

APPENDIX 3G Details of Surface Characteristics

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Raster file is downloaded from the land utilization information (version 2019) disclosed by the Planning Department.
The land utilization is converted as the table below to meet the classification of the USEPA.

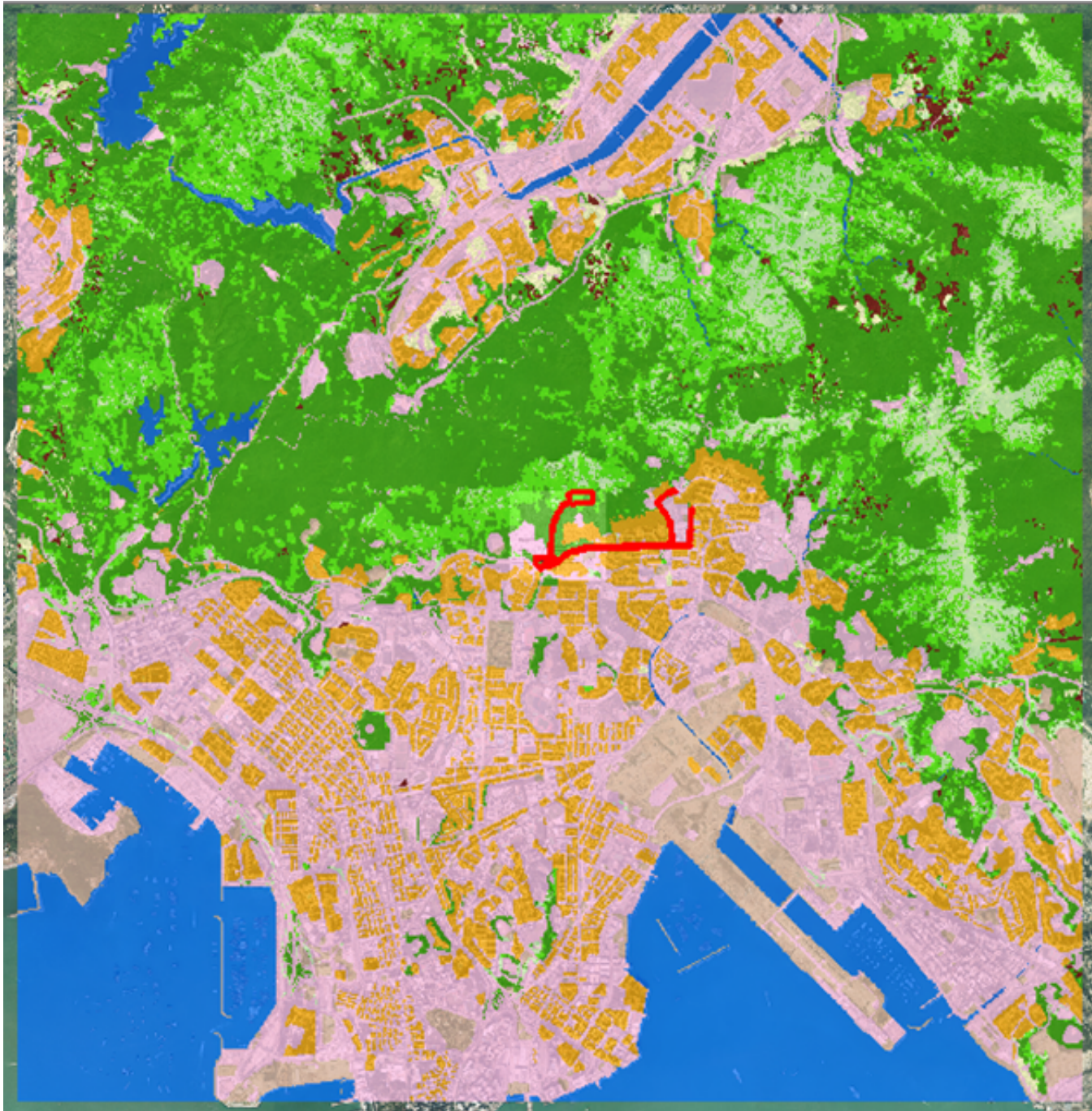
Hong Kong Planning Department Classification	USEPA
Private Residential	22 High Intensity Residential
Public Residential	22 High Intensity Residential
Rural Settlement	21 Low Intensity Residential
Commerical/Business and Office	23b Commercial/Industrial/Transp (Not at Airport)
Industrial Land	23b Commercial/Industrial/Transp (Not at Airport)
Industrial Estates/Science and Technology Parks	23b Commercial/Industrial/Transp (Not at Airport)
Warehouse and Open Storage	23b Commercial/Industrial/Transp (Not at Airport)
Government, Institutional and Community Facilities	23b Commercial/Industrial/Transp (Not at Airport)
Open Space and Recreation	23b Commercial/Industrial/Transp (Not at Airport)
Roads and Transport Facilities	23b Commercial/Industrial/Transp (Not at Airport)
Railways	23b Commercial/Industrial/Transp (Not at Airport)
Airport	23a Commercial/Industrial/Transp (Site at Airport)
Port Facilities	23b Commercial/Industrial/Transp (Not at Airport)
Cemeteries/Funeral Facilities	23b Commercial/Industrial/Transp (Not at Airport)
Utilities	23b Commercial/Industrial/Transp (Not at Airport)
Vacant Land/Construction in Progress	33 Transitional
Other Urban/built up land	33 Transitional
Agricultural Land	82 Row Crops
Fish Ponds/Gei Wais	11 Open Water
Woodland	41 Deciduous Forest
Shrubland	51b Shrubland (Non-arid Region)
Grassland	71 Grassland
Mangrove Swamp	91 Woody Wetland
Badland	51a Shrubland (Arid Region)
Rocky Shore	31a Bare Rock/ Sand/ Clay (Arid Region)
Reservoirs	11 Open Water
Streams and Nullahs	11 Open Water
open sea	11 Open Water

