Submittal Number: 29 - 08 80 00

Submittal Title: Engineering Calculations and Shop Drawings

Spec Section: 08 80 00 - Glazing

Prepared By: River City Glass

Submittal Comments:

ALASKA AIRLINES CONCOURSE C STOREFRONT ANCHORAGE

7000 NE Airport Way
Portland, Oregon 97218

STRUCTURAL CALCULATIONS

VLMK Project Number: 20230194

River City Glass
12432 SE Capps Road
Clackamas, OR 97015

dbc architecture inc.

- [x] A - NO EXCEPTION TAKEN
- [ ] B - MAKE CORRECTIONS NOTED
- [ ] C - REVISE AND RESUBMIT
- [ ] D - FOR INFORMATION ONLY
- [ ] E - NOT REVIEWED

Review of this submittal is only for general conformance with the design concept of the Project. Contractor is responsible for confirming dimensions correlated at the job site, information that pertains solely to the fabrication process or to the means and methods of construction, coordinating the work of all trades, and performing all work in a safe and satisfactory manner. Any deviation from plans or specifications not clearly noted by the Contractor has not been reviewed. This review does not modify the Contractor's duty to comply with the Contract Documents.

BY dave calem DATE 5/3/2023

04-13-23

EXPIRES: 12/31/2024

VLMK
ENGINEERING + DESIGN

Prepared By: Ken Rust, P.E.
April 2023

Project:	Alaska Airlines Concourse C Storefront Anchorage	*Project Number:*	20230194
Project Address:	7000 NE Airport Way Portland, Oregon 97218	*Document:*	Structural Calculations for Building Permit

TABLE OF CONTENTS

3933 S Kelly Avenue Portland, OR 97239 tel: 503.222.4453 fax: 503.248.9263 www.vlmk.com

DESCRIPTION OF STRUCTURAL SCOPE

This 'Alaska Airlines Concourse C' storefront anchorage project consists of determining the anchorage of exterior storefront and/or curtainwall to structure by others due to wind loads and checking the deflection of mullions.

CODES

2019 Oregon Structural Specialty Code (Based on the 2018 International Building Code)

DESIGN LOADS

Wind

Ultimate Design Wind Speed, V_{ult}	130 mph
Risk Category	III
Wind Exposure	C
Mean Roof Height	40 ft
Least Building Width	200 ft

MATERIALS

Self-Drilling Screws

Metal Stud and Steel Beam Screws

Elco Dril-Flex Structural Fasteners ICC ESR-3332

3933 S Kelly Avenue Portland, OR 97239 tel: 503.222.4453 fax: 503.248.9263 www.vlmk.com

ASCE 7-16 Wind load Program (30.3 Part 1: Low-Rise Building Wall Components and Cladding)
Wall Components and Cladding *(Mean Roof Height h <= 60 ft)*

Project: Alaska Airlines
Prepared by: KDR of VLMK
E-mail:

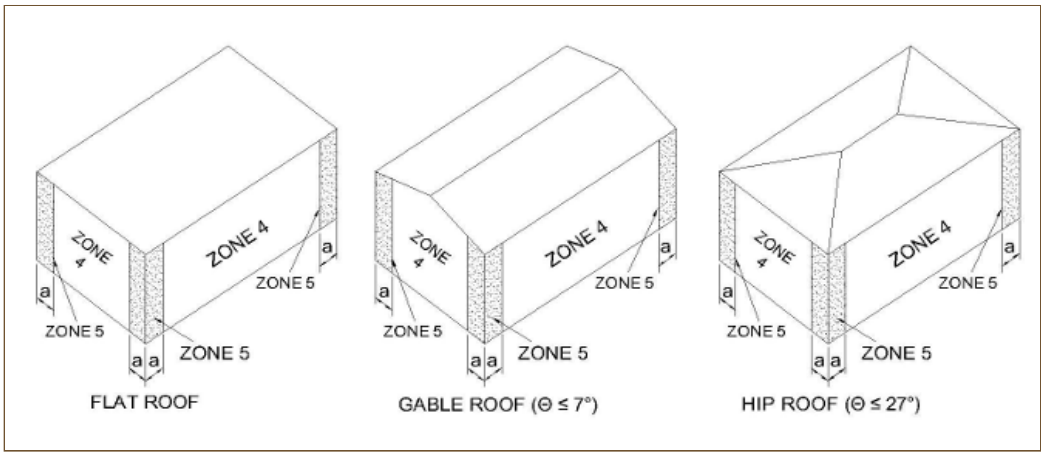
Input:
ASCE 7-16 Strength Design Load & Allowable Stress Design
Wind Speed = 130 mph
Building Exposure = C (Open Terrain with Scattered Obstructions)
Internal Pressure Coefficient GCpi = 0.18 Enclosed Building
Roof angle is less than or equal to 10° or flat (External Pressure Coefficient is reduced 10%)
Kzt = 1.00
Kd = 0.85
Ke = 1.00
Mean Roof Height = 40 ft

