Chain Link Fence
Wind Load Guide for the Selection of Line Post and Line Post Spacing
(WLG 2445)

Chain Link Fence Manufacturers Institute
10015 Old Columbia Road Suite B215
Columbia, MD 21046
Ph: 301-596-2583 Fax: 301-596-2594
email: clfmihq@aol.com
www.chainlinkinfo.org

DISCLAIMER

The Wind Load Guide for the Selection of Line Post Spacings for Woven Wire Chain Link Fencing is published by the Chain Link Fence Manufacturers Institute as a general information service in the selection of spacing for fencing line posts for chain link fence systems. However, because exposure, workmanship, soils, drainage, emplacement problems, wind and other weather conditions may vary, even at various locations in a single site, each application should be assessed by a qualified professional engineer. Accordingly, no representation or warranty is made, and none should be implied, respecting the suitability or adequacy of the information in this Guide for any particular application, nor is this Guide intended to establish industry "standards" respecting the selection of spacing for fencing line posts, or for any purpose.

TABLE OF CONTENTS

INTRODUCTION

The Chain Link Fence Manufacturers Institute (CLFMI) would like to acknowledge QProQ Engineering for the technical analysis of this Guide, as well as members of the CLFMI Technical Committee, for their complete and thorough editing effort on the orginal version. Also, further acknowledgement is extended to the American Society of Civil Engineers (ASCE) for agreeing to the use of its copyrighted materials, CLFMI wishes to extend special recognition to Charles Naegele, Chair of the CLFMI Technical Committee, for his leadership in the production of this Guide.

This Guide is intended to provide background information in the forms of charts and tables to assist fence designers and installers in the appropriate selection of fencing line posts for chain link fencing. However, because conditions vary from site to site, the information in the Guide should not be relied upon without the evaluation of a qualified professional engineer.

PLEASE READ THE DISCLAIMER.

The Guide includes nine tables for the spacings of line posts exposed to wind speeds of 70 mph up to and including 150 mph. These tables are based on the applicable ASCE 7-05 wind load standards. The spacing values listed in the seven tables must be adjusted using appropriate and selected coefficients to account for the size of the fabric gauge and mesh size, wind exposure and the probability for the development of icing conditions at that location. Moreover, the tables do not take into account wind speeds exceeding 150 mph, which may occur in category 5 hurricanes, tornadoes, at high elevations, or as the result of explosions.

Seven of the more commonly used fabric wire gage sizes and seven of the most commonly used mesh sizes when used in any combination and acted upon by the several sets of wind pressures (not wind speed or velocity) offers the user choices in the selection and/or specifying line posts based on local wind conditions, economics, aesthetics, functionality of other design criteria established for a specific application. It should be noted that this guide is specifically designed for the use with chain link fence systems only and is not intended for use with other fence designs..

The guide considers the following assumptions as being applicable in the design analysis based on the wind loading criteria outlined in **ASCE 7-05, " Minimum Load Design Criteria for Buildings and Other Structures", Section 6, Wind Loads**.

- Wind is acting in a direction normal to the plane of the fencing fabric and applied on the fabric side of the line post
- Tension wire or rail at the base and top of the fence accommodates the normal tensile loading being applied to take up vertical sag of the fence.

Additionally the line posts are considered to be embedded in the ground surface in accordance with the minimum size and depth established according to **ASTM F-567, "Standard Practice for Installation of Chain Link Fence"**. All posts are considered to be embedded in concrete, minimum 2,500 psi, of a depth consistent with local conditions for three ranges of soil types; ie., loose sand, medium dense clay or dense clay.

FACTORS WHICH INFLUENCE THE SIZE AND SPACINGS OF LINE POSTS*

- HEIGHT OF FENCE

The height of the fence influences the actual amount of wind force that must be resisted by the post and the required anchorage to the ground. The fence height times the line post spacing sets the total force acting on a solid panel of the fence which is transferred to the line posts and then into the footing.

- STYLE AND SIZE OF FABRIC

The style and size of fabric determines the net surface area of the solid fence panel exposed to the wind pressure which in turn must possess adequate tensile strength to transfer the developed loading to the supporting members of the fence assembly; i.e., line posts, top rail and base tension wire.

- MATERIAL STRENGTH AND SHAPE OF POST

Material strength and shape of post determines the size of posts and their spacing which will provide the required resistance to the maximum expected wind forces that may develop over the anticipated normal life-span of the installation and to remain serviceable subsequent to the maximum wind event.

- SOIL TYPE AS IT RELATES TO THE FOOTING SIZE AND DEPTH

The type of soil that will be encountered at the site of the fence installation will influence the post size and spacing by way of the passive soil pressures that can reasonably be expected to resist the tendency for the line posts to overturn and also to remain in an essentially plumb position after the wind event. For footing design criteria, it is advisable to contact a competent geotechnical professional for the appropriate soils information at the particular site. The minimum depth of footings in accordance with **ASTM F567** is 24" plus an additional 3" for each one (1) foot of fence height over 4 feet.

- WIND PRESSURE

Wind pressure is the most dominant factor that influences the post size and spacing since it is the only force that can reasonably be predicted and will be acting on the posts under normal conditions. Reference Table 14 for values of various wind speeds.

Wind pressure in itself is further influenced by other factors; i.e., geographical region, exposure, topography and ground surface features in the local area.

*Reference Figure I, "LINE POST SPACING GUIDE DETAILS" for graphic description of factors.

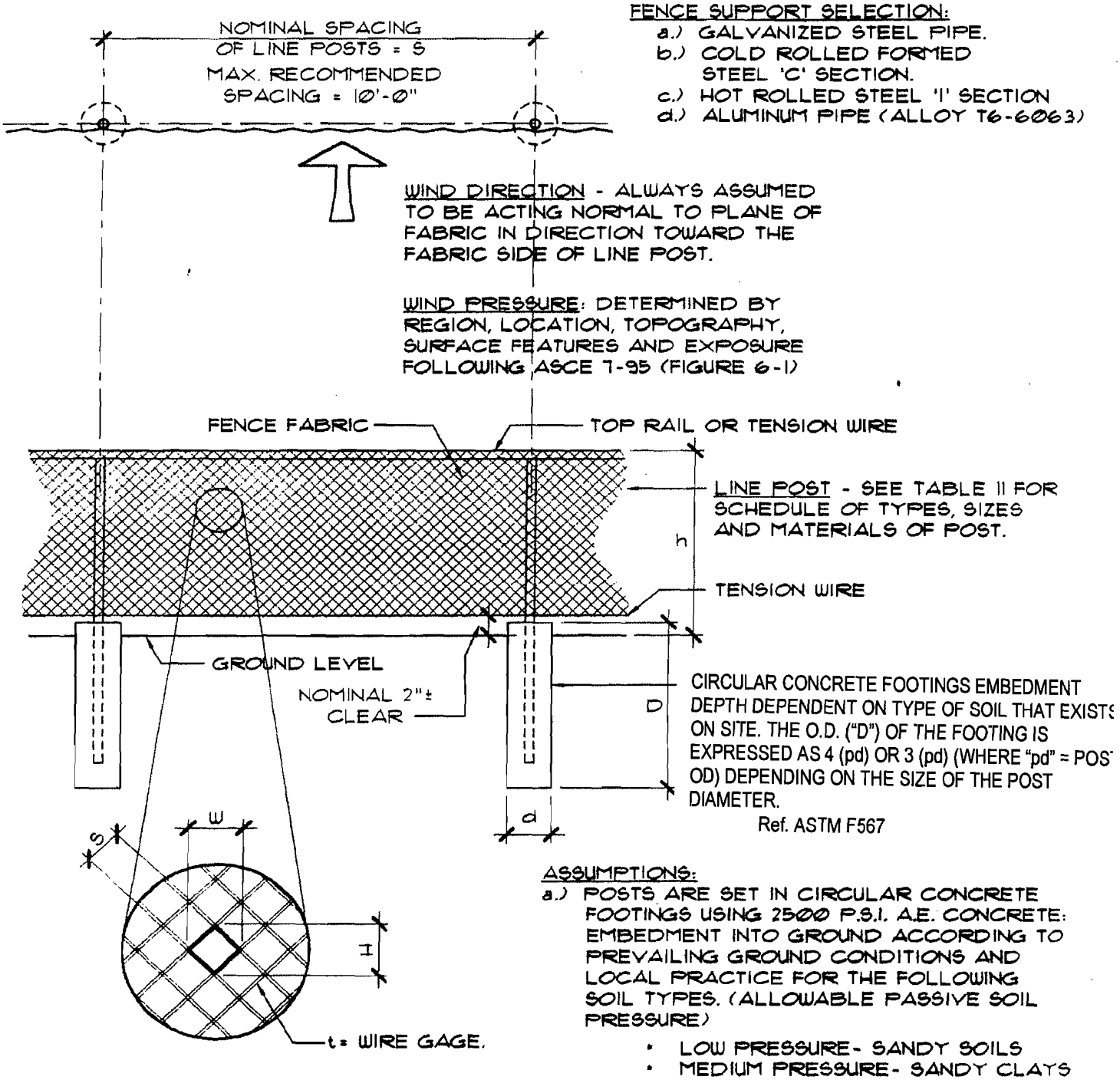


FIGURE #1

LINE POST SPACING GUIDE DETAILS

METHODOLOGY

The methodology applied to develop the tabular values of "S", the unmodified maximum spacings of line post materials, sizes and shapes most commonly employed in the chain link fencing industry, for the fence heights and wind speeds was based on wind loading criteria outlined in **ASCE 7-05**, Section 6, Wind Loads, excerpts of which are included in the Appendix of this Guide.

This application of the recommended loading criteria as it applies to fence construction takes into consideration all factors that influence the wind forces applied to the primary force resisting element of the fence; in this instance the line posts, which in-turn/must transfer that loading to the ground. This guide is based on the assumption of a solid panel of fencing and uses multiplication factors for various percentages of free area of the fence panel.

To establish the magnitude of the wind force that will be acting on the line post, it must be first established what the net surface area of the fence panel will be; i.e., the solid panel area, "h x S" less the void spaces within the fence. The net surface area of the wire fabric is what the wind force impinges on and is directed on to the post. Since the panel of the fence is essentially a perforated plane, it as necessary to quantify the actual solid surface to void area. The area of wire surface was determined by establishing the number of diamonds in a square foot of fabric and totaling the length of wire that area. This is the value used in combination with the computed wind velocity pressures that when applied as a load to the fence post acting as a flagpole design; i.e., a vertical cantilever, fixed at it's base to the footing and ground.

Now with the value known for the wind velocity pressure that develops for each of the selected range of the nine Wind Speed Classes of 70 Mph thru 150 Mph acting under normal conditions for a Wind Exposure Category "**B**", these forces are then applied to the face area of the fence panel assumed to be solid. With the height "**H**" of the fence known, the only variable that needs to be established to set the total gross area "$\mathbf{A_g}$" of the panel is the line post spacing "S". The values of "**S**" were generated based on the loading applied to the post as a vertical cantilever, in a similar fashion as the "classical" flagpole design.

Table 1 thru **Table 9** are set up for fence heights that range from 3 feet up to and including 20 feet and twenty-six combinations of line post sizes and types, in a solid panel configuration. The **"S"** values were computed on the basis of their physical, material properties and formulas listed in **Table 13** with a limiting value based on the maximum allowable stress.

