KLOPFER HANGER DOOR
NAPLES, FL
WIND LOAD CALCULATION
August 25, 2018

DOOR WIND LOAD CALCULATIONS

This structure has been designed in accordance with the requirements of the FLORIDA BUILDING CODE 6TH EDITION (2017) BUILDING, Chapter 16, Structural Loads. In accordance with Section 1606, the following wind load requirements were employed in the design of the structure:

- Wind Load Requirements employed in the Design of the Structure
  - Ultimate Wind Speed: V_{ULT} = 170 MPH
  - Wind Bourne Debris: YES
  - Basic Wind Speed: V_{ASD} = 132 MPH
  - Building Category II, Enclosed
  - Wind Exposure B

Door wind load calculations based on individual structural panels secured at top and bottom with rollers and pins with the door in the closed position whenever high winds are expected. Per Section 1606, wind forces and loads were determined using the provisions of ASCE 7. Door wind load calculations meet ASCE 7 "Minimum Design Loads for Buildings and Other Structures" for building mean roof height under 20 ft.

Calculations are limited to FOLDTITE SYSTEMS, INC., FOLD-TITE STACKER System Door Series CSA-5.0 Plus designed for:

George Klopfer, 43 ft 2 in X 12 ft 0 in
Fold-Tite Drawing # KLO_FT4312QT080318 (8/3/2018)
See Attached

To be installed:
3973 Skyway Dr.
Naples, FL 34112

William F. Stuhrke, PhD, P.E.
State of Florida PE # 22150

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WIND LOAD PRESSURE

Basic Wind Speed V_{ASD} = 132 MPH

Velocity pressure exposure coefficient exposure B (ASCE 7 Table 6-5)

$K_Z = 0.70$

Topographic factor (ASCE 7 Eq. 6-1, Figure 6-2, no hill or escarpment)

$K_{ZT} = 1.0$

Velocity pressure (ASCE 7 Eq. 6-13)

$Q_Z = 0.00256 \bullet K_Z \bullet K_{ZT} \bullet V^2$

$Q_Z = 31.22\ lb \bullet ft/ft^2$

External pressure coefficient (ASCE 7 Figure 6-5A)

Positive: 0.7, Negative: -0.8 $G_{CP} = -0.8$

Internal pressure coefficient enclosed (ASCE 7 Table 6-7)

Positive: 0.18, Negative: -0.18 $GC_{PI} = 0.18$

DESIGN WIND PRESSURE (MAX.)

Components and cladding, mean building height under 60 ft

$P = -Q_Z \bullet (GC_P - GC_{PI})$

$P = 30.60\ lb \bullet ft/ft^2$

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CRITICAL STRUCTURAL CONDITION

The critical structural condition for the door is the bending of the vertical members on the sides of the individual door panels. The critical panels are the center panels.

Panel Clear Span Height

$H = 11 \text{ ft } 7.5 \text{ in}$

$H = 139.5 \text{ in}$

Panel Width

$W = 5 \text{ ft } 4.45 \text{ in}$

$W = 64.45 \text{ in}$

Load on Vertical Edge Members

$L = P \bullet W/2$

$L = 82.17 \text{ lb} \bullet \text{ft/ft}$

$L = 6.85 \text{ lb} \bullet \text{ft/in}$

Moment on Vertical Edge Member

$M_{MAX} = L \bullet H \bullet H/8$

$M_{MAX} = 16{,}663 \text{ lb} \bullet \text{in}$

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Edge Member Properties

The edge member is an aluminum extrusion from KEYMARK CORPORATION, die number T-27743, Aluminum Alloy 6063 T-5 for FOLDTITE SYSTEMS #CSA-5.0 VERTICAL. The member has the following properties according to the KEYMARK CORPORATION. (See Attached)

$I_X = 3.460\ in^4$

$I_Y = 0.318\ in^4$

$S_X = 1.375\ in^3$

$S_Y = 0.213\ in^3$

Aluminum Properties Alloy 6063 T-5

$F_{YALLOWABLE} = 14{,}000\ lb / in^2$

Moment Allowable

$M_{ALLOWABLE} = S_X \bullet F_Y$

$M_{ALLOWABLE} = 19.250\ lb \bullet in$

THEREFORE, THE MEMBER IS ADEQUATE

HANGER BOLTS AND LOCK PINS

Loading on Hangers

Door Width (DW)

DW = 43 ft 7 in

Door Height (DH)

DH = 11 ft 7.5 in

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Hanger Spacing (HS)

HS = 5 ft 4.45 in

Lock Pin Spacing (LPS)

LPS = 5 ft 4.45 in

Drop Pin Spacing (DPS)

DPS = 5 ft 4.45 in

Number of Pins = 7 Each

Door Weight (DW)

DW = 1.99 lb/in

Wind Loading (P)

$P = 30.6\ lb \cdot ft/ft^2$

Dead Load / Hanger (DLH)

$DLH = 128.3\ lb \cdot ft$

Wind Load at Verticals (WLV)

$WLV = 955.1\ lb \cdot ft$

HANGER BOLTS, LOCK PINS LOADING & SIZE

Load capacity of threaded hanger rods/bolts, based on an allowable bolt stress (ABS) of 9000 $lb \cdot ft/in^2$ Grade 2

