WIND SPEED PROFILES OVER TERRAIN WITH ROUGHNESS CHANGES

1. NOTATION AND UNITS

		Units	
		SI	*British*
d	effective displacement height above ground of zero-plane to account for general level of ground obstacles in built-up or wooded areas (see Table 5.1)	m	ft
H	general height of buildings or trees in built-up or wooded areas	m	ft
H_r	height of general terrain level surrounding site above level of terrain at which reference wind speed applies	m	ft
$\hat{h}$	interlayer height, see Sketches 7.1 and 7.2	m	ft
K	wind speed profile factor at site; $\hat{V}_{zx}/\hat{V}_{10r}$ or V_{zx}/V_{10r}		
K_∞	value of K when $x \rightarrow \infty$		
K_x	fetch factor accounting for effect on wind speed of upwind change in terrain roughness; $\hat{V}_{zx}/\hat{V}_z$		
$K_{\tau x}$	gust factor for flat terrain; $\hat{V}_{zx}/V_{zx}$		
$\hat{V}_f$	fastest mile of wind (see Section 4.2)	m/s	mile/h
V_z	hourly-mean wind speed; wind speed averaged over 1 hour at height z above site assuming site terrain is flat and extends uniformly upwind for at least 50 km ($\approx$ 30 miles)	m/s	mile/h
$\hat{V}_z$	expected (or mean) maximum gust speed at height z above site, averaged over τ seconds, occurring in period of 1 hour, assuming site terrain is flat and extends uniformly upwind for at least 50 km ($\approx$ 30 miles)	m/s	mile/h
V_{zx}, $\hat{V}_{zx}$	values of V_z and $\hat{V}_z$ respectively when site is a distance x downwind of a change in terrain roughness	m/s	mile/h
V_{10r}	reference wind speed; hourly-mean value at z = 10 m over flat over country terrain ($z_0 \approx 0.03$ m)	m/s	mile/h
x	distance that uniform terrain roughness extends upwind of site	km	mile

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z	height measured from zero-plane displacement (d)	m	ft
z_0	surface roughness parameter (see Section 5)	m	ft
τ	gust duration or averaging time	s	s

Subscripts

f	relates to fastest mile of wind
m	denotes measured value
r	relates to reference conditions (see Section 4)
1,2	relate respectively to conditions upwind of first and second step changes in terrain roughness upwind from site

2. SIMPLIFIED PRESENTATION OF WIND SPEED PROFILE DATA

The estimation of wind speeds is central to all calculations involving wind loading assessments at a site. The variation of wind speed with height depends not only on the ground roughness at the site but also on the roughness of the terrain over which the wind has passed to reach the site.

The methods in ESDU 82026[1] and 83045[2] allow for changes in terrain roughness to be taken into account when estimating hourly-mean wind speeds or the expected maximum τ-second gusts occurring in a given period (usually 1 hour). Furthermore, a computer program, ESDUpac A9232 on disk (see ESDU 92032[4]) is now available in Volume S/W1 which provides values of the wind speed and turbulence properties of practical interest for strong winds over terrain with roughness changes including topographic effects. It is recommended that this program is used for most purposes since it is based on the full methods and not on the simplified methods derived for hand calculations. Differences between the program-generated values and the simplified procedures for the same conditions are not large where the site is not affected by topographic effects.

The purpose of this Item is to supplement these methods by providing simple 'look-up' tables of calculated wind speed factors giving, directly, the variation of the hourly-mean wind speed, or gusts, with height for various combinations of ground roughness at the site and upwind. These wind speed factors have been generated by the methods given in ESDU 82026 and 83045 and the user is referred to these sources for details of the methods, their derivation and other background information.

Data for cases not covered in the Tables can, of course, be obtained using the program A9232 but in many cases simple interpolation between adjacent values in the Tables will suffice.

The data in the Tables (Section 10) apply for nominally flat terrain (ground slope less than 0.05). Where the site is located on a hill or in a valley the local wind speed is accelerated and a separate factor is required to account for this speed-up effect as described in ESDU 91043[3] and provided by the computer program A9232[4].

3. HOW TO USE THE TABLES FOR FLAT TERRAIN

The wind speed factor given in the Tables in Section 10 is defined as

$$K = \hat{V}_{zx} / V_{10r}$$

where $\hat{V}_{zx}$ is the corresponding expected maximum gust speed (occurring in a period of 1 hour) averaged over τ seconds. When $\tau = 3600$ s, $\hat{V}_{zx}$ becomes the hourly-mean wind speed, V_{zx}. The reference wind speed, V_{10r} is the hourly-mean wind speed at a height of 10 m above open, level country as described in Section 4. The wind speed factor K will depend on the gust averaging time, height above the ground, the site roughness z_0, the upwind terrain roughness and the corresponding fetch, x.

The wind speed factor will also depend, to a much lesser extent, on the magnitude of the reference wind speed (or more precisely the gradient wind speed at the edge of the atmospheric boundary layer). The values of K derived for this Item can be applied to wind speeds greater than 10 m/s with little error.

The simple procedures in Sections 3.1 and 3.2 explain how to use the Tables for sites with either no roughness changes or a single roughness change upwind of the site. Section 7 provides a simple method for dealing with the situation when more than one roughness change is considered to be important. The K-factors in Section 10 apply for essentially flat terrain when the maximum slope of the upwind terrain is less than about 0.05.

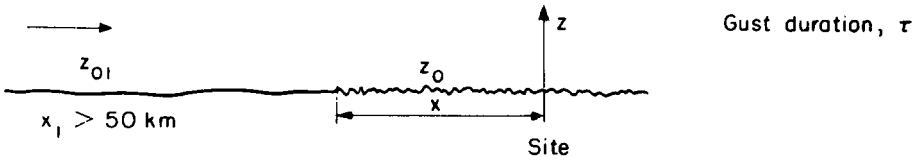
3.1 No Roughness Changes

Providing there are no significant roughness changes within about 50 km upwind of the site, the K factor is given by the final column of the Tables in Section 10 appropriate to the given site roughness (see Section 5) and the gust averaging time, τ. The required wind speed is then given by

$$\hat{V}_{zx} = K V_{10r}$$

where V_{10r} is the reference hourly-mean wind speed (see Section 4) corresponding to $z_{0r} = 0.03$ m, $z_r = 10$ m and $\tau = 3600$ s.

3.2 Single Change in Terrain Roughness



Sketch 3.1

(1) Select appropriate values of z_{01} and z_0 corresponding to the terrain roughness at the site and upwind of the roughness change. Guidance on this is provided in Section 5.

(2) For the required values of x, z and τ obtain the value of K from the appropriate Table, interpolating if necessary. An index to the Tables is given in Table 10.1.

(3) The required wind speed appropriate to the site and height is given by

$$\hat{V}_{zx} = KV_{10r}$$

where V_{10r} is the reference hourly-mean wind speed (see Section 4) corresponding to $z_{0r} = 0.03$ m, $z_r = 10$ m and $\tau = 3600$ s.

3.3 Several Changes in Terrain Roughness

This is considered in Section 7.

4. REFERENCE WIND SPEED

4.1 Hourly-mean Values

The reference wind speed, V_{10r}, on which the tabulated data are based is the hourly-mean wind speed ($\tau = 3600$ s) at a height of 10 m above open country terrain ($z_{0r} \approx 0.03$ m) with no significant roughness changes. Sources such as those given or referred to in Item 82026[1] provide this value directly when design wind speeds with a given return period are required.

When the available reference wind speed (V_m) is for other non-standard conditions (for example, an extreme value obtained from records appropriate to a nearby site with roughness changes upwind and for which $z_{0m} \neq 0.03$ m and $z_m \neq 10$ m) then this value can be corrected to the standard reference conditions ($z_{0r} = 0.03$ m, $z_r = 10$ m, $x \to \infty$) by using the Tables in Section 10 in reverse. Then,

$$V_{10r} = V_m / K_m$$

where K_m is the value of the K-factor taken from the appropriate Table corresponding to z_{0_m}, $z_{0_{1m}}$, z_m, x_m, *etc.*

Increasingly, extreme wind speeds are being analysed by direction. Where this information is available it may be appropriate to consider the variation of the reference or design wind speed with direction. This is particularly relevant where the site is affected by roughness changes in particular directions or is located in hilly terrain.

4.2 Fastest Mile of Wind

The relationship between a τ-second gust speed, $\hat{V}$, and hourly-mean wind speed, V, at a given height is given by

$$\hat{V}/V = 1 + gI_u \tag{4.1}$$

where g is the peak factor and I_u is the intensity of turbulence (σ_u/V) both given by ESDU 83045[2]. The peak factor given in Figure 2 of ESDU 83045 can be adequately represented by

$$g = 4.2 \exp[-0.08k^3 + 0.17k^2 - 0.3k] \tag{4.2}$$

where $k = 1 + \log_{10}\tau$

which gives values of $\hat{V}/V$ to within about $\pm 3\%$ of those calculated with the more fundamental relationship

in ESDU 83045.

In the United States the reference design wind speed may be provided in terms of the fastest mile of wind ($\hat{V}_f$) at z = 10 m over open country terrain ($z_0 \approx 0.03$ m). This is the highest wind speed in a period of 1 hour averaged over the time it takes for one mile of the wind to pass a given point. The corresponding averaging time is therefore $\tau_f = 3600/\hat{V}_f$ when V_f is in mile/h. When starting with $\hat{V}_f$ an estimate of the corresponding hourly-mean wind speed V_{10r} can be obtained using Equations (4.1) and (4.2) with $I_u = 0.18$ which then gives

$$V_{10r} = \hat{V}_f / [1 + 0.76 \exp(-0.08k^3 + 0.17k^2 - 0.3k)] \qquad (4.3)$$

where $k = 1 + \log_{10}\tau_f$.

Note that V_{10r} will be in mile/h if $\hat{V}_f$ is in mile/h. The example in Section 8.2 illustrates the use of the fastest mile of wind.

4.3 Correction to Reference Wind Speed for Terrain Altitude

When there is a difference in altitude (H_r) between the general level of the surrounding terrain at the site and that of the terrain for which the reference wind speed applies, then the reference wind speed (mean or gust value) must be increased by 0.001 H_r m/s where H_r is in metres.

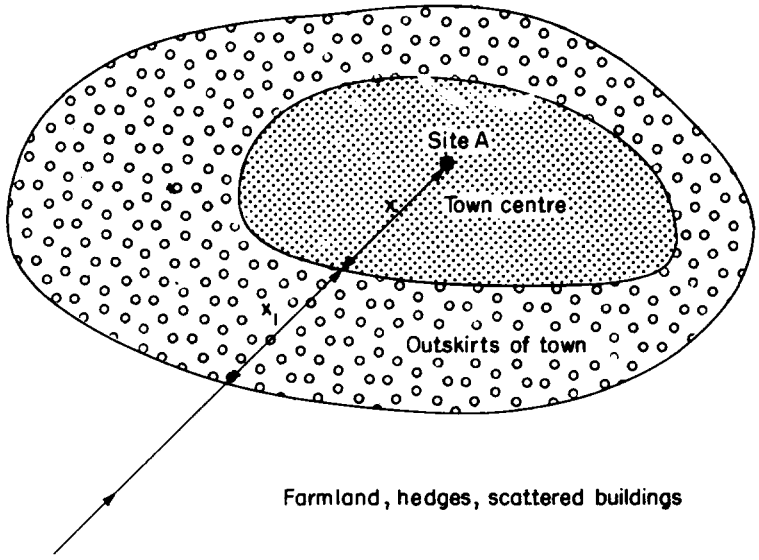
5. TERRAIN DESCRIPTION

5.1 Choice of z_0

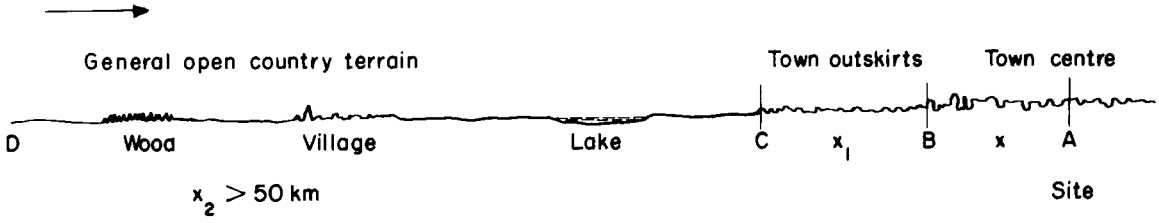
In all cases an estimate of the surface roughness parameter, z_0 , has to be made at the site and upwind of the site in the required direction or directions from which it is assumed the wind originates. Table 5.1 provides typical values based on terrain description and the photographs in Figures 1a to 1g can be used to help in this assessment. The most onerous direction for design purposes will be determined by the most critical orientation of the structure to the wind. This is not necessarily in the direction giving the highest wind speed since the wind loading is usually also a function of the orientation of the structure to the wind direction.

The estimation of the contours of surface roughness around the site is best assessed from detailed Ordnance Survey maps and supplemented where possible by visual inspection. For the purpose of using the wind speed factor tables in Section 10 it is only necessary to estimate the surface roughness parameters to the nearest value covered by the terrain categories in the tables (*i.e.* z_0 = 0.7, 0.3, 0.1, 0.03, 0.01, 0.003 and 0.001 m).

Only in exceptional cases will more than two step changes in surface roughness need to be taken into account. In most cases, because of the simplifying assumptions explained in Section 5.2, only one roughness change has to be considered and in some situations the need to consider roughness changes can be avoided altogether. The example in Sketch 5.1 illustrates two principal roughness changes upwind of site A when the wind is from the south west. Sketch 5.2 illustrates this situation in more detail and Section 5.2 explains how the apparently complex series of roughness changes in the open country terrain can be simplified.



Sketch 5.1



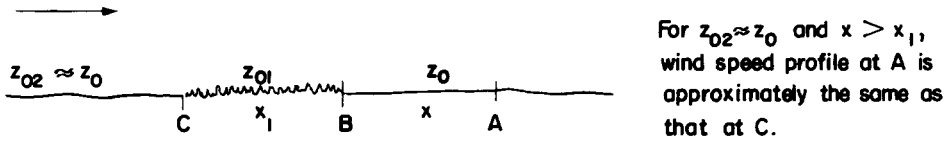
Sketch 5.2 Surface roughness profile for the site in Sketch 5.1

TABLE 5.1 Typical Values of Terrain Roughness Parameter z_0

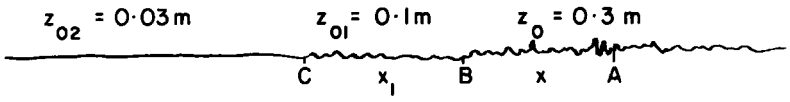
Terrain Description	Approx. value of z_0 (m)	Approx. value of d (m)
City centres Forests	0.7	$H - 2$
Small towns; suburbs Wooded country (many trees)	0.3	$H - 2$
Outskirts of small towns Villages Countryside with many hedges, some trees and some buildings	0.1	0
Open level country with few trees and hedges and isolated buildings; typical farmland	0.03	0
Fairly level grass plains with isolated trees Very rough sea in extreme storms (once in 50 yr extreme)	0.01	0
Flat areas with short grass and no obstructions Runway area of airports Rough sea in annual extreme storms	0.003	0
Snow covered farmland Flat desert or arid areas Inland lakes in extreme storms	0.001	0

5.2 Simplifying Assumptions

For the data (and the methods on which they are based) to apply, the furthest upwind fetch of terrain that is considered (*e.g.* x_2 in Sketch 5.4) should be uniform for at least 50 km in order that the wind speed variation with height at the first assumed step change in roughness (C in Sketch 5.2) has reached an equilibrium condition (*i.e.* the wind speed variation is no longer changing from place to place along the path of the wind). In many cases (as in Sketch 5.2) this is apparently unlikely due to the interspersion of small wooded regions, villages, lakes, *etc.* However, where the general nature of the terrain is uniform (*e.g.* open country), the effect of interspersed patches of greater or smaller roughness can generally be ignored. The reason for this is that when the wind has passed over the intervening roughness (*e.g.* z_{01} in Sketch 5.3), and providing $z_0 \approx z_{02}$ and $x > x_1$, the wind speed profile downwind of *A* will have reverted to that which exists over *C*, to a close approximation. Thus, although an upwind fetch of nominally uniform terrain may be apparently "patchy", the preceding simplifying assumption can usually be invoked to eliminate the need to consider the "patches". With these simplifications, the complex terrain in Sketch 5.2 can be reduced to two effective roughness changes as illustrated in Sketch 5.4.



Sketch 5.3



Sketch 5.4 Terrain roughness values for example in Sketch 5.2

In most cases the terrain generating the equilibrium wind speed profile prior to the roughness changes upwind of the site (*e.g.* z_{02} in Sketch 5.4) is likely to be open country or farmland terrain except near the coast where it may be the open sea.

6. EFFECTS OF TOPOGRAPHY

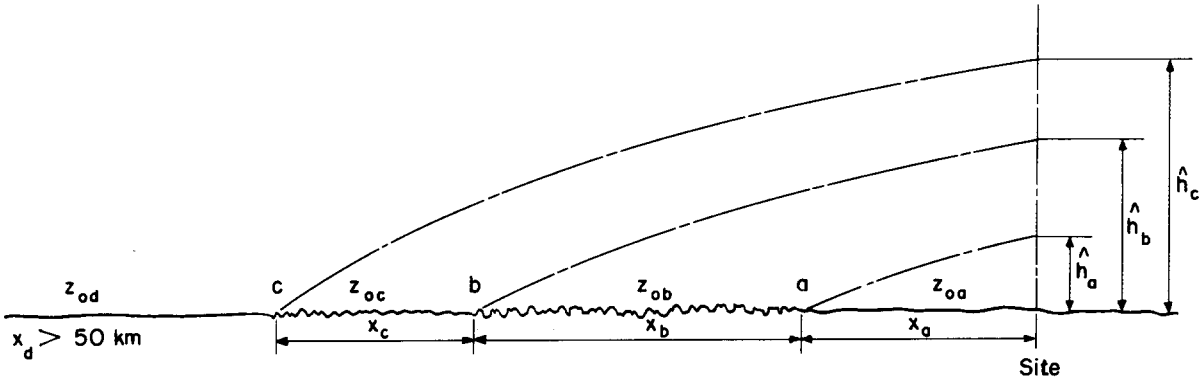
For sites near the crest of hills, ridges, cliffs or escarpments the wind speed is increased from that over corresponding flat terrain. The factor K_L by which the wind speed increases is primarily a function of the upwind slope, the position of the site relative to the crest and the height (z) above the local ground level.

A comprehensive method for estimating K_L is presented in ESDU 91043[3] and is part of the computer program A9232[4] .

7. MULTIPLE ROUGHNESS CHANGES

In practice, the multiplicity of parameters prevents the tabular presentation of *K*-factors for more than two changes of terrain roughness upwind of the site. In this case the site wind profile data can be generated directly using the program A9232[4]. Alternatively, the values in the Tables in Section 10 for single roughness changes can be used in the following way to generate the required composite profile when more than one roughness change occurs upwind of the site.

The basis of the procedure is the generalised method in ESDU 83045 but is much simplified through the use of the tabulated *K*-factors in this Item. For simplicity of explanation it assumes three roughness changes as illustrated in Sketch 7.1 but the procedure can be extended to other numbers of roughness changes in the same way. The example in Section 8.2 illustrates the application of this procedure.



Sketch 7.1 Site with three upwind roughness changes

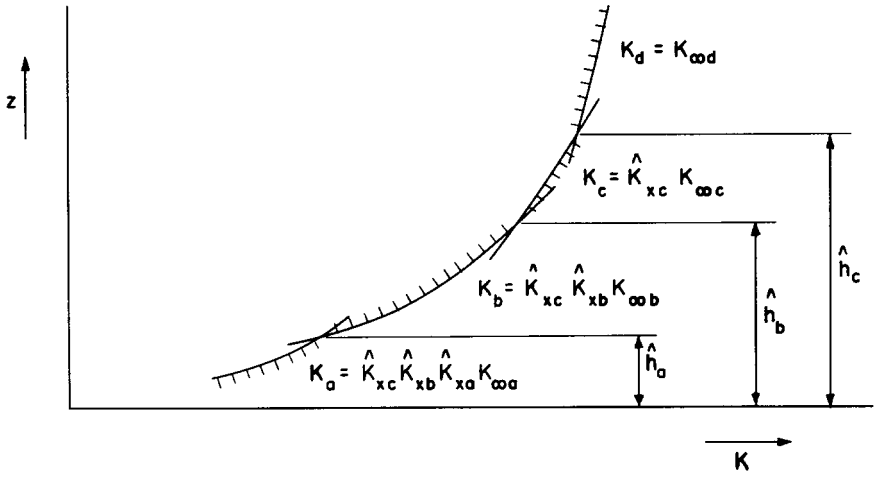
(1) Select appropriate values of the terrain roughness parameter (z_{0a} , z_{0b} , z_{0c} , z_{0d}) for each fetch of uniform roughness (see Section 5).

(2) For each roughness change (and the specified value of τ) find the corresponding *K*-factor from the Tables in Section 10 at z = 10 m assuming the data for a single roughness change applies with the terrain roughness downwind of the change extending to the site. For example, for the roughness change z_{0d} to z_{0c} in Sketch 7.1 the *K*-factor (K_c) for z = 10 m will be given by the appropriate case in Tables 10 for a roughness change z_{0d} to z_{0c} but with an effective fetch $x = x_a + x_b + x_c$. Similarly, K_b will relate to a roughness change z_{0c} to z_{0b} with $x = x_b + x_a$ and K_a will relate to the roughness change z_{0_b} to z_{0_a} with $x = x_a$, all for z = 10 m.

(3) From the same Tables as in step (2), obtain the corresponding equilibrium values of K_∞ for z = 10 m given in the column under $x > 600$ km for the roughness $z_0 = z_{0a}$, z_{0b} , and z_{0c} respectively, and for the required averaging time, τ.

(4) Evaluate the ratios $\hat{K}_x = K$ (step 2)/K_∞ (step 3) corresponding to each of the roughness changes to give the three values $\hat{K}_{xa}$, $\hat{K}_{xb}$ and $\hat{K}_{xc}$.

(5) The composite *K*-factor profile at the site is then built up from ground level as illustrated in Sketch 7.2. The factors $K_{\infty a}$, $K_{\infty b}$, $K_{\infty c}$ and $K_{\infty d}$ are values of the equilibrium *K*-factors from the tables in Section 10 appropriate to $z_0 = z_{0a}$, z_{0b} , z_{0c} and z_{0d} for $x > 600$ km at the required heights, z , and averaging time, τ . Note that it is not necessary to calculate the interlayer heights $\hat{h}_a$, $\hat{h}_b$ and $\hat{h}_c$; they are given by the intersection of the *K*-factor profiles, K_a with K_b, K_b with K_c, *etc*.

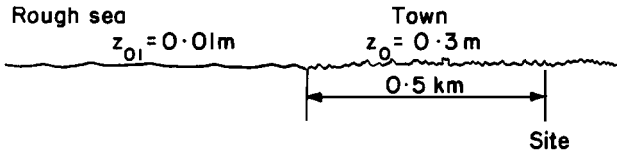


Sketch 7.2 *K*-factor profiles at site

8. EXAMPLES

8.1 Single Roughness Change

It is required to estimate the design 3-second gust speed profile up to 20 m above the ground at a flat site located in a small town near the coast when the wind is blowing off the sea. The corresponding reference hourly-mean design wind speed (50-year return period) for this case is assessed to be 22 m/s (corresponding to z_{0r} = 0.03 m and z_r = 10 m). The site location is illustrated in Sketch 8.1.



Sketch 8.1

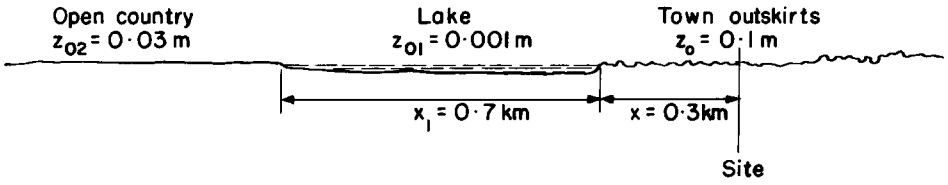
From Table 5.1, for a such a high wind speed, the sea roughness will be such that $z_{01} \approx 0.01$ m. For a small town, $z_0 \approx 0.3$ m and typically $d = H - 1 = 9$ m taking the typical height of surrounding buildings to be 10 m.

From Table 10.10 the following gust profile can be obtained for τ = 3 s by interpolating for x = 0.5 km.

z (m)	Height from ground (m)	K	$\hat{V}_{zx} = V_{10r}K$ (m/s)
2	11	0.98	21.6
4	13	1.19	26.2
6	15	1.31	28.8
8	17	1.40	30.8
10	19	1.46	32.1
15	24	1.59	35.0
20	29	1.68	37.0

8.2 Two Roughness Changes

The hourly-mean wind speed profile is required up to z = 70 m at a site near a lake in the outskirts of a small town, as illustrated in Sketch 8.2. In the most exposed direction the wind originates from open country terrain passing over the lake thus being affected by two roughness changes before arriving at the site. The appropriate reference wind speed is given in terms of the fastest mile of wind $(\hat{V}_f)$ which for this location is 90 mile/h at z_r = 10 m corresponding to z_{0r} = 0.03 m.



Sketch 8.2

Firstly, it is necessary to translate $\hat{V}_f$ into a corresponding hourly-mean value, V_{10r}. The averaging time of the gust corresponding to $\hat{V}_f$ = 90 mile/h is τ_f = 3600/90 = 40 s.

Using Equation (4.1) it follows that

$$V_{10r} = 90/[1 + 0.76 \exp(-0.08 \times 2.602^3 + 0.17 \times 2.602^2 - 0.3 \times 2.602)]$$
$$= 70.9 \text{ mile/h}$$
$$= 31.7 \text{ m/s corresponding to } z_r = 10 \text{ m and } z_{0r} = 0.03 \text{ m.}$$

The procedure in Section 7 will now be followed to calculate K factors for the site with two upwind roughness changes.

(1) z_0 = 0.1 m; z_{01} = 0.001 m; z_{02} = 0.03 m.

(2) Hourly-mean values required; τ = 3600 s.
For the first upwind roughness change z_{01} to z_0, and for x = 0.3 km, from Table 10.18, K_a (at z = 10 m) = 1.15.
For the second upwind roughness change z_{02} to z_{01}, and for x = 0.7 + 0.3 = 1.0 km, from Table 10.31, K_b (at z = 10 m) = 1.11.

(3) Values of K_∞ ($x > 600$ km) at z = 10 m and τ = 3600 s.
For z_0 = 0.1 m, z = 10 m, $K_{\infty a}$ = 0.87 (Table 10.18).
For z_0 = 0.001 m, z = 10 m, $K_{\infty b}$ = 1.30 (Table 10.31).

(4) $\hat{K}_x$ = K(step 2)/K_∞(step 3).
$\hat{K}_{xa}$ = 1.15/0.87 = 1.32.
$\hat{K}_{xb}$ = 1.11/1.30 = 0.85.

(5) $K_a = \hat{K}_{xa}\hat{K}_{xb}K_\infty$; $0 < z < \hat{h}_a$, see Sketch 7.2
$K_b = \hat{K}_{xb}K_{\infty b}$; $\hat{h}_a < z < \hat{h}_b$.
$K_c = K_{\infty c}$; $\hat{h}_b < z$
τ = 3600 s

z (m)	$K_{\infty a}$ z_0 = 0.1 m Table 10.18	$K_{\infty b}$ z_0 = 0.001 m Table 10.31	$K_{\infty c}$ z_0 = 0.03 m Table 10.21	K_a	K_b	K_c	Actual K at site
4	0.69	1.17		0.77			0.77
10	0.87	1.30		0.98			0.98
20	1.00	1.40	1.13	1.12	1.24	1.13	1.12
30	1.08	1.46	1.20	1.21	1.28	1.20	1.21
40	1.14	1.50	1.25	1.28	1.31	1.25	1.28
50	1.18	1.54	1.30	1.32	1.33	1.30	1.31
60		1.57	1.33		1.35	1.33	1.33
70		1.59	1.36			1.36	1.36

The actual hourly-mean wind speed profile is then given by the values of K in the final column of the preceding Table multiplied by the reference wind speed, V_{10r} = 31.7 m/s.

9. REFERENCES

1. ESDU — Strong winds in the atmospheric boundary layer. Part 1: mean-hourly wind speeds. Item No. 82026, ESDU International, London, 1982.

2. ESDU — Strong winds in the atmospheric boundary layer. Part 2: discrete gust speeds. Item No. 83045, ESDU International, London, 1983.

3. ESDU — Mean wind speeds over hills and other topography. Item No. 91043, ESDU International, 1991.

4. ESDU — Computer program for wind speeds and turbulence properties: flat or hilly sites in terrain with roughness changes. Item No. 92032 and ESDUpac program A9232 (on disk in Vol. S/W1), ESDU International, London, 1992.

10. TABLES OF WIND SPEED PROFILE FACTORS

Values of the *K*-factor, describing the variation of wind speed with height, are provided in Tables 10.2 to 10.31 for gust durations (τ) of l, 3, 10, 30 and 60 s and for the hourly-mean wind speed (τ = 3600 s). The Tables on each page apply for a particular site roughness with a specified roughness change at a distance *x* upwind. An index to the Table numbers for the cases covered is provided in Table 10.1.

Values of *K* at intermediate values of *x* and τ can be obtained to a sufficiently close approximation by linear interpolation with respect to log *x* and log τ.

TABLE 10.1

	Site z_0 (m)						
Upwind z_{01} (m)	0.7	0.3	0.1	0.03	0.01	0.003	0.001
0.7	*	10.7	10.13	10.19			
0.3	10.2	*	10.14	10.20	10.25	10.28	
0.1	10.3	10.8	*	10.21	10.26		10.30
0.03	10.4	10.9	10.15	*	10.27	10.29	10.31
0.01	10.5	10.10	10.16	10.22	*		
0.003	10.6	10.11	10.17	10.23		*	
0.001		10.12	10.18	10.24			*

* For the cases marked with an asterisk in Table 10.1 there are no roughness changes. Values of *K* for these cases are given in the Table indicated under the column headed $x > 600$ km for the site roughness in question.

TABLE 10.2 *K*-factors for Site Roughness z_0 = 0.7 m and Upwind Roughness z_{01} = 0.3 m

τ = 1 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.82	0.81	0.80	0.79	0.79	0.78	0.77
4	1.04	1.03	1.01	1.00	1.00	0.99	0.98
6	1.17	1.16	1.14	1.13	1.12	1.11	1.10
8	1.26	1.25	1.23	1.22	1.21	1.20	1.19
10	1.33	1.32	1.30	1.29	1.28	1.27	1.26
15	1.46	1.45	1.43	1.41	1.40	1.39	1.38
20	1.56	1.54	1.52	1.50	1.49	1.48	1.47
30	1.67	1.67	1.64	1.63	1.61	1.60	1.59
40	1.75	1.75	1.73	1.72	1.70	1.69	1.68
50	1.81	1.81	1.80	1.78	1.77	1.76	1.74
60	1.86	1.86	1.86	1.84	1.82	1.81	1.80
70	1.90	1.90	1.90	1.89	1.87	1.86	1.84
80	1.93	1.93	1.93	1.93	1.91	1.90	1.88
90	1.96	1.96	1.96	1.96	1.94	1.93	1.91
100	1.99	1.99	1.99	1.99	1.97	1.96	1.94
120	2.03	2.03	2.03	2.03	2.02	2.01	1.99
140	2.06	2.06	2.06	2.06	2.06	2.05	2.04
160	2.09	2.09	2.09	2.09	2.09	2.09	2.07
180	2.12	2.12	2.12	2.12	2.12	2.12	2.10
200	2.14	2.14	2.14	2.14	2.14	2.14	2.13
250	2.19	2.19	2.19	2.19	2.19	2.19	2.18
300	2.23	2.23	2.23	2.23	2.23	2.23	2.23
350	2.26	2.26	2.26	2.26	2.26	2.26	2.26
400	2.29	2.29	2.29	2.29	2.29	2.29	2.29

τ = 3 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.76	0.75	0.74	0.73	0.72	0.72	0.71
4	0.97	0.96	0.95	0.94	0.93	0.92	0.91
6	1.10	1.08	1.07	1.06	1.05	1.04	1.03
8	1.19	1.17	1.16	1.14	1.13	1.12	1.12
10	1.26	1.24	1.22	1.21	1.20	1.19	1.18
15	1.39	1.37	1.35	1.33	1.32	1.31	1.30
20	1.48	1.45	1.43	1.42	1.41	1.40	1.38
30	1.59	1.58	1.56	1.54	1.53	1.52	1.50
40	1.67	1.67	1.65	1.63	1.61	1.60	1.59
50	1.73	1.73	1.71	1.70	1.68	1.67	1.65
60	1.77	1.77	1.77	1.75	1.73	1.72	1.71
70	1.81	1.81	1.81	1.80	1.78	1.77	1.75
80	1.84	1.84	1.84	1.83	1.82	1.80	1.79
90	1.87	1.87	1.87	1.87	1.85	1.84	1.82
100	1.90	1.90	1.90	1.90	1.88	1.87	1.85
120	1.94	1.94	1.94	1.94	1.93	1.92	1.90
140	1.98	1.98	1.98	1.98	1.97	1.96	1.94
160	2.01	2.01	2.01	2.01	2.01	1.99	1.98
180	2.03	2.03	2.03	2.03	2.03	2.03	2.01
200	2.06	2.06	2.06	2.06	2.06	2.05	2.04
250	2.11	2.11	2.11	2.11	2.11	2.11	2.09
300	2.15	2.15	2.15	2.15	2.15	2.15	2.14
350	2.19	2.19	2.19	2.19	2.19	2.19	2.18
400	2.22	2.22	2.22	2.22	2.22	2.22	2.21

τ = 10 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.66	0.65	0.64	0.63	0.62	0.62	0.61
4	0.86	0.85	0.84	0.83	0.82	0.81	0.80
6	0.98	0.97	0.95	0.94	0.93	0.92	0.92
8	1.07	1.05	1.04	1.02	1.01	1.01	1.00
10	1.14	1.12	1.10	1.09	1.08	1.07	1.06
15	1.26	1.24	1.22	1.20	1.19	1.18	1.17
20	1.34	1.32	1.30	1.29	1.27	1.26	1.25
30	1.46	1.44	1.42	1.40	1.39	1.38	1.37
40	1.53	1.53	1.51	1.49	1.47	1.46	1.45
50	1.59	1.59	1.57	1.55	1.54	1.52	1.51
60	1.63	1.63	1.62	1.60	1.59	1.57	1.56
70	1.67	1.67	1.67	1.65	1.63	1.62	1.60
80	1.71	1.71	1.71	1.69	1.67	1.66	1.64
90	1.73	1.73	1.73	1.72	1.70	1.69	1.67
100	1.76	1.76	1.76	1.75	1.73	1.72	1.70
120	1.80	1.80	1.80	1.80	1.78	1.77	1.75
140	1.84	1.84	1.84	1.84	1.82	1.81	1.79
160	1.87	1.87	1.87	1.87	1.86	1.85	1.83
180	1.90	1.90	1.90	1.90	1.89	1.88	1.86
200	1.92	1.92	1.92	1.92	1.92	1.91	1.89
250	1.98	1.98	1.98	1.98	1.98	1.97	1.95
300	2.02	2.02	2.02	2.02	2.02	2.01	2.00
350	2.06	2.06	2.06	2.06	2.06	2.06	2.04
400	2.10	2.10	2.10	2.10	2.10	2.10	2.08

τ = 30 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.54	0.53	0.52	0.52	0.51	0.50	0.50
4	0.74	0.72	0.71	0.70	0.69	0.69	0.68
6	0.85	0.84	0.82	0.81	0.80	0.79	0.78
8	0.93	0.92	0.90	0.89	0.88	0.87	0.86
10	1.00	0.98	0.96	0.95	0.93	0.93	0.92
15	1.11	1.09	1.07	1.06	1.04	1.03	1.02
20	1.20	1.17	1.15	1.14	1.12	1.11	1.10
30	1.31	1.29	1.26	1.25	1.23	1.22	1.21
40	1.38	1.37	1.34	1.33	1.31	1.30	1.28
50	1.43	1.43	1.41	1.39	1.37	1.36	1.34
60	1.48	1.48	1.46	1.44	1.42	1.41	1.39
70	1.51	1.51	1.50	1.48	1.46	1.45	1.43
80	1.54	1.54	1.54	1.52	1.50	1.48	1.47
90	1.57	1.57	1.57	1.55	1.53	1.52	1.50
100	1.60	1.60	1.60	1.58	1.56	1.54	1.53
120	1.64	1.64	1.64	1.63	1.61	1.59	1.58
140	1.68	1.68	1.68	1.67	1.65	1.64	1.62
160	1.71	1.71	1.71	1.71	1.69	1.67	1.65
180	1.74	1.74	1.74	1.74	1.72	1.71	1.69
200	1.77	1.77	1.77	1.77	1.75	1.73	1.71
250	1.82	1.82	1.82	1.82	1.81	1.80	1.78
300	1.87	1.87	1.87	1.87	1.87	1.85	1.83
350	1.91	1.91	1.91	1.91	1.91	1.90	1.87
400	1.95	1.95	1.95	1.95	1.95	1.94	1.92

τ = 60 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.47	0.46	0.45	0.44	0.43	0.43	0.42
4	0.66	0.64	0.63	0.62	0.61	0.60	0.60
6	0.77	0.75	0.74	0.72	0.71	0.71	0.70
8	0.85	0.83	0.81	0.80	0.79	0.78	0.77
10	0.91	0.89	0.87	0.86	0.84	0.84	0.82
15	1.02	1.00	0.98	0.96	0.95	0.94	0.93
20	1.10	1.08	1.06	1.04	1.02	1.01	1.00
30	1.21	1.19	1.16	1.15	1.13	1.12	1.10
40	1.28	1.27	1.24	1.22	1.20	1.19	1.18
50	1.33	1.33	1.30	1.28	1.26	1.25	1.23
60	1.37	1.37	1.35	1.33	1.31	1.30	1.28
70	1.41	1.41	1.40	1.37	1.35	1.34	1.32
80	1.44	1.44	1.43	1.41	1.39	1.37	1.36
90	1.47	1.47	1.47	1.44	1.42	1.41	1.39
100	1.49	1.49	1.49	1.47	1.45	1.43	1.42
120	1.54	1.54	1.54	1.52	1.50	1.48	1.46
140	1.58	1.58	1.58	1.56	1.54	1.53	1.51
160	1.61	1.61	1.61	1.60	1.58	1.56	1.54
180	1.64	1.64	1.64	1.64	1.61	1.60	1.57
200	1.67	1.67	1.67	1.67	1.64	1.62	1.60
250	1.73	1.73	1.73	1.73	1.71	1.69	1.67
300	1.78	1.78	1.78	1.78	1.76	1.74	1.72
350	1.82	1.82	1.82	1.82	1.81	1.79	1.77
400	1.86	1.86	1.86	1.86	1.86	1.84	1.81

Mean-hourly (τ = 3600 s)

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.26	0.25	0.25	0.24	0.24	0.23	0.23
4	0.44	0.42	0.41	0.40	0.39	0.39	0.38
6	0.54	0.52	0.51	0.50	0.49	0.48	0.47
8	0.61	0.59	0.58	0.56	0.55	0.54	0.53
10	0.67	0.65	0.63	0.62	0.60	0.59	0.58
15	0.77	0.75	0.73	0.71	0.70	0.69	0.67
20	0.84	0.82	0.80	0.78	0.76	0.75	0.74
30	0.95	0.92	0.90	0.88	0.86	0.85	0.83
40	1.01	1.00	0.97	0.95	0.93	0.91	0.90
50	1.06	1.05	1.02	1.00	0.98	0.97	0.95
60	1.10	1.10	1.07	1.05	1.03	1.01	0.99
70	1.14	1.14	1.11	1.09	1.07	1.05	1.03
80	1.17	1.17	1.15	1.12	1.10	1.08	1.06
90	1.20	1.20	1.18	1.15	1.13	1.11	1.09
100	1.22	1.22	1.21	1.18	1.16	1.14	1.12
120	1.27	1.27	1.26	1.23	1.21	1.19	1.17
140	1.31	1.31	1.31	1.28	1.25	1.23	1.21
160	1.34	1.34	1.34	1.32	1.29	1.27	1.25
180	1.37	1.37	1.37	1.35	1.32	1.30	1.28
200	1.40	1.40	1.40	1.38	1.36	1.34	1.31
250	1.47	1.47	1.47	1.46	1.43	1.41	1.38
300	1.52	1.52	1.52	1.52	1.49	1.47	1.44
350	1.57	1.57	1.57	1.57	1.54	1.52	1.49
400	1.62	1.62	1.62	1.62	1.59	1.57	1.54

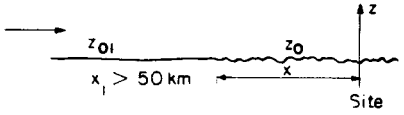


TABLE 10.3 *K*-factors for Site Roughness z_0 = 0.7 m and Upwind Roughness z_{01} = 0.1 m

τ = 1 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.87	0.85	0.83	0.81	0.80	0.79	0.77
4	1.10	1.08	1.05	1.03	1.01	1.00	0.98
6	1.24	1.21	1.18	1.16	1.14	1.12	1.10
8	1.34	1.30	1.27	1.25	1.22	1.21	1.19
10	1.41	1.38	1.34	1.32	1.29	1.28	1.26
15	1.55	1.51	1.48	1.45	1.42	1.40	1.38
20	1.65	1.61	1.57	1.54	1.51	1.49	1.47
30	1.77	1.74	1.70	1.67	1.64	1.62	1.59
40	1.83	1.83	1.79	1.76	1.73	1.70	1.68
50	1.88	1.88	1.86	1.83	1.79	1.77	1.74
60	1.92	1.92	1.92	1.88	1.85	1.83	1.80
70	1.96	1.96	1.96	1.93	1.90	1.87	1.84
80	1.98	1.98	1.98	1.97	1.94	1.91	1.88
90	2.01	2.01	2.01	2.01	1.97	1.95	1.91
100	2.03	2.03	2.03	2.03	2.00	1.98	1.94
120	2.06	2.06	2.06	2.06	2.05	2.03	1.99
140	2.09	2.09	2.09	2.09	2.09	2.07	2.04
160	2.12	2.12	2.12	2.12	2.12	2.10	2.07
180	2.14	2.14	2.14	2.14	2.14	2.14	2.10
200	2.16	2.16	2.16	2.16	2.16	2.16	2.13
250	2.20	2.20	2.20	2.20	2.20	2.20	2.18
300	2.23	2.23	2.23	2.23	2.23	2.23	2.23
350	2.26	2.26	2.26	2.26	2.26	2.26	2.26
400	2.29	2.29	2.29	2.29	2.29	2.29	2.29

τ = 3 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.81	0.79	0.77	0.75	0.74	0.73	0.71
4	1.04	1.01	0.98	0.96	0.94	0.93	0.91
6	1.17	1.14	1.11	1.08	1.06	1.05	1.03
8	1.26	1.23	1.20	1.17	1.15	1.13	1.12
10	1.34	1.30	1.27	1.24	1.22	1.20	1.18
15	1.47	1.43	1.40	1.37	1.34	1.32	1.30
20	1.57	1.53	1.49	1.46	1.43	1.41	1.38
30	1.69	1.66	1.62	1.58	1.55	1.53	1.50
40	1.75	1.75	1.71	1.67	1.64	1.62	1.59
50	1.80	1.80	1.78	1.74	1.71	1.68	1.65
60	1.84	1.84	1.83	1.79	1.76	1.74	1.71
70	1.88	1.88	1.88	1.84	1.81	1.78	1.75
80	1.90	1.90	1.90	1.88	1.85	1.82	1.79
90	1.93	1.93	1.93	1.92	1.88	1.85	1.82
100	1.95	1.95	1.95	1.95	1.91	1.88	1.85
120	1.98	1.98	1.98	1.98	1.96	1.93	1.90
140	2.01	2.01	2.01	2.01	2.00	1.98	1.94
160	2.04	2.04	2.04	2.04	2.04	2.01	1.98
180	2.06	2.06	2.06	2.06	2.06	2.04	2.01
200	2.08	2.08	2.08	2.08	2.08	2.07	2.04
250	2.12	2.12	2.12	2.12	2.12	2.12	2.09
300	2.16	2.16	2.16	2.16	2.16	2.16	2.14
350	2.19	2.19	2.19	2.19	2.19	2.19	2.18
400	2.22	2.22	2.22	2.22	2.22	2.22	2.21

