迎海
DOUBLE COVE

Technical Seminar for HKGBC Guidebook on Urban Microclimate Study Case Sharing: Double Cove

恒基兆業地產有限公司
HENDERSON LAND DEVELOPMENT COMPANY LIMITED

新世界發展有限公司
New World Development Company Limited

培新集團
PETERSON GROUP

Mr. Kevin Ng, Ir Edward Chan
Henderson Land Development Co. Ltd.

16 January 2018

DOUBLE COVE

International Property Awards
Best International Residential High-rise Development

World Green Building Council Asia Pacific Leadership in Green Building Awards - Winner of "Leadership in Sustainable Design and Performance (Residential)"

Quality Building Award – Grand Award
Hong Kong Residential
(Multiple Buildings) Category

LEED Neighbourhood Development
Pre-Certification Gold Level

DOUBLE COVE

HEALTH & WELL-BEING

Trends of Green Building

PEOPLE-ORIENTED

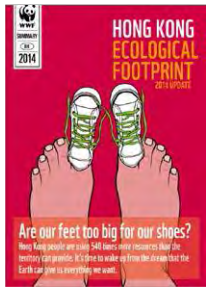

Ultra high-density city
Hong Kong
Population density around
6392 persons / km²
Beijing
Population density around
1047 persons / km²
Shanghai
Population density around
2699 persons / km²


Why should we develop green building and improve the urban microclimatic environment?
High-density urban environment
High expectation of
indoor and outdoor environments

ECOLOGICAL FOOTPRINT IN HONG KONG

How many earths does it take to support Hong Kong's lifestyle?

3.1



Hong Kong's ecological deficit

540x

"Living in a Park"
in a walkable community
by Lord Richard Rogers

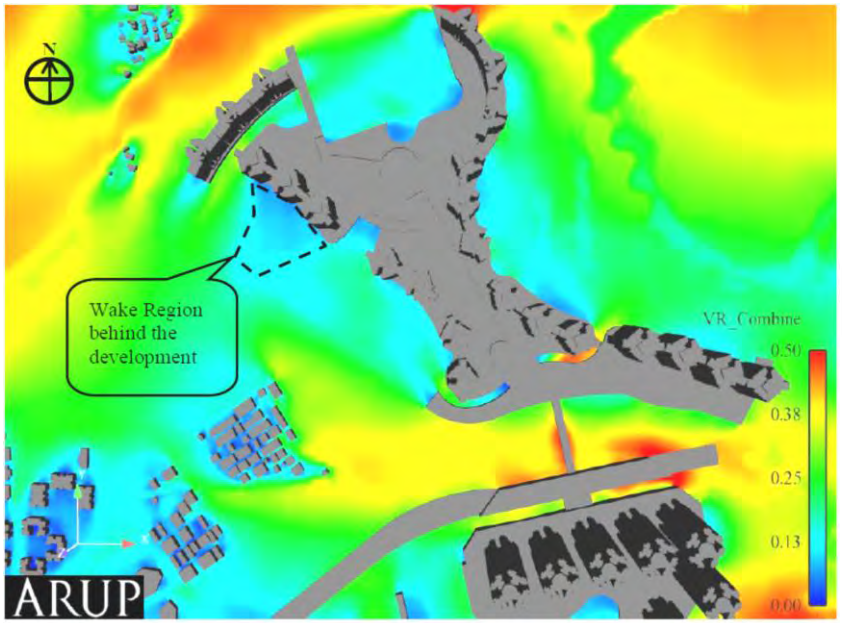
Core Value

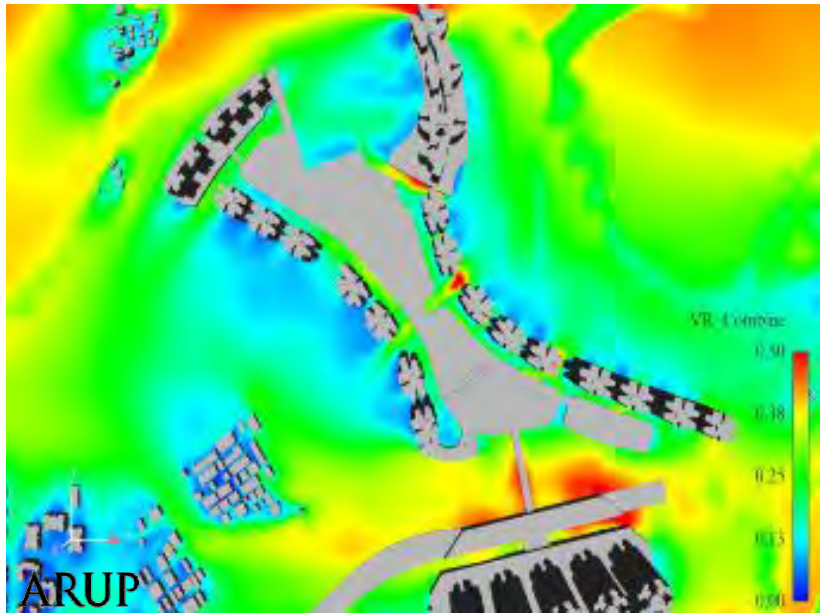

恒基兆業地產集團
HENDERSON LAND GROUP
A successful business is a sustainable business. We recognize that the long-term success of the Group is closely linked with the **health and prosperity** of the **communities** we operate in.

