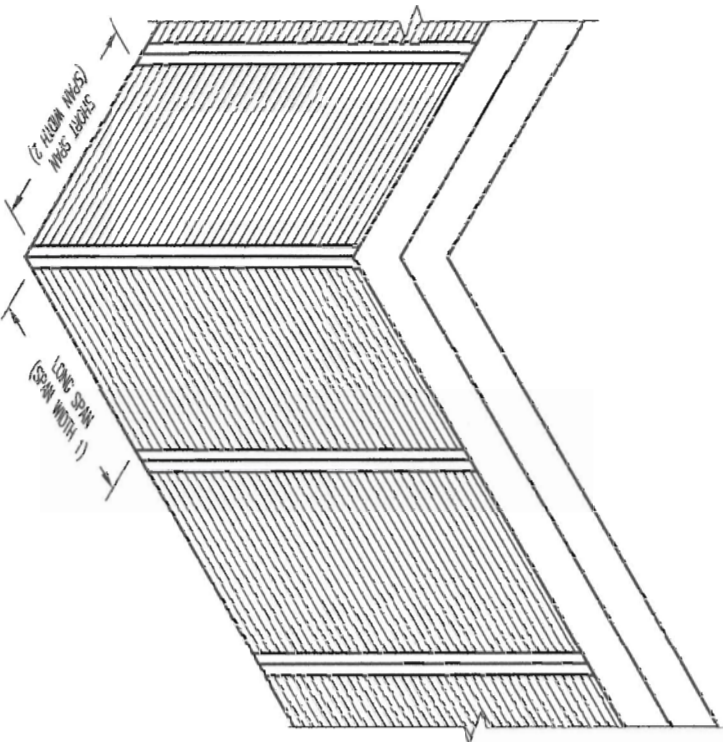


**INTERMEDIATE AND END MULLION - ELEVATION**  
SINGLE OR MULTIPLE MULLION INSTALLATIONS - N.T.S.



**CORNER MULLION - ELEVATION**  
SINGLE OR MULTIPLE MULLION INSTALLATIONS - N.T.S.

**NOTES:**

- THE DIFFERENCE IN ADJACENT SLAT SPANS OF AN INTERMEDIATE MULLION SHALL NOT EXCEED 25% EXCEPT WHERE CORNER MULLION TABLES ARE USED FOR INTERMEDIATE MULLIONS
- SEE TABLES FOR MAXIMUM DESIGN PRESSURES FOR SLAT SPAN WIDTHS AND MULLION LENGTHS
- INTERMEDIATE MULLIONS ARE NOT REQUIRED WITH CORNER MULLIONS OR END MULLIONS

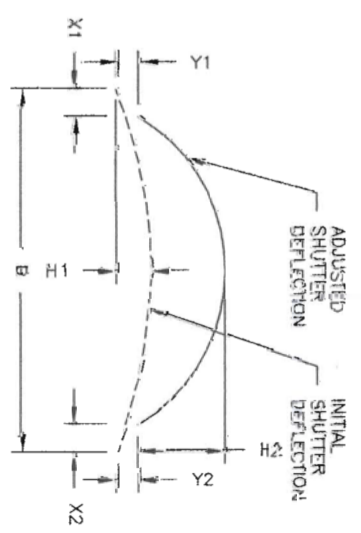
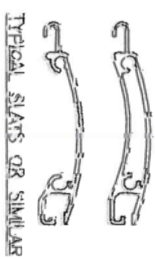
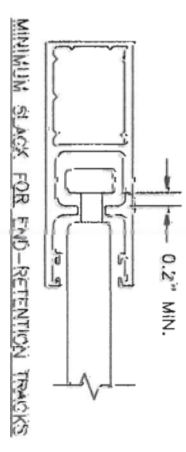
**GENERAL NOTES:**

1. TKJ ENGINEERING, LLC, HAS NO CONTROL OF THE MANUFACTURING, PERFORMANCE OR INSTALLATION OF THIS PRODUCT. THESE GENERIC PLANS WERE ENGINEERED IN ACCORDANCE WITH ACCEPTED ENGINEERING PRACTICES AND TEST DATA PROVIDED BY THE MANUFACTURER.
  2. THE ROLL-UP SHUTTER MULLIONS SHOWN ON THIS PRODUCT EVALUATION DOCUMENT HAS BEEN DESIGNED IN ACCORDANCE WITH THE 2010 FLORIDA BUILDING CODE AND THE 2009 INTERNATIONAL BUILDING CODE. THESE ROLL-UP SHUTTER MULLIONS CAN BE INSTALLED IN HIGH VELOCITY HURRICANE ZONES (MIAMI-DADE COUNTY/BROWARD COUNTY) AND IN WIND ZONE 4 (SEE FBC SECTION 1609.1.2.4). DESIGN WIND LOADS SHALL BE DETERMINED AS PER SECTION 1609 OF THE ABOVE REFERENCED CODES. IN ACCORDANCE WITH ASCE 7, AND FOR A BASIC WIND SPEED AS REQUIRED BY THE JURISDICTION WHERE THE ROLL-UP SHUTTER MULLIONS WILL BE INSTALLED, THE ROLL-UP SHUTTER MULLIONS ADEQUACY FOR IMPACT HAS BEEN VERIFIED IN ACCORDANCE WITH SECTION 1609.1.2 OF THE ABOVE REFERENCED CODES AND AS PER ASTM E1996 & E1996 AND TAS 201 AT AMERICAN TEST LAB OF SOUTH FLORIDA PER THEIR REPORTS (SEE LIST OF REPORTS).
  3. LIMITATIONS OF USE:
    - A. THIS PRODUCT CAN BE USED IN HIGH VELOCITY HURRICANE ZONES.
    - B. IN HIGH VELOCITY HURRICANE ZONE, WIND ZONE 4 REGIONS, AND ESSENTIAL FACILITIES THE DEFLECTION FROM THE MULLIONS SHALL BE ACCOUNTED FOR IN THE SEPARATION TO GLASS (PER FBC 1615.3) FOR THE MULLION AND SHUTTER. SEE EQUATIONS ON THIS SHEET FOR SHUTTER DEFLECTION ADJUSTMENTS.
    - C. THIS PRODUCT EVALUATION DOCUMENT IS FOR ROLL-UP SHUTTER MULLIONS ONLY. ALL SHUTTERS AND SHUTTER COMPONENTS SHOWN ARE FOR REFERENCE/ILLUSTRATION PURPOSES. ALL END-RETENTION AND NON RETENTION SHUTTERS USED IN COMBINATION WITH THESE MULLIONS SHALL HAVE A SEPARATE PRODUCT APPROVAL AND ALLOW THE USE OF MULLIONS. THESE ROLL-UP SHUTTER MULLIONS SHALL NOT BE USED WITH WINDOWS OR DOORS AND CAN BE USED TO SUPPLEMENT MULLIONS (INCLUDED WITH THE ROLL-UP SHUTTERS PRODUCT APPROVAL).
    - D. INSTALLATIONS SHALL NOT EXCEED THE MAXIMUM ALLOWABLE STRESS DESIGN (ASD) DESIGN RATINGS AND MAXIMUM SIZE PROVIDED IN THESE DRAWINGS. ULTIMATE DESIGN WIND LOADS DETERMINED BY THE FBC AND ASCE 7-10 SHALL BE REDUCED TO ASD BY MULTIPLYING 0.8 (SEE FBC SECTION 1609.1.2.3).
    - E. SHUTTER SLAT LIMITS: MODULES OF ELASTICITY,  $E < 11,000$  KSI  
MOMENT OF INERTIA,  $I > 0.040$  IN<sup>4</sup>/FT  
SECTIONAL AREA,  $A < 1,800$  IN<sup>2</sup>/FT  
MINIMUM SLACK (SLIP),  $Slack > 0.20$  IN
    - F. IMPACT LEVEL D: 9-1/4 LB LARGE MISSILE IMPACT.
    - G. ANCHORING OR LOADING CONDITIONS OTHER THAN THOSE SHOWN IN THESE DETAILS ARE NOT PART OF THIS APPROVAL.
    - H. THIS PRODUCT SHALL ONLY BE USED IN CONJUNCTION WITH ASSA ROLL SHUTTER SYSTEMS. OTHER PRODUCTS REQUIRE WRITTEN AUTHORIZATION FROM ASSA.
    - I. INCREASE IN ALLOWABLE STRESS (1.33) HAS NOT BEEN INCORPORATED INTO THE DESIGN OF THIS PRODUCT.
  4. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THAT THE EXISTING STRUCTURE IS DESIGNED TO SUPPORT THE LOADS FROM THE SHUTTER SYSTEM AND MULLIONS. EXISTING STRUCTURES NOT ABLE TO SUPPORT THESE LOADS SHALL BE EVALUATED AS A SITE SPECIFIC PROJECT. SEE NOTE 4 OF PRODUCT EVALUATION NOTES.
  5. ALL ALUMINUM EXTRUSIONS SHALL BE 6063-T6 ALLOY (UNLESS OTHERWISE NOTED OR CAN BE REPLACED WITH 6061-T6 ALLOY).
- PRODUCT EVALUATION NOTES:**
1. THIS PRODUCT EVALUATION DOCUMENT (P.E.D.) PREPARED BY THIS ENGINEER IS GENERIC AND DOES NOT PROVIDE INFORMATION FOR A SITE SPECIFIC PROJECT. I.E. WHERE THE SITE CONDITIONS DEVIATE FROM THE P.E.D.
  2. CONTRACTOR SHALL BE RESPONSIBLE FOR THE SELECTION, PURCHASE, AND INSTALLATION OF THIS PRODUCT BASED ON THIS PRODUCT EVALUATION PROVIDED AND SHALL NOT DEVIATE FROM THE CONDITIONS DETAILED ON THIS DOCUMENT.
  3. THIS PRODUCT EVALUATION DOCUMENT WILL BE CONSIDERED INVALID IF ALTERED BY ANY MEANS.
  4. SITE SPECIFIC PROJECTS SHALL BE PREPARED BY A FLORIDA REGISTERED ENGINEER OR ARCHITECT WHICH WILL BECOME THE ENGINEER OF RECORD (E.O.R.) FOR THE PROJECT AND WHO WILL BE RESPONSIBLE FOR THE PROPER USE OF THE P.E.D. THE ENGINEER OF RECORD, ACTING AS A DELEGATED ENGINEER TO THE P.E.D. ENGINEER, SHALL SUBMIT SITE SPECIFIC DRAWINGS FOR REVIEW.
- ANCHOR & FASTENING NOTES:**
1. ALL FASTENERS SHALL BE CORROSION RESISTANT COATED CARBON STEEL AS PER DIN 50018 OR STAINLESS STEEL 304 OR 316 SERIES WITH 50 KSI YIELD POINT AND 90 KSI ULTIMATE TENSILE STRENGTH.
  2. NO EMBEDMENT INTO NON-STRUCTURAL COMPONENTS SUCH AS, STUCCO, TILE, SIDING, ETC. SHALL BE CONSIDERED AS PART OF THE EMBEDMENT.
  3. THE ANCHOR SPACING AND DESIGN PRESSURES ARE VALID FOR EDGE DISTANCES AND MINIMUM EMBEDMENT BELOW.

ANCHOR	Concrete & Filled CMU (3500 PSI)		Hollow CMU (1800 PSI)		Wood (S.G. = 55)	
	Min. Edge	Min. Emb.	Min. Edge	Min. Emb.	Min. Edge	Min. Emb.
1/4" ULTRACONFH	2"	2"	2"	1 1/4"	2"	2"
5/16" ULTRACONFH	3 1/2"	2"	3 1/2"	1 1/4"	2"	2"
3/8" CONFLX	3 3/4"	3 1/2"	-	-	-	-
3/8" STAINLESS STEEL W/ RAMSET G5	3 1/2"	3 3/8"	-	-	-	-
1/2" STAINLESS STEEL W/ RAMSET G5	4"	4 1/2"	-	-	-	-

**LIST OF REPORTS:**

AMERICAN TEST LAB OF SOUTH FLORIDA	REPORT # 030401-08
DATE: APRIL 4, 2008	TEST PROTOCOL: E1996-05, E1996-05, TAS 201
MULLIONS: 4x6x1/4x144	
ATLSE REPORT # 032101-09	DATE: APRIL 16, 2009
TEST PROTOCOL: E1996-05, E1996-05, TAS 201	MULLIONS: 3x4x1/8x144, 4x6x1/8x144
	4x4x1/4x144, 4x6x1/8x144



ADJUSTED TOTAL DEFLECTION =  $H/2 + Y$

$$H/2 = \frac{\sqrt{4+H^2} - 2 - \sqrt{3+Y^2} + 6+8+X}{Z}$$

$$X = X1 + X2$$

$$Y = \frac{X1 + X2}{Z}$$

ADJUSTED DEFLECTION EQUATIONS  
NOTE: SEE MULLION TABLES FOR MULLION X AND Y DEFLECTIONS

DATE	REVISIONS
2/20/12	REVISED NOTES

**ASSA**  
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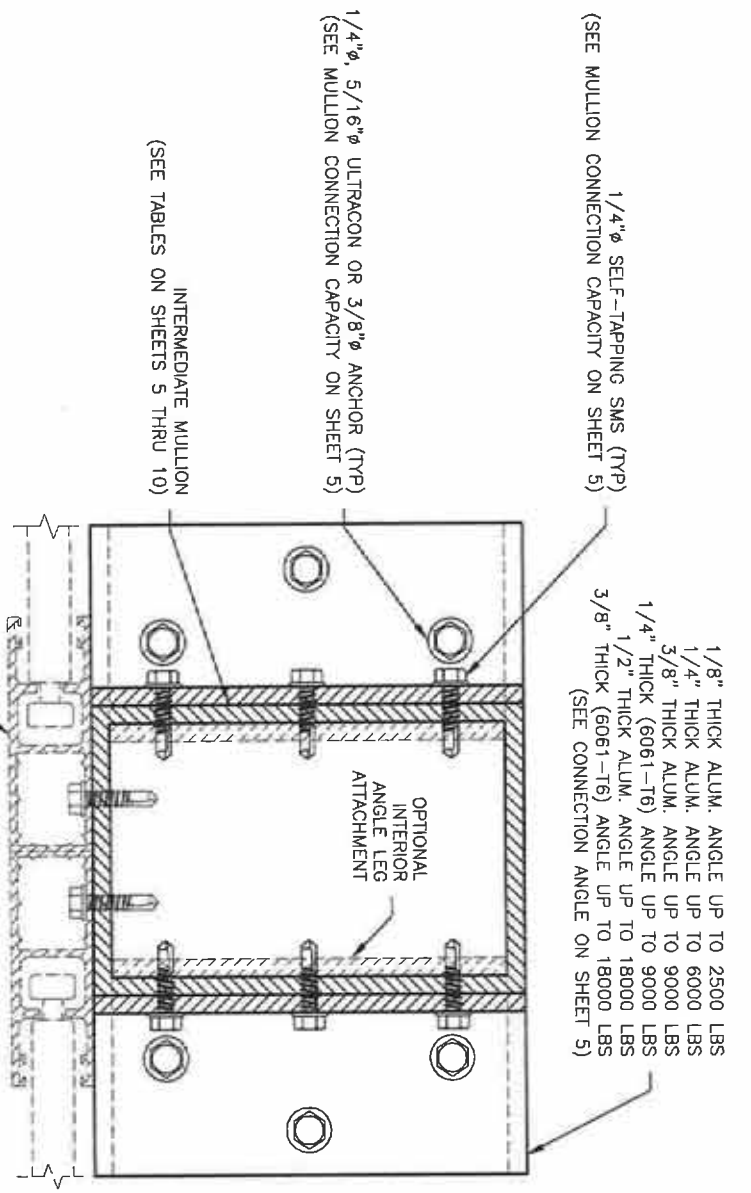
**ROLL-UP SHUTTER MULLIONS**

