



小冊 1
brochure 1

IRRETRACT: IT

cover on demand

自立式可開合天幕結構
香港本地團隊設計及安裝

Self supporting retractable roof structure

Designed, Engineered and Assembled in Hong Kong

香港的營商環境需求安裝簡單迅速、能應付颱風、必要時又能相對簡單移除的天幕系統。
Commercial realities of Hong Kong creates a demand for a system that covers space quickly, that can withstand typhoon winds and be removed with the least amount of effort, if required.

LIGHTWEIGHT WORKS團隊檢視過市面的其他產品，判定一套模組化可開合的天幕結構能夠對應很多需求。

The team at LIGHTWEIGHT WORKS reviewed many products on the market and concluded that a modular retractable roof frame will solve many challenges.

The benefits,

- **系統耐用可靠**

A durable and reliable tool that covers outdoor space effectively

- **天幕的開合操作簡單輕鬆**

A retractable roof system that is easy and quick to operate

- **模組化支架：可以互相連接，增加覆蓋範圍**

A modular system that can be joined for continuous dry space

- **四邊可以加配圍布形成閉合空間（可配冷氣使用）**

The system can be enclosed with side panels

- **可以加上品牌宣傳的元素**

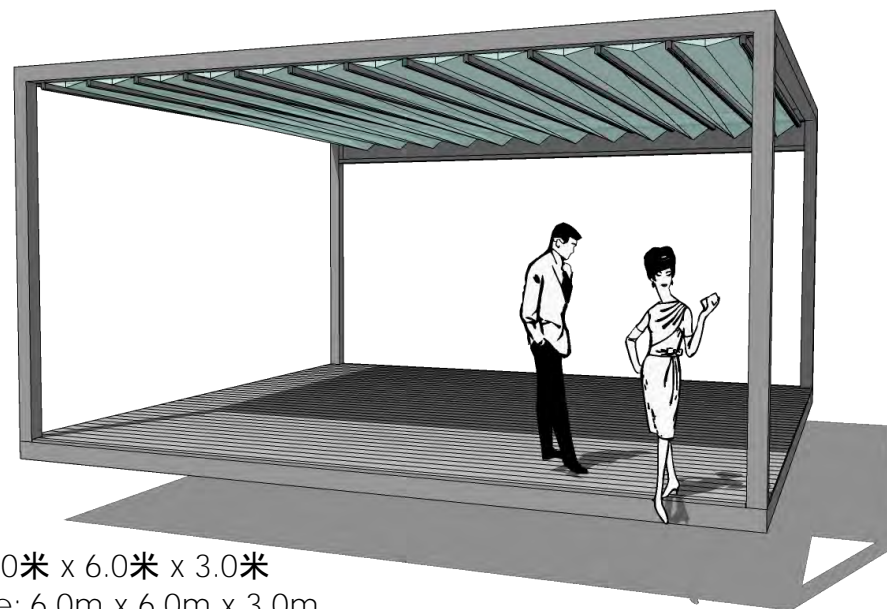
Branding accommodated and visible

- **系統組件可以拆除、再搬遷去另一個場地從新裝嵌**

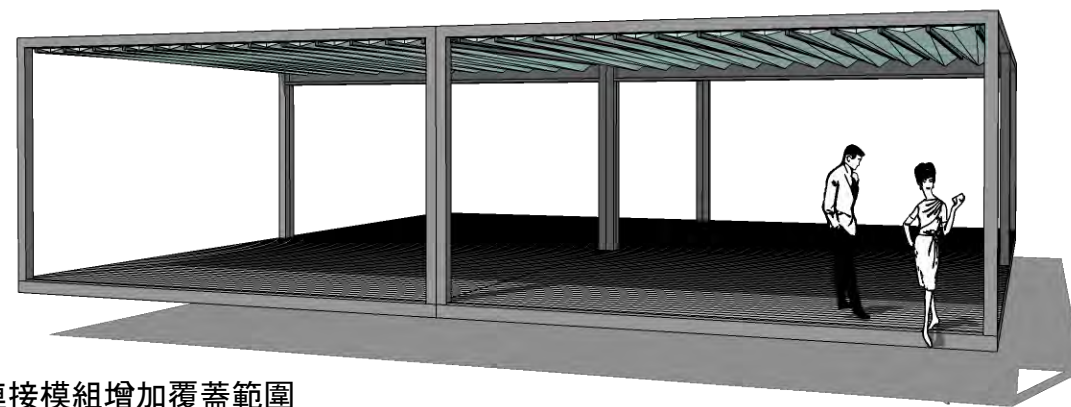
An assembly of parts that can be dismantled and moved as required

- **系統組件可以重用、回收，減少浪費**

A system that can be reused or recycled, nothing wasted



模組: 6.0米 x 6.0米 x 3.0米
module: 6.0m x 6.0m x 3.0m



連接模組增加覆蓋範圍
Add on for continuous dry space

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設計理念

Always ask why?

“

我們需要遮陽擋雨

The natural desire to protect from the weather

同時嚮往風和日麗

is as great as the need to experience the open sky.

”

我們在室外建立遮蓋去拓展生活空間，可供選擇的材料和建築方式不少，但可以隨時打開的選擇不多。

Covering outdoor space creates ideal conditions for human occupation and activity. This can be achieved with many building materials currently available. However the need to open up outdoor space to the sky is equally desirable.