τ = 10 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.71	0.69	0.67	0.65	0.64	0.63	0.61
4	0.93	0.90	0.87	0.85	0.83	0.82	0.80
6	1.05	1.02	0.99	0.97	0.95	0.93	0.92
8	1.15	1.11	1.08	1.05	1.03	1.02	1.00
10	1.22	1.18	1.15	1.12	1.10	1.08	1.06
15	1.35	1.31	1.27	1.24	1.21	1.19	1.17
20	1.44	1.40	1.36	1.32	1.30	1.28	1.25
30	1.56	1.52	1.48	1.45	1.41	1.39	1.37
40	1.63	1.62	1.57	1.53	1.50	1.47	1.45
50	1.68	1.68	1.64	1.60	1.56	1.54	1.51
60	1.72	1.72	1.69	1.65	1.62	1.59	1.56
70	1.75	1.75	1.74	1.70	1.66	1.63	1.60
80	1.78	1.78	1.78	1.74	1.70	1.67	1.64
90	1.80	1.80	1.80	1.77	1.73	1.70	1.67
100	1.82	1.82	1.82	1.80	1.76	1.73	1.70
120	1.86	1.86	1.86	1.85	1.81	1.78	1.75
140	1.89	1.89	1.89	1.89	1.86	1.83	1.79
160	1.92	1.92	1.92	1.92	1.89	1.86	1.83
180	1.94	1.94	1.94	1.94	1.93	1.90	1.86
200	1.96	1.96	1.96	1.96	1.95	1.92	1.89
250	2.01	2.01	2.01	2.01	2.01	1.98	1.95
300	2.05	2.05	2.05	2.05	2.05	2.03	2.00
350	2.09	2.09	2.09	2.09	2.09	2.08	2.04
400	2.12	2.12	2.12	2.12	2.12	2.12	2.08

τ = 30 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.59	0.57	0.55	0.53	0.52	0.51	0.50
4	0.80	0.77	0.75	0.72	0.71	0.69	0.68
6	0.92	0.89	0.86	0.84	0.82	0.80	0.78
8	1.01	0.98	0.94	0.92	0.89	0.88	0.86
10	1.08	1.04	1.01	0.98	0.95	0.94	0.92
15	1.21	1.16	1.12	1.09	1.07	1.05	1.02
20	1.30	1.25	1.21	1.17	1.14	1.12	1.10
30	1.42	1.37	1.33	1.29	1.26	1.23	1.21
40	1.48	1.46	1.41	1.37	1.34	1.31	1.28
50	1.53	1.53	1.48	1.43	1.40	1.37	1.34
60	1.57	1.57	1.53	1.49	1.45	1.42	1.39
70	1.60	1.60	1.57	1.53	1.49	1.46	1.43
80	1.63	1.63	1.61	1.57	1.53	1.50	1.47
90	1.65	1.65	1.65	1.60	1.56	1.53	1.50
100	1.68	1.68	1.68	1.63	1.59	1.56	1.53
120	1.71	1.71	1.71	1.69	1.64	1.61	1.58
140	1.75	1.75	1.75	1.73	1.69	1.66	1.62
160	1.78	1.78	1.78	1.77	1.72	1.69	1.65
180	1.80	1.80	1.80	1.80	1.76	1.73	1.69
200	1.82	1.82	1.82	1.82	1.79	1.75	1.71
250	1.88	1.88	1.88	1.88	1.85	1.82	1.78
300	1.92	1.92	1.92	1.92	1.91	1.87	1.83
350	1.96	1.96	1.96	1.96	1.95	1.92	1.87
400	2.00	2.00	2.00	2.00	2.00	1.96	1.92

τ = 60 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.51	0.49	0.47	0.46	0.45	0.44	0.42
4	0.72	0.69	0.66	0.64	0.63	0.61	0.60
6	0.84	0.81	0.78	0.75	0.73	0.72	0.70
8	0.93	0.89	0.86	0.83	0.81	0.79	0.77
10	0.99	0.95	0.92	0.89	0.86	0.85	0.82
15	1.12	1.07	1.03	1.00	0.97	0.95	0.93
20	1.20	1.16	1.11	1.08	1.05	1.03	1.00
30	1.33	1.28	1.23	1.19	1.16	1.13	1.10
40	1.39	1.36	1.31	1.27	1.23	1.21	1.18
50	1.43	1.43	1.37	1.33	1.29	1.27	1.23
60	1.47	1.47	1.43	1.38	1.34	1.32	1.28
70	1.51	1.51	1.47	1.43	1.39	1.36	1.32
80	1.53	1.53	1.51	1.46	1.42	1.39	1.36
90	1.56	1.56	1.55	1.50	1.46	1.42	1.39
100	1.58	1.58	1.58	1.53	1.48	1.45	1.42
120	1.62	1.62	1.62	1.58	1.54	1.50	1.46
140	1.65	1.65	1.65	1.63	1.58	1.55	1.51
160	1.68	1.68	1.68	1.66	1.62	1.58	1.54
180	1.71	1.71	1.71	1.70	1.65	1.62	1.57
200	1.74	1.74	1.74	1.73	1.68	1.65	1.60
250	1.79	1.79	1.79	1.79	1.75	1.71	1.67
300	1.84	1.84	1.84	1.84	1.81	1.77	1.72
350	1.88	1.88	1.88	1.88	1.86	1.82	1.77
400	1.92	1.92	1.92	1.92	1.90	1.86	1.81

Mean-hourly (τ = 3600 s)

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.30	0.28	0.27	0.26	0.25	0.24	0.23
4	0.49	0.47	0.44	0.42	0.41	0.40	0.38
6	0.61	0.58	0.55	0.52	0.50	0.49	0.47
8	0.69	0.65	0.62	0.59	0.57	0.55	0.53
10	0.75	0.71	0.68	0.65	0.62	0.61	0.58
15	0.87	0.82	0.78	0.75	0.72	0.70	0.67
20	0.95	0.90	0.86	0.82	0.79	0.77	0.74
30	1.07	1.02	0.96	0.92	0.89	0.86	0.83
40	1.14	1.10	1.04	1.00	0.96	0.93	0.90
50	1.18	1.16	1.10	1.06	1.01	0.99	0.95
60	1.22	1.21	1.15	1.10	1.06	1.03	0.99
70	1.25	1.25	1.20	1.15	1.10	1.07	1.03
80	1.28	1.28	1.23	1.18	1.14	1.10	1.06
90	1.31	1.31	1.27	1.22	1.17	1.13	1.09
100	1.33	1.33	1.30	1.25	1.20	1.16	1.12
120	1.37	1.37	1.36	1.30	1.25	1.21	1.17
140	1.41	1.41	1.40	1.35	1.29	1.26	1.21
160	1.44	1.44	1.44	1.39	1.33	1.29	1.25
180	1.47	1.47	1.47	1.42	1.37	1.33	1.28
200	1.50	1.50	1.50	1.46	1.40	1.36	1.31
250	1.56	1.56	1.56	1.53	1.47	1.43	1.38
300	1.62	1.62	1.62	1.60	1.54	1.49	1.44
350	1.67	1.67	1.67	1.66	1.60	1.55	1.49
400	1.71	1.71	1.71	1.71	1.65	1.60	1.54

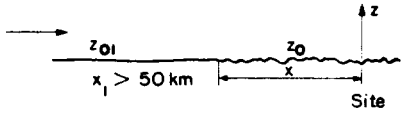


TABLE 10.4 *K*-factors for Site Roughness z_0 = 0.7 m and Upwind Roughness z_{01} = 0.03 m

τ = 1 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.92	0.89	0.86	0.83	0.81	0.79	0.77
4	1.17	1.12	1.08	1.05	1.03	1.01	0.98
6	1.31	1.26	1.22	1.18	1.15	1.13	1.10
8	1.41	1.36	1.31	1.28	1.24	1.22	1.19
10	1.49	1.44	1.39	1.35	1.31	1.29	1.26
15	1.64	1.58	1.52	1.48	1.44	1.41	1.38
20	1.74	1.68	1.62	1.57	1.53	1.50	1.47
30	1.85	1.82	1.76	1.71	1.66	1.63	1.59
40	1.90	1.90	1.85	1.80	1.75	1.72	1.68
50	1.94	1.94	1.93	1.87	1.82	1.79	1.74
60	1.98	1.98	1.98	1.93	1.88	1.84	1.80
70	2.00	2.00	2.00	1.98	1.92	1.89	1.84
80	2.03	2.03	2.03	2.02	1.97	1.93	1.88
90	2.05	2.05	2.05	2.05	2.00	1.96	1.91
100	2.06	2.06	2.06	2.06	2.03	1.99	1.94
120	2.09	2.09	2.09	2.09	2.08	2.04	1.99
140	2.11	2.11	2.11	2.11	2.11	2.09	2.04
160	2.13	2.13	2.13	2.13	2.13	2.12	2.07
180	2.15	2.15	2.15	2.15	2.15	2.15	2.10
200	2.17	2.17	2.17	2.17	2.17	2.17	2.13
250	2.20	2.20	2.20	2.20	2.20	2.20	2.18
300	2.23	2.23	2.23	2.23	2.23	2.23	2.23
350	2.26	2.26	2.26	2.26	2.26	2.26	2.26
400	2.29	2.29	2.29	2.29	2.29	2.29	2.29

τ = 3 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.86	0.82	0.79	0.77	0.75	0.73	0.71
4	1.10	1.06	1.02	0.98	0.96	0.94	0.91
6	1.24	1.19	1.15	1.11	1.08	1.06	1.03
8	1.34	1.29	1.24	1.20	1.17	1.14	1.12
10	1.42	1.36	1.31	1.27	1.24	1.21	1.18
15	1.56	1.50	1.44	1.40	1.36	1.33	1.30
20	1.66	1.60	1.54	1.49	1.45	1.42	1.38
30	1.77	1.74	1.67	1.62	1.58	1.54	1.50
40	1.83	1.83	1.77	1.71	1.66	1.63	1.59
50	1.87	1.87	1.84	1.78	1.73	1.70	1.65
60	1.90	1.90	1.90	1.84	1.79	1.75	1.71
70	1.93	1.93	1.93	1.89	1.83	1.80	1.75
80	1.95	1.95	1.95	1.93	1.87	1.84	1.79
90	1.97	1.97	1.97	1.96	1.91	1.87	1.82
100	1.99	1.99	1.99	1.99	1.94	1.90	1.85
120	2.02	2.02	2.02	2.02	1.99	1.95	1.90
140	2.05	2.05	2.05	2.05	2.04	1.99	1.94
160	2.07	2.07	2.07	2.07	2.07	2.03	1.98
180	2.09	2.09	2.09	2.09	2.09	2.06	2.01
200	2.10	2.10	2.10	2.10	2.10	2.09	2.04
250	2.14	2.14	2.14	2.14	2.14	2.14	2.09
300	2.17	2.17	2.17	2.17	2.17	2.17	2.14
350	2.20	2.20	2.20	2.20	2.20	2.20	2.18
400	2.23	2.23	2.23	2.23	2.23	2.23	2.21

τ = 10 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.75	0.72	0.69	0.67	0.65	0.63	0.61
4	0.99	0.95	0.91	0.88	0.85	0.83	0.80
6	1.12	1.08	1.03	1.00	0.97	0.94	0.92
8	1.22	1.17	1.12	1.08	1.05	1.03	1.00
10	1.30	1.24	1.19	1.15	1.12	1.09	1.06
15	1.44	1.38	1.32	1.27	1.23	1.21	1.17
20	1.54	1.47	1.41	1.36	1.32	1.29	1.25
30	1.65	1.61	1.54	1.49	1.44	1.41	1.37
40	1.71	1.70	1.63	1.57	1.52	1.49	1.45
50	1.75	1.75	1.70	1.64	1.59	1.55	1.51
60	1.79	1.79	1.76	1.70	1.64	1.61	1.56
70	1.81	1.81	1.81	1.74	1.69	1.65	1.60
80	1.84	1.84	1.84	1.78	1.73	1.69	1.64
90	1.86	1.86	1.86	1.82	1.76	1.72	1.67
100	1.88	1.88	1.88	1.85	1.79	1.75	1.70
120	1.91	1.91	1.91	1.91	1.85	1.80	1.75
140	1.94	1.94	1.94	1.94	1.89	1.85	1.79
160	1.96	1.96	1.96	1.96	1.93	1.88	1.83
180	1.98	1.98	1.98	1.98	1.96	1.91	1.86
200	2.00	2.00	2.00	2.00	1.99	1.94	1.89
250	2.04	2.04	2.04	2.04	2.04	2.00	1.95
300	2.08	2.08	2.08	2.08	2.08	2.05	2.00
350	2.11	2.11	2.11	2.11	2.11	2.10	2.04
400	2.14	2.14	2.14	2.14	2.14	2.14	2.08

τ = 30 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.63	0.60	0.57	0.55	0.53	0.52	0.50
4	0.86	0.82	0.78	0.75	0.72	0.70	0.68
6	0.99	0.95	0.90	0.86	0.83	0.81	0.78
8	1.09	1.04	0.99	0.95	0.91	0.89	0.86
10	1.16	1.11	1.05	1.01	0.97	0.95	0.92
15	1.30	1.24	1.18	1.13	1.09	1.06	1.02
20	1.40	1.33	1.26	1.21	1.17	1.14	1.10
30	1.52	1.46	1.39	1.33	1.28	1.25	1.21
40	1.57	1.55	1.47	1.42	1.36	1.33	1.28
50	1.62	1.62	1.54	1.48	1.43	1.39	1.34
60	1.65	1.65	1.60	1.54	1.48	1.44	1.39
70	1.68	1.68	1.65	1.58	1.52	1.48	1.43
80	1.70	1.70	1.69	1.62	1.56	1.52	1.47
90	1.73	1.73	1.72	1.66	1.60	1.55	1.50
100	1.75	1.75	1.75	1.69	1.63	1.58	1.53
120	1.78	1.78	1.78	1.74	1.68	1.63	1.58
140	1.81	1.81	1.81	1.79	1.72	1.67	1.62
160	1.83	1.83	1.83	1.83	1.76	1.71	1.65
180	1.86	1.86	1.86	1.86	1.79	1.75	1.69
200	1.88	1.88	1.88	1.88	1.82	1.78	1.71
250	1.92	1.92	1.92	1.92	1.89	1.84	1.78
300	1.97	1.97	1.97	1.97	1.95	1.89	1.83
350	2.00	2.00	2.00	2.00	2.00	1.94	1.87
400	2.04	2.04	2.04	2.04	2.04	1.98	1.92

τ = 60 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.56	0.53	0.50	0.48	0.46	0.44	0.42
4	0.78	0.74	0.70	0.67	0.64	0.62	0.60
6	0.91	0.86	0.82	0.78	0.75	0.72	0.70
8	1.01	0.95	0.90	0.86	0.82	0.80	0.77
10	1.08	1.02	0.97	0.92	0.88	0.86	0.82
15	1.21	1.15	1.08	1.04	0.99	0.96	0.93
20	1.31	1.24	1.17	1.12	1.07	1.04	1.00
30	1.43	1.36	1.29	1.23	1.18	1.15	1.10
40	1.49	1.46	1.38	1.32	1.26	1.22	1.18
50	1.53	1.53	1.45	1.38	1.32	1.28	1.23
60	1.56	1.56	1.50	1.43	1.38	1.33	1.28
70	1.59	1.59	1.55	1.48	1.42	1.37	1.32
80	1.62	1.62	1.59	1.52	1.46	1.41	1.36
90	1.64	1.64	1.63	1.55	1.49	1.44	1.39
100	1.66	1.66	1.66	1.58	1.52	1.47	1.42
120	1.70	1.70	1.70	1.64	1.57	1.52	1.46
140	1.73	1.73	1.73	1.69	1.62	1.57	1.51
160	1.75	1.75	1.75	1.73	1.65	1.60	1.54
180	1.78	1.78	1.78	1.76	1.69	1.64	1.57
200	1.80	1.80	1.80	1.80	1.72	1.67	1.60
250	1.85	1.85	1.85	1.85	1.79	1.73	1.67
300	1.89	1.89	1.89	1.89	1.85	1.79	1.72
350	1.93	1.93	1.93	1.93	1.90	1.84	1.77
400	1.97	1.97	1.97	1.97	1.95	1.89	1.81

Mean-hourly (τ = 3600 s)

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.33	0.31	0.28	0.27	0.25	0.24	0.23
4	0.55	0.51	0.47	0.45	0.42	0.40	0.38
6	0.67	0.63	0.58	0.55	0.52	0.50	0.47
8	0.77	0.71	0.66	0.62	0.59	0.56	0.53
10	0.84	0.78	0.72	0.68	0.64	0.62	0.58
15	0.97	0.90	0.84	0.79	0.74	0.71	0.67
20	1.06	0.99	0.92	0.86	0.81	0.78	0.74
30	1.19	1.11	1.03	0.97	0.92	0.88	0.83
40	1.25	1.20	1.11	1.05	0.99	0.95	0.90
50	1.30	1.27	1.18	1.11	1.05	1.00	0.95
60	1.33	1.33	1.23	1.16	1.10	1.05	0.99
70	1.36	1.36	1.28	1.20	1.14	1.09	1.03
80	1.39	1.39	1.32	1.24	1.17	1.12	1.06
90	1.41	1.41	1.36	1.28	1.21	1.16	1.09
100	1.44	1.44	1.39	1.31	1.24	1.18	1.12
120	1.48	1.48	1.45	1.37	1.29	1.23	1.17
140	1.51	1.51	1.50	1.41	1.33	1.28	1.21
160	1.54	1.54	1.54	1.46	1.38	1.32	1.25
180	1.57	1.57	1.57	1.50	1.41	1.35	1.28
200	1.60	1.60	1.60	1.53	1.45	1.39	1.31
250	1.65	1.65	1.65	1.61	1.52	1.46	1.38
300	1.70	1.70	1.70	1.68	1.59	1.52	1.44
350	1.75	1.75	1.75	1.74	1.65	1.58	1.49
400	1.79	1.79	1.79	1.79	1.70	1.63	1.54

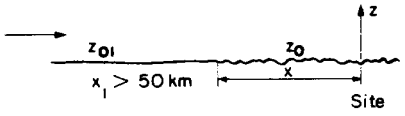


TABLE 10.5 *K*-factors for Site Roughness z_0 = 0.7 m and Upwind Roughness z_{01} = 0.01 m

τ = 1 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.96	0.92	0.88	0.85	0.82	0.80	0.77
4	1.22	1.17	1.11	1.07	1.04	1.01	0.98
6	1.37	1.31	1.25	1.21	1.17	1.14	1.10
8	1.48	1.41	1.35	1.30	1.26	1.23	1.19
10	1.56	1.49	1.43	1.38	1.33	1.30	1.26
15	1.72	1.64	1.57	1.51	1.46	1.42	1.38
20	1.82	1.74	1.66	1.60	1.55	1.51	1.47
30	1.90	1.89	1.80	1.74	1.68	1.64	1.59
40	1.95	1.95	1.90	1.83	1.77	1.73	1.68
50	1.99	1.99	1.98	1.91	1.84	1.80	1.74
60	2.02	2.02	2.02	1.97	1.90	1.85	1.80
70	2.04	2.04	2.04	2.02	1.95	1.90	1.84
80	2.06	2.06	2.06	2.06	1.99	1.94	1.88
90	2.07	2.07	2.07	2.07	2.02	1.98	1.91
100	2.09	2.09	2.09	2.09	2.06	2.01	1.94
120	2.11	2.11	2.11	2.11	2.11	2.06	1.99
140	2.13	2.13	2.13	2.13	2.13	2.10	2.04
160	2.15	2.15	2.15	2.15	2.15	2.14	2.07
180	2.16	2.16	2.16	2.16	2.16	2.16	2.10
200	2.18	2.18	2.18	2.18	2.18	2.18	2.13
250	2.21	2.21	2.21	2.21	2.21	2.21	2.18
300	2.24	2.24	2.24	2.24	2.24	2.24	2.23
350	2.26	2.26	2.26	2.26	2.26	2.26	2.26
400	2.29	2.29	2.29	2.29	2.29	2.29	2.29

τ = 3 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.90	0.86	0.82	0.78	0.76	0.74	0.71
4	1.15	1.10	1.05	1.01	0.97	0.94	0.91
6	1.30	1.24	1.18	1.14	1.09	1.07	1.03
8	1.40	1.34	1.28	1.23	1.18	1.15	1.12
10	1.49	1.42	1.35	1.30	1.25	1.22	1.18
15	1.64	1.56	1.49	1.43	1.38	1.34	1.30
20	1.74	1.66	1.58	1.52	1.47	1.43	1.38
30	1.84	1.80	1.72	1.65	1.60	1.55	1.50
40	1.88	1.88	1.82	1.75	1.69	1.64	1.59
50	1.92	1.92	1.89	1.82	1.76	1.71	1.65
60	1.95	1.95	1.95	1.88	1.81	1.76	1.71
70	1.97	1.97	1.97	1.93	1.86	1.81	1.75
80	1.99	1.99	1.99	1.97	1.90	1.85	1.79
90	2.01	2.01	2.01	2.00	1.93	1.88	1.82
100	2.02	2.02	2.02	2.02	1.96	1.91	1.85
120	2.05	2.05	2.05	2.05	2.02	1.97	1.90
140	2.07	2.07	2.07	2.07	2.06	2.01	1.94
160	2.09	2.09	2.09	2.09	2.09	2.04	1.98
180	2.10	2.10	2.10	2.10	2.10	2.08	2.01
200	2.12	2.12	2.12	2.12	2.12	2.10	2.04
250	2.15	2.15	2.15	2.15	2.15	2.15	2.09
300	2.18	2.18	2.18	2.18	2.18	2.18	2.14
350	2.21	2.21	2.21	2.21	2.21	2.21	2.18
400	2.24	2.24	2.24	2.24	2.24	2.24	2.21

τ = 10 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.79	0.75	0.71	0.68	0.66	0.64	0.61
4	1.04	0.99	0.94	0.90	0.86	0.83	0.80
6	1.19	1.12	1.07	1.02	0.98	0.95	0.92
8	1.29	1.22	1.16	1.11	1.07	1.03	1.00
10	1.37	1.30	1.23	1.18	1.13	1.10	1.06
15	1.52	1.44	1.36	1.30	1.25	1.22	1.17
20	1.62	1.54	1.46	1.39	1.34	1.30	1.25
30	1.72	1.68	1.59	1.52	1.46	1.42	1.37
40	1.77	1.77	1.68	1.61	1.55	1.50	1.45
50	1.81	1.81	1.75	1.68	1.61	1.57	1.51
60	1.84	1.84	1.81	1.74	1.67	1.62	1.56
70	1.86	1.86	1.86	1.79	1.71	1.66	1.60
80	1.89	1.89	1.89	1.83	1.75	1.70	1.64
90	1.90	1.90	1.90	1.86	1.79	1.74	1.67
100	1.92	1.92	1.92	1.89	1.82	1.77	1.70
120	1.95	1.95	1.95	1.95	1.87	1.82	1.75
140	1.97	1.97	1.97	1.97	1.92	1.86	1.79
160	1.99	1.99	1.99	1.99	1.96	1.90	1.83
180	2.01	2.01	2.01	2.01	1.99	1.93	1.86
200	2.03	2.03	2.03	2.03	2.02	1.96	1.89
250	2.06	2.06	2.06	2.06	2.06	2.02	1.95
300	2.10	2.10	2.10	2.10	2.10	2.07	2.00
350	2.13	2.13	2.13	2.13	2.13	2.12	2.04
400	2.16	2.16	2.16	2.16	2.16	2.16	2.08

τ = 30 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.67	0.63	0.60	0.57	0.54	0.52	0.50
4	0.91	0.86	0.81	0.77	0.73	0.71	0.68
6	1.06	0.99	0.93	0.89	0.85	0.82	0.78
8	1.16	1.09	1.02	0.97	0.93	0.90	0.86
10	1.24	1.16	1.09	1.04	0.99	0.96	0.92
15	1.38	1.30	1.22	1.16	1.11	1.07	1.02
20	1.48	1.39	1.31	1.25	1.19	1.15	1.10
30	1.60	1.53	1.44	1.37	1.31	1.26	1.21
40	1.65	1.63	1.53	1.46	1.39	1.34	1.28
50	1.68	1.68	1.60	1.52	1.45	1.40	1.34
60	1.71	1.71	1.66	1.58	1.51	1.45	1.39
70	1.74	1.74	1.71	1.63	1.55	1.50	1.43
80	1.76	1.76	1.75	1.67	1.59	1.53	1.47
90	1.78	1.78	1.78	1.70	1.62	1.57	1.50
100	1.80	1.80	1.80	1.73	1.65	1.60	1.53
120	1.83	1.83	1.83	1.79	1.71	1.65	1.58
140	1.86	1.86	1.86	1.84	1.75	1.69	1.62
160	1.88	1.88	1.88	1.88	1.79	1.73	1.65
180	1.90	1.90	1.90	1.90	1.83	1.76	1.69
200	1.92	1.92	1.92	1.92	1.86	1.79	1.71
250	1.96	1.96	1.96	1.96	1.92	1.86	1.78
300	2.00	2.00	2.00	2.00	1.98	1.91	1.83
350	2.04	2.04	2.04	2.04	2.03	1.96	1.87
400	2.07	2.07	2.07	2.07	2.07	2.00	1.92

τ = 60 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.59	0.56	0.52	0.49	0.46	0.45	0.42
4	0.83	0.78	0.73	0.69	0.65	0.63	0.60
6	0.97	0.91	0.85	0.80	0.76	0.73	0.70
8	1.07	1.00	0.94	0.89	0.84	0.81	0.77
10	1.15	1.08	1.01	0.95	0.90	0.87	0.82
15	1.29	1.21	1.13	1.07	1.01	0.97	0.93
20	1.40	1.31	1.22	1.15	1.09	1.05	1.00
30	1.51	1.44	1.35	1.27	1.21	1.16	1.10
40	1.56	1.54	1.44	1.36	1.29	1.24	1.18
50	1.60	1.60	1.51	1.42	1.35	1.30	1.23
60	1.63	1.63	1.56	1.48	1.40	1.35	1.28
70	1.66	1.66	1.61	1.53	1.45	1.39	1.32
80	1.68	1.68	1.66	1.57	1.48	1.43	1.36
90	1.70	1.70	1.69	1.60	1.52	1.46	1.39
100	1.72	1.72	1.72	1.63	1.55	1.49	1.42
120	1.75	1.75	1.75	1.69	1.60	1.54	1.46
140	1.78	1.78	1.78	1.74	1.65	1.58	1.51
160	1.81	1.81	1.81	1.78	1.69	1.62	1.54
180	1.83	1.83	1.83	1.82	1.72	1.66	1.57
200	1.85	1.85	1.85	1.85	1.76	1.69	1.60
250	1.90	1.90	1.90	1.90	1.83	1.75	1.67
300	1.94	1.94	1.94	1.94	1.88	1.81	1.72
350	1.98	1.98	1.98	1.98	1.94	1.86	1.77
400	2.01	2.01	2.01	2.01	1.98	1.91	1.81

Mean-hourly (τ = 3600 s)

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.36	0.33	0.30	0.28	0.26	0.25	0.23
4	0.60	0.55	0.50	0.46	0.43	0.41	0.38
6	0.73	0.67	0.62	0.57	0.53	0.50	0.47
8	0.83	0.76	0.70	0.65	0.60	0.57	0.53
10	0.91	0.84	0.76	0.71	0.66	0.63	0.58
15	1.05	0.97	0.88	0.82	0.76	0.72	0.67
20	1.15	1.06	0.97	0.90	0.84	0.79	0.74
30	1.30	1.19	1.09	1.01	0.94	0.89	0.83
40	1.35	1.29	1.18	1.09	1.02	0.96	0.90
50	1.39	1.36	1.25	1.16	1.08	1.02	0.95
60	1.42	1.42	1.30	1.21	1.13	1.07	0.99
70	1.45	1.45	1.35	1.26	1.17	1.11	1.03
80	1.47	1.47	1.40	1.30	1.21	1.14	1.06
90	1.50	1.50	1.43	1.33	1.24	1.17	1.09
100	1.52	1.52	1.47	1.36	1.27	1.20	1.12
120	1.55	1.55	1.53	1.42	1.32	1.25	1.17
140	1.59	1.59	1.59	1.47	1.37	1.30	1.21
160	1.62	1.62	1.62	1.52	1.41	1.34	1.25
180	1.64	1.64	1.64	1.56	1.45	1.37	1.28
200	1.67	1.67	1.67	1.60	1.49	1.41	1.31
250	1.72	1.72	1.72	1.68	1.56	1.48	1.38
300	1.77	1.77	1.77	1.75	1.63	1.54	1.44
350	1.82	1.82	1.82	1.82	1.69	1.60	1.49
400	1.86	1.86	1.86	1.86	1.75	1.65	1.54

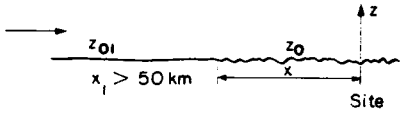


TABLE 10.6 *K*-factors for Site Roughness z_0 = 0.7 m and Upwind Roughness z_{01} = 0.003 m

τ = 1 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.01	0.95	0.90	0.86	0.83	0.80	0.77
4	1.28	1.21	1.15	1.10	1.05	1.02	0.98
6	1.43	1.36	1.29	1.23	1.18	1.15	1.10
8	1.55	1.47	1.39	1.33	1.27	1.24	1.19
10	1.63	1.55	1.47	1.40	1.35	1.31	1.26
15	1.79	1.70	1.61	1.54	1.48	1.43	1.38
20	1.89	1.81	1.71	1.64	1.57	1.52	1.47
30	1.96	1.96	1.86	1.77	1.70	1.65	1.59
40	2.00	2.00	1.96	1.87	1.80	1.74	1.68
50	2.03	2.03	2.03	1.95	1.87	1.81	1.74
60	2.05	2.05	2.05	2.01	1.93	1.87	1.80
70	2.07	2.07	2.07	2.06	1.97	1.91	1.84
80	2.09	2.09	2.09	2.09	2.02	1.95	1.88
90	2.10	2.10	2.10	2.10	2.05	1.99	1.91
100	2.11	2.11	2.11	2.11	2.08	2.02	1.94
120	2.13	2.13	2.13	2.13	2.13	2.07	1.99
140	2.15	2.15	2.15	2.15	2.15	2.12	2.04
160	2.16	2.16	2.16	2.16	2.16	2.15	2.07
180	2.17	2.17	2.17	2.17	2.17	2.17	2.10
200	2.19	2.19	2.19	2.19	2.19	2.19	2.13
250	2.21	2.21	2.21	2.21	2.21	2.21	2.18
300	2.24	2.24	2.24	2.24	2.24	2.24	2.23
350	2.27	2.27	2.27	2.27	2.27	2.27	2.27
400	2.29	2.29	2.29	2.29	2.29	2.29	2.29

τ = 3 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.94	0.89	0.84	0.80	0.77	0.74	0.71
4	1.21	1.14	1.08	1.03	0.98	0.95	0.91
6	1.36	1.29	1.21	1.16	1.11	1.07	1.03
8	1.47	1.39	1.31	1.25	1.20	1.16	1.12
10	1.56	1.47	1.39	1.33	1.27	1.23	1.18
15	1.72	1.62	1.53	1.46	1.40	1.35	1.30
20	1.83	1.73	1.63	1.56	1.49	1.44	1.38
30	1.89	1.88	1.77	1.69	1.62	1.57	1.50
40	1.93	1.93	1.87	1.79	1.71	1.65	1.59
50	1.97	1.97	1.95	1.86	1.78	1.72	1.65
60	1.99	1.99	1.99	1.92	1.84	1.78	1.71
70	2.01	2.01	2.01	1.97	1.88	1.82	1.75
80	2.03	2.03	2.03	2.01	1.92	1.86	1.79
90	2.04	2.04	2.04	2.04	1.96	1.90	1.82
100	2.05	2.05	2.05	2.05	1.99	1.93	1.85
120	2.07	2.07	2.07	2.07	2.05	1.98	1.90
140	2.09	2.09	2.09	2.09	2.09	2.02	1.94
160	2.11	2.11	2.11	2.11	2.11	2.06	1.98
180	2.12	2.12	2.12	2.12	2.12	2.09	2.01
200	2.13	2.13	2.13	2.13	2.13	2.12	2.04
250	2.17	2.17	2.17	2.17	2.17	2.17	2.09
300	2.20	2.20	2.20	2.20	2.20	2.20	2.14
350	2.22	2.22	2.22	2.22	2.22	2.22	2.18
400	2.25	2.25	2.25	2.25	2.25	2.25	2.21

τ = 10 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.84	0.79	0.74	0.70	0.67	0.64	0.61
4	1.10	1.03	0.97	0.92	0.87	0.84	0.80
6	1.25	1.17	1.10	1.05	1.00	0.96	0.92
8	1.36	1.28	1.20	1.14	1.08	1.04	1.00
10	1.44	1.35	1.27	1.21	1.15	1.11	1.06
15	1.60	1.50	1.41	1.34	1.27	1.23	1.17
20	1.71	1.60	1.50	1.43	1.36	1.31	1.25
30	1.79	1.75	1.64	1.56	1.48	1.43	1.37
40	1.83	1.83	1.74	1.65	1.57	1.51	1.45
50	1.86	1.86	1.81	1.72	1.64	1.58	1.51
60	1.89	1.89	1.87	1.78	1.69	1.63	1.56
70	1.91	1.91	1.91	1.83	1.74	1.68	1.60
80	1.93	1.93	1.93	1.87	1.78	1.72	1.64
90	1.94	1.94	1.94	1.91	1.82	1.75	1.67
100	1.96	1.96	1.96	1.94	1.85	1.78	1.70
120	1.98	1.98	1.98	1.98	1.90	1.83	1.75
140	2.00	2.00	2.00	2.00	1.95	1.88	1.79
160	2.02	2.02	2.02	2.02	1.99	1.91	1.83
180	2.04	2.04	2.04	2.04	2.02	1.95	1.86
200	2.05	2.05	2.05	2.05	2.05	1.98	1.89
250	2.09	2.09	2.09	2.09	2.09	2.04	1.95
300	2.12	2.12	2.12	2.12	2.12	2.09	2.00
350	2.15	2.15	2.15	2.15	2.15	2.13	2.04
400	2.18	2.18	2.18	2.18	2.18	2.17	2.08

τ = 30 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.71	0.66	0.62	0.58	0.55	0.53	0.50
4	0.97	0.90	0.84	0.79	0.75	0.72	0.68
6	1.12	1.04	0.97	0.91	0.86	0.83	0.78
8	1.23	1.14	1.06	1.00	0.95	0.91	0.86
10	1.31	1.22	1.14	1.07	1.01	0.97	0.92
15	1.46	1.36	1.27	1.19	1.13	1.08	1.02
20	1.57	1.46	1.36	1.28	1.21	1.16	1.10
30	1.67	1.61	1.49	1.41	1.33	1.27	1.21
40	1.71	1.71	1.59	1.50	1.41	1.35	1.28
50	1.75	1.75	1.66	1.57	1.48	1.42	1.34
60	1.77	1.77	1.72	1.62	1.53	1.47	1.39
70	1.80	1.80	1.77	1.67	1.58	1.51	1.43
80	1.82	1.82	1.82	1.71	1.62	1.55	1.47
90	1.83	1.83	1.83	1.75	1.65	1.58	1.50
100	1.85	1.85	1.85	1.78	1.68	1.61	1.53
120	1.88	1.88	1.88	1.84	1.74	1.66	1.58
140	1.90	1.90	1.90	1.89	1.78	1.71	1.62
160	1.92	1.92	1.92	1.92	1.82	1.75	1.65
180	1.94	1.94	1.94	1.94	1.86	1.78	1.69
200	1.96	1.96	1.96	1.96	1.89	1.81	1.71
250	2.00	2.00	2.00	2.00	1.96	1.88	1.78
300	2.04	2.04	2.04	2.04	2.02	1.93	1.83
350	2.07	2.07	2.07	2.07	2.07	1.98	1.87
400	2.10	2.10	2.10	2.10	2.10	2.02	1.92

τ = 60 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.63	0.59	0.54	0.51	0.47	0.45	0.42
4	0.89	0.82	0.76	0.71	0.67	0.63	0.60
6	1.04	0.96	0.89	0.83	0.78	0.74	0.70
8	1.15	1.06	0.98	0.92	0.86	0.82	0.77
10	1.23	1.14	1.05	0.98	0.92	0.88	0.82
15	1.38	1.28	1.18	1.10	1.03	0.99	0.93
20	1.49	1.38	1.27	1.19	1.12	1.06	1.00
30	1.59	1.52	1.40	1.31	1.23	1.17	1.10
40	1.64	1.62	1.50	1.40	1.31	1.25	1.18
50	1.67	1.67	1.57	1.47	1.38	1.31	1.23
60	1.70	1.70	1.63	1.53	1.43	1.36	1.28
70	1.72	1.72	1.68	1.57	1.48	1.41	1.32
80	1.74	1.74	1.73	1.62	1.51	1.44	1.36
90	1.76	1.76	1.76	1.65	1.55	1.48	1.39
100	1.78	1.78	1.78	1.69	1.58	1.51	1.42
120	1.81	1.81	1.81	1.74	1.64	1.56	1.46
140	1.83	1.83	1.83	1.79	1.68	1.60	1.51
160	1.86	1.86	1.86	1.84	1.72	1.64	1.54
180	1.88	1.88	1.88	1.87	1.76	1.68	1.57
200	1.90	1.90	1.90	1.90	1.79	1.71	1.60
250	1.94	1.94	1.94	1.94	1.86	1.77	1.67
300	1.98	1.98	1.98	1.98	1.92	1.83	1.72
350	2.02	2.02	2.02	2.02	1.98	1.88	1.77
400	2.05	2.05	2.05	2.05	2.03	1.93	1.81

Mean-hourly (τ = 3600 s)

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.39	0.35	0.32	0.29	0.27	0.25	0.23
4	0.65	0.59	0.53	0.48	0.44	0.42	0.38
6	0.80	0.72	0.65	0.60	0.55	0.51	0.47
8	0.90	0.82	0.74	0.68	0.62	0.58	0.53
10	0.99	0.90	0.81	0.74	0.68	0.64	0.58
15	1.14	1.03	0.93	0.85	0.78	0.73	0.67
20	1.25	1.13	1.02	0.94	0.86	0.81	0.74
30	1.39	1.28	1.15	1.05	0.97	0.91	0.83
40	1.43	1.38	1.24	1.14	1.04	0.98	0.90
50	1.47	1.46	1.32	1.21	1.11	1.04	0.95
60	1.50	1.50	1.38	1.26	1.16	1.08	0.99
70	1.53	1.53	1.43	1.31	1.20	1.12	1.03
80	1.55	1.55	1.47	1.35	1.24	1.16	1.06
90	1.57	1.57	1.51	1.39	1.27	1.19	1.09
100	1.59	1.59	1.55	1.42	1.31	1.22	1.12
120	1.63	1.63	1.62	1.48	1.36	1.27	1.17
140	1.66	1.66	1.66	1.54	1.41	1.32	1.21
160	1.69	1.69	1.69	1.58	1.45	1.36	1.25
180	1.71	1.71	1.71	1.62	1.49	1.40	1.28
200	1.74	1.74	1.74	1.66	1.53	1.43	1.31
250	1.79	1.79	1.79	1.75	1.61	1.50	1.38
300	1.84	1.84	1.84	1.83	1.68	1.57	1.44
350	1.88	1.88	1.88	1.88	1.74	1.63	1.49
400	1.92	1.92	1.92	1.92	1.80	1.68	1.54

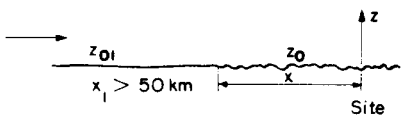


TABLE 10.7 *K*-factors for Site Roughness z_0 = 0.3 m and Upwind Roughness z_{01} = 0.7 m

τ = 1 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.88	0.89	0.89	0.90	0.91	0.92	0.93
4	1.06	1.07	1.08	1.09	1.10	1.10	1.12
6	1.16	1.17	1.18	1.19	1.20	1.21	1.23
8	1.24	1.25	1.26	1.27	1.28	1.29	1.31
10	1.30	1.31	1.32	1.33	1.34	1.35	1.37
15	1.40	1.41	1.43	1.44	1.45	1.46	1.49
20	1.48	1.49	1.50	1.52	1.53	1.54	1.56
30	1.59	1.59	1.61	1.62	1.64	1.65	1.67
40	1.68	1.68	1.68	1.70	1.71	1.73	1.75
50	1.74	1.74	1.74	1.76	1.77	1.78	1.81
60	1.80	1.80	1.80	1.80	1.82	1.83	1.86
70	1.84	1.84	1.84	1.84	1.85	1.87	1.90
80	1.88	1.88	1.88	1.88	1.89	1.90	1.93
90	1.91	1.91	1.91	1.91	1.92	1.93	1.96
100	1.94	1.94	1.94	1.94	1.94	1.95	1.99
120	1.99	1.99	1.99	1.99	1.99	2.00	2.03
140	2.04	2.04	2.04	2.04	2.04	2.04	2.06
160	2.07	2.07	2.07	2.07	2.07	2.07	2.09
180	2.10	2.10	2.10	2.10	2.10	2.10	2.12
200	2.13	2.13	2.13	2.13	2.13	2.13	2.14
250	2.18	2.18	2.18	2.18	2.18	2.18	2.19
300	2.23	2.23	2.23	2.23	2.23	2.23	2.23
350	2.27	2.27	2.27	2.27	2.27	2.27	2.27
400	2.30	2.30	2.30	2.30	2.30	2.30	2.30

τ = 3 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.82	0.83	0.83	0.84	0.85	0.85	0.87
4	0.99	1.00	1.01	1.02	1.03	1.04	1.05
6	1.09	1.10	1.11	1.12	1.13	1.14	1.16
8	1.17	1.18	1.19	1.20	1.21	1.22	1.24
10	1.22	1.23	1.25	1.26	1.27	1.28	1.30
15	1.32	1.34	1.35	1.36	1.37	1.38	1.41
20	1.40	1.41	1.42	1.44	1.45	1.46	1.48
30	1.50	1.51	1.53	1.54	1.55	1.57	1.59
40	1.59	1.59	1.60	1.61	1.63	1.64	1.67
50	1.65	1.65	1.66	1.67	1.69	1.70	1.73
60	1.71	1.71	1.71	1.72	1.73	1.74	1.77
70	1.75	1.75	1.75	1.75	1.77	1.78	1.81
80	1.79	1.79	1.79	1.79	1.80	1.81	1.84
90	1.82	1.82	1.82	1.82	1.83	1.84	1.87
100	1.85	1.85	1.85	1.85	1.85	1.87	1.90
120	1.90	1.90	1.90	1.90	1.90	1.91	1.94
140	1.94	1.94	1.94	1.94	1.94	1.95	1.98
160	1.98	1.98	1.98	1.98	1.98	1.98	2.01
180	2.01	2.01	2.01	2.01	2.01	2.01	2.03
200	2.04	2.04	2.04	2.04	2.04	2.04	2.06
250	2.09	2.09	2.09	2.09	2.09	2.09	2.11
300	2.14	2.14	2.14	2.14	2.14	2.14	2.15
350	2.18	2.18	2.18	2.18	2.18	2.18	2.19
400	2.21	2.21	2.21	2.21	2.21	2.21	2.22

τ = 10 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.72	0.73	0.74	0.74	0.75	0.76	0.77
4	0.88	0.89	0.90	0.91	0.92	0.93	0.95
6	0.98	0.99	1.00	1.01	1.02	1.03	1.05
8	1.05	1.06	1.07	1.08	1.09	1.10	1.12
10	1.10	1.11	1.13	1.14	1.15	1.16	1.18
15	1.20	1.21	1.23	1.24	1.25	1.26	1.28
20	1.27	1.28	1.30	1.31	1.32	1.33	1.36
30	1.37	1.38	1.40	1.41	1.42	1.43	1.46
40	1.45	1.45	1.46	1.48	1.49	1.51	1.53
50	1.51	1.51	1.52	1.53	1.55	1.56	1.59
60	1.56	1.56	1.56	1.58	1.59	1.61	1.63
70	1.60	1.60	1.60	1.61	1.63	1.64	1.67
80	1.64	1.64	1.64	1.65	1.66	1.68	1.71
90	1.67	1.67	1.67	1.67	1.69	1.70	1.73
100	1.70	1.70	1.70	1.70	1.71	1.73	1.76
120	1.75	1.75	1.75	1.75	1.76	1.77	1.80
140	1.79	1.79	1.79	1.79	1.79	1.81	1.84
160	1.83	1.83	1.83	1.83	1.83	1.84	1.87
180	1.86	1.86	1.86	1.86	1.86	1.86	1.90
200	1.89	1.89	1.89	1.89	1.89	1.89	1.92
250	1.95	1.95	1.95	1.95	1.95	1.95	1.98
300	2.00	2.00	2.00	2.00	2.00	2.00	2.02
350	2.04	2.04	2.04	2.04	2.04	2.04	2.06
400	2.08	2.08	2.08	2.08	2.08	2.08	2.10

