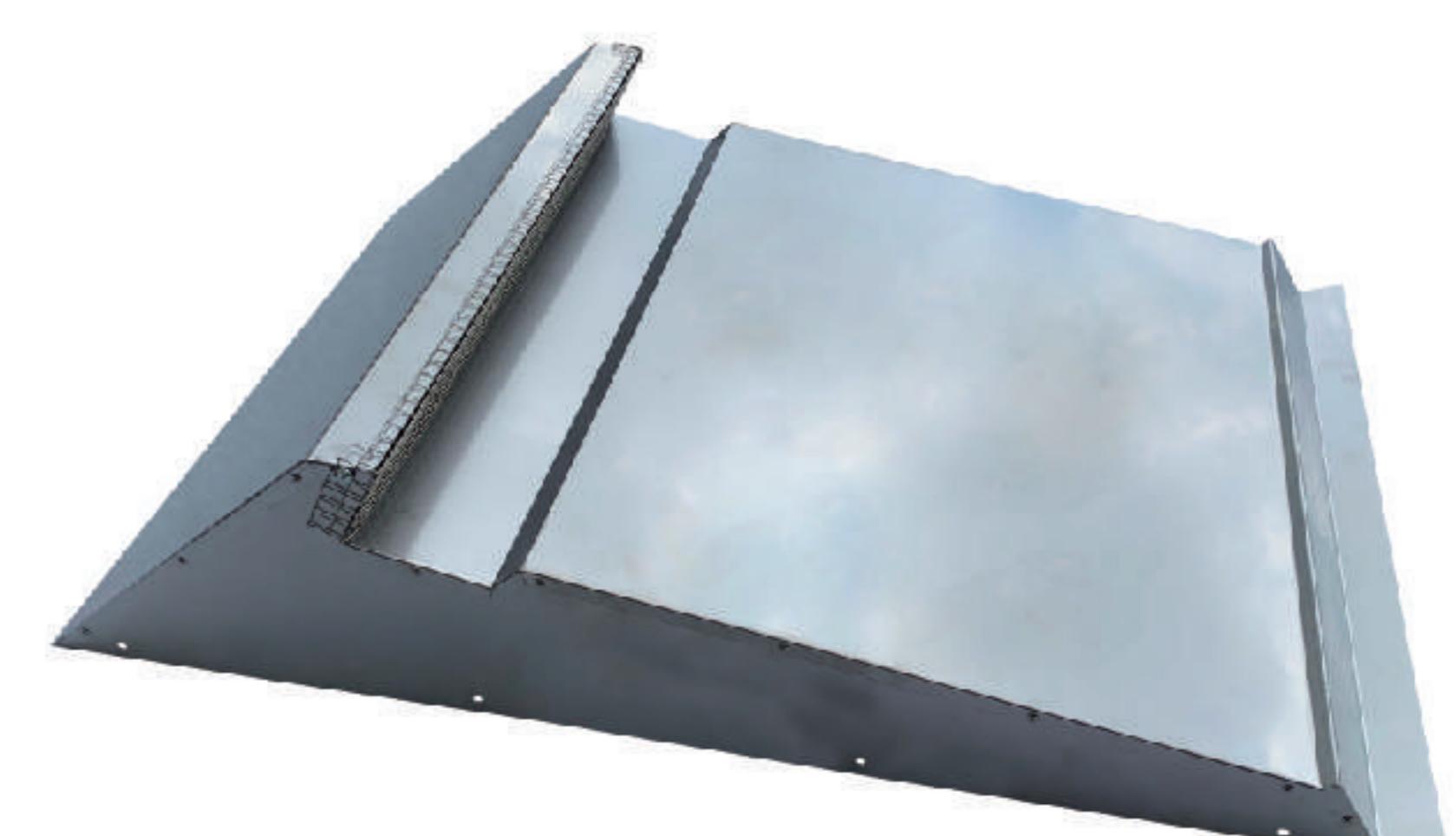
專業風速檢測認證

MIRDC Testing Report & Certificate

排熱強通風器排風量平均數據：4.5
螺旋通風球排風量平均數據：0.91



排熱強 SAVCO Ventilator



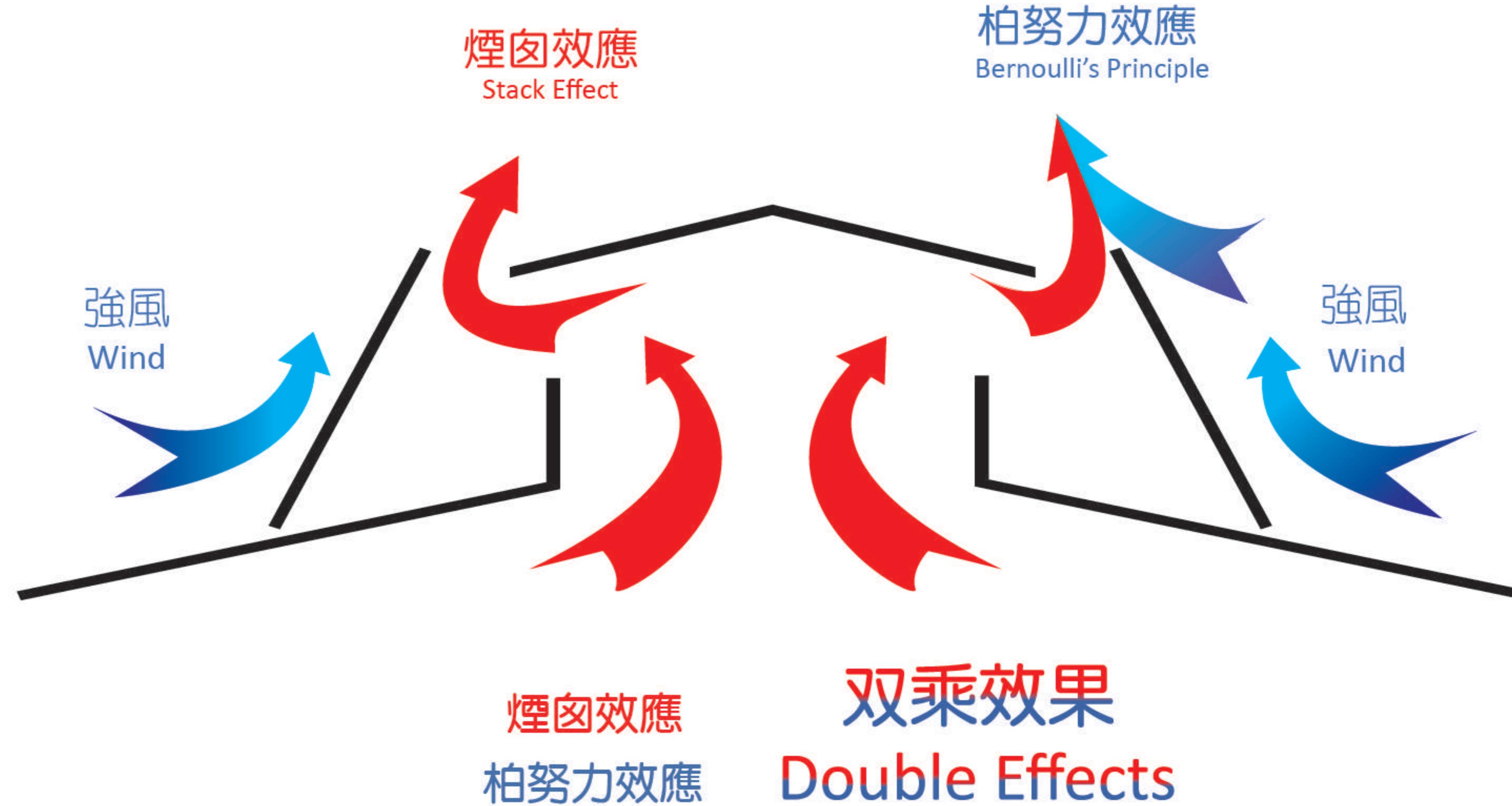
太子樓 專利結構空氣樓

SAVCOOL Airflow Tower Patent Ventilator

- 快速散熱
Faster Heat Exhaust
- 防雨水噴濺
Anti-Rain Splatter
- 終生免維修
Maintenance Free Forever
- 低風阻設計
Design Against Wind Drag
- 無動力結構設計
No Electricity Design Required

風越大 吸力越強

When the wind is strong enough, it can take away more volume of the internal heat of attic.