天幕用布料制成，能夠遮陽擋雨，又可以隨時靈活打開，比起固定不能開合的結構有很多好處。

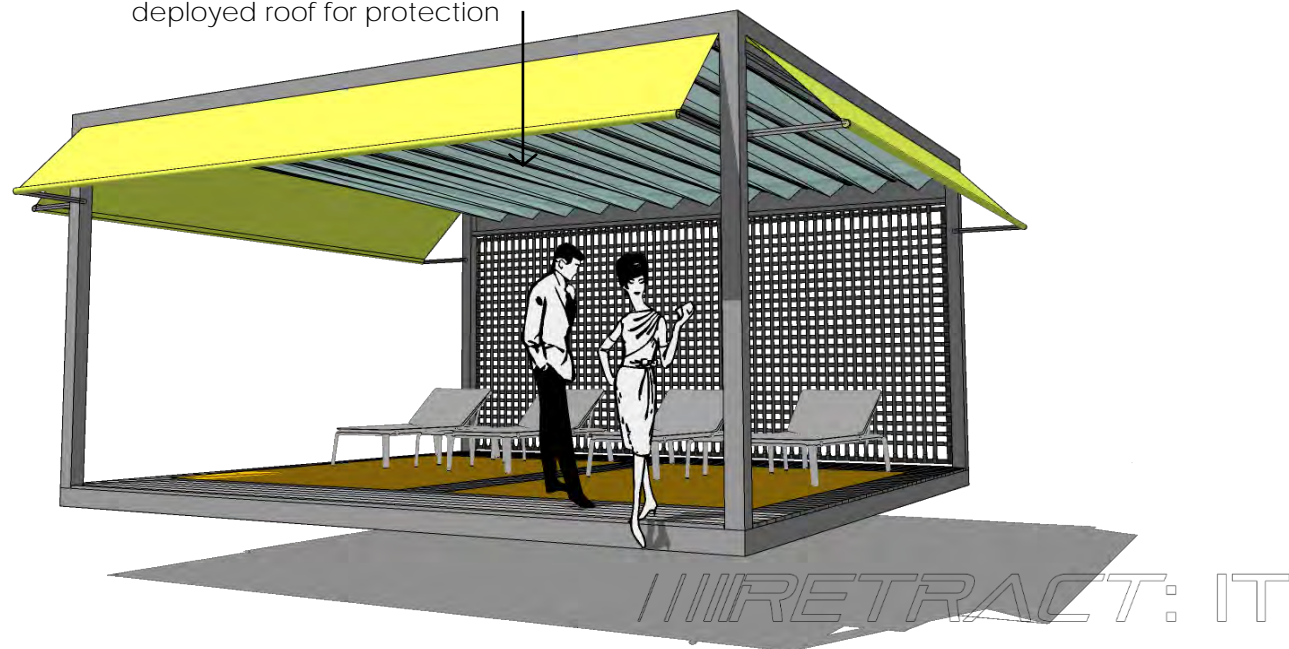
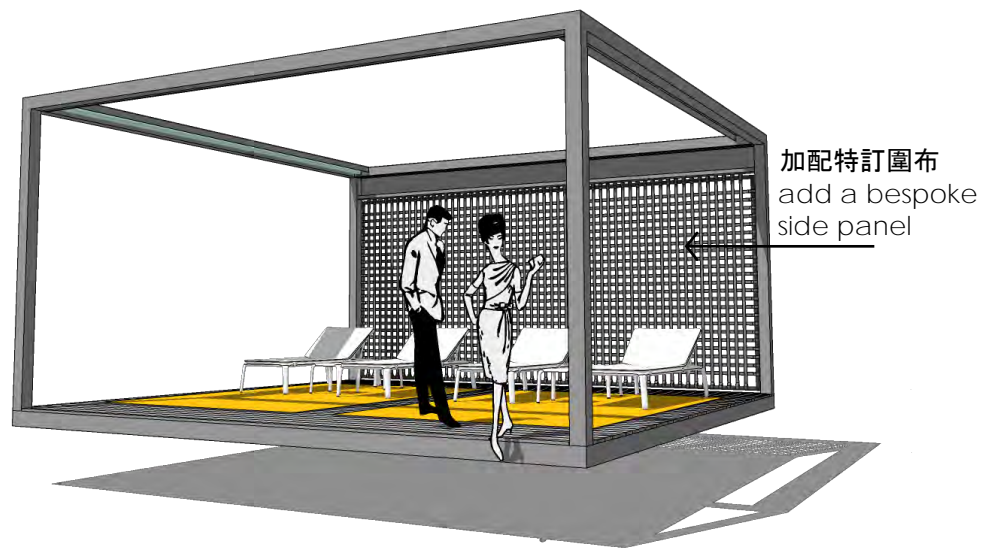
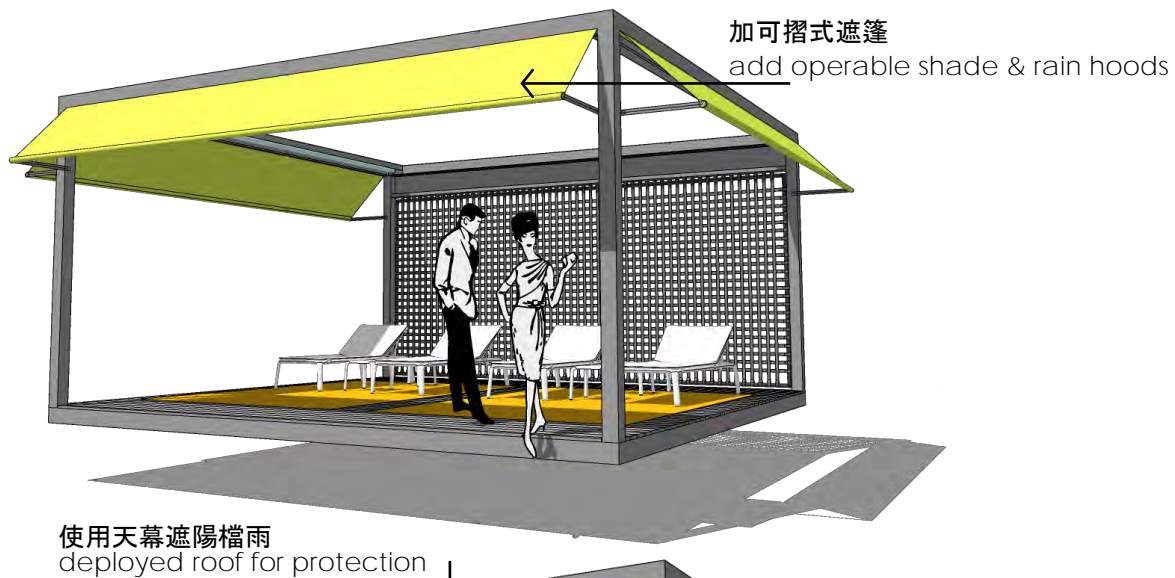
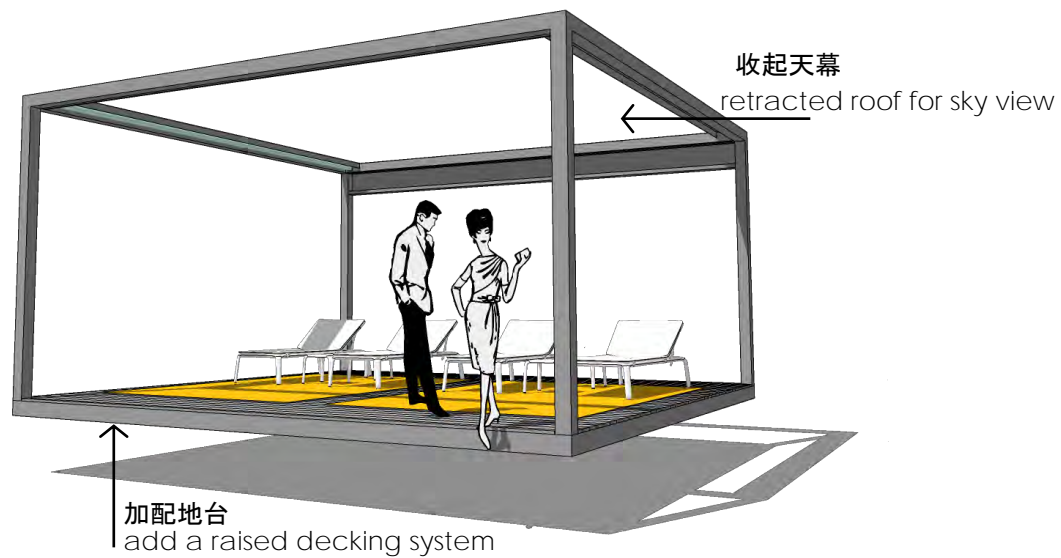
For the same roof protection to be adaptable and do both, to open and close easily, is a challenge best solved with fabric roof systems. Solutions that provide the capability to manage the end uses comfort zone, experience and activity. A distinct advantage over fixed roof structures.

而且，要應付香港的熱帶季風氣候和頻繁的颱風，天幕所承受的風力很強。把天幕收起來便能減少受風。

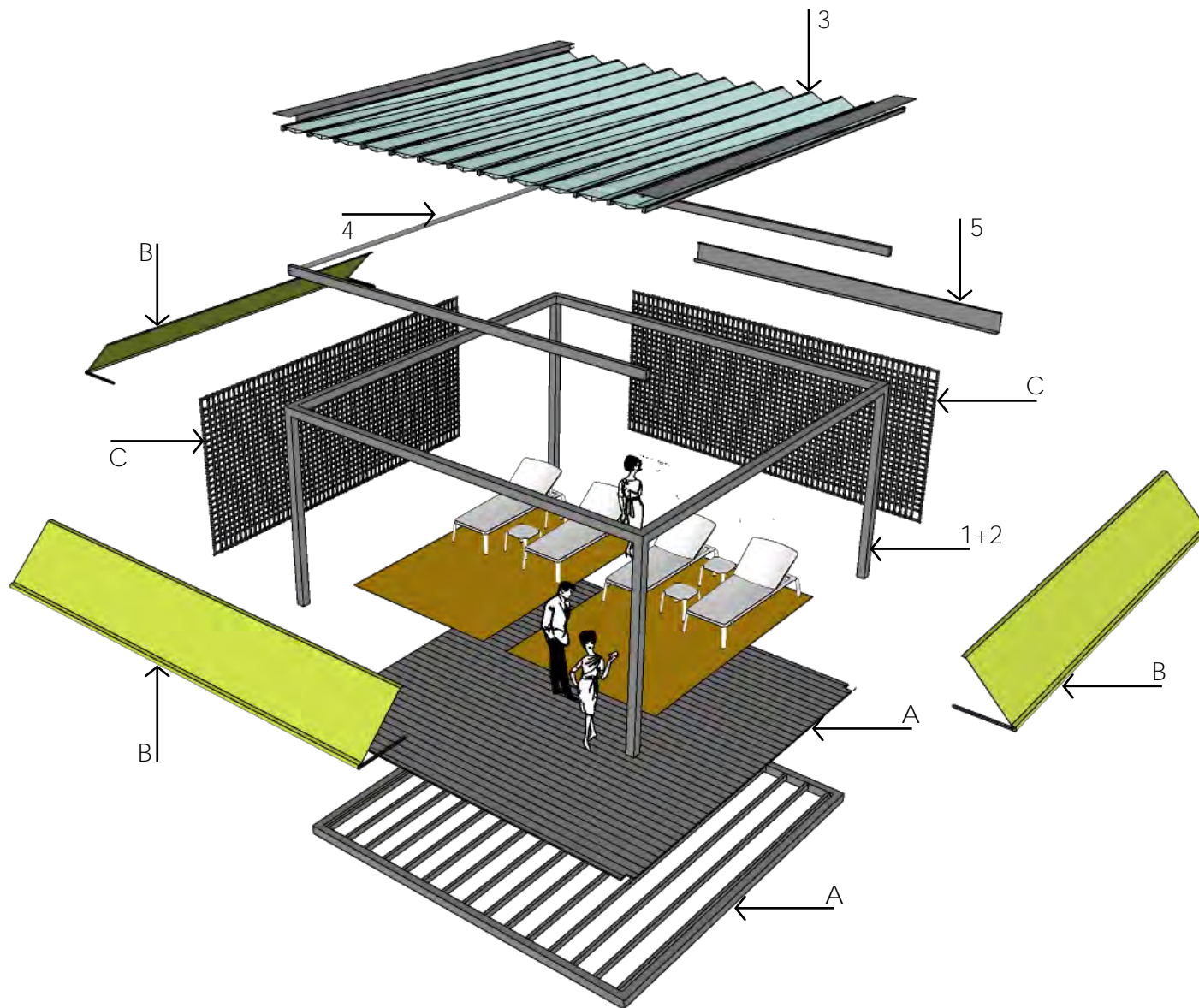
Additionally, in a tropical monsoon environment like Hong Kong, that is subject to annual typhoon seasons, any roof and structure is subjected to extreme wind pressures. Reducing the wind load by retracting the roof surface area is another huge advantage to be considered.