τ = 30 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.61	0.61	0.62	0.63	0.64	0.64	0.66
4	0.76	0.77	0.78	0.79	0.80	0.80	0.82
6	0.85	0.86	0.87	0.88	0.89	0.90	0.92
8	0.91	0.93	0.94	0.95	0.96	0.97	0.99
10	0.96	0.98	0.99	1.00	1.01	1.02	1.04
15	1.05	1.07	1.08	1.09	1.11	1.12	1.14
20	1.12	1.13	1.15	1.16	1.17	1.18	1.21
30	1.21	1.22	1.24	1.25	1.27	1.28	1.31
40	1.28	1.29	1.31	1.32	1.34	1.35	1.38
50	1.34	1.34	1.36	1.37	1.39	1.40	1.43
60	1.39	1.39	1.40	1.42	1.43	1.45	1.48
70	1.43	1.43	1.44	1.45	1.47	1.48	1.51
80	1.47	1.47	1.47	1.48	1.50	1.51	1.54
90	1.50	1.50	1.50	1.51	1.53	1.54	1.57
100	1.53	1.53	1.53	1.53	1.55	1.57	1.60
120	1.58	1.58	1.58	1.58	1.59	1.61	1.64
140	1.62	1.62	1.62	1.62	1.63	1.65	1.68
160	1.65	1.65	1.65	1.65	1.66	1.68	1.71
180	1.69	1.69	1.69	1.69	1.69	1.71	1.74
200	1.71	1.71	1.71	1.71	1.71	1.73	1.77
250	1.78	1.78	1.78	1.78	1.78	1.79	1.82
300	1.83	1.83	1.83	1.83	1.83	1.83	1.87
350	1.87	1.87	1.87	1.87	1.87	1.88	1.91
400	1.92	1.92	1.92	1.92	1.92	1.92	1.95

τ = 60 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.53	0.54	0.55	0.56	0.56	0.57	0.58
4	0.68	0.69	0.70	0.71	0.72	0.72	0.74
6	0.77	0.78	0.79	0.80	0.81	0.82	0.83
8	0.83	0.84	0.85	0.86	0.87	0.88	0.90
10	0.87	0.89	0.90	0.91	0.92	0.93	0.95
15	0.96	0.97	0.99	1.00	1.01	1.02	1.05
20	1.02	1.04	1.05	1.06	1.08	1.09	1.11
30	1.11	1.12	1.14	1.15	1.17	1.18	1.21
40	1.18	1.19	1.20	1.22	1.23	1.25	1.28
50	1.23	1.24	1.25	1.27	1.29	1.30	1.33
60	1.28	1.28	1.30	1.31	1.33	1.34	1.37
70	1.32	1.32	1.33	1.35	1.36	1.38	1.41
80	1.36	1.36	1.36	1.38	1.39	1.41	1.44
90	1.39	1.39	1.39	1.40	1.42	1.44	1.47
100	1.42	1.42	1.42	1.43	1.45	1.46	1.49
120	1.46	1.46	1.46	1.47	1.49	1.50	1.54
140	1.51	1.51	1.51	1.51	1.52	1.54	1.58
160	1.54	1.54	1.54	1.54	1.56	1.57	1.61
180	1.57	1.57	1.57	1.57	1.59	1.60	1.64
200	1.60	1.60	1.60	1.60	1.61	1.63	1.67
250	1.67	1.67	1.67	1.67	1.67	1.69	1.73
300	1.72	1.72	1.72	1.72	1.72	1.74	1.78
350	1.77	1.77	1.77	1.77	1.77	1.78	1.82
400	1.81	1.81	1.81	1.81	1.81	1.82	1.86

Mean-hourly (τ = 3600 s)

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.34	0.35	0.36	0.36	0.37	0.37	0.39
4	0.47	0.48	0.49	0.50	0.51	0.51	0.53
6	0.55	0.56	0.57	0.58	0.58	0.59	0.61
8	0.60	0.61	0.62	0.63	0.64	0.65	0.67
10	0.64	0.65	0.66	0.67	0.69	0.70	0.72
15	0.71	0.73	0.74	0.75	0.77	0.78	0.80
20	0.77	0.78	0.80	0.81	0.82	0.84	0.86
30	0.85	0.86	0.88	0.89	0.91	0.92	0.95
40	0.90	0.92	0.94	0.95	0.97	0.98	1.01
50	0.95	0.96	0.98	1.00	1.01	1.03	1.06
60	0.99	1.00	1.02	1.04	1.05	1.07	1.10
70	1.03	1.03	1.05	1.07	1.09	1.10	1.14
80	1.06	1.06	1.08	1.10	1.12	1.13	1.17
90	1.09	1.09	1.11	1.12	1.14	1.16	1.20
100	1.12	1.12	1.13	1.15	1.17	1.18	1.22
120	1.17	1.17	1.17	1.19	1.21	1.23	1.27
140	1.21	1.21	1.21	1.23	1.25	1.27	1.31
160	1.25	1.25	1.25	1.26	1.28	1.30	1.34
180	1.28	1.28	1.28	1.29	1.31	1.33	1.37
200	1.31	1.31	1.31	1.32	1.34	1.36	1.40
250	1.38	1.38	1.38	1.38	1.40	1.42	1.47
300	1.44	1.44	1.44	1.44	1.46	1.48	1.52
350	1.49	1.49	1.49	1.49	1.51	1.53	1.57
400	1.54	1.54	1.54	1.54	1.55	1.57	1.62

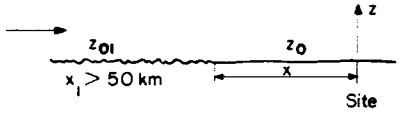


TABLE 10.8 *K*-factors for Site Roughness z_0 = 0.3 m and Upwind Roughness z_{01} = 0.1 m

τ = 1 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.99	0.98	0.96	0.95	0.95	0.94	0.93
4	1.20	1.18	1.16	1.15	1.14	1.13	1.12
6	1.31	1.30	1.28	1.26	1.25	1.24	1.23
8	1.40	1.38	1.36	1.35	1.33	1.32	1.31
10	1.46	1.44	1.42	1.41	1.39	1.39	1.37
15	1.58	1.56	1.54	1.52	1.51	1.50	1.49
20	1.67	1.64	1.62	1.60	1.59	1.58	1.56
30	1.77	1.76	1.74	1.72	1.70	1.69	1.67
40	1.83	1.83	1.82	1.80	1.78	1.77	1.75
50	1.88	1.88	1.88	1.86	1.84	1.83	1.81
60	1.92	1.92	1.92	1.91	1.89	1.87	1.86
70	1.96	1.96	1.96	1.95	1.93	1.91	1.90
80	1.98	1.98	1.98	1.98	1.96	1.95	1.93
90	2.01	2.01	2.01	2.01	1.99	1.98	1.96
100	2.03	2.03	2.03	2.03	2.02	2.00	1.99
120	2.06	2.06	2.06	2.06	2.06	2.05	2.03
140	2.09	2.09	2.09	2.09	2.09	2.08	2.06
160	2.12	2.12	2.12	2.12	2.12	2.11	2.09
180	2.14	2.14	2.14	2.14	2.14	2.14	2.12
200	2.16	2.16	2.16	2.16	2.16	2.16	2.14
250	2.20	2.20	2.20	2.20	2.20	2.20	2.19
300	2.23	2.23	2.23	2.23	2.23	2.23	2.23
350	2.26	2.26	2.26	2.26	2.26	2.26	2.26
400	2.29	2.29	2.29	2.29	2.29	2.29	2.29

τ = 3 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.93	0.92	0.90	0.89	0.88	0.88	0.87
4	1.13	1.11	1.10	1.08	1.07	1.06	1.05
6	1.24	1.23	1.21	1.19	1.18	1.17	1.16
8	1.33	1.31	1.29	1.27	1.26	1.25	1.24
10	1.39	1.37	1.35	1.33	1.32	1.31	1.30
15	1.51	1.48	1.46	1.45	1.43	1.42	1.41
20	1.59	1.57	1.54	1.53	1.51	1.50	1.48
30	1.69	1.68	1.66	1.64	1.62	1.61	1.59
40	1.75	1.75	1.73	1.71	1.70	1.68	1.67
50	1.80	1.80	1.79	1.77	1.76	1.74	1.73
60	1.84	1.84	1.84	1.82	1.80	1.79	1.77
70	1.88	1.88	1.88	1.86	1.84	1.83	1.81
80	1.90	1.90	1.90	1.90	1.88	1.86	1.84
90	1.93	1.93	1.93	1.92	1.91	1.89	1.87
100	1.95	1.95	1.95	1.95	1.93	1.92	1.90
120	1.98	1.98	1.98	1.98	1.97	1.96	1.94
140	2.01	2.01	2.01	2.01	2.01	2.00	1.98
160	2.04	2.04	2.04	2.04	2.04	2.03	2.01
180	2.06	2.06	2.06	2.06	2.06	2.05	2.03
200	2.08	2.08	2.08	2.08	2.08	2.08	2.06
250	2.12	2.12	2.12	2.12	2.12	2.12	2.11
300	2.16	2.16	2.16	2.16	2.16	2.16	2.15
350	2.19	2.19	2.19	2.19	2.19	2.19	2.19
400	2.22	2.22	2.22	2.22	2.22	2.22	2.22

τ = 10 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.83	0.82	0.80	0.79	0.78	0.78	0.77
4	1.02	1.00	0.99	0.98	0.96	0.96	0.95
6	1.13	1.11	1.10	1.08	1.07	1.06	1.05
8	1.21	1.19	1.17	1.16	1.14	1.13	1.12
10	1.27	1.25	1.23	1.22	1.20	1.19	1.18
15	1.39	1.36	1.34	1.32	1.31	1.30	1.28
20	1.47	1.44	1.42	1.40	1.38	1.37	1.36
30	1.56	1.55	1.53	1.51	1.49	1.48	1.46
40	1.63	1.63	1.60	1.58	1.56	1.55	1.53
50	1.68	1.68	1.66	1.64	1.62	1.61	1.59
60	1.72	1.72	1.71	1.69	1.67	1.65	1.63
70	1.75	1.75	1.75	1.72	1.70	1.69	1.67
80	1.78	1.78	1.78	1.76	1.74	1.72	1.71
90	1.80	1.80	1.80	1.79	1.77	1.75	1.73
100	1.82	1.82	1.82	1.81	1.79	1.78	1.76
120	1.86	1.86	1.86	1.86	1.84	1.82	1.80
140	1.89	1.89	1.89	1.89	1.87	1.86	1.84
160	1.92	1.92	1.92	1.92	1.91	1.89	1.87
180	1.94	1.94	1.94	1.94	1.93	1.92	1.90
200	1.96	1.96	1.96	1.96	1.96	1.94	1.92
250	2.01	2.01	2.01	2.01	2.01	2.00	1.98
300	2.05	2.05	2.05	2.05	2.05	2.04	2.02
350	2.09	2.09	2.09	2.09	2.09	2.08	2.06
400	2.12	2.12	2.12	2.12	2.12	2.12	2.10

τ = 30 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.72	0.70	0.69	0.68	0.67	0.66	0.66
4	0.90	0.88	0.86	0.85	0.84	0.83	0.82
6	1.01	0.99	0.97	0.95	0.94	0.93	0.92
8	1.08	1.06	1.04	1.02	1.01	1.00	0.99
10	1.14	1.12	1.10	1.08	1.06	1.05	1.04
15	1.25	1.22	1.20	1.18	1.16	1.15	1.14
20	1.32	1.30	1.27	1.25	1.24	1.22	1.21
30	1.42	1.40	1.38	1.36	1.34	1.32	1.31
40	1.48	1.48	1.45	1.43	1.41	1.39	1.38
50	1.53	1.53	1.51	1.48	1.46	1.45	1.43
60	1.57	1.57	1.55	1.53	1.51	1.49	1.48
70	1.60	1.60	1.59	1.57	1.55	1.53	1.51
80	1.63	1.63	1.63	1.60	1.58	1.56	1.54
90	1.65	1.65	1.65	1.63	1.61	1.59	1.57
100	1.68	1.68	1.68	1.66	1.63	1.62	1.60
120	1.71	1.71	1.71	1.70	1.68	1.66	1.64
140	1.75	1.75	1.75	1.74	1.72	1.70	1.68
160	1.78	1.78	1.78	1.78	1.75	1.73	1.71
180	1.80	1.80	1.80	1.80	1.78	1.76	1.74
200	1.82	1.82	1.82	1.82	1.81	1.79	1.77
250	1.88	1.88	1.88	1.88	1.86	1.85	1.82
300	1.92	1.92	1.92	1.92	1.91	1.90	1.87
350	1.96	1.96	1.96	1.96	1.96	1.94	1.91
400	2.00	2.00	2.00	2.00	2.00	1.98	1.95

τ = 60 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.64	0.63	0.62	0.61	0.60	0.59	0.58
4	0.82	0.80	0.78	0.77	0.76	0.75	0.74
6	0.92	0.90	0.88	0.87	0.86	0.85	0.83
8	1.00	0.98	0.95	0.94	0.92	0.91	0.90
10	1.06	1.03	1.01	0.99	0.98	0.97	0.95
15	1.16	1.13	1.11	1.09	1.07	1.06	1.05
20	1.23	1.21	1.18	1.16	1.14	1.13	1.11
30	1.33	1.31	1.28	1.26	1.24	1.23	1.21
40	1.39	1.38	1.35	1.33	1.31	1.29	1.28
50	1.43	1.43	1.41	1.38	1.36	1.35	1.33
60	1.47	1.47	1.45	1.43	1.41	1.39	1.37
70	1.51	1.51	1.49	1.47	1.45	1.43	1.41
80	1.53	1.53	1.53	1.50	1.48	1.46	1.44
90	1.56	1.56	1.56	1.53	1.51	1.49	1.47
100	1.58	1.58	1.58	1.56	1.53	1.52	1.49
120	1.62	1.62	1.62	1.60	1.58	1.56	1.54
140	1.65	1.65	1.65	1.64	1.62	1.60	1.58
160	1.68	1.68	1.68	1.68	1.65	1.63	1.61
180	1.71	1.71	1.71	1.71	1.68	1.66	1.64
200	1.74	1.74	1.74	1.74	1.71	1.69	1.67
250	1.79	1.79	1.79	1.79	1.77	1.75	1.73
300	1.84	1.84	1.84	1.84	1.82	1.80	1.78
350	1.88	1.88	1.88	1.88	1.87	1.85	1.82
400	1.92	1.92	1.92	1.92	1.91	1.89	1.86

Mean-hourly (τ = 3600 s)

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.45	0.43	0.42	0.41	0.40	0.39	0.39
4	0.61	0.59	0.57	0.56	0.55	0.54	0.53
6	0.70	0.68	0.66	0.65	0.63	0.62	0.61
8	0.77	0.75	0.73	0.71	0.70	0.68	0.67
10	0.83	0.80	0.78	0.76	0.74	0.73	0.72
15	0.92	0.90	0.87	0.85	0.83	0.82	0.80
20	0.99	0.96	0.93	0.91	0.89	0.88	0.86
30	1.08	1.06	1.03	1.00	0.98	0.97	0.95
40	1.14	1.13	1.10	1.07	1.05	1.03	1.01
50	1.18	1.18	1.15	1.12	1.10	1.08	1.06
60	1.22	1.22	1.19	1.17	1.14	1.12	1.10
70	1.25	1.25	1.23	1.20	1.18	1.16	1.14
80	1.28	1.28	1.27	1.24	1.21	1.19	1.17
90	1.31	1.31	1.30	1.27	1.24	1.22	1.20
100	1.33	1.33	1.32	1.29	1.27	1.25	1.22
120	1.37	1.37	1.37	1.34	1.31	1.29	1.27
140	1.41	1.41	1.41	1.38	1.35	1.33	1.31
160	1.44	1.44	1.44	1.42	1.39	1.37	1.34
180	1.47	1.47	1.47	1.45	1.42	1.40	1.37
200	1.50	1.50	1.50	1.48	1.45	1.43	1.40
250	1.56	1.56	1.56	1.55	1.52	1.50	1.47
300	1.62	1.62	1.62	1.61	1.58	1.55	1.52
350	1.67	1.67	1.67	1.67	1.63	1.61	1.57
400	1.71	1.71	1.71	1.71	1.68	1.65	1.62

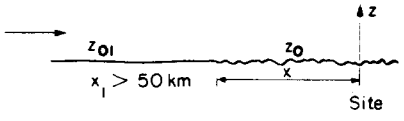


TABLE 10.9 *K*-factors for Site Roughness z_0 = 0.3 m and Upwind Roughness z_{01} = 0.03 m

τ = 1 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.05	1.02	0.99	0.98	0.96	0.95	0.93
4	1.26	1.23	1.20	1.17	1.15	1.14	1.12
6	1.39	1.35	1.32	1.29	1.27	1.25	1.23
8	1.47	1.44	1.40	1.37	1.35	1.33	1.31
10	1.54	1.51	1.47	1.44	1.41	1.40	1.37
15	1.67	1.63	1.59	1.56	1.53	1.51	1.49
20	1.76	1.71	1.67	1.64	1.61	1.59	1.56
30	1.85	1.84	1.79	1.76	1.72	1.70	1.67
40	1.90	1.90	1.87	1.84	1.80	1.78	1.75
50	1.94	1.94	1.94	1.90	1.86	1.84	1.81
60	1.98	1.98	1.98	1.95	1.91	1.89	1.86
70	2.00	2.00	2.00	1.99	1.95	1.93	1.90
80	2.03	2.03	2.03	2.02	1.99	1.96	1.93
90	2.05	2.05	2.05	2.05	2.02	1.99	1.96
100	2.06	2.06	2.06	2.06	2.04	2.02	1.99
120	2.09	2.09	2.09	2.09	2.09	2.06	2.03
140	2.11	2.11	2.11	2.11	2.11	2.10	2.06
160	2.13	2.13	2.13	2.13	2.13	2.13	2.09
180	2.15	2.15	2.15	2.15	2.15	2.15	2.12
200	2.17	2.17	2.17	2.17	2.17	2.17	2.14
250	2.20	2.20	2.20	2.20	2.20	2.20	2.19
300	2.23	2.23	2.23	2.23	2.23	2.23	2.23
350	2.26	2.26	2.26	2.26	2.26	2.26	2.26
400	2.29	2.29	2.29	2.29	2.29	2.29	2.29

τ = 3 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.98	0.96	0.93	0.91	0.90	0.88	0.87
4	1.19	1.16	1.13	1.11	1.09	1.07	1.05
6	1.32	1.28	1.25	1.22	1.20	1.18	1.16
8	1.40	1.37	1.33	1.30	1.28	1.26	1.24
10	1.47	1.43	1.39	1.37	1.34	1.32	1.30
15	1.59	1.55	1.51	1.48	1.45	1.43	1.41
20	1.68	1.64	1.59	1.56	1.53	1.51	1.48
30	1.77	1.76	1.71	1.67	1.64	1.62	1.59
40	1.83	1.83	1.79	1.75	1.72	1.70	1.67
50	1.87	1.87	1.85	1.82	1.78	1.76	1.73
60	1.90	1.90	1.90	1.86	1.83	1.80	1.77
70	1.93	1.93	1.93	1.90	1.87	1.84	1.81
80	1.95	1.95	1.95	1.94	1.90	1.88	1.84
90	1.97	1.97	1.97	1.97	1.93	1.91	1.87
100	1.99	1.99	1.99	1.99	1.96	1.93	1.90
120	2.02	2.02	2.02	2.02	2.00	1.98	1.94
140	2.05	2.05	2.05	2.05	2.04	2.01	1.98
160	2.07	2.07	2.07	2.07	2.07	2.04	2.01
180	2.09	2.09	2.09	2.09	2.09	2.07	2.03
200	2.10	2.10	2.10	2.10	2.10	2.09	2.06
250	2.14	2.14	2.14	2.14	2.14	2.14	2.11
300	2.17	2.17	2.17	2.17	2.17	2.17	2.15
350	2.20	2.20	2.20	2.20	2.20	2.20	2.19
400	2.23	2.23	2.23	2.23	2.23	2.23	2.22

τ = 10 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.89	0.86	0.83	0.81	0.80	0.78	0.77
4	1.09	1.06	1.02	1.00	0.98	0.96	0.95
6	1.21	1.17	1.14	1.11	1.09	1.07	1.05
8	1.29	1.25	1.22	1.19	1.16	1.14	1.12
10	1.36	1.32	1.28	1.25	1.22	1.20	1.18
15	1.48	1.43	1.39	1.36	1.33	1.31	1.28
20	1.56	1.51	1.47	1.44	1.41	1.38	1.36
30	1.65	1.63	1.58	1.55	1.51	1.49	1.46
40	1.71	1.71	1.66	1.62	1.59	1.56	1.53
50	1.75	1.75	1.72	1.68	1.65	1.62	1.59
60	1.79	1.79	1.77	1.73	1.69	1.67	1.63
70	1.81	1.81	1.81	1.77	1.73	1.71	1.67
80	1.84	1.84	1.84	1.80	1.77	1.74	1.71
90	1.86	1.86	1.86	1.84	1.80	1.77	1.73
100	1.88	1.88	1.88	1.86	1.82	1.79	1.76
120	1.91	1.91	1.91	1.91	1.87	1.84	1.80
140	1.94	1.94	1.94	1.94	1.91	1.88	1.84
160	1.96	1.96	1.96	1.96	1.94	1.91	1.87
180	1.98	1.98	1.98	1.98	1.97	1.94	1.90
200	2.00	2.00	2.00	2.00	1.99	1.96	1.92
250	2.04	2.04	2.04	2.04	2.04	2.02	1.98
300	2.08	2.08	2.08	2.08	2.08	2.06	2.02
350	2.11	2.11	2.11	2.11	2.11	2.10	2.06
400	2.14	2.14	2.14	2.14	2.14	2.14	2.10

τ = 30 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.77	0.75	0.72	0.70	0.68	0.67	0.66
4	0.97	0.93	0.90	0.88	0.86	0.84	0.82
6	1.08	1.04	1.01	0.98	0.96	0.94	0.92
8	1.16	1.12	1.08	1.06	1.03	1.01	0.99
10	1.23	1.18	1.14	1.11	1.09	1.07	1.04
15	1.34	1.30	1.25	1.22	1.19	1.17	1.14
20	1.42	1.37	1.33	1.29	1.26	1.24	1.21
30	1.52	1.49	1.44	1.40	1.36	1.34	1.31
40	1.57	1.57	1.51	1.47	1.44	1.41	1.38
50	1.62	1.62	1.57	1.53	1.49	1.46	1.43
60	1.65	1.65	1.62	1.58	1.54	1.51	1.48
70	1.68	1.68	1.66	1.62	1.58	1.55	1.51
80	1.70	1.70	1.70	1.65	1.61	1.58	1.54
90	1.73	1.73	1.73	1.68	1.64	1.61	1.57
100	1.75	1.75	1.75	1.71	1.67	1.64	1.60
120	1.78	1.78	1.78	1.76	1.71	1.68	1.64
140	1.81	1.81	1.81	1.80	1.75	1.72	1.68
160	1.83	1.83	1.83	1.83	1.78	1.75	1.71
180	1.86	1.86	1.86	1.86	1.81	1.78	1.74
200	1.88	1.88	1.88	1.88	1.84	1.81	1.77
250	1.92	1.92	1.92	1.92	1.90	1.87	1.82
300	1.97	1.97	1.97	1.97	1.95	1.92	1.87
350	2.00	2.00	2.00	2.00	2.00	1.96	1.91
400	2.04	2.04	2.04	2.04	2.04	2.00	1.95

τ = 60 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.70	0.67	0.65	0.63	0.61	0.60	0.58
4	0.89	0.86	0.82	0.80	0.78	0.76	0.74
6	1.00	0.96	0.93	0.90	0.87	0.86	0.83
8	1.08	1.04	1.00	0.97	0.94	0.92	0.90
10	1.15	1.10	1.06	1.03	1.00	0.98	0.95
15	1.26	1.21	1.16	1.13	1.10	1.07	1.05
20	1.34	1.29	1.24	1.20	1.17	1.14	1.11
30	1.43	1.40	1.34	1.30	1.27	1.24	1.21
40	1.49	1.48	1.42	1.38	1.34	1.31	1.28
50	1.53	1.53	1.48	1.43	1.39	1.36	1.33
60	1.56	1.56	1.53	1.48	1.44	1.41	1.37
70	1.59	1.59	1.57	1.52	1.48	1.45	1.41
80	1.62	1.62	1.60	1.55	1.51	1.48	1.44
90	1.64	1.64	1.63	1.58	1.54	1.51	1.47
100	1.66	1.66	1.66	1.61	1.57	1.53	1.49
120	1.70	1.70	1.70	1.66	1.61	1.58	1.54
140	1.73	1.73	1.73	1.70	1.65	1.62	1.58
160	1.75	1.75	1.75	1.74	1.69	1.65	1.61
180	1.78	1.78	1.78	1.77	1.72	1.68	1.64
200	1.80	1.80	1.80	1.80	1.75	1.71	1.67
250	1.85	1.85	1.85	1.85	1.81	1.77	1.73
300	1.89	1.89	1.89	1.89	1.86	1.82	1.78
350	1.93	1.93	1.93	1.93	1.91	1.87	1.82
400	1.97	1.97	1.97	1.97	1.95	1.91	1.86

Mean-hourly (τ = 3600 s)

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.50	0.47	0.45	0.43	0.41	0.40	0.39
4	0.68	0.64	0.61	0.59	0.56	0.55	0.53
6	0.79	0.75	0.71	0.68	0.65	0.63	0.61
8	0.86	0.82	0.78	0.75	0.72	0.70	0.67
10	0.92	0.88	0.83	0.80	0.77	0.74	0.72
15	1.03	0.98	0.93	0.89	0.86	0.83	0.80
20	1.11	1.05	1.00	0.96	0.92	0.89	0.86
30	1.20	1.16	1.10	1.05	1.01	0.98	0.95
40	1.25	1.23	1.17	1.12	1.08	1.05	1.01
50	1.30	1.29	1.23	1.18	1.13	1.10	1.06
60	1.33	1.33	1.28	1.22	1.18	1.14	1.10
70	1.36	1.36	1.32	1.26	1.21	1.18	1.14
80	1.39	1.39	1.35	1.30	1.25	1.21	1.17
90	1.41	1.41	1.39	1.33	1.28	1.24	1.20
100	1.44	1.44	1.41	1.36	1.30	1.27	1.22
120	1.48	1.48	1.47	1.41	1.35	1.31	1.27
140	1.51	1.51	1.51	1.45	1.39	1.35	1.31
160	1.54	1.54	1.54	1.49	1.43	1.39	1.34
180	1.57	1.57	1.57	1.52	1.47	1.42	1.37
200	1.60	1.60	1.60	1.56	1.50	1.45	1.40
250	1.65	1.65	1.65	1.63	1.57	1.52	1.47
300	1.70	1.70	1.70	1.69	1.63	1.58	1.52
350	1.75	1.75	1.75	1.75	1.68	1.63	1.57
400	1.79	1.79	1.79	1.79	1.73	1.68	1.62

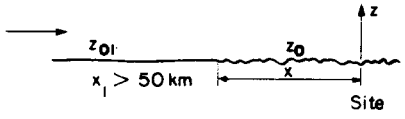


TABLE 10.10 *K*-factors for Site Roughness z_0 = 0.3 m and Upwind Roughness z_{01} = 0.01 m

τ = 1 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.09	1.05	1.02	0.99	0.97	0.95	0.93
4	1.31	1.27	1.23	1.20	1.17	1.15	1.12
6	1.45	1.40	1.35	1.32	1.28	1.26	1.23
8	1.54	1.49	1.44	1.40	1.37	1.34	1.31
10	1.61	1.56	1.51	1.47	1.43	1.40	1.37
15	1.74	1.68	1.63	1.58	1.55	1.52	1.49
20	1.83	1.77	1.71	1.67	1.63	1.60	1.56
30	1.90	1.90	1.84	1.79	1.74	1.71	1.67
40	1.95	1.95	1.92	1.87	1.82	1.79	1.75
50	1.99	1.99	1.99	1.93	1.89	1.85	1.81
60	2.02	2.02	2.02	1.98	1.94	1.90	1.86
70	2.04	2.04	2.04	2.03	1.98	1.94	1.90
80	2.06	2.06	2.06	2.06	2.01	1.98	1.93
90	2.07	2.07	2.07	2.07	2.04	2.00	1.96
100	2.09	2.09	2.09	2.09	2.07	2.03	1.99
120	2.11	2.11	2.11	2.11	2.11	2.07	2.03
140	2.13	2.13	2.13	2.13	2.13	2.11	2.06
160	2.15	2.15	2.15	2.15	2.15	2.14	2.09
180	2.16	2.16	2.16	2.16	2.16	2.16	2.12
200	2.18	2.18	2.18	2.18	2.18	2.18	2.14
250	2.21	2.21	2.21	2.21	2.21	2.21	2.19
300	2.24	2.24	2.24	2.24	2.24	2.24	2.23
350	2.26	2.26	2.26	2.26	2.26	2.26	2.26
400	2.29	2.29	2.29	2.29	2.29	2.29	2.29

τ = 3 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.03	0.99	0.96	0.93	0.91	0.89	0.87
4	1.25	1.20	1.16	1.13	1.10	1.08	1.05
6	1.38	1.33	1.28	1.25	1.21	1.19	1.16
8	1.47	1.42	1.37	1.33	1.29	1.27	1.24
10	1.54	1.48	1.43	1.39	1.36	1.33	1.30
15	1.67	1.61	1.55	1.51	1.47	1.44	1.41
20	1.76	1.70	1.64	1.59	1.55	1.52	1.48
30	1.84	1.82	1.76	1.71	1.66	1.63	1.59
40	1.88	1.88	1.84	1.79	1.74	1.71	1.67
50	1.92	1.92	1.90	1.85	1.80	1.77	1.73
60	1.95	1.95	1.95	1.90	1.85	1.82	1.77
70	1.97	1.97	1.97	1.94	1.89	1.86	1.81
80	1.99	1.99	1.99	1.98	1.93	1.89	1.84
90	2.01	2.01	2.01	2.01	1.96	1.92	1.87
100	2.02	2.02	2.02	2.02	1.98	1.94	1.90
120	2.05	2.05	2.05	2.05	2.03	1.99	1.94
140	2.07	2.07	2.07	2.07	2.06	2.03	1.98
160	2.09	2.09	2.09	2.09	2.09	2.06	2.01
180	2.10	2.10	2.10	2.10	2.10	2.08	2.03
200	2.12	2.12	2.12	2.12	2.12	2.11	2.06
250	2.15	2.15	2.15	2.15	2.15	2.15	2.11
300	2.18	2.18	2.18	2.18	2.18	2.18	2.15
350	2.21	2.21	2.21	2.21	2.21	2.21	2.19
400	2.24	2.24	2.24	2.24	2.24	2.24	2.22

τ = 10 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.93	0.89	0.86	0.83	0.81	0.79	0.77
4	1.14	1.10	1.06	1.02	0.99	0.97	0.95
6	1.27	1.22	1.17	1.13	1.10	1.08	1.05
8	1.36	1.30	1.25	1.21	1.18	1.15	1.12
10	1.43	1.37	1.32	1.28	1.24	1.21	1.18
15	1.55	1.49	1.43	1.39	1.35	1.32	1.28
20	1.64	1.58	1.51	1.47	1.42	1.39	1.36
30	1.72	1.70	1.63	1.58	1.53	1.50	1.46
40	1.77	1.77	1.71	1.66	1.61	1.58	1.53
50	1.81	1.81	1.77	1.72	1.67	1.63	1.59
60	1.84	1.84	1.82	1.77	1.72	1.68	1.63
70	1.86	1.86	1.86	1.81	1.76	1.72	1.67
80	1.89	1.89	1.89	1.84	1.79	1.75	1.71
90	1.90	1.90	1.90	1.87	1.82	1.78	1.73
100	1.92	1.92	1.92	1.90	1.85	1.81	1.76
120	1.95	1.95	1.95	1.95	1.89	1.85	1.80
140	1.97	1.97	1.97	1.97	1.93	1.89	1.84
160	1.99	1.99	1.99	1.99	1.96	1.92	1.87
180	2.01	2.01	2.01	2.01	1.99	1.95	1.90
200	2.03	2.03	2.03	2.03	2.02	1.98	1.92
250	2.06	2.06	2.06	2.06	2.06	2.03	1.98
300	2.10	2.10	2.10	2.10	2.10	2.08	2.02
350	2.13	2.13	2.13	2.13	2.13	2.12	2.06
400	2.16	2.16	2.16	2.16	2.16	2.15	2.10

τ = 30 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.82	0.78	0.75	0.72	0.69	0.68	0.66
4	1.02	0.98	0.93	0.90	0.87	0.85	0.82
6	1.15	1.09	1.04	1.01	0.97	0.95	0.92
8	1.23	1.18	1.12	1.08	1.05	1.02	0.99
10	1.30	1.24	1.18	1.14	1.10	1.07	1.04
15	1.42	1.36	1.30	1.25	1.21	1.18	1.14
20	1.51	1.44	1.38	1.33	1.28	1.25	1.21
30	1.60	1.56	1.49	1.43	1.38	1.35	1.31
40	1.65	1.64	1.57	1.51	1.46	1.42	1.38
50	1.68	1.68	1.63	1.57	1.52	1.48	1.43
60	1.71	1.71	1.68	1.62	1.56	1.52	1.48
70	1.74	1.74	1.72	1.66	1.60	1.56	1.51
80	1.76	1.76	1.76	1.69	1.64	1.59	1.54
90	1.78	1.78	1.78	1.72	1.67	1.62	1.57
100	1.80	1.80	1.80	1.75	1.69	1.65	1.60
120	1.83	1.83	1.83	1.80	1.74	1.70	1.64
140	1.86	1.86	1.86	1.84	1.78	1.73	1.68
160	1.88	1.88	1.88	1.88	1.81	1.77	1.71
180	1.90	1.90	1.90	1.90	1.84	1.80	1.74
200	1.92	1.92	1.92	1.92	1.87	1.82	1.77
250	1.96	1.96	1.96	1.96	1.93	1.88	1.82
300	2.00	2.00	2.00	2.00	1.98	1.93	1.87
350	2.04	2.04	2.04	2.04	2.03	1.98	1.91
400	2.07	2.07	2.07	2.07	2.07	2.02	1.95

τ = 60 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.75	0.71	0.67	0.65	0.62	0.60	0.58
4	0.95	0.90	0.86	0.82	0.79	0.77	0.74
6	1.07	1.02	0.96	0.93	0.89	0.86	0.83
8	1.15	1.10	1.04	1.00	0.96	0.93	0.90
10	1.22	1.16	1.10	1.06	1.02	0.99	0.95
15	1.34	1.27	1.21	1.16	1.12	1.08	1.05
20	1.43	1.36	1.29	1.24	1.19	1.15	1.11
30	1.51	1.47	1.40	1.34	1.29	1.25	1.21
40	1.56	1.55	1.48	1.42	1.36	1.32	1.28
50	1.60	1.60	1.54	1.47	1.42	1.38	1.33
60	1.63	1.63	1.59	1.52	1.46	1.42	1.37
70	1.66	1.66	1.63	1.56	1.50	1.46	1.41
80	1.68	1.68	1.67	1.60	1.54	1.49	1.44
90	1.70	1.70	1.70	1.63	1.57	1.52	1.47
100	1.72	1.72	1.72	1.66	1.60	1.55	1.49
120	1.75	1.75	1.75	1.71	1.64	1.60	1.54
140	1.78	1.78	1.78	1.75	1.68	1.64	1.58
160	1.81	1.81	1.81	1.79	1.72	1.67	1.61
180	1.83	1.83	1.83	1.82	1.75	1.70	1.64
200	1.85	1.85	1.85	1.85	1.78	1.73	1.67
250	1.90	1.90	1.90	1.90	1.84	1.79	1.73
300	1.94	1.94	1.94	1.94	1.90	1.84	1.78
350	1.98	1.98	1.98	1.98	1.94	1.89	1.82
400	2.01	2.01	2.01	2.01	1.99	1.93	1.86

Mean-hourly (τ = 3600 s)

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.54	0.51	0.47	0.45	0.42	0.41	0.39
4	0.74	0.69	0.65	0.61	0.58	0.56	0.53
6	0.86	0.80	0.75	0.71	0.67	0.64	0.61
8	0.94	0.88	0.82	0.77	0.73	0.71	0.67
10	1.00	0.94	0.88	0.83	0.78	0.75	0.72
15	1.12	1.05	0.98	0.93	0.88	0.84	0.80
20	1.21	1.13	1.05	1.00	0.94	0.91	0.86
30	1.30	1.24	1.16	1.09	1.04	1.00	0.95
40	1.35	1.32	1.23	1.17	1.11	1.06	1.01
50	1.39	1.39	1.29	1.22	1.16	1.12	1.06
60	1.42	1.42	1.34	1.27	1.21	1.16	1.10
70	1.45	1.45	1.39	1.31	1.24	1.20	1.14
80	1.47	1.47	1.43	1.35	1.28	1.23	1.17
90	1.50	1.50	1.46	1.38	1.31	1.26	1.20
100	1.52	1.52	1.49	1.41	1.34	1.28	1.22
120	1.55	1.55	1.55	1.46	1.39	1.33	1.27
140	1.59	1.59	1.59	1.51	1.43	1.37	1.31
160	1.62	1.62	1.62	1.55	1.47	1.41	1.34
180	1.64	1.64	1.64	1.58	1.50	1.44	1.37
200	1.67	1.67	1.67	1.62	1.53	1.47	1.40
250	1.72	1.72	1.72	1.69	1.61	1.54	1.47
300	1.77	1.77	1.77	1.76	1.67	1.60	1.52
350	1.82	1.82	1.82	1.82	1.72	1.66	1.57
400	1.86	1.86	1.86	1.86	1.78	1.71	1.62

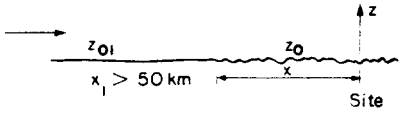


TABLE 10.11 *K*-factors for Site Roughness z_0 = 0.3 m and Upwind Roughness z_{01} = 0.003 m

τ = 1 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.14	1.09	1.05	1.01	0.98	0.96	0.93
4	1.37	1.31	1.26	1.22	1.18	1.15	1.12
6	1.51	1.45	1.39	1.34	1.30	1.27	1.23
8	1.61	1.54	1.47	1.43	1.38	1.35	1.31
10	1.68	1.61	1.54	1.49	1.45	1.41	1.37
15	1.82	1.74	1.67	1.61	1.56	1.53	1.49
20	1.89	1.83	1.76	1.70	1.65	1.61	1.56
30	1.96	1.96	1.88	1.82	1.76	1.72	1.67
40	2.00	2.00	1.97	1.90	1.85	1.80	1.75
50	2.03	2.03	2.03	1.97	1.91	1.86	1.81
60	2.05	2.05	2.05	2.02	1.96	1.91	1.86
70	2.07	2.07	2.07	2.06	2.00	1.95	1.90
80	2.09	2.09	2.09	2.09	2.03	1.99	1.93
90	2.10	2.10	2.10	2.10	2.06	2.02	1.96
100	2.11	2.11	2.11	2.11	2.09	2.04	1.99
120	2.13	2.13	2.13	2.13	2.13	2.09	2.03
140	2.15	2.15	2.15	2.15	2.15	2.12	2.06
160	2.16	2.16	2.16	2.16	2.16	2.15	2.09
180	2.17	2.17	2.17	2.17	2.17	2.17	2.12
200	2.19	2.19	2.19	2.19	2.19	2.19	2.14
250	2.21	2.21	2.21	2.21	2.21	2.21	2.19
300	2.24	2.24	2.24	2.24	2.24	2.24	2.23
350	2.27	2.27	2.27	2.27	2.27	2.27	2.26
400	2.29	2.29	2.29	2.29	2.29	2.29	2.29

τ = 3 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.08	1.03	0.98	0.95	0.92	0.90	0.87
4	1.31	1.25	1.19	1.15	1.11	1.09	1.05
6	1.44	1.38	1.32	1.27	1.23	1.20	1.16
8	1.54	1.47	1.40	1.35	1.31	1.28	1.24
10	1.61	1.54	1.47	1.42	1.37	1.34	1.30
15	1.74	1.67	1.59	1.54	1.49	1.45	1.41
20	1.83	1.76	1.68	1.62	1.57	1.53	1.48
30	1.89	1.89	1.80	1.74	1.68	1.64	1.59
40	1.93	1.93	1.89	1.82	1.76	1.72	1.67
50	1.97	1.97	1.96	1.89	1.82	1.78	1.73
60	1.99	1.99	1.99	1.94	1.87	1.83	1.77
70	2.01	2.01	2.01	1.98	1.91	1.87	1.81
80	2.03	2.03	2.03	2.02	1.95	1.90	1.84
90	2.04	2.04	2.04	2.04	1.98	1.93	1.87
100	2.05	2.05	2.05	2.05	2.01	1.96	1.90
120	2.07	2.07	2.07	2.07	2.05	2.00	1.94
140	2.09	2.09	2.09	2.09	2.09	2.04	1.98
160	2.11	2.11	2.11	2.11	2.11	2.07	2.01
180	2.12	2.12	2.12	2.12	2.12	2.10	2.03
200	2.13	2.13	2.13	2.13	2.13	2.12	2.06
250	2.17	2.17	2.17	2.17	2.17	2.17	2.11
300	2.20	2.20	2.20	2.20	2.20	2.20	2.15
350	2.22	2.22	2.22	2.22	2.22	2.22	2.19
400	2.25	2.25	2.25	2.25	2.25	2.25	2.22

τ = 10 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.98	0.93	0.89	0.85	0.82	0.80	0.77
4	1.20	1.14	1.09	1.05	1.01	0.98	0.95
6	1.33	1.27	1.21	1.16	1.12	1.09	1.05
8	1.43	1.36	1.29	1.24	1.19	1.16	1.12
10	1.50	1.43	1.36	1.30	1.26	1.22	1.18
15	1.63	1.55	1.48	1.42	1.37	1.33	1.28
20	1.72	1.64	1.56	1.50	1.44	1.40	1.36
30	1.79	1.77	1.68	1.61	1.55	1.51	1.46
40	1.83	1.83	1.76	1.69	1.63	1.59	1.53
50	1.86	1.86	1.83	1.76	1.69	1.65	1.59
60	1.89	1.89	1.88	1.81	1.74	1.69	1.63
70	1.91	1.91	1.91	1.85	1.78	1.73	1.67
80	1.93	1.93	1.93	1.88	1.82	1.77	1.71
90	1.94	1.94	1.94	1.92	1.85	1.80	1.73
100	1.96	1.96	1.96	1.94	1.87	1.82	1.76
120	1.98	1.98	1.98	1.98	1.92	1.87	1.80
140	2.00	2.00	2.00	2.00	1.96	1.90	1.84
160	2.02	2.02	2.02	2.02	1.99	1.94	1.87
180	2.04	2.04	2.04	2.04	2.02	1.97	1.90
200	2.05	2.05	2.05	2.05	2.05	1.99	1.92
250	2.09	2.09	2.09	2.09	2.09	2.05	1.98
300	2.12	2.12	2.12	2.12	2.12	2.09	2.02
350	2.15	2.15	2.15	2.15	2.15	2.13	2.06
400	2.18	2.18	2.18	2.18	2.18	2.17	2.10

τ = 30 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.87	0.82	0.77	0.74	0.71	0.68	0.66
4	1.08	1.02	0.97	0.92	0.88	0.86	0.82
6	1.21	1.15	1.08	1.03	0.99	0.96	0.92
8	1.30	1.23	1.16	1.11	1.06	1.03	0.99
10	1.38	1.30	1.23	1.17	1.12	1.08	1.04
15	1.50	1.42	1.34	1.28	1.23	1.19	1.14
20	1.60	1.51	1.42	1.36	1.30	1.26	1.21
30	1.67	1.63	1.54	1.47	1.41	1.36	1.31
40	1.71	1.71	1.62	1.55	1.48	1.43	1.38
50	1.75	1.75	1.69	1.61	1.54	1.49	1.43
60	1.77	1.77	1.74	1.66	1.59	1.54	1.48
70	1.80	1.80	1.78	1.70	1.63	1.58	1.51
80	1.82	1.82	1.82	1.74	1.66	1.61	1.54
90	1.83	1.83	1.83	1.77	1.69	1.64	1.57
100	1.85	1.85	1.85	1.80	1.72	1.67	1.60
120	1.88	1.88	1.88	1.85	1.77	1.71	1.64
140	1.90	1.90	1.90	1.89	1.81	1.75	1.68
160	1.92	1.92	1.92	1.92	1.84	1.78	1.71
180	1.94	1.94	1.94	1.94	1.87	1.81	1.74
200	1.96	1.96	1.96	1.96	1.90	1.84	1.77
250	2.00	2.00	2.00	2.00	1.96	1.90	1.82
300	2.04	2.04	2.04	2.04	2.01	1.95	1.87
350	2.07	2.07	2.07	2.07	2.06	2.00	1.91
400	2.10	2.10	2.10	2.10	2.10	2.04	1.95