Output:
Velocity Pressure Exposure Coefficient "Kz max." = 1.04
Per Table 26.10-1, page 268
LRFD uses wind speed Vult = 130 mph
Velocity Pressure (qh LRFD) = 38.25 psf = .00256*Kz*Kzt*Kd*Ke*V^2 lb/ft^2
Per eq.30.3-1, page 335
ASD uses wind speed Vasd[1] = 101 mph
Velocity Pressure (qh ASD) = 22.95 psf = .00256*Kz*Kzt*Kd*Ke*V^2*0.6 lb/ft^2

—	LRFD (Load Resistance Factor Design)			(Per Figure 30.4-1, Page 335)		
				External Pressure Coefficients		
Tributary Area Sq Feet	Positive Zone 4 & 5 psf	Negative Center Zone 4 psf	Negative Corner Zone 5 psf	Positive GCp	Negative Center GCp	Negative Corner GCp
10 ft²	41.3	-44.8	-55.1	0.90	-0.99	-1.26
20 ft²	39.5	-42.9	-51.4	0.85	-0.94	-1.16
50 ft²	37.1	-40.5	-46.6	0.79	-0.88	-1.04
100 ft²	35.2	-38.7	-42.9	0.74	-0.83	-0.94
200 ft²	33.4	-36.8	-39.3	0.69	-0.78	-0.85
500 ft²	31.0	-34.4	-34.4	0.63	-0.72	-0.72

Least Width = 40 ft a = 16 ft (Zone 5)

10% of least width or 0.4h, whichever is smaller but not less than 4% of least width or 3 ft.



VLMK ENGINEERING + DESIGN

Project: ALASKA AIRLINES *Job #:* 20230194 *By:* KDR *Date:* 03/23 *Sheet #:*

STOREFRONT ANCHORAGE:

COLD FORMED STEEL ATTACHMENT (HEAD): #12-14 ELCO SELF-DRILLING SCREWS

Vallow = 280# [SSMA 18 GAGE STEEL]
Tallow = 124# [SSMA 18 GAGE STEEL]

Vu = (44.8 psf)(2.00')(2.10') = 188# (JAMBS - A)

Tu = 188#(0.50")/(2.25") = 42# (JAMBS)

UNITY = 188#(0.6)/(2*280#) + 42#(0.6)/(2*124#) = 0.30 (JAMBS - OK)

USE (2) SCREWS AT JAMB MULLIONS

STEEL ATTACHMENT (HEAD/SILL): #12-24 ELCO SELF-DRILLING SCREWS

Vallow = 1009#(0.6) = 605# [SEE ICC-3332, TABLE 2, 3, 4]
Tallow = 609# [SEE ICC-3332, TABLE 2, 3, 5]

Vu = (44.8 psf)(2.00')(2.10') = 188# (JAMBS - A)

Tu = 188#(2.0")/(1.75") = 215# (JAMBS)

UNITY = 188#/(2*605#) + 215#/(2*609#) = 0.33 (JAMBS - OK)

USE (2) SCREWS AT JAMB MULLIONS

Screw Capacities

Table Notes

1. Capacities based on AISI S100 Section E4.
2. When connecting materials of different steel thicknesses or tensile strengths, use the lowest values. Tabulated values assume two sheets of equal thickness are connected.
3. Capacities are based on Allowable Strength Design (ASD) and include safety factor of 3.0.
4. Where multiple fasteners are used, screws are assumed to have a center-to-center spacing of at least 3 times the nominal diameter (d).
5. Screws are assumed to have a center-of-screw to edge-of-steel dimension of at least 1.5 times the nominal diameter (d) of the screw.
6. Pull-out capacity is based on the lesser of pull-out capacity in sheet closest to screw tip or tension strength of screw.
7. Pull-over capacity is based on the lesser of pull-over capacity for sheet closest to screw header or tension strength of screw.
8. Values are for pure shear or tension loads. See AISI Section E4.5 for combined shear and pull-over.
9. Screw Shear (Pss), tension (Pts), diameter, and head diameter are from CFSEI Tech Note (F701-12).
10. Screw shear strength is the average value, and tension strength is the lowest value listed in CFSEI Tech Note (F701-12).
11. Higher values for screw strength (Pss, Pts), may be obtained by specifying screws from a specific manufacturer.