“ 自定零件組合 ”
build your unique solution



“ 零件組合 ”
assembly of standard parts



標準模組 (最大6.0米 x 6.0米 x 3.0米)
Standard module (6.0m x 6.0m x 3.0m maximum)

1. 100mm x 100mm 鋁合金支架 (噴粉成面)
100mm x 100mm aluminium powder coated frame
2. 不銹鋼連接件及底座
Steel junctions & base plates
3. PVC布料可開合防水天幕
PVC fabric retractable waterproof roof assembly
4. 手動或電動操作系統
Manual or electric drive assembly
5. 水槽排水系統
Integrated water gutter collection system

可加配組件

Add on components

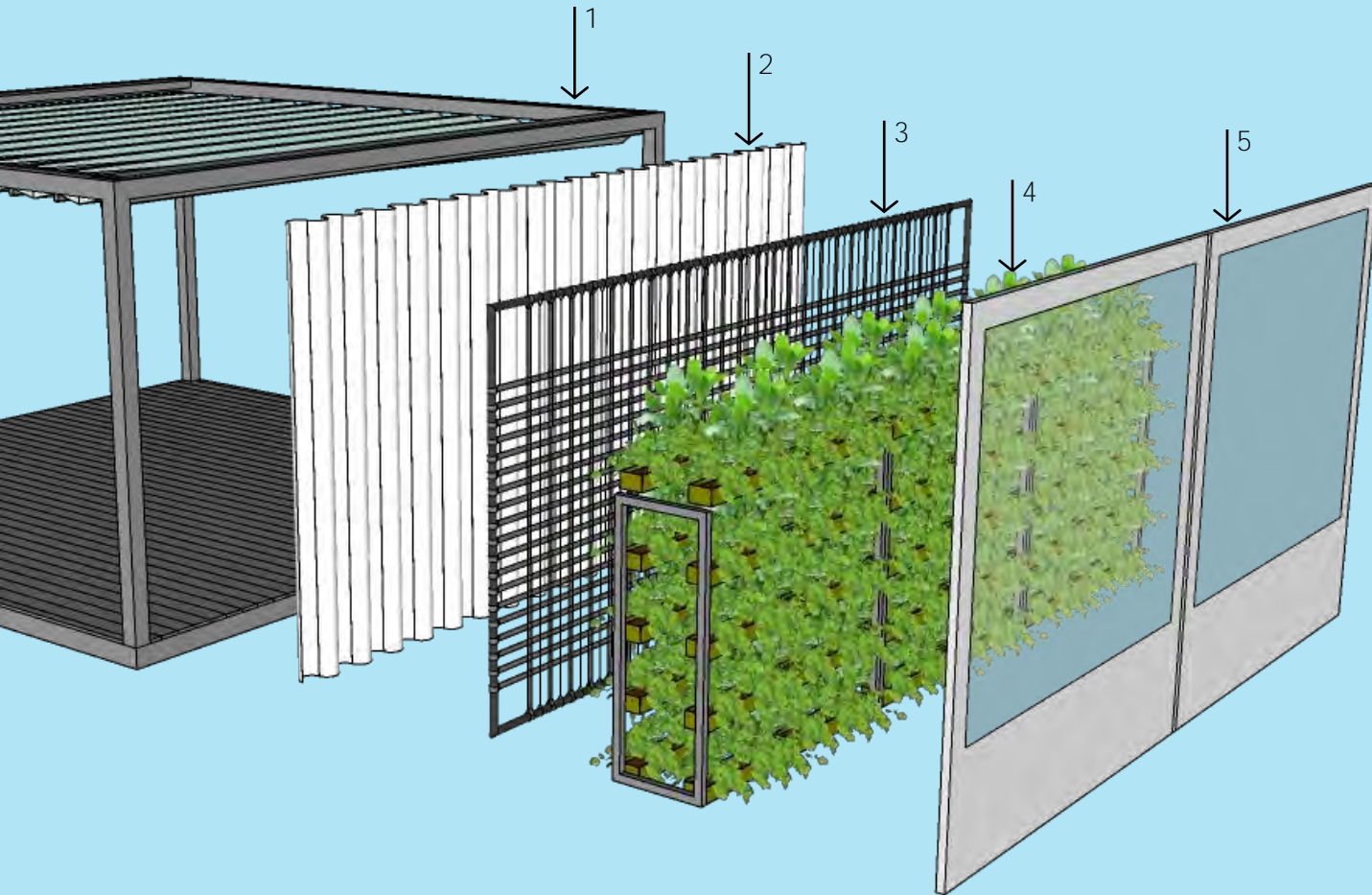
- A. 地台 Floor decking & support frame
- B. 可摺式PVC布料遮篷 (可以打印品牌logo)
PVC fabric sun shade, fold out hood (for logo print)
- C. 四邊圍布 — 全防水/疏氣遮陽
Side panels, waterproof or shade provision

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“ 零件組合 ” *assembly of standard parts*

視乎情況需要，標準框架上可以配上不同類型的圍布選擇。

The standard frame can be fitted with a number of side panel solutions dependent on specific requirements.



1. 開放式 — 沒有圍布

Standard frame module with open sides.

2. 防水布料拉簾 — 可遮陰、用作屏閉，同時輕度保持空氣流通

Fabric waterproof curtain plus rail for shade, privacy and allowing some air flow.

3. 聚酯纖維布帶 — 可輕度遮陰、用作屏閉、同時保持空氣流通

Woven polyester belt screen for partial privacy and shade, retaining air flow.

4. 垂直式植物垂簾 — 可遮陰、用作屏閉，同時輕度保持空氣流通

Vertical landscape modules for privacy and shade with some air flow.

5. 可捲起式PVC圍布 — 完全防水擋雨、不透氣、用作屏閉

Roll up PVC fabric side panels with clear inserts to manage air flow, rain and privacy.

如果還有其他圍布的想法可以找我們商量。

Other screen solutions are possible and limited only to our imagination. Lets talk.

“ 行內守則 ” *the world of compliance*

Lightweight Works有多年從事工程經驗，應付過屋宇處、民政事務總署及食物環境衛生署的標準和要求。

Lightweight Works has years of experience taking on the many challenges of complicated sites and working to compliance requirements from BD, HAD and FEHD. Its never simple.

我們的團隊裡面有認可人士和註冊結構工程師，了解審批準則。

Our team includes an Authorized Person and an RSE, both know the system and how to gain approval.

天幕結構的標準模組（處於天幕收起、四邊開放的狀態下）經過計算合乎2019年香港風力效應作業守則。

The standard module has been engineered, as an open sided frame (the roof retracted, no side panels) to withstand the compliance requirements under the HK Wind Code 2019.

Lightweight Works作為專門公司與顧問團隊合作，可以把天幕系統擴展在更大型的項目上應用。

As a specialist company, Lightweight Works supports the consultant project team with all technical planning and detailing, to integrate the product into a larger project.

為不同參與單位整合和提供技術資料，方便採購流程。

Providing information and simplifying the procurement for all parties involved.



APPROVED

///RETRACT: IT

“ 風的季節 ” typhoon season +10

我們都受年度風季影響，需要在極端天氣下確保結構安全。

We are all impacted by the annual typhoons sweeping through or past Hong Kong. Logically all structures need to be safe against these weather phenomena.

Retract:IT系統經過仔細設計，確保在颱風環境下能承受風力。經由註冊結構工程師計算，當天幕處於收起狀態時，經正確方法安裝的框架十分安全。

The Retract:IT system has been designed, detailed and made to withstand the high typhoon wind pressures. By retracting the fabric roof, the open frame, with proper installation procedures followed, has been checked by a Registered Structural Engineer to ensure maximum safety.

