Louis Poulsen USA Post Top Wind Load Technical Guide

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Introduction

Wind loading is an important consideration in determining the correct pole design that will safely support the mounted post top luminaires. Wind load evaluation estimates the forces applied to a pole when winds push against the mounted post top luminaire. A pole's strength is determined by its specifications including material, height, and cross section geometry. The pole's strength should exceed the estimated wind loads by a certain safety margin to be considered safe to use.

The luminaire's weight and effective projected area (EPA) are included in the loading estimate. A luminaire's EPA is based on the profile that has the largest cross section area and has units of square feet and adjusted for certain geometric factors. Wind speeds to be considered vary by location and by elevation above ground. The AASHTO standard maps the forecasted ground level wind speeds used in this analysis, and vary from 85 MPH up to 150 MPH.

On the next page, one table shows the post top luminaires' EPA and weights. The second table shows the standard pole designs' maximum EPA limit that can be supported based on pole height and wind speed up to 110 MPH. The following standard pole designs are included:

- Round Straight Aluminum (RSA-4.5", 0.13" WALL)
- Dual Round Aluminum (DRA-5"-3", .16" WALL)
- Taper 5"-2.4", 0.19" WALL

The Nyhavn Park and Flindt Plaza utilize different pole designs. They have separate sections that follow for wind loading guidance.

To use the tables, one can select a post top luminaire, note its EPA. Then, referencing the second table, one can check if this EPA is below the maximum limit for the desired pole design and wind speed.

For example, the Albertslund Maxi post top has an EPA of 1.8 square feet. The second table shows that a RSA-4.5" pole of 12 ft height in a wind speed of 100 MPH has a maximum EPA limit of 4.2 square feet. As the pole design limit is higher than the post top's EPA, this combination meets the AASHTO standard.

Please contact Louis Poulsen or their sales representatives for wind speeds or pole designs not shown. Louis Poulsen frequently provides custom pole designs tailored to meet their clients specifications. Alternative pole heights, direct bury mounting, banner arms or accommodations for photometric sensors are commonly provided.

Reference Tables

Post top	EPA (sq ft)	Weight (lbs)
Albertslund Maxi	1.8	38
Albertslund Mini	1.1	22
Flindt Plaza	See Flindt Plaza section	
Homann Park	0.6	14
HW Patina	1.3	19
Kastrup	1.3	19
Kipp	1.7	29
LP Capsule	1.3	18
LP Icon Mini	1.4	26
LP Nest	1.3	23
LP Xperi	1.0	22
Nyhavn Park	2.0	32
Toldbod	0.6	24

Maximum Post Top Effective Projected Area (EPA), square feet

	Round Straight Aluminum (RSA-4.5", 0.13" WALL)			Dual Round Aluminum (DRA-5"-3", .16" WALL)		
Wind Speed	**10 FT**	**12 FT**	**14 FT**	**10 FT**	**12 FT**	**14 FT**
90 MPH	7.1	5.3	3.5	5.3	3.7	2.9
100 MPH	5.6	4.2	2.6	4.1	2.8	2.1
110 MPH	4.6	3.4	1.9	3.3	2.1	1.6

	Taper 5"-2.4", 0.19" WALL				
Wind Speed	**10 FT**	**12 FT**	**14 FT**	**16 FT**	**18 FT**
90 MPH	9.5	11.4	9.2	7.2	5.6
100 MPH	7.5	9.0	7.2	5.5	4.2
110 MPH	6.1	7.3	5.7	4.3	3.2

The information provided is for reference only. All projects involving these products should be evaluated by professionals for compliance to applicable codes and safety requirements. The data in this document is based on the 2013 AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals. This includes the AASTHO LTS-5 wind map that is based on the association's 3-second gust methodology.

Nyhavn Park

The poles for Nyhavn Park are unique and different from the above shown poles. The following tables provide guidance that are exclusive to Nyhavn Park, both in single and twin mounted arrangements. The pole height and light section quantity combinations that are marked as “STANDARD” are compliant to that wind speed per 2013 AASHTO standard. “CUSTOM” indicates the standard pole design will not STANDARD the loading requirements and alternative pole design must be developed. Standard pole design is straight, round aluminum, 4.0 inch outside diameter, 0.23 inch wall thickness, (4) ¾ inch anchor bolts on 7.5 inch bolt diameter.