Number of grids of each surface type is calculated from the raster file.

Number	Type (USEPA)	Albedo (a) (Seasonal Average) ⁽¹⁾	Bowen Ratio (b) (Seasonal Average) ⁽¹⁾	No. of grid (n) ⁽²⁾	Percentage	$b^{n/Sn}$
11	Open Water	0.1	0.1	125421	13%	0.7491676
21	Low Intensity Residential	0.165	0.9	8926	1%	0.99906
22	High Intensity Residential	0.18	1.5	121766	12%	1.050611
23a	Commercial/Industrial/Transp (Site at Airport)	0.18	1.5	0	0%	1
23b	Commercial/Industrial/Transp (Not at Airport)	0.18	1.5	268578	27%	1.1150497
31a	Bare Rock/ Sand/ Clay (Arid Region)	0.2	4.75	0	0%	1
33	Transitional	0.18	1	47802	5%	1
41	Deciduous Forest	0.1625	0.75	266524	27%	0.9261916
51a	Shrubland (Arid Region)	0.1625	0.75	0	0%	1
51b	Shrubland (Non-arid Region)	0.18	1.25	108472	11%	1.0245001
71	Grassland	0.185	0.8	44454	4%	0.9901294
82	Row Crops	0.18	0.55	8057	1%	0.9951948
91	Woody Wetland	0.14	0.225	0	0%	1
	Mean ⁽³⁾	0.165	0.820			

Note:

- Reference from Tables A-1 and A-2 from AERSURFACE User's Guide, USEPA.
- Each grid of size 10m x 10m for the 10km x 10km domain. There are 1.00E+06 grids, and the representative land use type was determined for each grid.
- Simple unweighted arithmetic mean for Albedo = $S(a \times n) / Sn$; simple unweighted geometry mean for Bowen Ratio = $P b^{n/Sn}$
- The albedo and bowen ratio are calculated according to the latest AERMOD Implementation Guide.