能承受2019年香港風力效應作業守則設定的風力。

The open frame is adequate to withstand the wind load stipulated in the Code of Practice on Wind Effects in Hong Kong 2019.

經由註冊結構工程師準備的報告可供參考 — 它適用於6.0m x 6.0m x 3.0m的標準模組。

The structural adequacy Checking Report prepared by an RSE is available for review. This covers a standard 6.0m x 6.0m x 3.0m (h) structural module.

即使特別度尺訂造的天幕結構也一樣可以符合安全準則。

Alternatively a bespoke solution for a specific building and terrace can be prepared to ensure the maximum level of safety.

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我們的願景

Vision statement of Lightweight Works

“ 符合自然，為人類在一個可持續發展、有生氣的地球上建築 ”
enabling humanity to build in collaboration with nature, toward our sustainable, living planet

在Retract:IT系統裡融入可再生策略。

Regenerative strategies built into the Retract:IT system.

1. 減少使用物料種類 Reduced material types used,

I. 鋁合金 Aluminium

II. PVC聚酯纖維PVC polyester

III. 尼龍 Nylon

IV. 鋼鐵 Steel

框架及其他組件 frame & other components

布料 fabric membrane

3D打印物料 3d printed components

連接部件 junction components

2. 系統壽命：15年+天幕系統可以多年使用。若果定期每年檢查的話，預料可以使用15年以上

Working life of 15-years plus. The product is designed to operate and provide value to the end user for many years. With a single and annual checkup, a working life beyond 15-years is achievable.

3. 零件可更換或維理由非專門和普及的零件組成，可由本地購買保養

Replaceable or repairable parts, none specialist, all easily and locally available.

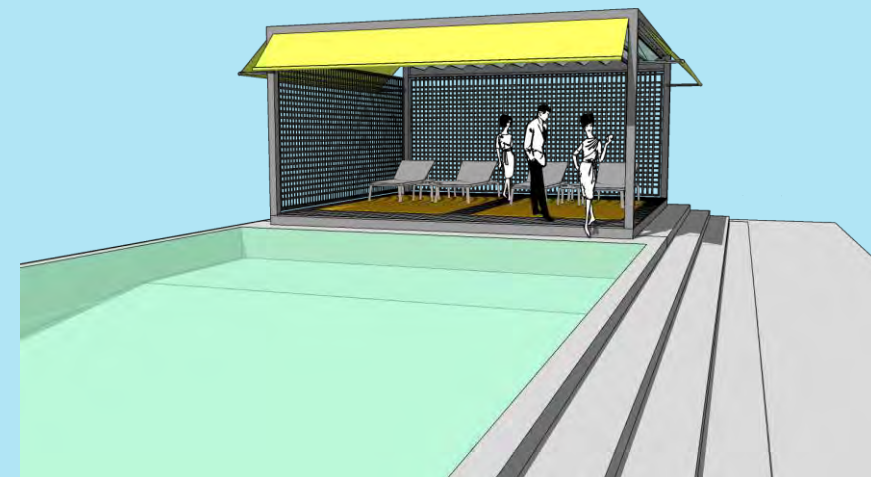
4. 升級再造 可由Lightweight Works翻新天幕系統，延長壽命；又或者翻新轉售他人

Upcycling of the structure is done through a Lightweight Works refurbishment program that will extend the working life for another 15-years. Alternatively, refurbished and resold.

5. 循環再造 可循環再造的物料都會交予政府認可的供應商。Lightweight Works致力做到每一套系統的循環再造

Recycling of all the materials is possible as of today using government approved vendors. Lightweight Works will support this initiative for each structure.

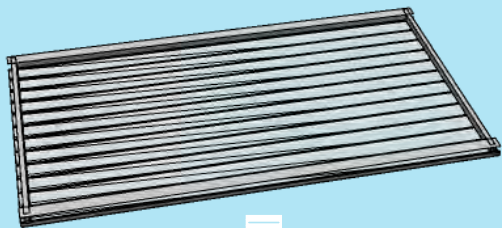
always consider
upcycle



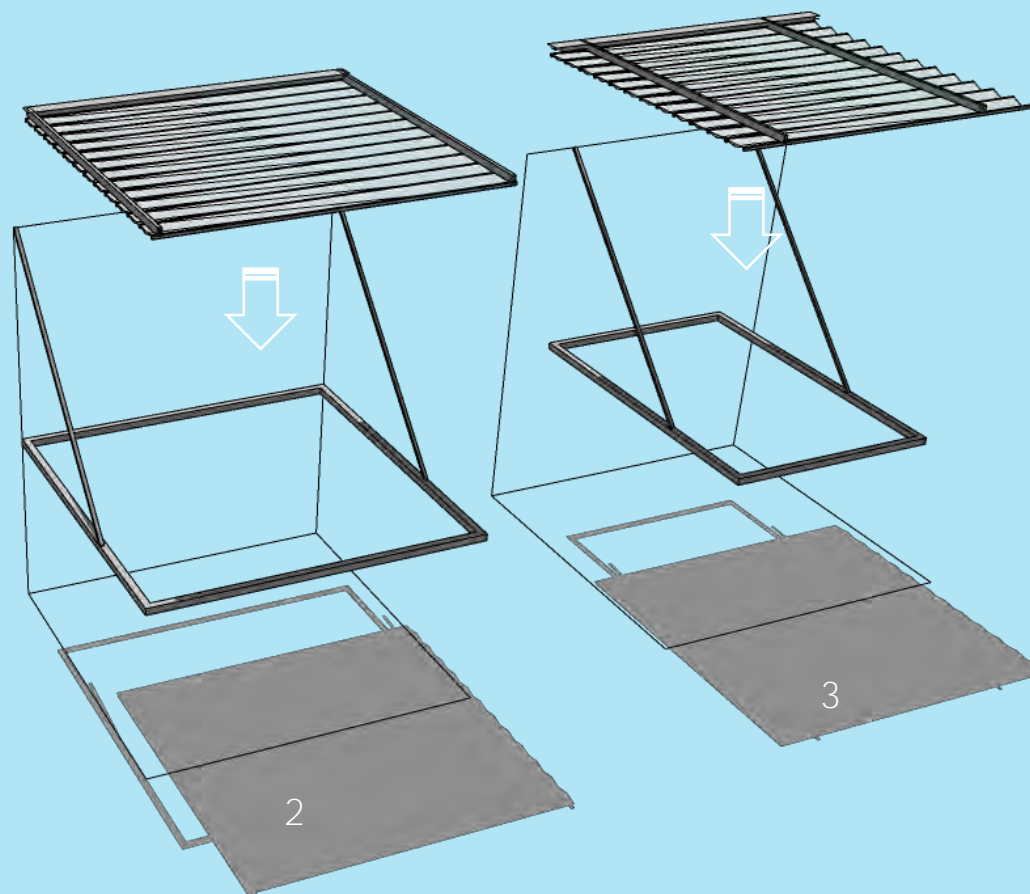
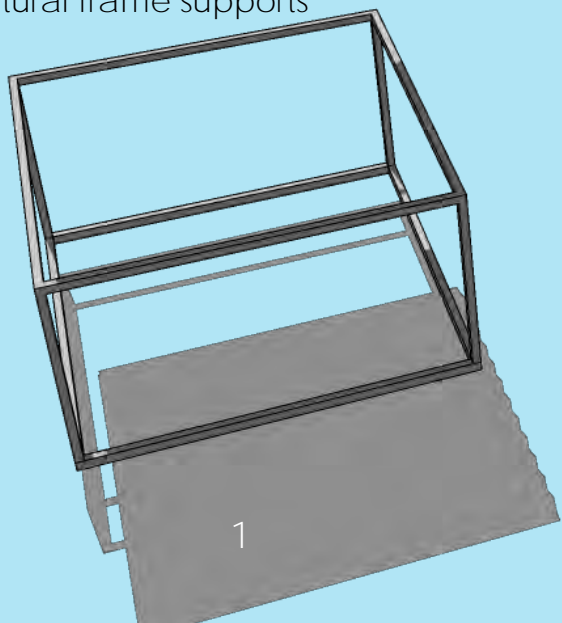
///RETRACT: IT

“度身訂做”
adapt to fit

可開合天幕
Folding fabric roof assembly



不同支架類型
Structural frame supports



天幕可以配上不同類型的支架結構。

The fabric roof component plus drive assembly can be adapted to fit into a range of structural frame supports.

使用哪一款支架視乎你的現場環境、場地業主的要求和天幕的使用方式等因素。

The building, the landlord and the functionality of the outdoor space will determine the supporting frame configuration.