**TKJ Engineering, LLC.**  
11835 WILLOW CREEK DRIVE, RIVERVIEW, FL 33569  
PH: 813.304.7649; EM: TKJENGINEERING@GMAIL.COM  
CERTIFICATE OF AUTHORIZATION NUMBER: 26582

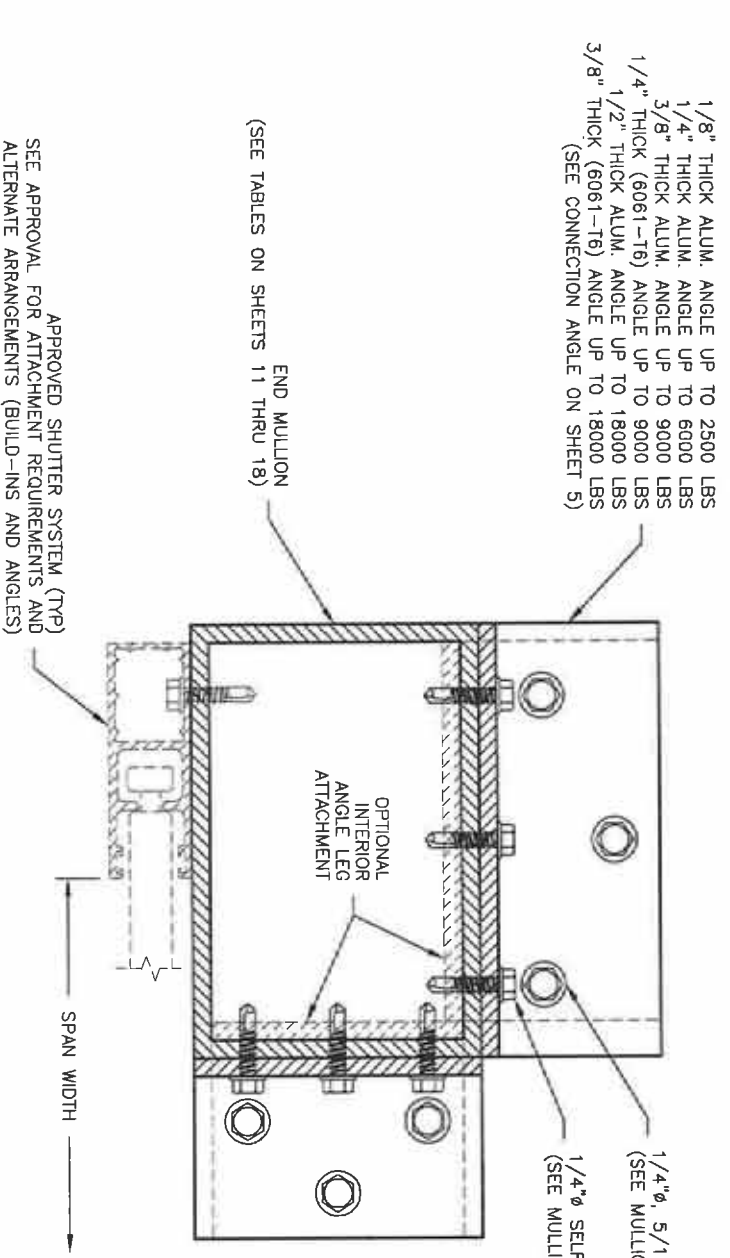
DRAWN BY:	SCALE:	PROJ. #:
TKJ	N.T.S.	11-0401

**REVOR JOHNSON**  
REGISTERED PROFESSIONAL ENGINEER  
FLORIDA P.L. # 105624

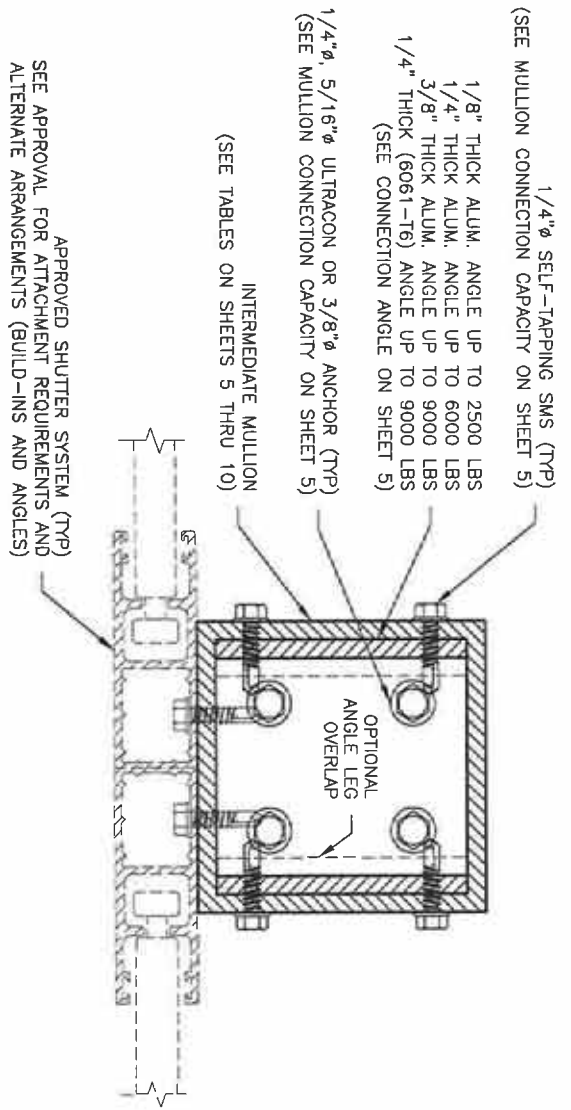




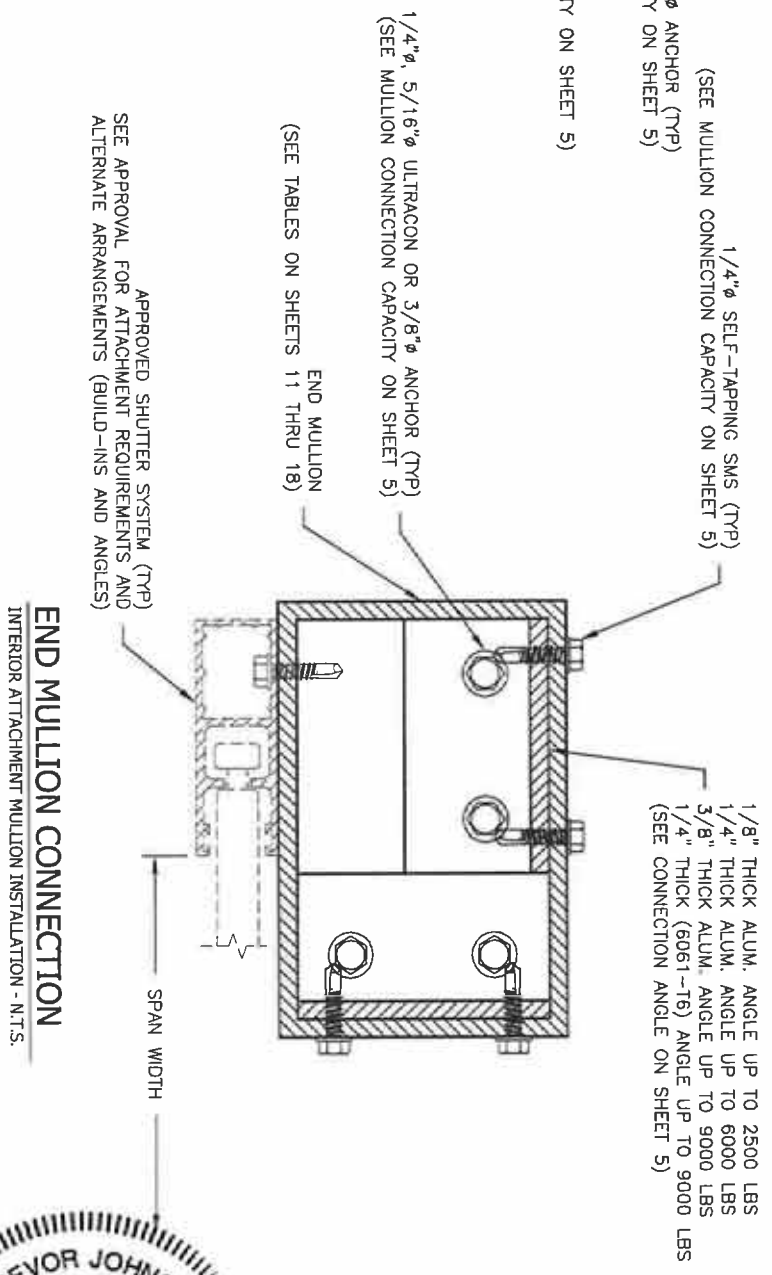
**INTERMEDIATE MULLION CONNECTION**  
TYPICAL MULLION INSTALLATION - N.T.S.



**END MULLION CONNECTION**  
TYPICAL MULLION INSTALLATION - N.T.S.



**INTERMEDIATE MULLION CONNECTION**  
INTERIOR ATTACHMENT MULLION INSTALLATION - N.T.S.



**END MULLION CONNECTION**  
INTERIOR ATTACHMENT MULLION INSTALLATION - N.T.S.

NO.	DATE	REVISIONS

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**ROLL-UP SHUTTER MULLIONS**

**Engineering, LLC.**  
35 AUTUMN CREEK DRIVE, RIVERVIEW, FL 33569  
813.404.7649; EM: TKJENGINEERING@VERIZON.NET  
CERTIFICATE OF AUTHORIZATION NUMBER: 28582

DATE:	DRAWN BY:	SCALE:	PROJ. #:
12/20/11	TKJ	N.T.S.	:11-0401

**TREVOR JOHNSON**  
LICENSE  
No 65624  
PROFESSIONAL ENGINEER  
FLORIDA  
2 OF 29

NOTE: INTERIOR ANGLE LEG ATTACHMENT CAN BE USED IN COMBINATION WITH INTERIOR ATTACHMENT

APPROVED SHUTTER SYSTEM (TYP)  
SEE APPROVAL FOR ATTACHMENT REQUIREMENTS AND ALTERNATE ARRANGEMENTS (BUILD-INS AND ANGLES)

APPROVED SHUTTER SYSTEM (TYP)  
SEE APPROVAL FOR ATTACHMENT REQUIREMENTS AND ALTERNATE ARRANGEMENTS (BUILD-INS AND ANGLES)

APPROVED SHUTTER SYSTEM (TYP)  
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APPROVED SHUTTER SYSTEM (TYP)  
SEE APPROVAL FOR ATTACHMENT REQUIREMENTS AND ALTERNATE ARRANGEMENTS (BUILD-INS AND ANGLES)

1/8" THICK ALUM. ANGLE UP TO 2500 LBS  
1/4" THICK ALUM. ANGLE UP TO 6000 LBS  
3/8" THICK ALUM. ANGLE UP TO 9000 LBS  
1/4" THICK (6061-T6) ANGLE UP TO 18000 LBS  
1/2" THICK ALUM. ANGLE UP TO 18000 LBS  
3/8" THICK (6061-T6) ANGLE UP TO 18000 LBS  
(SEE CONNECTION ANGLE ON SHEET 5)

1/8" THICK ALUM. ANGLE UP TO 2500 LBS  
1/4" THICK ALUM. ANGLE UP TO 6000 LBS  
3/8" THICK ALUM. ANGLE UP TO 9000 LBS  
1/4" THICK (6061-T6) ANGLE UP TO 18000 LBS  
1/2" THICK ALUM. ANGLE UP TO 18000 LBS  
3/8" THICK (6061-T6) ANGLE UP TO 18000 LBS  
(SEE CONNECTION ANGLE ON SHEET 5)

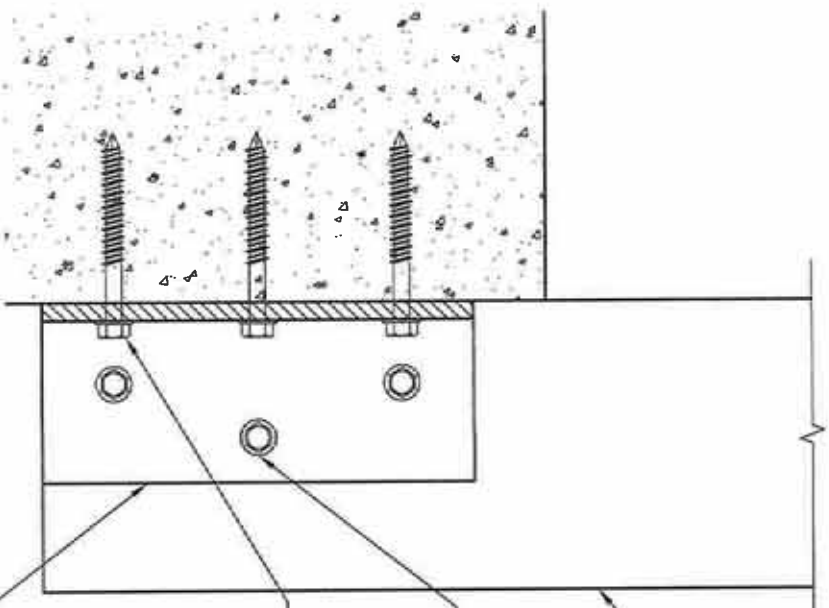
1/4" SELF-TAPPING SMS (TYP)  
(SEE MULLION CONNECTION CAPACITY ON SHEET 5)

1/4" SELF-TAPPING SMS (TYP)  
(SEE MULLION CONNECTION CAPACITY ON SHEET 5)

1/8" THICK ALUM. ANGLE UP TO 2500 LBS  
1/4" THICK ALUM. ANGLE UP TO 6000 LBS  
3/8" THICK ALUM. ANGLE UP TO 9000 LBS  
1/4" THICK (6061-T6) ANGLE UP TO 9000 LBS  
(SEE CONNECTION ANGLE ON SHEET 5)

1/4" ULTRACON OR 3/8" ANCHOR (TYP)  
(SEE MULLION CONNECTION CAPACITY ON SHEET 5)

1/4" ULTRACON OR 3/8" ANCHOR (TYP)  
(SEE MULLION CONNECTION CAPACITY ON SHEET 5)