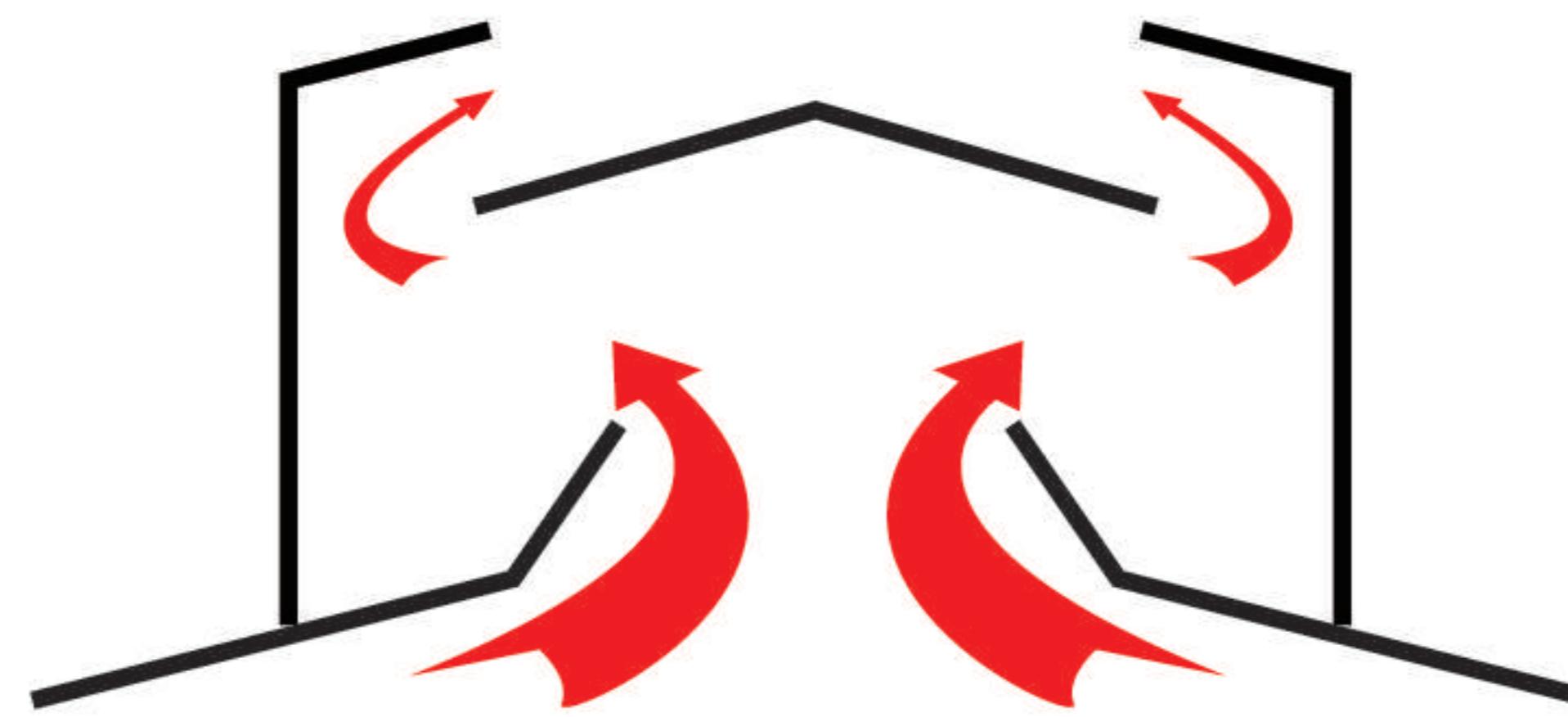
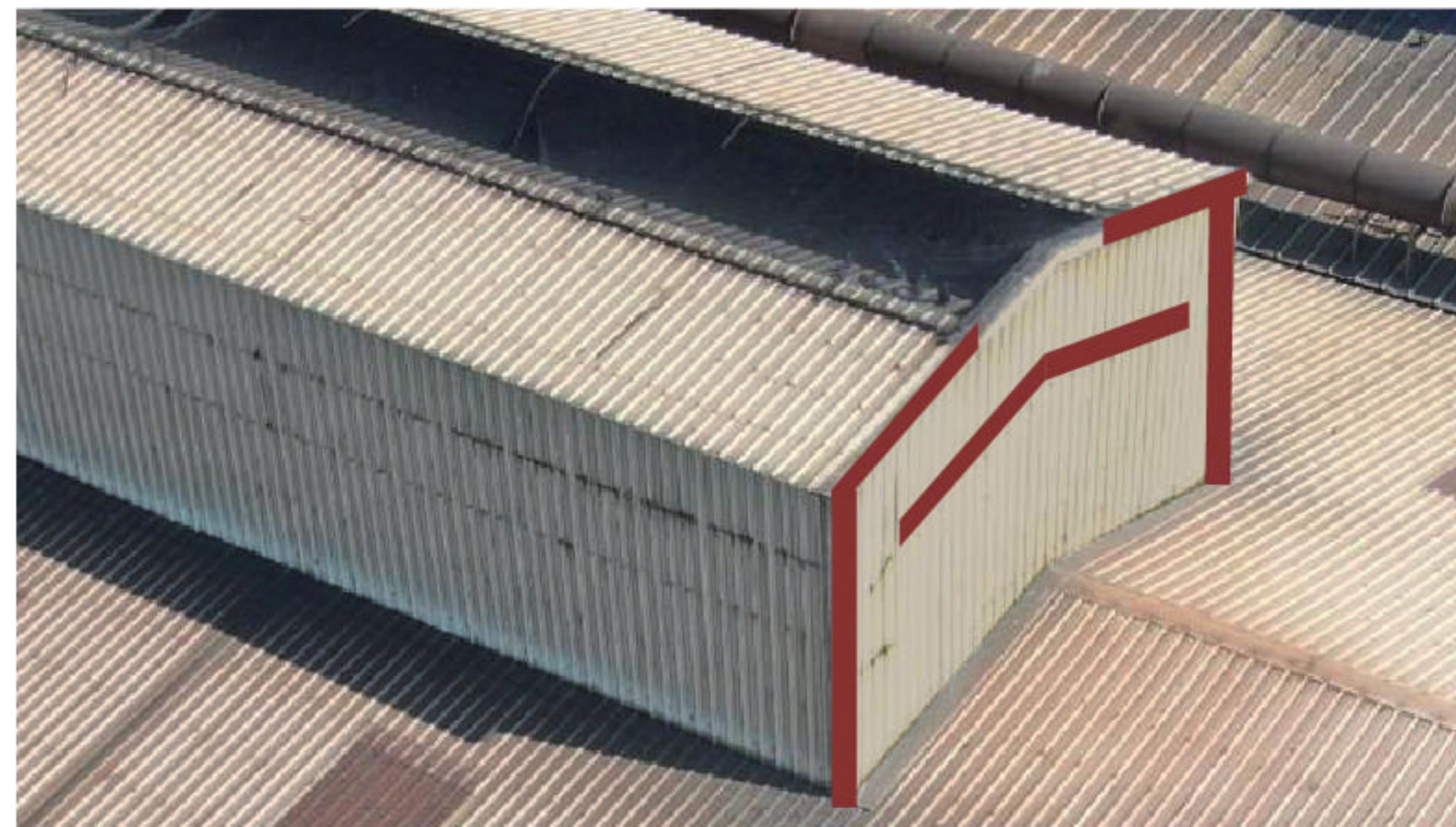