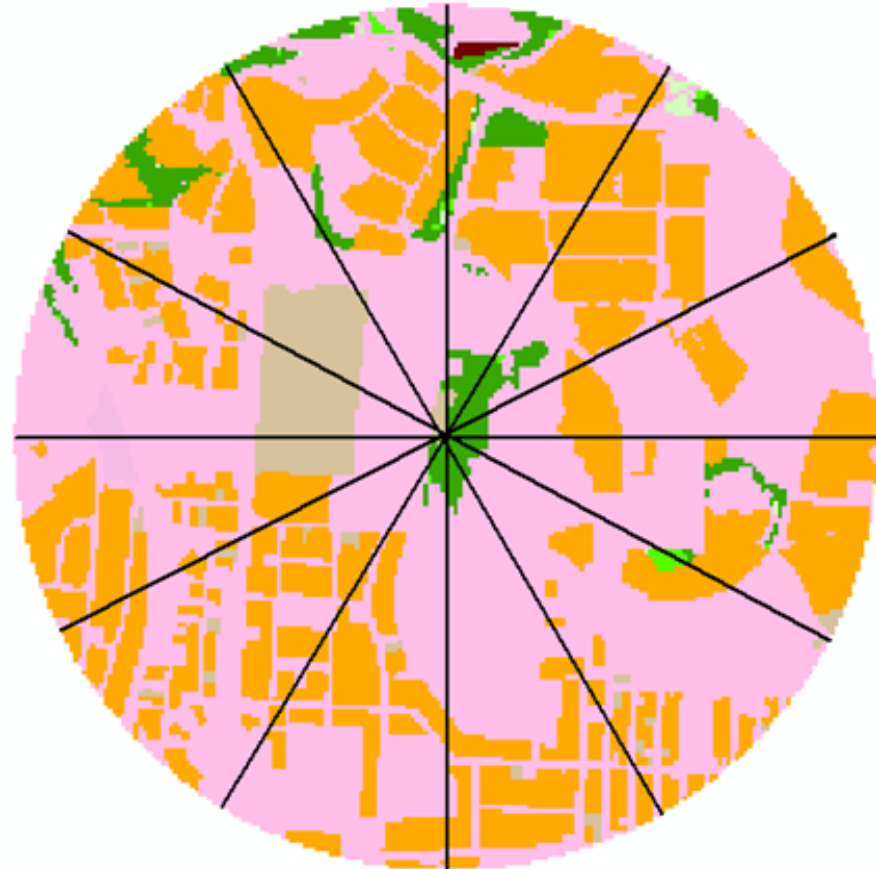


- Legend**
- 11 Open Water
 - 21 Low Intensity Residential
 - 22 High Intensity Residential
 - 23b Commercial/Industrial/Transp (Not at Airport)
 - 33 Transitional
 - 41 Deciduous Forest
 - 51b Shrubland (Non-arid Region)
 - 71 Grassland
 - 82 Row Crops
 - Project Boundary

Appendix 3G Details of Surface Characteristics

	0-30	30-60	60-90	90-120	120-150	150-180	180-210	210-240	240-270	270-300	300-330	330-360
4135	0.7972	0.8517	0.7909	0.7914	0.7620	0.7896	0.7996	0.7838	0.6495	0.5247	0.5746	0.7080
4136	0.4839	0.7833	0.8289	0.7835	0.8509	0.8808	0.7798	0.7066	0.7628	0.6270	0.5641	0.6606
4236	0.6185	0.8636	0.8287	0.8107	0.8650	0.7493	0.7313	0.7542	0.7091	0.6746	0.6092	0.4817