	Luminaire(s) EPA (sq ft)	Post arm bracket EPA (sq ft)	Combined EPA (sq ft)	Combined weight (lbs)
Nyhavn Park, single mount	2.0	1.3	3.3	42.0
Nyhavn Park, twin mount	4.0	1.6	5.6	78.0

Pole height: 8 feet				
	90 MPH	100 MPH	110 MPH	>110 MPH
Nyhavn Park, single mount	STANDARD	STANDARD	STANDARD	CUSTOM
Nyhavn Park, twin mount	STANDARD	STANDARD	CUSTOM	CUSTOM

Pole height: 10 feet				
	90 MPH	100 MPH	110 MPH	>110 MPH
Nyhavn Park, single mount	STANDARD	STANDARD	STANDARD	CUSTOM
Nyhavn Park, twin mount	STANDARD	CUSTOM	CUSTOM	CUSTOM

Pole height: 12 feet				
	90 MPH	100 MPH	110 MPH	>110 MPH
Nyhavn Park, single mount	STANDARD	STANDARD	STANDARD	CUSTOM
Nyhavn Park, twin mount	STANDARD	CUSTOM	CUSTOM	CUSTOM

Pole height: 14 feet				
	90 MPH	100 MPH	110 MPH	>110 MPH
Nyhavn Park, single mount	STANDARD	STANDARD	STANDARD	CUSTOM
Nyhavn Park, twin mount	CUSTOM	CUSTOM	CUSTOM	CUSTOM

Pole height: 16 feet				
	90 MPH	100 MPH	110 MPH	>110 MPH
Nyhavn Park, single mount	STANDARD	STANDARD	CUSTOM	CUSTOM
Nyhavn Park, twin mount	CUSTOM	CUSTOM	CUSTOM	CUSTOM

Flindt Plaza

The following tables provide guidance to the maximum number of stacked light sections on standard Flindt Plaza poles. The pole height and light section quantity combinations that are marked as "STANDARD" are compliant to that wind speed per 2013 AASHTO standard. "CUSTOM" indicates the standard pole design will not STANDARD the loading requirements and alternative pole design must be developed. Standard pole design is straight, round aluminum, 5.5 inch outside diameter, 0.19 inch wall thickness, (4) 1 inch anchor bolts on 9.5 inch bolt diameter. Note: some pole heights are not included with standard price lists and require price quotations provided on a case-by-case basis.

Pole height: 8 feet

Stacked light sections	90 MPH	130 MPH	150 MPH
1 - 3	STANDARD	STANDARD	STANDARD
4	STANDARD	STANDARD	STANDARD
5	STANDARD	STANDARD	STANDARD

Pole height: 14 feet

Stacked light sections	90 MPH	130 MPH	150 MPH
1 - 3	STANDARD	STANDARD	STANDARD
4	STANDARD	STANDARD	STANDARD
5	STANDARD	STANDARD	STANDARD

Pole height: 10 feet

Stacked light sections	90 MPH	130 MPH	150 MPH
1 - 3	STANDARD	STANDARD	STANDARD
4	STANDARD	STANDARD	STANDARD
5	STANDARD	STANDARD	STANDARD

Pole height: 16 feet

Stacked light sections	90 MPH	130 MPH	150 MPH
1 - 3	STANDARD	STANDARD	STANDARD
4	STANDARD	STANDARD	STANDARD
5	STANDARD	STANDARD	***CUSTOM***

Pole height: 12 feet

Stacked light sections	90 MPH	130 MPH	150 MPH
1 - 3	STANDARD	STANDARD	STANDARD
4	STANDARD	STANDARD	STANDARD
5	STANDARD	STANDARD	STANDARD

Pole height: 18 feet

Stacked light sections	90 MPH	130 MPH	150 MPH
1 - 3	STANDARD	STANDARD	STANDARD
4	STANDARD	STANDARD	***CUSTOM***
5	STANDARD	***CUSTOM***	***CUSTOM***