

# **Pruning Strategy for Stonewall Trees in Hong Kong: an Arboriculture Practice to Conserve Natural Heritage**

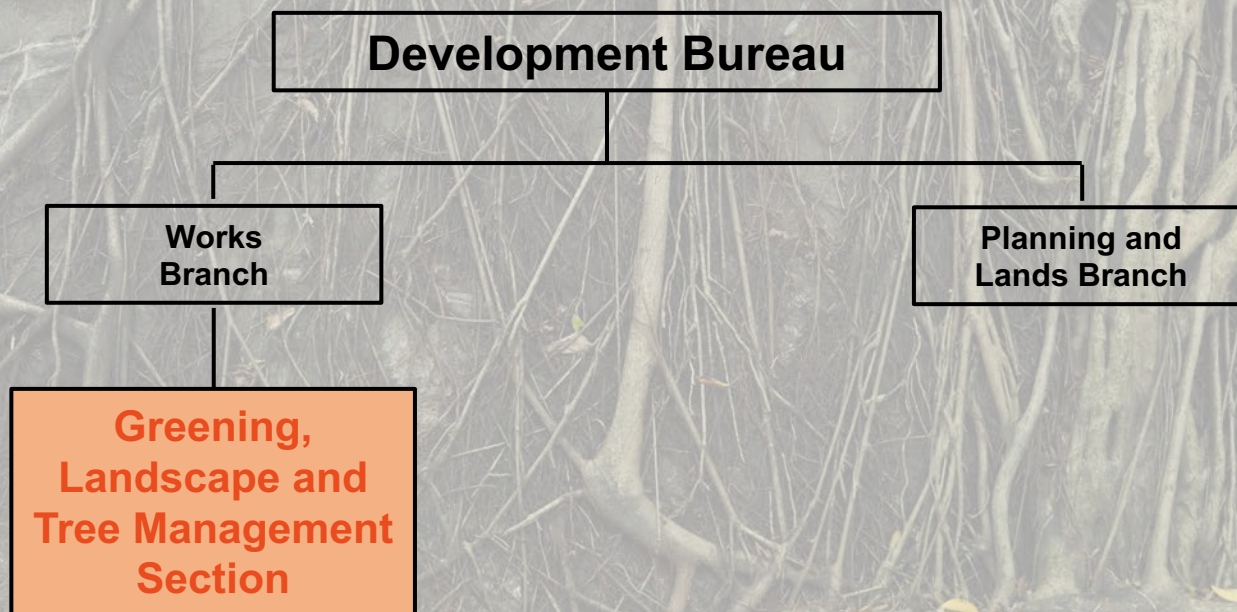
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# Greening, Landscape and Tree Management Section (GLTMS)

- Established in 2010 to champion a new and strategic policy on greening, landscaping and tree management, with a view to achieving the sustainable development of a greener environment for Hong Kong.



# Greening, Landscape and Tree Management Section (GLTMS)

## Works of GLTMS

- Central coordination of Government's greening and landscape planning and design efforts
- Promotion of a quality-oriented approach to tree management
- Enhanced training to raise the professional standard;
- Enhancement of public education and community involvement.