Allowable Screw Connection Capacity (lbs)

Thickness (Mils)	Design Thickness	Fy Yield (ksi)	Fu Tensile (ksi)	#6 Screw (Pss = 643 lbs, Pts = 419 lbs) 0.138" dia, 0.272" Head			#8 Screw (Pss= 1278 lbs, Pts = 586 lbs) 0.164" dia, 0.272" Head			#10 Screw (Pss= 1644 lbs, Pts = 1158 lbs) 0.190" dia, 0.340" Head			#12 Screw (Pss= 2330 lbs, Pts = 2325 lbs) 0.216" dia, 0.340" Head			¼" Screw (Pss= 3048 lbs, Pts = 3201 lbs) 0.250" dia, 0.409" Head		
				Shear	Pull-Out	Pull-Over	Shear	Pull-Out	Pull-Over	Shear	Pull-Out	Pull-Over	Shear	Pull-Out	Pull-Over	Shear	Pull-Out	Pull-Over
18	0.0188	33	33	44	24	84	48	29	84	52	33	105	55	38	105	60	44	127
27	0.0283	33	33	82	37	127	89	43	127	96	50	159	102	57	159	110	66	191
30	0.0312	33	33	95	40	140	103	48	140	111	55	175	118	63	175	127	73	211
33	0.0346	33	45	151	61	140	164	72	195	177	84	265	188	95	265	203	110	318
43	0.0451	33	45	214	79	140	244	94	195	263	109	345	280	124	345	302	144	415
54	0.0566	33	45	214	100	140	344	118	195	370	137	386	394	156	433	424	180	521
68	0.0713	33	45	214	125	140	426	149	195	523	173	386	557	196	545	600	227	656
97	0.1017	33	45	214	140	140	426	195	195	548	246	386	777	280	775	1,016	324	936
118	0.1242	33	45	214	140	140	426	195	195	548	301	386	777	342	775	1,016	396	1,067
54	0.0566	50	65	214	140	140	426	171	195	534	198	386	569	225	625	613	261	752
68	0.0713	50	65	214	140	140	426	195	195	548	249	386	777	284	775	866	328	948
97	0.1017	50	65	214	140	140	426	195	195	548	356	386	777	405	775	1,016	468	1,067
118	0.1242	50	65	214	140	140	426	195	195	548	386	386	777	494	775	1,016	572	1,067

Weld Capacities

Table Notes

1. Capacities based on the AISI S100 Specification Sections E2.4 for fillet welds and E2.5 for flare groove welds.
2. When connecting materials of different steel thicknesses or tensile strengths, use the lowest values.
3. Capacities are based on Allowable Strength Design (ASD).
4. Weld capacities are based on E60 electrodes. For material thinner than 68 mil, 0.030" to 0.035" diameter wire electrodes may provide best results.
5. Longitudinal capacity is considered to be loading in the direction of the length of the weld.
6. Transverse capacity is loading in perpendicular direction of the length of the weld.
7. For flare groove welds, the effective throat of weld is conservatively assumed to be less than 2t.
8. For longitudinal fillet welds, a minimum value of EQ E2.4-1, E2.4-2, and E2.4-4 was used.
9. For transverse fillet welds, a minimum value of EQ E2.4-3 and E2.4-4 was used.
10. For longitudinal flare groove welds, a minimum value of EQ E2.5-2 and E2.5-3 was used.

Allowable Weld Capacity (lbs / in)

Thickness (Mils)	Design Thickness	Fy Yield (ksi)	Fu Tensile (ksi)	Fillet Welds		Flare Groove Welds	
				Longitudinal	Transverse	Longitudinal	Transverse
43	0.0451	33	45	499	864	544	663
54	0.0566	33	45	626	1084	682	832
68	0.0713	33	45	789	1365	859	1048
97	0.1017	33	45	1125	1269	- [1]	- [1]
54	0.0566	50	65	905	1566	985	1202
68	0.0713	50	65	1140	1972	1241	1514
97	0.1017	50	65	1269	1269	- [1]	- [1]

[1] *Weld capacity for material thickness greater than 0.10" requires engineering judgment to determine leg of welds, W1 and W2.*