τ = 60 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.79	0.75	0.70	0.66	0.63	0.61	0.58
4	1.01	0.95	0.89	0.85	0.80	0.78	0.74
6	1.14	1.07	1.00	0.95	0.91	0.87	0.83
8	1.23	1.15	1.08	1.03	0.98	0.94	0.90
10	1.30	1.22	1.15	1.09	1.03	1.00	0.95
15	1.43	1.34	1.26	1.19	1.14	1.10	1.05
20	1.52	1.43	1.34	1.27	1.21	1.17	1.11
30	1.59	1.55	1.45	1.38	1.31	1.27	1.21
40	1.64	1.64	1.54	1.46	1.39	1.34	1.28
50	1.67	1.67	1.60	1.52	1.44	1.39	1.33
60	1.70	1.70	1.65	1.57	1.49	1.44	1.37
70	1.72	1.72	1.70	1.61	1.53	1.48	1.41
80	1.74	1.74	1.73	1.65	1.57	1.51	1.44
90	1.76	1.76	1.76	1.68	1.60	1.54	1.47
100	1.78	1.78	1.78	1.71	1.62	1.57	1.49
120	1.81	1.81	1.81	1.76	1.67	1.61	1.54
140	1.83	1.83	1.83	1.80	1.71	1.65	1.58
160	1.86	1.86	1.86	1.84	1.75	1.69	1.61
180	1.88	1.88	1.88	1.87	1.78	1.72	1.64
200	1.90	1.90	1.90	1.90	1.81	1.75	1.67
250	1.94	1.94	1.94	1.94	1.88	1.81	1.73
300	1.98	1.98	1.98	1.98	1.93	1.86	1.78
350	2.02	2.02	2.02	2.02	1.98	1.91	1.82
400	2.05	2.05	2.05	2.05	2.02	1.95	1.86

Mean-hourly (τ = 3600 s)

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.59	0.54	0.50	0.46	0.43	0.41	0.39
4	0.80	0.74	0.68	0.63	0.59	0.56	0.53
6	0.93	0.85	0.79	0.73	0.69	0.65	0.61
8	1.02	0.94	0.86	0.80	0.75	0.72	0.67
10	1.09	1.00	0.92	0.86	0.80	0.77	0.72
15	1.21	1.12	1.03	0.96	0.90	0.86	0.80
20	1.31	1.20	1.11	1.03	0.97	0.92	0.86
30	1.39	1.33	1.22	1.14	1.06	1.01	0.95
40	1.43	1.41	1.30	1.21	1.13	1.08	1.01
50	1.47	1.47	1.36	1.27	1.19	1.13	1.06
60	1.50	1.50	1.42	1.32	1.24	1.18	1.10
70	1.53	1.53	1.46	1.36	1.28	1.21	1.14
80	1.55	1.55	1.50	1.40	1.31	1.25	1.17
90	1.57	1.57	1.54	1.43	1.34	1.28	1.20
100	1.59	1.59	1.57	1.47	1.37	1.30	1.22
120	1.63	1.63	1.63	1.52	1.42	1.35	1.27
140	1.66	1.66	1.66	1.57	1.47	1.39	1.31
160	1.69	1.69	1.69	1.61	1.50	1.43	1.34
180	1.71	1.71	1.71	1.65	1.54	1.46	1.37
200	1.74	1.74	1.74	1.68	1.57	1.50	1.40
250	1.79	1.79	1.79	1.76	1.65	1.57	1.47
300	1.84	1.84	1.84	1.83	1.71	1.63	1.52
350	1.88	1.88	1.88	1.88	1.77	1.68	1.57
400	1.92	1.92	1.92	1.92	1.82	1.73	1.62

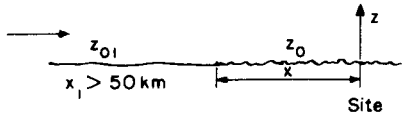


TABLE 10.12 *K*-factors for Site Roughness z_0 = 0.3 m and Upwind Roughness z_{01} = 0.001 m

τ = 1 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.18	1.12	1.07	1.03	0.99	0.96	0.93
4	1.42	1.35	1.29	1.24	1.19	1.16	1.12
6	1.56	1.49	1.42	1.36	1.31	1.28	1.23
8	1.66	1.58	1.51	1.45	1.40	1.36	1.31
10	1.74	1.66	1.58	1.52	1.46	1.42	1.37
15	1.88	1.79	1.71	1.64	1.58	1.54	1.49
20	1.94	1.89	1.80	1.73	1.66	1.62	1.56
30	2.00	2.00	1.92	1.85	1.78	1.73	1.67
40	2.03	2.03	2.01	1.93	1.86	1.81	1.75
50	2.06	2.06	2.06	2.00	1.93	1.87	1.81
60	2.08	2.08	2.08	2.05	1.98	1.92	1.86
70	2.09	2.09	2.09	2.09	2.02	1.96	1.90
80	2.11	2.11	2.11	2.11	2.05	2.00	1.93
90	2.12	2.12	2.12	2.12	2.09	2.03	1.96
100	2.13	2.13	2.13	2.13	2.11	2.06	1.99
120	2.14	2.14	2.14	2.14	2.14	2.10	2.03
140	2.16	2.16	2.16	2.16	2.16	2.14	2.06
160	2.17	2.17	2.17	2.17	2.17	2.17	2.09
180	2.18	2.18	2.18	2.18	2.18	2.18	2.12
200	2.19	2.19	2.19	2.19	2.19	2.19	2.14
250	2.22	2.22	2.22	2.22	2.22	2.22	2.19
300	2.25	2.25	2.25	2.25	2.25	2.25	2.23
350	2.27	2.27	2.27	2.27	2.27	2.27	2.26
400	2.30	2.30	2.30	2.30	2.30	2.30	2.29

τ = 3 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.12	1.06	1.01	0.97	0.93	0.90	0.87
4	1.36	1.29	1.22	1.17	1.13	1.09	1.05
6	1.49	1.42	1.35	1.29	1.24	1.21	1.16
8	1.59	1.51	1.44	1.38	1.32	1.29	1.24
10	1.67	1.59	1.51	1.44	1.39	1.35	1.30
15	1.81	1.72	1.63	1.56	1.50	1.46	1.41
20	1.88	1.81	1.72	1.65	1.59	1.54	1.48
30	1.94	1.94	1.85	1.77	1.70	1.65	1.59
40	1.97	1.97	1.93	1.85	1.78	1.73	1.67
50	2.00	2.00	2.00	1.92	1.84	1.79	1.73
60	2.02	2.02	2.02	1.97	1.89	1.84	1.77
70	2.04	2.04	2.04	2.01	1.94	1.88	1.81
80	2.05	2.05	2.05	2.05	1.97	1.91	1.84
90	2.06	2.06	2.06	2.06	2.00	1.94	1.87
100	2.07	2.07	2.07	2.07	2.03	1.97	1.90
120	2.09	2.09	2.09	2.09	2.07	2.01	1.94
140	2.11	2.11	2.11	2.11	2.11	2.05	1.98
160	2.12	2.12	2.12	2.12	2.12	2.08	2.01
180	2.13	2.13	2.13	2.13	2.13	2.11	2.03
200	2.15	2.15	2.15	2.15	2.15	2.14	2.06
250	2.18	2.18	2.18	2.18	2.18	2.18	2.11
300	2.21	2.21	2.21	2.21	2.21	2.21	2.15
350	2.24	2.24	2.24	2.24	2.24	2.24	2.19
400	2.26	2.26	2.26	2.26	2.26	2.26	2.22

τ = 10 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.02	0.96	0.91	0.87	0.83	0.80	0.77
4	1.25	1.18	1.12	1.06	1.02	0.99	0.95
6	1.39	1.31	1.24	1.18	1.13	1.09	1.05
8	1.49	1.40	1.32	1.26	1.21	1.17	1.12
10	1.56	1.47	1.39	1.33	1.27	1.23	1.18
15	1.70	1.60	1.51	1.44	1.38	1.34	1.28
20	1.78	1.70	1.60	1.53	1.46	1.41	1.36
30	1.84	1.83	1.72	1.64	1.57	1.52	1.46
40	1.88	1.88	1.81	1.73	1.65	1.60	1.53
50	1.91	1.91	1.88	1.79	1.71	1.66	1.59
60	1.93	1.93	1.93	1.84	1.76	1.70	1.63
70	1.95	1.95	1.95	1.88	1.80	1.74	1.67
80	1.96	1.96	1.96	1.92	1.84	1.78	1.71
90	1.98	1.98	1.98	1.95	1.87	1.81	1.73
100	1.99	1.99	1.99	1.98	1.90	1.83	1.76
120	2.01	2.01	2.01	2.01	1.94	1.88	1.80
140	2.03	2.03	2.03	2.03	1.98	1.92	1.84
160	2.04	2.04	2.04	2.04	2.02	1.95	1.87
180	2.06	2.06	2.06	2.06	2.04	1.98	1.90
200	2.07	2.07	2.07	2.07	2.07	2.00	1.92
250	2.11	2.11	2.11	2.11	2.11	2.06	1.98
300	2.14	2.14	2.14	2.14	2.14	2.11	2.02
350	2.17	2.17	2.17	2.17	2.17	2.15	2.06
400	2.20	2.20	2.20	2.20	2.20	2.18	2.10

τ = 30 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.91	0.85	0.80	0.75	0.72	0.69	0.66
4	1.14	1.06	1.00	0.94	0.90	0.86	0.82
6	1.27	1.19	1.11	1.06	1.00	0.96	0.92
8	1.37	1.28	1.20	1.13	1.08	1.04	0.99
10	1.44	1.35	1.26	1.20	1.14	1.09	1.04
15	1.58	1.48	1.38	1.31	1.24	1.20	1.14
20	1.67	1.57	1.47	1.39	1.32	1.27	1.21
30	1.72	1.70	1.59	1.50	1.43	1.37	1.31
40	1.76	1.76	1.67	1.58	1.50	1.45	1.38
50	1.80	1.80	1.74	1.64	1.56	1.50	1.43
60	1.82	1.82	1.79	1.70	1.61	1.55	1.48
70	1.84	1.84	1.84	1.74	1.65	1.59	1.51
80	1.86	1.86	1.86	1.78	1.69	1.62	1.54
90	1.87	1.87	1.87	1.81	1.72	1.65	1.57
100	1.89	1.89	1.89	1.84	1.74	1.68	1.60
120	1.91	1.91	1.91	1.89	1.79	1.73	1.64
140	1.93	1.93	1.93	1.93	1.83	1.76	1.68
160	1.95	1.95	1.95	1.95	1.87	1.80	1.71
180	1.97	1.97	1.97	1.97	1.90	1.83	1.74
200	1.99	1.99	1.99	1.99	1.93	1.86	1.77
250	2.03	2.03	2.03	2.03	1.99	1.92	1.82
300	2.07	2.07	2.07	2.07	2.04	1.97	1.87
350	2.10	2.10	2.10	2.10	2.09	2.01	1.91
400	2.13	2.13	2.13	2.13	2.13	2.05	1.95

τ = 60 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.84	0.78	0.72	0.68	0.64	0.61	0.58
4	1.07	0.99	0.92	0.87	0.82	0.78	0.74
6	1.20	1.12	1.04	0.98	0.92	0.88	0.83
8	1.30	1.21	1.12	1.05	0.99	0.95	0.90
10	1.37	1.27	1.18	1.11	1.05	1.01	0.95
15	1.51	1.40	1.30	1.22	1.16	1.11	1.05
20	1.59	1.49	1.38	1.30	1.23	1.18	1.11
30	1.65	1.62	1.50	1.41	1.33	1.28	1.21
40	1.69	1.69	1.59	1.49	1.41	1.35	1.28
50	1.72	1.72	1.65	1.56	1.47	1.41	1.33
60	1.75	1.75	1.71	1.61	1.52	1.45	1.37
70	1.77	1.77	1.75	1.65	1.56	1.49	1.41
80	1.79	1.79	1.79	1.69	1.59	1.52	1.44
90	1.81	1.81	1.81	1.72	1.62	1.55	1.47
100	1.82	1.82	1.82	1.75	1.65	1.58	1.49
120	1.85	1.85	1.85	1.80	1.70	1.63	1.54
140	1.88	1.88	1.88	1.85	1.74	1.67	1.58
160	1.90	1.90	1.90	1.88	1.78	1.70	1.61
180	1.92	1.92	1.92	1.92	1.81	1.73	1.64
200	1.94	1.94	1.94	1.94	1.84	1.76	1.67
250	1.98	1.98	1.98	1.98	1.91	1.82	1.73
300	2.02	2.02	2.02	2.02	1.96	1.88	1.78
350	2.05	2.05	2.05	2.05	2.01	1.93	1.82
400	2.09	2.09	2.09	2.09	2.06	1.97	1.86

Mean-hourly (τ = 3600 s)

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.63	0.57	0.52	0.48	0.44	0.42	0.39
4	0.86	0.78	0.71	0.66	0.61	0.57	0.53
6	0.99	0.90	0.82	0.76	0.70	0.66	0.61
8	1.09	0.99	0.90	0.83	0.77	0.73	0.67
10	1.16	1.06	0.96	0.89	0.82	0.77	0.72
15	1.30	1.18	1.08	0.99	0.92	0.87	0.80
20	1.40	1.27	1.16	1.07	0.99	0.93	0.86
30	1.46	1.40	1.27	1.18	1.09	1.02	0.95
40	1.50	1.49	1.36	1.25	1.16	1.09	1.01
50	1.54	1.54	1.42	1.31	1.22	1.15	1.06
60	1.57	1.57	1.48	1.37	1.26	1.19	1.10
70	1.59	1.59	1.53	1.41	1.30	1.23	1.14
80	1.62	1.62	1.57	1.45	1.34	1.26	1.17
90	1.64	1.64	1.61	1.48	1.37	1.29	1.20
100	1.66	1.66	1.64	1.51	1.40	1.32	1.22
120	1.69	1.69	1.69	1.57	1.45	1.37	1.27
140	1.72	1.72	1.72	1.62	1.50	1.41	1.31
160	1.75	1.75	1.75	1.66	1.54	1.45	1.34
180	1.77	1.77	1.77	1.70	1.57	1.48	1.37
200	1.79	1.79	1.79	1.74	1.61	1.51	1.40
250	1.84	1.84	1.84	1.82	1.68	1.59	1.47
300	1.89	1.89	1.89	1.89	1.75	1.65	1.52
350	1.93	1.93	1.93	1.93	1.81	1.70	1.57
400	1.97	1.97	1.97	1.97	1.86	1.75	1.62

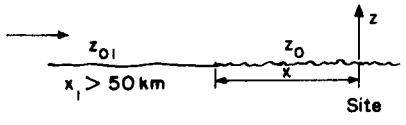


TABLE 10.13 *K*-factors for Site Roughness z_0 = 0.1 m and Upwind Roughness z_{01} = 0.7 m

τ = 1 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.98	0.99	1.01	1.03	1.05	1.07	1.10
4	1.13	1.15	1.17	1.19	1.21	1.23	1.27
6	1.22	1.24	1.27	1.29	1.31	1.33	1.37
8	1.28	1.31	1.33	1.35	1.38	1.40	1.44
10	1.33	1.36	1.38	1.41	1.43	1.45	1.50
15	1.42	1.45	1.47	1.50	1.53	1.55	1.60
20	1.48	1.51	1.54	1.57	1.59	1.62	1.67
30	1.59	1.60	1.63	1.66	1.69	1.71	1.77
40	1.68	1.68	1.69	1.72	1.75	1.78	1.83
50	1.74	1.74	1.74	1.77	1.80	1.82	1.88
60	1.80	1.80	1.80	1.80	1.84	1.86	1.92
70	1.84	1.84	1.84	1.84	1.87	1.89	1.96
80	1.88	1.88	1.88	1.88	1.89	1.92	1.98
90	1.91	1.91	1.91	1.91	1.92	1.94	2.01
100	1.94	1.94	1.94	1.94	1.94	1.96	2.03
120	1.99	1.99	1.99	1.99	1.99	2.00	2.06
140	2.04	2.04	2.04	2.04	2.04	2.04	2.09
160	2.07	2.07	2.07	2.07	2.07	2.07	2.12
180	2.10	2.10	2.10	2.10	2.10	2.10	2.14
200	2.13	2.13	2.13	2.13	2.13	2.13	2.16
250	2.18	2.18	2.18	2.18	2.18	2.18	2.20
300	2.23	2.23	2.23	2.23	2.23	2.23	2.23
350	2.27	2.27	2.27	2.27	2.27	2.27	2.27
400	2.30	2.30	2.30	2.30	2.30	2.30	2.30

τ = 3 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.92	0.93	0.95	0.97	0.99	1.01	1.04
4	1.06	1.09	1.11	1.13	1.15	1.17	1.21
6	1.15	1.17	1.20	1.22	1.24	1.26	1.30
8	1.21	1.24	1.26	1.28	1.31	1.33	1.37
10	1.26	1.28	1.31	1.34	1.36	1.38	1.43
15	1.34	1.37	1.40	1.43	1.45	1.48	1.52
20	1.40	1.43	1.46	1.49	1.52	1.54	1.59
30	1.50	1.52	1.55	1.58	1.61	1.63	1.69
40	1.59	1.59	1.61	1.64	1.67	1.70	1.75
50	1.65	1.65	1.66	1.69	1.72	1.75	1.80
60	1.71	1.71	1.71	1.72	1.76	1.78	1.84
70	1.75	1.75	1.75	1.75	1.79	1.82	1.88
80	1.79	1.79	1.79	1.79	1.81	1.84	1.90
90	1.82	1.82	1.82	1.82	1.84	1.87	1.93
100	1.85	1.85	1.85	1.85	1.86	1.89	1.95
120	1.90	1.90	1.90	1.90	1.90	1.92	1.98
140	1.94	1.94	1.94	1.94	1.94	1.95	2.01
160	1.98	1.98	1.98	1.98	1.98	1.98	2.04
180	2.01	2.01	2.01	2.01	2.01	2.01	2.06
200	2.04	2.04	2.04	2.04	2.04	2.04	2.08
250	2.09	2.09	2.09	2.09	2.09	2.09	2.12
300	2.14	2.14	2.14	2.14	2.14	2.14	2.16
350	2.18	2.18	2.18	2.18	2.18	2.18	2.19
400	2.21	2.21	2.21	2.21	2.21	2.21	2.22

τ = 10 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.82	0.84	0.86	0.87	0.89	0.91	0.94
4	0.96	0.98	1.00	1.02	1.04	1.06	1.10
6	1.04	1.06	1.09	1.11	1.13	1.15	1.19
8	1.10	1.12	1.15	1.17	1.20	1.22	1.26
10	1.14	1.17	1.20	1.22	1.24	1.27	1.31
15	1.22	1.25	1.28	1.31	1.33	1.36	1.41
20	1.28	1.31	1.34	1.37	1.39	1.42	1.47
30	1.37	1.39	1.42	1.45	1.48	1.51	1.56
40	1.45	1.45	1.48	1.51	1.54	1.57	1.63
50	1.51	1.51	1.53	1.56	1.59	1.62	1.68
60	1.56	1.56	1.56	1.59	1.63	1.65	1.72
70	1.60	1.60	1.60	1.62	1.66	1.69	1.75
80	1.64	1.64	1.64	1.65	1.68	1.71	1.78
90	1.67	1.67	1.67	1.67	1.71	1.74	1.80
100	1.70	1.70	1.70	1.70	1.73	1.76	1.82
120	1.75	1.75	1.75	1.75	1.76	1.79	1.86
140	1.79	1.79	1.79	1.79	1.79	1.82	1.89
160	1.83	1.83	1.83	1.83	1.83	1.85	1.92
180	1.86	1.86	1.86	1.86	1.86	1.87	1.94
200	1.89	1.89	1.89	1.89	1.89	1.89	1.96
250	1.95	1.95	1.95	1.95	1.95	1.95	2.01
300	2.00	2.00	2.00	2.00	2.00	2.00	2.05
350	2.04	2.04	2.04	2.04	2.04	2.04	2.09
400	2.08	2.08	2.08	2.08	2.08	2.08	2.12

τ = 30 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.71	0.72	0.74	0.76	0.78	0.79	0.83
4	0.83	0.86	0.88	0.90	0.92	0.94	0.98
6	0.91	0.93	0.96	0.98	1.00	1.02	1.07
8	0.96	0.99	1.02	1.04	1.06	1.08	1.13
10	1.00	1.03	1.06	1.08	1.11	1.13	1.18
15	1.08	1.11	1.14	1.16	1.19	1.22	1.27
20	1.13	1.16	1.20	1.22	1.25	1.28	1.33
30	1.21	1.24	1.27	1.30	1.33	1.36	1.42
40	1.28	1.30	1.33	1.36	1.39	1.42	1.48
50	1.34	1.34	1.37	1.40	1.44	1.47	1.53
60	1.39	1.39	1.41	1.44	1.47	1.50	1.57
70	1.43	1.43	1.44	1.47	1.51	1.54	1.60
80	1.47	1.47	1.47	1.50	1.53	1.56	1.63
90	1.50	1.50	1.50	1.52	1.56	1.59	1.65
100	1.53	1.53	1.53	1.54	1.58	1.61	1.68
120	1.58	1.58	1.58	1.58	1.61	1.64	1.71
140	1.62	1.62	1.62	1.62	1.64	1.68	1.75
160	1.65	1.65	1.65	1.65	1.67	1.70	1.78
180	1.69	1.69	1.69	1.69	1.69	1.73	1.80
200	1.71	1.71	1.71	1.71	1.72	1.75	1.82
250	1.78	1.78	1.78	1.78	1.78	1.80	1.88
300	1.83	1.83	1.83	1.83	1.83	1.84	1.92
350	1.87	1.87	1.87	1.87	1.87	1.88	1.96
400	1.92	1.92	1.92	1.92	1.92	1.92	2.00

τ = 60 s

x(km) / z(m)	0.1	0.3	1	3	I0	30	>600
2	0.63	0.65	0.67	0.69	0.70	0.72	0.75
4	0.75	0.78	0.80	0.82	0.84	0.86	0.90
6	0.82	0.85	0.87	0.90	0.92	0.94	0.98
8	0.88	0.90	0.93	0.95	0.98	1.00	1.05
10	0.91	0.94	0.97	0.99	1.02	1.04	1.09
15	0.99	1.02	1.05	1.07	1.10	1.13	1.18
20	1.04	1.07	1.10	1.13	1.16	1.18	1.24
30	1.11	1.14	1.18	1.21	1.24	1.27	1.33
40	1.18	1.19	1.23	1.26	1.30	1.32	1.39
50	1.23	1.24	1.27	1.31	1.34	1.37	1.43
60	1.28	1.28	1.31	1.34	1.38	1.41	1.47
70	1.32	1.32	1.34	1.37	1.41	1.44	1.51
80	1.36	1.36	1.36	1.40	1.43	1.46	1.53
90	1.39	1.39	1.39	1.42	1.46	1.49	1.56
100	1.42	1.42	1.42	1.44	1.48	1.51	1.58
120	1.46	1.46	1.46	1.48	1.51	1.55	1.62
140	1.51	1.51	1.51	1.51	1.55	1.58	1.65
160	1.54	1.54	1.54	1.54	1.57	1.61	1.68
180	1.57	1.57	1.57	1.57	1.60	1.63	1.71
200	1.60	1.60	1.60	1.60	1.62	1.66	1.74
250	1.67	1.67	1.67	1.67	1.67	1.71	1.79
300	1.72	1.72	1.72	1.72	1.72	1.75	1.84
350	1.77	1.77	1.77	1.77	1.77	1.79	1.88
400	1.81	1.81	1.81	1.81	1.81	1.83	1.92

Mean-hourly (τ = 3600 s)

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.44	0.46	0.48	0.49	0.51	0.53	0.56
4	0.54	0.57	0.59	0.61	0.63	0.65	0.69
6	0.60	0.63	0.65	0.68	0.70	0.72	0.77
8	0.65	0.67	0.70	0.73	0.75	0.77	0.82
10	0.68	0.71	0.74	0.76	0.79	0.81	0.87
15	0.74	0.77	0.80	0.83	0.86	0.89	0.94
20	0.78	0.82	0.85	0.88	0.91	0.94	1.00
30	0.85	0.88	0.92	0.95	0.99	1.02	1.08
40	0.90	0.93	0.97	1.00	1.04	1.07	1.14
50	0.95	0.97	1.01	1.04	1.08	1.11	1.18
60	0.99	1.00	1.04	1.08	1.11	1.15	1.22
70	1.03	1.03	1.07	1.11	1.14	1.18	1.25
80	1.06	1.06	1.09	1.13	1.17	1.21	1.28
90	1.09	1.09	1.11	1.15	1.20	1.23	1.31
100	1.12	1.12	1.13	1.17	1.22	1.25	1.33
120	1.17	1.17	1.17	1.21	1.26	1.29	1.37
140	1.21	1.21	1.21	1.24	1.29	1.33	1.41
160	1.25	1.25	1.25	1.27	1.32	1.36	1.44
180	1.28	1.28	1.28	1.30	1.35	1.39	1.47
200	1.31	1.31	1.31	1.32	1.37	1.41	1.50
250	1.38	1.38	1.38	1.38	1.43	1.47	1.56
300	1.44	1.44	1.44	1.44	1.48	1.52	1.62
350	1.49	1.49	1.49	1.49	1.52	1.57	1.67
400	1.54	1.54	1.54	1.54	1.56	1.61	1.71

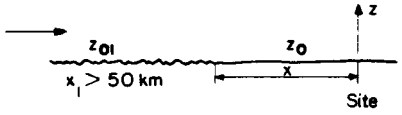


TABLE 10.14 *K*-factors for Site Roughness z_0 = 0.1 m and Upwind Roughness z_{01} = 0.3 m

τ = 1 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.03	1.04	1.05	1.06	1.07	1.08	1.10
4	1.19	1.20	1.22	1.23	1.24	1.25	1.27
6	1.29	1.30	1.31	1.32	1.34	1.35	1.37
8	1.35	1.37	1.38	1.39	1.41	1.42	1.44
10	1.40	1.42	1.43	1.45	1.46	1.47	1.50
15	1.50	1.51	1.53	1.54	1.56	1.57	1.60
20	1.56	1.58	1.60	1.61	1.63	1.64	1.67
30	1.67	1.67	1.69	1.70	1.72	1.73	1.77
40	1.75	1.75	1.75	1.77	1.79	1.80	1.83
50	1.81	1.81	1.81	1.82	1.83	1.85	1.88
60	1.86	1.86	1.86	1.86	1.87	1.89	1.92
70	1.90	1.90	1.90	1.90	1.91	1.92	1.96
80	1.93	1.93	1.93	1.93	1.93	1.95	1.98
90	1.96	1.96	1.96	1.96	1.96	1.97	2.01
100	1.99	1.99	1.99	1.99	1.99	1.99	2.03
120	2.03	2.03	2.03	2.03	2.03	2.03	2.06
140	2.06	2.06	2.06	2.06	2.06	2.06	2.09
160	2.09	2.09	2.09	2.09	2.09	2.09	2.12
180	2.12	2.12	2.12	2.12	2.12	2.12	2.14
200	2.14	2.14	2.14	2.14	2.14	2.14	2.16
250	2.19	2.19	2.19	2.19	2.19	2.19	2.20
300	2.23	2.23	2.23	2.23	2.23	2.23	2.23
350	2.26	2.26	2.26	2.26	2.26	2.26	2.26
400	2.29	2.29	2.29	2.29	2.29	2.29	2.29

τ = 3 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.97	0.98	0.99	1.00	1.01	1.02	1.04
4	1.13	1.14	1.15	1.16	1.17	1.18	1.21
6	1.22	1.23	1.24	1.26	1.27	1.28	1.30
8	1.28	1.30	1.31	1.32	1.34	1.35	1.37
10	1.33	1.35	1.36	1.38	1.39	1.40	1.43
15	1.42	1.44	1.45	1.47	1.48	1.50	1.52
20	1.49	1.50	1.52	1.53	1.55	1.56	1.59
30	1.59	1.59	1.61	1.63	1.64	1.66	1.69
40	1.67	1.67	1.67	1.69	1.71	1.72	1.75
50	1.73	1.73	1.73	1.74	1.76	1.77	1.80
60	1.77	1.77	1.77	1.78	1.79	1.81	1.84
70	1.81	1.81	1.81	1.81	1.83	1.84	1.88
80	1.84	1.84	1.84	1.84	1.85	1.87	1.90
90	1.87	1.87	1.87	1.87	1.88	1.89	1.93
100	1.90	1.90	1.90	1.90	1.90	1.91	1.95
120	1.94	1.94	1.94	1.94	1.94	1.95	1.98
140	1.98	1.98	1.98	1.98	1.98	1.98	2.01
160	2.01	2.01	2.01	2.01	2.01	2.01	2.04
180	2.03	2.03	2.03	2.03	2.03	2.03	2.06
200	2.06	2.06	2.06	2.06	2.06	2.06	2.08
250	2.11	2.11	2.11	2.11	2.11	2.11	2.12
300	2.15	2.15	2.15	2.15	2.15	2.15	2.16
350	2.19	2.19	2.19	2.19	2.19	2.19	2.19
400	2.22	2.22	2.22	2.22	2.22	2.22	2.22

τ = 10 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.87	0.88	0.89	0.90	0.91	0.92	0.94
4	1.02	1.03	1.05	1.06	1.07	1.08	1.10
6	1.11	1.12	1.13	1.15	1.16	1.17	1.19
8	1.17	1.18	1.20	1.21	1.22	1.24	1.26
10	1.22	1.23	1.25	1.26	1.27	1.29	1.31
15	1.30	1.32	1.33	1.35	1.36	1.38	1.41
20	1.36	1.38	1.40	1.41	1.43	1.44	1.47
30	1.46	1.47	1.48	1.50	1.52	1.53	1.56
40	1.53	1.53	1.55	1.56	1.58	1.59	1.63
50	1.59	1.59	1.59	1.61	1.63	1.64	1.68
60	1.63	1.63	1.63	1.65	1.67	1.68	1.72
70	1.67	1.67	1.67	1.68	1.70	1.71	1.75
80	1.71	1.71	1.71	1.71	1.72	1.74	1.78
90	1.73	1.73	1.73	1.73	1.75	1.76	1.80
100	1.76	1.76	1.76	1.76	1.77	1.79	1.82
120	1.80	1.80	1.80	1.80	1.80	1.82	1.86
140	1.84	1.84	1.84	1.84	1.84	1.85	1.89
160	1.87	1.87	1.87	1.87	1.87	1.88	1.92
180	1.90	1.90	1.90	1.90	1.90	1.90	1.94
200	1.92	1.92	1.92	1.92	1.92	1.92	1.96
250	1.98	1.98	1.98	1.98	1.98	1.98	2.01
300	2.02	2.02	2.02	2.02	2.02	2.02	2.05
350	2.06	2.06	2.06	2.06	2.06	2.06	2.09
400	2.10	2.10	2.10	2.10	2.10	2.10	2.12

τ = 30 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.76	0.77	0.78	0.79	0.80	0.81	0.83
4	0.90	0.91	0.92	0.93	0.95	0.96	0.98
6	0.98	0.99	1.01	1.02	1.03	1.04	1.07
8	1.04	1.05	1.06	1.08	1.09	1.10	1.13
10	1.08	1.10	1.11	1.12	1.14	1.15	1.18
15	1.16	1.18	1.19	1.21	1.22	1.24	1.27
20	1.22	1.24	1.25	1.27	1.29	1.30	1.33
30	1.31	1.32	1.34	1.35	1.37	1.39	1.42
40	1.38	1.38	1.40	1.41	1.43	1.45	1.48
50	1.43	1.43	1.44	1.46	1.48	1.49	1.53
60	1.48	1.48	1.48	1.50	1.51	1.53	1.57
70	1.51	1.51	1.51	1.53	1.55	1.56	1.60
80	1.54	1.54	1.54	1.55	1.57	1.59	1.63
90	1.57	1.57	1.57	1.58	1.60	1.62	1.65
100	1.60	1.60	1.60	1.60	1.62	1.64	1.68
120	1.64	1.64	1.64	1.64	1.66	1.67	1.71
140	1.68	1.68	1.68	1.68	1.69	1.71	1.75
160	1.71	1.71	1.71	1.71	1.72	1.73	1.78
180	1.74	1.74	1.74	1.74	1.74	1.76	1.80
200	1.77	1.77	1.77	1.77	1.77	1.78	1.82
250	1.82	1.82	1.82	1.82	1.82	1.83	1.88
300	1.87	1.87	1.87	1.87	1.87	1.88	1.92
350	1.91	1.91	1.91	1.91	1.91	1.92	1.96
400	1.95	1.95	1.95	1.95	1.95	1.95	2.00

τ = 60 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.68	0.70	0.71	0.72	0.73	0.74	0.75
4	0.82	0.83	0.84	0.85	0.87	0.88	0.90
6	0.89	0.91	0.92	0.94	0.95	0.96	0.98
8	0.95	0.96	0.98	0.99	1.01	1.02	1.05
10	0.99	1.01	1.02	1.04	1.05	1.06	1.09
15	1.07	1.09	1.10	1.12	1.13	1.15	1.18
20	1.13	1.14	1.16	1.18	1.19	1.21	1.24
30	1.21	1.22	1.24	1.26	1.28	1.29	1.33
40	1.28	1.28	1.30	1.32	1.33	1.35	1.39
50	1.33	1.33	1.34	1.36	1.38	1.40	1.43
60	1.37	1.37	1.38	1.40	1.42	1.44	1.47
70	1.41	1.41	1.41	1.43	1.45	1.47	1.51
80	1.44	1.44	1.44	1.46	1.48	1.49	1.53
90	1.47	1.47	1.47	1.48	1.50	1.52	1.56
100	1.49	1.49	1.49	1.50	1.52	1.54	1.58
120	1.54	1.54	1.54	1.54	1.56	1.58	1.62
140	1.58	1.58	1.58	1.58	1.59	1.61	1.65
160	1.61	1.61	1.61	1.61	1.62	1.64	1.68
180	1.64	1.64	1.64	1.64	1.65	1.67	1.71
200	1.67	1.67	1.67	1.67	1.67	1.69	1.74
250	1.73	1.73	1.73	1.73	1.73	1.74	1.79
300	1.78	1.78	1.78	1.78	1.78	1.79	1.84
350	1.82	1.82	1.82	1.82	1.82	1.83	1.88
400	1.86	1.86	1.86	1.86	1.86	1.87	1.92

Mean-hourly (τ = 3600 s)

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.49	0.50	0.51	0.52	0.53	0.54	0.56
4	0.61	0.62	0.63	0.65	0.66	0.67	0.69
6	0.67	0.69	0.70	0.72	0.73	0.74	0.77
8	0.72	0.74	0.75	0.77	0.78	0.80	0.82
10	0.76	0.78	0.79	0.81	0.82	0.84	0.87
15	0.83	0.85	0.86	0.88	0.90	0.91	0.94
20	0.88	0.90	0.92	0.93	0.95	0.97	1.00
30	0.95	0.97	0.99	1.01	1.03	1.04	1.08
40	1.01	1.02	1.04	1.06	1.08	1.10	1.14
50	1.06	1.06	1.08	1.10	1.12	1.14	1.18
60	1.10	1.10	1.12	1.14	1.16	1.18	1.22
70	1.14	1.14	1.15	1.17	1.19	1.21	1.25
80	1.17	1.17	1.18	1.20	1.22	1.24	1.28
90	1.20	1.20	1.20	1.22	1.24	1.26	1.31
100	1.22	1.22	1.22	1.24	1.27	1.29	1.33
120	1.27	1.27	1.27	1.28	1.31	1.33	1.37
140	1.31	1.31	1.31	1.32	1.34	1.36	1.41
160	1.34	1.34	1.34	1.35	1.37	1.40	1.44
180	1.37	1.37	1.37	1.38	1.40	1.42	1.47
200	1.40	1.40	1.40	1.40	1.43	1.45	1.50
250	1.47	1.47	1.47	1.47	1.49	1.51	1.56
300	1.52	1.52	1.52	1.52	1.54	1.56	1.62
350	1.57	1.57	1.57	1.57	1.58	1.61	1.67
400	1.62	1.62	1.62	1.62	1.63	1.65	1.71

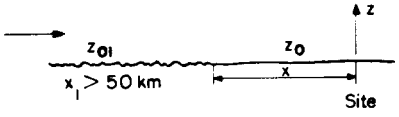


TABLE 10.15 *K*-factors for Site Roughness z_0 = 0.1 m and Upwind Roughness z_{01} = 0.03 m

τ = 1 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.16	1.15	1.14	1.12	1.12	1.11	1.10
4	1.35	1.33	1.31	1.30	1.29	1.28	1.27
6	1.45	1.43	1.42	1.40	1.39	1.38	1.37
8	1.53	1.51	1.49	1.48	1.46	1.46	1.44
10	1.59	1.57	1.55	1.53	1.52	1.51	1.50
15	1.69	1.67	1.65	1.64	1.62	1.61	1.60
20	1.76	1.74	1.72	1.71	1.69	1.68	1.67
30	1.85	1.85	1.82	1.81	1.79	1.78	1.77
40	1.90	1.90	1.89	1.87	1.86	1.85	1.83
50	1.94	1.94	1.94	1.93	1.91	1.90	1.88
60	1.98	1.98	1.98	1.97	1.95	1.94	1.92
70	2.00	2.00	2.00	2.00	1.98	1.97	1.96
80	2.03	2.03	2.03	2.03	2.01	2.00	1.98
90	2.05	2.05	2.05	2.05	2.03	2.02	2.01
100	2.06	2.06	2.06	2.06	2.06	2.04	2.03
120	2.09	2.09	2.09	2.09	2.09	2.08	2.06
140	2.11	2.11	2.11	2.11	2.11	2.11	2.09
160	2.13	2.13	2.13	2.13	2.13	2.13	2.12
180	2.15	2.15	2.15	2.15	2.15	2.15	2.14
200	2.17	2.17	2.17	2.17	2.17	2.17	2.16
250	2.20	2.20	2.20	2.20	2.20	2.20	2.20
300	2.23	2.23	2.23	2.23	2.23	2.23	2.23
350	2.26	2.26	2.26	2.26	2.26	2.26	2.26
400	2.29	2.29	2.29	2.29	2.29	2.29	2.29

τ = 3 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.10	1.09	1.08	1.06	1.05	1.05	1.04
4	1.28	1.26	1.25	1.24	1.22	1.22	1.21
6	1.39	1.37	1.35	1.34	1.32	1.31	1.30
8	1.46	1.44	1.42	1.41	1.39	1.38	1.37
10	1.52	1.50	1.48	1.46	1.45	1.44	1.43
15	1.62	1.60	1.58	1.56	1.55	1.54	1.52
20	1.69	1.67	1.65	1.63	1.62	1.61	1.59
30	1.77	1.77	1.75	1.73	1.71	1.70	1.69
40	1.83	1.83	1.81	1.80	1.78	1.77	1.75
50	1.87	1.87	1.87	1.85	1.83	1.82	1.80
60	1.90	1.90	1.90	1.89	1.87	1.86	1.84
70	1.93	1.93	1.93	1.92	1.90	1.89	1.88
80	1.95	1.95	1.95	1.95	1.93	1.92	1.90
90	1.97	1.97	1.97	1.97	1.96	1.94	1.93
100	1.99	1.99	1.99	1.99	1.98	1.96	1.95
120	2.02	2.02	2.02	2.02	2.01	2.00	1.98
140	2.05	2.05	2.05	2.05	2.04	2.03	2.01
160	2.07	2.07	2.07	2.07	2.07	2.06	2.04
180	2.09	2.09	2.09	2.09	2.09	2.08	2.06
200	2.10	2.10	2.10	2.10	2.10	2.10	2.08
250	2.14	2.14	2.14	2.14	2.14	2.14	2.12
300	2.17	2.17	2.17	2.17	2.17	2.17	2.16
350	2.20	2.20	2.20	2.20	2.20	2.20	2.19
400	2.23	2.23	2.23	2.23	2.23	2.23	2.22

τ = 10 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.01	0.99	0.98	0.97	0.96	0.95	0.94
4	1.18	1.16	1.14	1.13	1.12	1.11	1.10
6	1.28	1.26	1.24	1.23	1.21	1.21	1.19
8	1.35	1.33	1.31	1.30	1.28	1.27	1.26
10	1.41	1.38	1.36	1.35	1.33	1.32	1.31
15	1.50	1.48	1.46	1.44	1.43	1.42	1.41
20	1.57	1.55	1.53	1.51	1.50	1.48	1.47
30	1.65	1.65	1.62	1.61	1.59	1.58	1.56
40	1.71	1.71	1.69	1.67	1.65	1.64	1.63
50	1.75	1.75	1.74	1.72	1.70	1.69	1.68
60	1.79	1.79	1.78	1.76	1.74	1.73	1.72
70	1.81	1.81	1.81	1.80	1.78	1.76	1.75
80	1.84	1.84	1.84	1.83	1.81	1.79	1.78
90	1.86	1.86	1.86	1.85	1.83	1.82	1.80
100	1.88	1.88	1.88	1.87	1.85	1.84	1.82
120	1.91	1.91	1.91	1.91	1.89	1.88	1.86
140	1.94	1.94	1.94	1.94	1.92	1.91	1.89
160	1.96	1.96	1.96	1.96	1.95	1.94	1.92
180	1.98	1.98	1.98	1.98	1.97	1.96	1.94
200	2.00	2.00	2.00	2.00	2.00	1.98	1.96
250	2.04	2.04	2.04	2.04	2.04	2.03	2.01
300	2.08	2.08	2.08	2.08	2.08	2.07	2.05
350	2.11	2.11	2.11	2.11	2.11	2.10	2.09
400	2.14	2.14	2.14	2.14	2.14	2.14	2.12

τ = 30 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.90	0.88	0.87	0.85	0.84	0.84	0.83
4	1.06	1.04	1.02	1.01	1.00	0.99	0.98
6	1.16	1.14	1.12	1.10	1.09	1.08	1.07
8	1.22	1.20	1.18	1.17	1.15	1.14	1.13
10	1.28	1.26	1.23	1.22	1.20	1.19	1.18
15	1.37	1.35	1.33	1.31	1.29	1.28	1.27
20	1.44	1.42	1.39	1.37	1.36	1.34	1.33
30	1.52	1.51	1.48	1.46	1.45	1.43	1.42
40	1.57	1.57	1.55	1.53	1.51	1.50	1.48
50	1.62	1.62	1.60	1.58	1.56	1.55	1.53
60	1.65	1.65	1.64	1.62	1.60	1.58	1.57
70	1.68	1.68	1.67	1.65	1.63	1.62	1.60
80	1.70	1.70	1.70	1.68	1.66	1.65	1.63
90	1.73	1.73	1.73	1.71	1.69	1.67	1.65
100	1.75	1.75	1.75	1.73	1.71	1.69	1.68
120	1.78	1.78	1.78	1.77	1.75	1.73	1.71
140	1.81	1.81	1.81	1.80	1.78	1.77	1.75
160	1.83	1.83	1.83	1.83	1.81	1.80	1.78
180	1.86	1.86	1.86	1.86	1.84	1.82	1.80
200	1.88	1.88	1.88	1.88	1.86	1.84	1.82
250	1.92	1.92	1.92	1.92	1.91	1.90	1.88
300	1.97	1.97	1.97	1.97	1.96	1.94	1.92
350	2.00	2.00	2.00	2.00	2.00	1.98	1.96
400	2.04	2.04	2.04	2.04	2.04	2.02	2.00

τ = 60 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.83	0.81	0.79	0.78	0.77	0.76	0.75
4	0.99	0.97	0.95	0.93	0.92	0.91	0.90
6	1.08	1.06	1.04	1.02	1.01	1.00	0.98
8	1.15	1.12	1.10	1.08	1.07	1.06	1.05
10	1.20	1.17	1.15	1.13	1.12	1.11	1.09
15	1.29	1.27	1.24	1.22	1.21	1.19	1.18
20	1.35	1.33	1.31	1.29	1.27	1.25	1.24
30	1.43	1.42	1.40	1.37	1.36	1.34	1.33
40	1.49	1.49	1.46	1.44	1.42	1.40	1.39
50	1.53	1.53	1.51	1.49	1.47	1.45	1.43
60	1.56	1.56	1.55	1.53	1.51	1.49	1.47
70	1.59	1.59	1.59	1.56	1.54	1.52	1.51
80	1.62	1.62	1.62	1.59	1.57	1.55	1.53
90	1.64	1.64	1.64	1.62	1.59	1.58	1.56
100	1.66	1.66	1.66	1.64	1.62	1.60	1.58
120	1.70	1.70	1.70	1.68	1.66	1.64	1.62
140	1.73	1.73	1.73	1.72	1.69	1.68	1.65
160	1.75	1.75	1.75	1.75	1.72	1.71	1.68
180	1.78	1.78	1.78	1.78	1.75	1.73	1.71
200	1.80	1.80	1.80	1.80	1.78	1.76	1.74
250	1.85	1.85	1.85	1.85	1.83	1.81	1.79
300	1.89	1.89	1.89	1.89	1.88	1.86	1.84
350	1.93	1.93	1.93	1.93	1.92	1.90	1.88
400	1.97	1.97	1.97	1.97	1.96	1.94	1.92

Mean-hourly (τ = 3600 s)

