

VISICOM PRODUCT DESCRIPTION

Singapore

3D City model 1m sample
(Tailored for 5G planning requirements)



How to contact us:

VISICOM Company

25/2 Velyka Zhytomyrska Str.
Kiev, 01001 Ukraine

Phone: +38 (044) 201-0086

Fax: +38 (044) 201-0026

E-mail: radioplan@visi.com.ua

<http://www.visicom.ua>



GENERAL INFORMATION

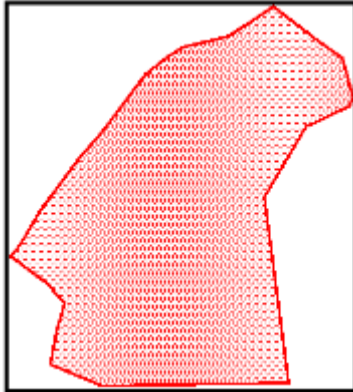
Coverage

This geographic product covers 4,1 sq. km of Singapore sample area.

The geographic coordinates of the bounding rectangle (reference ellipsoid WGS 84) are the following:

E 103.8693599°
N 1.30622881°

E 103.8521569°
N 1.30622881°



E 103.8693599°
N 1.28732092°

E 103.8521569°
N 1.28732092°

Data presented in Atoll format

Package content in Atoll format includes:

- Digital Terrain Model (DTM) (data contains in the *Height* folder);
- Land Use Map (Clutter Model) (data contains in the *Clutter* folder);
- Vector layers including building footprints and detailed vegetation with heights (data contains in the *Vector* folder);
- Obstacles Height Model (data contains in the *Clutter Height* folder)

Language: English

Resolution (cell size): 1m



CARTOGRAPHIC REFERENCE

Data are given in geographic coordinates on ellipsoid WGS 84 with the following references:

Ellipsoid

- Name: WGS 84
- Big axis: 6378137.0 meters
- Eccentricity: 0.081819191

Projection

- Type : UTM 48N
- Azimuth angle : 0.0 degrees
- Longitude 0 : 105.0 degrees
- Latitude 0 : 0.0 degrees
- X axis 0 : 500000.0 meters
- Y axis 0 : 0.0 meters
- Scale factor: 0.9996

Coordinates of the North-West corner of the image are the following:

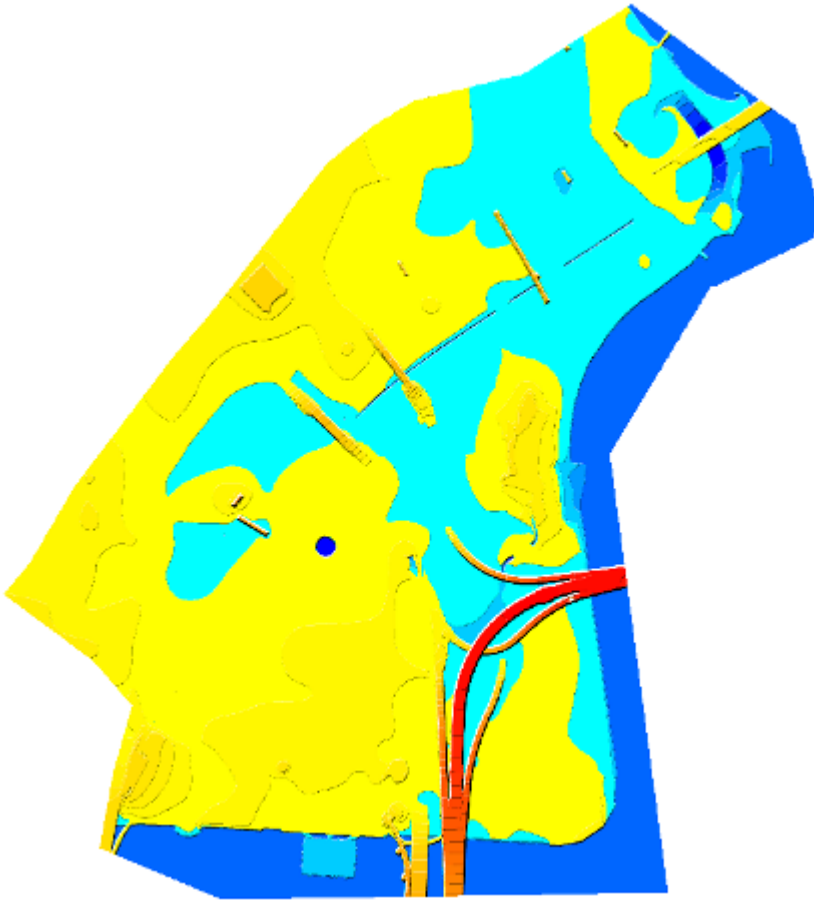
X = 372298 m Y = 144407 m

Number of columns (DIM_X)	1916 pixels
Number of Rows (DIM_Y)	2091 pixels
Pixel Size (resolution)	1 meters
North-West corner	(372298; 144407) meters
South-East corner	(374213; 142317) meters



DIGITAL TERRAIN MODEL

General view



Meanings of pixel values

Each image pixel stores the value of terrain elevation.