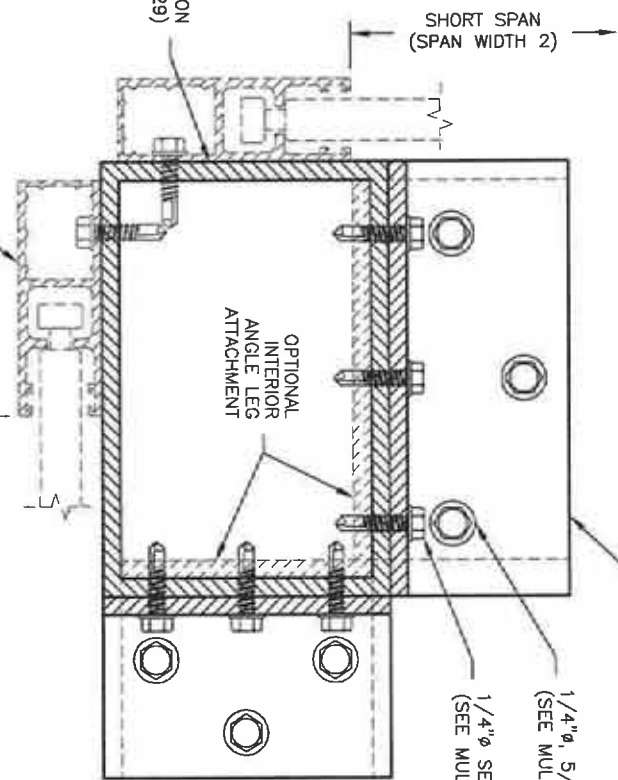


**WALL MOUNTED CONNECTION**  
OPTIONAL MULLION INSTALLATION - N.T.S.

- INTERMEDIATE OR END MULLION  
(SEE TABLES ON SHEETS 5 THRU 18)
- 1/4"  $\phi$  SELF-TAPPING SMS (TYP)  
(SEE MULLION CONNECTION CAPACITY ON SHEET 5)
- 1/4"  $\phi$ , 5/16"  $\phi$  ULTRACON OR 3/8"  $\phi$  ANCHOR (TYP)  
(SEE MULLION CONNECTION CAPACITY ON SHEET 5)
- 1/8" THICK ALUM. ANGLE UP TO 2500 LBS
- 1/4" THICK ALUM. ANGLE UP TO 6000 LBS
- 3/8" THICK ALUM. ANGLE UP TO 9000 LBS
- 1/4" THICK (6061-T6) ANGLE UP TO 9000 LBS
- 1/2" THICK ALUM. ANGLE UP TO 18000 LBS
- 3/8" THICK (6061-T6) ANGLE UP TO 18000 LBS  
(SEE CONNECTION ANGLE ON SHEET 5)

CORNER MULLION  
(SEE TABLES ON SHEETS 18 THRU 29)

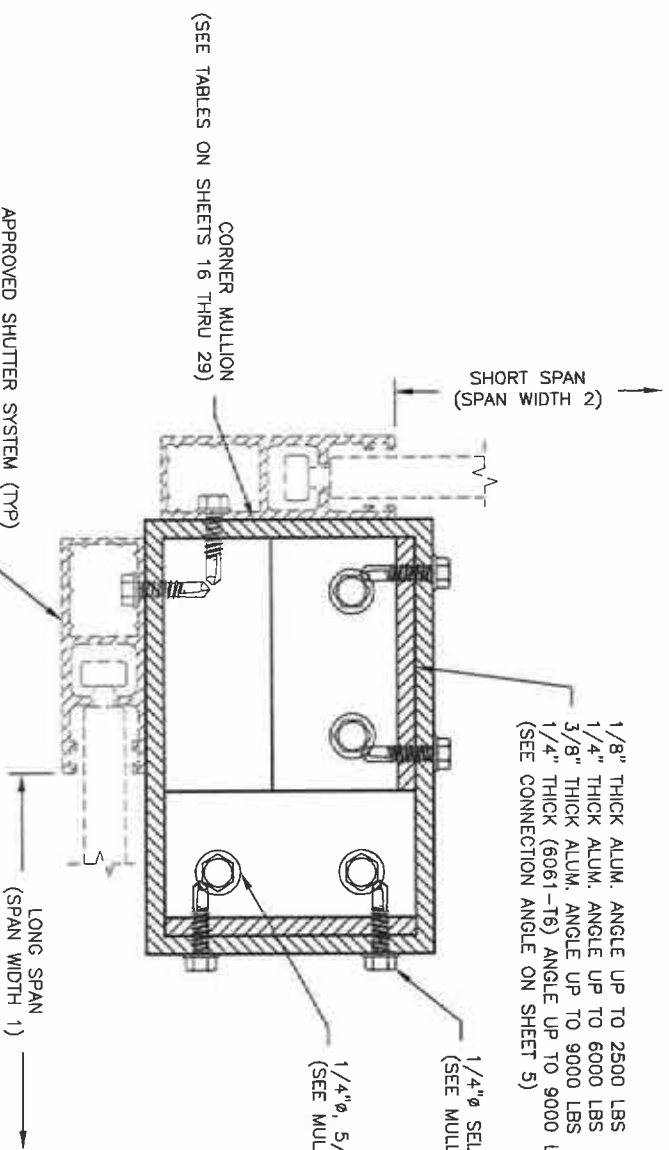
APPROVED SHUTTER SYSTEM (TYP)  
SEE APPROVAL FOR ATTACHMENT REQUIREMENTS AND  
ALTERNATE ARRANGEMENTS (BUILD-INS AND ANGLES)



- 1/8" THICK ALUM. ANGLE UP TO 2500 LBS
- 1/4" THICK ALUM. ANGLE UP TO 6000 LBS
- 3/8" THICK ALUM. ANGLE UP TO 9000 LBS
- 1/4" THICK (6061-T6) ANGLE UP TO 9000 LBS
- 1/2" THICK ALUM. ANGLE UP TO 18000 LBS
- 3/8" THICK (6061-T6) ANGLE UP TO 18000 LBS  
(SEE CONNECTION ANGLE ON SHEET 5)

- 1/4"  $\phi$ , 5/16"  $\phi$  ULTRACON OR 3/8"  $\phi$  ANCHOR (TYP)  
(SEE MULLION CONNECTION CAPACITY ON SHEET 5)
- 1/4"  $\phi$  SELF-TAPPING SMS (TYP)  
(SEE MULLION CONNECTION CAPACITY ON SHEET 5)

**END MULLION CONNECTION**  
TYPICAL MULLION INSTALLATION - N.T.S.



- 1/8" THICK ALUM. ANGLE UP TO 2500 LBS
- 1/4" THICK ALUM. ANGLE UP TO 6000 LBS
- 3/8" THICK ALUM. ANGLE UP TO 9000 LBS
- 1/4" THICK (6061-T6) ANGLE UP TO 9000 LBS  
(SEE CONNECTION ANGLE ON SHEET 5)

- 1/4"  $\phi$  SELF-TAPPING SMS (TYP)  
(SEE MULLION CONNECTION CAPACITY ON SHEET 5)
- 1/4"  $\phi$ , 5/16"  $\phi$  ULTRACON OR 3/8"  $\phi$  ANCHOR (TYP)  
(SEE MULLION CONNECTION CAPACITY ON SHEET 5)

CORNER MULLION  
(SEE TABLES ON SHEETS 16 THRU 29)

APPROVED SHUTTER SYSTEM (TYP)  
SEE APPROVAL FOR ATTACHMENT REQUIREMENTS AND  
ALTERNATE ARRANGEMENTS (BUILD-INS AND ANGLES)

**END MULLION CONNECTION**  
INTERIOR ATTACHMENT MULLION INSTALLATION - N.T.S.

NOTE: INTERIOR ANGLE LEG ATTACHMENT CAN BE USED IN  
COMBINATION WITH INTERIOR ATTACHMENT

#	DATE	REVISIONS

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**ROLL-UP SHUTTER  
MULLIONS**

**TKJ Engineering, LLC.**  
835 AUTUMN CREEK DRIVE, RIVERVIEW, FL 33569  
TEL: 813.404.7649; EM: TKJENGINEERING@VERIZON.NET  
CERTIFICATE OF AUTHORIZATION NUMBER: 28582

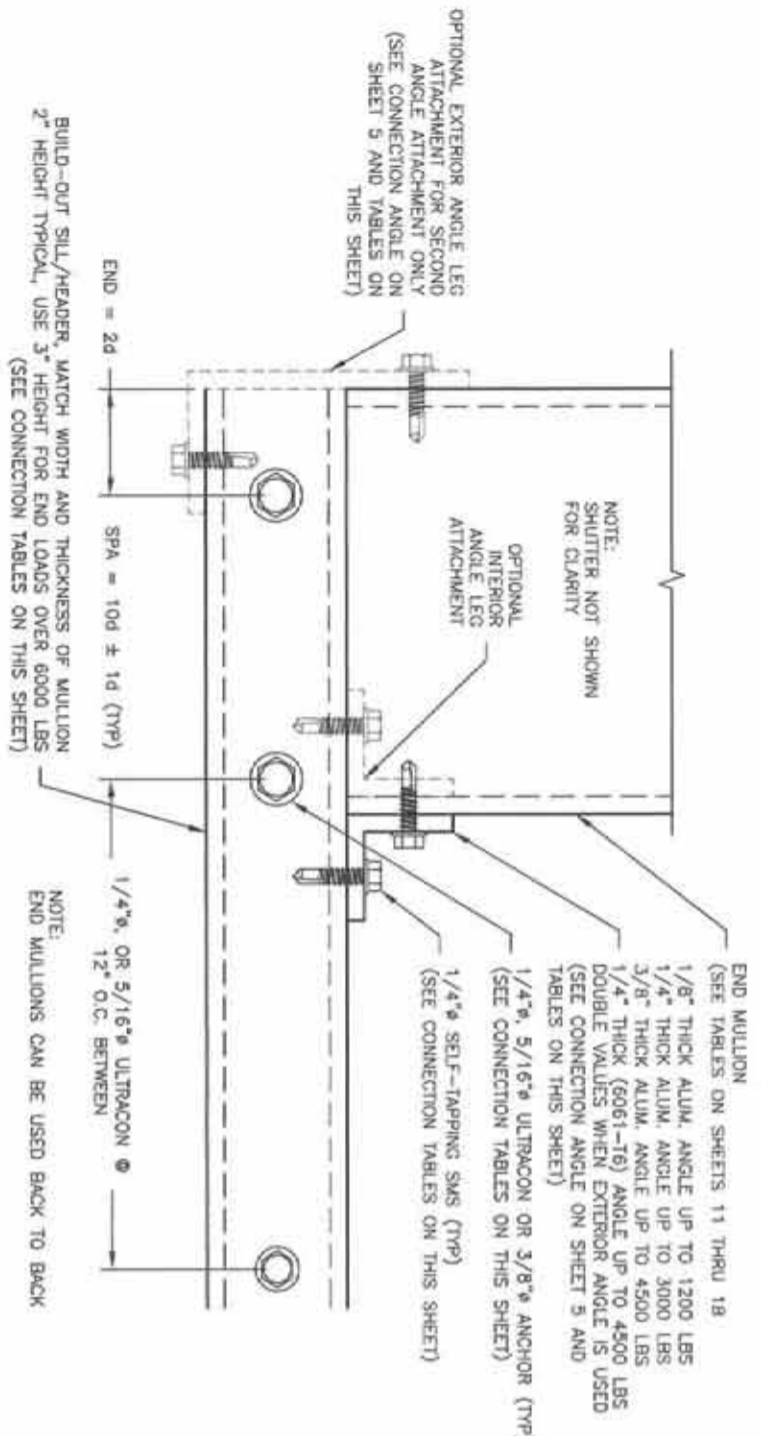
DATE:	DRAWN BY:	SCALE:	PROJ. #:
12/20/11	TKJ	N.T.S.	;11-0401

**TREVOR JOHNSON**  
LICENSE  
No 65624  
PROFESSIONAL ENGINEER  
FLORIDA P.E. # 65624

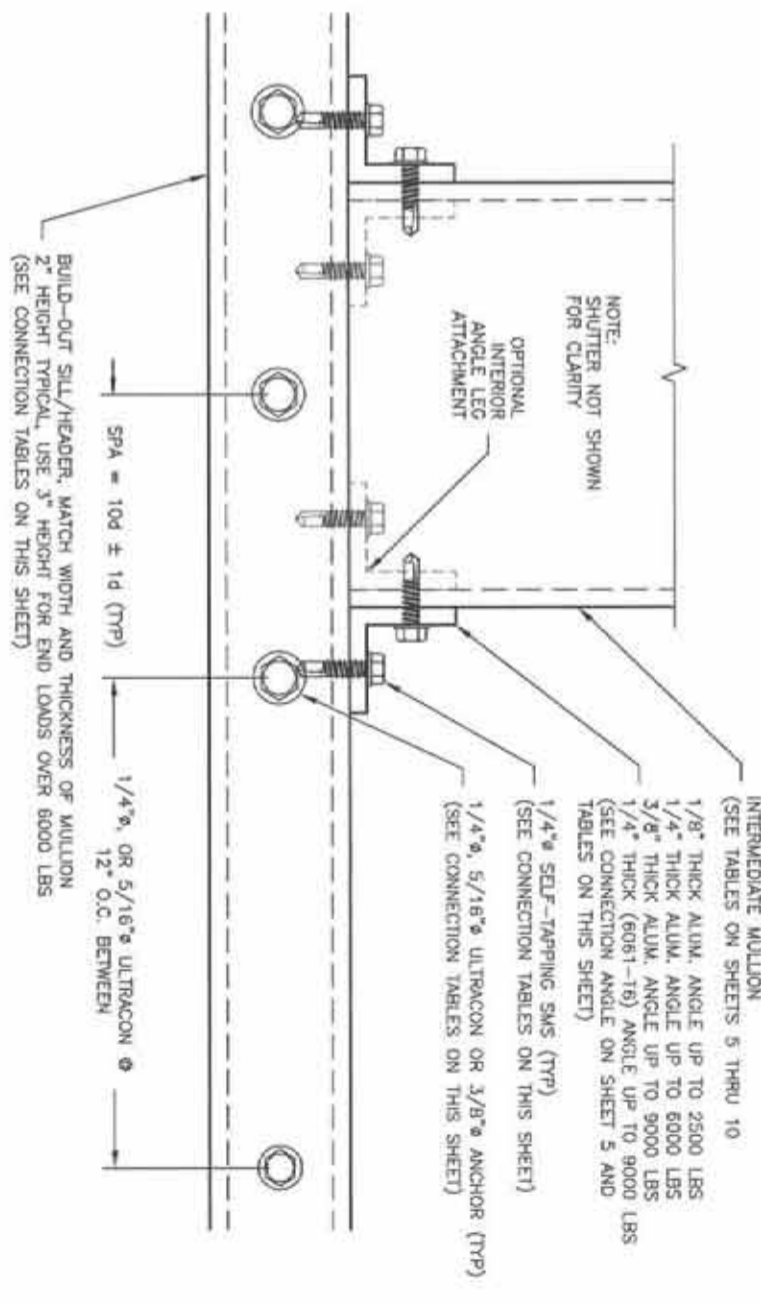
THIS IS TO CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE, THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE STATE REQUIREMENTS.