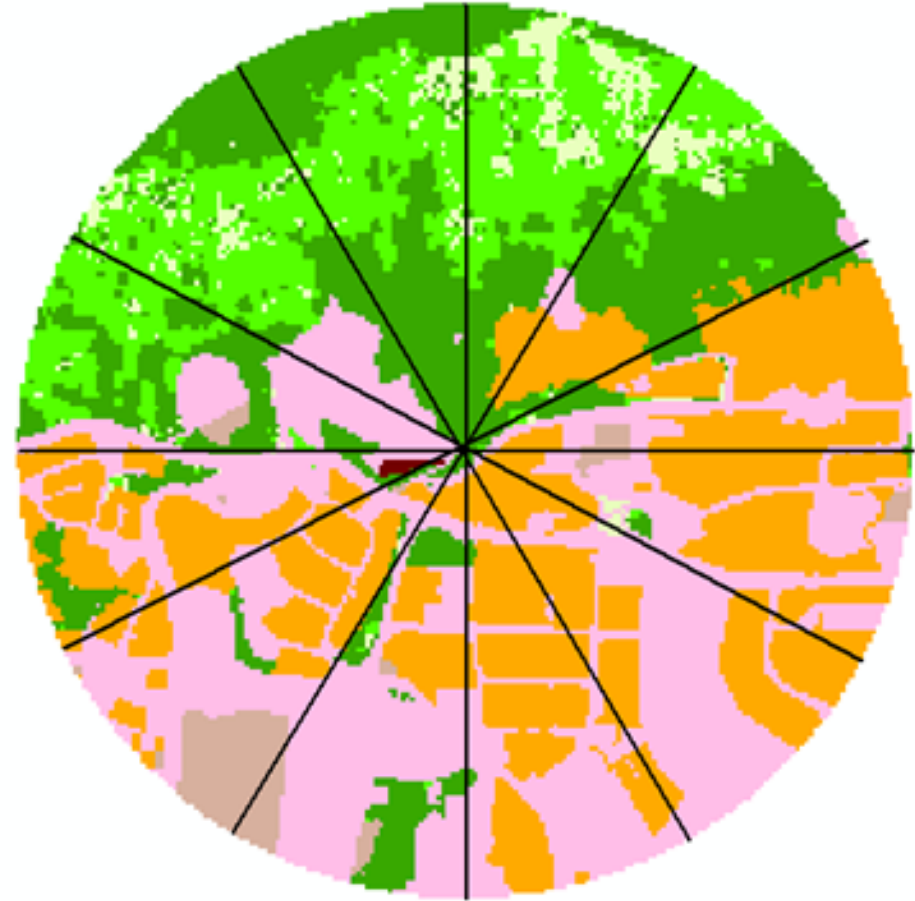
4135












Legend

- 11 Open Water
- 21 Low Intensity Residential
- 22 High Intensity Residential
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- 33 Transitional
- 41 Deciduous Forest
- 51b Shrubland (Non-arid Region)
- 71 Grassland
- 82 Row Crops