# Content

## Trees and Community



## Understanding of Stonewall Tree



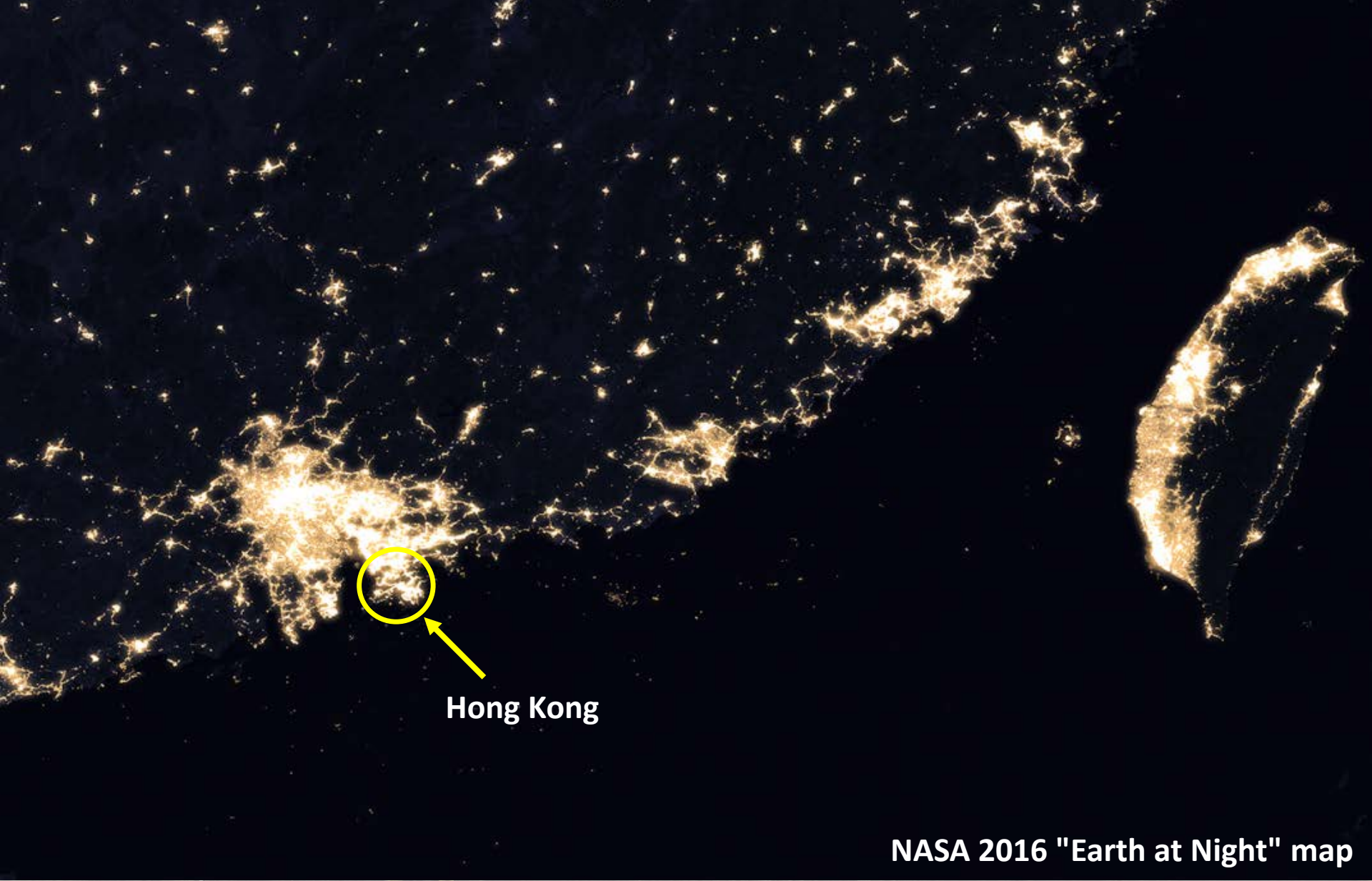
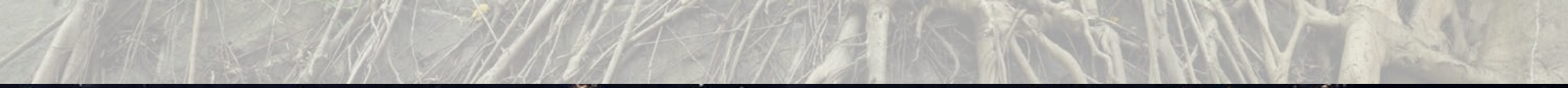
## Pruning Strategy of Stonewall Tree



## Further Study on Stonewall Tree



Source: "Arborist Heart & Hands" in Redbull TV "The coolest jobs on the Earth" series