Bolt Length = 7.00 in, Bolt Diameter = ½ in

Bolt Area = 0.13 in^2, Max Allowable Load = 1100 $lb \cdot ft$

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Bolt Stresses for Applied Loads

Axial Tension Stress (ATS) = DLH/BA

ATS = 986.9 lb/in^2

Shear Stress (SS) = WLV/BA

SS = 7346 lb/in^2

Combined Stress

CS = ATS/ABS + SS/ABS ≤1.0

CS = .926

THEREFORE, THE HANGER BOLTS ARE ADEQUATE

DROP LOCK PINS

Load capacity of drop lock pins, based on an allowable pin stress (APS) of 9000 $lb \cdot ft/in^2$

Pin Diameter = ½ in

Pin = 0.196 in^2

Pin Stress for Applied Load

SS = 4873 lb/in^2

THEREFORE, THE DROP PINS ARE ADEQUATE

THEREFORE, THE DOOR DESIGN IS ADEQUATE

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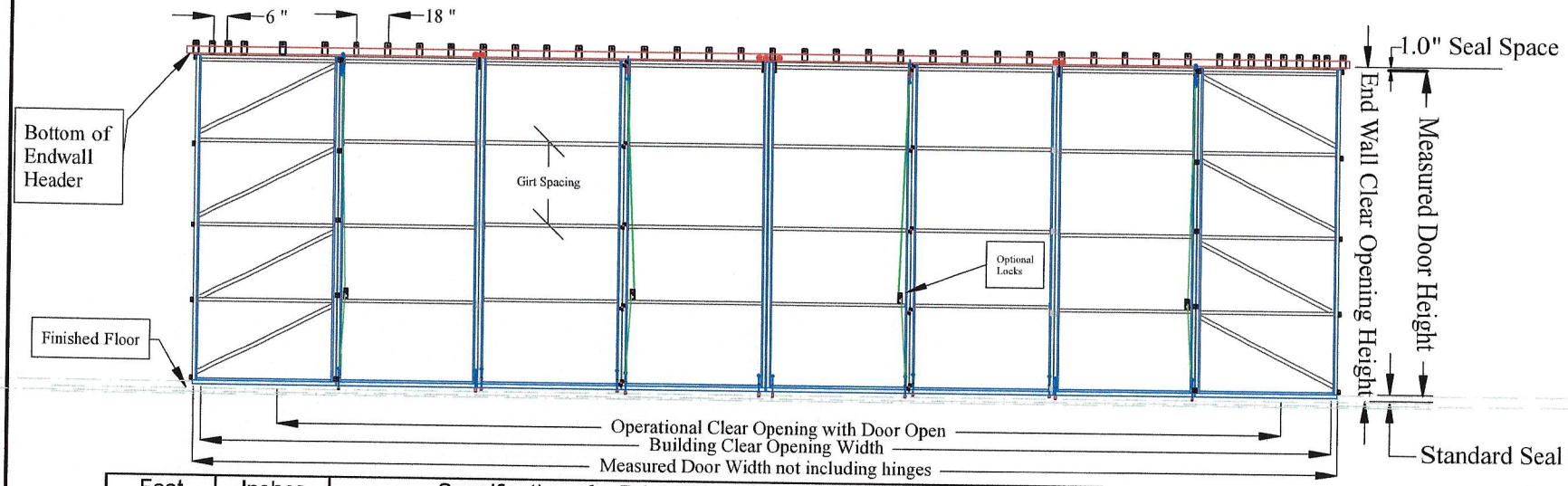
FoldTite Systems
www.FoldTite.com

NOT TO SCALE

George Klopfer
3973 Skyway Drive
Wing Sourth Lot 16
Naples, FL 34112

Check Actual System for Panel and Girt Quantity
Print Shows - 8 Panel 4 Girts including Top Rail
Rail plus bottom rail.



Feet	Inches	Specifications for Print Dimensions		
43	2	Building Framed Opening Width	Door Series	CSA-5.0 Plus
12	0	Framed Opening Height	Total Panels	8
5	3.95	Outboard Hinged Panel	Panel Qty	2
5	4.45	Standard Sliding Panel Width	Panel Qty	4
5	8.449	Center Panels	Panel Qty	2
3	5.72	Fold Tite Stack Dimension		
43	7.09	Measured Door Width with 2.75" Lap and 1/2" between center panels		
44	0.89	Overall Width required for door operation		
40	7.17	Operational Clear Opening with Door Open (overall width minus stack)		
	1.5	Seal Space Under Door		
	6	Space required for Door Installation on Front face of Header		
11	9.51	Measured Door Height		
11	7.5	Sheeting Height (For Covering Supplied By Others) Confirm at Site		
11	7.5	Actual Length of Vertical as shipped		
2	8.69	Horizontal Girt Spacing between girts	Girt Qty	4

Rollers for recessed guide supplied, channel in concrete required

Approved as Is

Date

Approved with Changes Noted:

Date:

Fold Tite Sys,Inc.	Fold-Tite Stacker System
Actual System 8 Panel 4 Girt Plus Bottom Rail	8/3/2018
Door System CSA-5.0 Plus	KLO_FT4312Q T080318