1. 標準自立式支架

Standard self supporting module

2. 壁掛式標準支架

Wall mounted module with standard frame


3. 壁掛式特定支架

Wall mounted module Wall mounted module with minimized frame

聯絡我們，為你的場所制定方案。

Talk to us and let's find a solution to your challenge.

///RETRACT: IT

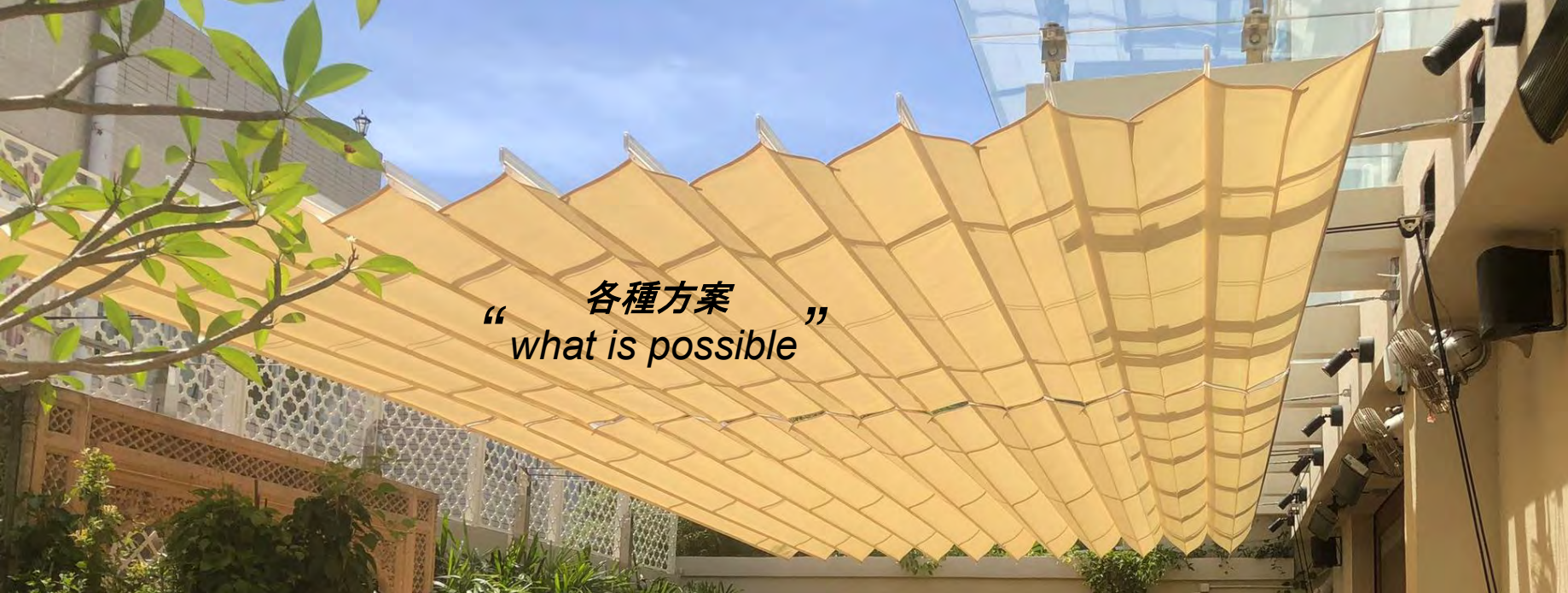
The image shows a modern outdoor patio area. A large, light-colored retractable canopy is extended over the space, supported by a series of vertical poles. The patio is surrounded by lush green plants and trees. In the foreground, there is a wooden dining table with several chairs. The background shows a building with a glass door and some outdoor lighting fixtures.

“ 各種方案 ”
what is possible

簡約主義的設計方案
A minimalist solution.

借用原有的牆身建築支撐天幕，一樣可以容易開合。
Use the existing building to create shade and rain protection.
Then retract and appreciated the sky view.

///RETRACT: IT



“ 各種方案 ”
what is possible

標準模組方案。

The standard modular solution.

適合有露天平台的餐廳。

Perfect for restaurants with outdoor terrace space exposed to unpredictable weather conditions.

增進顧客的舒適度從而增加收入。

Environmental management is essential to their patrons comfort level and their revenue.





“ 各種方案 ”
what is possible





“ 各種方案 ”
what is possible

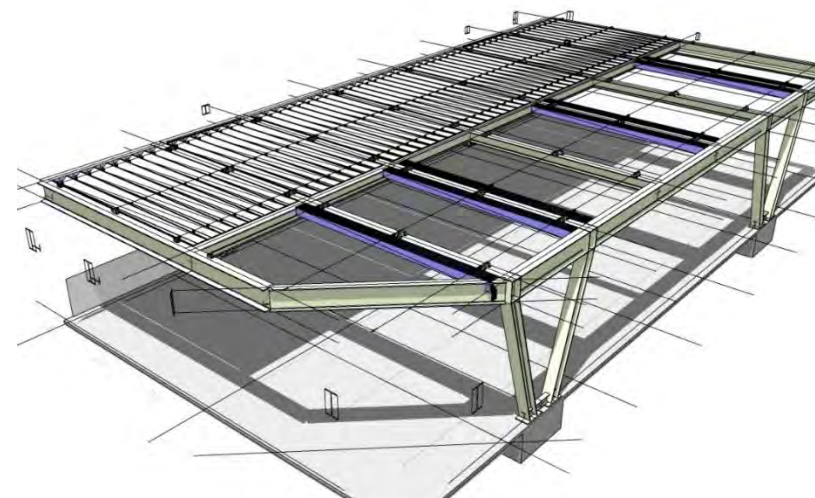


“ 各種方案 ”
what is possible

嵌入式開合天幕。
The retractable roof insert solution.

此項目展示了天幕系統的靈活應用，可以嵌入符合建築和工程要求的大型框架內。
This is a perfect demonstration of how the fabric component can adapt and be inserted into a larger scale frame that addresses architectural and engineering requirements.

這結構已向屋宇署入則並獲批。
This example was submitted and approved by Building Department.



///RETRACT: IT



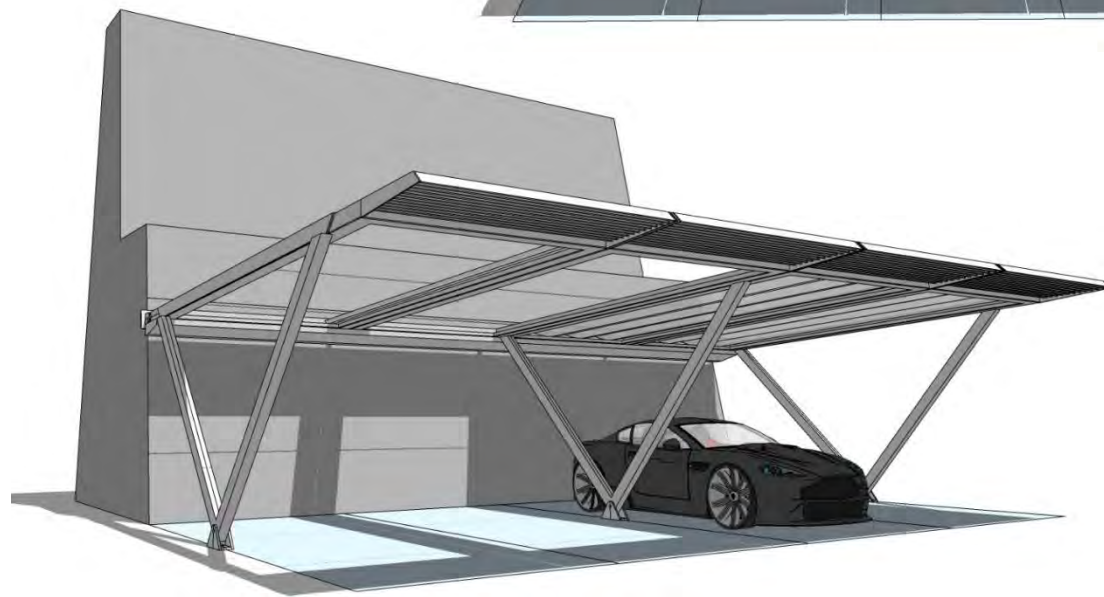
“ 各種方案 ” *what is possible*”