Drivers of Creating Urban Microclimate Environment

1. Financial Considerations

No more
"Birthday Cake" design





Drivers of Creating Urban Microclimate Environment

2. Customer Considerations

Insufficient hours of sunshine

Small land area, Low greenery rate

Poor indoor & outodor air environment

Environmental Nuisance

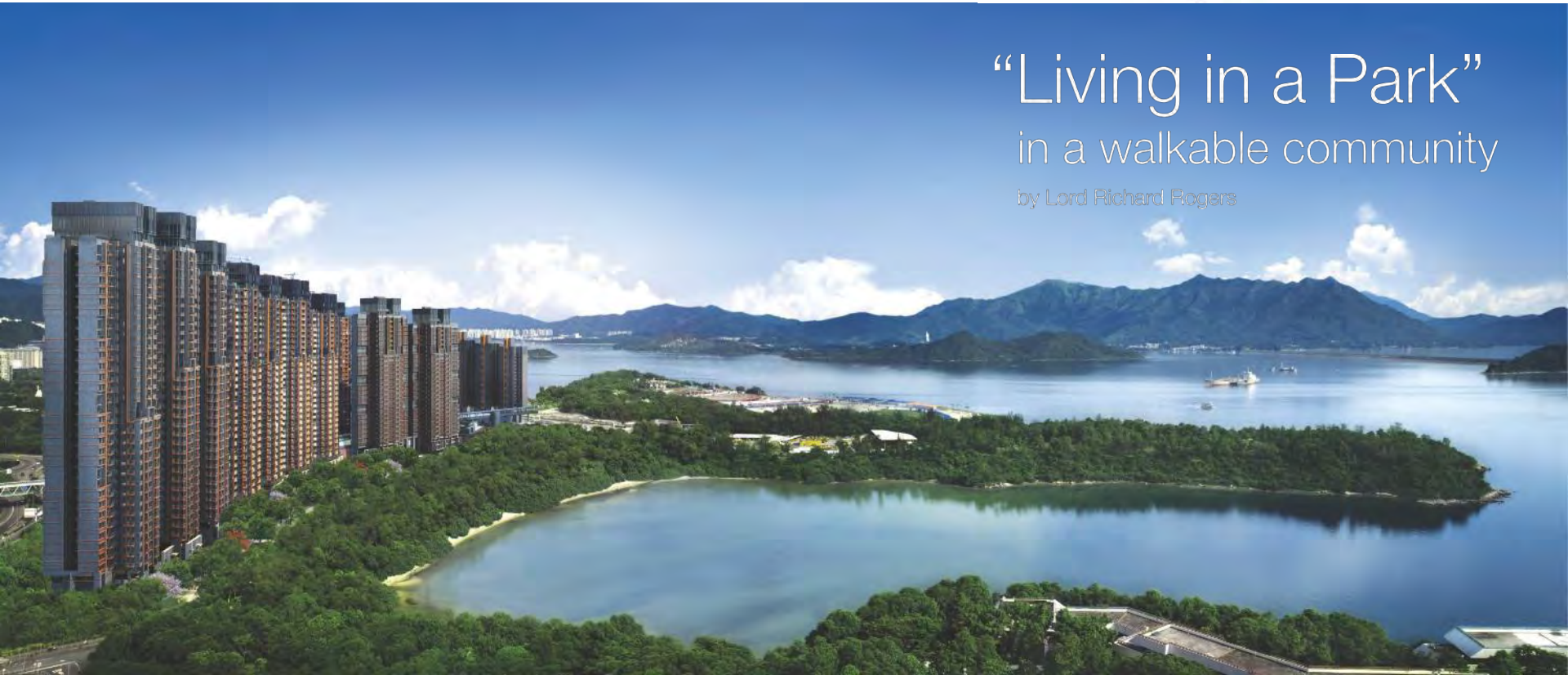
Create HEALTHY & COMFORT ENVIRONMENT

Built for LIVABLE COMMUNITY

Drivers of Creating Urban Microclimate Environment

3. Design Considerations

Capturing & Capitalizing on the Nature...



Technical Seminar for HKGBC Guidebook on Urban Microclimate Study Case Sharing: Double Cove

16 January 2018

Technical Seminar for HKGBC Guidebook on Urban Microclimate Study Case Sharing: Double Cove

16 January 2018

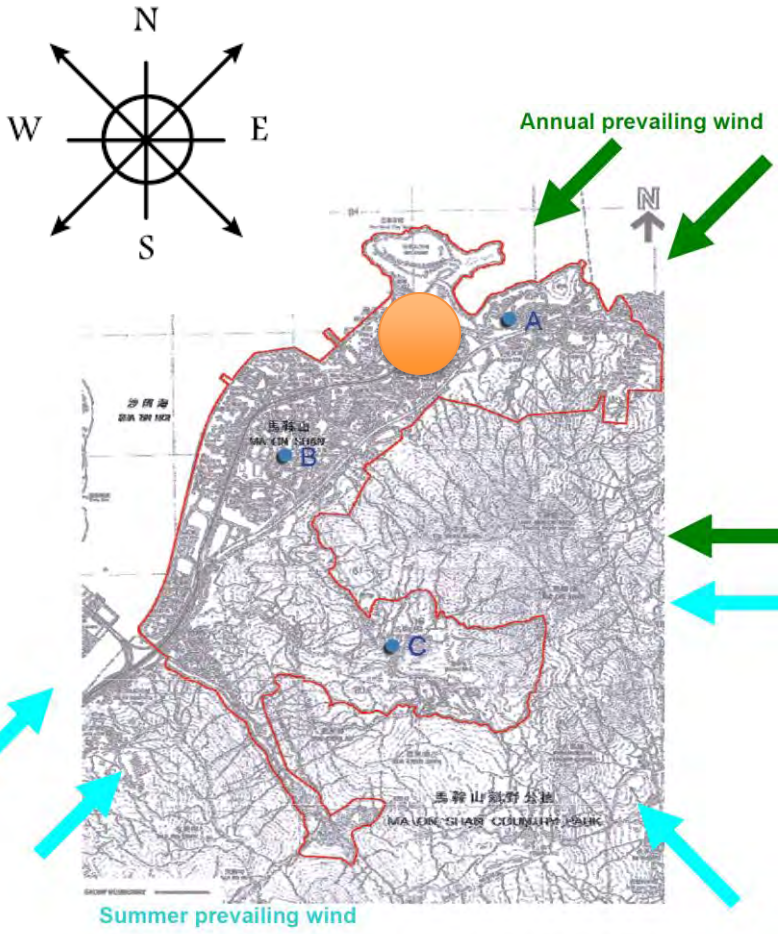


Figure 3.16 *A summary of the prevailing winds of the study area*

Technical Seminar for HKGBC Guidebook on Urban Microclimate Study Case Sharing: Double Cove

16 January 2018

Site Area:	96,481 sq.m
GFA:	264,000 sq.m (residential) 13,000 sq.m (clubhouse) 9,000 sq.m (retail) 940 sq.m (kindergarten)
Usage:	Mixed-Use
Tower:	21 residential towers heights ranging from 35 storeys to 15 storeys
Population:	3,537 residential units, design population 10,680 persons
Completed:	2016