3 OF 29

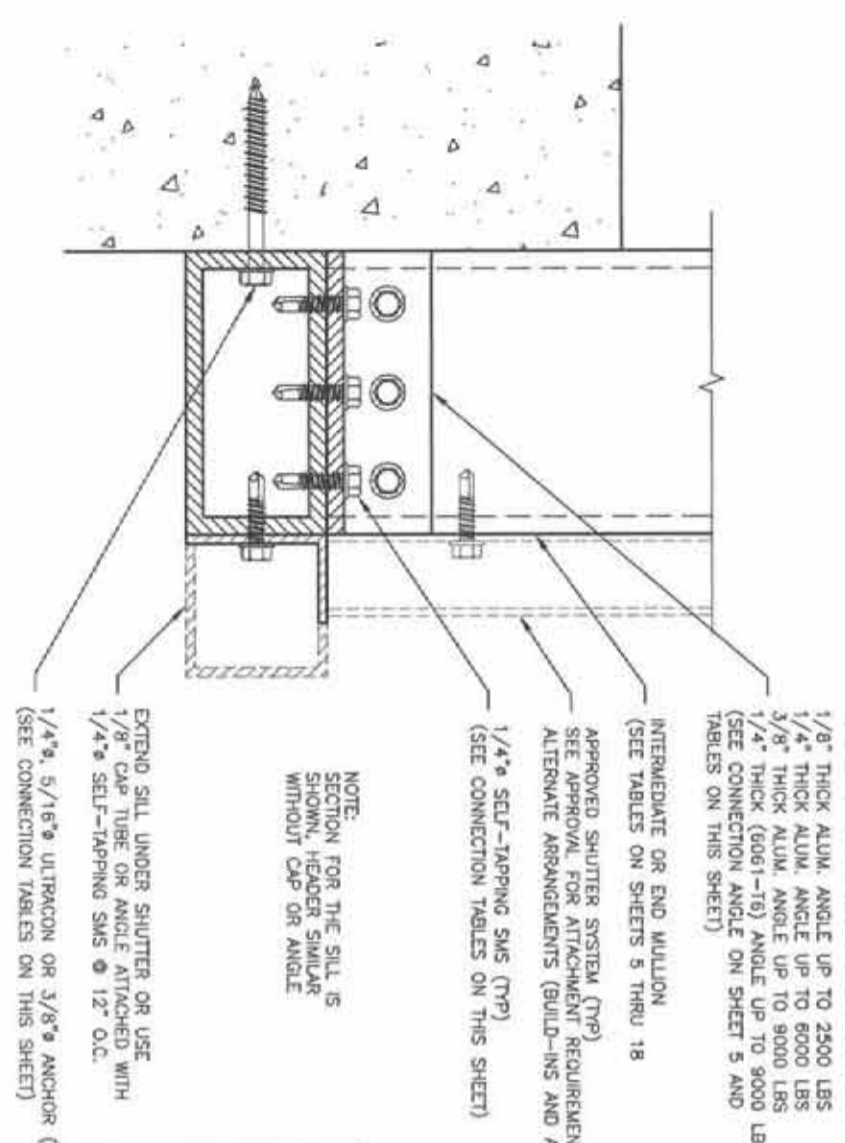




**BUILD-OUT SILL/HEADER CONNECTION**  
OPTIONAL END MULLION INSTALLATION - N.T.S.



**BUILD-OUT SILL/HEADER CONNECTION**  
OPTIONAL INTERMEDIATE MULLION INSTALLATION - N.T.S.



**BUILD-OUT SILL/HEADER SECTION**  
OPTIONAL END AND INTERMEDIATE MULLION INSTALLATION - N.T.S.

NOTE: SECTION FOR THE SILL IS SHOWN, HEADER SIMILAR WITHOUT CAP OR ANGLE

1/8" THICK ALUM. ANGLE UP TO 2500 LBS  
1/4" THICK ALUM. ANGLE UP TO 6000 LBS  
3/8" THICK ALUM. ANGLE UP TO 9000 LBS  
1/4" THICK (6061-T6) ANGLE UP TO 9000 LBS (SEE CONNECTION ANGLE ON SHEET 5 AND TABLES ON THIS SHEET)

INTERMEDIATE OR END MULLION (SEE TABLES ON SHEETS 11 THRU 18)

APPROVED SHUTTER SYSTEM (TYP) SEE APPROVAL FOR ATTACHMENT REQUIREMENTS AND ALTERNATE ARRANGEMENTS (BUILD-INS AND ANGLES)

1/4" SELF-TAPPING SMS (TYP) (SEE CONNECTION TABLES ON THIS SHEET)

EXTEND SILL UNDER SHUTTER OR USE 1/8" CAP TUBE OR ANGLE ATTACHED WITH 1/4" SELF-TAPPING SMS @ 12" O.C.

1/4", 5/16" ULTRACON OR 3/8" ANCHOR (TYP) (SEE CONNECTION TABLES ON THIS SHEET)

BUILD-OUT SILL/HEADER CONNECTION ANGLE CAPACITY (2 REQUIRED)		1/4" MIN. ALUMINIUM	
DESIGN LOAD (LBS)	ANCHORS REQUIRED EACH ANGLE	DESIGN LOAD (LBS)	ANCHORS REQUIRED EACH ANGLE
1990	(2) 1/4-14 DRILL-FLEX	3200	(2) 1/4-14 DRILL-FLEX
2940	(3) 1/4-14 DRILL-FLEX	4900	(3) 1/4-14 DRILL-FLEX
3920	(4) 1/4-14 DRILL-FLEX	6400	(4) 1/4-14 DRILL-FLEX
4900	(5) 1/4-14 DRILL-FLEX	9600	(5) 1/4-14 DRILL-FLEX
6990	(6) 1/4-14 DRILL-FLEX	12800	(6) 1/4-14 DRILL-FLEX

BUILD-OUT SILL/HEADER CONNECTION ANGLE CAPACITY (1 REQUIRED)		1/4" MIN. ALUMINIUM	
DESIGN LOAD (LBS)	ANCHORS REQUIRED EACH ANGLE	DESIGN LOAD (LBS)	ANCHORS REQUIRED EACH ANGLE
990	(2) 1/4-14 DRILL-FLEX	1600	(2) 1/4-14 DRILL-FLEX
1470	(3) 1/4-14 DRILL-FLEX	2400	(3) 1/4-14 DRILL-FLEX
1990	(4) 1/4-14 DRILL-FLEX	3200	(4) 1/4-14 DRILL-FLEX
2450	(5) 1/4-14 DRILL-FLEX	4800	(5) 1/4-14 DRILL-FLEX
2940	(6) 1/4-14 DRILL-FLEX	6400	(6) 1/4-14 DRILL-FLEX

BUILD-OUT SILL/HEADER CONNECTION CAPACITY			
DESIGN LOAD (LBS)	CONCRETE & FILLED CMU ANCHORS REQUIRED EACH ANGLE	HOLLOW CMU ANCHORS REQUIRED EACH ANGLE	WOOD ANCHORS REQUIRED EACH ANGLE
2090	(2) 5/16" ULTRACON	(3) 1/4" ULTRACON	(3) 1/4" ULTRACON
3120	(3) 5/16" ULTRACON	(4) 1/4" ULTRACON	(4) 1/4" ULTRACON
4160	(4) 5/16" ULTRACON	(3) 5/16" ULTRACON	(3) 5/16" ULTRACON
6240	(6) 5/16" ULTRACON	(4) 5/16" ULTRACON	(4) 5/16" ULTRACON
4500	(2) 3/8" ANCHOR	(5) 5/16" ULTRACON	(5) 5/16" ULTRACON
6750	(3) 3/8" ANCHOR	(6) 5/16" ULTRACON	(6) 5/16" ULTRACON
9000	(4) 3/8" ANCHOR	(8) 5/16" ULTRACON	(8) 5/16" ULTRACON

NOTE: ADD MULLION END LOADS TOGETHER FROM BOTH MULLIONS (ABOVE AND BELOW) WHEN A SHARED SILL/HEADER IS USED



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E-MAIL: TKJENGINEERING@VERIZON.NET  
PROFESSIONAL ENGINEER OF AUTHORIZATION NUMBER: 28582

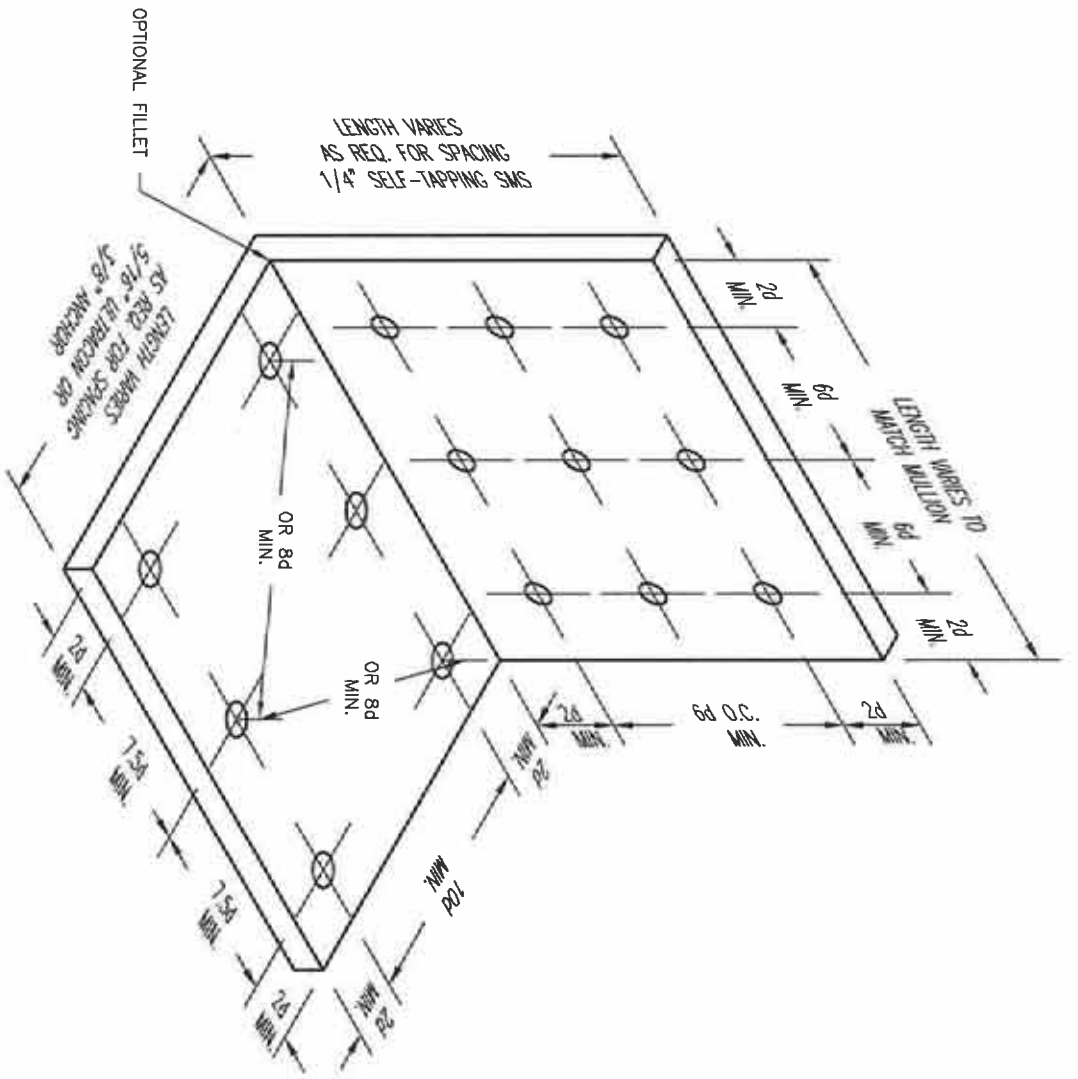
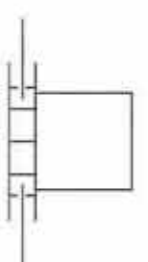
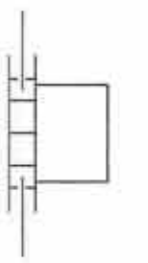
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**ROLL-UP SHUTTER MULLIONS**

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#	DATE	REVISIONS





**CONNECTION ANGLE**  
MULLION INSTALLATION - N.T.S.

NOTE: SEE MULLION CONNECTION CAPACITY TABLE FOR REQUIRED ANCHORS, USE CENTER ANCHOR SPACING AND LOCATIONS WHEN REQUIRED.  
SEE MULLION END LOAD ON MAXIMUM DESIGN PRESSURE MULLION TABLES FOR THE REQUIRED MINIMUM CONNECTION CAPACITY

MAXIMUM DESIGN PRESSURE OF A INTERMEDIATE 3'X4'X1/8" MULLION (6063-T6)						
AVERAGE SPAN WIDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION Y (IN)	
60°	72"	93	1395	0.64	0.73	
	84"	68	1190	0.73	0.96	
	96"	52	1040	0.96	1.21	
72°	108"	41	923	1.21	1.44	
	120"	32	800	1.44	1.85	
	60"	60"	111	1865	0.37	0.54
84°	72"	77	1386	0.54	0.74	
	84"	57	1197	0.74	0.95	
	96"	43	1032	0.95	1.20	
96°	108"	34	918	1.20	1.63	
	120"	29	814	1.63	2.08	
	60"	60"	83	1660	0.37	0.54
108°	72"	66	1386	0.54	0.74	
	84"	49	1201	0.74	0.95	
	96"	37	1036	0.95	1.20	
120°	108"	29	914	1.20	1.63	
	120"	24	806	1.63	2.08	
	60"	60"	51	1377	0.54	0.74
132°	72"	58	1392	0.54	0.74	
	84"	43	1204	0.74	0.96	
	96"	33	1056	0.96	1.20	

MAXIMUM DESIGN PRESSURE OF A INTERMEDIATE 4'X4'X1/8" MULLION (6063-T6)						
AVERAGE SPAN WIDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION Y (IN)	
60°	72"	135	2025	0.41	0.55	
	84"	99	1733	0.55	0.72	
	96"	76	1520	0.72	0.91	
72°	108"	60	1350	0.91	1.14	
	120"	49	1225	1.14	1.41	
	60"	60"	112	2016	0.40	0.55
84°	72"	83	1743	0.55	0.72	
	84"	63	1512	0.72	0.91	
	96"	50	1350	0.91	1.11	
96°	108"	40	1200	1.11	1.41	
	120"	36	1225	1.41	1.74	
	60"	60"	62	1736	0.55	0.71
108°	72"	71	1740	0.55	0.71	
	84"	54	1512	0.72	0.92	
	96"	43	1355	0.92	1.14	
120°	108"	35	1225	1.14	1.41	
	120"	30	1200	1.41	1.74	
	60"	60"	47	1504	0.71	0.81
132°	72"	37	1332	0.90	1.02	
	84"	30	1200	1.11	1.32	
	96"	27	1088	1.32	1.63	