To account for the variations in the fabric wire sizes and sizes of mesh, **Table 10** was developed and lists the Coefficient" **$\mathbf{Cf_1}$**" which accounts for the variation and is based on a ratio of net area to gross area of a solid panel for each of the commonly used styles employed in the industry.

The base program for the line post spacing was set up using the condition where Wind Exposure Category "**B**" is the new normal situation replacing "**A**" from ASCE 795; to account for the other two Wind Exposure Categories, "**C**", "**D**", and **Table 11** was developed to list the Coefficient "**Cf_2**" which is a ratio of the Wind Exposure Coefficient "**Kz**" for Exposure "**B**" to the other two exposure coefficients as listed in **ASCE 7-05, Table 6.3**.

In **Table 12**, Ice Effect Probability Coefficient "**Cf_3**" is included in the guide and was set up using arbitrary values to permit the designer the ability to make an intelligent decision relative to his perception and experience as to the probability that a severe icing condition may develop concurrent with the listed maximum wind speed for that particular geographical location for non-solid fencing.

Although Fig. 6-1 from **ASCE 7-05** shows wind speed categories in the range of 90 Mph to 150 Mph, most all building codes in effect in the United States list design wind speeds ranging from 70 Mph up to and including 120 Mph. This guide provides values of wind speeds that cover the entire range of velocities that may be encountered in all codes. For those intermediate wind speeds, it is acceptable to interpolate linearly.

The user of this guide is advised that he may want to consider use of the full allowable stress of the material being employed which has a built-in Factor of Safety equivalent to 1.5; ie., 0.66 Fy, **Reference Table 13**. The user may also want to consider the merits of using a higher maximum allowable stress increase due to the fact that wind loadings usually may not be a sustained condition for that specific location where the fence installation is being planned.

HOW TO USE THE GUIDE

For the fence fabric configuration and size of line post being considered, go to the appropriate table (Table 1,2,3, ... ,9) that closely agrees with the maximum anticipated wind speed designated by the local codes for that geographical area where the fence installation is planned. From that table, find the value of "**S**" for the line post size and height desired. This value of "**S**" must then be multiplied by correction coefficients that account for the type, size and mesh of the wire fabric, "**Cf1**" from **Table 10**; Wind exposure category coefficient, "**Cf2**" from **Table 11**; Icing effects probability coefficient, "**Cf3**" from **Table 12**.

The recommended post spacing **S' = S X Cf1 x Cf2 x Cf3**

EXAMPLE I:

Select a line post spacing for a 12' high Chain Link fence, constructed of #9 gage wire, having a mesh size pattern of 1-3/4". The installation location is for a park in an urban location in the Eastern U. S., where the wind exposure is considered, ' Exposure C'. Assume the local governing code indicates that the maximum wind speed for this application is 90 mph; localized icing effects are considered to be moderate. One possible line post material selection for this example is Group 1A, Schedule 40 steel pipe.

From **Table 3, Wind Speed 90 Mph**, for a **4.0"** outside diam. (3.5 nominal) pipe, the listed "**S**" value for a 12' high fence is 3.5.
From **Table 10**, the Coefficient "**Cf1**", for a #9 gage, 1-3/4" mesh fabric = **6.4**
From **Table 11**, the Coefficient "**Cf2**", for a Wind Exposure Category C = **0.67**
From **Table 12**, the Coefficient "**Cf3**", for Moderate Icing Effects = **0.85**

Thus the recommended maximum spacing for the 4" diam. Schedule 40, steel pipe post for the 12' high fence with a #9 gage wire and 1-3/4" mesh would be:

S' = S X Cf1 x Cf2 x Cf3 = 3.5 x 6.4 x 0.67 x 0.85 = 12.75'

The maximum recommended spacing would be 10'-**0" c/c** for the posts.

EXAMPLE 2

For a situation where the Wind Velocity is other than for one of the seven listed tables of line post spacings in the guide.

Select a line post size and spacing for an 18' high chain link fence installation for which the fabric is to be a #9 gage - 1/2" mesh pattern. Assume the fence location is in an open terrain where the Wind Exposure Category is "C" and the code listed maximum wind speed is 105 mph; icing effects potential is considered to be moderate.

From **Table 10**, the coefficient "**Cf_1**" for mesh size and gage = 2.20

From **Table 11**, the coefficient "**Cf_2**" for wind exposure "**C**" = 0.69

From **Table 12**, the coefficient "**Cf_3**" for moderate icing effect = 0.85

From **Table 4**, for a 100 Mph wind and an 18' high fence, select a Trial line post size spacing factor **"S" = 4.6** for a Group IA, 6-5/8" nom. diam. steel pipe.

For this arrangement the maximum spacing would be the result of 4.6 x 2.20 x 0.69 x 0.85 = 5.94' ; This may not be an economical or practical spacing.

Therefore try the spacing for a Group IA, 8-5/8" nom. diam. steel pipe where **"S" = 9.2** whose maximum recommended spacing would be 9.2/4.6 x 5.94' = 11.88'.

If the maximum wind speed were **105 Mph** condition the recommended spacing would be 9.2/105 x 11.88' = **11.31' or 10'- 0" on centers**, which would be more consistent with the usual standard spacing followed in the industry.

EXAMPLE 3:

For a site location with a high wind condition and the design selection of an appropriate footing size and depth.

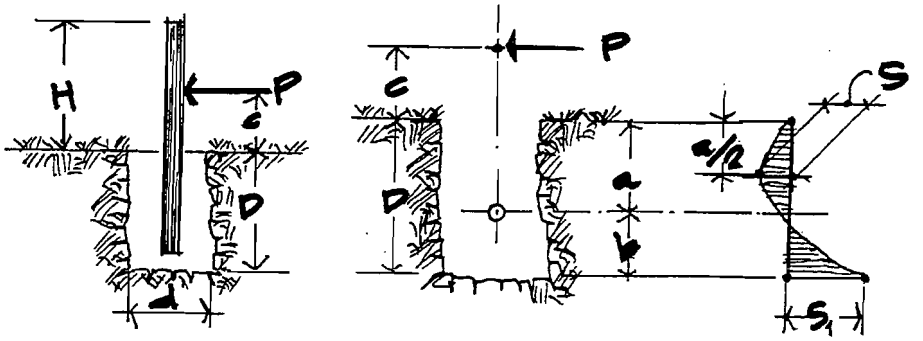
Select a line post size, it's spacing and footing for a 10' high chain link fence that will consist of a #9 gage 1-3/4" mesh fabric. Installation will be in Southern Florida in an open terrain with a wind exposure category "C" and a maximum wind velocity of 120 Mph. Soil condition is assumed to be a medium dense clay. (Actual soil properties should be established by a qualified geotechnical engineer familiar with local soil conditions.)

From **Table 6** for 120 Mph wind and under 10' high fence and a trial size line post of Group IA, 3.5" nom. diam. steel pipe "**S**" = **2.0**

"**Cf_1**" for the fabric size and gage = 6.4
"**Cf_2**" for the wind exposure category= 0.67
"**Cf_3**" for icing condition = 1.0

Thus the maximum spacing for the Group IA, 3.5" diam. pipe = 2.0 x 6.4 x 0.67 x 1.0 = 8.58'. This may not be an economical spacing; try another trial size post.
Checking the spacing for a Group IA, 4" nom. diam pipe where "S" = 2.9 Maximum spacing will be 2.9/2.0 x 8.58' = 12.44' use 10.0'

For the 4" diam line post the minimum footing size is 4 x Pipe Diam per ASTM F-567 or 16"; However, it is recommended that footing size of 20" diam. be used. The minimum depth of footing embedment in the medium dense clay soil is to be calculated as follows:



LINE POST FOOTING PRESSURE

Allowable soil bearing pressure (S_1) for medium dense clay = 6,000 psf*
Factor of Safety = 1.2
Design maximum allowable soil pressure = S_1/F.S. = 6,000/F.S = 5,000 psf

EXAMPLE 3 (Continued):

Distance of applied force above footing "c" = 2/3H=0.67 x 10' = 6.67'

Applied Force "P" = (1/Cf1) x Net Area of Fence x Wind Pressure where Cf1 is the Mesh and Fabric Size Coefficient from Table 10 and the Wind Pressure is the Design Wind Pressure from Table 14.

= (0.16 sf/sf) (100 sf) (29.43lb/sf) = 460 lbs

Diameter of footing "d" = 20" = 1.67'

Solving for "D" $D = \frac{6P + (36P^2 + 240{,}000\ dPc)^{1/2}}{2S1d}$

$= \frac{(6)(460) + [(36)(460)^2 + (240{,}000)(1.67)(460)(6.67)]^{1/2}}{(2((5{,}000)(1.67)}$

=2.27' minimum depth\of footing by calculation.

However; footing depth by calculation does not agree with the minimum footing depth as set by **ASTM F-567** which is 24" + [3" X (10'- 4.0')] = **24" + 18" = 42"** which is the footing depth that should be utilized.

• Assumed allowable soil bearing pressure; actual value should be determined by appropriate means.

TABLE 1
LINE POST SELECTION GUIDE: WIND SPEED 70 MPH
EXPOSURE CATEGORY "B"