Hong Kong

NASA 2016 "Earth at Night" map

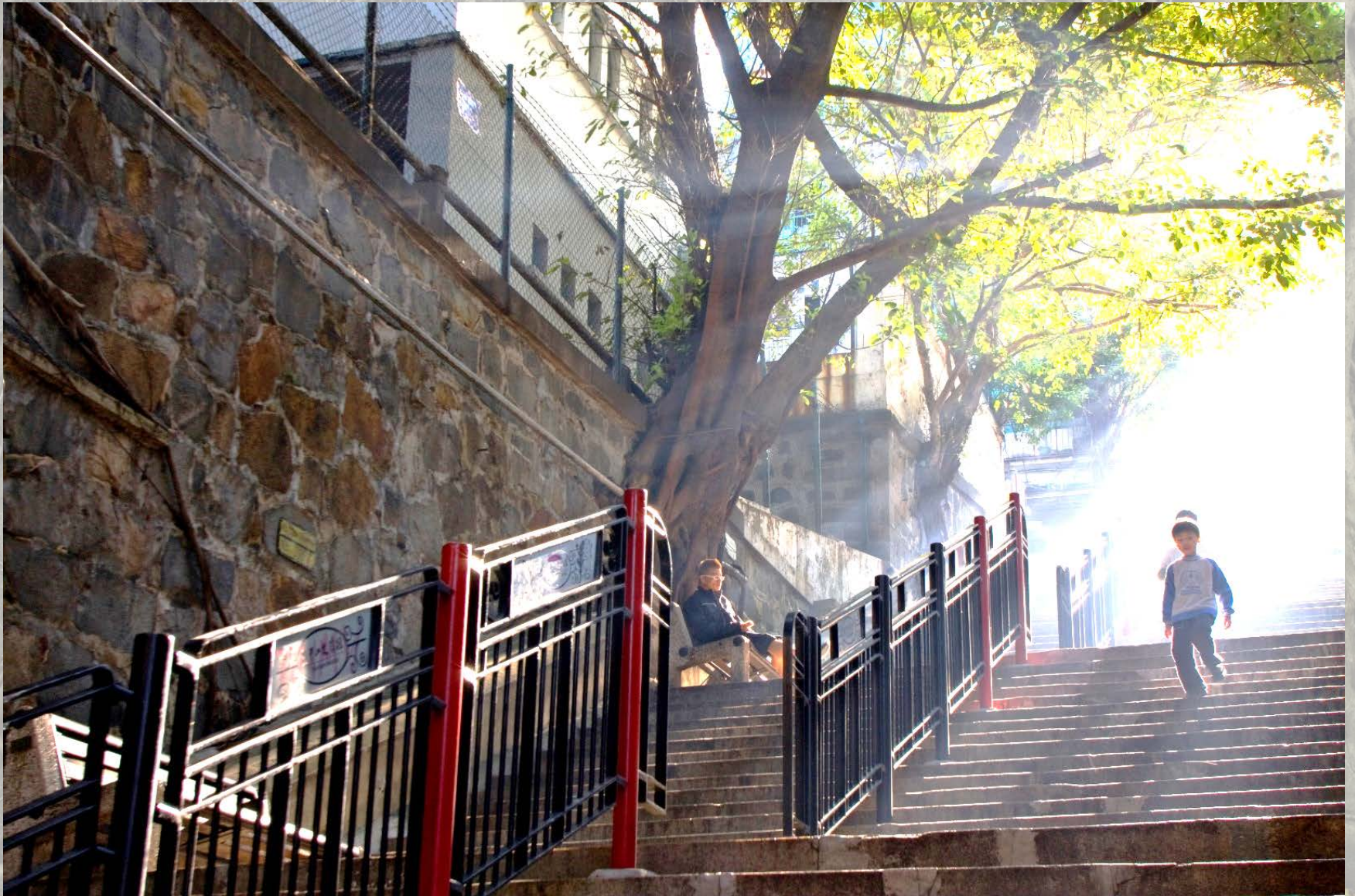


# Trees and Community

- Densely-populated city
- High pedestrian and vehicle use
- Close relationship with trees