NOTE: USE DEFLECTIONS PROVIDED WHEN MINIMUM SEPARATION TO GLASS

CONCRETE		CONCRETE & FILLED CMU		HOLLOW CMU		WOOD		1/8" MIN ALUMINUM		1/4" MIN ALUMINUM	
DESIGN LOAD (LBS)	ANCHORS REQUIRED EACH ANGLE	DESIGN LOAD (LBS)	ANCHORS REQUIRED EACH ANGLE	DESIGN LOAD (LBS)	ANCHORS REQUIRED EACH ANGLE	DESIGN LOAD (LBS)	ANCHORS REQUIRED EACH ANGLE	DESIGN LOAD (LBS)	ANCHORS REQUIRED EACH ANGLE	DESIGN LOAD (LBS)	ANCHORS REQUIRED EACH ANGLE
3900	(1) 3/8" RAMSET G5	4160	(2) 5/16" ULTRACON	1400	(2) 1/4" ULTRACON	1200	(2) 1/4" ULTRACON	2640	(2) 1/4-14 DRILL-FLEX	4240	(2) 1/4-14 DRILL-FLEX
7800	(2) 3/8" RAMSET G5	6240	(3) 5/16" ULTRACON	2100	(3) 1/4" ULTRACON	1800	(3) 1/4" ULTRACON	3960	(3) 1/4-14 DRILL-FLEX	6360	(3) 1/4-14 DRILL-FLEX
11700	(3) 3/8" RAMSET G5	8320	(4) 5/16" ULTRACON	2860	(2) 5/16" ULTRACON	2360	(2) 5/16" ULTRACON	5280	(4) 1/4-14 DRILL-FLEX	8480	(4) 1/4-14 DRILL-FLEX
7020	(1) 1/2" RAMSET G5	9000	(2) 3/8" ANCHOR	2680	(3) 5/16" ULTRACON	3540	(3) 5/16" ULTRACON	6600	(6) 1/4-14 DRILL-FLEX	12720	(6) 1/4-14 DRILL-FLEX
14040	(2) 1/2" RAMSET G5	13600	(3) 3/8" ANCHOR	3440	(4) 5/16" ULTRACON	4720	(4) 5/16" ULTRACON	7920	(8) 1/4-14 DRILL-FLEX	16960	(8) 1/4-14 DRILL-FLEX
21060	(3) 1/2" RAMSET G5	18000	(4) 3/8" ANCHOR	5180	(6) 5/16" ULTRACON	7080	(6) 5/16" ULTRACON	10560	(8) 1/4-14 DRILL-FLEX	21200	(10) 1/4-14 DRILL-FLEX

TREVOR JOHNSON  
LICENSE  
No 65624  
FLORIDA  
PROFESSIONAL ENGINEER

**Engineering, LLC.**  
35 AUTUMN CREEK DRIVE, RIVERVIEW, FL 33569  
813.404.7649; EM: TKJENGINEERING@VERIZON.NET  
CERTIFICATE OF AUTHORIZATION NUMBER: 28562

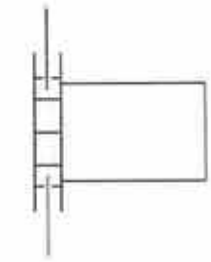
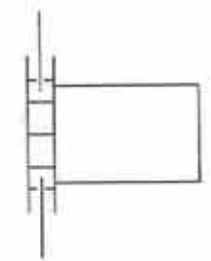
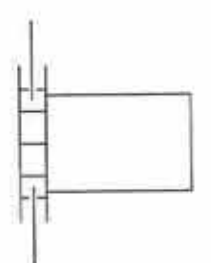
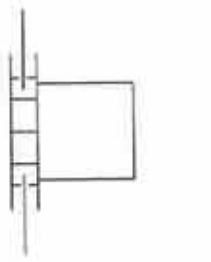
DATE: 12/20/11 DRAWN BY: TKJ SCALE: N.T.S. PROJ. #: ;11-0401

**ROLL-UP SHUTTER MULLIONS**

**ASSA**  
"Knowledge is Your Best Protection"  
AMERICAN SHUTTER SYSTEM ASSOCIATION, INC.  
268 WESTROADS DRIVE, WEST PALM BEACH, FL, 33407  
PHONE: 800.432.2204; FAX: 561.841.0852  
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MAXIMUM DESIGN PRESSURE OF A INTERMEDIATE 4"x4"x1/4" MULLION (60x3-16)

AVERAGE SPAN WIDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)
60"	96"	138	2760	0.72
	108"	109	2453	0.91
	120"	88	2200	1.12
	132"	73	2008	1.36
	144"	61	1830	1.61
	96"	115	2760	0.72
	108"	91	2457	0.91
	120"	74	2220	1.13
	132"	61	2013	1.37
	144"	51	1836	1.62
	96"	99	2772	0.72
	108"	78	2457	0.91
	120"	63	2202	1.12
	132"	52	2002	1.36
	144"	44	1848	1.63
	96"	86	2752	0.72
	108"	68	2448	0.91
	120"	55	2200	1.12
	132"	46	2024	1.37
	144"	38	1824	1.61
	96"	77	2772	0.72
	108"	61	2471	0.92
	120"	49	2205	1.12
	132"	41	2030	1.38
	144"	34	1836	1.62
	84"	90	3150	0.55
	96"	69	2760	0.72
	108"	54	2430	0.90
	120"	44	2200	1.12
	132"	36	1980	1.34
	84"	82	3157	0.55
	96"	63	2772	0.72
	108"	50	2475	0.92
	120"	40	2200	1.12
	132"	33	1997	1.35

MAXIMUM DESIGN PRESSURE OF A INTERMEDIATE 4"x6"x1/8" MULLION (60x3-16)

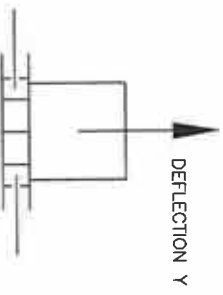
AVERAGE SPAN WIDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)
60"	96"	131	2620	0.48
	108"	104	2340	0.61
	120"	84	2100	0.75
	132"	69	1898	0.90
	144"	58	1740	1.07
	96"	109	2616	0.48
	108"	86	2322	0.60
	120"	70	2100	0.75
	132"	58	1914	0.91
	144"	49	1764	1.09
	96"	94	2632	0.48
	108"	74	2331	0.61
	120"	60	2100	0.75
	132"	50	1925	0.92
	144"	42	1764	1.09
	96"	82	2624	0.48
	108"	65	2340	0.61
	120"	52	2080	0.74
	132"	43	1892	0.90
	144"	36	1728	1.07
	96"	73	2628	0.48
	108"	58	2349	0.61
	120"	47	2115	0.76
	132"	39	1931	0.92
	144"	32	1728	1.07
	84"	86	3010	0.37
	96"	66	2640	0.48
	108"	52	2340	0.61
	120"	42	2100	0.75
	132"	35	1925	0.92
	84"	78	3003	0.37
	96"	60	2640	0.48
	108"	47	2327	0.61
	120"	38	2090	0.75
	132"	32	1936	0.92

MAXIMUM DESIGN PRESSURE OF A INTERMEDIATE 4"x8"x1/4" MULLION (60x3-16)

AVERAGE SPAN WIDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)
120"	96"	122	4880	0.48
	108"	97	4365	0.61
	120"	78	3900	0.75
	132"	65	3575	0.91
	144"	54	3240	1.07
	96"	111	4884	0.48
	108"	88	4356	0.61
	120"	71	3905	0.75
	132"	59	3670	0.91
	144"	49	3234	1.07
	96"	102	4896	0.48
	108"	81	4374	0.61
	120"	65	3900	0.75
	132"	54	3564	0.91
	144"	45	3240	1.07
	96"	94	4888	0.48
	108"	74	4329	0.60
	120"	60	3900	0.75
	132"	50	3575	0.91
	144"	42	3276	1.09
	96"	82	4920	0.48
	108"	64	4320	0.60
	120"	52	3900	0.75
	132"	43	3548	0.91
	144"	36	3240	1.07
	96"	76	4864	0.48
	108"	60	4320	0.60
	120"	49	3920	0.75
	132"	40	3520	0.90
	144"	34	3264	1.08
	96"	72	4896	0.48
	108"	57	4361	0.61
	120"	46	3910	0.75
	132"	38	3553	0.91
	144"	32	3264	1.08

MAXIMUM DESIGN PRESSURE OF A INTERMEDIATE 4"x6"x1/4" MULLION (60x3-16)

AVERAGE SPAN WIDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)
216"	96"	88	4896	0.48
	108"	68	4374	0.61
	120"	54	3970	0.74
	132"	43	3564	0.91
	144"	36	3240	1.07
	96"	64	4864	0.48
	108"	51	4361	0.61
	120"	41	3985	0.75
	132"	34	3563	0.91
	144"	29	3306	1.10
	96"	61	4880	0.48
	108"	48	4320	0.60
	120"	39	3900	0.75
	132"	32	3520	0.90
	144"	27	3240	1.07
	96"	76	5586	0.37
	108"	58	4872	0.48
	120"	46	4347	0.61
	132"	37	3885	0.74
	144"	31	3581	0.91
	96"	73	5621	0.37
	108"	56	4928	0.48
	120"	44	4356	0.61
	132"	36	3960	0.76
	144"	29	3509	0.90
	96"	69	5555	0.37
	108"	53	4876	0.48
	120"	42	4347	0.61
	132"	34	3910	0.75
	144"	28	3542	0.90
	96"	67	5628	0.37
	108"	51	4896	0.48
	120"	40	4320	0.60
	132"	33	3960	0.76
	144"	27	3564	0.91



NOTE: USE DEFLECTIONS PROVIDED WHEN DETERMINING MINIMUM SEPARATION TO GLASS

#	DATE	REVISIONS

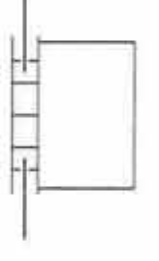
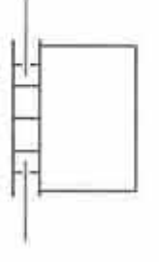
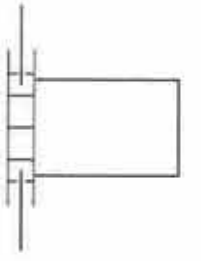
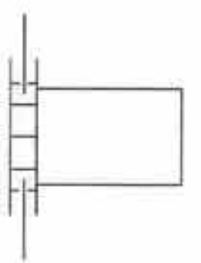
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**ROLL-UP SHUTTER MULLIONS**

**Engineering, LLC.**  
 285 AUTUMN CREEK DRIVE, RIVERVIEW, FL 33569  
 813.404.7649; EM.: TKJENGINEERING@VERIZON.NET  
 CERTIFICATE OF AUTHORIZATION NUMBER: 28582

DATE:	DRAWN BY:	SCALE:	PROJ. #:
12/20/11	TKJ	N.T.S.	:11-0401

**TREVOR JOHNSON**  
 LICENSE No. 65624  
 PROFESSIONAL ENGINEER  
 STATE OF FLORIDA



MAXIMUM DESIGN PRESSURE OF A  
INTERMEDIATE 4"x8"x1/4" MULLION (6063-T6)

AVERAGE SPAN WIDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)
132"	96"	150	6600	0.32
	108"	134	6633	0.46
	120"	108	6940	0.56
	132"	89	6385	0.68
144"	144"	75	4950	0.81
	96"	150	7200	0.35
	108"	122	6588	0.45
	120"	99	6940	0.56
156"	144"	89	4968	0.81
	120"	82	5412	0.68
	108"	113	6611	0.46
	96"	143	7436	0.36
168"	108"	105	6615	0.46
	120"	85	6950	0.56
	132"	70	6390	0.68
	144"	59	4956	0.81
180"	96"	124	7440	0.36
	108"	98	6615	0.46
	120"	79	5925	0.56
	132"	66	5445	0.68
192"	144"	55	4950	0.81
	96"	116	7424	0.36
	108"	92	6624	0.46
	120"	74	5920	0.56
204"	144"	61	6368	0.68
	144"	52	4992	0.82
	96"	109	7412	0.36
	108"	86	6579	0.45
204"	120"	70	5950	0.56
	132"	58	5423	0.68
	144"	49	4998	0.82

MAXIMUM DESIGN PRESSURE OF A  
INTERMEDIATE 4"x8"x1/4" MULLION (6063-T6)

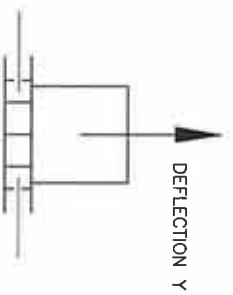
AVERAGE SPAN WIDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)
216"	96"	103	7416	0.36
	108"	82	6642	0.46
	120"	66	5940	0.56
	132"	55	5445	0.68
228"	144"	46	4968	0.81
	96"	98	7448	0.36
	108"	77	6584	0.45
	120"	63	5985	0.57
240"	132"	52	5434	0.68
	120"	60	6000	0.57
	108"	73	6570	0.45
	96"	93	7440	0.36
252"	144"	41	4920	0.80
	144"	41	4920	0.80
	120"	49	5390	0.68
	132"	47	5429	0.68
264"	144"	39	4914	0.80
	96"	85	7480	0.36
	108"	67	6533	0.46
	120"	54	5940	0.56
276"	132"	45	5445	0.68
	144"	38	5016	0.82
	96"	81	7452	0.36
	108"	64	6624	0.46
288"	120"	52	5980	0.57
	132"	43	5440	0.68
	144"	36	4968	0.81
	96"	78	7488	0.36
288"	108"	61	6588	0.45
	120"	50	6000	0.57
	132"	41	5412	0.68
	144"	34	4896	0.80

MAXIMUM DESIGN PRESSURE OF A  
INTERMEDIATE 4"x6"x1/8" MULLION (6063-T6)

AVERAGE SPAN WIDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)
60"	96"	105	2100	0.72
	108"	83	1868	0.91
	120"	67	1675	1.12
	132"	56	1540	1.37
72"	144"	47	1410	1.63
	96"	88	2112	0.72
	108"	69	1863	0.91
	120"	56	1680	1.12
84"	132"	46	1518	1.35
	144"	39	1404	1.62
	96"	75	2100	0.72
	108"	59	1859	0.91
96"	120"	48	1680	1.12
	132"	40	1540	1.37
	144"	33	1386	1.60
	96"	66	2112	0.72
108"	108"	52	1872	0.91
	120"	42	1680	1.12
	132"	35	1540	1.37
	144"	29	1392	1.61
120"	84"	76	2394	0.55
	96"	58	2088	0.71
	108"	46	1863	0.91
	120"	37	1665	1.11
132"	132"	31	1535	1.37
	84"	69	2415	0.55
	96"	53	2120	0.73
	108"	42	1890	0.92
144"	120"	34	1700	1.14
	132"	28	1540	1.37
	72"	85	2805	0.41
	84"	62	2397	0.55
156"	96"	48	2112	0.72
	108"	38	1881	0.92
	120"	31	1705	1.14

MAXIMUM DESIGN PRESSURE OF A  
INTERMEDIATE 4"x6"x1/4" MULLION (6063-T6)