開合天幕系統可安裝在標準或特製的框架內，再一次顯示它的靈活應用。
覆蓋的空間可有多種用途，用作停車棚或休憩陽台。

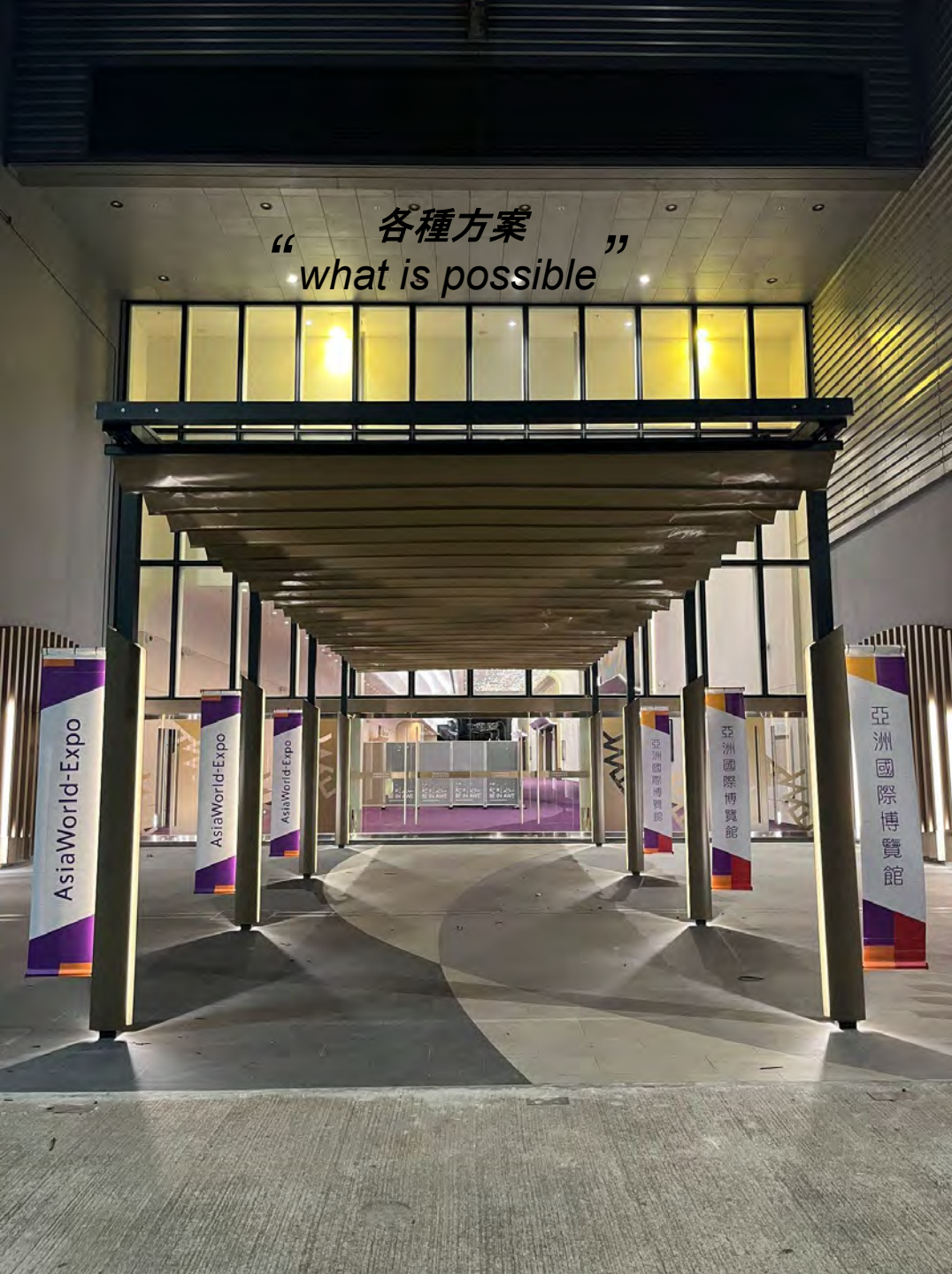
The retractable roof system inserted into a standard module or inserted into a bespoke frame demonstrates again its versatility.

The space underneath can have dual functions, a carport or an entertainment terrace.

一切除你所需。
Its all up to you.



/// RETRACT: IT





“ 各種方案 ”
what is possible



///RETRACT: IT



“ 各種方案 ”
what is possible

WIRETRACT: IT



“ 各種方案 ”
what is possible



“ 各種方案 ”
what is possible



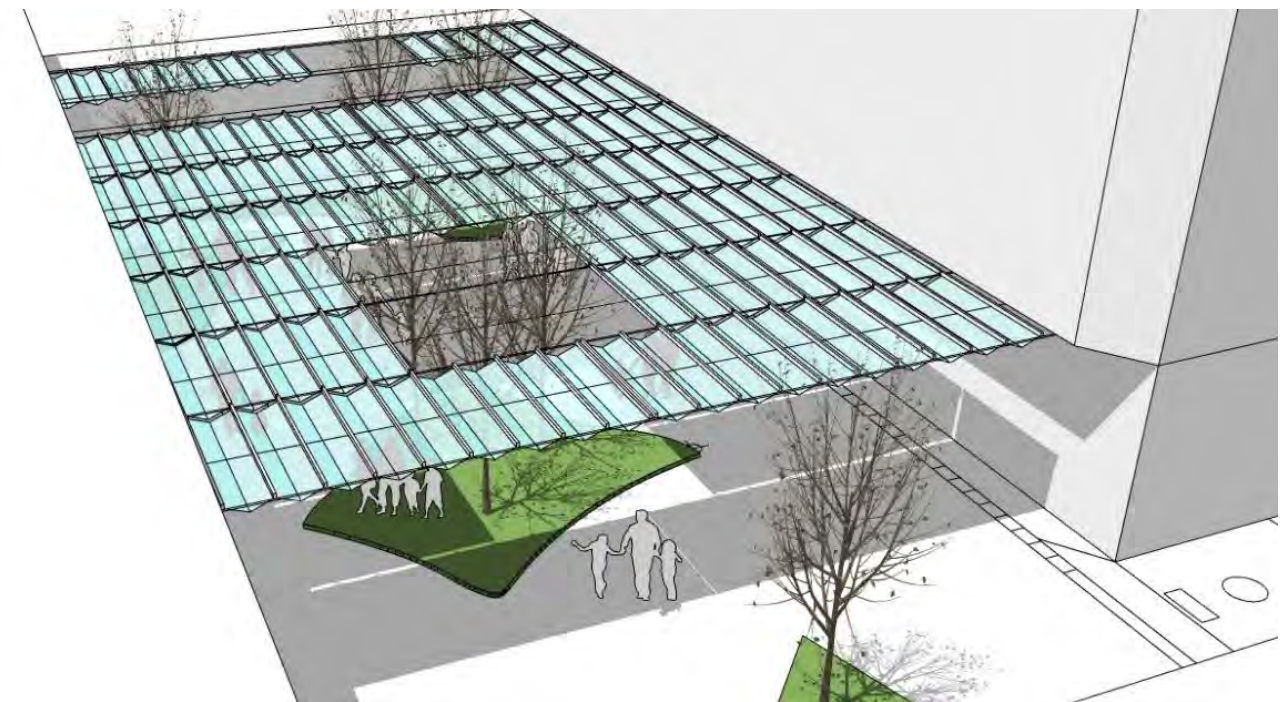
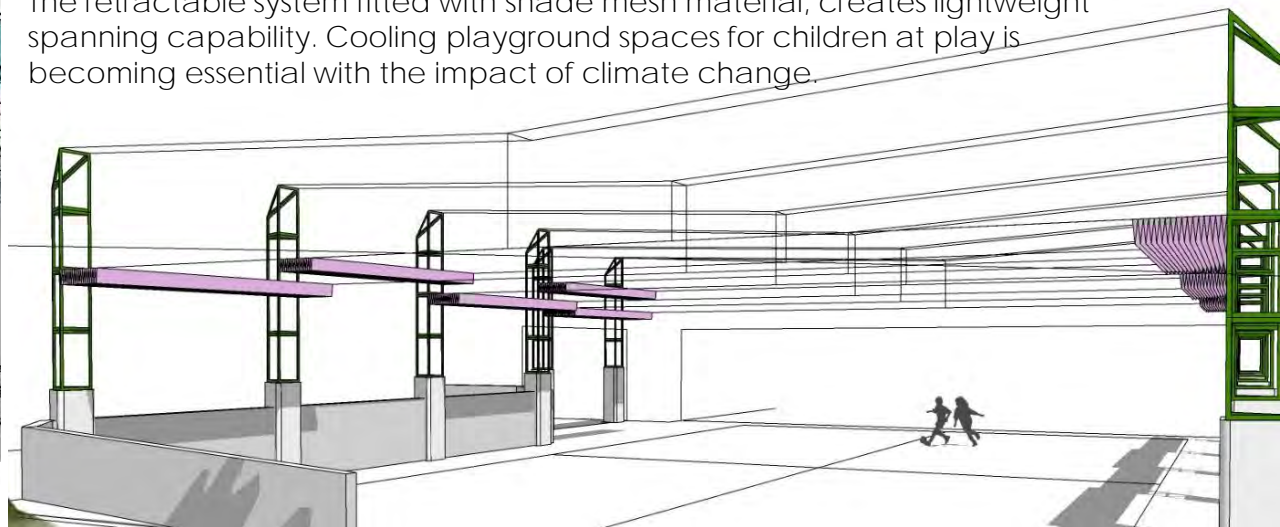
THRETRACT.COM