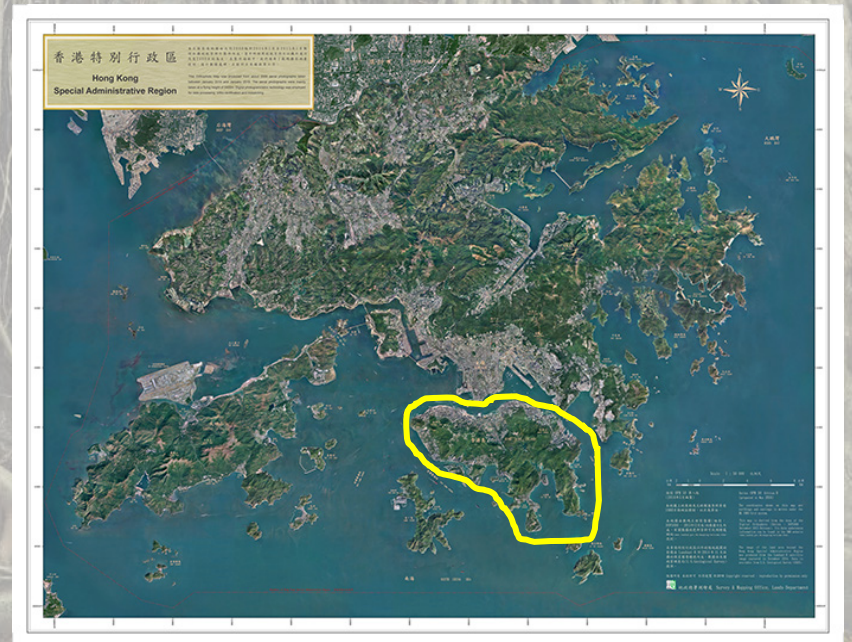


# Trees and Community



# Stonewall Trees

- An assemblage of bricks or building blocks as a wall
- Most are retaining walls constructed during the period from 1850 to 1950
- Majority of the masonry walls can be found on Hong Kong Island

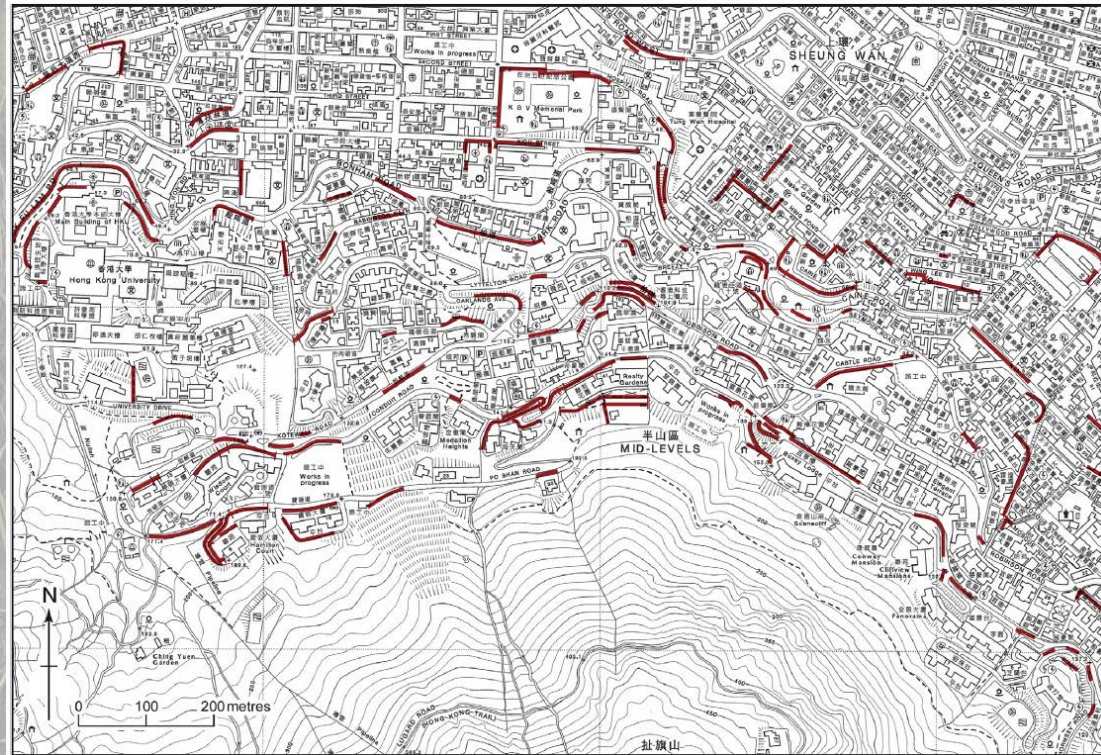






# Stonewall Trees

- Widely-distributed masonry walls
- Narrow niche for self-sown trees in the gaps between the stones and soil behind the wall
- Tree species dominated by genus *Ficus* of Moraceae family