AVERAGE SPAN WIDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)
96"	96"	121	3872	0.72
	108"	95	3420	0.91
	120"	77	3080	1.12
	132"	64	2816	1.37
108"	144"	54	2582	1.63
	96"	107	3852	0.72
	108"	85	3443	0.91
	120"	69	3105	1.13
120"	132"	57	2822	1.37
	144"	48	2582	1.63
	96"	96	3940	0.72
	108"	76	3420	0.91
132"	120"	62	3100	1.13
	144"	51	2805	1.36
	144"	43	2580	1.62
	96"	88	3872	0.72
144"	108"	69	3416	0.91
	120"	56	3080	1.12
	132"	46	2783	1.35
	144"	39	2574	1.62
156"	96"	80	3940	0.72
	108"	64	3456	0.92
	120"	51	3060	1.12
	132"	43	2838	1.38
168"	144"	36	2592	1.63
	96"	74	3848	0.72
	108"	59	3452	0.92
	120"	47	3055	1.11
180"	132"	39	2789	1.35
	144"	33	2574	1.62
	96"	69	3864	0.72
	108"	54	3402	0.90
192"	120"	44	3080	1.12
	132"	36	2772	1.34
	144"	31	2604	1.64



NOTE: USE DEFLECTIONS PROVIDED WHEN DETERMINING MINIMUM SEPARATION TO GLASS

#	DATE	REVISIONS

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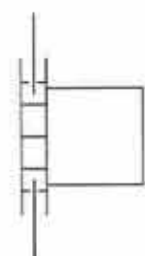
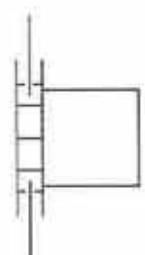
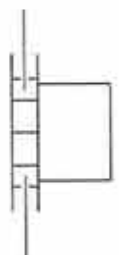
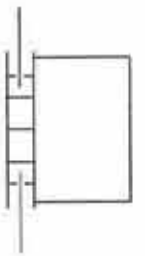
**ROLL-UP SHUTTER MULLIONS**

**Engineering, LLC.**  
117 AUTUMN CREEK DRIVE, RIVERVIEW, FL 33569  
TEL: 813.404.7649; EM: TKJENGINEERING@VERIZON.NET  
CERTIFICATE OF AUTHORIZATION NUMBER: 28582

DATE:	DRAWN BY:	SCALE:	PROJ. #:
12/20/11	TKJ	N.T.S.	;11-0401

**TREVOR JOHNSON**  
LICENSE  
No. 65694  
STATE OF FLORIDA  
PROFESSIONAL ENGINEER  
12/20/11





MAXIMUM DESIGN PRESSURE OF A  
INTERMEDIATE 4"x8"x1/4" MULLION (6063-T6)

AVERAGE SPAN WIDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)
120"	96"	124	4980	0.72
	108"	98	4410	0.91
	120"	79	3950	1.12
	132"	66	3630	1.37
	144"	55	3300	1.62
	96"	113	4972	0.72
	108"	89	4406	0.91
	120"	72	3960	1.12
	132"	60	3630	1.37
	144"	50	3300	1.62
	96"	103	4944	0.72
	108"	82	4428	0.92
	120"	66	3960	1.12
	132"	55	3630	1.37
	144"	46	3312	1.62
	96"	95	4940	0.72
	108"	75	4388	0.91
	120"	61	3965	1.12
	132"	50	3675	1.35
	144"	42	3276	1.61
	96"	89	4984	0.72
	108"	70	4410	0.91
	120"	57	3990	1.13
	132"	47	3619	1.37
	144"	39	3276	1.61
	96"	83	4980	0.72
	108"	65	4388	0.91
	120"	53	3975	1.13
	132"	44	3630	1.37
	144"	37	3330	1.63
	96"	77	4928	0.72
	108"	61	4392	0.91
	120"	50	4000	1.13
	132"	41	3608	1.36
	144"	34	3264	1.60

MAXIMUM DESIGN PRESSURE OF A  
INTERMEDIATE 3"x4"x1/8" MULLION (6061-T6)

AVERAGE SPAN WIDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)
60"	72"	130	1930	0.76
	84"	93	1628	1.00
	96"	62	1240	1.14
	108"	44	990	1.30
	120"	32	800	1.44
	60"	150	2260	0.51
	72"	108	1944	0.76
	84"	77	1617	1.00
	96"	52	1248	1.15
	108"	36	972	1.27
	60"	133	2328	0.52
	72"	93	1963	0.76
	84"	66	1617	1.00
	96"	44	1232	1.13
	108"	31	977	1.28
	48"	150	2400	0.28
	60"	117	2340	0.53
	72"	81	1944	0.76
	84"	58	1624	1.00
	96"	39	1248	1.15
	48"	150	2700	0.31
	60"	104	2340	0.53
	72"	72	1944	0.76
	84"	51	1607	0.99
	96"	34	1224	1.13
	48"	146	2920	0.34
	60"	93	2325	0.52
	72"	65	1950	0.76
	84"	46	1610	0.99
	96"	31	1240	1.14
	48"	133	2926	0.34
	60"	85	2338	0.53
	72"	59	1947	0.76
	84"	42	1617	1.00
	96"	28	1232	1.13

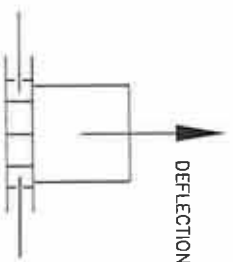
MAXIMUM DESIGN PRESSURE OF A  
INTERMEDIATE 4"x4"x1/8" MULLION (6061-T6)

AVERAGE SPAN WIDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)
60"	96"	106	2120	1.01
	108"	84	1890	1.28
	120"	62	1650	1.44
	132"	46	1265	1.56
	144"	36	1080	1.73
	96"	88	2112	1.00
	108"	70	1890	1.28
	120"	51	1630	1.42
	132"	39	1287	1.59
	144"	30	1080	1.73
	96"	99	2426	0.77
	108"	76	2128	1.01
	120"	60	1890	1.28
	132"	44	1540	1.43
	144"	33	1271	1.57
	96"	87	2436	0.77
	108"	66	2112	1.00
	120"	52	1872	1.27
	132"	39	1560	1.45
	144"	29	1276	1.57
	96"	105	2835	0.57
	108"	77	2426	0.77
	120"	59	2124	1.01
	132"	47	1904	1.29
	144"	34	1630	1.42
	96"	94	2820	0.56
	108"	69	2415	0.77
	120"	53	2120	1.01
	132"	42	1890	1.28
	144"	31	1650	1.44
	96"	86	2838	0.57
	108"	63	2426	0.77
	120"	48	2112	1.00
	132"	38	1881	1.27
	144"	28	1640	1.43

MAXIMUM DESIGN PRESSURE OF A  
INTERMEDIATE 4"x4"x1/4" MULLION (6061-T6)

AVERAGE SPAN WIDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)
60"	96"	150	3000	0.78
	108"	112	2800	1.25
	120"	84	2310	1.43
	132"	65	1960	1.57
	144"	50	1660	1.72
	96"	150	3600	0.94
	108"	127	3429	1.27
	120"	93	2790	1.42
	132"	70	2310	1.57
	144"	54	1944	1.71
	96"	138	3864	1.01
	108"	109	3434	1.28
	120"	80	2800	1.43
	132"	60	2310	1.57
	144"	46	1992	1.70
	96"	121	3872	1.01
	108"	95	3420	1.27
	120"	70	2800	1.43
	132"	53	2332	1.58
	144"	41	1988	1.73
	96"	107	3852	1.01
	108"	85	3443	1.28
	120"	62	2790	1.42
	132"	47	2327	1.58
	144"	36	1944	1.71
	96"	97	3880	1.01
	108"	76	3420	1.27
	120"	56	2800	1.43
	132"	42	2310	1.57
	144"	32	1920	1.69
	96"	88	3872	1.01
	108"	69	3416	1.27
	120"	51	2805	1.43
	132"	38	2299	1.56
	144"	29	1914	1.69

DEFLECTION Y



NOTE: USE DEFLECTIONS PROVIDED WHEN DETERMINING MINIMUM SEPARATION TO GLASS

#	DATE	REVISIONS

**ASSA**  
"Knowledge is Your Best Protection"  
AMERICAN SHUTTER SYSTEM ASSOCIATION, INC.  
4268 WESTROADS DRIVE, WEST PALM BEACH, FL, 33407  
PHONE: 800.432.2204; FAX: 561.841.0852  
WWW.AMSSHUTTER.ORG

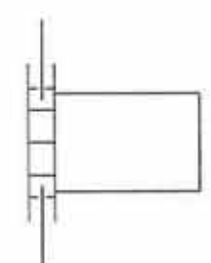
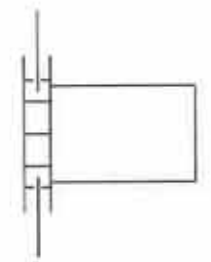
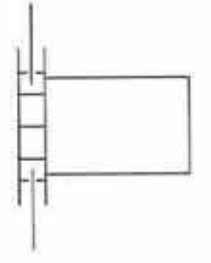
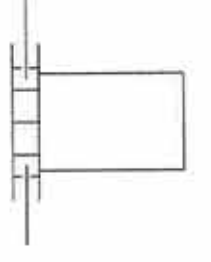
**ROLL-UP SHUTTER MULLIONS**

**Engineering, LLC.**  
1165 AUTUMN CREEK DRIVE, RIVERVIEW, FL 33569  
PH: 813.404.7649; E-MAIL: TKJENGINEERING@VERIZON.NET  
CERTIFICATE OF AUTHORIZATION NUMBER: 28582

DATE:	DRAWN BY:	SCALE:	PROJ. #:
12/20/11	TKJ	N.T.S.	;11-0401

**TREVOR JOHNSON**  
LICENSE  
No. 65624  
FLORIDA  
PROFESSIONAL ENGINEER





MAXIMUM DESIGN PRESSURE OF A  
INTERMEDIATE 4"x6"x1/8" MULLION (6061-16)

AVERAGE SPAN WIDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)
60"	96"	150	3000	0.55
	108"	145	3263	0.85
	120"	118	2950	1.05
	132"	97	2668	1.27
	144"	82	2460	1.52
	156"	68	2248	1.81
	168"	58	2067	2.12
	180"	51	1920	2.44
	192"	45	1800	2.77
	204"	40	1700	3.11
	216"	36	1620	3.46
	228"	32	1560	3.81
	240"	29	1500	4.17
	252"	26	1440	4.53
	264"	24	1380	4.89
	276"	22	1320	5.25
	288"	20	1260	5.61
	300"	19	1200	5.97

MAXIMUM DESIGN PRESSURE OF A  
INTERMEDIATE 4"x6"x1/4" MULLION (6061-16)

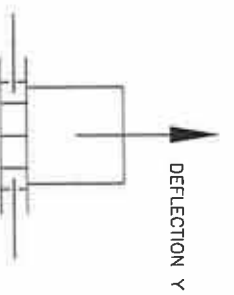
AVERAGE SPAN WIDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)
60"	96"	150	6800	0.85
	108"	123	6089	1.05
	120"	100	5600	1.26
	132"	82	4961	1.51
	144"	69	4564	1.76
	156"	58	4260	2.01
	168"	49	3990	2.26
	180"	42	3750	2.51
	192"	36	3540	2.76
	204"	31	3360	3.01
	216"	27	3210	3.26
	228"	24	3090	3.51
	240"	21	2990	3.76
	252"	19	2910	4.01
	264"	17	2840	4.26
	276"	16	2780	4.51
	288"	15	2730	4.76
	300"	14	2690	5.01

MAXIMUM DESIGN PRESSURE OF A  
INTERMEDIATE 4"x8"x1/4" MULLION (6061-16)

AVERAGE SPAN WIDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)
60"	96"	95	6840	0.67
	108"	75	6075	0.85
	120"	61	5490	1.05
	132"	50	4950	1.26
	144"	42	4536	1.50
	156"	36	4224	1.75
	168"	31	3960	2.00
	180"	27	3720	2.25
	192"	24	3510	2.50
	204"	21	3330	2.75
	216"	19	3180	3.00
	228"	17	3060	3.25
	240"	16	2960	3.50
	252"	15	2880	3.75
	264"	14	2810	4.00
	276"	13	2760	4.25
	288"	12	2720	4.50
	300"	12	2690	4.75

MAXIMUM DESIGN PRESSURE OF A  
INTERMEDIATE 4"x8"x1/4" MULLION (6061-16)

AVERAGE SPAN WIDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)
60"	96"	150	6600	0.32
	108"	150	7425	0.51
	120"	150	8250	0.78
	132"	125	7663	0.95
	144"	105	6930	1.13
	156"	90	6300	1.31
	168"	78	5760	1.50
	180"	68	5280	1.69
	192"	60	4860	1.88
	204"	54	4470	2.07
	216"	48	4110	2.26
	228"	43	3780	2.45
	240"	39	3480	2.64
	252"	35	3210	2.83
	264"	32	2970	3.02
	276"	29	2760	3.21
	288"	27	2580	3.40
	300"	25	2430	3.59



NOTE: USE DEFLECTIONS PROVIDED WHEN DETERMINING MINIMUM SEPARATION TO GLASS

#	DATE	REVISIONS

**ASSA**  
"Knowledge is Your Best Protection"  
AMERICAN SHUTTER SYSTEM ASSOCIATION, INC.  
4268 WESTROADS DRIVE, WEST PALM BEACH, FL, 33407  
PHONE: 800.432.2204; FAX: 561.841.0852  
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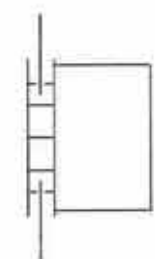
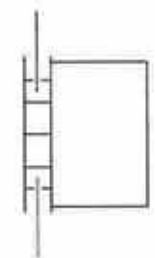
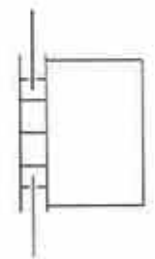
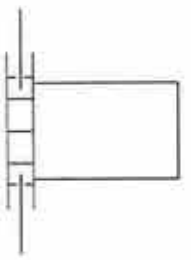
**ROLL-UP SHUTTER MULLIONS**

**Engineering, LLC.**  
15 AUTUMN CREEK DRIVE, RIVERVIEW, FL 33569  
813.404.7649; EM.: TKJENGINEERING@VERIZON.NET  
CERTIFICATE OF AUTHORIZATION NUMBER: 28582

DATE:	DRAWN BY:	SCALE:	PROJ. #:
12/20/11	TKJ	N.T.S.	;11-0401

**TREVOR JOHNSON**  
LICENSE  
No 65624  
FLORIDA PROFESSIONAL ENGINEER  
THIS IS TO CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE, THESE PLANS AND SPECIFICATIONS ARE IN CONFORMANCE WITH THE BOARDING REQUIREMENTS.