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.64	0.62	0.60	0.59	0.58	0.57	0.56
4	0.79	0.76	0.74	0.73	0.71	0.70	0.69
6	0.87	0.85	0.83	0.81	0.79	0.78	0.77
8	0.93	0.91	0.89	0.87	0.85	0.84	0.82
10	0.98	0.96	0.93	0.91	0.89	0.88	0.87
15	1.07	1.04	1.01	0.99	0.97	0.96	0.94
20	1.13	1.10	1.07	1.05	1.03	1.02	1.00
30	1.20	1.19	1.16	1.14	1.11	1.10	1.08
40	1.25	1.25	1.22	1.20	1.17	1.16	1.14
50	1.30	1.30	1.27	1.24	1.22	1.20	1.18
60	1.33	1.33	1.31	1.29	1.26	1.24	1.22
70	1.36	1.36	1.35	1.32	1.29	1.28	1.25
80	1.39	1.39	1.38	1.35	1.32	1.31	1.28
90	1.41	1.41	1.41	1.38	1.35	1.33	1.31
100	1.44	1.44	1.43	1.40	1.38	1.36	1.33
120	1.48	1.48	1.48	1.45	1.42	1.40	1.37
140	1.51	1.51	1.51	1.49	1.46	1.44	1.41
160	1.54	1.54	1.54	1.52	1.49	1.47	1.44
180	1.57	1.57	1.57	1.55	1.52	1.50	1.47
200	1.60	1.60	1.60	1.58	1.55	1.53	1.50
250	1.65	1.65	1.65	1.65	1.61	1.59	1.56
300	1.70	1.70	1.70	1.70	1.67	1.65	1.62
350	1.75	1.75	1.75	1.75	1.72	1.70	1.67
400	1.79	1.79	1.79	1.79	1.77	1.74	1.71

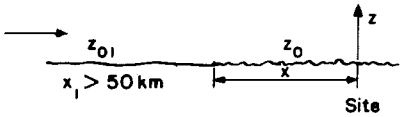


TABLE 10.16 *K*-factors for Site Roughness z_0 = 0.1 m and Upwind Roughness z_{01} = 0.01 m

τ = 1 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.21	1.19	1.16	1.14	1.13	1.11	1.10
4	1.40	1.37	1.34	1.32	1.30	1.29	1.27
6	1.51	1.48	1.45	1.43	1.41	1.39	1.37
8	1.59	1.56	1.53	1.50	1.48	1.46	1.44
10	1.65	1.62	1.58	1.56	1.54	1.52	1.50
15	1.76	1.72	1.69	1.66	1.64	1.62	1.60
20	1.83	1.80	1.76	1.73	1.71	1.69	1.67
30	1.90	1.90	1.87	1.84	1.81	1.79	1.77
40	1.95	1.95	1.94	1.90	1.88	1.86	1.83
50	1.99	1.99	1.99	1.96	1.93	1.91	1.88
60	2.02	2.02	2.02	2.00	1.97	1.95	1.92
70	2.04	2.04	2.04	2.03	2.00	1.98	1.96
80	2.06	2.06	2.06	2.06	2.03	2.01	1.98
90	2.07	2.07	2.07	2.07	2.06	2.03	2.01
100	2.09	2.09	2.09	2.09	2.08	2.05	2.03
120	2.11	2.11	2.11	2.11	2.11	2.09	2.06
140	2.13	2.13	2.13	2.13	2.13	2.12	2.09
160	2.15	2.15	2.15	2.15	2.15	2.14	2.12
180	2.16	2.16	2.16	2.16	2.16	2.16	2.14
200	2.18	2.18	2.18	2.18	2.18	2.18	2.16
250	2.21	2.21	2.21	2.21	2.21	2.21	2.20
300	2.24	2.24	2.24	2.24	2.24	2.24	2.23
350	2.26	2.26	2.26	2.26	2.26	2.26	2.26
400	2.29	2.29	2.29	2.29	2.29	2.29	2.29

τ = 3 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.15	1.13	1.10	1.08	1.07	1.05	1.04
4	1.34	1.31	1.28	1.26	1.24	1.22	1.21
6	1.45	1.41	1.38	1.36	1.34	1.32	1.30
8	1.52	1.49	1.46	1.43	1.41	1.39	1.37
10	1.58	1.55	1.51	1.49	1.46	1.45	1.43
15	1.69	1.65	1.62	1.59	1.56	1.55	1.52
20	1.76	1.73	1.69	1.66	1.63	1.62	1.59
30	1.84	1.83	1.79	1.76	1.73	1.71	1.69
40	1.88	1.88	1.86	1.83	1.80	1.78	1.75
50	1.92	1.92	1.91	1.88	1.85	1.83	1.80
60	1.95	1.95	1.95	1.92	1.89	1.87	1.84
70	1.97	1.97	1.97	1.96	1.92	1.90	1.88
80	1.99	1.99	1.99	1.98	1.95	1.93	1.90
90	2.01	2.01	2.01	2.01	1.98	1.96	1.93
100	2.02	2.02	2.02	2.02	2.00	1.98	1.95
120	2.05	2.05	2.05	2.05	2.04	2.01	1.98
140	2.07	2.07	2.07	2.07	2.07	2.04	2.01
160	2.09	2.09	2.09	2.09	2.09	2.07	2.04
180	2.10	2.10	2.10	2.10	2.10	2.09	2.06
200	2.12	2.12	2.12	2.12	2.12	2.11	2.08
250	2.15	2.15	2.15	2.15	2.15	2.15	2.12
300	2.18	2.18	2.18	2.18	2.18	2.18	2.16
350	2.21	2.21	2.21	2.21	2.21	2.21	2.19
400	2.24	2.24	2.24	2.24	2.24	2.24	2.22

τ = 10 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.06	1.03	1.01	0.99	0.97	0.96	0.94
4	1.24	1.21	1.18	1.15	1.13	1.12	1.10
6	1.34	1.31	1.28	1.25	1.23	1.21	1.19
8	1.42	1.38	1.35	1.32	1.30	1.28	1.26
10	1.47	1.44	1.40	1.37	1.35	1.33	1.31
15	1.58	1.54	1.50	1.47	1.45	1.43	1.41
20	1.65	1.61	1.57	1.54	1.51	1.49	1.47
30	1.72	1.71	1.67	1.64	1.61	1.59	1.56
40	1.77	1.77	1.74	1.70	1.67	1.65	1.63
50	1.81	1.81	1.79	1.76	1.73	1.70	1.68
60	1.84	1.84	1.83	1.80	1.77	1.74	1.72
70	1.86	1.86	1.86	1.83	1.80	1.78	1.75
80	1.89	1.89	1.89	1.86	1.83	1.80	1.78
90	1.90	1.90	1.90	1.89	1.85	1.83	1.80
100	1.92	1.92	1.92	1.91	1.88	1.85	1.82
120	1.95	1.95	1.95	1.95	1.91	1.89	1.86
140	1.97	1.97	1.97	1.97	1.95	1.92	1.89
160	1.99	1.99	1.99	1.99	1.97	1.95	1.92
180	2.01	2.01	2.01	2.01	2.00	1.97	1.94
200	2.03	2.03	2.03	2.03	2.02	1.99	1.96
250	2.06	2.06	2.06	2.06	2.06	2.04	2.01
300	2.10	2.10	2.10	2.10	2.10	2.08	2.05
350	2.13	2.13	2.13	2.13	2.13	2.12	2.09
400	2.16	2.16	2.16	2.16	2.16	2.15	2.12

τ = 30 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.95	0.92	0.89	0.87	0.86	0.84	0.83
4	1.12	1.09	1.06	1.03	1.01	1.00	0.98
6	1.22	1.19	1.15	1.13	1.10	1.09	1.07
8	1.29	1.26	1.22	1.19	1.17	1.15	1.13
10	1.35	1.31	1.27	1.25	1.22	1.20	1.18
15	1.45	1.41	1.37	1.34	1.31	1.29	1.27
20	1.52	1.48	1.44	1.41	1.38	1.36	1.33
30	1.60	1.58	1.53	1.50	1.47	1.45	1.42
40	1.65	1.65	1.60	1.56	1.53	1.51	1.48
50	1.68	1.68	1.65	1.62	1.58	1.56	1.53
60	1.71	1.71	1.69	1.66	1.62	1.60	1.57
70	1.74	1.74	1.73	1.69	1.66	1.63	1.60
80	1.76	1.76	1.76	1.72	1.68	1.66	1.63
90	1.78	1.78	1.78	1.75	1.71	1.68	1.65
100	1.80	1.80	1.80	1.77	1.73	1.71	1.68
120	1.83	1.83	1.83	1.81	1.77	1.75	1.71
140	1.86	1.86	1.86	1.85	1.81	1.78	1.75
160	1.88	1.88	1.88	1.88	1.84	1.81	1.78
180	1.90	1.90	1.90	1.90	1.86	1.84	1.80
200	1.92	1.92	1.92	1.92	1.89	1.86	1.82
250	1.96	1.96	1.96	1.96	1.94	1.91	1.88
300	2.00	2.00	2.00	2.00	1.99	1.96	1.92
350	2.04	2.04	2.04	2.04	2.03	2.00	1.96
400	2.07	2.07	2.07	2.07	2.07	2.03	2.00

τ = 60 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.88	0.85	0.82	0.80	0.78	0.77	0.75
4	1.05	1.02	0.98	0.96	0.94	0.92	0.90
6	1.15	1.11	1.08	1.05	1.02	1.01	0.98
8	1.22	1.18	1.14	1.11	1.09	1.07	1.05
10	1.27	1.23	1.19	1.16	1.14	1.12	1.09
15	1.37	1.33	1.29	1.25	1.22	1.20	1.18
20	1.44	1.40	1.35	1.32	1.29	1.27	1.24
30	1.51	1.50	1.45	1.41	1.38	1.35	1.33
40	1.56	1.56	1.51	1.48	1.44	1.42	1.39
50	1.60	1.60	1.57	1.53	1.49	1.46	1.43
60	1.63	1.63	1.61	1.57	1.53	1.50	1.47
70	1.66	1.66	1.64	1.60	1.56	1.54	1.51
80	1.68	1.68	1.68	1.63	1.59	1.57	1.53
90	1.70	1.70	1.70	1.66	1.62	1.59	1.56
100	1.72	1.72	1.72	1.68	1.64	1.62	1.58
120	1.75	1.75	1.75	1.73	1.69	1.66	1.62
140	1.78	1.78	1.78	1.76	1.72	1.69	1.65
160	1.81	1.81	1.81	1.79	1.75	1.72	1.68
180	1.83	1.83	1.83	1.82	1.78	1.75	1.71
200	1.85	1.85	1.85	1.85	1.80	1.77	1.74
250	1.90	1.90	1.90	1.90	1.86	1.83	1.79
300	1.94	1.94	1.94	1.94	1.91	1.88	1.84
350	1.98	1.98	1.98	1.98	1.95	1.92	1.88
400	2.01	2.01	2.01	2.01	1.99	1.96	1.92

Mean-hourly (τ = 3600 s)

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.69	0.66	0.63	0.61	0.59	0.58	0.56
4	0.85	0.82	0.78	0.75	0.73	0.71	0.69
6	0.95	0.91	0.87	0.84	0.81	0.79	0.77
8	1.02	0.97	0.93	0.90	0.87	0.85	0.82
10	1.07	1.02	0.98	0.94	0.91	0.89	0.87
15	1.17	1.11	1.07	1.03	1.00	0.97	0.94
20	1.23	1.18	1.13	1.09	1.06	1.03	1.00
30	1.30	1.27	1.22	1.18	1.14	1.11	1.08
40	1.35	1.34	1.29	1.24	1.20	1.17	1.14
50	1.39	1.39	1.34	1.29	1.25	1.22	1.18
60	1.42	1.42	1.38	1.33	1.29	1.26	1.22
70	1.45	1.45	1.42	1.37	1.32	1.29	1.25
80	1.47	1.47	1.45	1.40	1.35	1.32	1.28
90	1.50	1.50	1.48	1.43	1.38	1.35	1.31
100	1.52	1.52	1.51	1.45	1.41	1.37	1.33
120	1.55	1.55	1.55	1.50	1.45	1.42	1.37
140	1.59	1.59	1.59	1.54	1.49	1.45	1.41
160	1.62	1.62	1.62	1.58	1.52	1.49	1.44
180	1.64	1.64	1.64	1.61	1.56	1.52	1.47
200	1.67	1.67	1.67	1.64	1.59	1.55	1.50
250	1.72	1.72	1.72	1.71	1.65	1.61	1.56
300	1.77	1.77	1.77	1.76	1.71	1.67	1.62
350	1.82	1.82	1.82	1.82	1.76	1.72	1.67
400	1.86	1.86	1.86	1.86	1.81	1.76	1.71

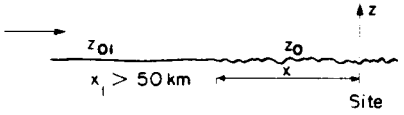


TABLE 10.17 *K*-factors for Site Roughness z_0 = 0.1 m and Upwind Roughness z_{01} = 0.003 m

τ = 1 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.26	1.22	1.19	1.16	1.14	1.12	1.10
4	1.46	1.41	1.37	1.34	1.32	1.30	1.27
6	1.57	1.53	1.48	1.45	1.42	1.40	1.37
8	1.65	1.61	1.56	1.53	1.49	1.47	1.44
10	1.72	1.67	1.62	1.58	1.55	1.53	1.50
15	1.83	1.78	1.73	1.69	1.65	1.63	1.60
20	1.89	1.86	1.80	1.76	1.73	1.70	1.67
30	1.96	1.96	1.91	1.87	1.83	1.80	1.77
40	2.00	2.00	1.98	1.94	1.90	1.87	1.83
50	2.03	2.03	2.03	1.99	1.95	1.92	1.88
60	2.05	2.05	2.05	2.03	1.99	1.96	1.92
70	2.07	2.07	2.07	2.07	2.02	1.99	1.96
80	2.09	2.09	2.09	2.09	2.05	2.02	1.98
90	2.10	2.10	2.10	2.10	2.08	2.05	2.01
100	2.11	2.11	2.11	2.11	2.10	2.07	2.03
120	2.13	2.13	2.13	2.13	2.13	2.10	2.06
140	2.15	2.15	2.15	2.15	2.15	2.13	2.09
160	2.16	2.16	2.16	2.16	2.16	2.16	2.12
180	2.17	2.17	2.17	2.17	2.17	2.17	2.14
200	2.19	2.19	2.19	2.19	2.19	2.19	2.16
250	2.21	2.21	2.21	2.21	2.21	2.21	2.20
300	2.24	2.24	2.24	2.24	2.24	2.24	2.23
350	2.27	2.27	2.27	2.27	2.27	2.27	2.26
400	2.29	2.29	2.29	2.29	2.29	2.29	2.29

τ = 3 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.20	1.16	1.13	1.10	1.08	1.06	1.04
4	1.39	1.35	1.31	1.28	1.25	1.23	1.21
6	1.51	1.46	1.42	1.38	1.35	1.33	1.30
8	1.59	1.54	1.49	1.46	1.42	1.40	1.37
10	1.65	1.60	1.55	1.51	1.48	1.46	1.43
15	1.76	1.71	1.66	1.62	1.58	1.56	1.52
20	1.83	1.78	1.73	1.69	1.65	1.63	1.59
30	1.89	1.89	1.83	1.79	1.75	1.72	1.69
40	1.93	1.93	1.91	1.86	1.82	1.79	1.75
50	1.97	1.97	1.96	1.91	1.87	1.84	1.80
60	1.99	1.99	1.99	1.95	1.91	1.88	1.84
70	2.01	2.01	2.01	1.99	1.95	1.91	1.88
80	2.03	2.03	2.03	2.02	1.97	1.94	1.90
90	2.04	2.04	2.04	2.04	2.00	1.97	1.93
100	2.05	2.05	2.05	2.05	2.02	1.99	1.95
120	2.07	2.07	2.07	2.07	2.06	2.03	1.98
140	2.09	2.09	2.09	2.09	2.09	2.06	2.01
160	2.11	2.11	2.11	2.11	2.11	2.08	2.04
180	2.12	2.12	2.12	2.12	2.12	2.10	2.06
200	2.13	2.13	2.13	2.13	2.13	2.12	2.08
250	2.17	2.17	2.17	2.17	2.17	2.17	2.12
300	2.20	2.20	2.20	2.20	2.20	2.20	2.16
350	2.22	2.22	2.22	2.22	2.22	2.22	2.19
400	2.25	2.25	2.25	2.25	2.25	2.25	2.22

τ = 10 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.11	1.07	1.03	1.01	0.98	0.96	0.94
4	1.29	1.25	1.21	1.18	1.15	1.13	1.10
6	1.40	1.36	1.31	1.28	1.24	1.22	1.19
8	1.48	1.43	1.38	1.35	1.31	1.29	1.26
10	1.54	1.49	1.44	1.40	1.37	1.34	1.31
15	1.65	1.60	1.54	1.50	1.46	1.44	1.41
20	1.72	1.67	1.61	1.57	1.53	1.50	1.47
30	1.79	1.78	1.72	1.67	1.63	1.60	1.56
40	1.83	1.83	1.79	1.74	1.70	1.66	1.63
50	1.86	1.86	1.84	1.79	1.75	1.71	1.68
60	1.89	1.89	1.88	1.83	1.79	1.75	1.72
70	1.91	1.91	1.91	1.87	1.82	1.79	1.75
80	1.93	1.93	1.93	1.90	1.85	1.82	1.78
90	1.94	1.94	1.94	1.92	1.88	1.84	1.80
100	1.96	1.96	1.96	1.95	1.90	1.86	1.82
120	1.98	1.98	1.98	1.98	1.94	1.90	1.86
140	2.00	2.00	2.00	2.00	1.97	1.93	1.89
160	2.02	2.02	2.02	2.02	2.00	1.96	1.92
180	2.04	2.04	2.04	2.04	2.02	1.99	1.94
200	2.05	2.05	2.05	2.05	2.04	2.01	1.96
250	2.09	2.09	2.09	2.09	2.09	2.06	2.01
300	2.12	2.12	2.12	2.12	2.12	2.10	2.05
350	2.15	2.15	2.15	2.15	2.15	2.13	2.09
400	2.18	2.18	2.18	2.18	2.18	2.17	2.12

τ = 30 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.00	0.96	0.92	0.89	0.87	0.85	0.83
4	1.18	1.14	1.09	1.06	1.03	1.00	0.98
6	1.29	1.24	1.19	1.15	1.12	1.10	1.07
8	1.37	1.31	1.26	1.22	1.19	1.16	1.13
10	1.42	1.37	1.32	1.27	1.24	1.21	1.18
15	1.53	1.47	1.41	1.37	1.33	1.30	1.27
20	1.60	1.54	1.48	1.44	1.40	1.37	1.33
30	1.67	1.65	1.58	1.53	1.49	1.46	1.42
40	1.71	1.71	1.65	1.60	1.55	1.52	1.48
50	1.75	1.75	1.71	1.65	1.60	1.57	1.53
60	1.77	1.77	1.75	1.69	1.65	1.61	1.57
70	1.80	1.80	1.79	1.73	1.68	1.64	1.60
80	1.82	1.82	1.82	1.76	1.71	1.67	1.63
90	1.83	1.83	1.83	1.79	1.74	1.70	1.65
100	1.85	1.85	1.85	1.81	1.76	1.72	1.68
120	1.88	1.88	1.88	1.85	1.80	1.76	1.71
140	1.90	1.90	1.90	1.89	1.83	1.79	1.75
160	1.92	1.92	1.92	1.92	1.86	1.82	1.78
180	1.94	1.94	1.94	1.94	1.89	1.85	1.80
200	1.96	1.96	1.96	1.96	1.92	1.87	1.82
250	2.00	2.00	2.00	2.00	1.97	1.93	1.88
300	2.04	2.04	2.04	2.04	2.02	1.97	1.92
350	2.07	2.07	2.07	2.07	2.06	2.01	1.96
400	2.10	2.10	2.10	2.10	2.10	2.05	2.00

τ = 60 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.93	0.89	0.85	0.82	0.80	0.78	0.75
4	1.11	1.06	1.02	0.98	0.95	0.93	0.90
6	1.22	1.17	1.12	1.08	1.04	1.02	0.98
8	1.29	1.24	1.18	1.14	1.10	1.08	1.05
10	1.35	1.29	1.24	1.19	1.15	1.13	1.09
15	1.46	1.39	1.33	1.29	1.24	1.21	1.18
20	1.53	1.47	1.40	1.35	1.31	1.28	1.24
30	1.59	1.57	1.50	1.45	1.40	1.37	1.33
40	1.64	1.64	1.57	1.51	1.46	1.43	1.39
50	1.67	1.67	1.62	1.57	1.51	1.48	1.43
60	1.70	1.70	1.67	1.61	1.56	1.52	1.47
70	1.72	1.72	1.70	1.64	1.59	1.55	1.51
80	1.74	1.74	1.74	1.68	1.62	1.58	1.53
90	1.76	1.76	1.76	1.70	1.65	1.61	1.56
100	1.78	1.78	1.78	1.73	1.67	1.63	1.58
120	1.81	1.81	1.81	1.77	1.71	1.67	1.62
140	1.83	1.83	1.83	1.81	1.75	1.71	1.65
160	1.86	1.86	1.86	1.84	1.78	1.74	1.68
180	1.88	1.88	1.88	1.87	1.81	1.76	1.71
200	1.90	1.90	1.90	1.90	1.83	1.79	1.74
250	1.94	1.94	1.94	1.94	1.89	1.85	1.79
300	1.98	1.98	1.98	1.98	1.94	1.89	1.84
350	2.02	2.02	2.02	2.02	1.99	1.94	1.88
400	2.05	2.05	2.05	2.05	2.03	1.98	1.92

Mean-hourly (τ = 3600 s)

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.75	0.71	0.67	0.63	0.61	0.59	0.56
4	0.92	0.87	0.82	0.78	0.75	0.72	0.69
6	1.03	0.97	0.91	0.87	0.83	0.80	0.77
8	1.10	1.04	0.98	0.93	0.89	0.86	0.82
10	1.16	1.09	1.03	0.98	0.93	0.90	0.87
15	1.26	1.19	1.12	1.07	1.02	0.99	0.94
20	1.32	1.26	1.19	1.13	1.08	1.04	1.00
30	1.39	1.36	1.28	1.22	1.17	1.13	1.08
40	1.43	1.43	1.35	1.29	1.23	1.19	1.14
50	1.47	1.47	1.40	1.34	1.28	1.23	1.18
60	1.50	1.50	1.45	1.38	1.32	1.27	1.22
70	1.53	1.53	1.49	1.42	1.35	1.31	1.25
80	1.55	1.55	1.52	1.45	1.38	1.34	1.28
90	1.57	1.57	1.55	1.48	1.41	1.37	1.31
100	1.59	1.59	1.58	1.51	1.44	1.39	1.33
120	1.63	1.63	1.63	1.55	1.48	1.43	1.37
140	1.66	1.66	1.66	1.59	1.52	1.47	1.41
160	1.69	1.69	1.69	1.63	1.56	1.51	1.44
180	1.71	1.71	1.71	1.67	1.59	1.54	1.47
200	1.74	1.74	1.74	1.70	1.62	1.57	1.50
250	1.79	1.79	1.79	1.77	1.69	1.63	1.56
300	1.84	1.84	1.84	1.83	1.75	1.69	1.62
350	1.88	1.88	1.88	1.88	1.80	1.74	1.67
400	1.92	1.92	1.92	1.92	1.85	1.79	1.71

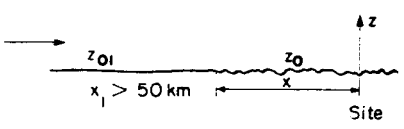


TABLE 10.18 *K*-factors for Site Roughness z_0 = 0.1 m and Upwind Roughness z_{01} = 0.001 m

τ = 1 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.30	1.26	1.21	1.18	1.15	1.13	1.10
4	1.51	1.45	1.40	1.36	1.33	1.30	1.27
6	1.62	1.57	1.51	1.47	1.43	1.41	1.37
8	1.71	1.65	1.59	1.55	1.51	1.48	1.44
10	1.77	1.71	1.65	1.61	1.56	1.54	1.50
15	1.89	1.83	1.76	1.71	1.67	1.64	1.60
20	1.94	1.91	1.84	1.79	1.74	1.71	1.67
30	2.00	2.00	1.95	1.89	1.84	1.81	1.77
40	2.03	2.03	2.02	1.96	1.91	1.88	1.83
50	2.06	2.06	2.06	2.02	1.96	1.93	1.88
60	2.08	2.08	2.08	2.06	2.01	1.97	1.92
70	2.09	2.09	2.09	2.09	2.04	2.00	1.96
80	2.11	2.11	2.11	2.11	2.07	2.03	1.98
90	2.12	2.12	2.12	2.12	2.09	2.06	2.01
100	2.13	2.13	2.13	2.13	2.12	2.08	2.03
120	2.14	2.14	2.14	2.14	2.14	2.11	2.06
140	2.16	2.16	2.16	2.16	2.16	2.14	2.09
160	2.17	2.17	2.17	2.17	2.17	2.17	2.12
180	2.18	2.18	2.18	2.18	2.18	2.18	2.14
200	2.19	2.19	2.19	2.19	2.19	2.19	2.16
250	2.22	2.22	2.22	2.22	2.22	2.22	2.20
300	2.25	2.25	2.25	2.25	2.25	2.25	2.23
350	2.27	2.27	2.27	2.27	2.27	2.27	2.26
400	2.30	2.30	2.30	2.30	2.30	2.30	2.29

τ = 3 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.24	1.20	1.15	1.12	1.09	1.07	1.04
4	1.44	1.39	1.34	1.30	1.26	1.24	1.21
6	1.56	1.50	1.45	1.40	1.36	1.34	1.30
8	1.64	1.58	1.52	1.48	1.44	1.41	1.37
10	1.71	1.64	1.58	1.54	1.49	1.46	1.43
15	1.82	1.76	1.69	1.64	1.60	1.56	1.52
20	1.88	1.83	1.77	1.71	1.67	1.63	1.59
30	1.94	1.94	1.87	1.82	1.77	1.73	1.69
40	1.97	1.97	1.94	1.89	1.84	1.80	1.75
50	2.00	2.00	2.00	1.94	1.89	1.85	1.80
60	2.02	2.02	2.02	1.98	1.93	1.89	1.84
70	2.04	2.04	2.04	2.02	1.96	1.92	1.88
80	2.05	2.05	2.05	2.05	1.99	1.95	1.90
90	2.06	2.06	2.06	2.06	2.02	1.98	1.93
100	2.07	2.07	2.07	2.07	2.04	2.00	1.95
120	2.09	2.09	2.09	2.09	2.08	2.04	1.98
140	2.11	2.11	2.11	2.11	2.11	2.07	2.01
160	2.12	2.12	2.12	2.12	2.12	2.09	2.04
180	2.13	2.13	2.13	2.13	2.13	2.11	2.06
200	2.15	2.15	2.15	2.15	2.15	2.13	2.08
250	2.18	2.18	2.18	2.18	2.18	2.18	2.12
300	2.21	2.21	2.21	2.21	2.21	2.21	2.16
350	2.24	2.24	2.24	2.24	2.24	2.24	2.19
400	2.26	2.26	2.26	2.26	2.26	2.26	2.22

τ = 10 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.15	1.10	1.06	1.02	0.99	0.97	0.94
4	1.34	1.29	1.24	1.20	1.16	1.13	1.10
6	1.46	1.40	1.34	1.30	1.26	1.23	1.19
8	1.54	1.48	1.42	1.37	1.33	1.30	1.26
10	1.60	1.54	1.47	1.42	1.38	1.35	1.31
15	1.72	1.65	1.58	1.53	1.48	1.45	1.41
20	1.78	1.72	1.65	1.60	1.55	1.51	1.47
30	1.84	1.83	1.76	1.70	1.65	1.61	1.56
40	1.88	1.88	1.83	1.77	1.71	1.67	1.63
50	1.91	1.91	1.88	1.82	1.76	1.72	1.68
60	1.93	1.93	1.93	1.86	1.81	1.77	1.72
70	1.95	1.95	1.95	1.90	1.84	1.80	1.75
80	1.96	1.96	1.96	1.93	1.87	1.83	1.78
90	1.98	1.98	1.98	1.96	1.90	1.85	1.80
100	1.99	1.99	1.99	1.98	1.92	1.88	1.82
120	2.01	2.01	2.01	2.01	1.96	1.91	1.86
140	2.03	2.03	2.03	2.03	1.99	1.95	1.89
160	2.04	2.04	2.04	2.04	2.02	1.97	1.92
180	2.06	2.06	2.06	2.06	2.04	2.00	1.94
200	2.07	2.07	2.07	2.07	2.07	2.02	1.96
250	2.11	2.11	2.11	2.11	2.11	2.07	2.01
300	2.14	2.14	2.14	2.14	2.14	2.11	2.05
350	2.17	2.17	2.17	2.17	2.17	2.15	2.09
400	2.20	2.20	2.20	2.20	2.20	2.18	2.12

τ = 30 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.05	1.00	0.95	0.91	0.88	0.86	0.83
4	1.24	1.18	1.12	1.08	1.04	1.01	0.98
6	1.35	1.28	1.22	1.18	1.13	1.10	1.07
8	1.43	1.36	1.29	1.25	1.20	1.17	1.13
10	1.49	1.42	1.35	1.30	1.25	1.22	1.18
15	1.60	1.52	1.45	1.40	1.35	1.31	1.27
20	1.67	1.60	1.52	1.47	1.41	1.38	1.33
30	1.72	1.71	1.63	1.56	1.51	1.47	1.42
40	1.76	1.76	1.70	1.63	1.57	1.53	1.48
50	1.80	1.80	1.75	1.68	1.62	1.58	1.53
60	1.82	1.82	1.80	1.73	1.67	1.62	1.57
70	1.84	1.84	1.83	1.76	1.70	1.66	1.60
80	1.86	1.86	1.86	1.79	1.73	1.68	1.63
90	1.87	1.87	1.87	1.82	1.76	1.71	1.65
100	1.89	1.89	1.89	1.85	1.78	1.73	1.68
120	1.91	1.91	1.91	1.89	1.82	1.77	1.71
140	1.93	1.93	1.93	1.93	1.86	1.81	1.75
160	1.95	1.95	1.95	1.95	1.89	1.84	1.78
180	1.97	1.97	1.97	1.97	1.91	1.86	1.80
200	1.99	1.99	1.99	1.99	1.94	1.89	1.82
250	2.03	2.03	2.03	2.03	1.99	1.94	1.88
300	2.07	2.07	2.07	2.07	2.04	1.99	1.92
350	2.10	2.10	2.10	2.10	2.08	2.03	1.96
400	2.13	2.13	2.13	2.13	2.12	2.07	2.00

τ = 60 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.98	0.93	0.88	0.84	0.81	0.78	0.75
4	1.17	1.11	1.05	1.00	0.96	0.93	0.90
6	1.28	1.21	1.15	1.10	1.06	1.02	0.98
8	1.36	1.29	1.22	1.17	1.12	1.09	1.05
10	1.42	1.35	1.27	1.22	1.17	1.14	1.09
15	1.53	1.45	1.37	1.32	1.26	1.22	1.18
20	1.59	1.53	1.45	1.38	1.33	1.29	1.24
30	1.65	1.63	1.55	1.48	1.42	1.38	1.33
40	1.69	1.69	1.62	1.55	1.48	1.44	1.39
50	1.72	1.72	1.67	1.60	1.54	1.49	1.43
60	1.75	1.75	1.72	1.64	1.58	1.53	1.47
70	1.77	1.77	1.76	1.68	1.61	1.56	1.51
80	1.79	1.79	1.79	1.71	1.64	1.59	1.53
90	1.81	1.81	1.81	1.74	1.67	1.62	1.56
100	1.82	1.82	1.82	1.77	1.69	1.64	1.58
120	1.85	1.85	1.85	1.81	1.74	1.68	1.62
140	1.88	1.88	1.88	1.85	1.77	1.72	1.65
160	1.90	1.90	1.90	1.88	1.80	1.75	1.68
180	1.92	1.92	1.92	1.91	1.83	1.78	1.71
200	1.94	1.94	1.94	1.94	1.86	1.80	1.74
250	1.98	1.98	1.98	1.98	1.92	1.86	1.79
300	2.02	2.02	2.02	2.02	1.97	1.91	1.84
350	2.05	2.05	2.05	2.05	2.01	1.95	1.88
400	2.09	2.09	2.09	2.09	2.05	1.99	1.92

Mean-hourly (τ = 3600 s)

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.80	0.74	0.69	0.65	0.62	0.59	0.56
4	0.98	0.92	0.85	0.81	0.76	0.73	0.69
6	1.09	1.02	0.95	0.89	0.85	0.81	0.77
8	1.17	1.09	1.02	0.96	0.91	0.87	0.82
10	1.23	1.15	1.07	1.01	0.95	0.91	0.87
15	1.34	1.25	1.17	1.10	1.04	1.00	0.94
20	1.40	1.33	1.23	1.16	1.10	1.05	1.00
30	1.46	1.43	1.33	1.26	1.19	1.14	1.08
40	1.50	1.50	1.40	1.32	1.25	1.20	1.14
50	1.54	1.54	1.46	1.38	1.30	1.25	1.18
60	1.57	1.57	1.51	1.42	1.34	1.29	1.22
70	1.59	1.59	1.55	1.46	1.38	1.32	1.25
80	1.62	1.62	1.58	1.49	1.41	1.35	1.28
90	1.64	1.64	1.62	1.52	1.44	1.38	1.31
100	1.66	1.66	1.65	1.55	1.47	1.41	1.33
120	1.69	1.69	1.69	1.60	1.51	1.45	1.37
140	1.72	1.72	1.72	1.64	1.55	1.49	1.41
160	1.75	1.75	1.75	1.68	1.59	1.52	1.44
180	1.77	1.77	1.77	1.72	1.62	1.56	1.47
200	1.79	1.79	1.79	1.75	1.65	1.58	1.50
250	1.84	1.84	1.84	1.82	1.72	1.65	1.56
300	1.89	1.89	1.89	1.88	1.78	1.71	1.62
350	1.93	1.93	1.93	1.93	1.83	1.76	1.67
400	1.97	1.97	1.97	1.97	1.88	1.81	1.71

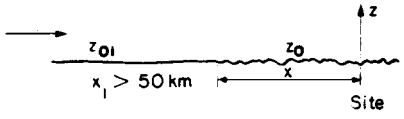


TABLE 10.19 *K*-factors for Site Roughness z_0 = 0.03 m and Upwind Roughness z_{01} = 0.7 m

τ = 1 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.06	1.09	1.12	1.15	1.17	1.20	1.25
4	1.19	1.22	1.26	1.29	1.32	1.35	1.41
6	1.26	1.30	1.34	1.37	1.40	1.43	1.50
8	1.32	1.36	1.39	1.43	1.46	1.50	1.56
10	1.36	1.40	1.44	1.47	1.51	1.54	1.61
15	1.43	1.47	1.52	1.55	1.59	1.63	1.70
20	1.49	1.53	1.57	1.61	1.65	1.69	1.76
30	1.59	1.60	1.65	1.69	1.73	1.77	1.85
40	1.68	1.68	1.70	1.74	1.78	1.82	1.90
50	1.74	1.74	1.74	1.78	1.82	1.86	1.94
60	1.80	1.80	1.80	1.81	1.85	1.89	1.98
70	1.84	1.84	1.84	1.84	1.88	1.92	2.00
80	1.88	1.88	1.88	1.88	1.90	1.94	2.03
90	1.91	1.91	1.91	1.91	1.92	1.96	2.05
100	1.94	1.94	1.94	1.94	1.94	1.97	2.06
120	1.99	1.99	1.99	1.99	1.99	2.00	2.09
140	2.04	2.04	2.04	2.04	2.04	2.04	2.11
160	2.07	2.07	2.07	2.07	2.07	2.07	2.13
180	2.10	2.10	2.10	2.10	2.10	2.10	2.15
200	2.13	2.13	2.13	2.13	2.13	2.13	2.17
250	2.18	2.18	2.18	2.18	2.18	2.18	2.20
300	2.23	2.23	2.23	2.23	2.23	2.23	2.23
350	2.27	2.27	2.27	2.27	2.27	2.27	2.27
400	2.30	2.30	2.30	2.30	2.30	2.30	2.30

τ = 3 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.00	1.03	1.06	1.09	1.11	1.14	1.19
4	1.12	1.16	1.19	1.22	1.26	1.28	1.34
6	1.20	1.23	1.27	1.30	1.34	1.37	1.43
8	1.25	1.29	1.33	1.36	1.40	1.43	1.49
10	1.29	1.33	1.37	1.40	1.44	1.47	1.54
15	1.36	1.40	1.45	1.48	1.52	1.56	1.63
20	1.41	1.46	1.50	1.54	1.58	1.61	1.69
30	1.50	1.53	1.57	1.61	1.66	1.69	1.77
40	1.59	1.59	1.62	1.66	1.71	1.75	1.83
50	1.65	1.65	1.66	1.70	1.75	1.79	1.87
60	1.71	1.71	1.71	1.73	1.78	1.82	1.90
70	1.75	1.75	1.75	1.76	1.80	1.84	1.93
80	1.79	1.79	1.79	1.79	1.83	1.87	1.95
90	1.82	1.82	1.82	1.82	1.84	1.89	1.97
100	1.85	1.85	1.85	1.85	1.86	1.90	1.99
120	1.90	1.90	1.90	1.90	1.90	1.93	2.02
140	1.94	1.94	1.94	1.94	1.94	1.95	2.05
160	1.98	1.98	1.98	1.98	1.98	1.98	2.07
180	2.01	2.01	2.01	2.01	2.01	2.01	2.09
200	2.04	2.04	2.04	2.04	2.04	2.04	2.10
250	2.09	2.09	2.09	2.09	2.09	2.09	2.14
300	2.14	2.14	2.14	2.14	2.14	2.14	2.17
350	2.18	2.18	2.18	2.18	2.18	2.18	2.20
400	2.21	2.21	2.21	2.21	2.21	2.21	2.23

τ = 10 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.90	0.93	0.96	0.99	1.02	1.04	1.10
4	1.02	1.05	1.09	1.12	1.15	1.18	1.24
6	1.09	1.12	1.16	1.20	1.23	1.26	1.33
8	1.14	1.18	1.22	1.25	1.29	1.32	1.39
10	1.18	1.21	1.26	1.29	1.33	1.36	1.43
15	1.24	1.29	1.33	1.37	1.41	1.44	1.52
20	1.29	1.34	1.38	1.42	1.46	1.50	1.57
30	1.37	1.40	1.45	1.49	1.54	1.57	1.65
40	1.45	1.45	1.50	1.54	1.59	1.63	1.71
50	1.51	1.51	1.54	1.58	1.63	1.67	1.75
60	1.56	1.56	1.57	1.61	1.66	1.70	1.79
70	1.60	1.60	1.60	1.64	1.68	1.73	1.81
80	1.64	1.64	1.64	1.66	1.71	1.75	1.84
90	1.67	1.67	1.67	1.68	1.73	1.77	1.86
100	1.70	1.70	1.70	1.70	1.74	1.79	1.88
120	1.75	1.75	1.75	1.75	1.77	1.82	1.91
140	1.79	1.79	1.79	1.79	1.80	1.84	1.94
160	1.83	1.83	1.83	1.83	1.83	1.86	1.96
180	1.86	1.86	1.86	1.86	1.86	1.88	1.98
200	1.89	1.89	1.89	1.89	1.89	1.90	2.00
250	1.95	1.95	1.95	1.95	1.95	1.95	2.04
300	2.00	2.00	2.00	2.00	2.00	2.00	2.08
350	2.04	2.04	2.04	2.04	2.04	2.04	2.11
400	2.08	2.08	2.08	2.08	2.08	2.08	2.14

τ = 30 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.78	0.81	0.85	0.87	0.90	0.93	0.98
4	0.89	0.93	0.96	1.00	1.03	1.06	1.12
6	0.96	0.99	1.03	1.07	1.10	1.14	1.20
8	1.00	1.04	1.08	1.12	1.16	1.19	1.26
10	1.04	1.08	1.12	1.16	1.20	1.23	1.30
15	1.10	1.14	1.19	1.23	1.27	1.31	1.38
20	1.15	1.19	1.24	1.28	1.32	1.36	1.44
30	1.21	1.26	1.31	1.35	1.39	1.43	1.52
40	1.28	1.30	1.35	1.40	1.45	1.49	1.57
50	1.34	1.34	1.39	1.44	1.48	1.53	1.62
60	1.39	1.39	1.42	1.47	1.52	1.56	1.65
70	1.43	1.43	1.44	1.49	1.54	1.59	1.68
80	1.47	1.47	1.47	1.51	1.56	1.61	1.70
90	1.50	1.50	1.50	1.53	1.58	1.63	1.73
100	1.53	1.53	1.53	1.55	1.60	1.65	1.75
120	1.58	1.58	1.58	1.58	1.63	1.68	1.78
140	1.62	1.62	1.62	1.62	1.66	1.71	1.81
160	1.65	1.65	1.65	1.65	1.68	1.73	1.83
180	1.69	1.69	1.69	1.69	1.70	1.75	1.86
200	1.71	1.71	1.71	1.71	1.72	1.77	1.88
250	1.78	1.78	1.78	1.78	1.78	1.82	1.92
300	1.83	1.83	1.83	1.83	1.83	1.86	1.97
350	1.87	1.87	1.87	1.87	1.87	1.89	2.00
400	1.92	1.92	1.92	1.92	1.92	1.92	2.04

τ = 60 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.71	0.74	0.77	0.80	0.83	0.86	0.91
4	0.81	0.85	0.88	0.92	0.95	0.98	1.05
6	0.87	0.91	0.95	0.98	1.02	1.05	1.12
8	0.91	0.95	1.00	1.03	1.07	1.11	1.18
10	0.95	0.99	1.03	1.07	1.11	1.15	1.22
15	1.01	1.05	1.10	1.14	1.18	1.22	1.30
20	1.05	1.10	1.14	1.19	1.23	1.27	1.35
30	1.11	1.16	1.21	1.25	1.30	1.34	1.43
40	1.18	1.20	1.26	1.30	1.35	1.39	1.49
50	1.23	1.24	1.29	1.34	1.39	1.43	1.53
60	1.28	1.28	1.32	1.37	1.42	1.47	1.56
70	1.32	1.32	1.35	1.40	1.45	1.49	1.59
80	1.36	1.36	1.37	1.42	1.47	1.52	1.62
90	1.39	1.39	1.39	1.44	1.49	1.54	1.64
100	1.42	1.42	1.42	1.46	1.51	1.56	1.66
120	1.46	1.46	1.46	1.49	1.54	1.59	1.70
140	1.51	1.51	1.51	1.51	1.57	1.62	1.73
160	1.54	1.54	1.54	1.54	1.59	1.64	1.75
180	1.57	1.57	1.57	1.57	1.62	1.67	1.78
200	1.60	1.60	1.60	1.60	1.64	1.69	1.80
250	1.67	1.67	1.67	1.67	1.68	1.74	1.85
300	1.72	1.72	1.72	1.72	1.72	1.78	1.89
350	1.77	1.77	1.77	1.77	1.77	1.81	1.93
400	1.81	1.81	1.81	1.81	1.81	1.85	1.97

Mean-hourly (τ = 3600 s)

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.51	0.54	0.57	0.61	0.64	0.66	0.72
4	0.59	0.63	0.67	0.71	0.74	0.77	0.84
6	0.64	0.68	0.73	0.76	0.80	0.84	0.91
8	0.68	0.72	0.77	0.81	0.85	0.89	0.96
10	0.70	0.75	0.80	0.84	0.88	0.92	1.00
15	0.75	0.80	0.85	0.90	0.95	0.99	1.08
20	0.79	0.84	0.90	0.94	0.99	1.03	1.13
30	0.84	0.90	0.95	1.00	1.06	1.10	1.20
40	0.90	0.94	1.00	1.05	1.10	1.15	1.25
50	0.95	0.97	1.03	1.08	1.14	1.19	1.30
60	0.99	0.99	1.06	1.11	1.17	1.22	1.33
70	1.03	1.03	1.08	1.14	1.20	1.25	1.36
80	1.06	1.06	1.10	1.16	1.22	1.28	1.39
90	1.09	1.09	1.12	1.18	1.24	1.30	1.41
100	1.12	1.12	1.14	1.20	1.26	1.32	1.44
120	1.17	1.17	1.17	1.23	1.30	1.35	1.48
140	1.21	1.21	1.21	1.26	1.33	1.39	1.51
160	1.25	1.25	1.25	1.29	1.36	1.41	1.54
180	1.28	1.28	1.28	1.31	1.38	1.44	1.57
200	1.31	1.31	1.31	1.33	1.40	1.46	1.60
250	1.38	1.38	1.38	1.38	1.45	1.52	1.65
300	1.44	1.44	1.44	1.44	1.50	1.56	1.70
350	1.49	1.49	1.49	1.49	1.54	1.61	1.75
400	1.54	1.54	1.54	1.54	1.58	1.65	1.79

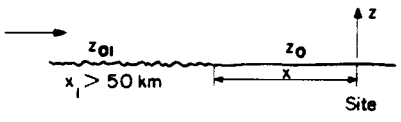


TABLE 10.20 *K*-factors for Site Roughness z_0 = 0.03 m and Upwind Roughness z_{01} = 0.3 m