TABLE 1—ELCO DRIL-FLEX SELF-DRILLING STRUCTURAL SCREWS

SCREW TYPE	DESCRIPTION (nominal size and tpi)	NOMINAL DIAMETER (inch)	HEAD STYLE[1]	HEX DRIVE SIZE (INCH) / PHILLIPS SIZE (No.)	NOMINAL HEAD DIAMETER (inch)	POINT TYPE	DRILLING CAPACITY[2] (inch)		MINIMUM REQUIRED PROTRUSION[3] (inch)
							Min.	Max.	
1	#10-16	0.190	PPH	2	0.365	#2	0.048	0.110	0.406
2A	#10-16	0.190	HWH	5/16	0.400	#3	0.048	0.150	0.500
2B	#10-16	0.190	HWH	5/16	0.415	#3	0.048	0.150	0.500
3	#10-24	0.190	PWH	2	0.470	#3	0.048	0.150	0.468
4	#12-14	0.216	HWH	5/16	0.500	#2	0.048	0.110	0.625
5	#12-14	0.216	HWH	5/16	0.415	#3	0.048	0.187	0.500
6	#12-14	0.216	PUFH	3	0.415	#3	0.048	0.187	0.500
7	#12-24	0.216	HWH	5/16	0.415	#5	0.048	0.500	0.938
8	1/4-14	0.250	HWH	3/8	0.500	#3	0.048	0.210	0.563
9	1/4-20	0.250	HWH	3/8	0.500	#4	0.060	0.312	0.688
10	1/4-20	0.250	HWH	3/8	0.500	#5	0.060	0.500	0.938
11	5/16-18	0.313	HWH	3/8	0.600	#3	0.096	0.210	0.688
12A	5/16-24	0.313	HWH	3/8	0.600	#4	0.105	0.312	0.750
12B	5/16-24	0.313	HWH	3/8	0.600	#4	0.105	0.312	0.750

For **SI:** 1 inch = 25.4 mm.

[1]Head styles: HWH = Hex Washer Head; PPH = Phillips Pan Head; PWH = Phillips Wafer Head; PUFH = Phillips Undercut Flat Head.
[2] The drilling capacity of a screw refers to minimum and maximum thickness of the steel that the screw is designed to drill through.
[3]Maximum load bearing length can be calculated by subtracting the minimum required protrusion from the nominal length of the screw.

TABLE 2—SCREW SHEAR AND TENSION STRENGTH, pounds-force[1,2,3]

SCREW TYPE	SCREW SIZE	HEAD STYLE[4]	NOMINAL STRENGTH (TESTED)		ALLOWABLE STRENGTH (ASD) Ω=3		DESIGN STRENGTH (LRFD) Φ=0.5	
			Shear, P_{ss}	Tension, P_{ts}	Shear, P_{ss}/Ω	Tension, P_{ts}/Ω	Shear, ΦP_{ss}	Tension, ΦP_{ts}
1	#10-16	PPH	1526	2273	509	758	763	1136
2A, 2B	#10-16	HWH	1463	2276	488	759	732	1138
3	#10-24	PWH	1080	2613	360	871	540	1307
4, 5	#12-14	HWH	1992	3216	664	1072	996	1608
6	#12-14	PUFH	2128	2663	709	888	1064	1332
7	#12-24	HWH	2503	4177	834	1392	1252	2088
8	1/4-14	HWH	2692	4363	897	1454	1346	2182
9, 10	1/4-20	HWH	2617	4619	872	1540	1308	2309
11	5/16-18	HWH	4568	8070	1523	2690	2284	4035
12A, 12B	5/16-24	HWH	5471	8757	1824	2919	2736	4379

For **SI:** 1 inch = 25.4 mm, 1 lbf = 4.4 N.

[1]For tension connections, the lower of the available screw tension strength, pullover strength, and pull-out strength found in Tables 2, 4 and 5, respectively, must be used for design.
[2]For shear connections, the lower of the available screw shear strength and the allowable shear (bearing) capacity found in Tables 2 and 3, respectively, must be used for design.
[3]Nominal strengths are based on laboratory tests.
[4]Head styles: HWH = Hex Washer Head; PPH = Phillips Pan Head; PWH = Phillips Wafer Head; PUFH = Phillips Undercut Flat Head.