高效率自然對流空氣樓

Airflow Tower Ventilator with Maximum Efficiency of Convection

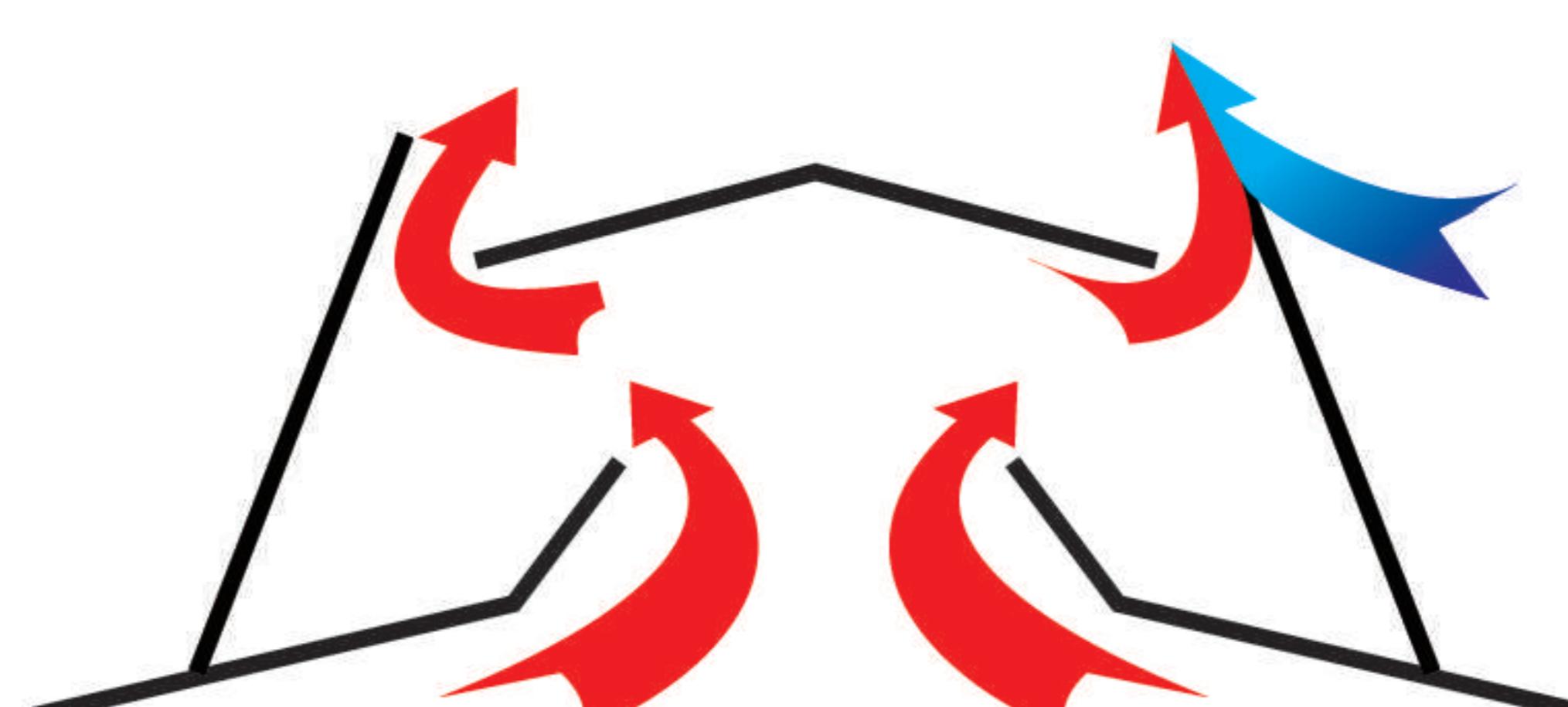
藉無側風效應設計結構，解決一般空氣樓懼風怕雨問題。由雙效應設計，排放快速安靜無聲永久免保養維修。適合大發熱量大空間建築如鋼鐵廠、鍋爐、橡塑膠射出、鑄造等高發熱量行業用。