The value of elevation above sea level:

- Height = 0 meters - 0
- Unknown values - - 9999
- Z values unit - meters

In this Digital Surface Model the altitudes are varied in the range of -2 to 34 meters.

Parameters of accuracy	Value
Resolution (cell size)	1 m
Absolute Planimetric accuracy (x, y)	2-3 m
Absolute Altimetric accuracy (z)	2-3 m

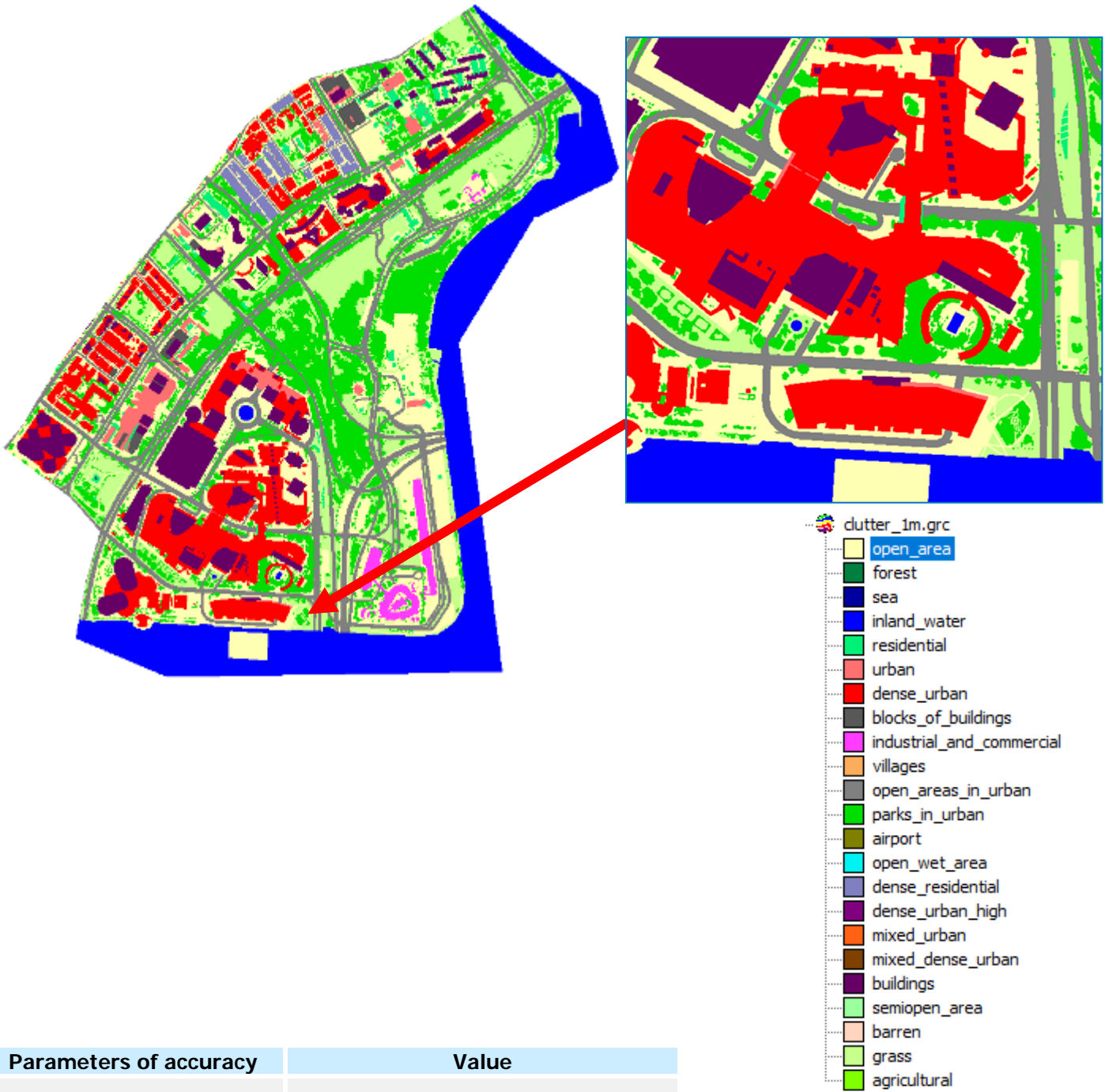
Sources:

Stereo pairs of Pleiades satellite images with 0,5 m resolution.