Source: A.Y. Lo, C.Y. Jim, 2015, *Cities* 42: 130-141

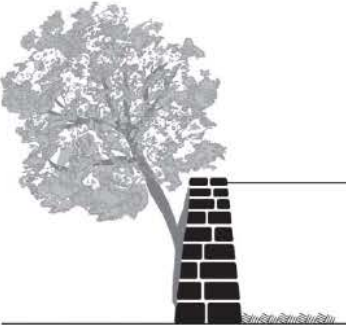
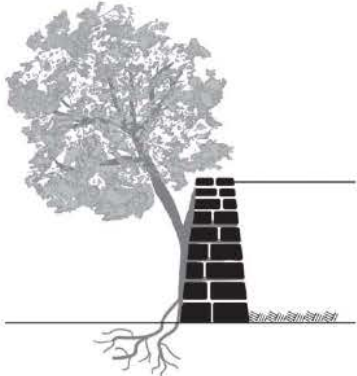

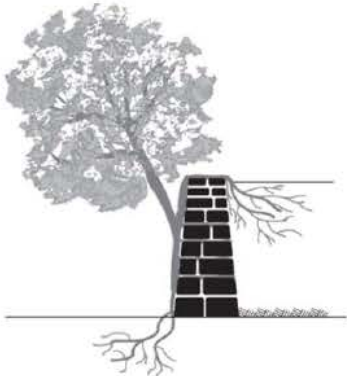


Forbes Street



King George V Memorial Park

# Types of Stonewall Trees

Root spread on masonry wall				
<b>Structural condition of tree anchorage</b>	<p><b>(a) Surface attachment only</b></p> <ul style="list-style-type: none"> <li>• Support solely by the surface root mass on wall with unknown amount of root penetration</li> <li>• Roots are mostly confined within masonry wall only</li> </ul>	<p><b>(b) Surface attachment and ground roots at toe</b></p> <ul style="list-style-type: none"> <li>• Support by the surface root mass on wall with unknown amount of root penetration and additional ground roots protruded to the wall toe</li> <li>• Only limited physical support could be provided by roots at toe</li> </ul>	<p><b>(c) Surface attachment and ground roots at crest</b></p> <ul style="list-style-type: none"> <li>• Support by the surface root mass on wall with unknown amount of root penetration and additional ground roots protruded to the wall crest</li> <li>• Provides additional strength on the tension side of SWT for anchorage</li> </ul>	<p><b>(d) Surface attachment and ground roots at crest and toe</b></p> <ul style="list-style-type: none"> <li>• Support by the surface root mass on wall with unknown amount of root penetration and additional ground roots protruded to both wall crest and toe</li> <li>• Provides additional strength on the tension side of SWT for anchorage</li> </ul>

