

Appendix 3.17 Determination of Surface Characteristics Parameters



Summary of Surface Characteristics for Scenario Year 2024 – 2030 (Construction and Operation Phases)

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Grid	Sector	Land Use	Albedo	Bowen Ratio	Surface Roughness (m)	Remark	
20, 47	0 - 90	Urban	0.2075	1.6250	3.7000	Planned high-rise buildings for port back-up storage and	
						workshop use and hilly terrain exist in the northeast.	
	90 - 360	Forest	0.1775	0.8250	1.3000	Trees on the hill in the northwest and southern area.	
20, 48	30 – 270	Urban	0.2075	1.6250	<u>3.7000</u>	Hilly terrain in the area. Planned high-rise buildings for port	
						back-up storage and workshop use exist in the southeast.	
	070 00		0.1.100	0.4500	0.0001	Thus surface roughness of 370 cm is assumed.	
00.40	270 - 30	Water	0.1400	0.4500	0.0001	Sea in the northwest.	
20, 49	90 - 150	Urban	0.2075	1.6250	1.0000	Village, low-rise buildings in the southeast	
01 44	150 - 90	water	0.1400	0.4500	0.0001	Sea for the rest of the area.	
21, 44	0 - 360	Urban	0.2075	1.6250	1.0000	Abundant village, low-rise buildings in the area	
21,45	0 - 360	Urban	0.2075	1.6250	1.0000	Abundant village, prowntield operation in the area	
21, 46	0 - 200	Urban	0.2075	1.6250	1.0000	Abundant village, low-rise buildings, open storage in the area.	
01 47	200 - 360	Forest	0.1775	0.8250	1.3000	Trees on the hill in the courthwest	
Z1, 47	180 - 270	Forest	0.1775	0.8250	1.3000	Abundant anan starsas and brownfield exerction in the area	
01 40	270 - 180	Urban	0.2075	1.0200	1.0000	Abundant open storage and prownlied operation in the area	
Z1, 48	0 - 300	Ulball	0.2075	1.0200	<u>3.7000</u>	Densely packed blowillieu operations exist in the area.	
						workshon use exist in southwest. Hilly slone locates in the	
						northwest. Thus surface roughness of 370 cm is assumed	
21 49	0 - 360	Urhan	0 2075	1 6250	1 0000	Densely packed brownfield operations exist in the area	
21, 77	0 300	orban	0.2075	1.0200	1.0000	Planned low-rise residential buildings locates in the south	
21, 50	90 – 180	Urban	0.2075	1.6250	1.0000	Abundant village, low-rise buildings exist in the southeast.	
2.,00	180 - 90	Water	0.1400	0.4500	0.0001	Sea for the rest of the area.	
22, 44	0 - 360	Urban	0.2075	1.6250	1.0000	Village and low-rise buildings are in the north and west and	
1						hilly terrain in the south and east. Thus surface roughness of	
						100 cm is assumed.	
22, 45	0 – 360	Urban	0.2075	1.6250	1.0000	Abundant village, low-rise residential buildings exist in the	
						area with a hill in the east and south. Thus surface roughness	
						of 100 cm is assumed.	
22, 46	0 – 360	Urban	0.2075	1.6250	<u>3.7000</u>	The area is developed with high-rise residential buildings.	
22, 47	0 – 360	Urban	0.2075	1.6250	1.0000	Village, low-rise buildings, open storage as majority, but a few	
						planned high-rise residential buildings in the east.	
22, 48	0 – 360	Urban	0.2075	1.6250	1.0000	Abundant village, low-rise buildings, open storage exist in the	
						area while existing high-rise residential buildings are in the	
22.40	0 0/0	L Lula a va	0.0075	1 () 5 0	2 7000	east. Thus surface roughness of 100 cm is assumed.	
22, 49	0 - 360	Urban	0.2075	1.6250	<u>3.7000</u>	Existing nigh-rise residential buildings are in the east side	
						while hilly terrain in the west. Thus surface roughness of 370	
23 16	0 360	Urban	0 2075	1.6250	1 0000	Abundant villago, low riso, buildings, opon storago, ovist in the	
23, 40	0 - 300	Ulball	0.2075	1.0250	1.0000	area	
23 /17	0 - 360	Urhan	0 2075	1 6250	3 7000	The area is surrounded by existing high-rise residential	
23, 47	0 - 300	Urban	0.2075	1.0230	<u>3.7000</u>	huildings in north and east and planned high-rise commercial	
						buildings on west and southwest. Thus surface roughness of	
						370 cm is assumed.	
23, 48	0 - 360	Urban	0.2075	1.6250	3.7000	Existing developed area with high-rise residential buildings.	
Note:						Jerre Street Stree	
Grev area i	s classified as	urban are	a Blue are	a is classifie	d as water area	Green area is classified as coniferous forest area.	