TABLE 3—SHEAR (BEARING) CAPACITY OF SCREW CONNECTIONS, pounds-force[1,2,3,4,5]

SCREW TYPE	SCREW SIZE	HEAD STYLE[11]	DESIGN THICKNESS (in.)[6]						
			0.048-0.048	0.048-0.075	0.060-0.060	0.075-0.075	1/8"-3/16"	3/16"-1/4"	1/4"-0.105"
ALLOWABLE STRENGTH (ASD)									
1	#10-16	PPH	289	289	404	-	-	-	-
2A, 2B	#10-16	HWH	369	395	453	-	-	-	-
3	#10-24	PWH	322[10]	571[10]	534[7,8,9]	-	-	-	-
4, 5	#12-14	HWH	356	573	513	497	-	-	-
6	#12-14	PUFH	325[10]	609[10]	481[7,8,9]	624[7,8]	-	-	-
7	#12-24	HWH	291[10]	610[10]	476[7,8,9]	647[7,8]	630[7,8,9]	734[7,8,9]	600[7,8,9]
8	1/4-14	HWH	377	626	520	661	638	-	-
9, 10	1/4-20	HWH	386[7,8]	526[7,8]	533[8]	670[8]	595[9]	624[9]	554[9]
11	5/16-18	HWH	408	622	561	891	-	-	-
12A, 12B	5/16-24	HWH	-	-	-	-	1347	-	887
DESIGN STRENGTH (LRFD)									
1	#10-16	PPH	433	433	605	-	-	-	-
2A, 2B	#10-16	HWH	590	631	724	-	-	-	-
3	#10-24	PWH	515[10]	854[10]	913[7,8,9]	-	-	-	-
4, 5	#12-14	HWH	569	917	820	795	-	-	-
6	#12-14	PUFH	520[10]	975[10]	770[7,8,9]	999[7,8]	-	-	-
7	#12-24	HWH	466[10]	976[10]	761[7,8,9]	1035[7,8]	1009[7,8,9]	1174[7,8,9]	960[7,8,9]
8	1/4-14	HWH	603	1001	833	1058	1021	-	-
9, 10	1/4-20	HWH	617[7,8]	842[7,8]	852[8]	1072[8]	952[9]	999[9]	886[9]
11	5/16-18	HWH	653	996	897	1425	-	-	-
12A, 12B	5/16-24	HWH	-	-	-	-	2155	-	1419

For **SI:** 1 inch = 25.4 mm, 1 lbf = 4.4 N, 1 ksi = 6.89 Mpa.

[1]Available strengths are based on laboratory tests, with safety factors/resistance factors calculated in accordance with AISI S100.
[2]For shear connections, the lower of the available screw shear strength and the available shear (bearing) capacity must be used for design.
[3]Values are based on steel members with a minimum yield strength of F_y = 33 ksi and a minimum tensile strength of F_u = 45 ksi.
[4]Available capacity for other member thickness may be determined by interpolating within the table.
[5]Unless otherwise noted, when both steel sheets have a minimum specified tensile strength $F_u \geq 58$ ksi, multiply tabulated values by 1.29 and when both steel sheets have a minimum tensile strength $F_u \geq 65$ ksi steel, multiply tabulated values by 1.44.
[6]The first number is the thickness of the steel sheet in in contact with the screw head (top sheet). The second number is the thickness of the steel sheet not in contact with the screw head (bottom sheet).
[7]When both steel sheets have a minimum specified tensile strength of $F_u \geq 55$ ksi (e.g. ASTM A653 SS Grade 40), multiply tabulated values by 1.22.
[8]When both steel sheets have a minimum specified tensile strength of $F_u \geq 52$ ksi (e.g. ASTM A653 SS Grade 37), multiply tabulated values by 1.15.
[9]When both steel sheets have a minimum specified tensile strength of $F_u \geq 58$ ksi (e.g. ASTM A36), multiply tabulated values by 1.29.
[10]Increasing values for higher steel tensile strength per Note 5 is not allowed.
[11]Head styles: HWH = Hex Washer Head; PPH = Phillips Pan Head; PWH = Phillips Wafer Head; PUFH = Phillips Undercut Flat Head.

TABLE 4—TENSILE PULL-OVER CAPACITY OF SCREW CONNECTIONS, pounds-force[1,3,4,5,6]