# Stonewall Tree Failure



# Stonewall Tree Failure



# Challenges

- Conflicts with human
- Structural stability
- Weather condition



# Stonewall Tree Management

## Management Guidelines for Stonewall Trees



GREENING, LANDSCAPE AND TREE MANAGEMENT SECTION  
DEVELOPMENT BUREAU

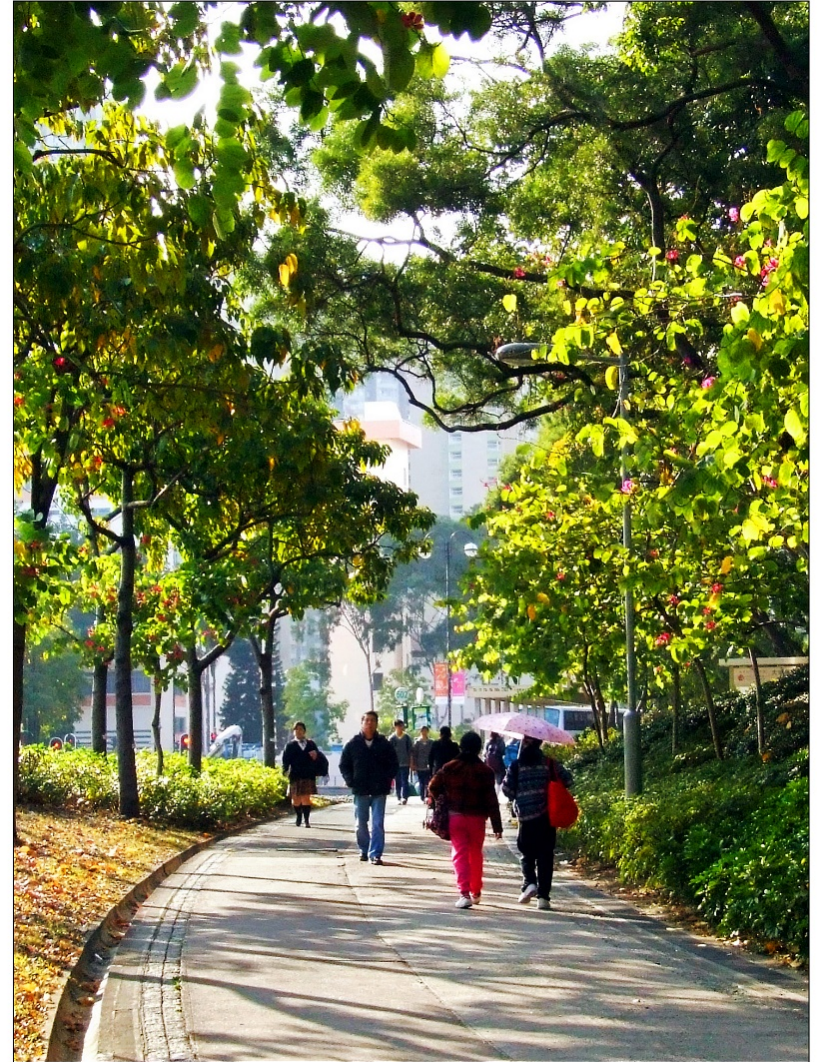
December 2013

- The key management strategies are
  - 1) to maintain a balanced crown architecture and branch structure which enhance stability; and
  - 2) to improve root anchorage and strengthen support
- Regular tree risk assessment on half-year basis



# Pruning Strategy

- 1) Regular crown size/ weight management;
- 2) Phased pruning works;
- 3) Pruning of defective branches; and



# Regular crown size/ weight management

- *Ficus* spp. are aggressive and fast-growing species
- Crown size can grow several feet per year
  - Adding substantial additional load on the anchor point
- Anchorage usually won't have considerable growth (site limitation)



# Regular crown size/ weight management

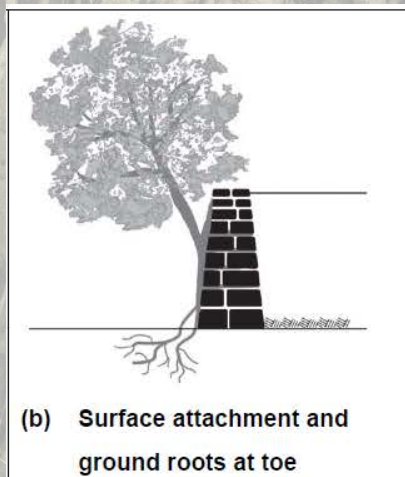
- Maintaining the crown size/weight
- Strictly following the pruning percentage limit
- Minimising the cuts while providing enough reduction to the crown weight and benefiting light penetration

# Crown size/weight management

## Example



- *Ficus microcarpa*
- Large branch failure happened
- Asymmetric crown with lion tailing branches



(b) Surface attachment and ground roots at toe



- Pruning percentage: <10%
- Pruning goal: to prevent overload of upward growing branches

07.11.2017

Example



Example



07.11.2017

Example



07.11.2017





# Example



*Before*



*After*

Keeping the epicormics as to alleviate the lion tailing problem



# Example



*Condition as at August 2019*

# Phased pruning works

- Every live branches are source of energy
- Every pruning wounds would bring stress to the tree and a possible entrance for infection
- Minimising the stress made to the tree while achieving the goal of pruning