Albedo, Bowen Ratio and Surface Roughness are generally suggested by AERMET by default. Underlined figure indicates modification due to the status of the site. Please see remarks.

Appendix 3.17 Determination of Surface Characteristics Parameters



Summary of Surface Characteristics for Scenario Year 2031 – 2039 (Construction Phase)

Grid	Sector	Land Use	Albedo	Bowen Ratio	Surface Roughness	Remark		
20 /7	0 - 90	Urban	0 2075	1 6250	3 7000	Diannod high riso buildings for port back up storago and workshop		
20, 47	0 - 70	Unbarr	0.2075	1.0230	<u>3.7000</u>	Plained high-fise buildings for port back-up storage and workshop		
	90 - 360	Forest	0 1775	0.8250	1 3000	Trees on the hill in the northwest and southern area		
20 48	30 - 270	Urban	0.2075	1 6250	3 7000	Hilly terrain in the area Planned high-rise buildings for port back-		
20, 10	00 270	0. Ball	0.2070		<u></u>	up storage and workshop use exist in the southeast. Thus surface		
						roughness of 370 cm is assumed.		
	270 – 30	Water	0.1400	0.4500	0.0001	Sea in the northwest.		
20, 49	90 – 150	Urban	0.2075	1.6250	1.0000	Village, low-rise buildings in the southeast		
	150 – 90	Water	0.1400	0.4500	0.0001	Sea for the rest of the area.		
21, 44	0 – 360	Urban	0.2075	1.6250	1.0000	Abundant village, low-rise buildings in the area		
21, 45	0 – 360	Urban	0.2075	1.6250	3.7000	The area is fully developed with high-rise residential and		
						commercial buildings		
21, 46	0 – 200	Urban	0.2075	1.6250	<u>3.7000</u>	The area is fully developed with high-rise residential, industrial and		
						commercial buildings.		
	200 - 360	Forest	0.1775	0.8250	1.3000	Trees on the hill in the west.		
21, 47	180 – 270	Forest	0.1775	0.8250	1.3000	Trees on the hill in the southwest.		
	270 – 180	Urban	0.2075	1.6250	1.0000	Abundant open storage and brownfield operation in the area in the		
						east and planned high-rise buildings for port backup and logistics		
01.10	0.0/0		0.0075	4 (050	0.7000	uses in the northwest.		
21, 48	0 - 360	Urban	0.2075	1.6250	<u>3.7000</u>	More planned high-rise buildings for port back-up storage and		
						workshop use exist in southwest. Hilly slope locates in the		
21 40	0 240	Urbon	0.2075	1 ()EO	2 7000	nonnwest. Thus surface roughness of 370 cm is assumed.		
21, 49	0 - 300	UIDAII	0.2075	1.0200	<u>3.7000</u>	infinite with Ghu (21, 48) because residential site 3-18 and 3-19 fail into two arids		
21 50	00 - 180	Urban	0 2075	1.6250	1 0000	Abundant village low-rise buildings exist in the southeast		
21, 30	180 - 90	Water	0.2073	0.4500	0.0001	Sea for the rest of the area		
22 44	0 - 360	Urhan	0.1400	1 6250	1,0000	Village and low-rise buildings are in the north and west and hilly		
22, 11	0 300	orban	0.2075	1.0230	1.0000	terrain in the south and east. Thus surface roughness of 100 cm is		
						assumed.		
22, 45	0 - 360	Urban	0.2075	1.6250	3.7000	The area is surrounded by planned high-rise buildings in the north		
-						and west and a hill in the east and south. Thus surface roughness		
						of 370 cm is assumed.		
22, 46	0 – 360	Urban	0.2075	1.6250	<u>3.7000</u>	The area is developed with high-rise residential buildings.		
22, 47	0 – 360	Urban	0.2075	1.6250	1.0000	Village, low-rise buildings, open storage as majority, but a few		
						planned high-rise residential buildings in the east.		
22, 48	0 – 360	Urban	0.2075	1.6250	1.0000	Abundant village, low-rise buildings, open storage exist in the area		
						while existing high-rise residential buildings are in the east. Thus		
						surface roughness of 100 cm is assumed.		
22, 49	0 – 360	Urban	0.2075	1.6250	<u>3.7000</u>	Existing high-rise residential buildings are in the east side while		
						nilly terrain in the west. Thus surface roughness of 370 cm is		
22.47	0 2/0	Urbon	0.0075	1 4 25 0	1 0000	dssumeu.		
23, 40	0 - 360	Urban	0.2075	1.0250	1.0000	Abundani village, low-rise buildings, open storage exist in the area.		
23, 47	0 - 360	nearo	0.2075	1.0250	3.7000	I me area is surrounded by existing high-fise residential buildings in		
						and southwest. Thus surface roughness of 370 cm is assumed		
23 18	0 _ 360	Urhan	0 2075	1 6250	3 7000	Existing developed area with high-rise residential huildings		
20,40	0 - 000	Undir	0.2015	1.0230	3.7000	Enisting developed area with high-hise residential ballatings.		