LINE POST SIZE	LINE POST MAXIMUM SPACING, S (FEET) FOR USE IN EQUATION: S' = S x Cf1 x Cf2 x Cf3 FENCE HEIGHT (FEET)																		
	3	3.5	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Group IA: (ASTM F1043) Schedule 40 Steel Pipe, ASTM F1083-06 Regular Grade (30,000 psi yield)																			
1 7/8"	9.6	9.6	7.2	4.5	3.0	2.0	1.4	----	----	----	----	----	----	----	----	----	----	----	----
2 3/8"	16.6	16.6	12.7	8.0	5.4	3.9	2.8	2.1	1.6	1.2	----	----	----	----	----	----	----	----	----
2 7/8"	31.4	31.4	24.2	15.4	10.6	7.7	5.8	4.4	3.5	2.8	2.2	1.8	1.4	1.1	----	----	----	----	----
3 1/2"	51.0	51.0	39.4	25.2	17.4	12.7	9.6	7.5	6.0	4.9	4.0	3.3	2.8	2.3	1.9	1.6	1.4	1.1	----
4	----	----	54.9	35.0	24.3	17.8	13.5	10.6	8.5	6.9	5.7	4.8	4.1	3.5	3.0	2.5	2.2	1.9	1.6
6 5/8"	----	----	----	----	----	----	48.8	38.5	31.1	25.7	21.5	18.3	15.7	13.6	11.9	10.5	9.3	8.3	7.5
8 5/8"	----	----	----	----	----	----	----	----	----	51.0	42.8	36.4	31.4	27.3	24.0	21.2	18.8	16.9	15.2
Group IC: (ASTM F1043) Steel Pipe (50,000 psi yield)																			
1 5/8"	9.7	9.4	7.0	4.2	2.6	1.7	1.0	----	----	----	----	----	----	----	----	----	----	----	----
1 7/8"	13.9	13.7	10.4	6.4	4.2	2.8	1.9	1.3	----	----	----	----	----	----	----	----	----	----	----
2 3/8"	24.1	24.1	18.4	11.6	7.8	5.5	4.0	3.0	2.2	1.6	1.2	----	----	----	----	----	----	----	----
2 7/8"	43.4	43.4	33.4	21.2	14.5	10.5	7.9	6.0	4.7	3.7	2.9	2.3	1.8	1.4	1.1	----	----	----	----
3 1/2"	----	----	51.2	32.6	22.5	16.4	12.4	9.6	7.6	6.2	5.0	4.1	3.4	2.8	2.3	1.9	1.6	1.3	1.0
4	----	----	----	43.5	30.1	22.0	16.7	13.0	10.4	8.5	7.0	5.8	4.9	4.1	3.5	3.0	2.5	2.1	1.8
Group IA: Intermediate Grade Schedule 40 Steel Pipe, ASTM F 1083-06 Intermediate Grade (50,000 psi yield)																			
6 5/8"	----	----	----	----	----	----	----	----	51.6	42.5	35.6	30.1	25.8	22.3	19.5	17.1	15.1	13.4	11.9
8 5/8"	----	----	----	----	----	----	----	----	----	----	----	----	51.8	44.9	39.3	34.7	30.7	27.4	24.6
Group IA: High Strength 83000 Grade Schedule 40 Pipe, ASTM F 1083-06 High Strength Grade (83,000 psi yield)																			
1 5/8"	19.3	18.8	14.2	8.6	5.5	3.5	2.3	1.4	----	----	----	----	----	----	----	----	----	----	----
1 7/8"	26.7	26.5	20.1	12.4	8.2	5.6	3.8	2.6	1.8	1.1	----	----	----	----	----	----	----	----	----
2 3/8"	46.0	46.0	35.2	22.2	15.0	10.7	7.8	5.8	4.3	3.3	2.4	1.7	1.2	----	----	----	----	----	----
2 7/8"	----	----	----	42.6	29.3	21.2	15.9	12.3	9.6	7.7	6.1	4.9	4.0	3.2	2.5	2.0	1.5	1.1	----
3 1/2"	----	----	----	----	48.1	35.1	26.6	20.8	16.6	13.4	11.0	9.1	7.6	6.4	5.4	4.5	3.8	3.2	2.6
4	----	----	----	----	----	49.1	37.4	29.3	23.5	19.2	15.9	13.3	11.3	9.6	8.2	7.0	6.1	5.2	4.5
GROUP II: (ASTM F1043) High Strength Cold Rolled Formed C-Shape (50,000 psi yield)																			
1 7/8" x 1 5/8"x.105	10.3	10.3	7.8	4.8	3.2	2.2	1.5	1.1	----	----	----	----	----	----	----	----	----	----	----
1 7/8" x 1 5/8"x.121	17.5	17.5	13.3	8.3	5.5	3.8	2.7	1.9	1.4	----	----	----	----	----	----	----	----	----	----
2 1/4" x 1 5/8" x.121	20.2	20.1	15.3	9.5	6.4	4.4	3.1	2.2	1.6	1.1	----	----	----	----	----	----	----	----	----
3 1/4" x 2 1/2" x .130	49.8	49.7	37.7	23.5	15.7	10.9	7.7	5.5	3.9	2.7	1.8	1.1	----	----	----	----	----	----	----
GROUP III: (ASTM F1043) Hot Rolled H-Beam (50,000 psi yield)																			
2 1/4" x 1 5/8"	38.6	38.6	29.7	18.8	12.8	9.2	6.8	5.2	4.0	3.1	2.4	1.9	1.4	1.1	----	----	----	----	----

TABLE 2
LINE POST SELECTION GUIDE: WIND SPEED 85 MPH
EXPOSURE CATEGORY "B"

LINE POST SIZE	LINE POST MAXIMUM SPACING, S (FEET) FOR USE IN EQUATION: S' = S x Cf1 x Cf2 x Cf3 FENCE HEIGHT (FEET)																		
	3	3.5	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Group IA: (ASTM F1043) Schedule 40 Steel Pipe, ASTM F1083-06 Regular Grade (30,000 psi yield)																			
1 7/8"	8.9	6.5	4.9	3.0	2.0	1.4	----	----	----	----	----	----	----	----	----	----	----	----	----
2 3/8"	15.5	11.3	8.6	5.4	3.7	2.6	1.9	1.4	1.1	----	----	----	----	----	----	----	----	----	----
2 7/8"	29.3	21.5	16.4	10.4	7.2	5.2	3.9	3.0	2.4	1.9	1.5	1.2	----	----	----	----	----	----	----
3 1/2"	47.6	35.0	26.7	17.1	11.8	8.6	6.5	5.1	4.1	3.3	2.7	2.2	1.9	1.6	1.3	1.1	----	----	----
4	----	48.6	37.2	23.8	16.5	12.0	9.2	7.2	5.8	4.7	3.9	3.3	2.8	2.3	2.0	1.7	1.5	1.3	1.1
6 5/8"	----	----	----	----	58.9	43.2	33.1	26.1	21.1	17.4	14.6	12.4	10.7	9.3	8.1	7.1	6.3	5.6	5.1
8 5/8"	----	----	----	----	----	----	----	51.7	41.9	34.6	29.0	24.7	21.3	18.5	16.2	14.4	12.8	11.4	10.3
Group IC: (ASTM F1043) Steel Pipe (50,000 psi yield)																			
1 5/8"	8.8	6.4	4.8	2.9	1.8	1.1	----	----	----	----	----	----	----	----	----	----	----	----	----
1 7/8"	12.8	9.3	7.0	4.3	2.8	1.9	1.3	----	----	----	----	----	----	----	----	----	----	----	----
2 3/8"	22.4	16.4	12.5	7.8	5.3	3.7	2.7	2.0	1.5	1.1	----	----	----	----	----	----	----	----	----
2 7/8"	40.5	29.7	22.7	14.4	9.9	7.1	5.3	4.1	3.2	2.5	2.0	1.6	1.2	----	----	----	----	----	----
3 1/2"	----	45.4	34.7	22.1	15.3	11.1	8.4	6.5	5.2	4.2	3.4	2.8	2.3	1.9	1.6	1.3	1.1	----	----
4	----	----	46.2	29.5	20.4	14.9	11.3	8.8	7.1	5.8	4.7	3.9	3.3	2.8	2.4	2.0	1.7	1.4	1.2
Group IA: Intermediate Grade Schedule 40 Steel Pipe, ASTM F 1083-06 Intermediate Grade (50,000 psi yield)																			
6 5/8"	----	----	----	----	----	----	55.0	43.4	35.0	28.8	24.1	20.4	17.5	15.1	13.2	11.6	10.2	9.1	8.1
8 5/8"	----	----	----	----	----	----	----	----	----	57.4	48.1	40.9	35.1	30.5	26.7	23.5	20.8	18.6	16.7
Group IA: High Strength 83000 Grade Schedule 40 Pipe, ASTM F 1083-06 High Strength Grade (83,000 psi yield)																			
1 5/8"	17.6	12.8	9.6	5.8	3.7	2.4	1.5	----	----	----	----	----	----	----	----	----	----	----	----
1 7/8"	24.7	18.0	13.6	8.4	5.5	3.8	2.6	1.8	1.2	----	----	----	----	----	----	----	----	----	----
2 3/8"	42.8	31.3	23.8	15.0	10.2	7.2	5.3	3.9	2.9	2.2	1.6	1.2	----	----	----	----	----	----	----
2 7/8"	----	59.6	45.5	28.9	19.9	14.4	10.8	8.3	6.5	5.2	4.2	3.3	2.7	2.1	1.7	1.3	1.0	----	----
3 1/2"	----	----	----	47.2	32.6	23.8	18.0	14.1	11.2	9.1	7.5	6.2	5.2	4.3	3.6	3.0	2.6	2.1	1.8
4	----	----	----	----	45.6	33.3	25.4	19.9	15.9	13.0	10.8	9.0	7.6	6.5	5.6	4.8	4.1	3.5	3.0
GROUP II: (ASTM F1043) High Strength Cold Rolled Formed C-Shape (50,000 psi yield)																			
1 7/8" x 1 5/8"x.105	9.5	7.0	5.3	3.3	2.2	1.5	1.0	----	----	----	----	----	----	----	----	----	----	----	----
1 7/8" x 1 5/8"x.121	16.2	11.8	9.0	5.6	3.7	2.6	1.8	1.3	----	----	----	----	----	----	----	----	----	----	----
2 1/4" x 1 5/8" x.121	18.7	13.7	10.4	6.5	4.3	3.0	2.1	1.5	1.1	----	----	----	----	----	----	----	----	----	----
3 1/4" x 2 1/2" x .130	46.2	33.7	25.6	16.0	10.7	7.4	5.2	3.7	2.6	1.8	1.2	----	----	----	----	----	----	----	----
GROUP III: (ASTM F1043) Hot Rolled H-Beam (50,000 psi yield)																			
2 1/4" x 1 5/8"	36.0	26.4	20.1	12.7	8.7	6.3	4.6	3.5	2.7	2.1	1.6	1.3	----	----	----	----	----	----	----

TABLE 3
LINE POST SELECTION GUIDE: WIND SPEED 90 MPH
EXPOSURE CATEGORY "B"