It takes advantage of the design against wind drag, rain-splatter. Moreover, inner hot air can be exhausted out quietly and quickly through the upper vent by the side-wind effect. Furthermore, Airflow Tower Ventilator requires maintenance free and is suitable for buildings with spacious inner space such as steel structures, industrial autoclave, casting and rubber & plastic injection equipment where they can create tons of heat.



傳統空氣樓熱氣緩慢排出
效果緩不濟急

The traditional airflow tower performs in power efficiency due to low ventilation rate.



智慧型空氣樓利用雙效應
快速排出熱氣不堆積

The smart airflow tower utilizes double effects to exhaust heats rapidly and never trapped.

各式散熱設計比較 Comparison with Various types of Ventilators

	SAVCO 空氣樓	太子樓型空氣樓	上開式空氣樓（一）	上開式空氣樓（二）	百葉窗式空氣樓	低矮延伸型空氣樓
抗風阻力 Wind Resistant	Excellent	X Poor	X Poor	X Poor	X Poor	X Poor
排氣速度 Efficiency of Heat Exhaust	Excellent	X Poor	X Poor	△ Good	X Poor	X Poor
阻水能力 Water Resistant	Excellent	X Poor	△ Good	Excellent	X Poor	X Poor
造價 Cost	△ Average	△ Average	X High	X High	△ Average	★ Low

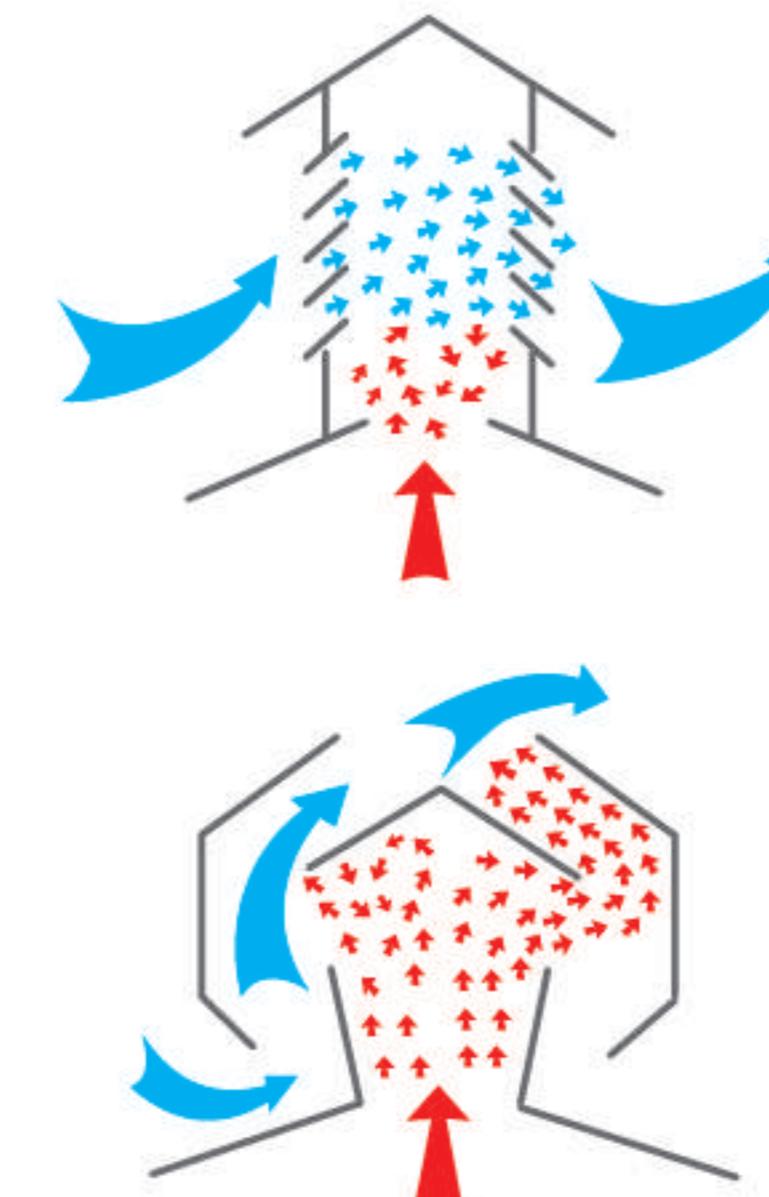
傳統空氣樓問題分析 Problem Analysis for Traditional Airflow Tower