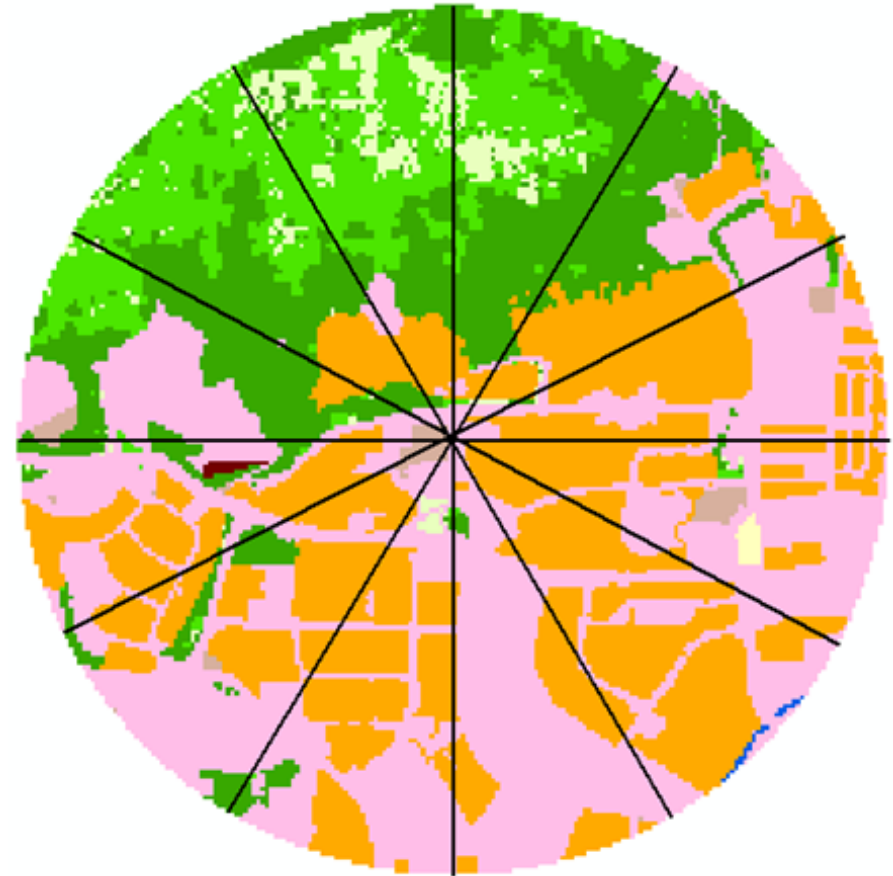
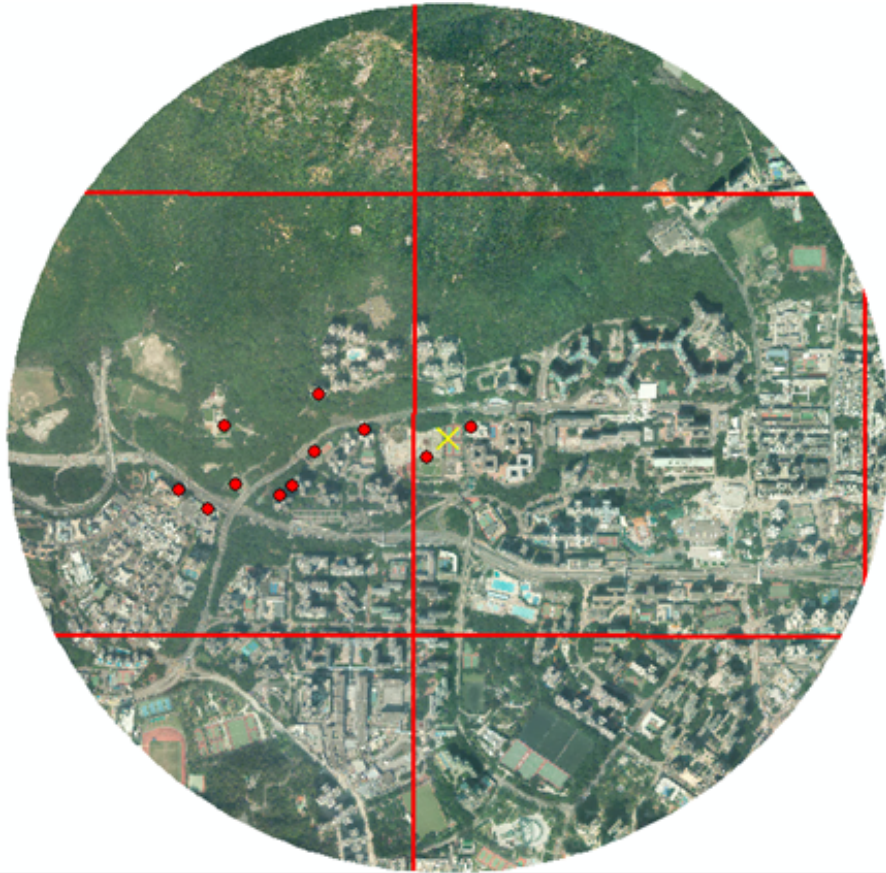
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Legend

-  11 Open Water
-  21 Low Intensity Residential
-  22 High Intensity Residential
-  23b Commercial/Industrial/Transp (Not at Airport)
-  33 Transitional
-  41 Deciduous Forest
-  51b Shrubland (Non-arid Region)
-  71 Grassland
-  82 Row Crops

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Legend

-  11 Open Water
-  21 Low Intensity Residential
-  22 High Intensity Residential
-  23b Commercial/Industrial/Transp (Not at Airport)
-  33 Transitional
-  41 Deciduous Forest
-  51b Shrubland (Non-arid Region)
-  71 Grassland
-  82 Row Crops