LINE POST SIZE	LINE POST MAXIMUM SPACING, S (FEET) FOR USE IN EQUATION: S' = S x Cf1 x Cf2 x Cf3 FENCE HEIGHT (FEET)																		
	3	3.5	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Group IA: (ASTM F1043) Schedule 40 Steel Pipe, ASTM F1083-06 Regular Grade (30,000 psi yield)																			
1 7/8"	8.0	5.8	4.4	2.7	1.8	1.2	----	----	----	----	----	----	----	----	----	----	----	----	----
2 3/8"	13.8	10.1	7.7	4.8	3.3	2.3	1.7	1.3	----	----	----	----	----	----	----	----	----	----	----
2 7/8"	26.1	19.2	14.7	9.3	6.4	4.6	3.5	2.7	2.1	1.7	1.3	1.1	----	----	----	----	----	----	----
3 1/2"	42.5	31.2	23.9	15.2	10.5	7.7	5.8	4.5	3.6	2.9	2.4	2.0	1.7	1.4	1.2	----	----	----	----
4	59.1	43.4	33.2	21.2	14.7	10.7	8.2	6.4	5.1	4.2	3.5	2.9	2.5	2.1	1.8	1.5	1.3	1.1	----
6 5/8"	----	----	----	----	52.5	38.6	29.5	23.3	18.8	15.5	13.0	11.1	9.5	8.3	7.2	6.4	5.6	5.0	4.5
8 5/8"	----	----	----	----	----	----	58.4	46.1	37.3	30.8	25.9	22.0	19.0	16.5	14.5	12.8	11.4	10.2	9.2
Group IC: (ASTM F1043) Steel Pipe (50,000 psi yield)																			
1 5/8"	7.9	5.7	4.3	2.5	1.6	1.0	----	----	----	----	----	----	----	----	----	----	----	----	----
1 7/8"	11.4	8.3	6.3	3.9	2.5	1.7	1.1	----	----	----	----	----	----	----	----	----	----	----	----
2 3/8"	20.0	14.6	11.1	7.0	4.7	3.3	2.4	1.8	1.3	----	----	----	----	----	----	----	----	----	----
2 7/8"	36.1	26.5	20.2	12.8	8.8	6.4	4.8	3.6	2.8	2.2	1.8	1.4	1.1	----	----	----	----	----	----
3 1/2"	55.2	40.5	31.0	19.7	13.6	9.9	7.5	5.8	4.6	3.7	3.0	2.5	2.1	1.7	1.4	1.2	----	----	----
4	----	53.9	41.2	26.3	18.2	13.3	10.1	7.9	6.3	5.1	4.2	3.5	3.0	2.5	2.1	1.8	1.5	1.3	1.1
Group IA: Intermediate Grade Schedule 40 Steel Pipe, ASTM F 1083-06 Intermediate Grade (50,000 psi yield)																			
6 5/8"	----	----	----	----	----	----	49.1	38.7	31.2	25.7	21.5	18.2	15.6	13.5	11.8	10.3	9.1	8.1	7.2
8 5/8"	----	----	----	----	----	----	----	----	----	51.2	42.9	36.5	31.3	27.2	23.8	21.0	18.6	16.6	14.9
Group IA: High Strength 83000 Grade Schedule 40 Pipe, ASTM F 1083-06 High Strength Grade (83,000 psi yield)																			
1 5/8"	15.7	11.4	8.6	5.2	3.3	2.1	1.4	----	----	----	----	----	----	----	----	----	----	----	----
1 7/8"	22.0	16.0	12.1	7.5	4.9	3.4	2.3	1.6	1.1	----	----	----	----	----	----	----	----	----	----
2 3/8"	38.2	27.9	21.3	13.4	9.1	6.5	4.7	3.5	2.6	2.0	1.5	1.1	----	----	----	----	----	----	----
2 7/8"	----	53.1	40.6	25.8	17.7	12.8	9.6	7.4	5.8	4.6	3.7	3.0	2.4	1.9	1.5	1.2	----	----	----
3 1/2"	----	----	----	42.1	29.1	21.2	16.1	12.6	10.0	8.1	6.7	5.5	4.6	3.9	3.2	2.7	2.3	1.9	1.6
4	----	----	----	58.7	40.6	29.7	22.6	17.7	14.2	11.6	9.6	8.1	6.8	5.8	5.0	4.3	3.7	3.2	2.7
GROUP II: (ASTM F1043) High Strength Cold Rolled Formed C-Shape (50,000 psi yield)																			
1 7/8" x 1 5/8"x.105	8.5	6.2	4.7	2.9	1.9	1.3	----	----	----	----	----	----	----	----	----	----	----	----	----
1 7/8" x 1 5/8"x.121	14.5	10.6	8.0	5.0	3.3	2.3	1.6	1.2	----	----	----	----	----	----	----	----	----	----	----
2 1/4" x 1 5/8" x.121	16.7	12.2	9.3	5.8	3.9	2.7	1.9	1.4	----	----	----	----	----	----	----	----	----	----	----
3 1/4" x 2 1/2" x .130	41.2	30.1	22.8	14.2	9.5	6.6	4.7	3.3	2.4	1.6	1.1	----	----	----	----	----	----	----	----
GROUP III: (ASTM F1043) Hot Rolled H-Beam (50,000 psi yield)																			
2 1/4" x 1 5/8"	32.1	23.5	18.0	11.4	7.8	5.6	4.1	3.1	2.4	1.9	1.5	1.1	----	----	----	----	----	----	----

TABLE 4
LINE POST SELECTION GUIDE: WIND SPEED 100 MPH
EXPOSURE CATEGORY "B"

LINE POST SIZE	LINE POST MAXIMUM SPACING, S (FEET) FOR USE IN EQUATION: S' = S x Cf1 x Cf2 x Cf3 FENCE HEIGHT (FEET)																		
	3	3.5	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Group IA: (ASTM F1043) Schedule 40 Steel Pipe, ASTM F1083-06 Regular Grade (30,000 psi yield)																			
1 7/8"	6.4	4.7	3.6	2.2	1.4	----	----	----	----	----	----	----	----	----	----	----	----	----	----
2 3/8"	11.2	8.2	6.2	3.9	2.7	1.9	1.4	1.0	----	----	----	----	----	----	----	----	----	----	----
2 7/8"	21.2	15.5	11.9	7.6	5.2	3.8	2.8	2.2	1.7	1.4	1.1	----	----	----	----	----	----	----	----
3 1/2"	34.4	25.3	19.3	12.3	8.5	6.2	4.7	3.7	2.9	2.4	2.0	1.6	1.3	1.1	----	----	----	----	----
4	47.9	35.1	26.9	17.2	11.9	8.7	6.6	5.2	4.2	3.4	2.8	2.4	2.0	1.7	1.5	1.2	1.1	----	----
6 5/8"	----	----	----	----	42.5	31.2	23.9	18.9	15.3	12.6	10.5	9.0	7.7	6.7	5.8	5.2	4.6	4.1	3.7
8 5/8"	----	----	----	----	----	----	47.3	37.4	30.2	25.0	21.0	17.9	15.4	13.4	11.7	10.4	9.2	8.3	7.4
Group IC: (ASTM F1043) Steel Pipe (50,000 psi yield)																			
1 5/8"	6.4	4.6	3.4	2.1	1.3	----	----	----	----	----	----	----	----	----	----	----	----	----	----
1 7/8"	9.2	6.7	5.1	3.1	2.0	1.4	----	----	----	----	----	----	----	----	----	----	----	----	----
2 3/8"	16.2	11.8	9.0	5.7	3.8	2.7	2.0	1.4	1.1	----	----	----	----	----	----	----	----	----	----
2 7/8"	29.2	21.4	16.4	10.4	7.1	5.1	3.8	2.9	2.3	1.8	1.4	1.1	----	----	----	----	----	----	----
3 1/2"	44.7	32.8	25.1	16.0	11.0	8.0	6.1	4.7	3.7	3.0	2.5	2.0	1.7	1.4	1.1	----	----	----	----
4	59.5	43.7	33.4	21.3	14.7	10.8	8.2	6.4	5.1	4.2	3.4	2.8	2.4	2.0	1.7	1.4	1.2	1.0	----
Group IA: Intermediate Grade Schedule 40 Steel Pipe, ASTM F 1083-06 Intermediate Grade (50,000 psi yield)																			
6 5/8"	----	----	----	----	----	52.0	39.7	31.3	25.3	20.8	17.4	14.8	12.7	10.9	9.5	8.4	7.4	6.6	5.8
8 5/8"	----	----	----	----	----	----	----	----	50.3	41.5	34.7	29.5	25.4	22.0	19.3	17.0	15.1	13.4	12.0
Group IA: High Strength 83000 Grade Schedule 40 Pipe, ASTM F 1083-06 High Strength Grade (83,000 psi yield)																			
1 5/8"	12.7	9.2	6.9	4.2	2.7	1.7	1.1	----	----	----	----	----	----	----	----	----	----	----	----
1 7/8"	17.8	13.0	9.8	6.1	4.0	2.7	1.9	1.3	----	----	----	----	----	----	----	----	----	----	----
2 3/8"	30.9	22.6	17.2	10.9	7.4	5.2	3.8	2.8	2.1	1.6	1.2	----	----	----	----	----	----	----	----
2 7/8"	58.7	43.0	32.9	20.9	14.4	10.4	7.8	6.0	4.7	3.8	3.0	2.4	1.9	1.6	1.2	----	----	----	----
3 1/2"	----	----	53.5	34.1	23.6	17.2	13.0	10.2	8.1	6.6	5.4	4.5	3.7	3.1	2.6	2.2	1.8	1.5	1.3
4	----	----	----	47.6	32.9	24.1	18.3	14.4	11.5	9.4	7.8	6.5	5.5	4.7	4.0	3.4	3.0	2.6	2.2
GROUP II: (ASTM F1043) High Strength Cold Rolled Formed C-Shape (50,000 psi yield)																			
1 7/8" x 1 5/8"x.105	6.9	5.0	3.8	2.4	1.6	1.1	----	----	----	----	----	----	----	----	----	----	----	----	----
1 7/8" x 1 5/8"x.121	11.7	8.6	6.5	4.1	2.7	1.9	1.3	----	----	----	----	----	----	----	----	----	----	----	----
2 1/4" x 1 5/8" x.121	13.5	9.9	7.5	4.7	3.1	2.2	1.5	1.1	----	----	----	----	----	----	----	----	----	----	----
3 1/4" x 2 1/2" x .130	33.4	24.4	18.5	11.5	7.7	5.3	3.8	2.7	1.9	1.3	----	----	----	----	----	----	----	----	----
GROUP III: (ASTM F1043) Hot Rolled H-Beam (50,000 psi yield)																			
2 1/4" x 1 5/8"	26.0	19.1	14.5	9.2	6.3	4.5	3.4	2.5	2.0	1.5	1.2	----	----	----	----	----	----	----	----

TABLE 5
LINE POST SELECTION GUIDE: WIND SPEED 110 MPH
EXPOSURE CATEGORY "B"

LINE POST SIZE	LINE POST MAXIMUM SPACING, S (FEET) FOR USE IN EQUATION: S' = S x Cf1 x Cf2 x Cf3 FENCE HEIGHT (FEET)																		
	3	3.5	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Group IA: (ASTM F1043) Schedule 40 Steel Pipe, ASTM F1083-06 Regular Grade (30,000 psi yield)																			
1 7/8"	5.3	3.9	2.9	1.8	1.2	----	----	----	----	----	----	----	----	----	----	----	----	----	----
2 3/8"	9.2	6.8	5.1	3.2	2.2	1.6	1.1	----	----	----	----	----	----	----	----	----	----	----	----
2 7/8"	17.5	12.8	9.8	6.2	4.3	3.1	2.3	1.8	1.4	1.1	----	----	----	----	----	----	----	----	----
3 1/2"	28.4	20.9	16.0	10.2	7.0	5.1	3.9	3.0	2.4	2.0	1.6	1.3	1.1	----	----	----	----	----	----
4	39.6	29.0	22.2	14.2	9.8	7.2	5.5	4.3	3.4	2.8	2.3	1.9	1.6	1.4	1.2	1.0	----	----	----
6 5/8"	----	----	----	50.7	35.2	25.8	19.7	15.6	12.6	10.4	8.7	7.4	6.4	5.5	4.8	4.3	3.8	3.4	3.0
8 5/8"	----	----	----	----	----	51.1	39.1	30.9	25.0	20.6	17.3	14.8	12.7	11.1	9.7	8.6	7.6	6.8	6.2
Group IC: (ASTM F1043) Steel Pipe (50,000 psi yield)																			
1 5/8"	5.3	3.8	2.8	1.7	1.1	----	----	----	----	----	----	----	----	----	----	----	----	----	----
1 7/8"	7.6	5.6	4.2	2.6	1.7	1.1	----	----	----	----	----	----	----	----	----	----	----	----	----
2 3/8"	13.4	9.8	7.4	4.7	3.2	2.2	1.6	1.2	----	----	----	----	----	----	----	----	----	----	----
2 7/8"	24.2	17.7	13.5	8.6	5.9	4.3	3.2	2.4	1.9	1.5	1.2	----	----	----	----	----	----	----	----
3 1/2"	37.0	27.1	20.7	13.2	9.1	6.6	5.0	3.9	3.1	2.5	2.0	1.7	1.4	1.1	----	----	----	----	----
4	49.2	36.1	27.6	17.6	12.2	8.9	6.8	5.3	4.2	3.4	2.8	2.4	2.0	1.7	1.4	1.2	1.0	----	----
Group IA: Intermediate Grade Schedule 40 Steel Pipe, ASTM F 1083-06 Intermediate Grade (50,000 psi yield)																			
6 5/8"	----	----	----	----	58.6	43.0	32.8	25.9	20.9	17.2	14.4	12.2	10.5	9.0	7.9	6.9	6.1	5.4	4.8
8 5/8"	----	----	----	----	----	----	----	51.4	41.5	34.3	28.7	24.4	21.0	18.2	15.9	14.0	12.4	11.1	9.9
Group IA: High Strength 83000 Grade Schedule 40 Pipe, ASTM F 1083-06 High Strength Grade (83,000 psi yield)																			
1 5/8"	10.5	7.6	5.7	3.5	2.2	1.4	----	----	----	----	----	----	----	----	----	----	----	----	----
1 7/8"	14.7	10.7	8.1	5.0	3.3	2.3	1.6	1.1	----	----	----	----	----	----	----	----	----	----	----
2 3/8"	25.6	18.7	14.2	9.0	6.1	4.3	3.2	2.3	1.8	1.3	----	----	----	----	----	----	----	----	----
2 7/8"	48.5	35.6	27.2	17.3	11.9	8.6	6.5	5.0	3.9	3.1	2.5	2.0	1.6	1.3	1.0	----	----	----	----
3 1/2"	----	57.8	44.2	28.2	19.5	14.2	10.8	8.4	6.7	5.4	4.5	3.7	3.1	2.6	2.2	1.8	1.5	1.3	1.1
4	----	----	----	39.3	27.2	19.9	15.1	11.9	9.5	7.8	6.4	5.4	4.6	3.9	3.3	2.8	2.5	2.1	1.8
GROUP II: (ASTM F1043) High Strength Cold Rolled Formed C-Shape (50,000 psi yield)																			
1 7/8" x 1 5/8"x.105	5.7	4.2	3.1	2.0	1.3	----	----	----	----	----	----	----	----	----	----	----	----	----	----
1 7/8" x 1 5/8"x.121	9.7	7.1	5.4	3.3	2.2	1.6	1.1	----	----	----	----	----	----	----	----	----	----	----	----
2 1/4" x 1 5/8" x.121	11.2	8.2	6.2	3.9	2.6	1.8	1.3	----	----	----	----	----	----	----	----	----	----	----	----
3 1/4" x 2 1/2" x .130	27.6	20.1	15.3	9.5	6.4	4.4	3.1	2.2	1.6	1.1	----	----	----	----	----	----	----	----	----
GROUP III: (ASTM F1043) Hot Rolled H-Beam (50,000 psi yield)																			
2 1/4" x 1 5/8"	21.5	15.8	12.0	7.6	5.2	3.7	2.8	2.1	1.6	1.3	----	----	----	----	----	----	----	----	----