側風效應 Cross-Wind Effect

屋頂冷風(高密度)強時，熱氣(低密度)出不去

Cold wind (high density) could block inside hot air from exhausting out.

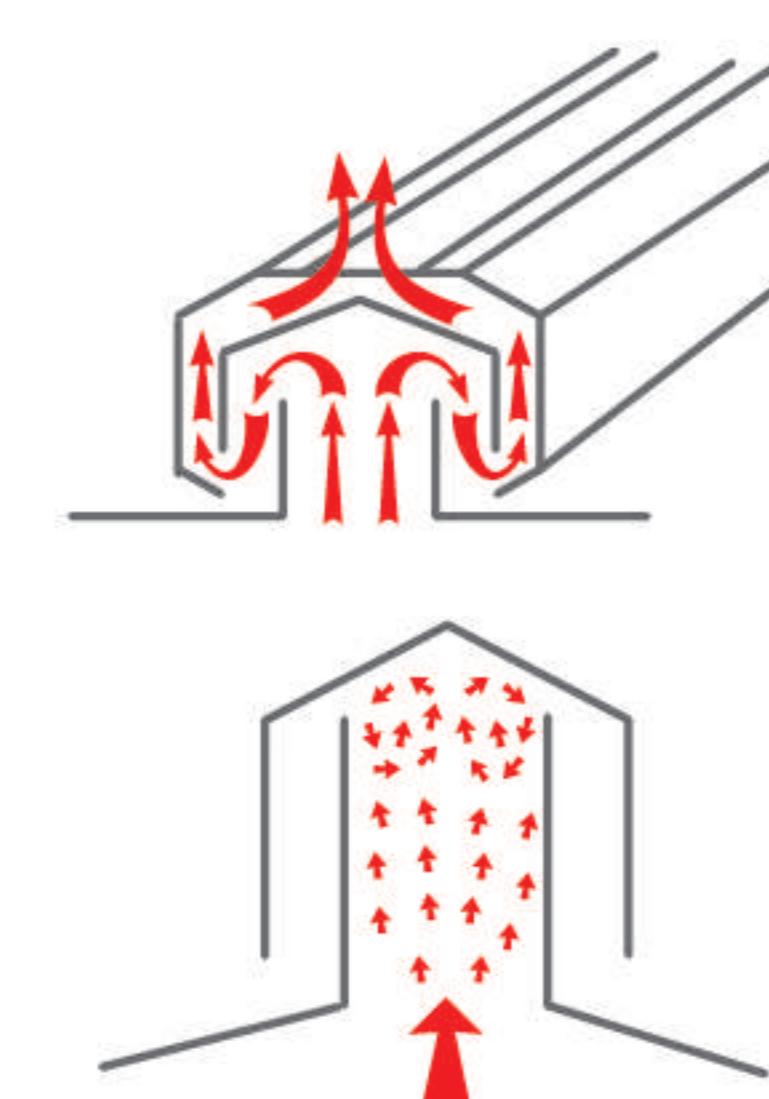
Hot Air (low density) is stagnant and difficultly moving around.



流道迂迴 Invalid Path Design of Airflow Tower

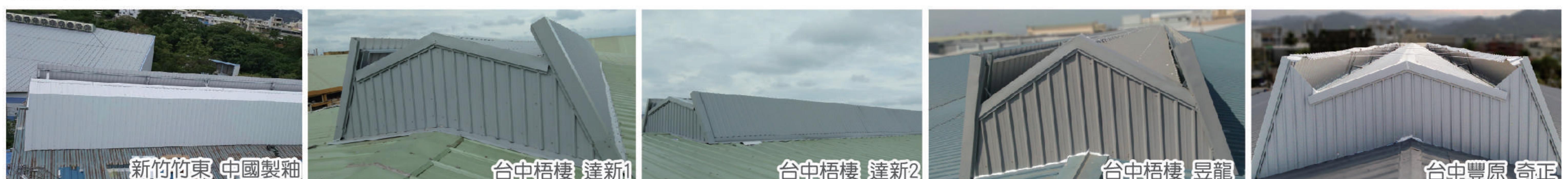
流道彎曲迂迴，阻礙減緩流速

The design for too many internal sharp turns can cause the efficiency of heat exhaust to be slowing down.