τ = 1 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.11	1.13	1.15	1.17	1.19	1.21	1.25
4	1.25	1.27	1.30	1.32	1.34	1.36	1.41
6	1.33	1.35	1.38	1.40	1.43	1.45	1.50
8	1.38	1.41	1.44	1.46	1.49	1.51	1.56
10	1.43	1.46	1.48	1.51	1.54	1.56	1.61
15	1.51	1.54	1.57	1.59	1.62	1.65	1.70
20	1.56	1.59	1.62	1.65	1.68	1.71	1.76
30	1.67	1.67	1.70	1.73	1.76	1.79	1.85
40	1.75	1.75	1.75	1.78	1.81	1.84	1.90
50	1.81	1.81	1.81	1.82	1.86	1.88	1.94
60	1.86	1.86	1.86	1.86	1.89	1.92	1.98
70	1.90	1.90	1.90	1.90	1.91	1.94	2.00
80	1.93	1.93	1.93	1.93	1.93	1.96	2.03
90	1.96	1.96	1.96	1.96	1.96	1.98	2.05
100	1.99	1.99	1.99	1.99	1.99	2.00	2.06
120	2.03	2.03	2.03	2.03	2.03	2.03	2.09
140	2.06	2.06	2.06	2.06	2.06	2.06	2.11
160	2.09	2.09	2.09	2.09	2.09	2.09	2.13
180	2.12	2.12	2.12	2.12	2.12	2.12	2.15
200	2.14	2.14	2.14	2.14	2.14	2.14	2.17
250	2.19	2.19	2.19	2.19	2.19	2.19	2.20
300	2.23	2.23	2.23	2.23	2.23	2.23	2.23
350	2.26	2.26	2.26	2.26	2.26	2.26	2.26
400	2.29	2.29	2.29	2.29	2.29	2.29	2.29

τ = 3 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.05	1.07	1.09	1.11	1.14	1.15	1.19
4	1.18	1.21	1.23	1.26	1.28	1.30	1.34
6	1.26	1.29	1.31	1.34	1.36	1.39	1.43
8	1.32	1.34	1.37	1.40	1.42	1.45	1.49
10	1.36	1.39	1.42	1.44	1.47	1.49	1.54
15	1.43	1.46	1.50	1.52	1.55	1.58	1.63
20	1.49	1.52	1.55	1.58	1.61	1.63	1.69
30	1.59	1.59	1.63	1.66	1.69	1.71	1.77
40	1.67	1.67	1.68	1.71	1.74	1.77	1.83
50	1.73	1.73	1.73	1.75	1.78	1.81	1.87
60	1.77	1.77	1.77	1.78	1.81	1.84	1.90
70	1.81	1.81	1.81	1.81	1.84	1.87	1.93
80	1.84	1.84	1.84	1.84	1.86	1.89	1.95
90	1.87	1.87	1.87	1.87	1.88	1.91	1.97
100	1.90	1.90	1.90	1.90	1.90	1.93	1.99
120	1.94	1.94	1.94	1.94	1.94	1.95	2.02
140	1.98	1.98	1.98	1.98	1.98	1.98	2.05
160	2.01	2.01	2.01	2.01	2.01	2.01	2.07
180	2.03	2.03	2.03	2.03	2.03	2.03	2.09
200	2.06	2.06	2.06	2.06	2.06	2.06	2.10
250	2.11	2.11	2.11	2.11	2.11	2.11	2.14
300	2.15	2.15	2.15	2.15	2.15	2.15	2.17
350	2.19	2.19	2.19	2.19	2.19	2.19	2.20
400	2.22	2.22	2.22	2.22	2.22	2.22	2.23

τ = 10 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.95	0.97	1.00	1.02	1.04	1.06	1.10
4	1.08	1.10	1.13	1.15	1.18	1.20	1.24
6	1.15	1.18	1.21	1.23	1.26	1.28	1.33
8	1.20	1.23	1.26	1.29	1.31	1.34	1.39
10	1.24	1.27	1.30	1.33	1.36	1.38	1.43
15	1.32	1.35	1.38	1.41	1.44	1.46	1.52
20	1.37	1.40	1.43	1.46	1.49	1.52	1.57
30	1.46	1.47	1.51	1.54	1.57	1.60	1.65
40	1.53	1.53	1.56	1.59	1.62	1.65	1.71
50	1.59	1.59	1.60	1.63	1.66	1.69	1.75
60	1.63	1.63	1.63	1.66	1.69	1.72	1.79
70	1.67	1.67	1.67	1.68	1.72	1.75	1.81
80	1.71	1.71	1.71	1.71	1.74	1.77	1.84
90	1.73	1.73	1.73	1.73	1.76	1.79	1.86
100	1.76	1.76	1.76	1.76	1.78	1.81	1.88
120	1.80	1.80	1.80	1.80	1.81	1.84	1.91
140	1.84	1.84	1.84	1.84	1.84	1.87	1.94
160	1.87	1.87	1.87	1.87	1.87	1.89	1.96
180	1.90	1.90	1.90	1.90	1.90	1.91	1.98
200	1.92	1.92	1.92	1.92	1.92	1.93	2.00
250	1.98	1.98	1.98	1.98	1.98	1.98	2.04
300	2.02	2.02	2.02	2.02	2.02	2.02	2.08
350	2.06	2.06	2.06	2.06	2.06	2.06	2.11
400	2.10	2.10	2.10	2.10	2.10	2.10	2.14

τ = 30 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.84	0.86	0.88	0.90	0.93	0.94	0.98
4	0.95	0.98	1.01	1.03	1.06	1.08	1.12
6	1.02	1.05	1.08	1.10	1.13	1.15	1.20
8	1.07	1.10	1.13	1.16	1.18	1.21	1.26
10	1.11	1.14	1.17	1.20	1.23	1.25	1.30
15	1.18	1.21	1.24	1.27	1.30	1.33	1.38
20	1.23	1.26	1.29	1.32	1.35	1.38	1.44
30	1.31	1.33	1.36	1.39	1.43	1.46	1.52
40	1.38	1.38	1.41	1.45	1.48	1.51	1.57
50	1.43	1.43	1.45	1.48	1.52	1.55	1.62
60	1.48	1.48	1.48	1.52	1.55	1.58	1.65
70	1.51	1.51	1.51	1.54	1.58	1.61	1.68
80	1.54	1.54	1.54	1.56	1.60	1.63	1.70
90	1.57	1.57	1.57	1.58	1.62	1.66	1.73
100	1.60	1.60	1.60	1.60	1.64	1.67	1.75
120	1.64	1.64	1.64	1.64	1.67	1.71	1.78
140	1.68	1.68	1.68	1.68	1.70	1.73	1.81
160	1.71	1.71	1.71	1.71	1.72	1.76	1.83
180	1.74	1.74	1.74	1.74	1.75	1.78	1.86
200	1.77	1.77	1.77	1.77	1.77	1.80	1.88
250	1.82	1.82	1.82	1.82	1.82	1.85	1.92
300	1.87	1.87	1.87	1.87	1.87	1.88	1.97
350	1.91	1.91	1.91	1.91	1.91	1.92	2.00
400	1.95	1.95	1.95	1.95	1.95	1.95	2.04

τ = 60 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.76	0.79	0.81	0.83	0.85	0.87	0.91
4	0.87	0.90	0.93	0.95	0.98	1.00	1.05
6	0.94	0.97	1.00	1.02	1.05	1.07	1.12
8	0.98	1.01	1.04	1.07	1.10	1.13	1.18
10	1.02	1.05	1.08	1.11	1.14	1.17	1.22
15	1.08	1.12	1.15	1.18	1.21	1.24	1.30
20	1.13	1.16	1.20	1.23	1.26	1.29	1.35
30	1.21	1.23	1.27	1.30	1.34	1.37	1.43
40	1.28	1.28	1.32	1.35	1.39	1.42	1.49
50	1.33	1.33	1.36	1.39	1.43	1.46	1.53
60	1.37	1.37	1.39	1.42	1.46	1.49	1.56
70	1.41	1.41	1.41	1.45	1.49	1.52	1.59
80	1.44	1.44	1.44	1.47	1.51	1.54	1.62
90	1.47	1.47	1.47	1.49	1.53	1.57	1.64
100	1.49	1.49	1.49	1.51	1.55	1.59	1.66
120	1.54	1.54	1.54	1.54	1.58	1.62	1.70
140	1.58	1.58	1.58	1.58	1.61	1.65	1.73
160	1.61	1.61	1.61	1.61	1.64	1.67	1.75
180	1.64	1.64	1.64	1.64	1.66	1.70	1.78
200	1.67	1.67	1.67	1.67	1.68	1.72	1.80
250	1.73	1.73	1.73	1.73	1.73	1.77	1.85
300	1.78	1.78	1.78	1.78	1.78	1.81	1.89
350	1.82	1.82	1.82	1.82	1.82	1.85	1.93
400	1.86	1.86	1.86	1.86	1.86	1.88	1.97

Mean-hourly (τ = 3600 s)

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.57	0.59	0.61	0.64	0.66	0.68	0.72
4	0.66	0.69	0.72	0.74	0.77	0.79	0.84
6	0.71	0.74	0.78	0.80	0.83	0.86	0.91
8	0.75	0.79	0.82	0.85	0.88	0.91	0.96
10	0.78	0.82	0.85	0.88	0.92	0.94	1.00
15	0.84	0.88	0.91	0.95	0.98	1.01	1.08
20	0.88	0.92	0.96	0.99	1.03	1.06	1.13
30	0.95	0.98	1.02	1.06	1.10	1.13	1.20
40	1.01	1.02	1.07	1.10	1.14	1.18	1.25
50	1.06	1.06	1.10	1.14	1.18	1.22	1.30
60	1.10	1.10	1.13	1.17	1.22	1.25	1.33
70	1.14	1.14	1.16	1.20	1.24	1.28	1.36
80	1.17	1.17	1.18	1.22	1.27	1.31	1.39
90	1.20	1.20	1.20	1.24	1.29	1.33	1.41
100	1.22	1.22	1.22	1.26	1.31	1.35	1.44
120	1.27	1.27	1.27	1.30	1.35	1.39	1.48
140	1.31	1.31	1.31	1.33	1.38	1.42	1.51
160	1.34	1.34	1.34	1.36	1.41	1.45	1.54
180	1.37	1.37	1.37	1.38	1.43	1.47	1.57
200	1.40	1.40	1.40	1.40	1.45	1.50	1.60
250	1.47	1.47	1.47	1.47	1.51	1.55	1.65
300	1.52	1.52	1.52	1.52	1.55	1.60	1.70
350	1.57	1.57	1.57	1.57	1.60	1.65	1.75
400	1.62	1.62	1.62	1.62	1.64	1.69	1.79

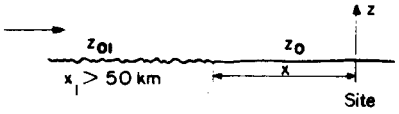


TABLE 10.21 *K*-factors for Site Roughness z_0 = 0.03 m and Upwind Roughness z_{01} = 0.1 m

τ = 1 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.18	1.19	1.20	1.21	1.22	1.23	1.25
4	1.32	1.34	1.35	1.36	1.37	1.38	1.41
6	1.41	1.42	1.44	1.45	1.46	1.47	1.50
8	1.47	1.48	1.50	1.51	1.52	1.54	1.56
10	1.52	1.53	1.55	1.56	1.57	1.58	1.61
15	1.60	1.61	1.63	1.64	1.66	1.67	1.70
20	1.67	1.67	1.69	1.70	1.72	1.73	1.76
30	1.77	1.77	1.77	1.78	1.80	1.81	1.85
40	1.83	1.83	1.83	1.84	1.86	1.87	1.90
50	1.88	1.88	1.88	1.88	1.90	1.91	1.94
60	1.92	1.92	1.92	1.92	1.93	1.94	1.98
70	1.96	1.96	1.96	1.96	1.96	1.97	2.00
80	1.98	1.98	1.98	1.98	1.98	1.99	2.03
90	2.01	2.01	2.01	2.01	2.01	2.01	2.05
100	2.03	2.03	2.03	2.03	2.03	2.03	2.06
120	2.06	2.06	2.06	2.06	2.06	2.06	2.09
140	2.09	2.09	2.09	2.09	2.09	2.09	2.11
160	2.12	2.12	2.12	2.12	2.12	2.12	2.13
180	2.14	2.14	2.14	2.14	2.14	2.14	2.15
200	2.16	2.16	2.16	2.16	2.16	2.16	2.17
250	2.20	2.20	2.20	2.20	2.20	2.20	2.20
300	2.23	2.23	2.23	2.23	2.23	2.23	2.23
350	2.26	2.26	2.26	2.26	2.26	2.26	2.26
400	2.29	2.29	2.29	2.29	2.29	2.29	2.29

τ = 3 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.12	1.13	1.14	1.15	1.16	1.17	1.19
4	1.26	1.27	1.29	1.30	1.31	1.32	1.34
6	1.34	1.36	1.37	1.38	1.40	1.41	1.43
8	1.40	1.42	1.43	1.44	1.46	1.47	1.49
10	1.45	1.46	1.48	1.49	1.50	1.52	1.54
15	1.53	1.54	1.56	1.57	1.59	1.60	1.63
20	1.59	1.60	1.62	1.63	1.65	1.66	1.69
30	1.69	1.69	1.70	1.71	1.73	1.74	1.77
40	1.75	1.75	1.75	1.77	1.78	1.80	1.83
50	1.80	1.80	1.80	1.81	1.82	1.84	1.87
60	1.84	1.84	1.84	1.84	1.86	1.87	1.90
70	1.88	1.88	1.88	1.88	1.88	1.90	1.93
80	1.90	1.90	1.90	1.90	1.91	1.92	1.95
90	1.93	1.93	1.93	1.93	1.93	1.94	1.97
100	1.95	1.95	1.95	1.95	1.95	1.96	1.99
120	1.98	1.98	1.98	1.98	1.98	1.99	2.02
140	2.01	2.01	2.01	2.01	2.01	2.01	2.05
160	2.04	2.04	2.04	2.04	2.04	2.04	2.07
180	2.06	2.06	2.06	2.06	2.06	2.06	2.09
200	2.08	2.08	2.08	2.08	2.08	2.08	2.10
250	2.12	2.12	2.12	2.12	2.12	2.12	2.14
300	2.16	2.16	2.16	2.16	2.16	2.16	2.17
350	2.19	2.19	2.19	2.19	2.19	2.19	2.20
400	2.22	2.22	2.22	2.22	2.22	2.22	2.23

τ = 10 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.02	1.03	1.04	1.06	1.07	1.08	1.10
4	1.16	1.17	1.18	1.19	1.21	1.22	1.24
6	1.24	1.25	1.26	1.28	1.29	1.30	1.33
8	1.29	1.31	1.32	1.33	1.35	1.36	1.39
10	1.33	1.35	1.36	1.38	1.39	1.41	1.43
15	1.41	1.43	1.44	1.46	1.47	1.49	1.52
20	1.47	1.48	1.50	1.51	1.53	1.54	1.57
30	1.56	1.56	1.58	1.59	1.61	1.62	1.65
40	1.63	1.63	1.63	1.65	1.66	1.68	1.71
50	1.68	1.68	1.68	1.69	1.70	1.72	1.75
60	1.72	1.72	1.72	1.72	1.74	1.75	1.79
70	1.75	1.75	1.75	1.75	1.76	1.78	1.81
80	1.78	1.78	1.78	1.78	1.79	1.80	1.84
90	1.80	1.80	1.80	1.80	1.81	1.82	1.86
100	1.82	1.82	1.82	1.82	1.83	1.84	1.88
120	1.86	1.86	1.86	1.86	1.86	1.87	1.91
140	1.89	1.89	1.89	1.89	1.89	1.90	1.94
160	1.92	1.92	1.92	1.92	1.92	1.92	1.96
180	1.94	1.94	1.94	1.94	1.94	1.94	1.98
200	1.96	1.96	1.96	1.96	1.96	1.96	2.00
250	2.01	2.01	2.01	2.01	2.01	2.01	2.04
300	2.05	2.05	2.05	2.05	2.05	2.05	2.08
350	2.09	2.09	2.09	2.09	2.09	2.09	2.11
400	2.12	2.12	2.12	2.12	2.12	2.12	2.14

τ = 30 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.91	0.92	0.93	0.94	0.95	0.96	0.98
4	1.03	1.05	1.06	1.07	1.09	1.10	1.12
6	1.11	1.12	1.14	1.15	1.16	1.18	1.20
8	1.16	1.18	1.19	1.21	1.22	1.23	1.26
10	1.20	1.22	1.23	1.25	1.26	1.28	1.30
15	1.28	1.29	1.31	1.32	1.34	1.35	1.38
20	1.33	1.35	1.36	1.38	1.40	1.41	1.44
30	1.42	1.42	1.44	1.45	1.47	1.49	1.52
40	1.48	1.48	1.49	1.51	1.52	1.54	1.57
50	1.53	1.53	1.53	1.55	1.57	1.58	1.62
60	1.57	1.57	1.57	1.58	1.60	1.62	1.65
70	1.60	1.60	1.60	1.61	1.63	1.64	1.68
80	1.63	1.63	1.63	1.63	1.65	1.67	1.70
90	1.65	1.65	1.65	1.65	1.67	1.69	1.73
100	1.68	1.68	1.68	1.68	1.69	1.71	1.75
120	1.71	1.71	1.71	1.71	1.72	1.74	1.78
140	1.75	1.75	1.75	1.75	1.75	1.77	1.81
160	1.78	1.78	1.78	1.78	1.78	1.79	1.83
180	1.80	1.80	1.80	1.80	1.80	1.82	1.86
200	1.82	1.82	1.82	1.82	1.82	1.84	1.88
250	1.88	1.88	1.88	1.88	1.88	1.88	1.92
300	1.92	1.92	1.92	1.92	1.92	1.92	1.97
350	1.96	1.96	1.96	1.96	1.96	1.96	2.00
400	2.00	2.00	2.00	2.00	2.00	2.00	2.04

τ = 60 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.83	0.85	0.86	0.87	0.88	0.89	0.91
4	0.96	0.97	0.98	1.00	1.01	1.02	1.05
6	1.03	1.04	1.06	1.07	1.08	1.10	1.12
8	1.08	1.09	1.11	1.12	1.14	1.15	1.18
10	1.12	1.13	1.15	1.16	1.18	1.19	1.22
15	1.19	1.20	1.22	1.24	1.25	1.27	1.30
20	1.24	1.26	1.27	1.29	1.31	1.32	1.35
30	1.33	1.33	1.35	1.36	1.38	1.40	1.43
40	1.39	1.39	1.40	1.42	1.43	1.45	1.49
50	1.43	1.43	1.44	1.46	1.48	1.49	1.53
60	1.47	1.47	1.47	1.49	1.51	1.53	1.56
70	1.51	1.51	1.51	1.52	1.54	1.55	1.59
80	1.53	1.53	1.53	1.54	1.56	1.58	1.62
90	1.56	1.56	1.56	1.56	1.58	1.60	1.64
100	1.58	1.58	1.58	1.58	1.60	1.62	1.66
120	1.62	1.62	1.62	1.62	1.64	1.66	1.70
140	1.65	1.65	1.65	1.65	1.67	1.69	1.73
160	1.68	1.68	1.68	1.68	1.69	1.71	1.75
180	1.71	1.71	1.71	1.71	1.72	1.74	1.78
200	1.74	1.74	1.74	1.74	1.74	1.76	1.80
250	1.79	1.79	1.79	1.79	1.79	1.81	1.85
300	1.84	1.84	1.84	1.84	1.84	1.85	1.89
350	1.88	1.88	1.88	1.88	1.88	1.89	1.93
400	1.92	1.92	1.92	1.92	1.92	1.92	1.97

Mean-hourly (τ = 3600 s)

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.64	0.65	0.67	0.68	0.69	0.70	0.72
4	0.75	0.76	0.78	0.79	0.81	0.82	0.84
6	0.81	0.83	0.84	0.86	0.87	0.89	0.91
8	0.85	0.87	0.89	0.90	0.92	0.93	0.96
10	0.89	0.91	0.93	0.94	0.96	0.97	1.00
15	0.95	0.97	0.99	1.01	1.03	1.04	1.08
20	1.00	1.02	1.04	1.06	1.08	1.09	1.13
30	1.08	1.08	1.11	1.13	1.15	1.16	1.20
40	1.14	1.14	1.16	1.18	1.20	1.22	1.25
50	1.18	1.18	1.19	1.22	1.24	1.26	1.30
60	1.22	1.22	1.23	1.25	1.27	1.29	1.33
70	1.25	1.25	1.26	1.28	1.30	1.32	1.36
80	1.28	1.28	1.28	1.30	1.33	1.35	1.39
90	1.31	1.31	1.31	1.33	1.35	1.37	1.41
100	1.33	1.33	1.33	1.35	1.37	1.39	1.44
120	1.37	1.37	1.37	1.38	1.41	1.43	1.48
140	1.41	1.41	1.41	1.42	1.44	1.46	1.51
160	1.44	1.44	1.44	1.44	1.47	1.49	1.54
180	1.47	1.47	1.47	1.47	1.50	1.52	1.57
200	1.50	1.50	1.50	1.50	1.52	1.54	1.60
250	1.56	1.56	1.56	1.56	1.58	1.60	1.65
300	1.62	1.62	1.62	1.62	1.63	1.65	1.70
350	1.67	1.67	1.67	1.67	1.67	1.70	1.75
400	1.71	1.71	1.71	1.71	1.71	1.74	1.79

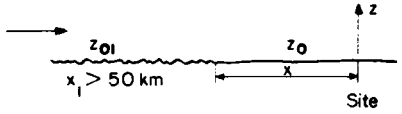


TABLE 10.22 *K*-factors for Site Roughness z_0 = 0.03 m and Upwind Roughness z_{01} = 0.01 m

τ = 1 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.31	1.29	1.28	1.27	1.27	1.26	1.25
4	1.47	1.46	1.44	1.43	1.42	1.42	1.41
6	1.56	1.55	1.53	1.52	1.51	1.51	1.50
8	1.63	1.61	1.60	1.59	1.58	1.57	1.56
10	1.68	1.67	1.65	1.64	1.63	1.62	1.61
15	1.77	1.76	1.74	1.73	1.72	1.71	1.70
20	1.83	1.82	1.80	1.79	1.78	1.77	1.76
30	1.90	1.90	1.89	1.88	1.86	1.86	1.85
40	1.95	1.95	1.95	1.93	1.92	1.91	1.90
50	1.99	1.99	1.99	1.98	1.96	1.96	1.94
60	2.02	2.02	2.02	2.01	2.00	1.99	1.98
70	2.04	2.04	2.04	2.04	2.03	2.02	2.00
80	2.06	2.06	2.06	2.06	2.05	2.04	2.03
90	2.07	2.07	2.07	2.07	2.07	2.06	2.05
100	2.09	2.09	2.09	2.09	2.08	2.07	2.06
120	2.11	2.11	2.11	2.11	2.11	2.10	2.09
140	2.13	2.13	2.13	2.13	2.13	2.13	2.11
160	2.15	2.15	2.15	2.15	2.15	2.15	2.13
180	2.16	2.16	2.16	2.16	2.16	2.16	2.15
200	2.18	2.18	2.18	2.18	2.18	2.18	2.17
250	2.21	2.21	2.21	2.21	2.21	2.21	2.20
300	2.24	2.24	2.24	2.24	2.24	2.24	2.23
350	2.26	2.26	2.26	2.26	2.26	2.26	2.26
400	2.29	2.29	2.29	2.29	2.29	2.29	2.29

τ = 3 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.25	1.24	1.22	1.21	1.21	1.20	1.19
4	1.41	1.39	1.38	1.37	1.36	1.35	1.34
6	1.50	1.48	1.47	1.46	1.45	1.44	1.43
8	1.56	1.55	1.53	1.52	1.51	1.50	1.49
10	1.61	1.60	1.58	1.57	1.56	1.55	1.54
15	1.70	1.69	1.67	1.66	1.65	1.64	1.63
20	1.76	1.75	1.73	1.72	1.71	1.70	1.69
30	1.84	1.84	1.82	1.80	1.79	1.78	1.77
40	1.88	1.88	1.88	1.86	1.85	1.84	1.83
50	1.92	1.92	1.92	1.90	1.89	1.88	1.87
60	1.95	1.95	1.95	1.94	1.93	1.92	1.90
70	1.97	1.97	1.97	1.97	1.95	1.94	1.93
80	1.99	1.99	1.99	1.99	1.98	1.97	1.95
90	2.01	2.01	2.01	2.01	2.00	1.99	1.97
100	2.02	2.02	2.02	2.02	2.01	2.00	1.99
120	2.05	2.05	2.05	2.05	2.04	2.03	2.02
140	2.07	2.07	2.07	2.07	2.07	2.06	2.05
160	2.09	2.09	2.09	2.09	2.09	2.08	2.07
180	2.10	2.10	2.10	2.10	2.10	2.10	2.09
200	2.12	2.12	2.12	2.12	2.12	2.12	2.10
250	2.15	2.15	2.15	2.15	2.15	2.15	2.14
300	2.18	2.18	2.18	2.18	2.18	2.18	2.17
350	2.21	2.21	2.21	2.21	2.21	2.21	2.20
400	2.24	2.24	2.24	2.24	2.24	2.24	2.23

τ = 10 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.15	1.14	1.13	1.12	1.11	1.10	1.10
4	1.31	1.29	1.28	1.27	1.26	1.25	1.24
6	1.40	1.38	1.36	1.35	1.34	1.34	1.33
8	1.46	1.44	1.43	1.41	1.40	1.40	1.39
10	1.51	1.49	1.47	1.46	1.45	1.44	1.43
15	1.60	1.58	1.56	1.55	1.53	1.53	1.52
20	1.65	1.64	1.62	1.61	1.59	1.58	1.57
30	1.72	1.72	1.70	1.69	1.68	1.67	1.65
40	1.77	1.77	1.76	1.75	1.73	1.72	1.71
50	1.81	1.81	1.80	1.79	1.78	1.77	1.75
60	1.84	1.84	1.84	1.82	1.81	1.80	1.79
70	1.86	1.86	1.86	1.85	1.84	1.83	1.81
80	1.89	1.89	1.89	1.88	1.86	1.85	1.84
90	1.90	1.90	1.90	1.90	1.88	1.87	1.86
100	1.92	1.92	1.92	1.92	1.90	1.89	1.88
120	1.95	1.95	1.95	1.95	1.93	1.92	1.91
140	1.97	1.97	1.97	1.97	1.96	1.95	1.94
160	1.99	1.99	1.99	1.99	1.98	1.97	1.96
180	2.01	2.01	2.01	2.01	2.00	1.99	1.98
200	2.03	2.03	2.03	2.03	2.02	2.01	2.00
250	2.06	2.06	2.06	2.06	2.06	2.05	2.04
300	2.10	2.10	2.10	2.10	2.10	2.09	2.08
350	2.13	2.13	2.13	2.13	2.13	2.13	2.11
400	2.16	2.16	2.16	2.16	2.16	2.16	2.14

τ = 30 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.05	1.03	1.02	1.01	1.00	0.99	0.98
4	1.19	1.18	1.16	1.15	1.14	1.13	1.12
6	1.28	1.26	1.24	1.23	1.22	1.21	1.20
8	1.34	1.32	1.30	1.29	1.28	1.27	1.26
10	1.39	1.37	1.35	1.34	1.32	1.31	1.30
15	1.47	1.45	1.43	1.42	1.40	1.40	1.38
20	1.52	1.51	1.49	1.48	1.46	1.45	1.44
30	1.60	1.59	1.57	1.56	1.54	1.53	1.52
40	1.65	1.65	1.63	1.61	1.60	1.59	1.57
50	1.68	1.68	1.67	1.66	1.64	1.63	1.62
60	1.71	1.71	1.71	1.69	1.68	1.66	1.65
70	1.74	1.74	1.74	1.72	1.70	1.69	1.68
80	1.76	1.76	1.76	1.75	1.73	1.72	1.70
90	1.78	1.78	1.78	1.77	1.75	1.74	1.73
100	1.80	1.80	1.80	1.79	1.77	1.76	1.75
120	1.83	1.83	1.83	1.82	1.81	1.79	1.78
140	1.86	1.86	1.86	1.85	1.83	1.82	1.81
160	1.88	1.88	1.88	1.88	1.86	1.85	1.83
180	1.90	1.90	1.90	1.90	1.88	1.87	1.86
200	1.92	1.92	1.92	1.92	1.91	1.89	1.88
250	1.96	1.96	1.96	1.96	1.95	1.94	1.92
300	2.00	2.00	2.00	2.00	1.99	1.98	1.97
350	2.04	2.04	2.04	2.04	2.03	2.02	2.00
400	2.07	2.07	2.07	2.07	2.07	2.05	2.04

τ = 60 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.98	0.96	0.95	0.94	0.93	0.92	0.91
4	1.12	1.10	1.09	1.07	1.06	1.06	1.05
6	1.20	1.19	1.17	1.15	1.14	1.13	1.12
8	1.26	1.24	1.23	1.21	1.20	1.19	1.18
10	1.31	1.29	1.27	1.26	1.24	1.23	1.22
15	1.39	1.37	1.35	1.34	1.32	1.31	1.30
20	1.44	1.43	1.41	1.39	1.38	1.37	1.35
30	1.51	1.51	1.49	1.47	1.46	1.45	1.43
40	1.56	1.56	1.55	1.53	1.51	1.50	1.49
50	1.60	1.60	1.59	1.57	1.55	1.54	1.53
60	1.63	1.63	1.63	1.61	1.59	1.58	1.56
70	1.66	1.66	1.66	1.64	1.62	1.61	1.59
80	1.68	1.68	1.68	1.66	1.65	1.63	1.62
90	1.70	1.70	1.70	1.69	1.67	1.66	1.64
100	1.72	1.72	1.72	1.71	1.69	1.68	1.66
120	1.75	1.75	1.75	1.74	1.72	1.71	1.70
140	1.78	1.78	1.78	1.77	1.76	1.74	1.73
160	1.81	1.81	1.81	1.80	1.78	1.77	1.75
180	1.83	1.83	1.83	1.83	1.81	1.79	1.78
200	1.85	1.85	1.85	1.85	1.83	1.82	1.80
250	1.90	1.90	1.90	1.90	1.88	1.87	1.85
300	1.94	1.94	1.94	1.94	1.93	1.91	1.89
350	1.98	1.98	1.98	1.98	1.97	1.95	1.93
400	2.01	2.01	2.01	2.01	2.00	1.99	1.97

Mean-hourly (τ = 3600 s)

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.80	0.78	0.76	0.75	0.74	0.73	0.72
4	0.93	0.91	0.89	0.88	0.86	0.85	0.84
6	1.01	0.99	0.97	0.95	0.94	0.93	0.91
8	1.06	1.04	1.02	1.00	0.99	0.98	0.96
10	1.10	1.08	1.06	1.04	1.03	1.02	1.00
15	1.18	1.16	1.14	1.12	1.10	1.09	1.08
20	1.23	1.21	1.19	1.17	1.15	1.14	1.13
30	1.30	1.29	1.27	1.25	1.23	1.22	1.20
40	1.35	1.35	1.32	1.30	1.28	1.27	1.25
50	1.39	1.39	1.37	1.35	1.33	1.31	1.30
60	1.42	1.42	1.41	1.38	1.36	1.35	1.33
70	1.45	1.45	1.44	1.42	1.40	1.38	1.36
80	1.47	1.47	1.47	1.44	1.42	1.41	1.39
90	1.50	1.50	1.49	1.47	1.45	1.43	1.41
100	1.52	1.52	1.52	1.49	1.47	1.45	1.44
120	1.55	1.55	1.55	1.53	1.51	1.49	1.48
140	1.59	1.59	1.59	1.57	1.55	1.53	1.51
160	1.62	1.62	1.62	1.60	1.58	1.56	1.54
180	1.64	1.64	1.64	1.63	1.61	1.59	1.57
200	1.67	1.67	1.67	1.66	1.63	1.62	1.60
250	1.72	1.72	1.72	1.72	1.69	1.68	1.65
300	1.77	1.77	1.77	1.77	1.75	1.73	1.70
350	1.82	1.82	1.82	1.82	1.79	1.77	1.75
400	1.86	1.86	1.86	1.86	1.84	1.82	1.79

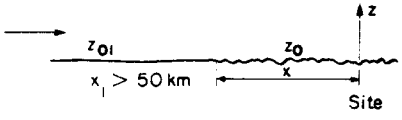


TABLE 10.23 *K*-factors for Site Roughness z_0 = 0.03 m and Upwind Roughness z_{01} = 0.003 m

τ = 1 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.35	1.33	1.31	1.29	1.28	1.27	1.25
4	1.52	1.50	1.47	1.45	1.44	1.42	1.41
6	1.62	1.59	1.57	1.55	1.53	1.51	1.50
8	1.69	1.66	1.63	1.61	1.59	1.58	1.56
10	1.74	1.71	1.68	1.66	1.64	1.63	1.61
15	1.84	1.81	1.78	1.75	1.73	1.72	1.70
20	1.89	1.87	1.84	1.82	1.80	1.78	1.76
30	1.96	1.96	1.93	1.90	1.88	1.86	1.85
40	2.00	2.00	1.99	1.96	1.94	1.92	1.90
50	2.03	2.03	2.03	2.01	1.98	1.97	1.94
60	2.05	2.05	2.05	2.04	2.02	2.00	1.98
70	2.07	2.07	2.07	2.07	2.04	2.03	2.00
80	2.09	2.09	2.09	2.09	2.07	2.05	2.03
90	2.10	2.10	2.10	2.10	2.09	2.07	2.05
100	2.11	2.11	2.11	2.11	2.10	2.08	2.06
120	2.13	2.13	2.13	2.13	2.13	2.11	2.09
140	2.15	2.15	2.15	2.15	2.15	2.14	2.11
160	2.16	2.16	2.16	2.16	2.16	2.16	2.13
180	2.17	2.17	2.17	2.17	2.17	2.17	2.15
200	2.19	2.19	2.19	2.19	2.19	2.19	2.17
250	2.21	2.21	2.21	2.21	2.21	2.21	2.20
300	2.24	2.24	2.24	2.24	2.24	2.24	2.23
350	2.27	2.27	2.27	2.27	2.27	2.27	2.26
400	2.29	2.29	2.29	2.29	2.29	2.29	2.29

τ = 3 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.30	1.27	1.25	1.23	1.22	1.21	1.19
4	1.46	1.43	1.41	1.39	1.37	1.36	1.34
6	1.56	1.53	1.50	1.48	1.46	1.45	1.43
8	1.62	1.60	1.57	1.55	1.53	1.51	1.49
10	1.68	1.65	1.62	1.59	1.57	1.56	1.54
15	1.77	1.74	1.71	1.68	1.66	1.65	1.63
20	1.83	1.80	1.77	1.75	1.72	1.71	1.69
30	1.89	1.89	1.86	1.83	1.81	1.79	1.77
40	1.93	1.93	1.92	1.89	1.87	1.85	1.83
50	1.97	1.97	1.96	1.93	1.91	1.89	1.87
60	1.99	1.99	1.99	1.97	1.94	1.93	1.90
70	2.01	2.01	2.01	2.00	1.97	1.95	1.93
80	2.03	2.03	2.03	2.02	2.00	1.98	1.95
90	2.04	2.04	2.04	2.04	2.02	2.00	1.97
100	2.05	2.05	2.05	2.05	2.03	2.01	1.99
120	2.07	2.07	2.07	2.07	2.06	2.04	2.02
140	2.09	2.09	2.09	2.09	2.09	2.07	2.05
160	2.11	2.11	2.11	2.11	2.11	2.09	2.07
180	2.12	2.12	2.12	2.12	2.12	2.11	2.09
200	2.13	2.13	2.13	2.13	2.13	2.13	2.10
250	2.17	2.17	2.17	2.17	2.17	2.16	2.14
300	2.20	2.20	2.20	2.20	2.20	2.20	2.17
350	2.22	2.22	2.22	2.22	2.22	2.22	2.20
400	2.25	2.25	2.25	2.25	2.25	2.25	2.23

τ = 10 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.20	1.18	1.16	1.14	1.12	1.11	1.10
4	1.36	1.34	1.31	1.29	1.27	1.26	1.24
6	1.46	1.43	1.40	1.38	1.36	1.34	1.33
8	1.52	1.49	1.46	1.44	1.42	1.40	1.39
10	1.57	1.54	1.51	1.49	1.47	1.45	1.43
15	1.67	1.63	1.60	1.57	1.55	1.54	1.52
20	1.72	1.69	1.66	1.63	1.61	1.59	1.57
30	1.79	1.78	1.75	1.72	1.69	1.68	1.65
40	1.83	1.83	1.80	1.78	1.75	1.73	1.71
50	1.86	1.86	1.85	1.82	1.79	1.78	1.75
60	1.89	1.89	1.88	1.86	1.83	1.81	1.79
70	1.91	1.91	1.91	1.88	1.86	1.84	1.81
80	1.93	1.93	1.93	1.91	1.88	1.86	1.84
90	1.94	1.94	1.94	1.93	1.90	1.88	1.86
100	1.96	1.96	1.96	1.95	1.92	1.90	1.88
120	1.98	1.98	1.98	1.98	1.95	1.93	1.91
140	2.00	2.00	2.00	2.00	1.98	1.96	1.94
160	2.02	2.02	2.02	2.02	2.00	1.98	1.96
180	2.04	2.04	2.04	2.04	2.03	2.00	1.98
200	2.05	2.05	2.05	2.05	2.05	2.02	2.00
250	2.09	2.09	2.09	2.09	2.09	2.07	2.04
300	2.12	2.12	2.12	2.12	2.12	2.10	2.08
350	2.15	2.15	2.15	2.15	2.15	2.14	2.11
400	2.18	2.18	2.18	2.18	2.18	2.17	2.14

τ = 30 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.10	1.07	1.05	1.03	1.01	1.00	0.98
4	1.25	1.22	1.20	1.17	1.15	1.14	1.12
6	1.34	1.31	1.28	1.26	1.24	1.22	1.20
8	1.41	1.37	1.34	1.32	1.29	1.28	1.26
10	1.46	1.42	1.39	1.36	1.34	1.32	1.30
15	1.55	1.51	1.47	1.45	1.42	1.41	1.38
20	1.60	1.57	1.53	1.51	1.48	1.46	1.44
30	1.67	1.66	1.62	1.59	1.56	1.54	1.52
40	1.71	1.71	1.68	1.65	1.62	1.60	1.57
50	1.75	1.75	1.72	1.69	1.66	1.64	1.62
60	1.77	1.77	1.76	1.73	1.70	1.68	1.65
70	1.80	1.80	1.79	1.76	1.73	1.71	1.68
80	1.82	1.82	1.82	1.78	1.75	1.73	1.70
90	1.83	1.83	1.83	1.80	1.77	1.75	1.73
100	1.85	1.85	1.85	1.82	1.79	1.77	1.75
120	1.88	1.88	1.88	1.86	1.83	1.81	1.78
140	1.90	1.90	1.90	1.89	1.86	1.84	1.81
160	1.92	1.92	1.92	1.92	1.88	1.86	1.83
180	1.94	1.94	1.94	1.94	1.91	1.88	1.86
200	1.96	1.96	1.96	1.96	1.93	1.91	1.88
250	2.00	2.00	2.00	2.00	1.98	1.95	1.92
300	2.04	2.04	2.04	2.04	2.02	2.00	1.97
350	2.07	2.07	2.07	2.07	2.06	2.03	2.00
400	2.10	2.10	2.10	2.10	2.09	2.07	2.04

τ = 60 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.04	1.01	0.98	0.96	0.94	0.93	0.91
4	1.19	1.15	1.12	1.10	1.08	1.06	1.05
6	1.27	1.24	1.21	1.18	1.16	1.14	1.12
8	1.34	1.30	1.27	1.24	1.22	1.20	1.18
10	1.38	1.35	1.31	1.28	1.26	1.24	1.22
15	1.47	1.43	1.40	1.37	1.34	1.32	1.30
20	1.53	1.49	1.45	1.42	1.40	1.38	1.35
30	1.59	1.58	1.54	1.51	1.48	1.46	1.43
40	1.64	1.64	1.60	1.56	1.53	1.51	1.49
50	1.67	1.67	1.64	1.61	1.58	1.56	1.53
60	1.70	1.70	1.68	1.64	1.61	1.59	1.56
70	1.72	1.72	1.71	1.68	1.64	1.62	1.59
80	1.74	1.74	1.74	1.70	1.67	1.65	1.62
90	1.76	1.76	1.76	1.73	1.69	1.67	1.64
100	1.78	1.78	1.78	1.75	1.71	1.69	1.66
120	1.81	1.81	1.81	1.78	1.75	1.73	1.70
140	1.83	1.83	1.83	1.82	1.78	1.76	1.73
160	1.86	1.86	1.86	1.84	1.81	1.78	1.75
180	1.88	1.88	1.88	1.87	1.83	1.81	1.78
200	1.90	1.90	1.90	1.89	1.86	1.83	1.80
250	1.94	1.94	1.94	1.94	1.91	1.88	1.85
300	1.98	1.98	1.98	1.98	1.95	1.93	1.89
350	2.02	2.02	2.02	2.02	2.00	1.97	1.93
400	2.05	2.05	2.05	2.05	2.03	2.01	1.97

Mean-hourly (τ = 3600 s)

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.86	0.83	0.80	0.78	0.76	0.74	0.72
4	1.00	0.97	0.93	0.91	0.88	0.86	0.84
6	1.09	1.05	1.01	0.98	0.96	0.94	0.91
8	1.15	1.11	1.07	1.04	1.01	0.99	0.96
10	1.19	1.15	1.11	1.08	1.05	1.03	1.00
15	1.28	1.23	1.19	1.15	1.12	1.10	1.08
20	1.32	1.29	1.25	1.21	1.18	1.16	1.13
30	1.39	1.38	1.33	1.29	1.25	1.23	1.20
40	1.43	1.43	1.39	1.35	1.31	1.29	1.25
50	1.47	1.47	1.43	1.39	1.35	1.33	1.30
60	1.50	1.50	1.47	1.43	1.39	1.37	1.33
70	1.53	1.53	1.51	1.46	1.42	1.40	1.36
80	1.55	1.55	1.54	1.49	1.45	1.42	1.39
90	1.57	1.57	1.56	1.52	1.48	1.45	1.41
100	1.59	1.59	1.59	1.54	1.50	1.47	1.44
120	1.63	1.63	1.63	1.58	1.54	1.51	1.48
140	1.66	1.66	1.66	1.62	1.58	1.55	1.51
160	1.69	1.69	1.69	1.65	1.61	1.58	1.54
180	1.71	1.71	1.71	1.68	1.64	1.61	1.57
200	1.74	1.74	1.74	1.71	1.67	1.63	1.60
250	1.79	1.79	1.79	1.77	1.73	1.69	1.65
300	1.84	1.84	1.84	1.83	1.78	1.75	1.70
350	1.88	1.88	1.88	1.88	1.83	1.79	1.75
400	1.92	1.92	1.92	1.92	1.87	1.84	1.79

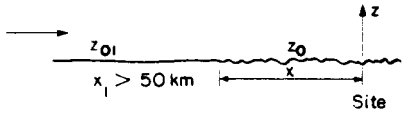


TABLE 10.24 *K*-factors for Site Roughness z_0 = 0.03 m and Upwind Roughness z_{01} = 0.001 m

τ = 1 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.40	1.36	1.33	1.31	1.29	1.27	1.25
4	1.57	1.53	1.50	1.47	1.45	1.43	1.41
6	1.67	1.63	1.59	1.56	1.54	1.52	1.50
8	1.74	1.70	1.66	1.63	1.60	1.59	1.56
10	1.80	1.75	1.71	1.68	1.66	1.64	1.61
15	1.89	1.85	1.81	1.77	1.75	1.73	1.70
20	1.94	1.92	1.87	1.84	1.81	1.79	1.76
30	2.00	2.00	1.96	1.93	1.90	1.87	1.85
40	2.03	2.03	2.02	1.99	1.95	1.93	1.90
50	2.06	2.06	2.06	2.03	2.00	1.97	1.94
60	2.08	2.08	2.08	2.06	2.03	2.01	1.98
70	2.09	2.09	2.09	2.09	2.06	2.03	2.00
80	2.11	2.11	2.11	2.11	2.08	2.06	2.03
90	2.12	2.12	2.12	2.12	2.10	2.08	2.05
100	2.13	2.13	2.13	2.13	2.12	2.09	2.06
120	2.14	2.14	2.14	2.14	2.14	2.12	2.09
140	2.16	2.16	2.16	2.16	2.16	2.15	2.11
160	2.17	2.17	2.17	2.17	2.17	2.17	2.13
180	2.18	2.18	2.18	2.18	2.18	2.18	2.15
200	2.19	2.19	2.19	2.19	2.19	2.19	2.17
250	2.22	2.22	2.22	2.22	2.22	2.22	2.20
300	2.25	2.25	2.25	2.25	2.25	2.25	2.23
350	2.27	2.27	2.27	2.27	2.27	2.27	2.26
400	2.30	2.30	2.30	2.30	2.30	2.30	2.29