SCREW TYPE	SCREW SIZE	HEAD STYLE[7]	MINIMUM EFFECTIVE PULL-OVER DIAMETER (in.)	DESIGN THICKNESS OF MEMBER IN CONTACT WITH SCREW HEAD (in.)							
				0.048	0.060	0.075	0.105	1/8"	3/16"	1/4"	5/16"
ALLOWABLE STRENGTH (ASD)											
1	#10-16	PPH	0.357	386	481[2]	481[2]	481[2]	481[2]	-	-	-
2A, 2B	#10-16	HWH	0.400	415	481[2]	481[2]	481[2]	481[2]	-	-	-
3	#10-24	PWH	0.470	610[2]	597[2]	715[2]	715[2]	715[2]	-	-	-
4, 5	#12-14	HWH	0.415	430	537	672	734[2]	734[2]	734[2]	-	-
6	#12-14	PUFH	0.415	391[2]	537[2]	683[2]	798[2]	798[2]	798[2]	-	-
7	#12-24	HWH	0.415	430	537	672	734[2]	734[2]	734[2]	734[2]	734[2]
8	1/4-14	HWH	0.500	518	648	810	1126[2]	1126[2]	1126[2]	-	-
9, 10	1/4-20	HWH	0.500	-	648	810	1126[2]	1126[2]	1126[2]	1126[2]	1126[2]
11	5/16-18	HWH	0.600	-	-	-	1169[2]	1169[2]	-	-	-
12A, 12B	5/16-24	HWH	0.600	-	-	-	1326[2]	1326[2]	1326[2]	1326[2]	1326[2]
DESIGN STRENGTH (LRFD)											
1	#10-16	PPH	0.357	578	723	781[2]	781[2]	781[2]	-	-	-
2A, 2B	#10-16	HWH	0.400	622	778	781[2]	781[2]	781[2]	-	-	-
3	#10-24	PWH	0.470	976[2]	955[2]	1143[2]	1143[2]	1143[2]	-	-	-
4, 5	#12-14	HWH	0.415	645	806	1007	1192[2]	1192[2]	1192[2]	-	-
6	#12-14	PUFH	0.415	626[2]	860[2]	1092[2]	1276[2]	1276[2]	1276[2]	-	-
7	#12-24	HWH	0.415	645	806	1007	1192[2]	1192[2]	1192[2]	1192[2]	1192[2]
8	1/4-14	HWH	0.500	778	972	1215	1701	1830[2]	1830[2]	-	-
9, 10	1/4-20	HWH	0.500	-	972	1215	1701	1830[2]	1830[2]	1830[2]	1830[2]
11	5/16-18	HWH	0.600	-	-	-	1871[2]	1871[2]	-	-	-
12A, 12B	5/16-24	HWH	0.600	-	-	-	2121[2]	2121[2]	2121[2]	2121[2]	2121[2]

For **SI:** 1 inch = 25.4 mm, 1 lbf = 4.4 N, 1 ksi = 6.89 Mpa.

[1]Available strengths are based on calculations in accordance with AISI S100, unless otherwise noted.
[2]Available strengths are based on laboratory tests, with safety factors/resistance factors calculated in accordance with AISI S100, or on the shear strength of the integral washer. Increasing values for higher steel tensile strength per Note 6 is not allowed.
[3]For tension connections, the lowest of the available pull-out, pull-over, and screw tension strength must be used for design.
[4]Values are based on steel members with a minimum yield strength of F_y = 33 ksi and a minimum tensile strength of F_u = 45 ksi.
[5]Available capacity for other member thickness may be determined by interpolating within the table.
[6]For steel with a minimum tensile strength $F_u \geq 58$ ksi, multiply tabulated values by 1.29 and for steel with a minimum tensile strength $F_u \geq 65$ ksi steel, multiply tabulated values by 1.44.
[7]Head styles: HWH = Hex Washer Head; PPH = Phillips Pan Head; PWH = Phillips Wafer Head; PUFH = Phillips Undercut Flat Head.

TABLE 5—TENSILE PULL-OUT CAPACITY OF SCREW CONNECTIONS, pounds-force[1,2,3,4,5]

SCREW TYPE	SCREW SIZE	HEAD STYLE[9]	DESIGN THICKNESS OF MEMBER NOT IN CONTACT WITH SCREW HEAD (in.)							
			0.048	0.060	0.075	0.105	1/8"	3/16"	1/4"	5/16"
ALLOWABLE STRENGTH (ASD)										
1	#10-16	PPH	136	193	236	307	297	-	-	-
2A, 2B	#10-16	HWH	136	193	236	307	297	-	-	-
3	#10-24	PWH	122[8]	186[7]	250[6]	415[6]	546[7]	-	-	-
4, 5	#12-14	HWH	132	205	264	328	510	665	-	-
6	#12-14	PUFH	132	205	264	328	510	665	-	-
7	#12-24	HWH	96[8]	165[7]	224[6]	381[6]	507[7]	891[7]	1020	1020
8	1/4-14	HWH	131	207	255	342	561	899	-	-
9, 10	1/4-20	HWH	-	204[6]	260[6]	423[6]	524[7]	914[7]	1044	1206
11	5/16-18	HWH	-	-	-	520	707	-	-	-
12A, 12B	5/16-24	HWH	-	-	-	459	637	724	1189	1424
DESIGN STRENGTH (LRFD)										
1	#10-16	PPH	217	309	378	492	476	-	-	-
2A, 2B	#10-16	HWH	217	309	378	492	476	-	-	-
3	#10-24	PWH	194[8]	298[7]	400[6]	664[6]	874[7]	-	-	-
4, 5	#12-14	HWH	211	328	423	525	816	1064	-	-
6	#12-14	PUFH	211	328	423	525	816	1064	-	-
7	#12-24	HWH	154[8]	264[7]	359[6]	609[6]	811[7]	1426[7]	1632	1632
8	1/4-14	HWH	210	331	409	548	897	1439	-	-
9, 10	1/4-20	HWH	-	326[6]	416[6]	677[6]	838[7]	1462[7]	1670	1930
11	5/16-18	HWH	-	-	-	832	1131	-	-	-
12A, 12B	5/16-24	HWH	-	-	-	735	1019	1159	1903	2279