TABLE 6
LINE POST SELECTION GUIDE: WIND SPEED 120 MPH
EXPOSURE CATEGORY "B"

LINE POST SIZE	LINE POST MAXIMUM SPACING, S (FEET) FOR USE IN EQUATION: S' = S x Cf1 x Cf2 x Cf3 FENCE HEIGHT (FEET)																		
	3	3.5	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Group IA: (ASTM F1043) Schedule 40 Steel Pipe, ASTM F1083-06 Regular Grade (30,000 psi yield)																			
1 7/8"	4.5	3.3	2.5	1.5	1.0	----	----	----	----	----	----	----	----	----	----	----	----	----	----
2 3/8"	7.8	5.7	4.3	2.7	1.8	1.3	----	----	----	----	----	----	----	----	----	----	----	----	----
2 7/8"	14.7	10.8	8.2	5.2	3.6	2.6	2.0	1.5	1.2	----	----	----	----	----	----	----	----	----	----
3 1/2"	23.9	17.5	13.4	8.6	5.9	4.3	3.3	2.6	2.0	1.7	1.4	1.1	----	----	----	----	----	----	----
4	33.2	24.4	18.7	11.9	8.3	6.0	4.6	3.6	2.9	2.4	2.0	1.6	1.4	1.2	1.0	----	----	----	----
6 5/8"	----	----	----	42.6	29.5	21.7	16.6	13.1	10.6	8.7	7.3	6.2	5.3	4.6	4.1	3.6	3.2	2.8	2.5
8 5/8"	----	----	----	----	58.5	42.9	32.9	25.9	21.0	17.3	14.6	12.4	10.7	9.3	8.2	7.2	6.4	5.7	5.2
Group IC: (ASTM F1043) Steel Pipe (50,000 psi yield)																			
1 5/8"	4.4	3.2	2.4	1.4	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
1 7/8"	6.4	4.7	3.5	2.2	1.4	----	----	----	----	----	----	----	----	----	----	----	----	----	----
2 3/8"	11.2	8.2	6.3	3.9	2.7	1.9	1.4	1.0	----	----	----	----	----	----	----	----	----	----	----
2 7/8"	20.3	14.9	11.4	7.2	4.9	3.6	2.7	2.0	1.6	1.3	----	----	----	----	----	----	----	----	----
3 1/2"	31.1	22.8	17.4	11.1	7.7	5.6	4.2	3.3	2.6	2.1	1.7	1.4	1.2	----	----	----	----	----	----
4	41.3	30.3	23.2	14.8	10.2	7.5	5.7	4.4	3.5	2.9	2.4	2.0	1.7	1.4	1.2	1.0	----	----	----
Group IA: Intermediate Grade Schedule 40 Steel Pipe, ASTM F 1083-06 Intermediate Grade (50,000 psi yield)																			
6 5/8"	----	----	----	----	49.2	36.1	27.6	21.8	17.6	14.5	12.1	10.3	8.8	7.6	6.6	5.8	5.1	4.6	4.1
8 5/8"	----	----	----	----	----	----	54.7	43.2	34.9	28.8	24.1	20.5	17.6	15.3	13.4	11.8	10.5	9.3	8.4
Group IA: High Strength 83000 Grade Schedule 40 Pipe, ASTM F 1083-06 High Strength Grade (83,000 psi yield)																			
1 5/8"	8.8	6.4	4.8	2.9	1.9	1.2	----	----	----	----	----	----	----	----	----	----	----	----	----
1 7/8"	12.4	9.0	6.8	4.2	2.8	1.9	1.3	----	----	----	----	----	----	----	----	----	----	----	----
2 3/8"	21.5	15.7	12.0	7.5	5.1	3.6	2.7	2.0	1.5	1.1	----	----	----	----	----	----	----	----	----
2 7/8"	40.7	29.9	22.8	14.5	10.0	7.2	5.4	4.2	3.3	2.6	2.1	1.7	1.3	1.1	----	----	----	----	----
3 1/2"	----	48.6	37.2	23.7	16.4	11.9	9.1	7.1	5.6	4.6	3.7	3.1	2.6	2.2	1.8	1.5	1.3	1.1	----
4	----	----	51.7	33.0	22.9	16.7	12.7	10.0	8.0	6.5	5.4	4.5	3.8	3.3	2.8	2.4	2.1	1.8	1.5
GROUP II: (ASTM F1043) High Strength Cold Rolled Formed C-Shape (50,000 psi yield)																			
1 7/8" x 1 5/8"x.105	4.8	3.5	2.6	1.6	1.1	----	----	----	----	----	----	----	----	----	----	----	----	----	----
1 7/8" x 1 5/8"x.121	8.1	5.9	4.5	2.8	1.9	1.3	----	----	----	----	----	----	----	----	----	----	----	----	----
2 1/4" x 1 5/8" x.121	9.4	6.9	5.2	3.2	2.2	1.5	1.1	----	----	----	----	----	----	----	----	----	----	----	----
3 1/4" x 2 1/2" x .130	23.2	16.9	12.8	8.0	5.3	3.7	2.6	1.9	1.3	----	----	----	----	----	----	----	----	----	----
GROUP III: (ASTM F1043) Hot Rolled H-Beam (50,000 psi yield)																			
2 1/4" x 1 5/8"	18.1	13.2	10.1	6.4	4.4	3.1	2.3	1.8	1.4	1.1	----	----	----	----	----	----	----	----	----

TABLE 7
LINE POST SELECTION GUIDE: WIND SPEED 130 MPH
EXPOSURE CATEGORY "B"

LINE POST SIZE	LINE POST MAXIMUM SPACING, S (FEET) FOR USE IN EQUATION: S' = S x Cf1 x Cf2 x Cf3 FENCE HEIGHT (FEET)																		
	3	3.5	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Group IA: (ASTM F1043) Schedule 40 Steel Pipe, ASTM F1083-06 Regular Grade (30,000 psi yield)																			
1 7/8"	3.8	2.8	2.1	1.3	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
2 3/8"	6.6	4.8	3.7	2.3	1.6	1.1	----	----	----	----	----	----	----	----	----	----	----	----	----
2 7/8"	12.5	9.2	7.0	4.5	3.1	2.2	1.7	1.3	1.0	----	----	----	----	----	----	----	----	----	----
3 1/2"	20.4	15.0	11.4	7.3	5.0	3.7	2.8	2.2	1.7	1.4	1.2	----	----	----	----	----	----	----	----
4	28.3	20.8	15.9	10.2	7.0	5.1	3.9	3.1	2.5	2.0	1.7	1.4	1.2	1.0	----	----	----	----	----
6 5/8"	----	----	56.7	36.3	25.2	18.5	14.1	11.2	9.0	7.4	6.2	5.3	4.6	4.0	3.5	3.1	2.7	2.4	2.2
8 5/8"	----	----	----	----	49.8	36.6	28.0	22.1	17.9	14.8	12.4	10.6	9.1	7.9	6.9	6.1	5.5	4.9	4.4
Group IC: (ASTM F1043) Steel Pipe (50,000 psi yield)																			
1 5/8"	3.8	2.7	2.0	1.2	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
1 7/8"	5.5	4.0	3.0	1.8	1.2	----	----	----	----	----	----	----	----	----	----	----	----	----	----
2 3/8"	9.6	7.0	5.3	3.4	2.3	1.6	1.2	----	----	----	----	----	----	----	----	----	----	----	----
2 7/8"	17.3	12.7	9.7	6.1	4.2	3.0	2.3	1.7	1.4	1.1	----	----	----	----	----	----	----	----	----
3 1/2"	26.5	19.4	14.9	9.5	6.5	4.8	3.6	2.8	2.2	1.8	1.5	1.2	----	----	----	----	----	----	----
4	35.2	25.8	19.8	12.6	8.7	6.4	4.8	3.8	3.0	2.5	2.0	1.7	1.4	1.2	1.0	----	----	----	----
Group IA: Intermediate Grade Schedule 40 Steel Pipe, ASTM F 1083-06 Intermediate Grade (50,000 psi yield)																			
6 5/8"	----	----	----	----	41.9	30.8	23.5	18.5	15.0	12.3	10.3	8.7	7.5	6.5	5.6	5.0	4.4	3.9	3.5
8 5/8"	----	----	----	----	----	----	46.6	36.8	29.7	24.5	20.6	17.5	15.0	13.0	11.4	10.0	8.9	7.9	7.1
Group IA: High Strength 83000 Grade Schedule 40 Pipe, ASTM F 1083-06 High Strength Grade (83,000 psi yield)																			
1 5/8"	7.5	5.5	4.1	2.5	1.6	1.0	----	----	----	----	----	----	----	----	----	----	----	----	----
1 7/8"	10.6	7.7	5.8	3.6	2.4	1.6	1.1	----	----	----	----	----	----	----	----	----	----	----	----
2 3/8"	18.3	13.4	10.2	6.4	4.4	3.1	2.3	1.7	1.3	----	----	----	----	----	----	----	----	----	----
2 7/8"	34.7	25.5	19.4	12.4	8.5	6.2	4.6	3.6	2.8	2.2	1.8	1.4	1.1	----	----	----	----	----	----
3 1/2"	56.4	41.4	31.7	20.2	14.0	10.2	7.7	6.0	4.8	3.9	3.2	2.6	2.2	1.8	1.6	1.3	1.1	----	----
4	----	57.6	44.1	28.1	19.5	14.2	10.8	8.5	6.8	5.6	4.6	3.9	3.3	2.8	2.4	2.0	1.8	1.5	1.3
GROUP II: (ASTM F1043) High Strength Cold Rolled Formed C-Shape (50,000 psi yield)																			
1 7/8" x 1 5/8"x.105	4.1	3.0	2.3	1.4	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
1 7/8" x 1 5/8"x.121	6.9	5.1	3.8	2.4	1.6	1.1	----	----	----	----	----	----	----	----	----	----	----	----	----
2 1/4" x 1 5/8" x.121	8.0	5.8	4.4	2.8	1.8	1.3	----	----	----	----	----	----	----	----	----	----	----	----	----
3 1/4" x 2 1/2" x .130	19.7	14.4	10.9	6.8	4.6	3.2	2.2	1.6	1.1	----	----	----	----	----	----	----	----	----	----
GROUP III: (ASTM F1043) Hot Rolled H-Beam (50,000 psi yield)																			
2 1/4" x 1 5/8"	15.4	11.3	8.6	5.4	3.7	2.7	2.0	1.5	1.2	----	----	----	----	----	----	----	----	----	----