τ = 3 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.34	1.30	1.27	1.25	1.23	1.21	1.19
4	1.51	1.47	1.43	1.41	1.38	1.37	1.34
6	1.61	1.57	1.53	1.50	1.47	1.46	1.43
8	1.68	1.63	1.60	1.57	1.54	1.52	1.49
10	1.73	1.69	1.65	1.62	1.59	1.57	1.54
15	1.83	1.78	1.74	1.71	1.68	1.66	1.63
20	1.88	1.85	1.80	1.77	1.74	1.72	1.69
30	1.94	1.94	1.89	1.86	1.82	1.80	1.77
40	1.97	1.97	1.95	1.92	1.88	1.86	1.83
50	2.00	2.00	2.00	1.96	1.93	1.90	1.87
60	2.02	2.02	2.02	1.99	1.96	1.93	1.90
70	2.04	2.04	2.04	2.02	1.99	1.96	1.93
80	2.05	2.05	2.05	2.05	2.01	1.99	1.95
90	2.06	2.06	2.06	2.06	2.03	2.01	1.97
100	2.07	2.07	2.07	2.07	2.05	2.02	1.99
120	2.09	2.09	2.09	2.09	2.08	2.05	2.02
140	2.11	2.11	2.11	2.11	2.10	2.08	2.05
160	2.12	2.12	2.12	2.12	2.12	2.10	2.07
180	2.13	2.13	2.13	2.13	2.13	2.12	2.09
200	2.15	2.15	2.15	2.15	2.15	2.14	2.10
250	2.18	2.18	2.18	2.18	2.18	2.17	2.14
300	2.21	2.21	2.21	2.21	2.21	2.21	2.17
350	2.24	2.24	2.24	2.24	2.24	2.24	2.20
400	2.26	2.26	2.26	2.26	2.26	2.26	2.23

τ = 10 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.25	1.21	1.18	1.15	1.13	1.12	1.10
4	1.41	1.37	1.34	1.31	1.28	1.26	1.24
6	1.51	1.47	1.43	1.40	1.37	1.35	1.33
8	1.58	1.53	1.49	1.46	1.43	1.41	1.39
10	1.63	1.58	1.54	1.51	1.48	1.46	1.43
15	1.72	1.68	1.63	1.60	1.57	1.54	1.52
20	1.78	1.74	1.69	1.66	1.63	1.60	1.57
30	1.84	1.83	1.78	1.74	1.71	1.68	1.65
40	1.88	1.88	1.84	1.80	1.77	1.74	1.71
50	1.91	1.91	1.89	1.85	1.81	1.78	1.75
60	1.93	1.93	1.92	1.88	1.85	1.82	1.79
70	1.95	1.95	1.95	1.91	1.87	1.85	1.81
80	1.96	1.96	1.96	1.94	1.90	1.87	1.84
90	1.98	1.98	1.98	1.96	1.92	1.89	1.86
100	1.99	1.99	1.99	1.98	1.94	1.91	1.88
120	2.01	2.01	2.01	2.01	1.97	1.94	1.91
140	2.03	2.03	2.03	2.03	2.00	1.97	1.94
160	2.04	2.04	2.04	2.04	2.02	1.99	1.96
180	2.06	2.06	2.06	2.06	2.04	2.01	1.98
200	2.07	2.07	2.07	2.07	2.06	2.03	2.00
250	2.11	2.11	2.11	2.11	2.11	2.08	2.04
300	2.14	2.14	2.14	2.14	2.14	2.11	2.08
350	2.17	2.17	2.17	2.17	2.17	2.15	2.11
400	2.20	2.20	2.20	2.20	2.20	2.18	2.14

τ = 30 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.15	1.11	1.07	1.05	1.02	1.01	0.98
4	1.31	1.26	1.22	1.19	1.17	1.15	1.12
6	1.40	1.35	1.31	1.28	1.25	1.23	1.20
8	1.47	1.42	1.37	1.34	1.31	1.29	1.26
10	1.52	1.47	1.42	1.39	1.35	1.33	1.30
15	1.61	1.56	1.51	1.47	1.44	1.41	1.38
20	1.67	1.62	1.57	1.53	1.50	1.47	1.44
30	1.72	1.71	1.66	1.62	1.58	1.55	1.52
40	1.76	1.76	1.72	1.67	1.64	1.61	1.57
50	1.80	1.80	1.76	1.72	1.68	1.65	1.62
60	1.82	1.82	1.80	1.76	1.71	1.69	1.65
70	1.84	1.84	1.83	1.79	1.74	1.72	1.68
80	1.86	1.86	1.86	1.81	1.77	1.74	1.70
90	1.87	1.87	1.87	1.84	1.79	1.76	1.73
100	1.89	1.89	1.89	1.86	1.81	1.78	1.75
120	1.91	1.91	1.91	1.89	1.85	1.82	1.78
140	1.93	1.93	1.93	1.92	1.88	1.85	1.81
160	1.95	1.95	1.95	1.95	1.90	1.87	1.83
180	1.97	1.97	1.97	1.97	1.93	1.90	1.86
200	1.99	1.99	1.99	1.99	1.95	1.92	1.88
250	2.03	2.03	2.03	2.03	2.00	1.97	1.92
300	2.07	2.07	2.07	2.07	2.04	2.01	1.97
350	2.10	2.10	2.10	2.10	2.08	2.05	2.00
400	2.13	2.13	2.13	2.13	2.12	2.08	2.04

τ = 60 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.08	1.04	1.01	0.98	0.95	0.94	0.91
4	1.24	1.20	1.15	1.12	1.09	1.07	1.05
6	1.33	1.29	1.24	1.20	1.17	1.15	1.12
8	1.40	1.35	1.30	1.26	1.23	1.21	1.18
10	1.45	1.40	1.35	1.31	1.28	1.25	1.22
15	1.54	1.49	1.43	1.39	1.36	1.33	1.30
20	1.59	1.55	1.49	1.45	1.41	1.39	1.35
30	1.65	1.64	1.58	1.54	1.50	1.47	1.43
40	1.69	1.69	1.64	1.59	1.55	1.52	1.49
50	1.72	1.72	1.69	1.64	1.60	1.57	1.53
60	1.75	1.75	1.72	1.68	1.63	1.60	1.56
70	1.77	1.77	1.76	1.71	1.66	1.63	1.59
80	1.79	1.79	1.79	1.73	1.69	1.66	1.62
90	1.81	1.81	1.81	1.76	1.71	1.68	1.64
100	1.82	1.82	1.82	1.78	1.73	1.70	1.66
120	1.85	1.85	1.85	1.82	1.77	1.74	1.70
140	1.88	1.88	1.88	1.85	1.80	1.77	1.73
160	1.90	1.90	1.90	1.88	1.83	1.80	1.75
180	1.92	1.92	1.92	1.91	1.86	1.82	1.78
200	1.94	1.94	1.94	1.93	1.88	1.84	1.80
250	1.98	1.98	1.98	1.98	1.93	1.89	1.85
300	2.02	2.02	2.02	2.02	1.98	1.94	1.89
350	2.05	2.05	2.05	2.05	2.02	1.98	1.93
400	2.09	2.09	2.09	2.09	2.06	2.02	1.97

Mean-hourly (τ = 3600 s)

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.91	0.87	0.83	0.80	0.77	0.75	0.72
4	1.07	1.01	0.97	0.93	0.90	0.87	0.84
6	1.15	1.10	1.05	1.01	0.97	0.95	0.91
8	1.22	1.16	1.11	1.06	1.02	1.00	0.96
10	1.27	1.21	1.15	1.11	1.07	1.04	1.00
15	1.36	1.29	1.23	1.19	1.14	1.11	1.08
20	1.40	1.36	1.29	1.24	1.20	1.17	1.13
30	1.46	1.44	1.38	1.32	1.28	1.24	1.20
40	1.50	1.50	1.44	1.38	1.33	1.30	1.25
50	1.54	1.54	1.49	1.43	1.38	1.34	1.30
60	1.57	1.57	1.53	1.47	1.42	1.38	1.33
70	1.59	1.59	1.56	1.50	1.45	1.41	1.36
80	1.62	1.62	1.59	1.53	1.48	1.44	1.39
90	1.64	1.64	1.62	1.56	1.50	1.46	1.41
100	1.66	1.66	1.65	1.58	1.53	1.49	1.44
120	1.69	1.69	1.69	1.63	1.57	1.53	1.48
140	1.72	1.72	1.72	1.66	1.60	1.56	1.51
160	1.75	1.75	1.75	1.70	1.64	1.59	1.54
180	1.77	1.77	1.77	1.73	1.67	1.62	1.57
200	1.79	1.79	1.79	1.76	1.69	1.65	1.60
250	1.84	1.84	1.84	1.82	1.76	1.71	1.65
300	1.89	1.89	1.89	1.88	1.81	1.76	1.70
350	1.93	1.93	1.93	1.93	1.86	1.81	1.75
400	1.97	1.97	1.97	1.97	1.91	1.86	1.79

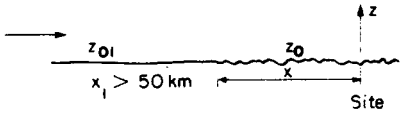


TABLE 10.25 *K*-factors for Site Roughness z_0 = 0.01 m and Upwind Roughness z_{01} = 0.3 m

τ = 1 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.17	1.20	1.23	1.26	1.29	1.31	1.37
4	1.29	1.32	1.36	1.39	1.42	1.45	1.51
6	1.36	1.40	1.43	1.47	1.50	1.53	1.59
8	1.41	1.45	1.49	1.52	1.55	1.59	1.65
10	1.45	1.49	1.53	1.56	1.60	1.63	1.70
15	1.52	1.56	1.60	1.63	1.67	1.70	1.78
20	1.56	1.60	1.65	1.68	1.72	1.76	1.83
30	1.67	1.67	1.71	1.75	1.79	1.83	1.90
40	1.75	1.75	1.76	1.80	1.84	1.87	1.95
50	1.81	1.81	1.81	1.83	1.87	1.91	1.99
60	1.86	1.86	1.86	1.86	1.90	1.94	2.02
70	1.90	1.90	1.90	1.90	1.92	1.96	2.04
80	1.93	1.93	1.93	1.93	1.94	1.98	2.06
90	1.96	1.96	1.96	1.96	1.96	1.99	2.07
100	1.99	1.99	1.99	1.99	1.99	2.00	2.09
120	2.03	2.03	2.03	2.03	2.03	2.03	2.11
140	2.06	2.06	2.06	2.06	2.06	2.06	2.13
160	2.09	2.09	2.09	2.09	2.09	2.09	2.15
180	2.12	2.12	2.12	2.12	2.12	2.12	2.16
200	2.14	2.14	2.14	2.14	2.14	2.14	2.18
250	2.19	2.19	2.19	2.19	2.19	2.19	2.21
300	2.23	2.23	2.23	2.23	2.23	2.23	2.24
350	2.26	2.26	2.26	2.26	2.26	2.26	2.26
400	2.29	2.29	2.29	2.29	2.29	2.29	2.29

τ = 3 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.11	1.14	1.17	1.20	1.23	1.25	1.31
4	1.23	1.26	1.30	1.33	1.36	1.39	1.45
6	1.30	1.33	1.37	1.40	1.44	1.47	1.53
8	1.34	1.38	1.42	1.45	1.49	1.52	1.59
10	1.38	1.42	1.46	1.49	1.53	1.56	1.63
15	1.45	1.49	1.53	1.56	1.60	1.64	1.71
20	1.49	1.53	1.58	1.61	1.65	1.69	1.76
30	1.59	1.60	1.64	1.68	1.72	1.76	1.84
40	1.67	1.67	1.69	1.73	1.77	1.81	1.88
50	1.73	1.73	1.73	1.76	1.80	1.84	1.92
60	1.77	1.77	1.77	1.79	1.83	1.87	1.95
70	1.81	1.81	1.81	1.81	1.85	1.89	1.97
80	1.84	1.84	1.84	1.84	1.87	1.91	1.99
90	1.87	1.87	1.87	1.87	1.89	1.92	2.01
100	1.90	1.90	1.90	1.90	1.90	1.94	2.02
120	1.94	1.94	1.94	1.94	1.94	1.96	2.05
140	1.98	1.98	1.98	1.98	1.98	1.98	2.07
160	2.01	2.01	2.01	2.01	2.01	2.01	2.09
180	2.03	2.03	2.03	2.03	2.03	2.03	2.10
200	2.06	2.06	2.06	2.06	2.06	2.06	2.12
250	2.11	2.11	2.11	2.11	2.11	2.11	2.15
300	2.15	2.15	2.15	2.15	2.15	2.15	2.18
350	2.19	2.19	2.19	2.19	2.19	2.19	2.21
400	2.22	2.22	2.22	2.22	2.22	2.22	2.24

τ = 10 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.01	1.04	1.08	1.10	1.13	1.16	1.22
4	1.12	1.16	1.19	1.23	1.26	1.29	1.35
6	1.19	1.22	1.26	1.30	1.33	1.36	1.43
8	1.23	1.27	1.31	1.35	1.38	1.41	1.48
10	1.27	1.31	1.35	1.38	1.42	1.45	1.52
15	1.33	1.37	1.42	1.45	1.49	1.53	1.60
20	1.38	1.42	1.46	1.50	1.54	1.58	1.65
30	1.46	1.48	1.53	1.57	1.61	1.65	1.72
40	1.53	1.53	1.57	1.61	1.65	1.69	1.77
50	1.59	1.59	1.60	1.64	1.69	1.73	1.81
60	1.63	1.63	1.63	1.67	1.72	1.76	1.84
70	1.67	1.67	1.67	1.69	1.74	1.78	1.86
80	1.71	1.71	1.71	1.71	1.76	1.80	1.89
90	1.73	1.73	1.73	1.73	1.78	1.82	1.90
100	1.76	1.76	1.76	1.76	1.79	1.83	1.92
120	1.80	1.80	1.80	1.80	1.82	1.86	1.95
140	1.84	1.84	1.84	1.84	1.84	1.88	1.97
160	1.87	1.87	1.87	1.87	1.87	1.90	1.99
180	1.90	1.90	1.90	1.90	1.90	1.92	2.01
200	1.92	1.92	1.92	1.92	1.92	1.93	2.03
250	1.98	1.98	1.98	1.98	1.98	1.98	2.06
300	2.02	2.02	2.02	2.02	2.02	2.02	2.10
350	2.06	2.06	2.06	2.06	2.06	2.06	2.13
400	2.10	2.10	2.10	2.10	2.10	2.10	2.16

τ = 30 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.90	0.93	0.96	0.99	1.02	1.05	1.11
4	1.00	1.03	1.07	1.10	1.14	1.17	1.23
6	1.06	1.10	1.14	1.17	1.21	1.24	1.31
8	1.10	1.14	1.18	1.22	1.26	1.29	1.36
10	1.13	1.17	1.22	1.25	1.29	1.33	1.40
15	1.19	1.24	1.28	1.32	1.36	1.40	1.47
20	1.23	1.28	1.32	1.37	1.41	1.44	1.52
30	1.31	1.34	1.39	1.43	1.47	1.51	1.60
40	1.38	1.38	1.43	1.47	1.52	1.56	1.65
50	1.43	1.43	1.46	1.51	1.55	1.60	1.68
60	1.48	1.48	1.49	1.54	1.58	1.62	1.71
70	1.51	1.51	1.51	1.56	1.61	1.65	1.74
80	1.54	1.54	1.54	1.58	1.63	1.67	1.76
90	1.57	1.57	1.57	1.60	1.64	1.69	1.78
100	1.60	1.60	1.60	1.61	1.66	1.70	1.80
120	1.64	1.64	1.64	1.64	1.69	1.73	1.83
140	1.68	1.68	1.68	1.68	1.71	1.76	1.86
160	1.71	1.71	1.71	1.71	1.73	1.78	1.88
180	1.74	1.74	1.74	1.74	1.75	1.80	1.90
200	1.77	1.77	1.77	1.77	1.77	1.82	1.92
250	1.82	1.82	1.82	1.82	1.82	1.86	1.96
300	1.87	1.87	1.87	1.87	1.87	1.90	2.00
350	1.91	1.91	1.91	1.91	1.91	1.93	2.04
400	1.95	1.95	1.95	1.95	1.95	1.96	2.07

τ = 60 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.82	0.85	0.89	0.92	0.95	0.98	1.04
4	0.91	0.95	0.99	1.02	1.06	1.09	1.16
6	0.97	1.01	1.05	1.09	1.13	1.16	1.23
8	1.01	1.05	1.10	1.13	1.17	1.21	1.28
10	1.04	1.08	1.13	1.17	1.21	1.24	1.32
15	1.10	1.14	1.19	1.23	1.27	1.31	1.39
20	1.14	1.18	1.23	1.28	1.32	1.36	1.44
30	1.21	1.24	1.29	1.34	1.39	1.43	1.51
40	1.28	1.28	1.34	1.38	1.43	1.47	1.56
50	1.33	1.33	1.37	1.42	1.47	1.51	1.60
60	1.37	1.37	1.40	1.44	1.49	1.54	1.63
70	1.41	1.41	1.42	1.47	1.52	1.56	1.66
80	1.44	1.44	1.44	1.49	1.54	1.59	1.68
90	1.47	1.47	1.47	1.51	1.56	1.60	1.70
100	1.49	1.49	1.49	1.52	1.58	1.62	1.72
120	1.54	1.54	1.54	1.55	1.60	1.65	1.75
140	1.58	1.58	1.58	1.58	1.63	1.68	1.78
160	1.61	1.61	1.61	1.61	1.65	1.70	1.81
180	1.64	1.64	1.64	1.64	1.67	1.72	1.83
200	1.67	1.67	1.67	1.67	1.69	1.74	1.85
250	1.73	1.73	1.73	1.73	1.74	1.79	1.90
300	1.78	1.78	1.78	1.78	1.78	1.83	1.94
350	1.82	1.82	1.82	1.82	1.82	1.86	1.98
400	1.86	1.86	1.86	1.86	1.86	1.90	2.01

Mean-hourly (τ = 3600 s)

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.61	0.65	0.69	0.72	0.76	0.79	0.85
4	0.69	0.73	0.78	0.82	0.85	0.89	0.96
6	0.74	0.78	0.83	0.87	0.91	0.95	1.03
8	0.77	0.82	0.87	0.91	0.95	0.99	1.08
10	0.80	0.85	0.90	0.94	0.99	1.03	1.11
15	0.85	0.90	0.95	1.00	1.05	1.09	1.18
20	0.88	0.94	0.99	1.04	1.09	1.13	1.23
30	0.95	0.99	1.05	1.10	1.15	1.20	1.30
40	1.01	1.03	1.09	1.14	1.19	1.24	1.35
50	1.06	1.06	1.12	1.17	1.23	1.28	1.39
60	1.10	1.10	1.15	1.20	1.26	1.31	1.42
70	1.14	1.14	1.17	1.23	1.29	1.34	1.45
80	1.17	1.17	1.19	1.25	1.31	1.36	1.47
90	1.20	1.20	1.21	1.27	1.33	1.38	1.50
100	1.22	1.22	1.23	1.28	1.35	1.40	1.52
120	1.27	1.27	1.27	1.32	1.38	1.43	1.55
140	1.31	1.31	1.31	1.34	1.41	1.46	1.59
160	1.34	1.34	1.34	1.37	1.43	1.49	1.62
180	1.37	1.37	1.37	1.39	1.46	1.52	1.64
200	1.40	1.40	1.40	1.41	1.48	1.54	1.67
250	1.47	1.47	1.47	1.47	1.53	1.59	1.72
300	1.52	1.52	1.52	1.52	1.57	1.64	1.77
350	1.57	1.57	1.57	1.57	1.61	1.68	1.82
400	1.62	1.62	1.62	1.62	1.65	1.72	1.86

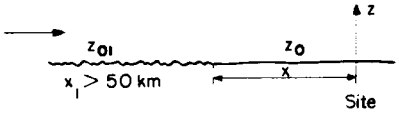


TABLE 10.26 *K*-factors for Site Roughness z_0 = 0.01 m and Upwind Roughness z_{01} = 0.1 m

τ = 1 s

x(km)	0.1	0.3	1	3	10	30	>600
z(m)							
2	1.23	1.25	1.28	1.29	1.31	1.33	1.37
4	1.36	1.38	1.41	1.43	1.45	1.47	1.51
6	1.44	1.46	1.49	1.51	1.53	1.55	1.59
8	1.49	1.51	1.54	1.56	1.59	1.61	1.65
10	1.53	1.55	1.58	1.60	1.63	1.65	1.70
15	1.60	1.63	1.65	1.68	1.70	1.73	1.78
20	1.67	1.68	1.71	1.73	1.76	1.78	1.83
30	1.77	1.77	1.77	1.80	1.83	1.85	1.90
40	1.83	1.83	1.83	1.85	1.88	1.90	1.95
50	1.88	1.88	1.88	1.88	1.91	1.94	1.99
60	1.92	1.92	1.92	1.92	1.94	1.96	2.02
70	1.96	1.96	1.96	1.96	1.96	1.98	2.04
80	1.98	1.98	1.98	1.98	1.98	2.00	2.06
90	2.01	2.01	2.01	2.01	2.01	2.02	2.07
100	2.03	2.03	2.03	2.03	2.03	2.03	2.09
120	2.06	2.06	2.06	2.06	2.06	2.06	2.11
140	2.09	2.09	2.09	2.09	2.09	2.09	2.13
160	2.12	2.12	2.12	2.12	2.12	2.12	2.15
180	2.14	2.14	2.14	2.14	2.14	2.14	2.16
200	2.16	2.16	2.16	2.16	2.16	2.16	2.18
250	2.20	2.20	2.20	2.20	2.20	2.20	2.21
300	2.23	2.23	2.23	2.23	2.23	2.23	2.24
350	2.26	2.26	2.26	2.26	2.26	2.26	2.26
400	2.29	2.29	2.29	2.29	2.29	2.29	2.29

τ = 3 s

x(km)	0.1	0.3	1	3	10	30	>600
z(m)							
2	1.17	1.20	1.22	1.24	1.26	1.27	1.31
4	1.30	1.32	1.35	1.37	1.39	1.41	1.45
6	1.37	1.40	1.42	1.44	1.47	1.49	1.53
8	1.42	1.45	1.47	1.50	1.52	1.54	1.59
10	1.46	1.49	1.51	1.54	1.56	1.58	1.63
15	1.53	1.56	1.59	1.61	1.64	1.66	1.71
20	1.59	1.61	1.64	1.66	1.69	1.71	1.76
30	1.69	1.69	1.70	1.73	1.76	1.78	1.84
40	1.75	1.75	1.75	1.78	1.81	1.83	1.88
50	1.80	1.80	1.80	1.81	1.84	1.87	1.92
60	1.84	1.84	1.84	1.84	1.87	1.89	1.95
70	1.88	1.88	1.88	1.88	1.89	1.92	1.97
80	1.90	1.90	1.90	1.90	1.91	1.94	1.99
90	1.93	1.93	1.93	1.93	1.93	1.95	2.01
100	1.95	1.95	1.95	1.95	1.95	1.97	2.02
120	1.98	1.98	1.98	1.98	1.98	1.99	2.05
140	2.01	2.01	2.01	2.01	2.01	2.01	2.07
160	2.04	2.04	2.04	2.04	2.04	2.04	2.09
180	2.06	2.06	2.06	2.06	2.06	2.06	2.10
200	2.08	2.08	2.08	2.08	2.08	2.08	2.12
250	2.12	2.12	2.12	2.12	2.12	2.12	2.15
300	2.16	2.16	2.16	2.16	2.16	2.16	2.18
350	2.19	2.19	2.19	2.19	2.19	2.19	2.21
400	2.22	2.22	2.22	2.22	2.22	2.22	2.24

τ = 10 s

x(km)	0.1	0.3	1	3	10	30	>600
z(m)							
2	1.08	1.10	1.12	1.14	1.16	1.18	1.22
4	1.20	1.22	1.24	1.27	1.29	1.31	1.35
6	1.26	1.29	1.32	1.34	1.36	1.38	1.43
8	1.31	1.34	1.37	1.39	1.41	1.44	1.48
10	1.35	1.38	1.40	1.43	1.45	1.48	1.52
15	1.42	1.45	1.47	1.50	1.53	1.55	1.60
20	1.47	1.49	1.52	1.55	1.58	1.60	1.65
30	1.56	1.56	1.59	1.62	1.65	1.67	1.72
40	1.63	1.63	1.64	1.66	1.69	1.72	1.77
50	1.68	1.68	1.68	1.70	1.73	1.75	1.81
60	1.72	1.72	1.72	1.73	1.76	1.78	1.84
70	1.75	1.75	1.75	1.75	1.78	1.81	1.86
80	1.78	1.78	1.78	1.78	1.80	1.83	1.89
90	1.80	1.80	1.80	1.80	1.82	1.84	1.90
100	1.82	1.82	1.82	1.82	1.83	1.86	1.92
120	1.86	1.86	1.86	1.86	1.86	1.89	1.95
140	1.89	1.89	1.89	1.89	1.89	1.91	1.97
160	1.92	1.92	1.92	1.92	1.92	1.93	1.99
180	1.94	1.94	1.94	1.94	1.94	1.95	2.01
200	1.96	1.96	1.96	1.96	1.96	1.96	2.03
250	2.01	2.01	2.01	2.01	2.01	2.01	2.06
300	2.05	2.05	2.05	2.05	2.05	2.05	2.10
350	2.09	2.09	2.09	2.09	2.09	2.09	2.13
400	2.12	2.12	2.12	2.12	2.12	2.12	2.16

τ = 30 s

x(km)	0.1	0.3	1	3	10	30	>600
z(m)							
2	0.96	0.99	1.01	1.03	1.05	1.07	1.11
4	1.07	1.10	1.12	1.15	1.17	1.19	1.23
6	1.14	1.16	1.19	1.21	1.24	1.26	1.31
8	1.18	1.21	1.24	1.26	1.29	1.31	1.36
10	1.22	1.25	1.28	1.30	1.33	1.35	1.40
15	1.28	1.31	1.34	1.37	1.40	1.42	1.47
20	1.33	1.36	1.39	1.42	1.45	1.47	1.52
30	1.42	1.42	1.45	1.48	1.51	1.54	1.60
40	1.48	1.48	1.50	1.53	1.56	1.59	1.65
50	1.53	1.53	1.53	1.56	1.60	1.62	1.68
60	1.57	1.57	1.57	1.59	1.63	1.65	1.71
70	1.60	1.60	1.60	1.62	1.65	1.68	1.74
80	1.63	1.63	1.63	1.64	1.67	1.70	1.76
90	1.65	1.65	1.65	1.66	1.69	1.72	1.78
100	1.68	1.68	1.68	1.68	1.71	1.73	1.80
120	1.71	1.71	1.71	1.71	1.73	1.76	1.83
140	1.75	1.75	1.75	1.75	1.76	1.79	1.86
160	1.78	1.78	1.78	1.78	1.78	1.81	1.88
180	1.80	1.80	1.80	1.80	1.80	1.83	1.90
200	1.82	1.82	1.82	1.82	1.82	1.85	1.92
250	1.88	1.88	1.88	1.88	1.88	1.89	1.96
300	1.92	1.92	1.92	1.92	1.92	1.93	2.00
350	1.96	1.96	1.96	1.96	1.96	1.97	2.04
400	2.00	2.00	2.00	2.00	2.00	2.00	2.07

τ = 60 s

x(km)	0.1	0.3	1	3	10	30	>600
z(m)							
2	0.89	0.91	0.93	0.96	0.98	1.00	1.04
4	0.99	1.02	1.05	1.07	1.09	1.11	1.16
6	1.05	1.08	1.11	1.13	1.16	1.18	1.23
8	1.10	1.13	1.16	1.18	1.21	1.23	1.28
10	1.13	1.16	1.19	1.22	1.25	1.27	1.32
15	1.19	1.22	1.26	1.28	1.31	1.34	1.39
20	1.24	1.27	1.30	1.33	1.36	1.39	1.44
30	1.33	1.33	1.37	1.40	1.43	1.45	1.51
40	1.39	1.39	1.41	1.44	1.47	1.50	1.56
50	1.43	1.43	1.44	1.48	1.51	1.54	1.60
60	1.47	1.47	1.47	1.51	1.54	1.57	1.63
70	1.51	1.51	1.51	1.53	1.56	1.59	1.66
80	1.53	1.53	1.53	1.55	1.59	1.62	1.68
90	1.56	1.56	1.56	1.57	1.61	1.64	1.70
100	1.58	1.58	1.58	1.59	1.62	1.65	1.72
120	1.62	1.62	1.62	1.62	1.65	1.68	1.75
140	1.65	1.65	1.65	1.65	1.68	1.71	1.78
160	1.68	1.68	1.68	1.68	1.70	1.74	1.81
180	1.71	1.71	1.71	1.71	1.72	1.76	1.83
200	1.74	1.74	1.74	1.74	1.74	1.78	1.85
250	1.79	1.79	1.79	1.79	1.79	1.82	1.90
300	1.84	1.84	1.84	1.84	1.84	1.86	1.94
350	1.88	1.88	1.88	1.88	1.88	1.90	1.98
400	1.92	1.92	1.92	1.92	1.92	1.93	2.01

Mean-hourly (τ = 3600 s)

x(km)	0.1	0.3	1	3	10	30	>600
z(m)							
2	0.69	0.71	0.74	0.76	0.79	0.81	0.85
4	0.78	0.81	0.84	0.86	0.89	0.91	0.96
6	0.83	0.86	0.89	0.92	0.95	0.97	1.03
8	0.87	0.90	0.94	0.96	0.99	1.02	1.08
10	0.90	0.93	0.97	1.00	1.03	1.05	1.11
15	0.96	0.99	1.03	1.06	1.09	1.12	1.18
20	1.00	1.03	1.07	1.10	1.13	1.16	1.23
30	1.08	1.09	1.13	1.16	1.20	1.23	1.30
40	1.14	1.14	1.17	1.21	1.24	1.28	1.35
50	1.18	1.18	1.21	1.24	1.28	1.31	1.39
60	1.22	1.22	1.23	1.27	1.31	1.35	1.42
70	1.25	1.25	1.26	1.30	1.34	1.37	1.45
80	1.28	1.28	1.28	1.32	1.36	1.40	1.47
90	1.31	1.31	1.31	1.34	1.38	1.42	1.50
100	1.33	1.33	1.33	1.36	1.40	1.44	1.52
120	1.37	1.37	1.37	1.39	1.44	1.47	1.55
140	1.41	1.41	1.41	1.42	1.47	1.50	1.59
160	1.44	1.44	1.44	1.45	1.49	1.53	1.62
180	1.47	1.47	1.47	1.47	1.52	1.56	1.64
200	1.50	1.50	1.50	1.50	1.54	1.58	1.67
250	1.56	1.56	1.56	1.56	1.59	1.63	1.72
300	1.62	1.62	1.62	1.62	1.64	1.68	1.77
350	1.67	1.67	1.67	1.67	1.68	1.72	1.82
400	1.71	1.71	1.71	1.71	1.72	1.76	1.86

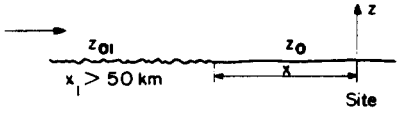


TABLE 10.27 *K*-factors for Site Roughness z_0 = 0.01 m and Upwind Roughness z_{01} = 0.03 m

τ = 1 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.30	1.31	1.32	1.33	1.34	1.35	1.37
4	1.44	1.45	1.46	1.47	1.48	1.49	1.51
6	1.52	1.53	1.54	1.55	1.56	1.57	1.59
8	1.57	1.59	1.60	1.61	1.62	1.63	1.65
10	1.62	1.63	1.64	1.65	1.66	1.67	1.70
15	1.70	1.70	1.72	1.73	1.74	1.75	1.78
20	1.76	1.76	1.77	1.78	1.80	1.81	1.83
30	1.85	1.85	1.85	1.85	1.87	1.88	1.90
40	1.90	1.90	1.90	1.90	1.92	1.93	1.95
50	1.94	1.94	1.94	1.94	1.95	1.96	1.99
60	1.98	1.98	1.98	1.98	1.98	1.99	2.02
70	2.00	2.00	2.00	2.00	2.00	2.01	2.04
80	2.03	2.03	2.03	2.03	2.03	2.03	2.06
90	2.05	2.05	2.05	2.05	2.05	2.05	2.07
100	2.06	2.06	2.06	2.06	2.06	2.06	2.09
120	2.09	2.09	2.09	2.09	2.09	2.09	2.11
140	2.11	2.11	2.11	2.11	2.11	2.11	2.13
160	2.13	2.13	2.13	2.13	2.13	2.13	2.15
180	2.15	2.15	2.15	2.15	2.15	2.15	2.16
200	2.17	2.17	2.17	2.17	2.17	2.17	2.18
250	2.20	2.20	2.20	2.20	2.20	2.20	2.21
300	2.23	2.23	2.23	2.23	2.23	2.23	2.24
350	2.26	2.26	2.26	2.26	2.26	2.26	2.26
400	2.29	2.29	2.29	2.29	2.29	2.29	2.29

τ = 3 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.25	1.26	1.27	1.27	1.28	1.29	1.31
4	1.38	1.39	1.40	1.41	1.42	1.43	1.45
6	1.45	1.47	1.48	1.49	1.50	1.51	1.53
8	1.51	1.52	1.53	1.54	1.55	1.56	1.59
10	1.55	1.56	1.57	1.59	1.60	1.61	1.63
15	1.63	1.64	1.65	1.66	1.67	1.68	1.71
20	1.69	1.69	1.70	1.71	1.73	1.74	1.76
30	1.77	1.77	1.77	1.79	1.80	1.81	1.84
40	1.83	1.83	1.83	1.83	1.85	1.86	1.88
50	1.87	1.87	1.87	1.87	1.88	1.89	1.92
60	1.90	1.90	1.90	1.90	1.91	1.92	1.95
70	1.93	1.93	1.93	1.93	1.93	1.95	1.97
80	1.95	1.95	1.95	1.95	1.95	1.96	1.99
90	1.97	1.97	1.97	1.97	1.97	1.98	2.01
100	1.99	1.99	1.99	1.99	1.99	2.00	2.02
120	2.02	2.02	2.02	2.02	2.02	2.02	2.05
140	2.05	2.05	2.05	2.05	2.05	2.05	2.07
160	2.07	2.07	2.07	2.07	2.07	2.07	2.09
180	2.09	2.09	2.09	2.09	2.09	2.09	2.10
200	2.10	2.10	2.10	2.10	2.10	2.10	2.12
250	2.14	2.14	2.14	2.14	2.14	2.14	2.15
300	2.17	2.17	2.17	2.17	2.17	2.17	2.18
350	2.20	2.20	2.20	2.20	2.20	2.20	2.21
400	2.23	2.23	2.23	2.23	2.23	2.23	2.24

τ = 10 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.15	1.16	1.17	1.18	1.19	1.20	1.22
4	1.28	1.29	1.30	1.31	1.32	1.33	1.35
6	1.35	1.36	1.37	1.38	1.40	1.41	1.43
8	1.40	1.41	1.43	1.44	1.45	1.46	1.48
10	1.44	1.45	1.47	1.48	1.49	1.50	1.52
15	1.52	1.53	1.54	1.55	1.56	1.58	1.60
20	1.57	1.58	1.59	1.60	1.62	1.63	1.65
30	1.65	1.65	1.66	1.67	1.69	1.70	1.72
40	1.71	1.71	1.71	1.72	1.74	1.75	1.77
50	1.75	1.75	1.75	1.76	1.77	1.78	1.81
60	1.79	1.79	1.79	1.79	1.80	1.81	1.84
70	1.81	1.81	1.81	1.81	1.82	1.84	1.86
80	1.84	1.84	1.84	1.84	1.84	1.86	1.89
90	1.86	1.86	1.86	1.86	1.86	1.88	1.90
100	1.88	1.88	1.88	1.88	1.88	1.89	1.92
120	1.91	1.91	1.91	1.91	1.91	1.92	1.95
140	1.94	1.94	1.94	1.94	1.94	1.94	1.97
160	1.96	1.96	1.96	1.96	1.96	1.96	1.99
180	1.98	1.98	1.98	1.98	1.98	1.98	2.01
200	2.00	2.00	2.00	2.00	2.00	2.00	2.03
250	2.04	2.04	2.04	2.04	2.04	2.04	2.06
300	2.08	2.08	2.08	2.08	2.08	2.08	2.10
350	2.11	2.11	2.11	2.11	2.11	2.11	2.13
400	2.14	2.14	2.14	2.14	2.14	2.14	2.16

τ = 30 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.04	1.05	1.06	1.07	1.08	1.09	1.11
4	1.16	1.17	1.18	1.19	1.20	1.21	1.23
6	1.23	1.24	1.25	1.26	1.28	1.29	1.31
8	1.28	1.29	1.30	1.31	1.33	1.34	1.36
10	1.31	1.33	1.34	1.35	1.37	1.38	1.40
15	1.38	1.40	1.41	1.42	1.44	1.45	1.47
20	1.44	1.45	1.46	1.47	1.49	1.50	1.52
30	1.52	1.52	1.53	1.54	1.56	1.57	1.60
40	1.57	1.57	1.58	1.59	1.61	1.62	1.65
50	1.62	1.62	1.62	1.63	1.64	1.66	1.68
60	1.65	1.65	1.65	1.66	1.67	1.69	1.71
70	1.68	1.68	1.68	1.68	1.70	1.71	1.74
80	1.70	1.70	1.70	1.70	1.72	1.73	1.76
90	1.73	1.73	1.73	1.73	1.74	1.75	1.78
100	1.75	1.75	1.75	1.75	1.75	1.77	1.80
120	1.78	1.78	1.78	1.78	1.78	1.80	1.83
140	1.81	1.81	1.81	1.81	1.81	1.82	1.86
160	1.83	1.83	1.83	1.83	1.83	1.85	1.88
180	1.86	1.86	1.86	1.86	1.86	1.87	1.90
200	1.88	1.88	1.88	1.88	1.88	1.89	1.92
250	1.92	1.92	1.92	1.92	1.92	1.93	1.96
300	1.97	1.97	1.97	1.97	1.97	1.97	2.00
350	2.00	2.00	2.00	2.00	2.00	2.00	2.04
400	2.04	2.04	2.04	2.04	2.04	2.04	2.07

τ = 60 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.97	0.98	0.99	1.00	1.01	1.02	1.04
4	1.08	1.09	1.10	1.12	1.13	1.14	1.16
6	1.15	1.16	1.17	1.18	1.20	1.21	1.23
8	1.19	1.21	1.22	1.23	1.25	1.26	1.28
10	1.23	1.24	1.26	1.27	1.29	1.30	1.32
15	1.30	1.31	1.33	1.34	1.35	1.37	1.39
20	1.35	1.36	1.38	1.39	1.40	1.42	1.44
30	1.43	1.43	1.44	1.46	1.47	1.49	1.51
40	1.49	1.49	1.49	1.51	1.52	1.53	1.56
50	1.53	1.53	1.53	1.54	1.56	1.57	1.60
60	1.56	1.56	1.56	1.57	1.59	1.60	1.63
70	1.59	1.59	1.59	1.60	1.61	1.63	1.66
80	1.62	1.62	1.62	1.62	1.64	1.65	1.68
90	1.64	1.64	1.64	1.64	1.66	1.67	1.70
100	1.66	1.66	1.66	1.66	1.67	1.69	1.72
120	1.70	1.70	1.70	1.70	1.71	1.72	1.75
140	1.73	1.73	1.73	1.73	1.73	1.75	1.78
160	1.75	1.75	1.75	1.75	1.76	1.77	1.81
180	1.78	1.78	1.78	1.78	1.78	1.79	1.83
200	1.80	1.80	1.80	1.80	1.80	1.82	1.85
250	1.85	1.85	1.85	1.85	1.85	1.86	1.90
300	1.89	1.89	1.89	1.89	1.89	1.90	1.94
350	1.93	1.93	1.93	1.93	1.93	1.94	1.98
400	1.97	1.97	1.97	1.97	1.97	1.98	2.01

Mean-hourly (τ = 3600 s)

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.77	0.79	0.80	0.81	0.82	0.83	0.85
4	0.88	0.89	0.90	0.92	0.93	0.94	0.96
6	0.94	0.95	0.96	0.98	0.99	1.00	1.03
8	0.98	0.99	1.01	1.02	1.04	1.05	1.08
10	1.01	1.03	1.04	1.06	1.07	1.08	1.11
15	1.08	1.09	1.11	1.12	1.14	1.15	1.18
20	1.13	1.13	1.15	1.17	1.18	1.20	1.23
30	1.20	1.20	1.22	1.23	1.25	1.26	1.30
40	1.25	1.25	1.26	1.28	1.30	1.31	1.35
50	1.30	1.30	1.30	1.32	1.34	1.35	1.39
60	1.33	1.33	1.33	1.35	1.37	1.38	1.42
70	1.36	1.36	1.36	1.38	1.40	1.41	1.45
80	1.39	1.39	1.39	1.40	1.42	1.44	1.47
90	1.41	1.41	1.41	1.42	1.44	1.46	1.50
100	1.44	1.44	1.44	1.44	1.46	1.48	1.52
120	1.48	1.48	1.48	1.48	1.50	1.52	1.55
140	1.51	1.51	1.51	1.51	1.53	1.55	1.59
160	1.54	1.54	1.54	1.54	1.56	1.58	1.62
180	1.57	1.57	1.57	1.57	1.58	1.60	1.64
200	1.60	1.60	1.60	1.60	1.61	1.63	1.67
250	1.65	1.65	1.65	1.65	1.66	1.68	1.72
300	1.70	1.70	1.70	1.70	1.71	1.73	1.77
350	1.75	1.75	1.75	1.75	1.75	1.77	1.82
400	1.79	1.79	1.79	1.79	1.79	1.81	1.86

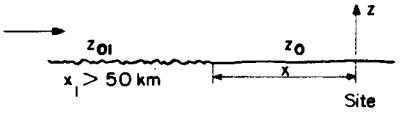


TABLE 10.28 *K*-factors for Site Roughness z_0 = 0.003 m and Upwind Roughness z_{01} = 0.3 m

τ = 1 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.23	1.26	1.30	1.34	1.38	1.41	1.48
4	1.33	1.38	1.42	1.46	1.50	1.53	1.61
6	1.40	1.44	1.49	1.53	1.57	1.60	1.68
8	1.44	1.49	1.53	1.57	1.62	1.65	1.73
10	1.47	1.52	1.57	1.61	1.65	1.69	1.77
15	1.53	1.58	1.63	1.67	1.72	1.76	1.84
20	1.57	1.62	1.67	1.72	1.76	1.81	1.89
30	1.67	1.68	1.73	1.78	1.82	1.87	1.96
40	1.75	1.75	1.77	1.81	1.86	1.91	2.00
50	1.81	1.81	1.81	1.84	1.89	1.93	2.03
60	1.86	1.86	1.86	1.86	1.91	1.96	2.05
70	1.90	1.90	1.90	1.90	1.93	1.97	2.07
80	1.93	1.93	1.93	1.93	1.94	1.99	2.09
90	1.96	1.96	1.96	1.96	1.96	2.00	2.10
100	1.99	1.99	1.99	1.99	1.99	2.01	2.11
120	2.03	2.03	2.03	2.03	2.03	2.03	2.13
140	2.06	2.06	2.06	2.06	2.06	2.06	2.15
160	2.09	2.09	2.09	2.09	2.09	2.09	2.16
180	2.12	2.12	2.12	2.12	2.12	2.12	2.17
200	2.14	2.14	2.14	2.14	2.14	2.14	2.19
250	2.19	2.19	2.19	2.19	2.19	2.19	2.21
300	2.23	2.23	2.23	2.23	2.23	2.23	2.24
350	2.26	2.26	2.26	2.26	2.26	2.26	2.27
400	2.29	2.29	2.29	2.29	2.29	2.29	2.29

τ = 3 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.17	1.21	1.25	1.28	1.32	1.35	1.42
4	1.27	1.31	1.36	1.40	1.44	1.47	1.55
6	1.33	1.38	1.42	1.46	1.50	1.54	1.62
8	1.38	1.42	1.47	1.51	1.55	1.59	1.67
10	1.41	1.45	1.50	1.54	1.59	1.63	1.71
15	1.47	1.51	1.56	1.61	1.65	1.69	1.78
20	1.51	1.55	1.61	1.65	1.70	1.74	1.83
30	1.59	1.61	1.66	1.71	1.76	1.80	1.89
40	1.67	1.67	1.70	1.75	1.80	1.84	1.93
50	1.73	1.73	1.73	1.78	1.83	1.87	1.97
60	1.77	1.77	1.77	1.80	1.85	1.89	1.99
70	1.81	1.81	1.81	1.81	1.87	1.91	2.01
80	1.84	1.84	1.84	1.84	1.88	1.93	2.03
90	1.87	1.87	1.87	1.87	1.89	1.94	2.04
100	1.90	1.90	1.90	1.90	1.91	1.95	2.05
120	1.94	1.94	1.94	1.94	1.94	1.97	2.07
140	1.98	1.98	1.98	1.98	1.98	1.99	2.09
160	2.01	2.01	2.01	2.01	2.01	2.01	2.11
180	2.03	2.03	2.03	2.03	2.03	2.03	2.12
200	2.06	2.06	2.06	2.06	2.06	2.06	2.13
250	2.11	2.11	2.11	2.11	2.11	2.11	2.17
300	2.15	2.15	2.15	2.15	2.15	2.15	2.20
350	2.19	2.19	2.19	2.19	2.19	2.19	2.22
400	2.22	2.22	2.22	2.22	2.22	2.22	2.25