“ 各種方案 ”
what is possible

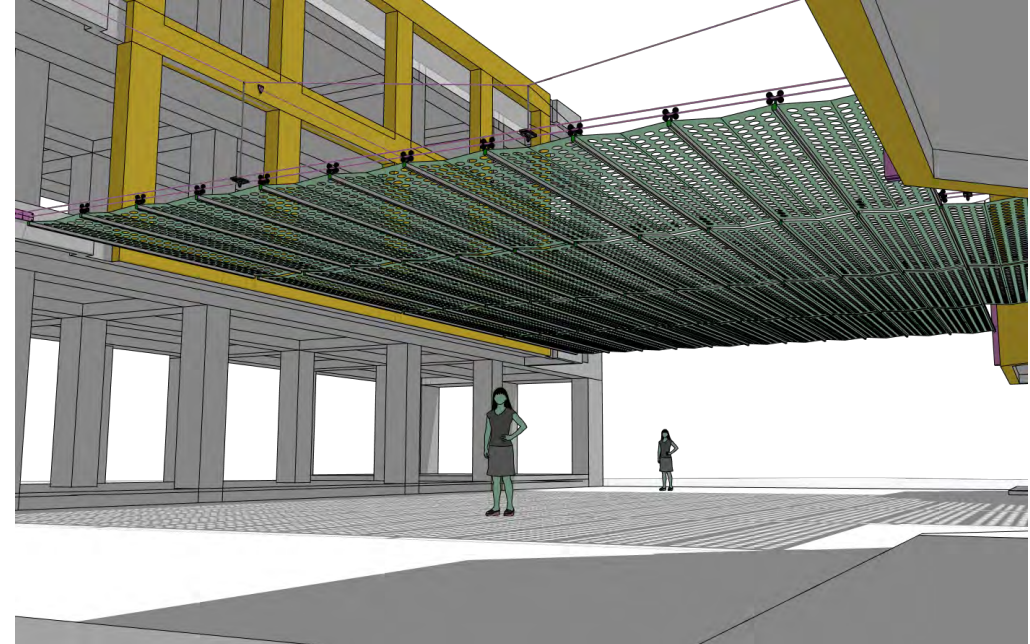
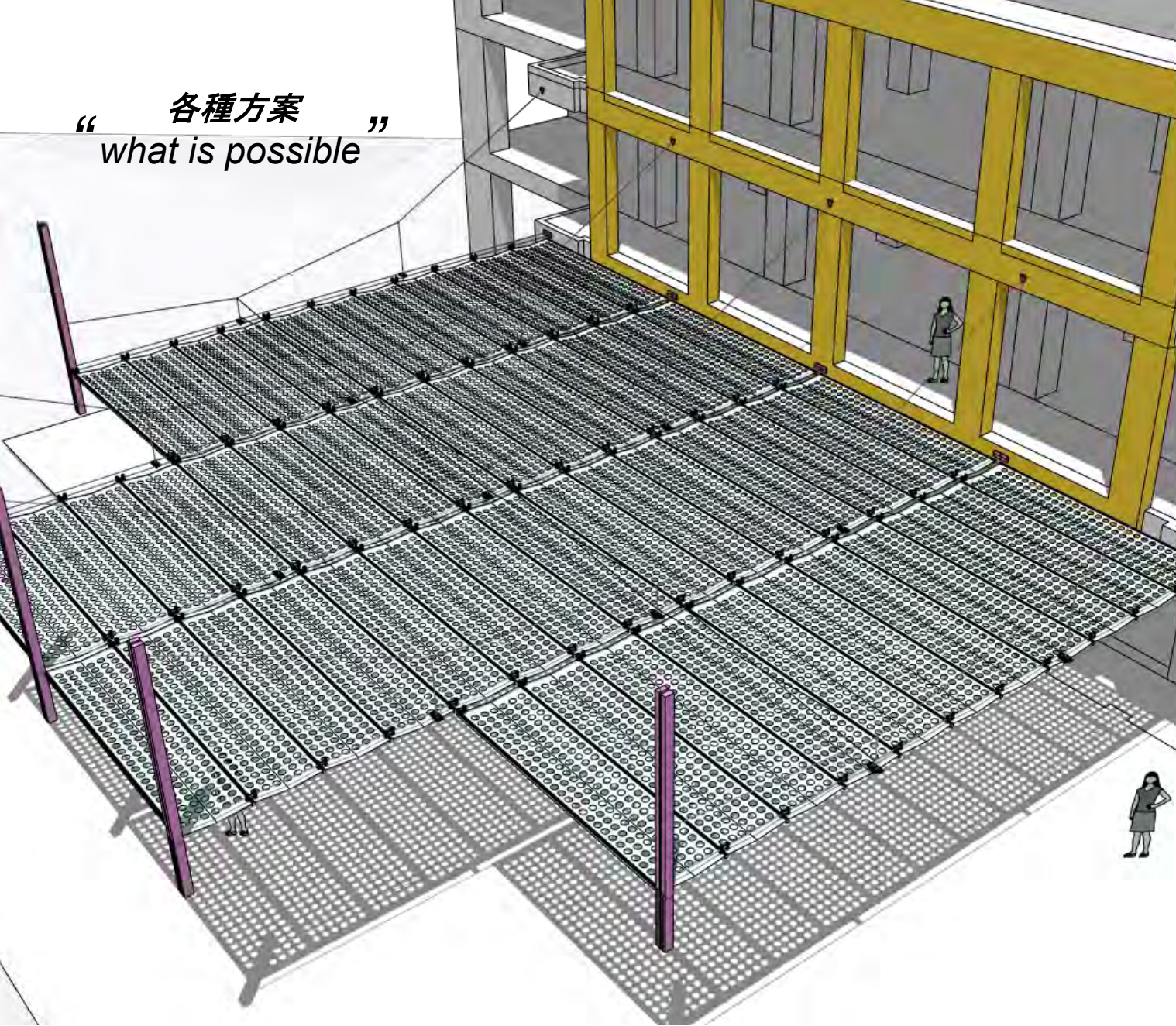


開合天幕系統如裝上遮陽網，重量輕、覆蓋能力高。隨著氣候變暖，為兒童遊樂場遮蔭降溫的需求將會提高。

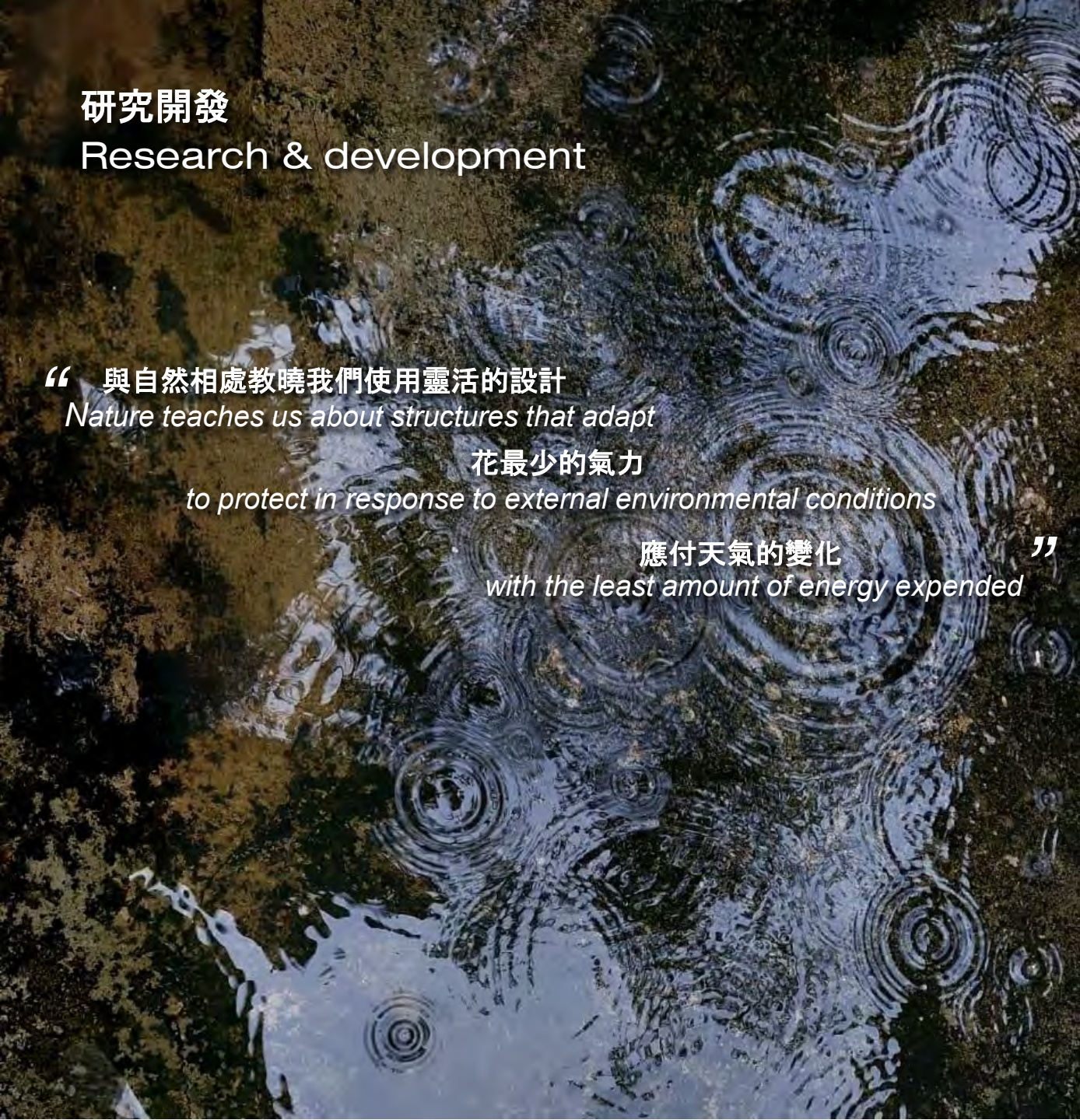
The retractable system fitted with shade mesh material, creates lightweight spanning capability. Cooling playground spaces for children at play is becoming essential with the impact of climate change.