TABLE 8
LINE POST SELECTION GUIDE: WIND SPEED 140 MPH
EXPOSURE CATEGORY "B"

LINE POST SIZE	LINE POST MAXIMUM SPACING, S (FEET) FOR USE IN EQUATION: S' = S x Cf1 x Cf2 x Cf3 FENCE HEIGHT (FEET)																		
	3	3.5	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Group IA: (ASTM F1043) Schedule 40 Steel Pipe, ASTM F1083-06 Regular Grade (30,000 psi yield)																			
1 7/8"	3.3	2.4	1.8	1.1	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
2 3/8"	5.7	4.2	3.2	2.0	1.4	----	----	----	----	----	----	----	----	----	----	----	----	----	----
2 7/8"	10.8	7.9	6.1	3.9	2.6	1.9	1.4	1.1	----	----	----	----	----	----	----	----	----	----	----
3 1/2"	17.6	12.9	9.9	6.3	4.3	3.2	2.4	1.9	1.5	1.2	----	----	----	----	----	----	----	----	----
4	24.4	17.9	13.7	8.8	6.1	4.4	3.4	2.6	2.1	1.7	1.4	1.2	1.0	----	----	----	----	----	----
6 5/8"	----	----	48.9	31.3	21.7	15.9	12.2	9.6	7.8	6.4	5.4	4.6	3.9	3.4	3.0	2.6	2.3	2.1	1.9
8 5/8"	----	----	----	----	42.9	31.5	24.1	19.1	15.4	12.7	10.7	9.1	7.8	6.8	6.0	5.3	4.7	4.2	3.8
Group IC: (ASTM F1043) Steel Pipe (50,000 psi yield)																			
1 5/8"	3.3	2.4	1.8	1.1	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
1 7/8"	4.7	3.4	2.6	1.6	1.0	----	----	----	----	----	----	----	----	----	----	----	----	----	----
2 3/8"	8.3	6.0	4.6	2.9	2.0	1.4	1.0	----	----	----	----	----	----	----	----	----	----	----	----
2 7/8"	14.9	10.9	8.4	5.3	3.6	2.6	2.0	1.5	1.2	----	----	----	----	----	----	----	----	----	----
3 1/2"	22.8	16.7	12.8	8.2	5.6	4.1	3.1	2.4	1.9	1.5	1.3	1.0	----	----	----	----	----	----	----
4	30.3	22.3	17.0	10.9	7.5	5.5	4.2	3.3	2.6	2.1	1.7	1.5	1.2	1.0	----	----	----	----	----
Group IA: Intermediate Grade Schedule 40 Steel Pipe, ASTM F 1083-06 Intermediate Grade (50,000 psi yield)																			
6 5/8"	----	----	----	52.1	36.2	26.5	20.3	16.0	12.9	10.6	8.9	7.5	6.5	5.6	4.9	4.3	3.8	3.3	3.0
8 5/8"	----	----	----	----	----	52.5	40.2	31.7	25.6	21.1	17.7	15.1	12.9	11.2	9.8	8.7	7.7	6.9	6.1
Group IA: High Strength 83000 Grade Schedule 40 Pipe, ASTM F 1083-06 High Strength Grade (83,000 psi yield)																			
1 5/8"	6.5	4.7	3.5	2.1	1.4	----	----	----	----	----	----	----	----	----	----	----	----	----	----
1 7/8"	9.1	6.6	5.0	3.1	2.0	1.4	----	----	----	----	----	----	----	----	----	----	----	----	----
2 3/8"	15.8	11.5	8.8	5.5	3.8	2.7	2.0	1.5	1.1	----	----	----	----	----	----	----	----	----	----
2 7/8"	29.9	22.0	16.8	10.7	7.3	5.3	4.0	3.1	2.4	1.9	1.5	1.2	----	----	----	----	----	----	----
3 1/2"	48.6	35.7	27.3	17.4	12.0	8.8	6.7	5.2	4.1	3.4	2.8	2.3	1.9	1.6	1.3	1.1	----	----	----
4	----	49.7	38.0	24.3	16.8	12.3	9.3	7.3	5.9	4.8	4.0	3.3	2.8	2.4	2.0	1.8	1.5	1.3	1.1
GROUP II: (ASTM F1043) High Strength Cold Rolled Formed C-Shape (50,000 psi yield)																			
1 7/8" x 1 5/8"x.105	3.5	2.6	1.9	1.2	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
1 7/8" x 1 5/8"x.121	6.0	4.4	3.3	2.1	1.4	----	----	----	----	----	----	----	----	----	----	----	----	----	----
2 1/4" x 1 5/8" x.121	6.9	5.0	3.8	2.4	1.6	1.1	----	----	----	----	----	----	----	----	----	----	----	----	----
3 1/4" x 2 1/2" x .130	17.0	12.4	9.4	5.9	3.9	2.7	1.9	1.4	----	----	----	----	----	----	----	----	----	----	----
GROUP III: (ASTM F1043) Hot Rolled H-Beam (50,000 psi yield)																			
2 1/4" x 1 5/8"	13.3	9.7	7.4	4.7	3.2	2.3	1.7	1.3	----	----	----	----	----	----	----	----	----	----	----

TABLE 9
LINE POST SELECTION GUIDE: WIND SPEED 150 MPH
EXPOSURE CATEGORY "B"

LINE POST SIZE	LINE POST MAXIMUM SPACING, S (FEET) FOR USE IN EQUATION: S' = S x Cf1 x Cf2 x Cf3 FENCE HEIGHT (FEET)																		
	3	3.5	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
Group IA: (ASTM F1043) Schedule 40 Steel Pipe, ASTM F1083-06 Regular Grade (30,000 psi yield)																			
1 7/8"	2.9	2.1	1.6	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
2 3/8"	5.0	3.6	2.8	1.7	1.2	----	----	----	----	----	----	----	----	----	----	----	----	----	----
2 7/8"	9.4	6.9	5.3	3.4	2.3	1.7	1.3	----	----	----	----	----	----	----	----	----	----	----	----
3 1/2"	15.3	11.2	8.6	5.5	3.8	2.8	2.1	1.6	1.3	1.1	----	----	----	----	----	----	----	----	----
4	21.3	15.6	11.9	7.6	5.3	3.9	2.9	2.3	1.9	1.5	1.3	1.0	----	----	----	----	----	----	----
6 5/8"	----	55.6	42.6	27.2	18.9	13.9	10.6	8.4	6.8	5.6	4.7	4.0	3.4	3.0	2.6	2.3	2.0	1.8	1.6
8 5/8"	----	----	----	53.9	37.4	27.5	21.0	16.6	13.4	11.1	9.3	7.9	6.8	5.9	5.2	4.6	4.1	3.7	3.3
Group IC: (ASTM F1043) Steel Pipe (50,000 psi yield)																			
1 5/8"	2.8	2.0	1.5	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
1 7/8"	4.1	3.0	2.3	1.4	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
2 3/8"	7.2	5.3	4.0	2.5	1.7	1.2	----	----	----	----	----	----	----	----	----	----	----	----	----
2 7/8"	13.0	9.5	7.3	4.6	3.2	2.3	1.7	1.3	1.0	----	----	----	----	----	----	----	----	----	----
3 1/2"	19.9	14.6	11.2	7.1	4.9	3.6	2.7	2.1	1.7	1.3	1.1	----	----	----	----	----	----	----	----
4	26.4	19.4	14.8	9.5	6.6	4.8	3.6	2.8	2.3	1.8	1.5	1.3	1.1	----	----	----	----	----	----
Group IA: Intermediate Grade Schedule 40 Steel Pipe, ASTM F 1083-06 Intermediate Grade (50,000 psi yield)																			
6 5/8"	----	----	----	45.4	31.5	23.1	17.7	13.9	11.2	9.3	7.7	6.6	5.6	4.9	4.2	3.7	3.3	2.9	2.6
8 5/8"	----	----	----	----	----	45.8	35.0	27.6	22.3	18.4	15.4	13.1	11.3	9.8	8.6	7.5	6.7	6.0	5.4
Group IA: High Strength 83000 Grade Schedule 40 Pipe, ASTM F 1083-06 High Strength Grade (83,000 psi yield)																			
1 5/8"	5.7	4.1	3.1	1.9	1.2	----	----	----	----	----	----	----	----	----	----	----	----	----	----
1 7/8"	7.9	5.8	4.4	2.7	1.8	1.2	----	----	----	----	----	----	----	----	----	----	----	----	----
2 3/8"	13.7	10.1	7.7	4.8	3.3	2.3	1.7	1.3	----	----	----	----	----	----	----	----	----	----	----
2 7/8"	26.1	19.1	14.6	9.3	6.4	4.6	3.5	2.7	2.1	1.7	1.3	1.1	----	----	----	----	----	----	----
3 1/2"	42.4	31.1	23.8	15.2	10.5	7.6	5.8	4.5	3.6	2.9	2.4	2.0	1.7	1.4	1.2	----	----	----	----
4	58.9	43.3	33.1	21.1	14.6	10.7	8.1	6.4	5.1	4.2	3.5	2.9	2.5	2.1	1.8	1.5	1.3	1.1	----
GROUP II: (ASTM F1043) High Strength Cold Rolled Formed C-Shape (50,000 psi yield)																			
1 7/8" x 1 5/8"x.105	3.1	2.2	1.7	1.0	----	----	----	----	----	----	----	----	----	----	----	----	----	----	----
1 7/8" x 1 5/8"x.121	5.2	3.8	2.9	1.8	1.2	----	----	----	----	----	----	----	----	----	----	----	----	----	----
2 1/4" x 1 5/8" x.121	6.0	4.4	3.3	2.1	1.4	----	----	----	----	----	----	----	----	----	----	----	----	----	----
3 1/4" x 2 1/2" x .130	14.8	10.8	8.2	5.1	3.4	2.4	1.7	1.2	----	----	----	----	----	----	----	----	----	----	----
GROUP III: (ASTM F1043) Hot Rolled H-Beam (50,000 psi yield)																			
2 1/4" x 1 5/8"	11.6	8.5	6.5	4.1	2.8	2.0	1.5	1.1	----	----	----	----	----	----	----	----	----	----	----

