



**STANGERS**

## Tree Root Surveys using Ground Penetrating Radar

We are the leading experts in Tree Radar (GPR) for locating tree roots in Hong Kong.

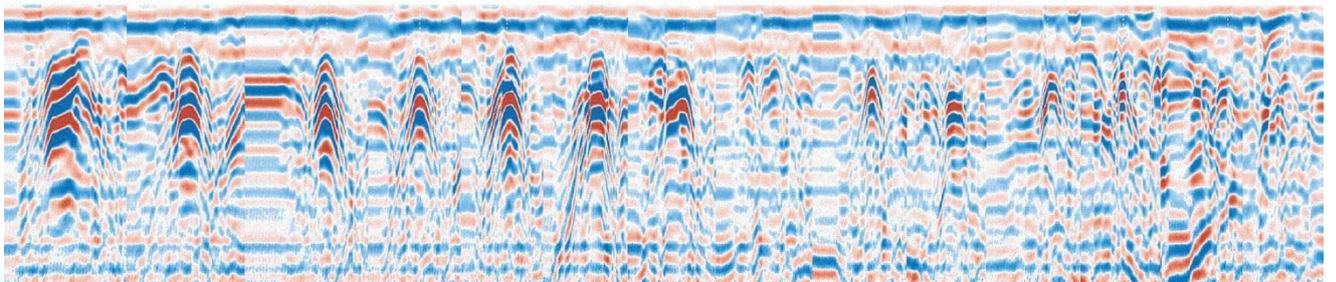
we can non-invasively inspect sites to provide images of the layout and density of subsurface structural roots. By carrying out a Tree Root Survey tree roots can accurately be located prior to constructing foundations or planning service trench routes.

Ground Penetrating Radar (GPR) is very fast and completely noninvasive.



GPR is a very useful method for tree root location and has several advantages over other methods:

- 1) it is capable of scanning root system of large tree under field conditions in a relatively short time,
- 2) it is completely noninvasive and does not disturb the soils or damage the trees examined,
- 3) being non-invasive, it allows repeated measurements that reveal long-term root system development,
- 4) it allows observation of root distribution beneath hard surfaces (e.g., concrete, asphalt, bricks, pavers, roads, buildings)
- 5) its accuracy is sufficient to detect structural roots with diameters as small as 1 cm.
- 6) We can normally penetrate down to about 1m, however under favourable conditions 3m penetration is possible





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**Test Procedures:**

We will carry out a visual assessment of the area to be surveyed and prepare a plan of the method gridlines to be scanned and the most appropriate antenna to use for the survey. We have a wide range of antennas to choose from dependent on soil conditions and penetration depth required. Scan lines for the survey can be either parallel lines or circular or semi-circular lines at varying distances from the trunk. A 2D planar image ("virtual trench") is created for each line scanned, and a top-down 3D image is created to show the root layout – location and depth – for the collection of lines scanned.

**Advantages:**

Rapid

Non-intrusive

2D and 3D pictorial results can be presented

Further computer processing can define multiple layers of roots under favourable conditions

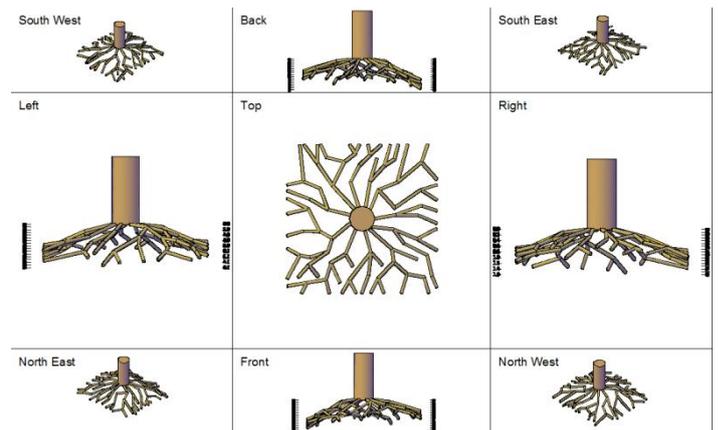
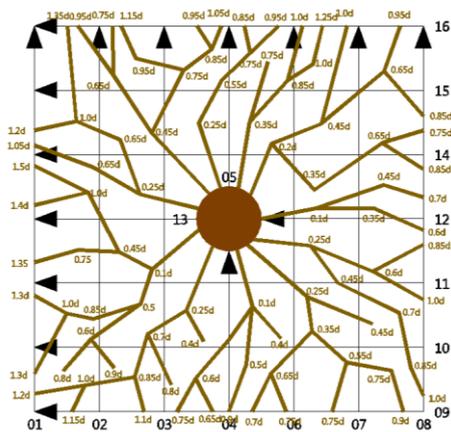
**Limitations:**

Soil properties have the potential to limit GPR penetration

Penetration in saturated soils will be limited.

Roots underneath reinforces concrete pavements may be difficult to detect

Surveying on slopes or uneven ground may limit survey reliability.



**STANGER ASIA LIMITED**

705-706, 7/F., Fuk Shing Commercial Building,  
28 On Lok Mun Street, On Lok Tsuen, Fanling, New Territories, Hong Kong.

Tel: (852) 2682 1203

Fax: (852) 2682 0046

Email : [stanger@stanger.com.hk](mailto:stanger@stanger.com.hk)

Website : [www.stanger.com.hk](http://www.stanger.com.hk)