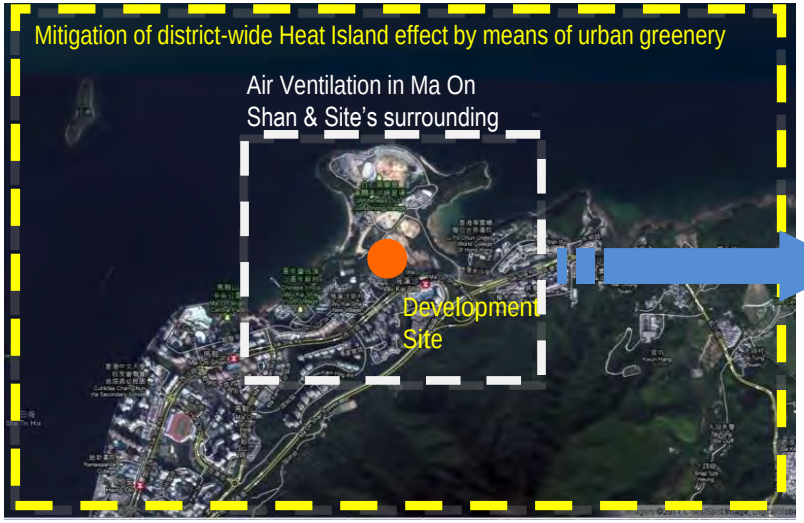
HKGBC
香港綠色建築議會

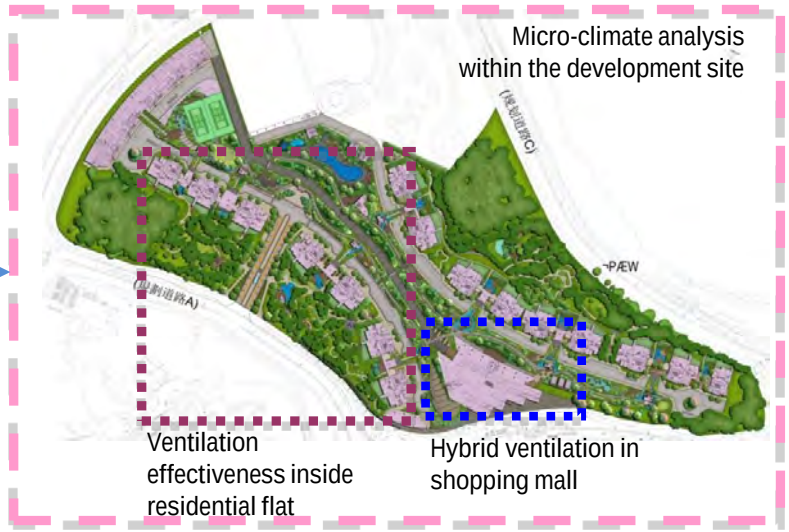
Guidebook on Urban Microclimate Study

1.	Manipulate layout massing to increase wind flow	Increase ventilation with site planning	Wind
2.	Wind corridor to align with the prevailing wind		
3.	Connect open spaces		
4.	Arrange buildings to channel wind		
5.	Building setback		
6.	Increase permeability of building blocks/ no wall building		
7.	Stepped building height profile		
8.	Increase building permeability	Increase ventilation with building design	
9.	Permeable sky garden		
10.	Reduce building frontage		
11.	Ventilation bay/ permeable podium		
12.	Reduce ground coverage		
13.	Increase ground zone air volume		
14.	Provide shading for pedestrian activities	Reduce direct solar radiation	Thermal radiation
15.	Provide tree canopies		
16.	Manipulate building façade design to provide shading		
17.	Shade openness by building blocks		
18.	Use cool material for ground surface	Reduce surface temperature	
19.	Green wall to reduce façade surface temperature		
20.	Increase albedo in buildings		
21.	Increase sky view factor to improve night cooling		
22.	Water features to increase evaporation	Increase evaporative cooling	Temperature
23.	Green wall to increase evapotranspiration		
24.	Greening to increase evapotranspiration		
25.	Use permeable paving		
26.	Increase ventilation to carry away heat energy	Reduce heat accumulation	
27.	Allow downhill wind flow		
28.	Allow sea breezes		
29.	Reduce anthropogenic heat discharge near pedestrian area	Reduce heat release	
30.	Reduce thermal mass heat storage of building materials		
31.	Provide cover for rain protection	Provide rain protection	Precipitation

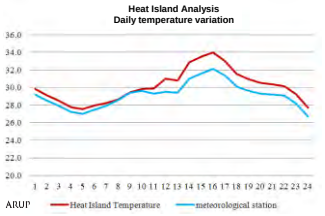
Wind: Increase ventilation with site planning
01. Manipulate Layout Massing to Increase Wind Flow

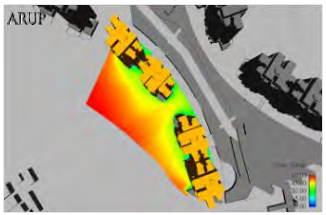
Mitigation of District-wide Heat Island Effect & Enhancement of Air Ventilation in the development and its surroundings



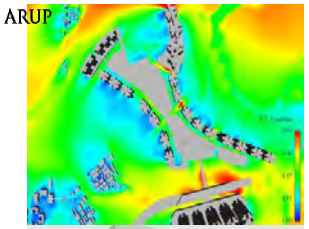


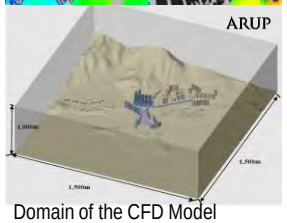
Mitigation of district-wide Heat Island Effect by means of Urban Greenery





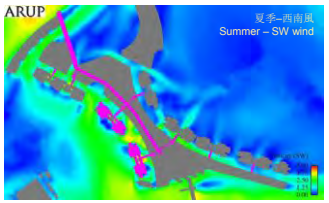
Air Ventilation in Ma On **Shan and Site's** surroundings

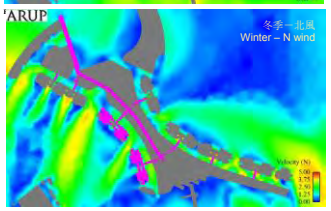




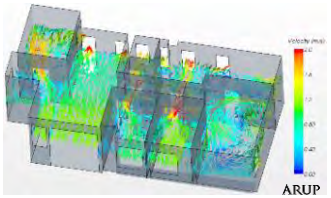
Domain of the CFD Model

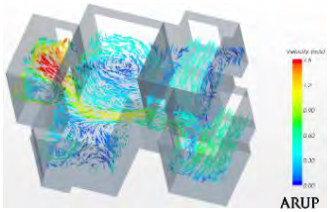
Micro-climate Analysis within the development site