LAND USE MAP (CLUTTER MODEL)

General view



Parameters of accuracy	Value
Resolution (cell size)	1 m
Absolute Planimetric accuracy (x, y)	2-3 m

Sources:

Stereo pairs of satellite images with 0,5 m resolution.



Meanings of pixel values

The value which is stored with each pixel of image corresponds to the code that represents land type (clutter class). The table of correspondences between codes and clutter class names (21 clutter classes in all) is presented below.

Code	Class Name	Class Description
1.	Open Dry	Open space outside the town without vegetation
2.	Dense Forest	Forested lands with closed tree canopy. No distinction is made between deciduous and coniferous
3.	Sea	Sea and Ocean
4.	Inland_Water	Rivers, canals of more than 10 m width, lakes, reservoirs
5.	Residential	Houses in suburban environment. Suburban density typically involves laid out street patterns in which streets are visible. Lots may be as small as 30m by 30m, but are typically larger and include vegetation cover. Individual houses are frequently visible. Average height is below 15m
6.	Urban	Mean urban building, more than 3 store height
7.	Dense Urban	Dense urban building, more than 3 store height
8.	Blocks_Buildings	Groups of buildings, either parallel or not, that may be separated by large green space. Height is above 30 meters.
9.	Industrial And Commercial	Areas including buildings with large footprints separated by streets (factories, shopping malls, storehouses etc.)
10.	Villages	Small built-up area in rural surrounding
11.	Open_In_Urban	Open spaces inside the town: streets, avenues, vacant lots, squares
12.	Parks_In_Urban	Park of less than 20m height trees
13.	Airport	Territory of airport without buildings and runways
14.	Open_Wet_Area	Marshes, swamp
15.	Dense Residential	Groups of houses or collectives residential buildings in suburban environment. Suburban density typically involves laid out street patterns in which streets are visible. There is no open space between constructions. Average height is below 15m
16.	Residential_with_trees	Residential environment with trees inside
17.	High buildings	Alone stand buildings, buildings with heights above 40m
18.	Low vegetation	Areas covered with low trees and bushes
19.	Barren	Areas covered by sparse, stunted vegetation
20.	Grass	The territory covered by low grass
21.	Agricultural	Agricultural lands



Obstacles Heights Model (matrix)

General view



Obstacles Heights Model includes – buildings and vegetated areas.

Parameters of accuracy	Value
Resolution (cell size)	1 m
Absolute Planimetric accuracy (x, y)	2-3 m
Accuracy of Buildings Heights (h):	2-3 m
Minimal Mapping Unit for Buildings	4x4 =16 sq.m
Minimal Recognizable Height for Buildings	3 m
Accuracy of other Obstacles Heights (h):	5 m
Minimal Mapping Unit for Vegetation	50 sq.m
Minimal Recognizable Height for Vegetation	5 m

Sources:

Stereo pairs of satellite images with 0,5 m resolution.



VECTOR LAYERS

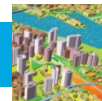
General view













Parameters of accuracy	Value
Absolute Planimetric accuracy (x, y)	2-3 m
Accuracy of Buildings Heights (h):	2-3 m
Minimal Mapping Unit for Buildings	4x4 = 16 sq.m
Minimal Recognizable Obstacle Height	3 m
Accuracy of other Obstacles Heights (h):	5 m
Minimal Mapping Unit for Vegetation	50 sq.m
Minimal Recognizable Height for Vegetation	5 m

Sources:

Stereo pairs of satellite images with 0,5 m resolution.



There are 10 linear classes in 3D Dataset for Singapore city:

	Nº	Class Name	Class Description
	1	Highways	International motor roads
	2	Major roads	Regional motor roads
	3	Streets	Town street axial lines
	4	Minor roads	Other roads
	5	Riveralke	Coastline of rivers and lakes. Rivers with less than 10 m width
	6	Railways	Railways
	7	Airports	Airport territory
	8	Admin Borders	Administrative boundaries of populated places
	9	Buildings	Polygonal building footprints with individual heights
	10	Vegetation	Vegetation polygons with heights of trees

*Classes marked with grey color doesn't meet at the small sample area polygon