專業太子樓設計修改 Retrofit & Extra built-up for Airflow Tower Ventilators

新建設計



修改設計

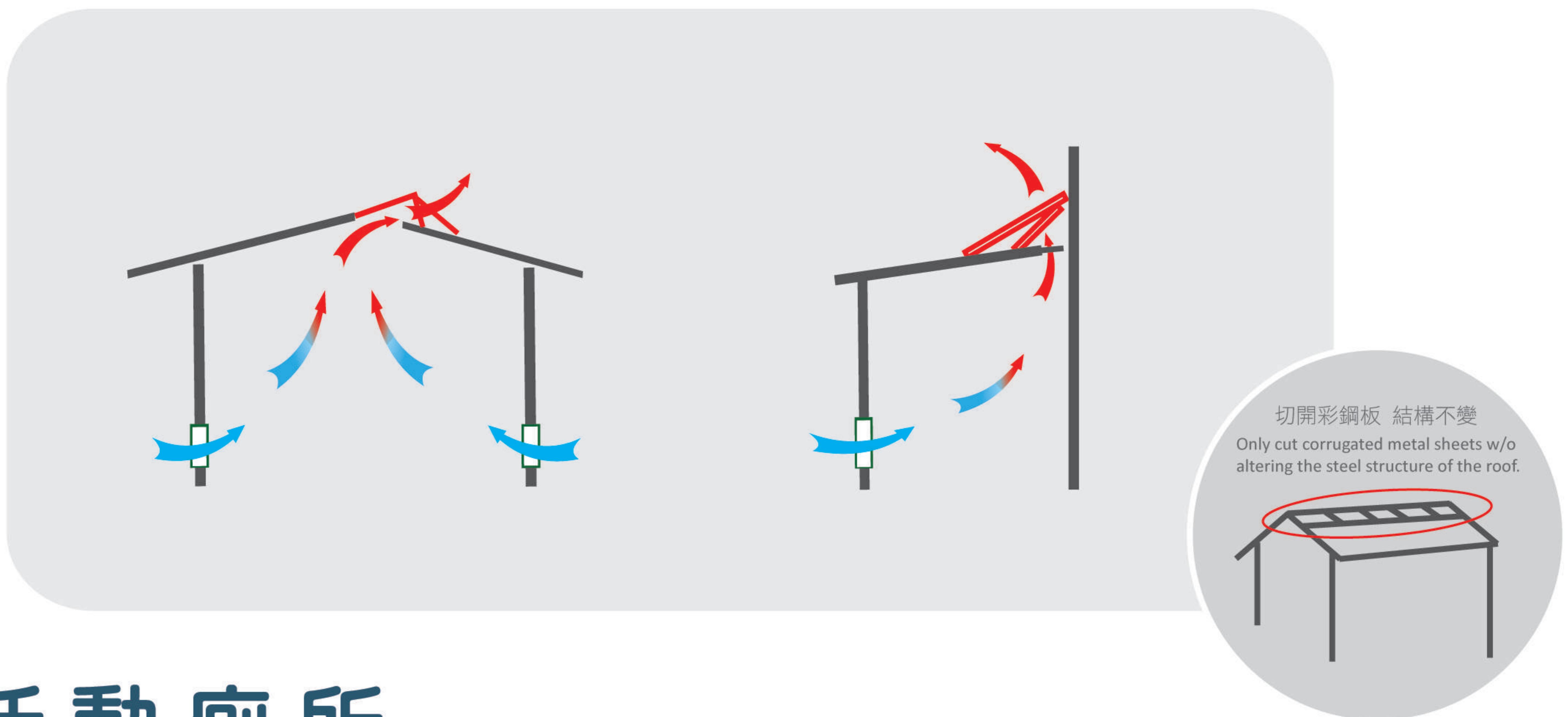


斜屋頂

Mono-Pitch / Pitch Roof Ventilation

雙斜屋頂 Pitch Roof

單斜屋頂 Mono-Pitch Roof



活動廁所

Mobile Toilet Ventilation

施工前 Before

上下溫差: 10.1度

The variation of temperatures between the upper and lower space is about 19°F

屋頂室內40.4度
Inside temperature of upper space 104°F



底部室內29.8度
Inside temperature of lower space 85°F



施工後 After

上下溫差: 1.5度

The variation of temperatures between the upper vent and lower intake is about 2°F