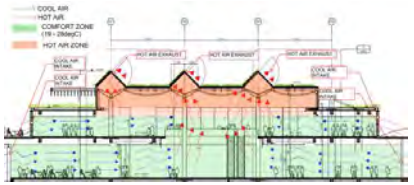


Ventilation Effectiveness inside residential flats

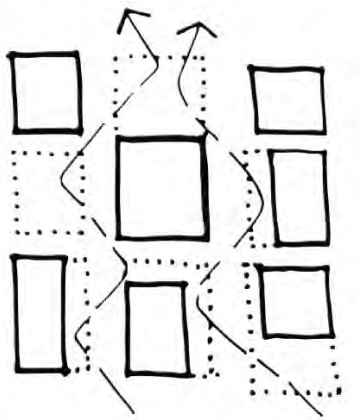




Hybrid Ventilation in Shopping Mall



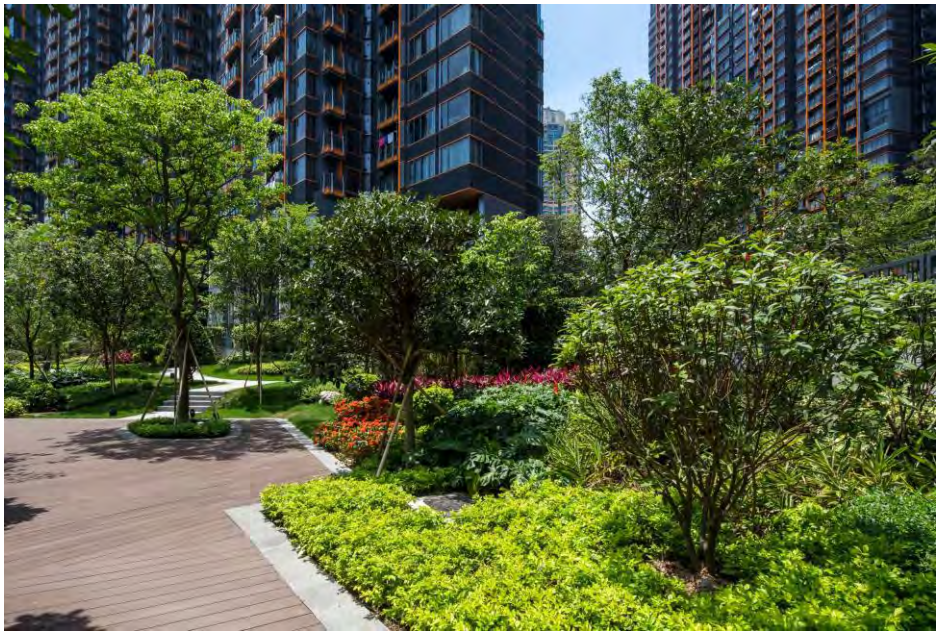
Wind: Increase ventilation with site planning
03. Connect Open Space



03 Connect open spaces

Communal Green Spaces

residents play and relax in same neighborhood; jogging, walking, cycling and other leisure activities plus separation of pedestrian and road traffic, promote a low carbon and healthy lifestyle.

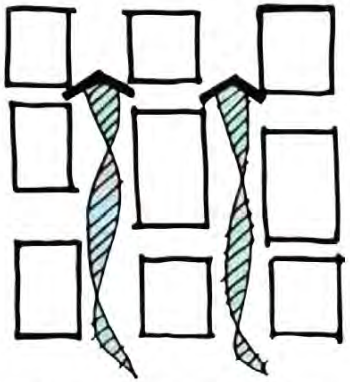


Walking / Jogging Path

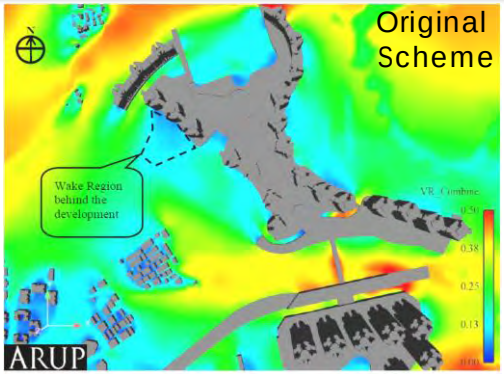
Shaded sitting-out Area

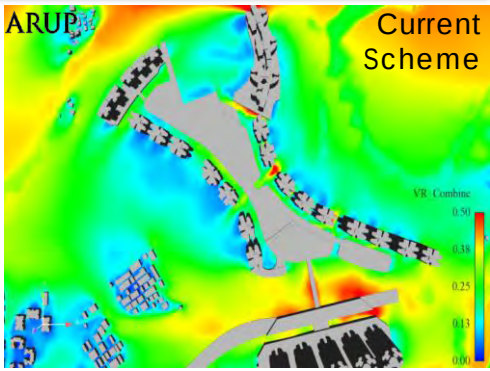
Water Feature with Artwork

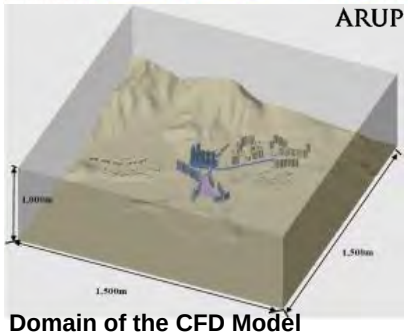
Wind: Increase ventilation with site planning
04. Arrange Buildings to Channel Wind



04 Arrange buildings to channel wind







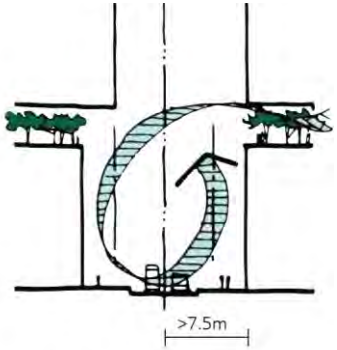
Domain of the CFD Model

Current Scheme	Spatial Averaged	Range
SVR	*0.27*	0.12 - 0.42
LVR	*0.27*	0.11 - 0.47