				TABLE 10				
		Mesh and Fabric Size Coefficients (Cf_1)*						
FABRIC WIRE SIZE (O.D.)		3/8"	½'	5/8"	1".	1 ¼"	1 ¾"	2"
metric equiv. (mm) =>		9.5	12.7	15.8	25.4	31.8	44.5	50.8
diam. (in)	**diam(mm)**							
.#5 (0.207)	5.26				2.92	3.52	4.73	5.33
#6 (0.192)	4.88				3.30	3.75	5.06	5.71
#8 (0.162)	4.11				3.58	4.36	5.89	6.67
#9 (0.148)	3.76	1.77	2.20	2.60	3.87	4.73	6.40	7.26
10 (0.135)	3.43	1.88	2.36	2.80	4.19	5.13	6.96	7.90
11 (0.120)	*3.05*	2.06	2.60	3.10	4.65	5.71	7.77	8.83
12 (0.113)	2.87	2.16	2.72	3.25	4.91	6.04	8.22	9.35
*** -(Cf_1) =1 for solid panel fence**								

TABLE 11

WIND EXPOSURE CATEGORY COEFFICIENTS (Cf2)

EXPOSURE CATEGORY	Kz		WIND COEFFICIENT: (Kz EXP B) / (Kz)	
Fence height	0-15 FT	15-20 FT	0-15 FT	15-20 FT
B	0.57	0.62	1.00	1.00
C	0.85	0.9	0.67	0.69
D	1.03	1.08	0.55	0.57

NOTES:

EXPOSURE B: Urban and suburban areas, wooded areas or other terrain with numerous closely spaced obstructions having the size of single-family dwellings or larger.

EXPOSURE C: Open terrain with scattered obstructions having heights generally less than 30 ft. This includes flat open country, grasslands, and all water surfaces in hurricane prone regions.

EXPOSURE D: Flat, unobstructed areas and water surfaces outside hurricane-prone regions. This category includes smooth mud flats, salt flats, and unbroken ice.

TABLE 12

Ice Exposure Coefficients (C_{f3})

Regional Conditions	C_{f3}
Regions likely to experience heavy ice storms	0.45
Regions subject to moderate icing effects	0.85
Regions **not** subject to the effects of icing	1.00

NOTES

1 Maximum spacing of posts may be limited by top rail design.

2 Recommended maximum spacing of posts not to exceed 10'-0"

3 For solid fence use exposure coefficient (C_{f3})=1.0

4 Ice exposure coefficient is an arbitrary value that may be assigned based on the judgment of the designer, considering the probability of an event occurring where maximum ice accumulation and peak wind velocity occurs at the same time in the locality the fence is installed.

TABLE 13

Line Post Material Properties Table

Nominal O.D. Size	O.D. (in)	I.D. (in)	S_x (in^3)	I_x (in^4)	F_y (kip/in^2)	M_{allow} (kip-ft)	E_m (kip/in^2)
Group IA: (ASTM F1043) Schedule 40 Steel Pipe ASTM F1083-06 Regular Grade 30,000 psi yield							
1 7/8"	1.900	1.610	0.33	0.31	30	0.54	29000
2 3/8"	2.375	2.067	0.56	0.67	30	0.93	29000
2 7/8"	2.875	2.469	1.06	1.53	30	1.76	29000
3 1/2"	3.500	3.068	1.72	3.02	30	2.84	29000
4"	4.000	3.548	2.39	4.79	30	3.95	29000
6 5/8"	6.625	6.065	8.50	28.14	30	14.02	29000
8 5/8"	8.625	7.981	16.81	72.49	30	27.74	29000
Group IA: Intermediate Grade Schedule 40 Steel Pipe, ASTM F 1083-06 Intermediate Grade 50,000 psi yield							
6 5/8"	6.625	6.065	8.50	28.14	50	23.37	29000
8 5/8"	8.625	7.981	16.81	72.49	50	46.23	29000
Group IA: High Strength 83000 Grade Schedule 40 Pipe, ASTM F 1083-06 High Strength 83000 Grade, 83,000 psi							
1 5/8"	1.660	1.380	0.23	0.19	83	1.07	29000
1 7/8"	1.900	1.610	0.33	0.31	83	1.49	29000
2 3/8"	2.375	2.067	0.56	0.67	83	2.57	29000
2 7/8"	2.875	2.469	1.06	1.53	83	4.87	29000
3 1/2"	3.500	3.068	1.72	3.02	83	7.86	29000
4"	4.000	3.548	2.39	4.79	83	10.95	29000
Group IC: (ASTM F1043) High Carbon Steel Pipe 50,000psi yield							
1 5/8"	1.660	1.438	0.20	0.16	50	0.54	29000
1 7/8"	1.900	1.660	0.28	0.27	50	0.77	29000
2 3/8"	2.375	2.115	0.49	0.58	50	1.34	29000
2 7/8"	2.875	2.555	0.88	1.26	50	2.41	29000
3 1/2"	3.500	3.180	1.34	2.35	50	3.69	29000
4"	4.000	3.680	1.78	3.56	50	4.90	29000
Group II: (ASTM F1043) Cold Rolled Formed C-Shape - 50,000 psi yield							
-	1 7/8" x 1 5/8"x.105		0.23	0.33	50	0.63	29000
-	1 7/8" x 1 5/8"x.121		0.39	0.36	50	1.07	29000
-	2 1/4" x 1 5/8" x.121		0.45	0.52	50	1.24	29000
-	3 1/4" x 2 1/2" x .130		1.11	1.88	50	3.05	29000
Group III: (ASTM F1043) Hot Rolled H-Beam							
-	2 1/4" x 1 45/64"		0.86	0.97	45	2.12	29000

S_x	Section Modulus
I_x	Moment of Inertia
Fy	Minimum Yield Strength
M_{allow}	Allowable Moment Capacity of Post: $(F_y)(S_x)$O.66/12 in./ft.
E_m	Modulus of Elasticity of Material

TABLE 14

DESIGN WIND PRESSURE, q (LB / SF)

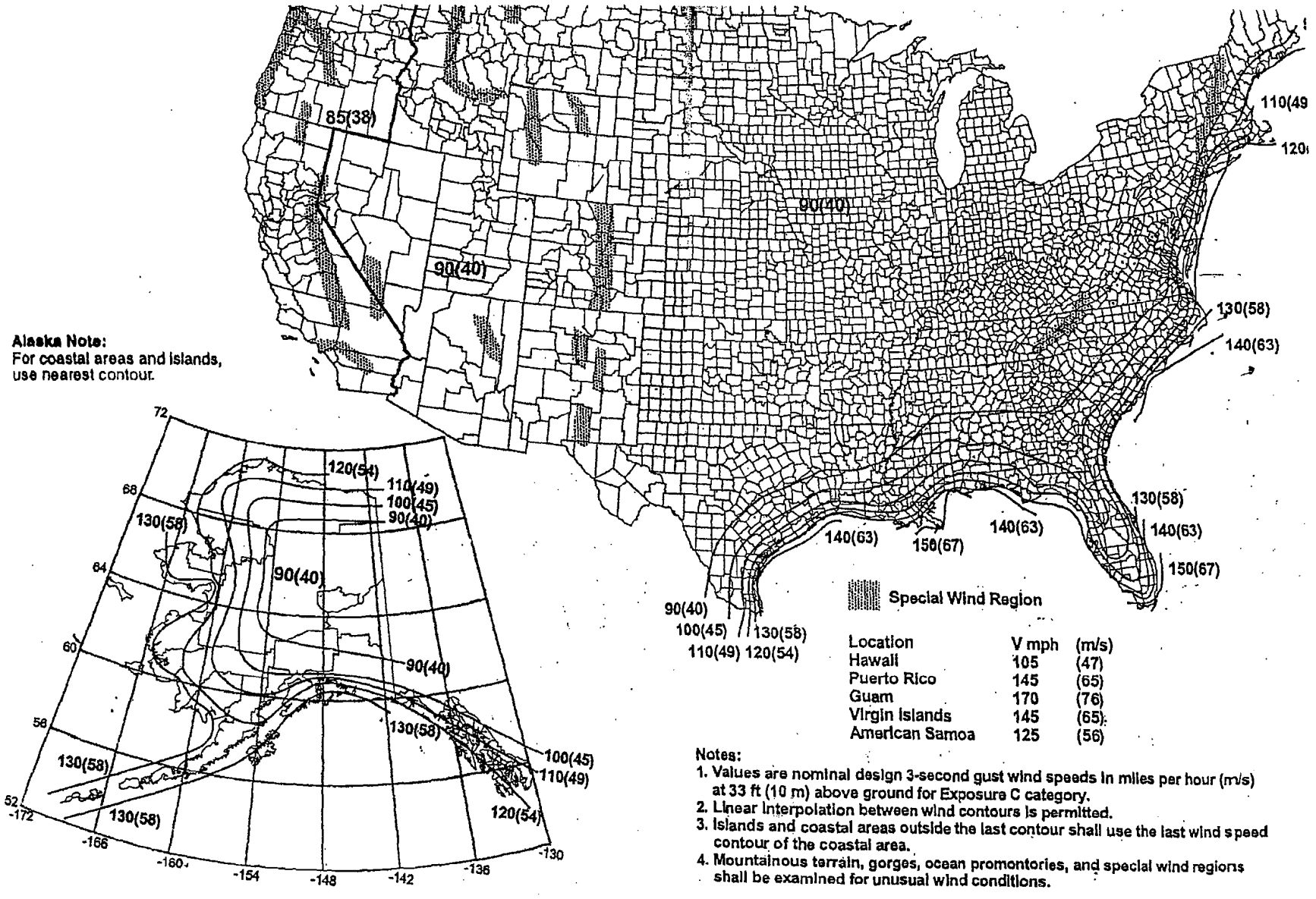
EXPOSURE CATEGORY	Height (ft)	Kz	WIND VELOCITY (MPH)								
			70	85	90	100	110	120	130	140	150
B	0-15	0.57	6.72	9.90	11.10	13.71	16.58	19.74	23.16	26.86	30.84
	15-20	0.62	7.30	10.77	12.08	14.91	18.04	21.47	25.19	29.22	33.54
C	0-15	0.85	10.01	14.77	16.55	20.44	24.73	29.43	34.54	40.06	45.99
	15-20	0.90	10.60	15.64	17.53	21.64	26.18	31.16	36.57	42.42	48.69
D	0-15	1.03	12.14	17.89	20.06	24.77	29.97	35.66	41.85	48.54	55.72
	15-20	1.08	12.72	18.76	21.03	25.97	31.42	37.39	43.89	50.90	58.43

NOTES:

$q = (0.00256)(Kz)(Kzt)(Kd)(G)(Cf)(V^2)(I)$

Kz = EXPOSURE COEFFICIENT (GIVEN ABOVE)
Kzt = 1.0 (TOPOGRAPHIC FACTOR, PRESUMED = 1 FOR NO TOPOGRAPHIC EFFECTS)
Kd = 0.85 (DIRECTIONALITY FACTOR
G = .85 (GUST FACTOR)
Cf = 1.3 (FORCE COEFFICIENT)
V = VELOCITY (GIVEN ABOVE)
I = 1.0 (IMPORTANCE FACTOR

REF: ASCE 7-05, "MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES"



Location	V mph	(m/s)
Hawaii	105	(47)
Puerto Rico	145	(65)
Guam	170	(76)
Virgin Islands	145	(65)
American Samoa	125	(56)

Notes:
1. Values are nominal design 3-second gust wind speeds in miles per hour (m/s) at 33 ft (10 m) above ground for Exposure C category.
2. Linear interpolation between wind contours is permitted.
3. Islands and coastal areas outside the last contour shall use the last wind speed contour of the coastal area.
4. Mountainous terrain, gorges, ocean promontories, and special wind regions shall be examined for unusual wind conditions.