For **SI:** 1 inch = 25.4 mm, 1 lbf = 4.4 N, 1 ksi = 6.89 Mpa.

[1]Available strengths are based on laboratory tests, with safety factors/resistance factors calculated in accordance with AISI S100.
[2]For tension connections, the lowest of the available pull-out, pull-over, and screw tension strength must be used for design.
[3]Values are based on steel members with a minimum yield strength of F_y = 33 ksi and a minimum tensile strength of F_u = 45 ksi.
[4]Available capacity for other member thickness may be determined by interpolating within the table.
[5]Unless otherwise noted, for steel with a minimum tensile strength $F_u \geq 58$ ksi, multiply tabulated values by 1.29 and for steel with a minimum tensile strength $F_u \geq 65$ ksi steel, multiply tabulated values by 1.44.
[6]When both steel sheets have a minimum specified tensile strength of $F_u \geq 52$ ksi (e.g. ASTM A653 SS Grade 37), multiply tabulated values by 1.15.
[7]When both steel sheets have a minimum specified tensile strength of $F_u \geq 58$ ksi (e.g. ASTM A36), multiply tabulated values by 1.29.
[8]Increasing values for higher steel tensile strength per Note 5 is not allowed.
[9]Head styles: HWH = Hex Washer Head; PPH = Phillips Pan Head; PWH = Phillips Wafer Head; PUFH = Phillips Undercut Flat Head.

TABLE 6—MINIMUM SCREW SPACING AND EDGE DISTANCE

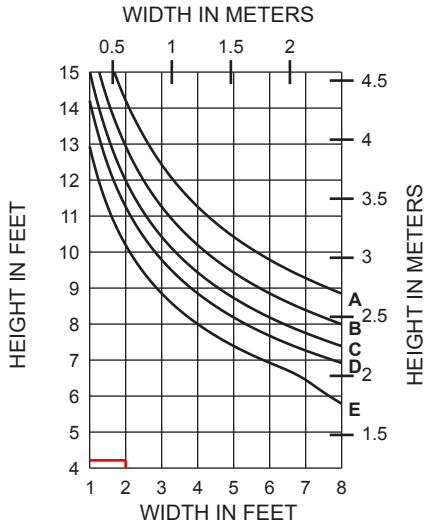
BASIC SCREW DIAMETER (inch)	FASTENED MATERIAL	MINIMUM SPACING[1] (inch) (3d)	MINIMUM EDGE DISTANCE (inch) (1.5d)	MINIMUM EDGE DISTANCE FOR FRAMING MEMBERS UNDER THE 2018, 2015 AND 2012 IBC[2] (inch) (3d)
0.190 (#10)	Steel	9/16	5/16	9/16
0.216 (#12)	Steel	11/16	3/8	11/16
0.250 (1/4)	Steel	3/4	3/8	3/4
0.3125 (5/16)	Steel	15/16	1/2	15/16

For **SI:** 1 inch = 25.4 mm.

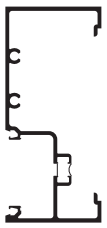
[1]For screws used in framing connections, when the spacing between screws is less than 3 times the nominal screws diameter, but at least 2 times the screw diameter, the connection shear strength values in Table 3 must be reduced by 20 percent [Refer to Section B1.5.1.3 of AISI S240 (Section D1.5 of AISI S200 for the 2015 and 2012 IBC)].

[2]For screws used in framing connections, when the edge is parallel to the direction of the applied force, the minimum edge distance may be 1.5 times the nominal screw diameter. [Refer to Section B1.5.1.3 of AISI S240 (Section D1.5 of AISI S200 for the 2015 and 2012 IBC)].