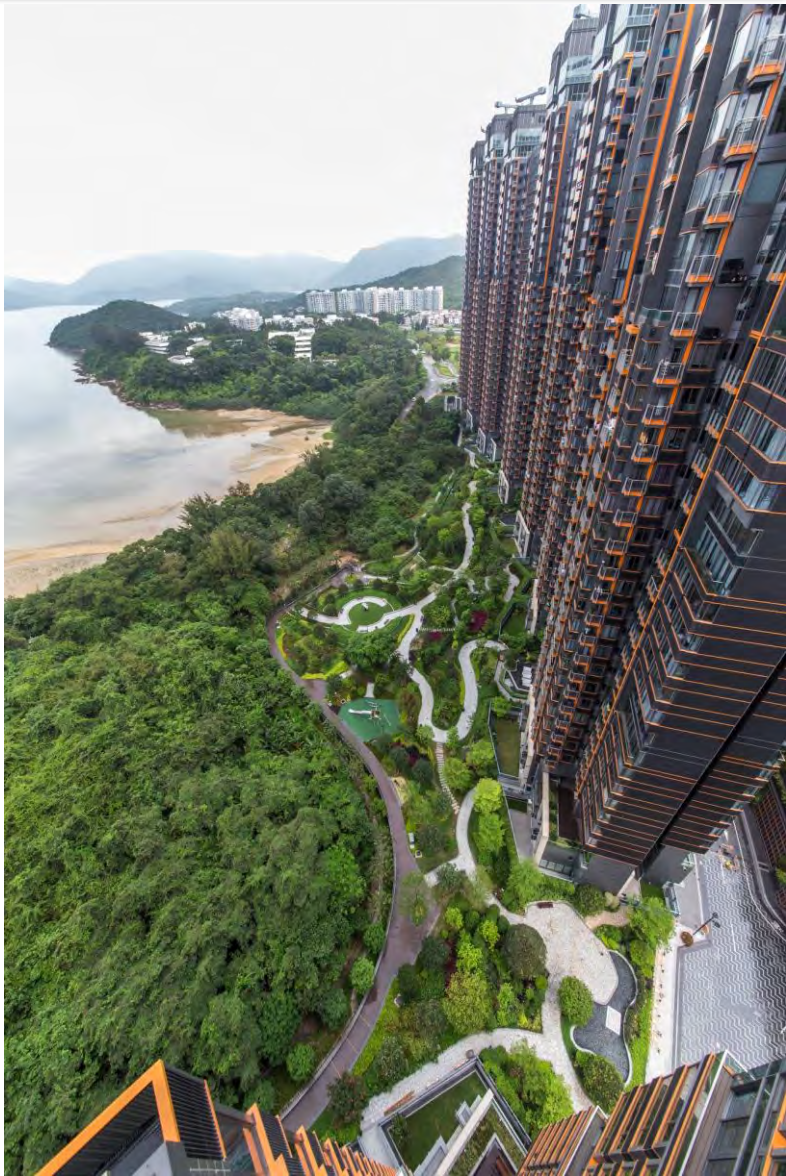
- Optimized site planning with benefits to surroundings in mind
- Enhancing good wind resources to the development and neighbourhood
- Refining massing disposition to avoid stagnant ventilation or undue wind amplification
- Outperformed in VR against other major residential zones in HK

Wind: Increase ventilation with site planning

05. Building Setback

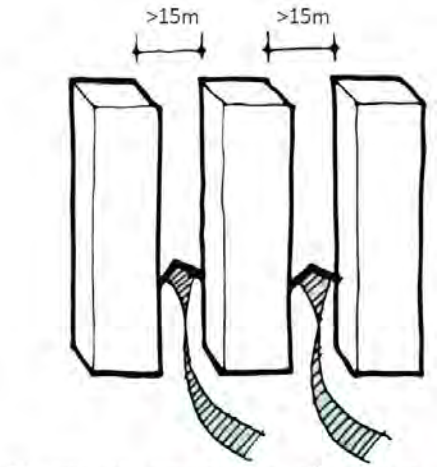


05 Building setback



Wind: Increase ventilation with site planning

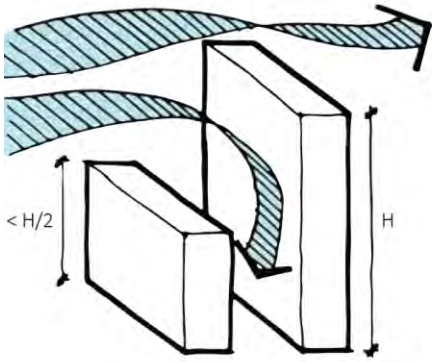
06. Increase Permeability of Building Blocks / No Wall Buildings



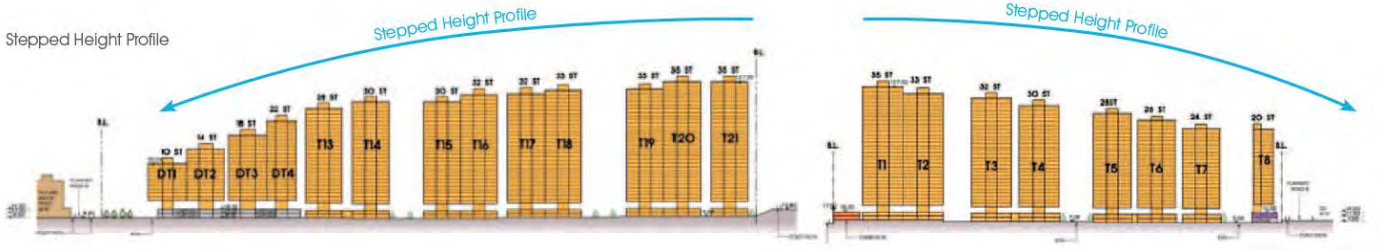
06 Increase permeability of building blocks/ No wall building

