

April 1, 2002

Mr. Alan C. Plante
Chief Plans Examiner
Building Division
Orange County Government
201 S. Rosalind Ave.
Orlando, Florida 33802-2687

Dear Mr. Plante:

This is to confirm that Norandex/Reynolds Distribution Company, AAMA and AAMA's Validator, Associated Laboratories Inc., use the attached Load Analysis Formulae and Derivations to determine the fiber stresses, deflections and concentrated loads for windows and doors (See attached Derivations). We also use the " Structural Engineering Handbook " by Edwin and Charles Gaylord, Third Edition and The Aluminum Association's " Aluminum Construction Manual. "

As requested, also attached are:

- 1) Three typical AAMA labels used by Norandex on windows and doors
- 2) Product Designations, Section 1.2.1. from AAMA / NWWDA 101 / I. S. 2 - 97
- 3) The required number of fasteners is calculated by:

Required Number of Fasteners -

$\text{Load Area in square feet} \times \text{Design Pressure} / \text{Design Shear Strength of Fasteners}$

- 4) Note: The number of fasteners is rounded up.

Sincerely,



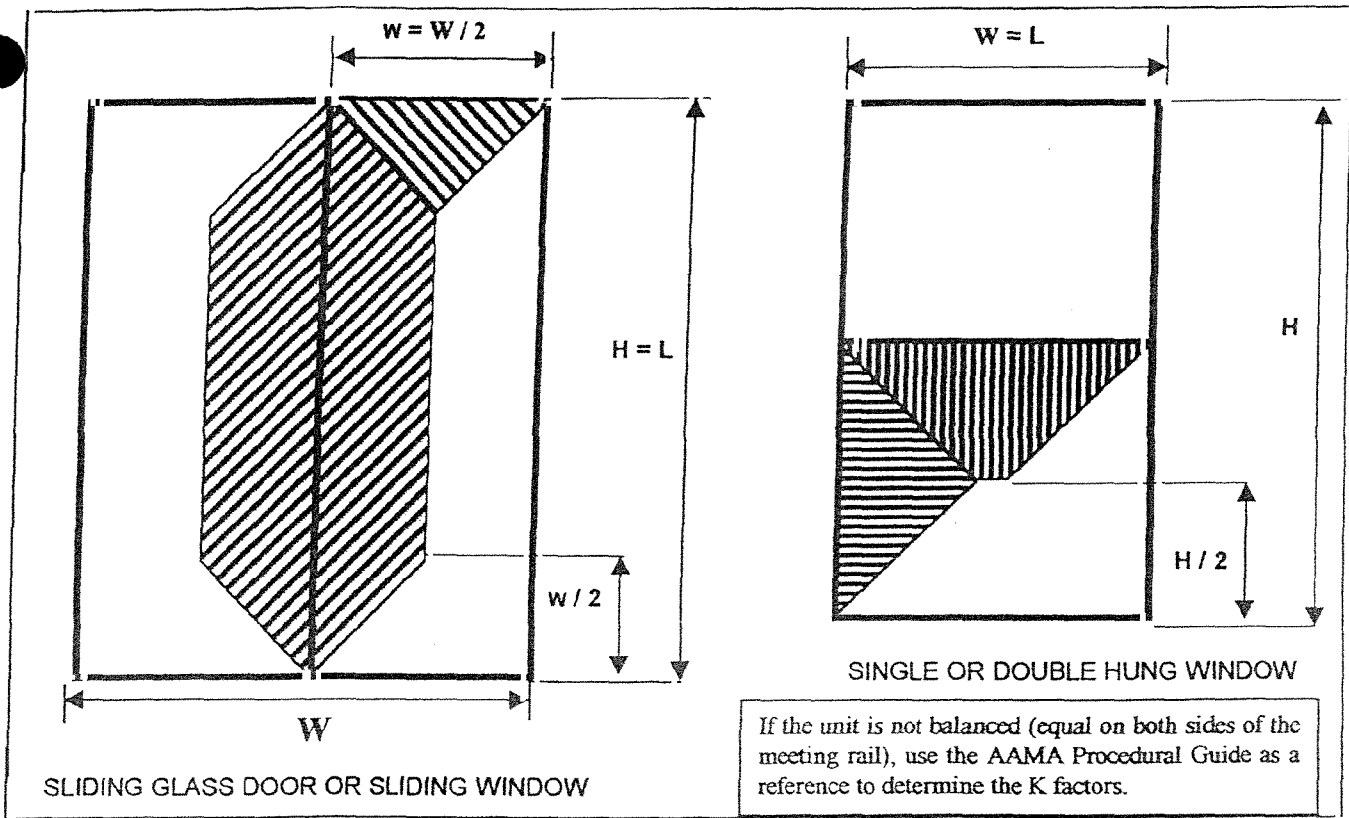
Charles A. Pagen, P. E., Ph. D.

Florida Professional Engineer # 49121

Attachments

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LOAD ANALYSIS FORMULAE & DERIVATIONS



GENERAL DERIVATIONS

FIBERSTRESS	DEFLECTIONS	CONCENTRATED LOAD
$f = M / S$ $M = T_1 L / K_f$ $f = T_1 L / K_f S = PAL / K_f S$ For $f_1 = f_2$ $P_1 A_1 L_1 / K_{f1} S_1 = P_2 A_2 L_2 / K_{f2} S_2$ Since $S_1 = S_2$	$D = T_1 L^3 / K_D EI$ $D = L / X^2$ $L / X = PAL / K_D EI$ For $X_1 = X_2$ $K_{D1} EI / P_1 A_1 L_1^2 = K_{D2} EI / P_2 A_2 L_2^2$	$C = PA / 2$ For $C_1 = C_2$ $P_1 A_1 / 2 = P_2 A_2 / 2$
$P_2 = P_1 A_1 L_1 / K_{f1} S_1 / A_2 L_2 / K_{f2} S_2$	$P_2 = P_1 A_1 L_1^2 K_{D2} / A_2 L_2^2 K_{D1}$	$P_2 = P_1 A_1 / A_2$

- | | | |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|
| f = Fiberstress - psi
T ₁ = Total Load - lbs.
L = Span - in.
I = Moment of Inertia - in. ⁴
P ₁ = Design Pressure (tested unit) | M = Moment - in.lb.
P = Load - psf
K _f = Moment Coefficient
W = Width
P ₂ = Design Pressure (compared unit) | S = Section Modulus - in. ³
A = Tributary Area - ft. ²
K _D = Deflection Coefficient
H = Height |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------------------------------------------------|

$$K_D = (1920 - (1920 * C)) / ((25 - (40 * C^2)) + (16 * C^4))$$

$$K_f = (24 - (24 * C)) / (3 - (4 * C^2))$$

C. Hager, P.E.
 # 49121
 4/1/02