# Phased pruning works Example



# Phased pruning works

## Example

2017





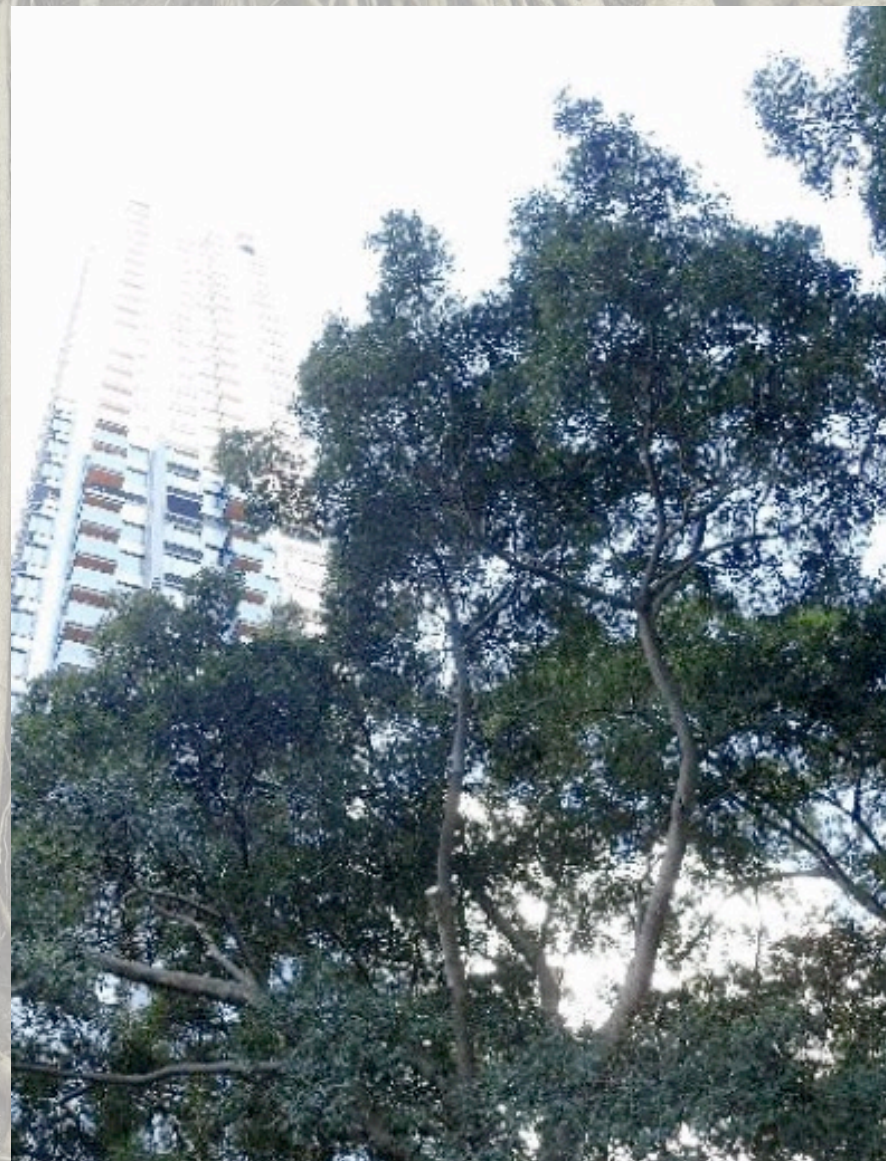
*Before*



*After*



*Before*



*After*

2018







*Before*



*After*



*Before*



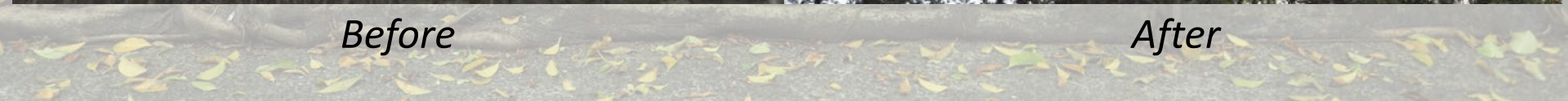
*After*



*Before*



*After*

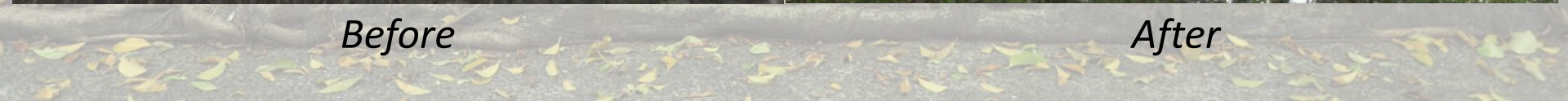




*Before*



*After*





2017



2019

# Pruning of defective branches



- To alleviate the hazards to public
- To reduce the load of the tree crown
- To improve the appearance of the trees

# Pruning of defective branches





# Pruning of defective branches



# Pruning of defective branches



# Pruning of defective branches



# Current Pruning Strategy



- Based on the unique conditions in Hong Kong and special features of the trees
- Regular crown management + phased pruning works + pruning of necessary branches

# Further study on stonewall trees

- Better understand the architecture of stonewall trees
- Better understand the structural stability and load capacity
- Apply advanced technology to monitor tree conditions



- Avoid unnecessary or excessive pruning
- Proactively improve the structure of the stonewall trees

# Acknowledgement

- Colleagues from various tree management departments
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