Wind: Increase ventilation with site planning

07. Stepped Building Height Profile

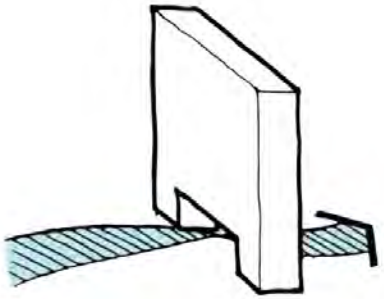


07 Stepped building height profile

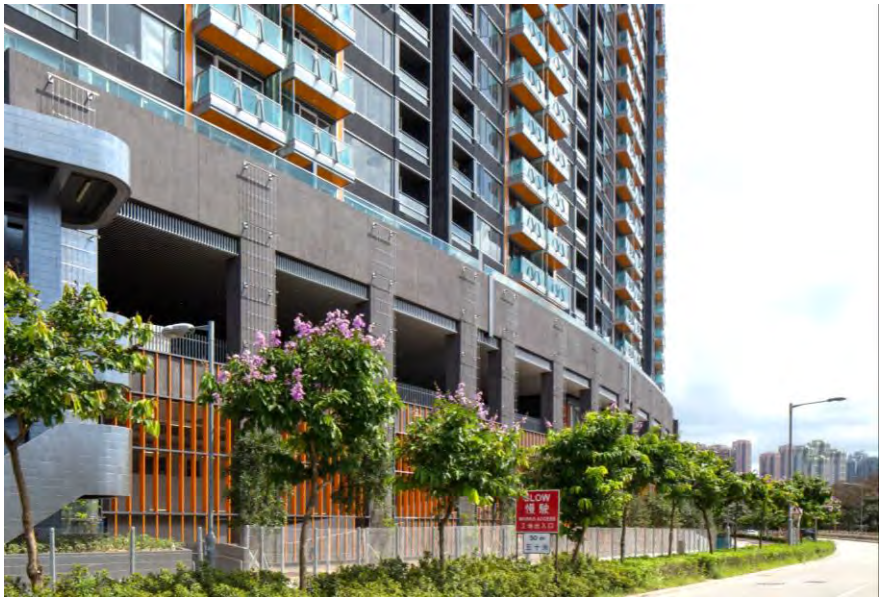


Wind: Increase ventilation with building design

11. Ventilation Bay / Permeable Podium

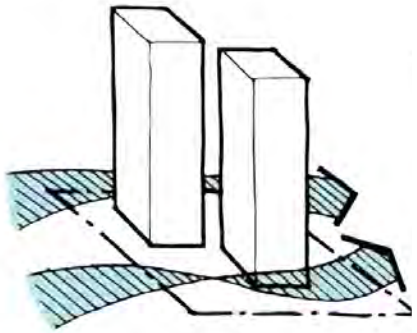


11 Ventilation bay/ permeable podium



Wind: Increase ventilation with building design

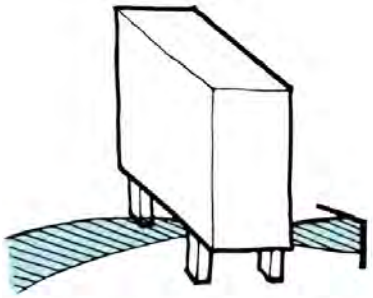
12. Reduce Ground Coverage



12 Reduce ground coverage

Wind: Increase ventilation with building design

13. Increase Ground Zone Air Volume



13 Increase ground zone air volume

Thermal Radiation: Reduce Direct Solar Radiation

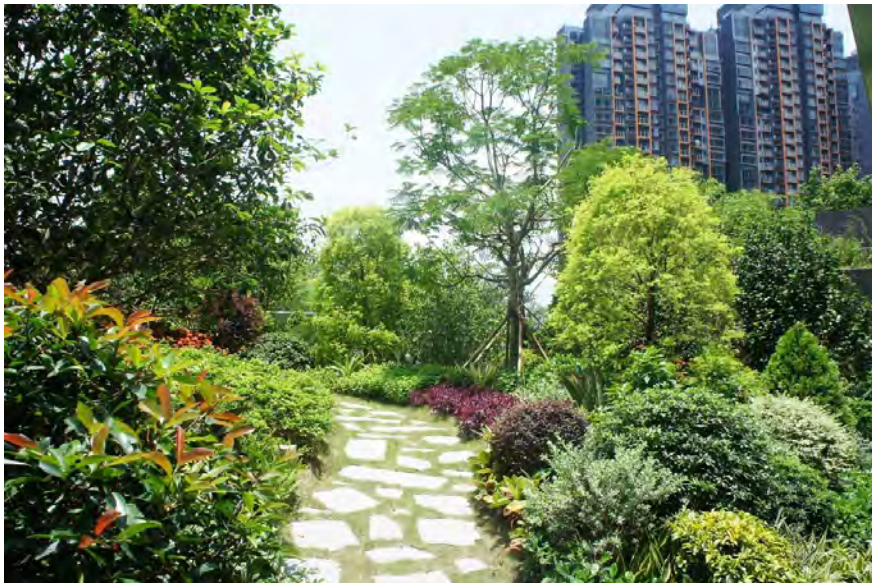
14. Provide Shading for Pedestrian Activities

Holding Nursery

20,000 sq.m. Purchase of local species trees housed in off-site nursery in China before handover to residents and Visit of Nursery by Senior Management.

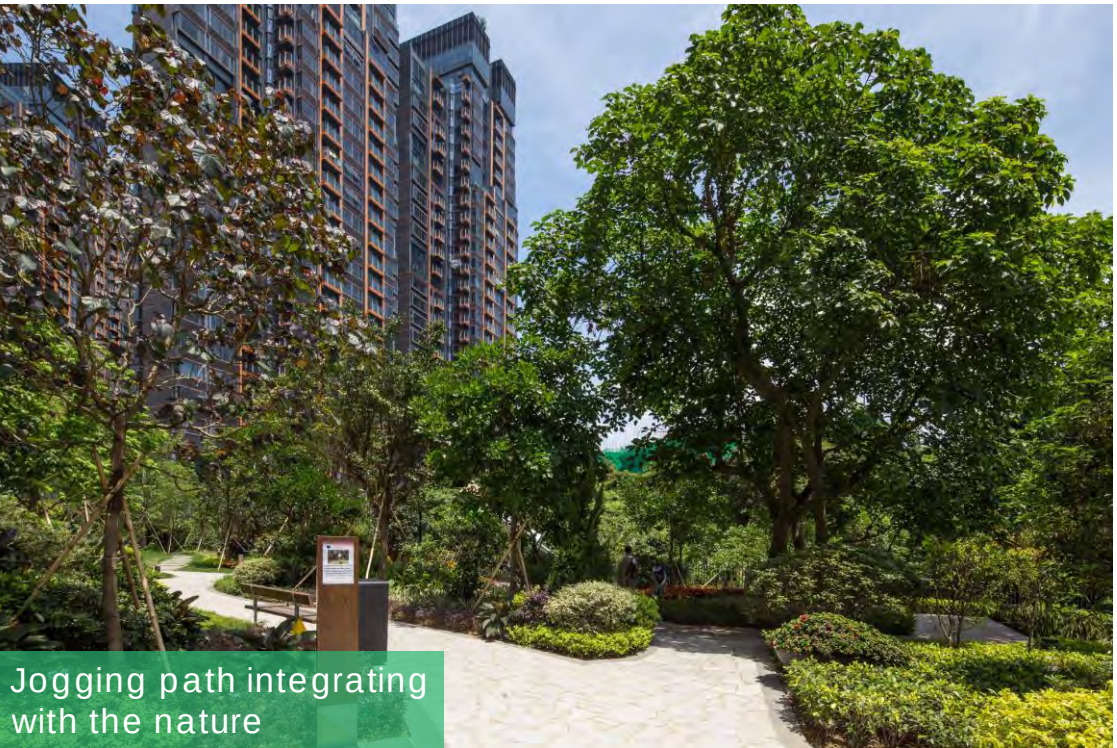
Preserved and recreated woodland

Early plant procurement: Achieved "instant effect".