“ 各種方案 ”
what is possible



///RETRACT: IT



研究開發

Research & development

“ 與自然相處教曉我們使用靈活的设计

Nature teaches us about structures that adapt

花最少的氣力

to protect in response to external environmental conditions

應付天氣的變化

with the least amount of energy expended ”

香港熱帶季風氣候頻繁變化的天氣，驅使我們找最有效率的應對方法。

The annual monsoon weather system has taught us to be quick in response and adaptable to finding solutions that work effectively.

在同一天裡，可能有需要遮陽擋雨，又有想打開天幕享受風和日麗的時候。

Observing our clients needs to open up to beautiful weather and then close and protect, all within a day.

因此需要一個靈活開合的天幕結構。

This requires a different solution to fixed immobile roof structures.

與其去找來自外地的產品，我們針對本地氣候開發自己的設計。

Instead of finding a solution developed in other climatic environments, we have taken on the challenge of creating solutions that satisfy local requirements.

縱然外觀上可能和外地產品相似，我們的天幕更實際適用於香港的環境。

Whilst the overall solution may look similar to other products, our solutions work properly in the climatic environment we all live in.

Retract:IT 是一個在本地市場裡面獨特的產品。

That makes the Retract:IT system locally unique and of relevant value.

研究開發 Research & development

在研發天幕系統的過程，我們經常首先處理局部零件，再把優化了了的個別部分組合起來。

LIGHTWEIGHT-WORKS have spent considerable time reviewing solutions and finding ways to provide a flexible roof system. Something that in principle is resolved at small scale first and then developed further into larger scale covering systems.

很多時候關鍵在於減低活動零件之間的磨擦，以減少開合天幕時所需的力度。這涉及很多細節的調整，用3D打印樣版和模型測試；找出需要改良的部分，再度調整和測試，直至系統運作理想。

The challenge with these systems is reducing energy input by removing friction within the moving assembly. This requires many detailed explorations, testing with rapid prototyping, 3D printing and assembled into full scale, proof of concept assemblies. Identifying inefficiencies and repeating the testing process until a satisfactory and working prototype is realized. One that satisfies all conditions.

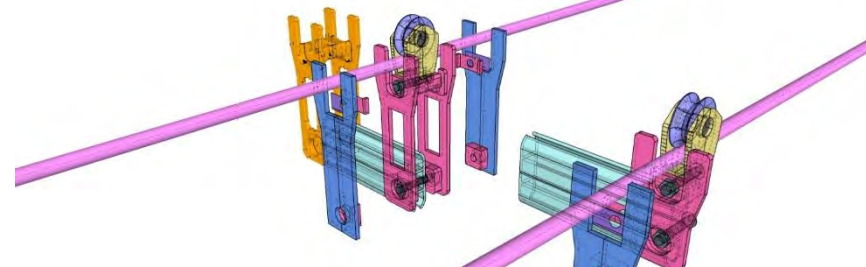
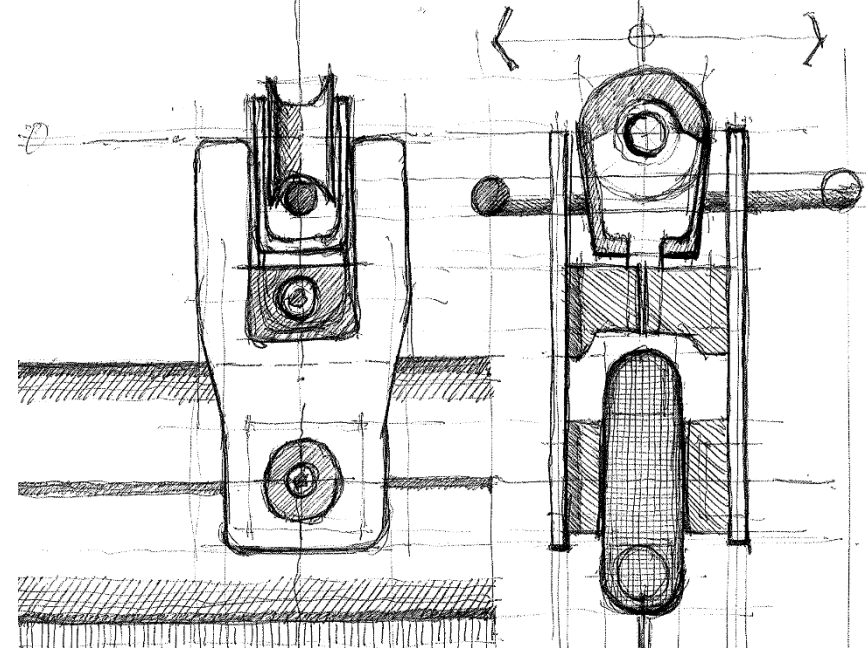
我們伙拍歐洲和中國內地的物料供應商，開發這套適用於香港本地的產品。

We have developed this by working with material supplier partners in Europe and China, all contributing to a full and uniquely Hong Kong developed system.

香港設計、本地安裝。

Designed, Engineered and Assembled in Hong Kong.

Lightweights Works OEM of the Retract: IT system.



開發團隊 THE development TEAM



我們的團隊從事輕質織膜結構工程，於2018 年開始開發天幕。

Development began in 2018 by a team working in the field of lightweight fabric structures.

經過設計、製作模型和測試零件，把概念變成實際操作的系統。

Leveraging the knowledge and abilities to design, model, fabricate and test details, the team are adept at developing concepts into a proper working system.

Clive Kirsten 是一位經驗豐富的建築師，擁有輕質膜結構碩士學位，在開發過程中領導和啟發團隊。

Clive Kirsten an experienced architect with a masters degree in lightweight membrane structures leads, challenges and inspires the team through the process.

Mike Chow 由微細的零件設計到整套系統的實際裝嵌和操作，都有所掌握。

Mike Chow brings his finely developed skills to accurate detailing and practical implementation from day one of this project. Working across all details he has a total overview of the assembly.

Henry Ip 負責在三維軟件建造立體模型、快速製作原型、測試和優化細節。

Henry Ip has spent countless hours in 3D modelling, rapid prototyping, testing and optimizing detail.

Fung Fan 負責落手安裝天幕結構，經驗零件的運作再反饋到優化設計的流程，改進系統。

Fung Fan has prepared and installed these structures, experiencing the implications of the detail and feeding back into the optimization process to bring about practical and functional improvements.

天幕系統經過多年開發和測試，成為設計良好和功能可靠的產品。

After years of development, the result delivers a well thought through and tested product. And this is on offer, to clients, looking for a well designed, reliable and functional solution.

來自團隊 From the team at

LIGHTWEIGHTWORKS





聯繫我們

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///IRTRACT: IT

cover on demand

自立式可開合天幕結構
香港本地團隊設計及安裝

Self supporting retractable roof structure

Designed, Engineered and Assembled in Hong Kong