WITH HORIZONTALS



	Allowable Stress Design Load	LRFD Ultimate Design Load
A =	15 PSF (720)	25 PSF (1200)
B =	20 PSF (960)	33 PSF (1580)
C =	25 PSF (1200)	42 PSF (2000)
D =	30 PSF (1440)	50 PSF (2400)
E =	40 PSF (1920)	67 PSF (3200)

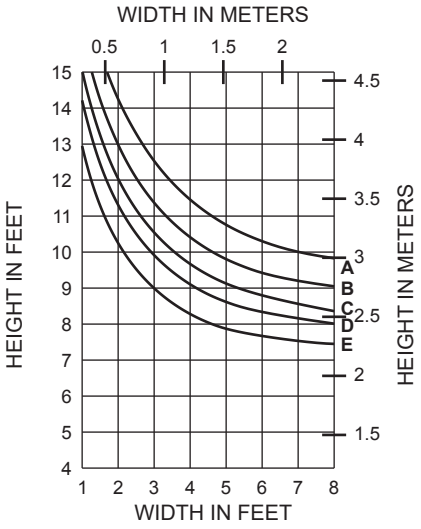


451TVG001

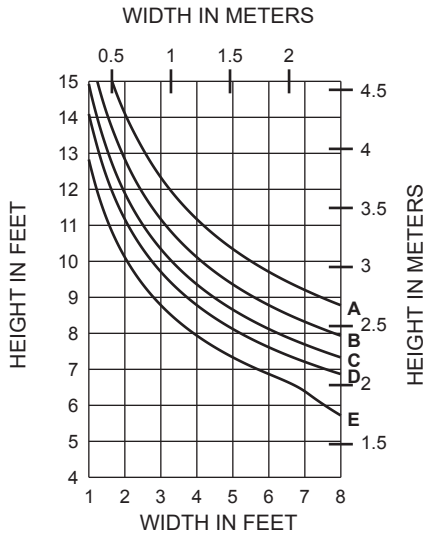
JAMBS:
AREA = (2.00')(4.10') = 8 sqft
Pw = +67.0 psf > 44.8 psf (OK)

CONTROLLING CASE = TYPE A

WITHOUT HORIZONTALS



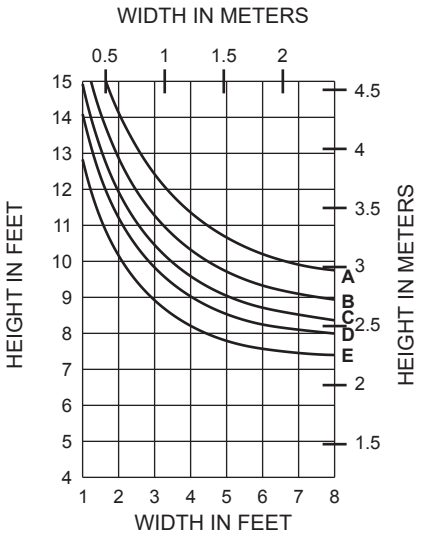
WITH HORIZONTALS



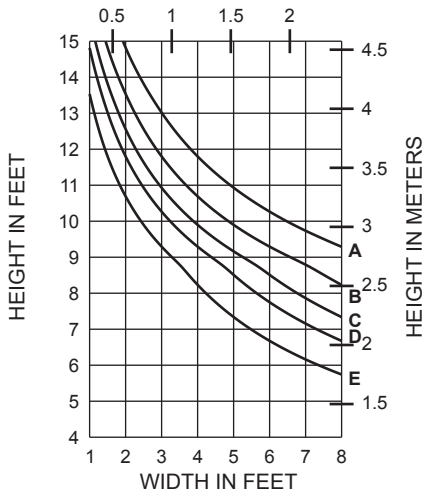
451TVG052

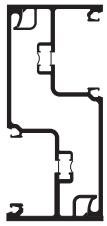
WIND LOAD CHARTS ARE BASED ON COMPOSITE PROPERTIES WHICH ARE CALCULATED IN ACCORDANCE WITH AAMA TIR-A8 AND AAMA 505

WITHOUT HORIZONTALS



WITH HORIZONTALS





451TVG069
451TVG069

WIND LOAD CHARTS ARE BASED ON COMPOSITE PROPERTIES WHICH ARE CALCULATED IN ACCORDANCE WITH AAMA TIR-A8 AND AAMA 505

WITHOUT HORIZONTALS