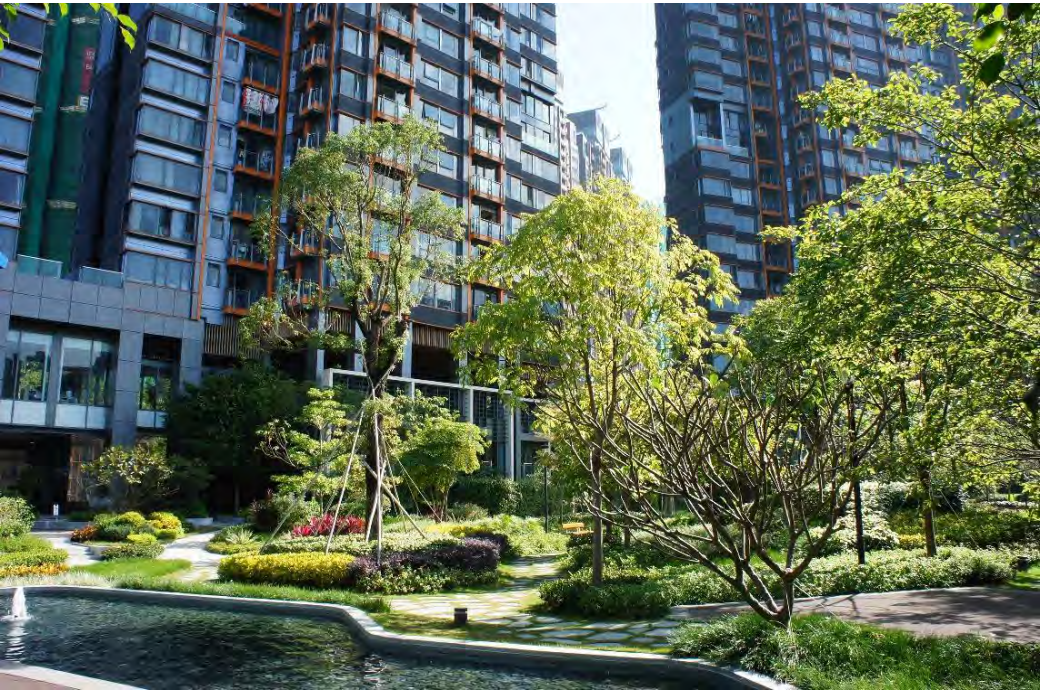
Thermal Radiation: Reduce Direct Solar Radiation

15. Provide Tree Canopies



Jogging path integrating with the nature

Thermal Radiation: Reduce Direct Solar Radiation
17. Shade Open Space by Building Blocks



Thermal Radiation: Reduce Surface Temperature
18. Use Cool Material for Ground Surface

Green Living
Urban Heat Island Mitigation

The 1st residential development in Hong Kong that investigates the Heat Island index via heat island analysis and various computational modelling techniques

Heat Island Analysis consists of:
- Local wind / site-wide ventilation environment
- Solar irradiance incident to studied areas
- Latent heat loss
- Thermal storage effect of studied area
- Material absorptivity
- Coverage of vegetation and tree type
- Skyview factor

Heat Island Index

Through heat island analysis, the averaged heat island temperature of the proposed development is less than 1.5°C (China National Standard)

Phase 1 Residential Portion: 1.1°C
Residential, Podium & Shopping mall: 1.3°C

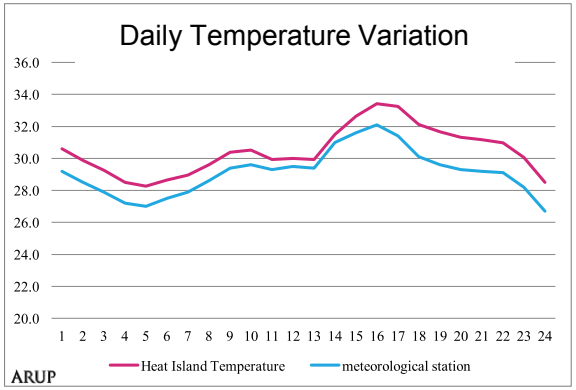
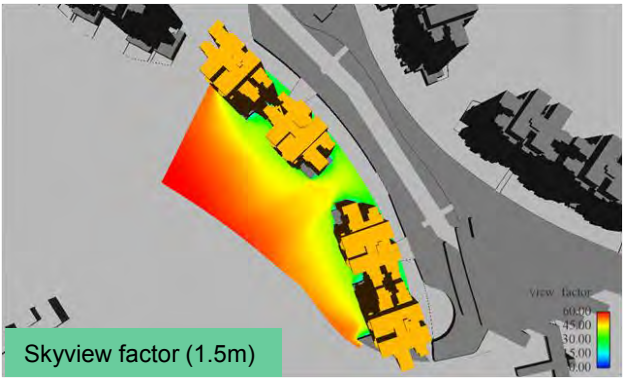
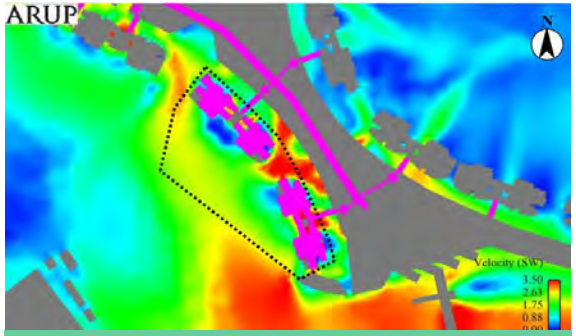