FIGURE 6-1

Data Source: ASCE Wind Load Section 6

APPENDIX

METRIC CONVERSION FACTORS

LENGTH:

1Ft	=	0.304 8 m
1In	=	25.4 mm

AREA:

1 sq ft	=	0.0929 sq m
1 sq in	=	645.16 sq mm

VELOCITY, SPEED:

1 Mph	=	1.6093 km/h

MASS:

1 lb	=	0.4536 kg

MASS PER UNIT AREA:

1 lb/sq ft	=	4.88224 kg/sq m

FORCE:

1 kip (1,000 lbf) = 4.44822 kN
1 lbf (pound-force) = 4.44822 N

FORCE PER UNIT LENGTH:

1 lb/ft	=	14.5939 N/m
1 lb/in	=	175.1268 N

PRESSURE, STRESS, MODULUS OF ELASTICITY (FORCE/UNIT AREA):

1 lb/sq in	=	6.8947 kPa
1 lb/sq ft	=	47.8803 Pa

6.5. 10 Velocity Pressure.

Velocity pressure, q_z, evaluated at height z shall be calculated by the following equation:

$$qz = 0.00256\ K_z K_{zt} K_d\ V^2\ I\ (\text{lb/ft}^2)$$

[In SI: $q_z = 0.613\ KzKztKd\ V^2\ I\ (N/m^2)$; V in m/s]

(Eq. 6-15)

where Kd is the wind directionality factor defined in Section 6.5.4.4, Kz is the velocity pressure exposure coefficient defined in Section 6.5.6.6 and Kzt is the topographic factor defined in Section 6.5.7.2, and qh is the velocity pressure calculated using Eq. 6-15 at mean roof height h.

The numerical coefficient 0.00256 (0.613 in SI) shall be used except where sufficient climatic data are available to justify the selection of a different value of this factor for a design application

6.5.6.3 Exposure Categories.

Exposure B: Exposure B shall apply where the ground surface roughness condition, as defined by Surface Roughness B, prevails in the upwind direction for a distance of at least 2600 ft (792 m) or 20 times the height of the building, whichever is greater.

Exception: For buildings whose mean roof height is less than or equal to 30 ft (9.1 m), the upwind distance may be reduced to 1500 ft (457 m).

Exposure C: Exposure C shall apply for all cases where exposures B or D do not apply.

Exposure D: Exposure D shall apply where the ground surface roughness, as defined by surface roughness D, prevails in the upwind direction for a distance at least 5000 ft (1524 m) or 20 times the building height, whichever is greater. Exposure D shall extend inland from the shoreline for a distance of 660 ft (200 m) or 20 times the height of the building, whichever is greater.

For a site located in the transition zone between exposure categories, the category resulting in the largest wind forces shall be used. Exception: An intermediate exposure between the preceding categories is permitted in a transition zone provided that it is determined by a rational analysis method defined in the recognized literature.

Terrain Exposure Constants

Table 6-2

Exposure	α	z_g (ft)	$\hat{a}$	$\hat{b}$	$\bar{\alpha}$	$\bar{b}$	c	ℓ (ft)	$\bar{\epsilon}$	z_{min} (ft)*
B	7.0	1200	1/7	0.84	1/4.0	0.45	0.30	320	1/3.0	30
C	9.5	900	1/9.5	1.00	1/6.5	0.65	0.20	500	1/5.0	15
D	11.5	700	1/11.5	1.07	1/9.0	0.80	0.15	650	1/8.0	7

*z_{min} = minimum height used to ensure that the equivalent height $\bar{z}$ is greater of $0.6h$ or z_{min}. For buildings with $h \le z_{min}$, $\bar{z}$ shall be taken as z_{min}.

Wind Directionality Factor, K_d

Table 6-4

Structure Type	Directionality Factor K_d*
Buildings	
Main Wind Force Resisting System	0.85
Components and Cladding	0.85
Arched Roofs	0.85
Chimneys, Tanks, and Similar Structures	
Square	0.90
Hexagonal	0.95
Round	0.95
Solid Signs	0.85
Open Signs and Lattice Framework	0.85
Trussed Towers	
Triangular, square, rectangular	0.85
All other cross sections	0.95

*Directionality Factor K_d has been calibrated with combinations of loads specified in Section 2. This factor shall only be applied when used in conjunction with load combinations specified in 2.3 and 2.4.

Velocity Pressure Exposure Coefficients, K_h and K_z

Table 6-3

Height above ground level, z		Exposure (Note 1)			
		B		C	D
ft	(m)	Case 1	Case 2	Cases 1 & 2	Cases 1 & 2
0-15	(0-4.6)	0.70	0.57	0.85	1.03
20	(6.1)	0.70	0.62	0.90	1.08
25	(7.6)	0.70	0.66	0.94	1.12
30	(9.1)	0.70	0.70	0.98	1.16
40	(12.2)	0.76	0.76	1.04	1.22
50	(15.2)	0.81	0.81	1.09	1.27
60	(18)	0.85	0.85	1.13	1.31
70	(21.3)	0.89	0.89	1.17	1.34
80	(24.4)	0.93	0.93	1.21	1.38
90	(27.4)	0.96	0.96	1.24	1.40
100	(30.5)	0.99	0.99	1.26	1.43
120	(36.6)	1.04	1.04	1.31	1.48
140	(42.7)	1.09	1.09	1.36	1.52
160	(48.8)	1.13	1.13	1.39	1.55
180	(54.9)	1.17	1.17	1.43	1.58
200	(61.0)	1.20	1.20	1.46	1.61
250	(76.2)	1.28	1.28	1.53	1.68
300	(91.4)	1.35	1.35	1.59	1.73
350	(106.7)	1.41	1.41	1.64	1.78
400	(121.9)	1.47	1.47	1.69	1.82
450	(137.2)	1.52	1.52	1.73	1.86
500	(152.4)	1.56	1.56	1.77	1.89

Notes:

1. **Case 1:** a. All components and cladding.
   b. Main wind force resisting system in low-rise buildings designed using Figure 6-10.

   Case 2: a. All main wind force resisting systems in buildings except those in low-rise buildings designed using Figure 6-10.
   b. All main wind force resisting systems in other structures.
2. The velocity pressure exposure coefficient K_z may be determined from the following formula:

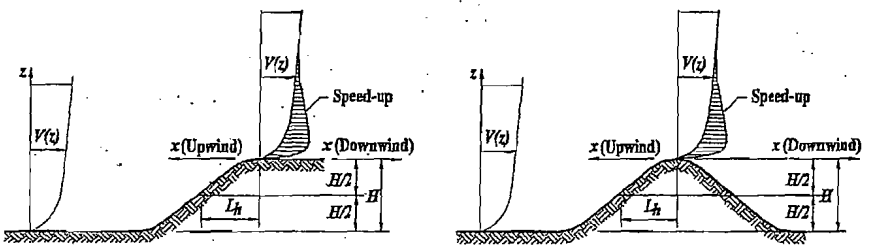
   For 15 ft. $\leq z \leq z_g$ $\quad K_z = 2.01\ (z/z_g)^{2/\alpha}$

   For $z < 15$ ft. $\quad K_z = 2.01\ (15/z_g)^{2/\alpha}$

   Note: z shall not be taken less than 30 feet for Case 1 in exposure B.
3. α and z_g are tabulated in Table 6-2.
4. Linear interpolation for intermediate values of height z is acceptable.
5. Exposure categories are defined in 6.5.6.

Topographic Factor, K_{zt} – Method 2

Figure 6-4



ESCARPMENT **2-D RIDGE OR 3-D AXISYMMETRICAL HILL**

Topographic Multipliers for Exposure C

H/L_h	K_1 Multiplier			x/L_h	K_2 Multiplier		z/L_h	K_3 Multiplier		
	2-D Ridge	2-D Escarp.	3-D Axisym. Hill		2-D Escarp.	All Other Cases		2-D Ridge	2-D Escarp.	3-D Axisym. Hill
0.20	0.29	0.17	0.21	0.00	1.00	1.00	0.00	1.00	1.00	1.00
0.25	0.36	0.21	0.26	0.50	0.88	0.67	0.10	0.74	0.78	0.67
0.30	0.43	0.26	0.32	1.00	0.75	0.33	0.20	0.55	0.61	0.45
0.35	0.51	0.30	0.37	1.50	0.63	0.00	0.30	0.41	0.47	0.30
0.40	0.58	0.34	0.42	2.00	0.50	0.00	0.40	0.30	0.37	0.20
0.45	0.65	0.38	0.47	2.50	0.38	0.00	0.50	0.22	0.29	0.14
0.50	0.72	0.43	0.53	3.00	0.25	0.00	0.60	0.17	0.22	0.09
				3.50	0.13	0.00	0.70	0.12	0.17	0.06
				4.00	0.00	0.00	0.80	0.09	0.14	0.04
							0.90	0.07	0.11	0.03
							1.00	0.05	0.08	0.02
							1.50	0.01	0.02	0.00
							2.00	0.00	0.00	0.00

Notes:

1. For values of H/L_h, x/L_h and z/L_h other than those shown, linear interpolation is permitted.
2. For $H/L_h > 0.5$, assume $H/L_h = 0.5$ for evaluating K_1 and substitute $2H$ for L_h for evaluating K_2 and K_3.
3. Multipliers are based on the assumption that wind approaches the hill or escarpment along the direction of maximum slope.
4. Notation:

   H: Height of hill or escarpment relative to the upwind terrain, in feet (meters).

   L_h: Distance upwind of crest to where the difference in ground elevation is half the height of hill or escarpment, in feet (meters).

   K_1: Factor to account for shape of topographic feature and maximum speed-up effect.

   K_2: Factor to account for reduction in speed-up with distance upwind or downwind of crest.

   K_3: Factor to account for reduction in speed-up with height above local terrain.

   x: Distance (upwind or downwind) from the crest to the building site, in feet (meters).

   z: Height above local ground level, in feet (meters).

   μ: Horizontal attenuation factor.

   γ: Height attenuation factor.

REFERENCES

ASCE Publication ASCE 7-05, "Minimum Load Design Criteria for Buildings and Other Structures," Section 6, Wind Loads.

American Society of Testing Materials Standard, ASTM F-I043, Standard Specification for Strength and Protective Coatings on Metal Industrial Chain Link Fence Framework

American Society of Testing Materials Standard, ASTM F-567, Standard Practice for Installation of Chain Link Fence.

American Society of Testing Materials Standard, ASTM F-I083-06, Pipe, Steel, Hot-Dipped Zinc Coated (Galvanized) Welded for Fence Structures

Chain Link Fence Manufacturers Institute Publication, "Measurement of Wind velocity for Solid Covered Fences, Steel and Aluminum," January 1976

Transmission Structures, Chapter 2, "Concrete Footing Design and Details," DS-10-7, 3/8/65

American Institute of Steel Construction, "Manual of Steel Construction-Allowable Stress Design"

2/20/08
revisions