MAXIMUM DESIGN PRESSURE OF A  
INTERMEDIATE 4"x8"x1/4" MULLION (6061-16)

AVERAGE SPAN WIDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)
216"	96"	145	10440	0.51
	108"	114	9234	0.64
	120"	93	8370	0.79
	132"	77	7623	0.96
228"	96"	64	6912	1.13
	108"	137	10412	0.50
	120"	108	9234	0.64
	132"	88	8360	0.79
240"	96"	72	7524	0.95
	108"	130	10400	0.64
	120"	103	9270	0.80
	132"	83	8300	0.95
252"	96"	58	6960	1.14
	108"	124	10416	0.50
	120"	98	8261	0.64
	132"	79	7623	0.96
264"	96"	55	6930	1.13
	108"	118	10384	0.50
	120"	94	9306	0.64
	132"	76	8360	0.79
276"	96"	63	7623	0.96
	108"	144	10464	0.51
	120"	109	9288	0.64
	132"	86	8280	0.78
288"	96"	53	6996	1.14
	108"	113	10396	0.50
	120"	89	9212	0.63
	132"	72	8280	0.78
296"	96"	60	7590	0.95
	108"	144	10464	0.51
	120"	109	9288	0.64
	132"	89	8280	0.78
304"	96"	50	6900	1.13
	108"	109	10464	0.51
	120"	86	9288	0.64
	132"	69	8280	0.78
312"	96"	48	6912	1.13
	108"	109	10464	0.51
	120"	86	9288	0.64
	132"	69	8280	0.78

MAXIMUM DESIGN PRESSURE OF A  
INTERMEDIATE 4"x6"x1/8" MULLION (6061-16)

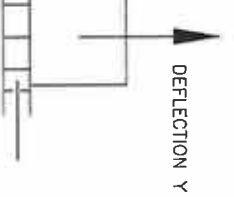
AVERAGE SPAN WIDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)
60"	96"	147	2940	1.01
	108"	116	2610	1.27
	120"	85	2125	1.42
	132"	64	1760	1.57
72"	96"	49	1470	1.70
	108"	123	2852	1.01
	120"	97	2819	1.28
	132"	71	2130	1.42
84"	96"	54	1782	1.59
	108"	144	1476	1.71
	120"	41	1476	1.71
	132"	105	2840	1.01
96"	96"	83	2615	1.27
	108"	61	2135	1.43
	120"	46	1771	1.58
	132"	35	1470	1.70
108"	96"	73	2944	1.01
	108"	92	2628	1.28
	120"	53	2120	1.42
	132"	40	1760	1.57
120"	96"	31	1488	1.72
	108"	82	2962	1.01
	120"	65	2633	1.28
	132"	47	2115	1.41
132"	96"	27	1458	1.68
	108"	96	3360	1.01
	120"	74	2960	1.01
	132"	58	2610	1.27
144"	96"	32	1760	1.57
	108"	87	3350	1.01
	120"	67	2948	1.01
	132"	53	2624	1.28
156"	96"	29	1755	1.56
	108"	87	3350	1.01
	120"	67	2948	1.01
	132"	53	2624	1.28

MAXIMUM DESIGN PRESSURE OF A  
INTERMEDIATE 4"x6"x1/4" MULLION (6061-16)

AVERAGE SPAN WIDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)
96"	96"	150	4800	0.90
	108"	133	4798	1.27
	120"	98	3920	1.43
	132"	74	3256	1.58
108"	96"	57	2736	1.72
	108"	150	5400	1.01
	120"	119	4820	1.28
	132"	87	3915	1.43
120"	96"	65	3218	1.56
	108"	135	5400	1.01
	120"	107	4815	1.28
	132"	78	3900	1.42
132"	96"	45	2700	1.70
	108"	123	5412	1.01
	120"	97	4802	1.28
	132"	71	3905	1.42
144"	96"	41	2706	1.58
	108"	113	5424	1.01
	120"	89	4806	1.28
	132"	65	3900	1.42
156"	96"	38	2736	1.57
	108"	104	5408	1.01
	120"	82	4797	1.27
	132"	60	3900	1.42
168"	96"	35	2730	1.56
	108"	96	5376	1.00
	120"	76	4788	1.27
	132"	56	3920	1.43
180"	96"	32	3234	1.57
	108"	76	4788	1.27
	120"	56	3920	1.43
	132"	42	3234	1.57
192"	96"	32	2688	1.69
	108"	76	4788	1.27
	120"	56	3920	1.43
	132"	42	3234	1.57

MAXIMUM DESIGN PRESSURE OF A  
INTERMEDIATE 4"x8"x1/4" MULLION (6061-16)

AVERAGE SPAN WIDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)
120"	96"	150	6000	0.87
	108"	137	6185	1.27
	120"	101	5050	1.43
	132"	76	4180	1.58
132"	96"	58	3480	1.71
	108"	150	6600	0.96
	120"	125	6188	1.28
	132"	92	5080	1.43
144"	96"	69	4175	1.58
	108"	145	6960	1.01
	120"	84	5040	1.43
	132"	63	4158	1.57
156"	96"	49	3528	1.73
	108"	134	6968	1.01
	120"	104	6143	1.27
	132"	78	5070	1.44
168"	96"	45	3510	1.57
	108"	124	6944	1.01
	120"	98	6174	1.28
	132"	88	4147	1.57
180"	96"	42	3528	1.73
	108"	116	6960	1.01
	120"	91	6143	1.27
	132"	67	5025	1.42
192"	96"	50	4125	1.56
	108"	39	3510	1.72
	120"	86	6192	1.28
	132"	63	5040	1.43
204"	96"	39	3510	1.72
	108"	108	6912	1.00
	120"	86	6192	1.28
	132"	63	5040	1.43
216"	96"	36	3456	1.69
	108"	108	6912	1.00
	120"	86	6192	1.28
	132"	63	5040	1.43



NOTE: USE DEFLECTIONS PROVIDED WHEN DETERMINING MINIMUM SEPARATION TO GLASS

#	DATE	REVISIONS

**ASSA**  
"Knowledge is Your Best Protection"  
AMERICAN SHUTTER SYSTEM ASSOCIATION, INC.  
4268 WESTROADS DRIVE, WEST PALM BEACH, FL, 33407  
PHONE: 800.432.2204; FAX: 561.841.0852  
WWW.AMSHUTTER.ORG

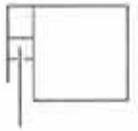
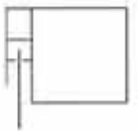
**ROLL-UP SHUTTER MULLIONS**

**Engineering, LLC.**  
335 AUTUMN CREEK DRIVE, RIVERVIEW, FL 33569  
813.404.7649; EM.: TKJENGINEERING@VERIZON.NET  
CERTIFICATE OF AUTHORIZATION NUMBER: 26582

DATE:	DRAWN BY:	SCALE:	PROJ. #:
12/20/11	TKJ	N.T.S.	:11-0401

**TREVOR JOHNSON**  
LICENSE  
No 65624  
FLORIDA PROFESSIONAL ENGINEER  
THIS IS TO CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE THESE PLANS AND SPECIFICATIONS ARE IN COMPLIANCE WITH THE BUILDING CODE REQUIREMENTS





MAXIMUM DESIGN PRESSURE OF AN  
END 4"x4"x1/8" MULLION (6063-16)

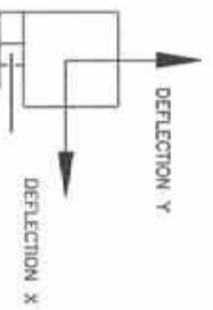
SPAN WIDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION X (IN)
80"	96"	150	2202	0.72	0.48
	108"	119	1834	0.91	0.36
	120"	97	1320	1.14	0.27
	132"	80	1112	1.37	0.04
72"	144"	67	1328	1.63	0.67
	96"	103	2397	0.59	0.69
	108"	99	2313	0.91	0.81
	120"	90	1640	1.13	0.64
84"	132"	66	1335	1.36	0.48
	144"	56	1493	1.64	0.78
	96"	67	2163	0.45	0.70
	108"	64	2092	0.69	0.83
96"	120"	67	2251	1.10	1.19
	132"	57	1763	1.36	1.08
	144"	48	1446	1.65	0.94
	96"	46	1986	0.36	0.88
108"	108"	45	1858	0.56	0.87
	120"	44	1970	0.83	1.03
	132"	44	1957	1.22	1.37
	144"	42	1830	1.65	1.56
120"	96"	37	2068	0.19	0.52
	108"	36	1977	0.31	0.70
	120"	32	1797	0.45	0.83
	132"	33	1884	0.71	1.18
132"	120"	30	1706	0.96	1.20
	132"	40	2587	0.06	0.27
	66"	36	2391	0.08	0.32
	72"	34	2306	0.11	0.41
144"	78"	31	2108	0.13	0.49
	84"	30	2084	0.17	0.55
	48"	46	3179	0.03	0.18
	54"	39	2857	0.04	0.23
132"	60"	34	2813	0.08	0.29
	66"	30	2376	0.07	0.35
72"	27	2202	0.09	0.39	

MAXIMUM DESIGN PRESSURE OF AN  
END 4"x4"x1/4" MULLION (6063-16)

SPAN WIDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION X (IN)
72"	96"	133	3862	0.42	0.74
	108"	127	3730	0.64	0.92
	120"	125	3732	0.96	1.17
	132"	121	3695	1.37	1.34
84"	144"	102	2883	1.63	1.16
	96"	88	3661	0.33	0.70
	108"	84	3405	0.50	0.92
	120"	82	3378	0.74	1.16
96"	132"	79	3302	1.04	1.36
	144"	78	3339	1.46	1.98
	96"	65	3458	0.28	0.73
	108"	61	3301	0.41	0.94
108"	120"	57	3118	0.69	1.11
	132"	55	3016	0.84	1.37
	144"	53	2868	1.14	1.57
	96"	49	3318	0.23	0.72
120"	108"	45	3091	0.35	0.91
	120"	42	2919	0.49	1.12
	132"	40	2835	0.69	1.31
	144"	39	2768	0.95	1.63
132"	96"	39	3280	0.21	0.70
	108"	36	2983	0.30	0.90
	120"	33	2881	0.43	1.09
	132"	31	2718	0.60	1.35
144"	144"	30	2694	0.82	1.57
	78"	40	3747	0.10	0.48
	84"	37	3672	0.13	0.55
	96"	34	3384	0.16	0.61
132"	96"	32	3215	0.19	0.72
	102"	31	3164	0.23	0.83
	66"	42	4283	0.06	0.34
	72"	38	4040	0.08	0.41
144"	78"	34	3737	0.10	0.47
	84"	31	3613	0.12	0.56
90"	29	3365	0.15	0.63	

MAXIMUM DESIGN PRESSURE OF AN  
END 4"x6"x1/8" MULLION (6063-16)

SPAN WIDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION X (IN)
72"	96"	117	3470	0.48	0.48
	108"	113	3376	0.75	0.63
	120"	108	3251	1.09	0.72
	132"	92	2549	1.37	0.88
84"	144"	77	1921	1.62	0.51
	96"	77	3198	0.37	0.46
	108"	74	3092	0.59	0.60
	120"	71	2975	0.94	0.74
96"	132"	71	3012	1.23	0.95
	144"	68	2727	1.63	1.05
	96"	57	3150	0.32	0.48
	108"	53	2927	0.47	0.63
108"	120"	50	2795	0.68	0.76
	132"	47	2688	0.94	0.83
	144"	48	2732	1.36	1.12
	96"	43	3037	0.27	0.48
120"	108"	40	2872	0.40	0.62
	120"	37	2637	0.57	0.78
	132"	35	2528	0.79	0.90
	144"	34	2500	1.09	1.03
132"	96"	39	3286	0.18	0.37
	108"	34	2942	0.24	0.49
	120"	31	2765	0.35	0.61
	132"	28	2511	0.48	0.73
144"	132"	27	2445	0.69	0.90
	78"	35	3457	0.12	0.31
	84"	32	3227	0.15	0.37
	96"	30	3095	0.18	0.43
132"	96"	28	2974	0.22	0.46
	102"	27	2886	0.27	0.55
	60"	43	4353	0.06	0.19
	66"	38	4059	0.07	0.23
144"	72"	33	3671	0.09	0.27
	78"	30	3477	0.11	0.31
84"	27	3200	0.13	0.37	



NOTE: USE DEFLECTIONS PROVIDED WHEN DETERMINING MINIMUM SEPARATION TO GLASS  
THE DEFLECTION IN THE X DIRECTION CAN BE NEGLECTED ON NON-RETENSION SHUTTERS  
AND WHEN STORM-BARS ARE USED TO REDUCE SHUTTER DEFLECTIONS.

#	DATE	REVISIONS

**ASSA**  
"Knowledge is Your Best Protection"  
AMERICAN SHUTTER SYSTEM ASSOCIATION, INC.  
4268 WESTROADS DRIVE, WEST PALM BEACH, FL 33407  
PHONE: 800.432.2204; FAX: 561.841.0852  
WWW.AMSSHUTTER.ORG

**ROLL-UP SHUTTER  
MULLIONS**

**TKJ Engineering, LLC.**  
11835 TWIN CREEK DRIVE, RIVERVIEW, FL 33569  
PHONE: 813.764.7649; EM: TKJENGINEERING@VERIZON.NET  
PROFESSIONAL ENGINEER LICENSE NUMBER: 28552

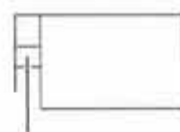
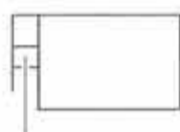
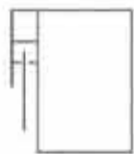
DATE: 12/20/11	DRAWN BY: TKJ	SCALE: N.T.S.	PROJ. #: :11-0401
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**TREVOR JOHNSON  
LICENSE**  
No. 185824  
STATE OF FLORIDA  
PROFESSIONAL ENGINEER









MAXIMUM DESIGN PRESSURE OF AN  
END 4'X6'X1/2" MULLION (6063-16)

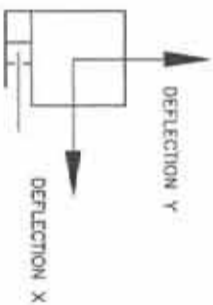
SPAN WIDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION X (IN)
96"	96"	132	9691	0.24	0.48
	108"	116	8819	0.33	0.62
	120"	103	8110	0.45	0.74
108"	132"	96	7645	0.61	0.92
	144"	88	7261	0.80	1.07
	96"	107	6661	0.22	0.49
108"	108"	82	8631	0.30	0.61
	120"	82	7987	0.41	0.77
	132"	75	7553	0.54	0.83
120"	144"	69	7113	0.71	1.10
	96"	88	6405	0.20	0.49
	108"	76	6666	0.27	0.61
120"	120"	67	7910	0.37	0.75
	132"	80	7318	0.48	0.91
	144"	55	6808	0.63	1.09
132"	96"	75	9401	0.19	0.49
	108"	64	8505	0.25	0.61
	120"	56	7786	0.34	0.75
132"	132"	50	7248	0.45	0.91
	144"	48	6881	0.58	1.09
	96"	64	8277	0.17	0.48
144"	108"	55	8430	0.24	0.62
	120"	48	7747	0.32	0.77
	132"	43	7261	0.42	0.92
144"	144"	38	6811	0.54	1.09
	96"	57	9380	0.17	0.48
	108"	48	8398	0.23	0.62
168"	120"	42	7742	0.30	0.77
	132"	37	7160	0.39	0.91
	144"	33	6633	0.50	1.07
168"	84"	61	10418	0.11	0.37
	96"	50	9251	0.16	0.49
	108"	42	8306	0.21	0.62
168"	120"	37	7751	0.29	0.76
	132"	33	7234	0.38	0.92