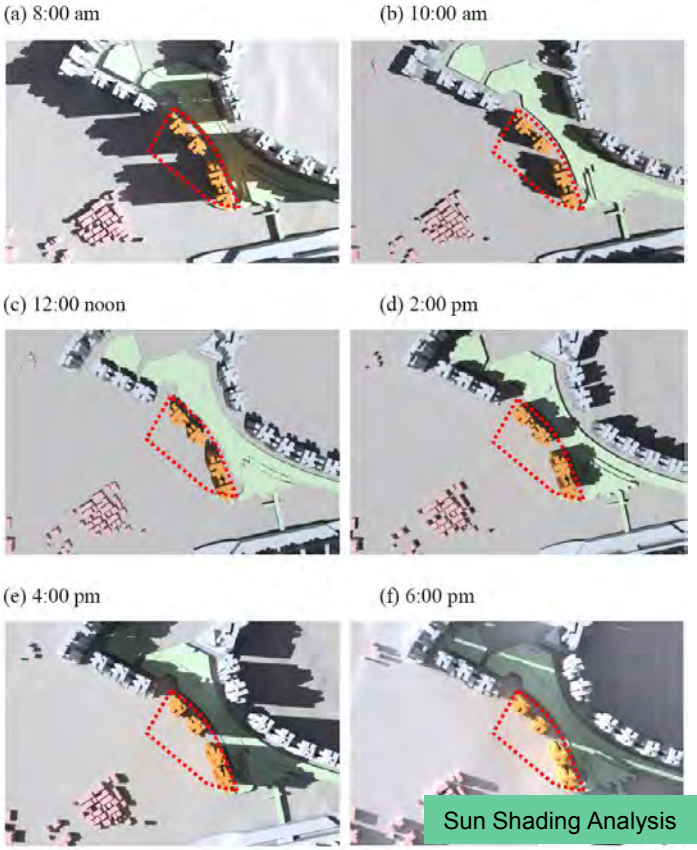
Figure 9 daily temperature variation of heat island temperature and meteorological station measured temperature



Skyview factor (1.5m)



Microclimate (Summer SW wind, 1.5m)



Sun Shading Analysis

Snap shot of sun shadowing analysis of the proposed development

Thermal Radiation: Reduce Surface Temperature
19. Green Wall to Reduce Façade Surface Temperature

Vertical Greenery

- 3 dimensional greenery
- Greenery coverage on the Podium façade (Clubhouse and shopping Arcade)

Green Roof

- Greenery coverage on the whole podium floor including Shopping Arcade
- Clubhouse and Skygarden

Vertical Greeeny along Podium Walls

Green Roof on Shopping Mall

Thermal Radiation: Reduce Surface Temperature
21. Increase Sky View to Improve Night Cooling

Temperature: Increase Evaporative Cooling
22. Water Features to Increase Evaporation

Symphony of Nature

DOUBLE COVE

Temperature: Increase Evaporative Cooling
22. Water Features to Increase Evaporation

Symphony of Nature

Temperature: Increase Evaporative Cooling
23. Green Wall to Increase Evapotranspiration

"Seamless boundaries"

Greening for Spatial Segregation

Green Hedge Fence wall

- A row of Ficus Benjamina of 2.5m height
- Aerobic filter to the exhaustive gases from traffic.

Green Hedge Fence wall along Site Boundary

Green Hedge Fence wall along Site Boundary

Temperature: Increase Evaporative Cooling
24. Greening to Increase Evapotranspiration

Extensive Greening

Extensive greening:
improves air quality, mitigates heat island effect

Greater than 40% of the site is landscaped area comprising preserved woodlands, recreated woodland parks and landscaped decks with extensive green roofs, walls and water features

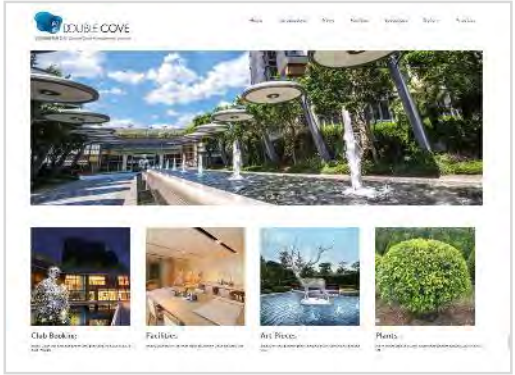
2779	30%	>40%
Trees planted	All trees are native species	Landscaped area

Newly planted flowering species encourage native insects to thrive, while native animal life retained by planting of native species

Temperature: Increase Evaporative Cooling
24. Greening to Increase Evapotranspiration

QR Code for

QR Code on Artworks Signage

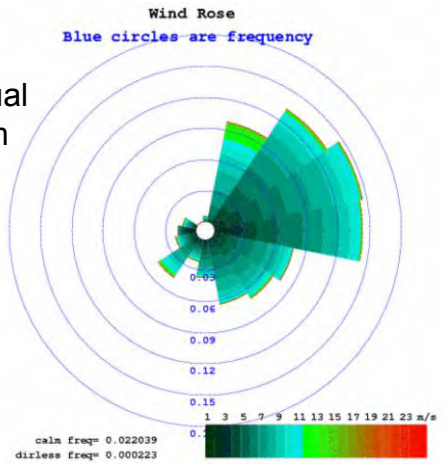


Artworks Information in Double Cove residents' website

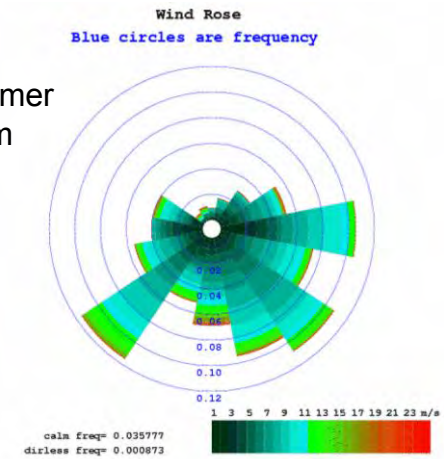
Temperature: Increase Evaporative Cooling
25. Use Permeable Paving

Temperature: Reduce Heat Accumulation
28. Allow Sea Breezes

Annual
120m



Summer
120m



Temperature: Reduce Heat Release

29. Reduce Anthropogenic Heat Discharge Near Pedestrian Area

Green Lifestyle
Health & Well-being Promotion

Podium Level Pedestrian Area

EV charging stations

Ground Level Pedestrian Area

Bicycle Rental Rack with the self-service system

Precipitation: Provide Rain Protection
31. Provide Cover for Rain Protection

24-hour Covered Walkway providing rain protection connecting from MTR station to all residential blocks


迎海
DOUBLE COVE
Thank You!
Actual view from
Double Cove