τ = 10 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.07	1.11	1.15	1.19	1.22	1.26	1.33
4	1.17	1.21	1.26	1.30	1.34	1.37	1.45
6	1.23	1.27	1.32	1.36	1.40	1.44	1.52
8	1.27	1.31	1.36	1.40	1.45	1.49	1.57
10	1.30	1.34	1.39	1.44	1.48	1.52	1.61
15	1.35	1.40	1.45	1.50	1.55	1.59	1.68
20	1.39	1.44	1.50	1.54	1.59	1.63	1.72
30	1.46	1.50	1.55	1.60	1.65	1.69	1.79
40	1.53	1.53	1.59	1.64	1.69	1.73	1.83
50	1.59	1.59	1.62	1.67	1.72	1.77	1.86
60	1.63	1.63	1.64	1.69	1.74	1.79	1.89
70	1.67	1.67	1.67	1.71	1.76	1.81	1.91
80	1.71	1.71	1.71	1.72	1.78	1.83	1.93
90	1.73	1.73	1.73	1.74	1.79	1.84	1.94
100	1.76	1.76	1.76	1.76	1.81	1.85	1.96
120	1.80	1.80	1.80	1.80	1.83	1.88	1.98
140	1.84	1.84	1.84	1.84	1.85	1.90	2.00
160	1.87	1.87	1.87	1.87	1.87	1.91	2.02
180	1.90	1.90	1.90	1.90	1.90	1.93	2.04
200	1.92	1.92	1.92	1.92	1.92	1.94	2.05
250	1.98	1.98	1.98	1.98	1.98	1.98	2.09
300	2.02	2.02	2.02	2.02	2.02	2.02	2.12
350	2.06	2.06	2.06	2.06	2.06	2.06	2.15
400	2.10	2.10	2.10	2.10	2.10	2.10	2.18

τ = 30 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.95	0.99	1.04	1.07	1.11	1.15	1.22
4	1.04	1.09	1.13	1.18	1.22	1.26	1.34
6	1.10	1.14	1.19	1.24	1.28	1.32	1.41
8	1.13	1.18	1.23	1.28	1.32	1.37	1.45
10	1.16	1.21	1.26	1.31	1.36	1.40	1.49
15	1.21	1.27	1.32	1.37	1.42	1.46	1.56
20	1.25	1.30	1.36	1.41	1.46	1.51	1.60
30	1.31	1.36	1.42	1.47	1.52	1.57	1.67
40	1.38	1.39	1.45	1.51	1.56	1.61	1.71
50	1.43	1.43	1.48	1.54	1.59	1.64	1.75
60	1.48	1.48	1.50	1.56	1.62	1.67	1.77
70	1.51	1.51	1.52	1.58	1.64	1.69	1.80
80	1.54	1.54	1.54	1.60	1.66	1.71	1.82
90	1.57	1.57	1.57	1.61	1.67	1.72	1.83
100	1.60	1.60	1.60	1.63	1.68	1.74	1.85
120	1.64	1.64	1.64	1.65	1.71	1.76	1.88
140	1.68	1.68	1.68	1.68	1.73	1.78	1.90
160	1.71	1.71	1.71	1.71	1.75	1.80	1.92
180	1.74	1.74	1.74	1.74	1.77	1.82	1.94
200	1.77	1.77	1.77	1.77	1.78	1.84	1.96
250	1.82	1.82	1.82	1.82	1.82	1.88	2.00
300	1.87	1.87	1.87	1.87	1.87	1.91	2.04
350	1.91	1.91	1.91	1.91	1.91	1.95	2.07
400	1.95	1.95	1.95	1.95	1.95	1.98	2.10

τ = 60 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.87	0.91	0.96	1.00	1.04	1.07	1.15
4	0.96	1.00	1.05	1.10	1.14	1.18	1.27
6	1.01	1.06	1.11	1.15	1.20	1.24	1.33
8	1.04	1.09	1.15	1.19	1.24	1.29	1.38
10	1.07	1.12	1.18	1.23	1.28	1.32	1.41
15	1.12	1.17	1.23	1.28	1.34	1.38	1.48
20	1.15	1.21	1.27	1.32	1.38	1.42	1.53
30	1.21	1.26	1.32	1.38	1.44	1.48	1.59
40	1.28	1.30	1.36	1.42	1.48	1.53	1.64
50	1.33	1.33	1.39	1.45	1.51	1.56	1.67
60	1.37	1.37	1.41	1.47	1.53	1.59	1.70
70	1.41	1.41	1.43	1.49	1.55	1.61	1.72
80	1.44	1.44	1.45	1.51	1.57	1.63	1.74
90	1.47	1.47	1.47	1.53	1.59	1.64	1.76
100	1.49	1.49	1.49	1.54	1.60	1.66	1.78
120	1.54	1.54	1.54	1.57	1.63	1.69	1.81
140	1.58	1.58	1.58	1.59	1.65	1.71	1.83
160	1.61	1.61	1.61	1.61	1.67	1.73	1.86
180	1.64	1.64	1.64	1.64	1.69	1.75	1.88
200	1.67	1.67	1.67	1.67	1.71	1.77	1.90
250	1.73	1.73	1.73	1.73	1.75	1.81	1.94
300	1.78	1.78	1.78	1.78	1.79	1.85	1.98
350	1.82	1.82	1.82	1.82	1.82	1.88	2.02
400	1.86	1.86	1.86	1.86	1.86	1.92	2.05

Mean-hourly (τ = 3600 s)

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.66	0.71	0.76	0.80	0.85	0.89	0.97
4	0.73	0.78	0.84	0.89	0.94	0.98	1.08
6	0.77	0.83	0.88	0.94	0.99	1.04	1.14
8	0.80	0.86	0.92	0.97	1.03	1.08	1.18
10	0.82	0.88	0.94	1.00	1.06	1.11	1.21
15	0.86	0.93	0.99	1.05	1.11	1.16	1.28
20	0.89	0.96	1.03	1.09	1.15	1.20	1.32
30	0.95	1.01	1.08	1.14	1.21	1.26	1.39
40	1.01	1.04	1.11	1.18	1.25	1.31	1.43
50	1.06	1.07	1.14	1.21	1.28	1.34	1.47
60	1.10	1.10	1.17	1.24	1.31	1.37	1.50
70	1.14	1.14	1.19	1.26	1.33	1.39	1.53
80	1.17	1.17	1.21	1.28	1.35	1.41	1.55
90	1.20	1.20	1.22	1.30	1.37	1.43	1.57
100	1.22	1.22	1.24	1.31	1.39	1.45	1.59
120	1.27	1.27	1.27	1.34	1.42	1.48	1.63
140	1.31	1.31	1.31	1.37	1.44	1.51	1.66
160	1.34	1.34	1.34	1.39	1.47	1.54	1.69
180	1.37	1.37	1.37	1.41	1.49	1.56	1.71
200	1.40	1.40	1.40	1.43	1.51	1.58	1.74
250	1.47	1.47	1.47	1.47	1.56	1.63	1.79
300	1.52	1.52	1.52	1.52	1.60	1.67	1.84
350	1.57	1.57	1.57	1.57	1.64	1.71	1.88
400	1.62	1.62	1.62	1.62	1.67	1.75	1.92

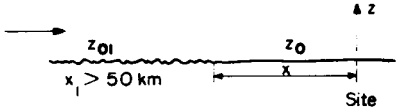


TABLE 10.29 *K*-factors for Site Roughness z_0 = 0.003 m and Upwind Roughness z_{01} = 0.03 m

τ = 1 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.35	1.37	1.39	1.41	1.43	1.44	1.48
4	1.47	1.49	1.51	1.53	1.55	1.57	1.61
6	1.54	1.56	1.58	1.60	1.62	1.64	1.68
8	1.59	1.61	1.63	1.65	1.67	1.69	1.73
10	1.62	1.65	1.67	1.69	1.71	1.73	1.77
15	1.70	1.71	1.74	1.76	1.78	1.80	1.84
20	1.76	1.76	1.78	1.81	1.83	1.85	1.89
30	1.85	1.85	1.85	1.87	1.89	1.91	1.96
40	1.90	1.90	1.90	1.91	1.93	1.95	2.00
50	1.94	1.94	1.94	1.94	1.96	1.98	2.03
60	1.98	1.98	1.98	1.98	1.98	2.00	2.05
70	2.00	2.00	2.00	2.00	2.00	2.02	2.07
80	2.03	2.03	2.03	2.03	2.03	2.04	2.09
90	2.05	2.05	2.05	2.05	2.05	2.05	2.10
100	2.06	2.06	2.06	2.06	2.06	2.06	2.11
120	2.09	2.09	2.09	2.09	2.09	2.09	2.13
140	2.11	2.11	2.11	2.11	2.11	2.11	2.15
160	2.13	2.13	2.13	2.13	2.13	2.13	2.16
180	2.15	2.15	2.15	2.15	2.15	2.15	2.17
200	2.17	2.17	2.17	2.17	2.17	2.17	2.19
250	2.20	2.20	2.20	2.20	2.20	2.20	2.21
300	2.23	2.23	2.23	2.23	2.23	2.23	2.24
350	2.26	2.26	2.26	2.26	2.26	2.26	2.27
400	2.29	2.29	2.29	2.29	2.29	2.29	2.29

τ = 3 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.29	1.31	1.33	1.35	1.37	1.38	1.42
4	1.41	1.43	1.45	1.47	1.49	1.51	1.55
6	1.48	1.50	1.52	1.54	1.56	1.58	1.62
8	1.52	1.55	1.57	1.59	1.61	1.63	1.67
10	1.56	1.58	1.61	1.63	1.65	1.67	1.71
15	1.63	1.65	1.67	1.69	1.72	1.74	1.78
20	1.69	1.69	1.72	1.74	1.76	1.78	1.83
30	1.77	1.77	1.78	1.80	1.83	1.85	1.89
40	1.83	1.83	1.83	1.84	1.87	1.89	1.93
50	1.87	1.87	1.87	1.87	1.90	1.92	1.97
60	1.90	1.90	1.90	1.90	1.92	1.94	1.99
70	1.93	1.93	1.93	1.93	1.94	1.96	2.01
80	1.95	1.95	1.95	1.95	1.95	1.98	2.03
90	1.97	1.97	1.97	1.97	1.97	1.99	2.04
100	1.99	1.99	1.99	1.99	1.99	2.00	2.05
120	2.02	2.02	2.02	2.02	2.02	2.02	2.07
140	2.05	2.05	2.05	2.05	2.05	2.05	2.09
160	2.07	2.07	2.07	2.07	2.07	2.07	2.11
180	2.09	2.09	2.09	2.09	2.09	2.09	2.12
200	2.10	2.10	2.10	2.10	2.10	2.10	2.13
250	2.14	2.14	2.14	2.14	2.14	2.14	2.17
300	2.17	2.17	2.17	2.17	2.17	2.17	2.20
350	2.20	2.20	2.20	2.20	2.20	2.20	2.22
400	2.23	2.23	2.23	2.23	2.23	2.23	2.25

τ = 10 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.20	1.22	1.24	1.26	1.28	1.29	1.33
4	1.31	1.33	1.35	1.37	1.39	1.41	1.45
6	1.37	1.40	1.42	1.44	1.46	1.48	1.52
8	1.42	1.44	1.47	1.49	1.51	1.53	1.57
10	1.45	1.48	1.50	1.52	1.55	1.57	1.61
15	1.52	1.54	1.57	1.59	1.61	1.63	1.68
20	1.57	1.58	1.61	1.63	1.66	1.68	1.72
30	1.65	1.65	1.67	1.69	1.72	1.74	1.79
40	1.71	1.71	1.71	1.73	1.76	1.78	1.83
50	1.75	1.75	1.75	1.77	1.79	1.81	1.86
60	1.79	1.79	1.79	1.79	1.82	1.84	1.89
70	1.81	1.81	1.81	1.81	1.84	1.86	1.91
80	1.84	1.84	1.84	1.84	1.85	1.88	1.93
90	1.86	1.86	1.86	1.86	1.87	1.89	1.94
100	1.88	1.88	1.88	1.88	1.88	1.91	1.96
120	1.91	1.91	1.91	1.91	1.91	1.93	1.98
140	1.94	1.94	1.94	1.94	1.94	1.95	2.00
160	1.96	1.96	1.96	1.96	1.96	1.97	2.02
180	1.98	1.98	1.98	1.98	1.98	1.98	2.04
200	2.00	2.00	2.00	2.00	2.00	2.00	2.05
250	2.04	2.04	2.04	2.04	2.04	2.04	2.09
300	2.08	2.08	2.08	2.08	2.08	2.08	2.12
350	2.11	2.11	2.11	2.11	2.11	2.11	2.15
400	2.14	2.14	2.14	2.14	2.14	2.14	2.18

τ = 30 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.09	1.11	1.13	1.15	1.17	1.18	1.22
4	1.19	1.21	1.24	1.26	1.28	1.30	1.34
6	1.25	1.27	1.30	1.32	1.34	1.36	1.41
8	1.29	1.32	1.34	1.37	1.39	1.41	1.45
10	1.33	1.35	1.38	1.40	1.42	1.45	1.49
15	1.39	1.41	1.44	1.46	1.49	1.51	1.56
20	1.44	1.45	1.48	1.51	1.53	1.56	1.60
30	1.52	1.52	1.54	1.57	1.59	1.62	1.67
40	1.57	1.57	1.58	1.61	1.64	1.66	1.71
50	1.62	1.62	1.62	1.64	1.67	1.69	1.75
60	1.65	1.65	1.65	1.67	1.69	1.72	1.77
70	1.68	1.68	1.68	1.69	1.72	1.74	1.80
80	1.70	1.70	1.70	1.71	1.74	1.76	1.82
90	1.73	1.73	1.73	1.73	1.75	1.78	1.83
100	1.75	1.75	1.75	1.75	1.77	1.79	1.85
120	1.78	1.78	1.78	1.78	1.79	1.82	1.88
140	1.81	1.81	1.81	1.81	1.82	1.84	1.90
160	1.83	1.83	1.83	1.83	1.84	1.86	1.92
180	1.86	1.86	1.86	1.86	1.86	1.88	1.94
200	1.88	1.88	1.88	1.88	1.88	1.90	1.96
250	1.92	1.92	1.92	1.92	1.92	1.94	2.00
300	1.97	1.97	1.97	1.97	1.97	1.98	2.04
350	2.00	2.00	2.00	2.00	2.00	2.01	2.07
400	2.04	2.04	2.04	2.04	2.04	2.04	2.10

τ = 60 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.01	1.03	1.06	1.08	1.10	1.11	1.15
4	1.11	1.13	1.16	1.18	1.20	1.22	1.27
6	1.17	1.19	1.22	1.24	1.27	1.29	1.33
8	1.21	1.24	1.26	1.29	1.31	1.33	1.38
10	1.24	1.27	1.30	1.32	1.35	1.37	1.41
15	1.30	1.33	1.36	1.38	1.41	1.43	1.48
20	1.35	1.37	1.40	1.42	1.45	1.48	1.53
30	1.43	1.43	1.46	1.48	1.51	1.54	1.59
40	1.49	1.49	1.50	1.53	1.56	1.58	1.64
50	1.53	1.53	1.53	1.56	1.59	1.61	1.67
60	1.56	1.56	1.56	1.59	1.62	1.64	1.70
70	1.59	1.59	1.59	1.61	1.64	1.67	1.72
80	1.62	1.62	1.62	1.63	1.66	1.69	1.74
90	1.64	1.64	1.64	1.64	1.68	1.70	1.76
100	1.66	1.66	1.66	1.66	1.69	1.72	1.78
120	1.70	1.70	1.70	1.70	1.72	1.75	1.81
140	1.73	1.73	1.73	1.73	1.74	1.77	1.83
160	1.75	1.75	1.75	1.75	1.77	1.79	1.86
180	1.78	1.78	1.78	1.78	1.79	1.82	1.88
200	1.80	1.80	1.80	1.80	1.80	1.83	1.90
250	1.85	1.85	1.85	1.85	1.85	1.88	1.94
300	1.89	1.89	1.89	1.89	1.89	1.92	1.98
350	1.93	1.93	1.93	1.93	1.93	1.95	2.02
400	1.97	1.97	1.97	1.97	1.97	1.99	2.05

Mean-hourly (τ = 3600 s)

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.81	0.84	0.86	0.89	0.91	0.93	0.97
4	0.90	0.93	0.96	0.98	1.01	1.03	1.08
6	0.95	0.98	1.01	1.04	1.06	1.09	1.14
8	0.99	1.02	1.05	1.08	1.10	1.13	1.18
10	1.02	1.05	1.08	1.11	1.14	1.16	1.21
15	1.08	1.10	1.14	1.16	1.19	1.22	1.28
20	1.13	1.14	1.18	1.21	1.24	1.26	1.32
30	1.20	1.20	1.23	1.26	1.30	1.33	1.39
40	1.25	1.25	1.27	1.31	1.34	1.37	1.43
50	1.30	1.30	1.31	1.34	1.38	1.41	1.47
60	1.33	1.33	1.34	1.37	1.40	1.44	1.50
70	1.36	1.36	1.36	1.39	1.43	1.46	1.53
80	1.39	1.39	1.39	1.42	1.45	1.48	1.55
90	1.41	1.41	1.41	1.43	1.47	1.50	1.57
100	1.44	1.44	1.44	1.45	1.49	1.52	1.59
120	1.48	1.48	1.48	1.48	1.52	1.56	1.63
140	1.51	1.51	1.51	1.51	1.55	1.59	1.66
160	1.54	1.54	1.54	1.54	1.58	1.61	1.69
180	1.57	1.57	1.57	1.57	1.60	1.64	1.71
200	1.60	1.60	1.60	1.60	1.62	1.66	1.74
250	1.65	1.65	1.65	1.65	1.67	1.71	1.79
300	1.70	1.70	1.70	1.70	1.72	1.76	1.84
350	1.75	1.75	1.75	1.75	1.76	1.80	1.88
400	1.79	1.79	1.79	1.79	1.80	1.83	1.92

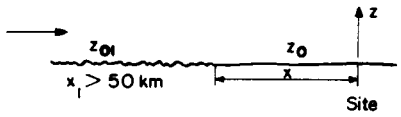


TABLE 10.30 *K*-factors for Site Roughness z_0 = 0.001 m and Upwind Roughness z_{01} = 0.1 m

τ = 1 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.33	1.37	1.40	1.43	1.47	1.50	1.56
4	1.43	1.47	1.51	1.55	1.58	1.61	1.68
6	1.49	1.53	1.57	1.61	1.65	1.68	1.75
8	1.53	1.57	1.62	1.65	1.69	1.73	1.80
10	1.57	1.61	1.65	1.69	1.73	1.76	1.83
15	1.62	1.66	1.71	1.75	1.79	1.82	1.90
20	1.67	1.70	1.75	1.79	1.83	1.86	1.94
30	1.77	1.77	1.80	1.84	1.88	1.92	2.00
40	1.83	1.83	1.83	1.87	1.91	1.95	2.03
50	1.88	1.88	1.88	1.89	1.94	1.98	2.06
60	1.92	1.92	1.92	1.92	1.96	1.99	2.08
70	1.96	1.96	1.96	1.96	1.97	2.01	2.09
80	1.98	1.98	1.98	1.98	1.98	2.02	2.11
90	2.01	2.01	2.01	2.01	2.01	2.03	2.12
100	2.03	2.03	2.03	2.03	2.03	2.04	2.13
120	2.06	2.06	2.06	2.06	2.06	2.06	2.14
140	2.09	2.09	2.09	2.09	2.09	2.09	2.16
160	2.12	2.12	2.12	2.12	2.12	2.12	2.17
180	2.14	2.14	2.14	2.14	2.14	2.14	2.18
200	2.16	2.16	2.16	2.16	2.16	2.16	2.19
250	2.20	2.20	2.20	2.20	2.20	2.20	2.22
300	2.23	2.23	2.23	2.23	2.23	2.23	2.25
350	2.26	2.26	2.26	2.26	2.26	2.26	2.27
400	2.29	2.29	2.29	2.29	2.29	2.29	2.30

τ = 3 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.27	1.31	1.35	1.38	1.41	1.44	1.50
4	1.37	1.41	1.45	1.49	1.52	1.55	1.62
6	1.43	1.47	1.51	1.55	1.59	1.62	1.69
8	1.47	1.51	1.55	1.59	1.63	1.66	1.74
10	1.50	1.54	1.59	1.62	1.66	1.70	1.77
15	1.56	1.60	1.64	1.68	1.72	1.76	1.84
20	1.59	1.64	1.68	1.72	1.76	1.80	1.88
30	1.69	1.69	1.73	1.77	1.82	1.86	1.94
40	1.75	1.75	1.77	1.81	1.85	1.89	1.97
50	1.80	1.80	1.80	1.83	1.88	1.92	2.00
60	1.84	1.84	1.84	1.85	1.90	1.94	2.02
70	1.88	1.88	1.88	1.88	1.91	1.95	2.04
80	1.90	1.90	1.90	1.90	1.92	1.96	2.05
90	1.93	1.93	1.93	1.93	1.94	1.98	2.06
100	1.95	1.95	1.95	1.95	1.95	1.99	2.07
120	1.98	1.98	1.98	1.98	1.98	2.00	2.09
140	2.01	2.01	2.01	2.01	2.01	2.02	2.11
160	2.04	2.04	2.04	2.04	2.04	2.04	2.12
180	2.06	2.06	2.06	2.06	2.06	2.06	2.13
200	2.08	2.08	2.08	2.08	2.08	2.08	2.15
250	2.12	2.12	2.12	2.12	2.12	2.12	2.18
300	2.16	2.16	2.16	2.16	2.16	2.16	2.21
350	2.19	2.19	2.19	2.19	2.19	2.19	2.24
400	2.22	2.22	2.22	2.22	2.22	2.22	2.26

τ = 10 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.18	1.21	1.25	1.28	1.32	1.35	1.41
4	1.27	1.31	1.35	1.39	1.43	1.46	1.53
6	1.33	1.37	1.41	1.45	1.49	1.52	1.59
8	1.37	1.41	1.45	1.49	1.53	1.56	1.64
10	1.39	1.44	1.48	1.52	1.56	1.60	1.68
15	1.45	1.49	1.54	1.58	1.62	1.66	1.74
20	1.48	1.53	1.58	1.62	1.66	1.70	1.78
30	1.56	1.58	1.63	1.67	1.71	1.75	1.84
40	1.63	1.63	1.66	1.70	1.75	1.79	1.88
50	1.68	1.68	1.69	1.73	1.78	1.82	1.91
60	1.72	1.72	1.72	1.75	1.80	1.84	1.93
70	1.75	1.75	1.75	1.77	1.82	1.86	1.95
80	1.78	1.78	1.78	1.78	1.83	1.87	1.96
90	1.80	1.80	1.80	1.80	1.84	1.88	1.98
100	1.82	1.82	1.82	1.82	1.85	1.90	1.99
120	1.86	1.86	1.86	1.86	1.87	1.92	2.01
140	1.89	1.89	1.89	1.89	1.89	1.93	2.03
160	1.92	1.92	1.92	1.92	1.92	1.95	2.04
180	1.94	1.94	1.94	1.94	1.94	1.97	2.06
200	1.96	1.96	1.96	1.96	1.96	1.98	2.07
250	2.01	2.01	2.01	2.01	2.01	2.01	2.11
300	2.05	2.05	2.05	2.05	2.05	2.05	2.14
350	2.09	2.09	2.09	2.09	2.09	2.09	2.17
400	2.12	2.12	2.12	2.12	2.12	2.12	2.20

τ = 30 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.06	1.10	1.14	1.17	1.21	1.24	1.31
4	1.15	1.19	1.23	1.27	1.31	1.35	1.42
6	1.20	1.24	1.29	1.33	1.37	1.41	1.48
8	1.24	1.28	1.33	1.37	1.41	1.45	1.53
10	1.26	1.31	1.36	1.40	1.44	1.48	1.56
15	1.31	1.36	1.41	1.45	1.50	1.54	1.62
20	1.35	1.40	1.45	1.49	1.54	1.58	1.67
30	1.42	1.45	1.50	1.54	1.59	1.63	1.72
40	1.48	1.48	1.53	1.58	1.63	1.67	1.76
50	1.53	1.53	1.56	1.61	1.66	1.70	1.80
60	1.57	1.57	1.58	1.63	1.68	1.72	1.82
70	1.60	1.60	1.60	1.65	1.70	1.74	1.84
80	1.63	1.63	1.63	1.66	1.72	1.76	1.86
90	1.65	1.65	1.65	1.68	1.73	1.78	1.87
100	1.68	1.68	1.68	1.69	1.74	1.79	1.89
120	1.71	1.71	1.71	1.71	1.77	1.81	1.91
140	1.75	1.75	1.75	1.75	1.79	1.83	1.93
160	1.78	1.78	1.78	1.78	1.80	1.85	1.95
180	1.80	1.80	1.80	1.80	1.82	1.87	1.97
200	1.82	1.82	1.82	1.82	1.84	1.89	1.99
250	1.88	1.88	1.88	1.88	1.88	1.92	2.03
300	1.92	1.92	1.92	1.92	1.92	1.96	2.07
350	1.96	1.96	1.96	1.96	1.96	1.99	2.10
400	2.00	2.00	2.00	2.00	2.00	2.02	2.13

τ = 60 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.98	1.02	1.06	1.10	1.14	1.17	1.24
4	1.07	1.11	1.15	1.19	1.24	1.27	1.35
6	1.11	1.16	1.21	1.25	1.29	1.33	1.41
8	1.15	1.20	1.24	1.29	1.33	1.37	1.46
10	1.17	1.22	1.27	1.32	1.36	1.40	1.49
15	1.22	1.27	1.33	1.37	1.42	1.46	1.55
20	1.26	1.31	1.36	1.41	1.46	1.50	1.59
30	1.33	1.36	1.41	1.46	1.51	1.56	1.65
40	1.39	1.39	1.45	1.50	1.55	1.60	1.69
50	1.43	1.43	1.47	1.53	1.58	1.62	1.72
60	1.47	1.47	1.50	1.55	1.60	1.65	1.75
70	1.51	1.51	1.52	1.57	1.62	1.67	1.77
80	1.53	1.53	1.53	1.58	1.64	1.69	1.79
90	1.56	1.56	1.56	1.60	1.66	1.70	1.81
100	1.58	1.58	1.58	1.61	1.67	1.72	1.82
120	1.62	1.62	1.62	1.64	1.69	1.74	1.85
140	1.65	1.65	1.65	1.66	1.72	1.77	1.88
160	1.68	1.68	1.68	1.68	1.74	1.79	1.90
180	1.71	1.71	1.71	1.71	1.75	1.81	1.92
200	1.74	1.74	1.74	1.74	1.77	1.82	1.94
250	1.79	1.79	1.79	1.79	1.81	1.86	1.98
300	1.84	1.84	1.84	1.84	1.85	1.90	2.02
350	1.88	1.88	1.88	1.88	1.88	1.93	2.05
400	1.92	1.92	1.92	1.92	1.92	1.97	2.09

Mean-hourly (τ = 3600 s)

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.77	0.81	0.86	0.90	0.95	0.99	1.07
4	0.84	0.89	0.94	0.99	1.03	1.08	1.17
6	0.88	0.93	0.99	1.04	1.09	1.13	1.22
8	0.91	0.96	1.02	1.07	1.12	1.17	1.26
10	0.93	0.99	1.05	1.10	1.15	1.20	1.30
15	0.98	1.03	1.10	1.15	1.20	1.25	1.36
20	1.01	1.07	1.13	1.18	1.24	1.29	1.40
30	1.08	1.11	1.18	1.24	1.29	1.35	1.46
40	1.14	1.15	1.21	1.27	1.33	1.39	1.50
50	1.18	1.18	1.24	1.30	1.37	1.42	1.54
60	1.22	1.22	1.27	1.33	1.39	1.45	1.57
70	1.25	1.25	1.29	1.35	1.41	1.47	1.59
80	1.28	1.28	1.31	1.37	1.43	1.49	1.62
90	1.31	1.31	1.32	1.39	1.45	1.51	1.64
100	1.33	1.33	1.34	1.40	1.47	1.53	1.66
120	1.37	1.37	1.37	1.43	1.50	1.56	1.69
140	1.41	1.41	1.41	1.46	1.53	1.59	1.72
160	1.44	1.44	1.44	1.48	1.55	1.61	1.75
180	1.47	1.47	1.47	1.50	1.57	1.63	1.77
200	1.50	1.50	1.50	1.52	1.59	1.65	1.79
250	1.56	1.56	1.56	1.56	1.64	1.70	1.84
300	1.62	1.62	1.62	1.62	1.68	1.74	1.89
350	1.67	1.67	1.67	1.67	1.71	1.78	1.93
400	1.71	1.71	1.71	1.71	1.75	1.82	1.97

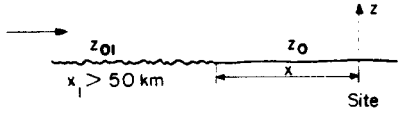


TABLE 10.31 *K*-factors for Site Roughness z_0 = 0.001 m and Upwind Roughness z_{01} = 0.03 m

τ = 1 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.39	1.42	1.44	1.47	1.49	1.51	1.56
4	1.50	1.53	1.56	1.58	1.61	1.63	1.68
6	1.56	1.59	1.62	1.65	1.67	1.70	1.75
8	1.60	1.63	1.66	1.69	1.72	1.74	1.80
10	1.64	1.67	1.70	1.73	1.75	1.78	1.83
15	1.70	1.72	1.76	1.79	1.82	1.84	1.90
20	1.76	1.76	1.80	1.83	1.86	1.88	1.94
30	1.85	1.85	1.85	1.88	1.91	1.94	2.00
40	1.90	1.90	1.90	1.91	1.95	1.97	2.03
50	1.94	1.94	1.94	1.94	1.97	2.00	2.06
60	1.98	1.98	1.98	1.98	1.99	2.02	2.08
70	2.00	2.00	2.00	2.00	2.00	2.03	2.09
80	2.03	2.03	2.03	2.03	2.03	2.04	2.11
90	2.05	2.05	2.05	2.05	2.05	2.05	2.12
100	2.06	2.06	2.06	2.06	2.06	2.06	2.13
120	2.09	2.09	2.09	2.09	2.09	2.09	2.14
140	2.11	2.11	2.11	2.11	2.11	2.11	2.16
160	2.13	2.13	2.13	2.13	2.13	2.13	2.17
180	2.15	2.15	2.15	2.15	2.15	2.15	2.18
200	2.17	2.17	2.17	2.17	2.17	2.17	2.19
250	2.20	2.20	2.20	2.20	2.20	2.20	2.22
300	2.23	2.23	2.23	2.23	2.23	2.23	2.25
350	2.26	2.26	2.26	2.26	2.26	2.26	2.27
400	2.29	2.29	2.29	2.29	2.29	2.29	2.30

τ = 3 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.33	1.36	1.39	1.41	1.44	1.46	1.50
4	1.44	1.47	1.50	1.52	1.55	1.57	1.62
6	1.50	1.53	1.56	1.59	1.61	1.64	1.69
8	1.54	1.57	1.60	1.63	1.66	1.68	1.74
10	1.57	1.60	1.64	1.66	1.69	1.72	1.77
15	1.63	1.66	1.69	1.72	1.75	1.78	1.84
20	1.69	1.70	1.73	1.76	1.79	1.82	1.88
30	1.77	1.77	1.79	1.82	1.85	1.88	1.94
40	1.83	1.83	1.83	1.85	1.88	1.91	1.97
50	1.87	1.87	1.87	1.88	1.91	1.94	2.00
60	1.90	1.90	1.90	1.90	1.93	1.96	2.02
70	1.93	1.93	1.93	1.93	1.94	1.97	2.04
80	1.95	1.95	1.95	1.95	1.96	1.99	2.05
90	1.97	1.97	1.97	1.97	1.97	2.00	2.06
100	1.99	1.99	1.99	1.99	1.99	2.01	2.07
120	2.02	2.02	2.02	2.02	2.02	2.03	2.09
140	2.05	2.05	2.05	2.05	2.05	2.05	2.11
160	2.07	2.07	2.07	2.07	2.07	2.07	2.12
180	2.09	2.09	2.09	2.09	2.09	2.09	2.13
200	2.10	2.10	2.10	2.10	2.10	2.10	2.15
250	2.14	2.14	2.14	2.14	2.14	2.14	2.18
300	2.17	2.17	2.17	2.17	2.17	2.17	2.21
350	2.20	2.20	2.20	2.20	2.20	2.20	2.24
400	2.23	2.23	2.23	2.23	2.23	2.23	2.26

τ = 10 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.24	1.27	1.29	1.32	1.34	1.37	1.41
4	1.34	1.37	1.40	1.42	1.45	1.48	1.53
6	1.40	1.43	1.46	1.49	1.51	1.54	1.59
8	1.44	1.47	1.50	1.53	1.56	1.58	1.64
10	1.47	1.50	1.53	1.56	1.59	1.62	1.68
15	1.52	1.56	1.59	1.62	1.65	1.68	1.74
20	1.57	1.59	1.63	1.66	1.69	1.72	1.78
30	1.65	1.65	1.68	1.71	1.75	1.78	1.84
40	1.71	1.71	1.72	1.75	1.78	1.81	1.88
50	1.75	1.75	1.75	1.78	1.81	1.84	1.91
60	1.79	1.79	1.79	1.80	1.83	1.86	1.93
70	1.81	1.81	1.81	1.81	1.85	1.88	1.95
80	1.84	1.84	1.84	1.84	1.86	1.89	1.96
90	1.86	1.86	1.86	1.86	1.88	1.91	1.98
100	1.88	1.88	1.88	1.88	1.89	1.92	1.99
120	1.91	1.91	1.91	1.91	1.91	1.94	2.01
140	1.94	1.94	1.94	1.94	1.94	1.96	2.03
160	1.96	1.96	1.96	1.96	1.96	1.97	2.04
180	1.98	1.98	1.98	1.98	1.98	1.99	2.06
200	2.00	2.00	2.00	2.00	2.00	2.00	2.07
250	2.04	2.04	2.04	2.04	2.04	2.04	2.11
300	2.08	2.08	2.08	2.08	2.08	2.08	2.14
350	2.11	2.11	2.11	2.11	2.11	2.11	2.17
400	2.14	2.14	2.14	2.14	2.14	2.14	2.20

τ = 30 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.13	1.15	1.18	1.21	1.24	1.26	1.31
4	1.22	1.25	1.28	1.31	1.34	1.36	1.42
6	1.27	1.31	1.34	1.37	1.40	1.43	1.48
8	1.31	1.35	1.38	1.41	1.44	1.47	1.53
10	1.34	1.38	1.41	1.44	1.47	1.50	1.56
15	1.39	1.43	1.47	1.50	1.53	1.56	1.62
20	1.44	1.47	1.50	1.54	1.57	1.60	1.67
30	1.52	1.52	1.56	1.59	1.63	1.66	1.72
40	1.57	1.57	1.59	1.63	1.67	1.70	1.76
50	1.62	1.62	1.62	1.66	1.69	1.73	1.80
60	1.65	1.65	1.65	1.68	1.72	1.75	1.82
70	1.68	1.68	1.68	1.70	1.74	1.77	1.84
80	1.70	1.70	1.70	1.71	1.75	1.79	1.86
90	1.73	1.73	1.73	1.73	1.77	1.80	1.87
100	1.75	1.75	1.75	1.75	1.78	1.81	1.89
120	1.78	1.78	1.78	1.78	1.80	1.84	1.91
140	1.81	1.81	1.81	1.81	1.83	1.86	1.93
160	1.83	1.83	1.83	1.83	1.84	1.88	1.95
180	1.86	1.86	1.86	1.86	1.86	1.90	1.97
200	1.88	1.88	1.88	1.88	1.88	1.91	1.99
250	1.92	1.92	1.92	1.92	1.92	1.95	2.03
300	1.97	1.97	1.97	1.97	1.97	1.99	2.07
350	2.00	2.00	2.00	2.00	2.00	2.02	2.10
400	2.04	2.04	2.04	2.04	2.04	2.05	2.13

τ = 60 s

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	1.05	1.08	1.11	1.14	1.17	1.19	1.24
4	1.14	1.17	1.21	1.23	1.27	1.29	1.35
6	1.19	1.23	1.26	1.29	1.32	1.35	1.41
8	1.23	1.26	1.30	1.33	1.36	1.39	1.46
10	1.26	1.29	1.33	1.36	1.40	1.43	1.49
15	1.31	1.35	1.38	1.42	1.45	1.48	1.55
20	1.35	1.38	1.42	1.46	1.49	1.52	1.59
30	1.43	1.43	1.47	1.51	1.55	1.58	1.65
40	1.49	1.49	1.51	1.55	1.59	1.62	1.69
50	1.53	1.53	1.54	1.58	1.62	1.65	1.72
60	1.56	1.56	1.56	1.60	1.64	1.68	1.75
70	1.59	1.59	1.59	1.62	1.66	1.70	1.77
80	1.62	1.62	1.62	1.64	1.68	1.72	1.79
90	1.64	1.64	1.64	1.65	1.70	1.73	1.81
100	1.66	1.66	1.66	1.67	1.71	1.75	1.82
120	1.70	1.70	1.70	1.70	1.74	1.77	1.85
140	1.73	1.73	1.73	1.73	1.76	1.80	1.88
160	1.75	1.75	1.75	1.75	1.78	1.82	1.90
180	1.78	1.78	1.78	1.78	1.80	1.84	1.92
200	1.80	1.80	1.80	1.80	1.81	1.85	1.94
250	1.85	1.85	1.85	1.85	1.85	1.89	1.98
300	1.89	1.89	1.89	1.89	1.89	1.93	2.02
350	1.93	1.93	1.93	1.93	1.93	1.97	2.05
400	1.97	1.97	1.97	1.97	1.97	2.00	2.09

Mean-hourly (τ = 3600 s)

x(km) / z(m)	0.1	0.3	1	3	10	30	>600
2	0.85	0.88	0.92	0.95	0.98	1.01	1.07
4	0.93	0.96	1.00	1.03	1.07	1.10	1.17
6	0.97	1.01	1.05	1.09	1.12	1.15	1.22
8	1.00	1.04	1.09	1.12	1.16	1.19	1.26
10	1.03	1.07	1.11	1.15	1.19	1.22	1.30
15	1.08	1.12	1.16	1.20	1.24	1.28	1.36
20	1.13	1.15	1.20	1.24	1.28	1.32	1.40
30	1.20	1.20	1.25	1.29	1.34	1.38	1.46
40	1.25	1.25	1.29	1.33	1.38	1.42	1.50
50	1.30	1.30	1.32	1.36	1.41	1.45	1.54
60	1.33	1.33	1.35	1.39	1.44	1.48	1.57
70	1.36	1.36	1.37	1.41	1.46	1.50	1.59
80	1.39	1.39	1.39	1.43	1.48	1.52	1.62
90	1.41	1.41	1.41	1.45	1.50	1.54	1.64
100	1.44	1.44	1.44	1.47	1.52	1.56	1.66
120	1.48	1.48	1.48	1.50	1.55	1.59	1.69
140	1.51	1.51	1.51	1.52	1.58	1.62	1.72
160	1.54	1.54	1.54	1.55	1.60	1.65	1.75
180	1.57	1.57	1.57	1.57	1.62	1.67	1.77
200	1.60	1.60	1.60	1.60	1.64	1.69	1.79
250	1.65	1.65	1.65	1.65	1.69	1.74	1.84
300	1.70	1.70	1.70	1.70	1.73	1.78	1.89
350	1.75	1.75	1.75	1.75	1.77	1.82	1.93
400	1.79	1.79	1.79	1.79	1.81	1.86	1.97

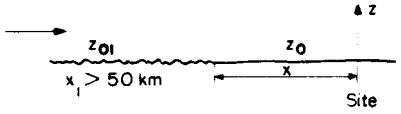


FIGURE 1a City centre terrain (z_0 = 0.7 m)

FIGURE 1b Centre of town (z_0 = 0.3 m)

FIGURE 1c Suburban terrain (z_0 = 0.3 m)

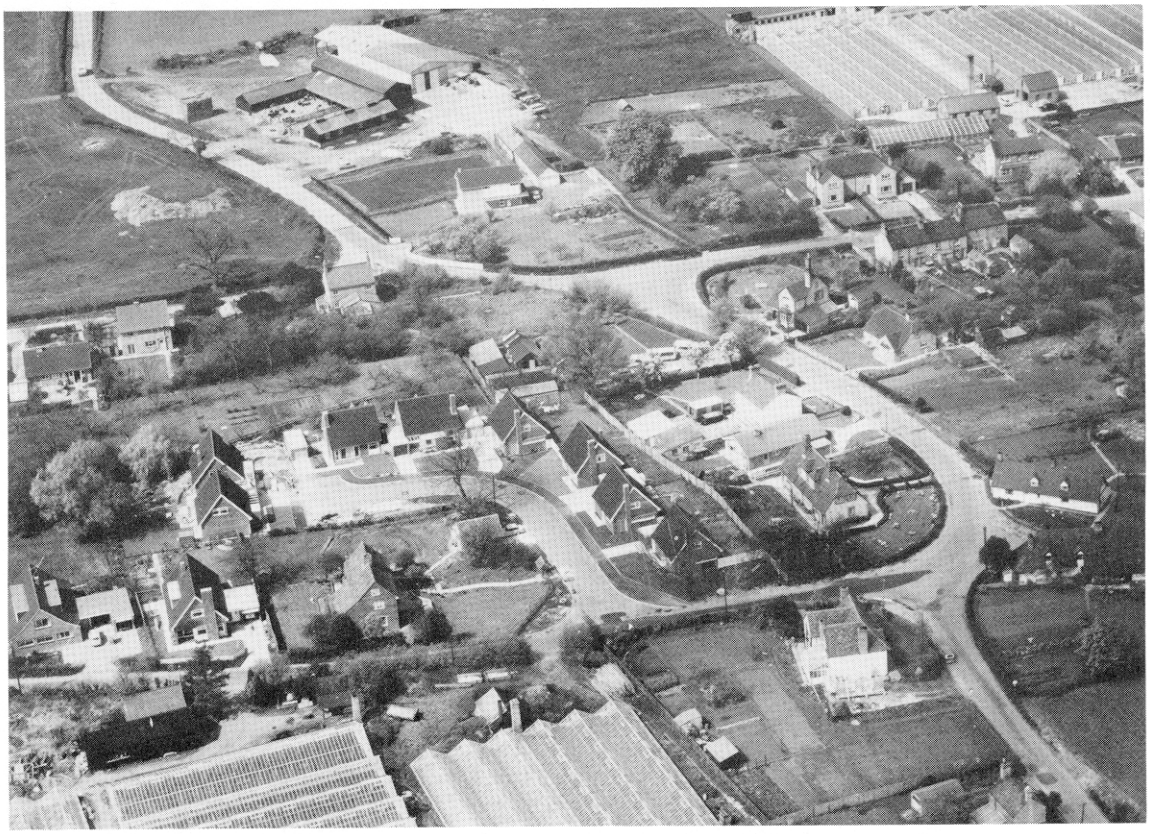


FIGURE 1d Outskirts of built-up area (z_0 = 0.1 m)

FIGURE 1e Typical open country terrain (z_0 = 0.03 m)

FIGURE 1f Flat plain with few obstructions (z_0 = 0.01 m)

FIGURE 1g Open fields with short grass (z_0 = 0.003 m)

THE PREPARATION OF THIS DATA ITEM

The work on this particular Item was monitored and guided by the Wind Engineering Panel which has the following constitution:

Chairman

Mr T.V. Lawson – Bristol University

Members

Mr D. Croft – Ove Arup and Partners
Prof. A.G. Davenport* – University of Western Ontario, Canada
Mr D.M. Deaves – Atkins Research and Development
Dr A.R. Flint – Flint and Neill
Mr D.H. Freeston* – Auckland University, New Zealand
Mr R.I. Harris – Cranfield Institute of Technology
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Mr R. Melling – Racal Antennas Ltd
Dr G.A. Mowatt – Earl and Wright Ltd
Mr J.R.C. Pedersen – Independent
Mr C. Scruton – Independent
Mr R.E. Whitbread – National Maritime Institute
Mr G. Wiskin – British Broadcasting Corporation.

* Corresponding Member

The work on this Item was carried out in the Wind Engineering Group of ESDU under the supervision of Mr N. Thompson. The member of staff who undertook the technical work involved in the initial assessment of available information and the construction and subsequent development of the Item was

Mr N. Thompson – Head of Wind Engineering Group.