Note:

Grey area is classified as urban area. Blue area is classified as water area. Green area is classified as coniferous forest area. Albedo, Bowen Ratio and Surface Roughness are generally suggested by AERMET by default. Underlined figure indicates modification due to the status of the site. Please see remarks.

Appendix 3.17 Determination of Surface Characteristics Parameters



Summary of Surface Characteristics for Scenario Year 2031 – 2039 (Operation Phase)

Grid Sector		Land Use	Albedo	Bowen Ratio	Surface Roughness (m)	
20, 47	0 - 90	Urban	0.2075	1.6250	<u>3.7000</u>	Plann works
	90 - 360	Forest	0.1775	0.8250	1.3000	Trees
20, 48	30 – 270	Urban	0.2075	1.6250	<u>3.7000</u>	Hilly te
						back-u
						Thus s
	270 – 30	Water	0.1400	0.4500	0.0001	Sea in
20, 49	90 – 150	Urban	0.2075	1.6250	1.0000	Village
	150 – 90	Water	0.1400	0.4500	0.0001	Sea fo
21, 44	0 – 360	Urban	0.2075	1.6250	1.0000	Abunc
21, 45	0 – 360	Urban	0.2075	1.6250	<u>3.7000</u>	The a
						comm
21, 46	0 – 200	Urban	0.2075	1.6250	<u>3.7000</u>	The a
						indust
	200 – 360	Forest	0.1775	0.8250	1.3000	Trees
21, 47	180 – 270	Forest	0.1775	0.8250	1.3000	Trees
	270 – 180	Urban	0.2075	1.6250	<u>3.7000</u>	The a
						backu
21, 48	0 – 360	Urban	0.2075	1.6250	<u>3.7000</u>	The a
						use.
21, 49	0 – 360	Urban	0.2075	1.6250	<u>3.7000</u>	The a
21, 50	90 – 180	Urban	0.2075	1.6250	1.0000	Abund
	180 – 90	Water	0.1400	0.4500	0.0001	Sea fo
22, 44	0 – 360	Urban	0.2075	1.6250	1.0000	Village
						hilly te
						100 cr
22, 45	0 – 360	Urban	0.2075	1.6250	<u>3.7000</u>	The a
						north
						rough
22, 46	0 - 360	Urban	0.2075	1.6250	<u>3.7000</u>	The a
22, 47	0 – 360	Urban	0.2075	1.6250	<u>3.7000</u>	I he ai buildir
22, 48	0 – 360	Urban	0.2075	1.6250	<u>3.7000</u>	The a
						buildir
22, 49	0 – 360	Urban	0.2075	1.6250	<u>3.7000</u>	Existir
						while I
						develo
						rough
23, 46	0 – 360	Urban	0.2075	1.6250	1.0000	Abunc
						area.
23, 47	0 – 360	Urban	0.2075	1.6250	<u>3.7000</u>	The a
						north
						in wes
23, 48	0 – 360	Urban	0.2075	1.6250	3.7000	Existir

Note:

Grey area is classified as urban area. Blue area is classified as water area. Green area is classified as coniferous forest area. Albedo, Bowen Ratio and Surface Roughness are generally suggested by AERMET by default. Underlined figure indicates modification due to the status of the site. Please see remarks.

Remark
ed high-rise buildings for port back-up storage and hop use and hilly terrain exist in the northeast.
on the hill in the northwest and southern area.
errain in the area. Planned high-rise buildings for port
up storage and workshop use exist in the southeast.
surface roughness of 370 cm is assumed.
n the northwest.
e, low-rise buildings in the southeast
or the rest of the area.
dant village, low-rise buildings in the area
rea is fully developed with high-rise residential and
nercial buildings
rea is fully developed with high-rise residential,
irial and commercial buildings.
on the hill in the west.
on the nill in the southwest.
rea is fully developed with high-rise buildings for port
ip and logistics uses.
rea is fully developed with high-fise buildings for various
rea is fully developed with high-rise residential buildings.
dant village, low-rise buildings exist in the southeast.
or the rest of the area.
e and low-rise buildings are in the north and west and
errain in the south and east. Thus surface roughness of
m is assumed.
rea is surrounded by planned high-rise buildings in the
and west and a nill in the east and south. Thus surface
ness of 370 cm is assumed.
rea is developed with high-rise residential buildings.
rea becomes fully developed with high-fise residential
rea becomes fully developed with high-rise residential
nas.
ng high-rise residential buildings are in the east side
hilly terrain in the west. The southwest area is
oped with high-rise residential buildings. Thus surface
ness of 370 cm is assumed.
dant village, low-rise buildings, open storage exist in the
rea consists of existing high-rise residential buildings in
and east and fully development with high-rise buildings
st and southwest

kisting developed area with high-rise residential buildings.