屋頂室內32度
Inside temperature of upper space 89°F



底部室內30.5度
Inside temperature of lower space 87°F



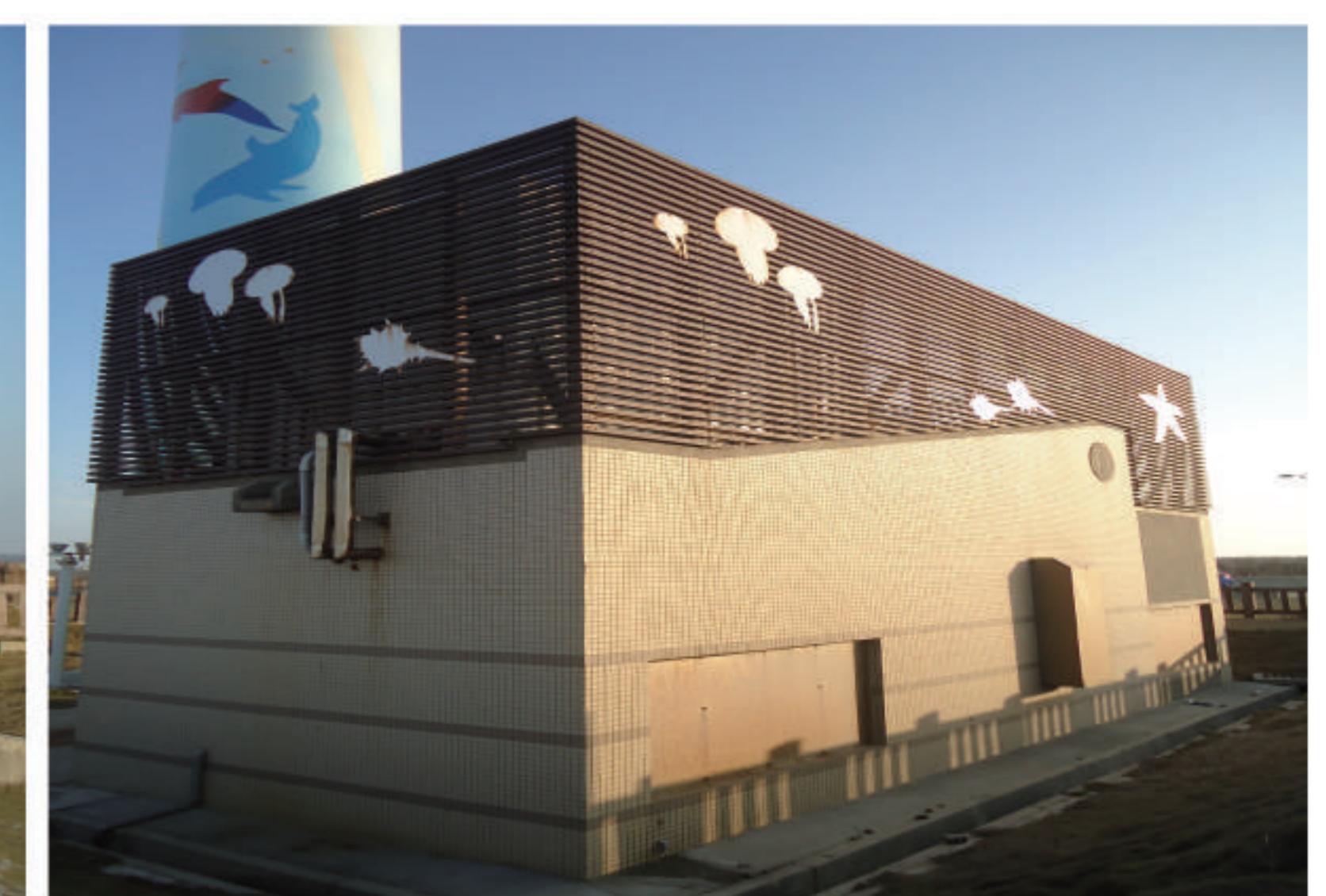
風力發電

Wind Power System Ventilation



防止風力發電機組過熱，增加通風及散熱效率。
解決傳統抽風機及冷氣機降溫效能問題。

When wind turbine is working, Wind Power System Ventilation(WPSV) can protect the generator and prevent it from over-heating or damage. The usage of SAVCO WPSV is to maximize air convection and the capacity of heat exhaust, while extractor fans or A/C cannot solve the problem of over-heating generator.



運用智慧型自然空調技術，通風散熱又零排碳，
不再懼風怕雨、機房悶熱不已。

Application on Natural Air Convection
Carbon Free
Rain/Wind Resistance
No More Sultry for Generator Room


客戶見證


Cases Study


強颱-梅姬、蘇迪勒、杜鵑 見證

Withstand Category 4 Hurricane Megi, Category 5 Hurricane Soudelor, Category 4 Hurricane Dujuan









效率提升
Efficiency Boost

消防排煙
Energy Conservation

節能無碳
Sustainable Ecology

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Whatapps