MAXIMUM DESIGN PRESSURE OF AN  
END 4'X6'X1/8" MULLION (6063-16)

SPAN WIDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION X (IN)
60"	108"	150	3653	0.58	0.95
	120"	150	2925	0.75	0.81
	132"	138	2655	0.91	0.70
60"	144"	116	2344	1.08	0.50
	156"	88	1950	1.28	0.28
	96"	117	3090	0.26	0.70
72"	108"	116	3102	0.41	0.55
	120"	115	3159	0.62	1.16
	132"	115	3247	0.91	1.40
84"	144"	97	2674	1.09	1.22
	96"	78	2880	0.20	0.72
	108"	76	2815	0.32	0.95
84"	120"	73	2722	0.46	1.15
	132"	73	2779	0.68	1.41
	144"	69	2702	0.91	1.41
96"	96"	56	2736	0.17	0.74
	108"	52	2539	0.25	0.91
	120"	51	2506	0.37	1.19
96"	132"	50	2512	0.53	1.41
	144"	48	2476	0.73	1.49
	84"	45	2273	0.09	0.52
108"	96"	42	2622	0.14	0.73
	108"	39	2460	0.21	0.92
	120"	37	2378	0.31	1.09
108"	132"	35	2261	0.42	1.28
	60"	53	3612	0.03	0.29
	60"	47	3322	0.04	0.36
120"	72"	43	3146	0.05	0.41
	78"	39	2892	0.06	0.48
	84"	37	2819	0.08	0.56
120"	48"	62	4425	0.02	0.18
	54"	52	4000	0.02	0.23
	60"	44	3668	0.03	0.28
132"	60"	39	3296	0.04	0.34
	66"	39	3139	0.05	0.41

MAXIMUM DESIGN PRESSURE OF AN  
END 4'X6'X1/4" MULLION (6063-16)

SPAN WIDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION X (IN)
72"	108"	148	4874	0.28	0.94
	120"	141	4726	0.41	1.12
	132"	139	4742	0.59	1.40
72"	144"	138	4796	0.83	1.71
	96"	108	4819	0.15	0.74
	108"	101	4597	0.22	0.94
84"	120"	95	4387	0.32	1.13
	132"	92	4296	0.46	1.41
	144"	89	4247	0.63	1.61
96"	96"	80	4691	0.13	0.73
	108"	73	4352	0.19	0.92
	120"	68	4120	0.26	1.14
96"	132"	65	3895	0.37	1.39
	144"	62	3871	0.50	1.60
	96"	52	4698	0.11	0.71
108"	108"	57	4309	0.16	0.93
	120"	52	4029	0.23	1.12
	132"	49	3839	0.32	1.39
108"	144"	47	3732	0.43	1.67
	84"	69	6056	0.07	0.56
	96"	51	4679	0.10	0.73
120"	108"	44	4101	0.14	0.88
	120"	40	3815	0.20	1.07
	132"	39	3786	0.28	1.41
120"	78"	64	6311	0.06	0.48
	84"	49	4991	0.06	0.56
	90"	45	4710	0.08	0.64
132"	96"	42	4474	0.09	0.74
	102"	39	4255	0.11	0.81
	78"	46	5271	0.05	0.48
144"	84"	42	4878	0.06	0.56
	90"	38	4617	0.07	0.65
	96"	36	4505	0.09	0.73
144"	102"	33	4225	0.10	0.81



NOTE: USE DEFLECTIONS PROVIDED WHEN DETERMINING MINIMUM SEPARATION TO GLASS  
THE DEFLECTION IN THE X DIRECTION CAN BE NEGLECTED ON NON-RETENSION SHUTTERS  
AND WHEN STORM-BARS ARE USED TO REDUCE SHUTTER DEFLECTIONS.



**TKJ Engineering, LLC.**  
11165 WINDY CREEK DRIVE, RIVERVIEW, FL 33569  
PH: 281.334.7649, EM: TKJENGINEERING@VERIZON.NET  
CERTIFICATE OF AUTHORIZATION NUMBER: 26582

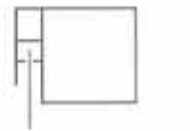
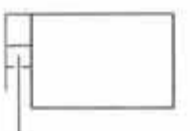
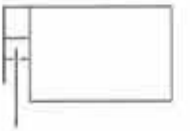
DATE: 12/20/11  
DRAWN BY: TKJ  
SCALE: N.T.S.  
PROJ. #: 11-0401

**ROLL-UP SHUTTER MULLIONS**

**ASSA**  
"Knowledge is Your Best Protection"  
AMERICAN SHUTTER SYSTEM ASSOCIATION, INC.  
4268 WESTROADS DRIVE, WEST PALM BEACH, FL, 33407  
PHONE: 800.432.2204; FAX: 561.841.0852  
WWW.AMSSHUTTER.ORG

#	DATE	REVISIONS





MAXIMUM DESIGN PRESSURE OF AN  
END 4'X6'X1/4" MULLION (6063-16)

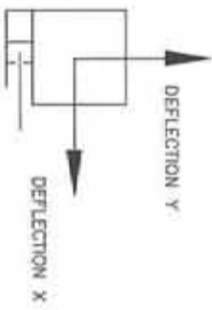
SPAN WIDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION X (IN)
84"	96"	127	6292	0.09	0.72
	108"	115	5651	0.13	0.90
	120"	109	5410	0.18	1.17
	132"	102	5182	0.25	1.32
96"	144"	99	5092	0.34	1.60
	96"	98	4947	0.08	0.73
	108"	86	5479	0.11	0.92
	120"	79	5175	0.15	1.10
108"	132"	75	4990	0.21	1.37
	144"	72	4871	0.29	1.65
	96"	76	5873	0.07	0.73
	108"	67	5388	0.09	0.92
120"	120"	61	5004	0.13	1.13
	132"	57	4775	0.18	1.38
	144"	54	4605	0.24	1.65
	96"	62	5807	0.06	0.73
132"	108"	54	5295	0.09	0.90
	120"	48	4828	0.12	1.13
	132"	45	4633	0.16	1.37
	144"	43	4527	0.22	1.68
144"	96"	52	5768	0.05	0.73
	108"	45	5203	0.08	0.94
	120"	40	4804	0.11	1.12
	132"	37	4598	0.14	1.34
156"	144"	34	4331	0.19	1.58
	84"	52	6288	0.04	0.55
	96"	44	5688	0.05	0.74
	108"	38	5150	0.07	0.91
168"	120"	34	4785	0.10	1.13
	132"	31	4476	0.13	1.42
	72"	56	7117	0.02	0.41
	84"	45	6252	0.03	0.55
180"	96"	38	5904	0.05	0.74
	108"	33	5147	0.07	0.91
	120"	29	4711	0.09	1.12

MAXIMUM DESIGN PRESSURE OF AN  
END 4'X6'X3/8" MULLION (6063-16)

SPAN WIDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION X (IN)
84"	96"	134	6531	0.13	0.74
	108"	121	6061	0.19	0.91
	120"	113	5750	0.27	1.14
	132"	108	5577	0.38	1.41
96"	144"	102	5358	0.51	1.60
	96"	101	6346	0.11	0.73
	108"	91	5886	0.17	0.93
	120"	83	5496	0.23	1.14
108"	132"	79	5343	0.32	1.41
	144"	74	5072	0.43	1.66
	96"	80	6277	0.10	0.72
	108"	71	5763	0.15	0.99
120"	120"	64	5339	0.20	1.13
	132"	60	5094	0.28	1.42
	144"	55	4813	0.36	1.55
	96"	65	6157	0.09	0.72
132"	108"	57	5629	0.13	0.92
	120"	51	5215	0.18	1.10
	132"	47	4939	0.24	1.34
	144"	45	4819	0.33	1.68
144"	96"	55	6150	0.09	0.73
	108"	47	5515	0.12	0.91
	120"	42	5195	0.16	1.09
	132"	39	4955	0.22	1.41
156"	144"	36	4650	0.29	1.60
	84"	55	6706	0.06	0.55
	96"	47	6118	0.08	0.73
	108"	41	5609	0.11	0.93
168"	120"	36	5097	0.15	1.16
	132"	32	4743	0.20	1.31
	72"	60	7620	0.04	0.41
	84"	49	6807	0.05	0.65
180"	96"	41	6094	0.08	0.73
	108"	36	5500	0.11	0.92
	120"	31	5058	0.14	1.17

MAXIMUM DESIGN PRESSURE OF AN  
END 4'X4'X1/8" MULLION (6061-16)

SPAN WIDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION X (IN)
72"	96"	128	3258	0.73	0.98
	108"	122	3345	1.17	1.28
	120"	102	2865	1.59	1.34
	132"	77	2350	1.91	1.08
84"	144"	59	1933	2.28	1.09
	96"	86	3013	0.57	1.00
	108"	81	2986	0.89	1.32
	120"	73	2682	1.33	1.59
96"	132"	66	2988	1.92	1.98
	144"	50	2419	2.29	1.69
	96"	62	2919	0.48	1.04
	108"	56	2735	0.71	1.21
108"	120"	50	2722	1.05	1.57
	132"	45	2688	1.49	1.87
	144"	44	2682	2.08	2.13
	96"	45	2708	0.39	0.97
120"	108"	42	2638	0.60	1.26
	120"	37	2524	0.88	1.60
	132"	34	2507	1.25	1.97
	144"	31	2457	1.69	2.08
132"	72"	47	3280	0.14	0.69
	84"	40	2912	0.23	0.75
	96"	35	2607	0.34	0.95
	108"	33	2488	0.52	1.28
144"	120"	28	2465	0.76	1.53
	66"	42	3380	0.10	0.47
	72"	38	3165	0.13	0.56
	78"	35	2988	0.16	0.68
156"	84"	33	2875	0.21	0.78
	90"	31	2745	0.26	0.89
	54"	48	4081	0.06	0.32
	60"	41	3888	0.07	0.40
168"	84"	41	3881	0.09	0.47
	65"	36	3381	0.09	0.57
	72"	33	3210	0.12	0.57
	78"	30	2988	0.15	0.69



NOTE: USE DEFLECTIONS PROVIDED WHEN DETERMINING MINIMUM SEPARATION TO CLASS  
THE DEFLECTION IN THE X DIRECTION CAN BE NEGLECTED ON NON-RETENSION SHUTTERS  
AND WHEN STORM-BARS ARE USED TO REDUCE SHUTTER DEFLECTIONS.



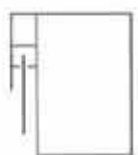
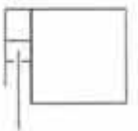
TKJ Engineering, LLC.  
11005 PALM CREEK DRIVE, RIVERVIEW, FL 33509  
TEL: 813-476-7649; EM: TKJENGINEERING@VERIZON.NET  
PROFESSIONAL ENGINEER  
DATE: 12/20/11 DRAWN BY: TKJ SCALE: N.T.S. PROJ. #: 11-0401

# ROLL-UP SHUTTER MULLIONS



#	DATE	REVISIONS





MAXIMUM DESIGN PRESSURE OF AN  
END 4'X4'X1/4" MULLION (6061-16)

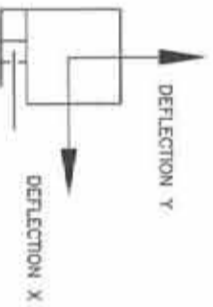
SPAN WIDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION X (IN)
84"	96"	119	5074	0.44	1.04
	108"	108	4847	0.66	1.32
	120"	94	4680	0.95	1.61
	132"	85	4618	1.35	2.00
96"	144"	78	4591	1.85	2.35
	96"	88	4908	0.37	1.01
	108"	79	4572	0.54	1.27
	120"	67	4438	0.78	1.60
108"	132"	60	4335	1.10	2.00
	144"	63	4245	1.50	2.34
	96"	69	4816	0.33	1.03
	108"	60	4459	0.47	1.30
120"	120"	51	4230	0.67	1.54
	132"	43	4074	0.92	1.91
	144"	39	3979	1.26	2.37
	96"	56	4761	0.30	1.03
120"	108"	48	4401	0.43	1.31
	120"	40	4162	0.60	1.63
	132"	34	3876	0.80	1.93
	144"	30	3798	1.08	2.26
132"	84"	53	5104	0.18	0.77
	96"	46	4854	0.27	1.02
	108"	40	4209	0.38	1.27
	120"	32	4017	0.63	1.60
144"	132"	27	3780	0.72	1.83
	84"	45	5090	0.17	0.75
	96"	42	4817	0.21	0.91
	108"	39	4587	0.26	1.04
156"	102"	36	4333	0.30	1.17
	108"	34	4189	0.35	1.28
	78"	43	5324	0.13	0.66
	84"	39	5009	0.16	0.77
96"	90"	36	4743	0.19	0.91
	96"	33	4486	0.23	1.00
102"	31	4292	0.28	1.17	

MAXIMUM DESIGN PRESSURE OF AN  
END 4'X6'X1/8" MULLION (6061-16)

SPAN WIDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION X (IN)
84"	96"	103	4575	0.50	0.88
	108"	96	4351	0.74	0.86
	120"	91	4148	1.08	1.07
	132"	88	4069	1.52	1.31
96"	144"	70	4092	2.13	1.59
	96"	76	4449	0.42	0.67
	108"	69	4116	0.61	0.84
	120"	65	3950	0.88	1.02
108"	132"	62	3827	1.23	1.24
	144"	60	3703	1.69	1.55
	96"	59	4354	0.37	0.89
	108"	64	4080	0.54	0.87
108"	120"	49	3752	0.75	1.05
	132"	45	3628	1.01	1.17
	144"	44	3486	1.40	1.48
	96"	47	4226	0.33	0.67
120"	108"	43	3689	0.48	0.86
	120"	39	3692	0.67	1.06
	132"	36	3463	0.91	1.27
	144"	34	3314	1.21	1.51
132"	84"	46	4689	0.21	0.63
	96"	39	4188	0.30	0.67
	108"	35	3893	0.43	0.86
	120"	32	3683	0.61	1.09
144"	132"	29	3377	0.81	1.26
	84"	39	4627	0.19	0.52
	96"	36	4396	0.23	0.61
	108"	33	4154	0.28	0.67
156"	102"	31	3882	0.34	0.75
	108"	29	3794	0.39	0.84
	78"	37	4990	0.15	0.44
	84"	34	4632	0.18	0.53
96"	90"	31	4381	0.22	0.59
	96"	29	4202	0.27	0.66
102"	27	4004	0.32	0.76	

MAXIMUM DESIGN PRESSURE OF AN  
END 4'X8'X1/4" MULLION (6061-16)

SPAN WIDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION X (IN)
84"	96"	150	6167	0.41	0.68
	108"	140	7639	0.59	0.84
	120"	131	7198	0.84	1.08
	132"	122	6842	1.15	1.29
96"	144"	116	6595	1.55	1.55
	96"	120	8007	0.36	0.67
	108"	107	7403	0.52	0.86
	120"	97	6826	0.71	1.05
108"	132"	90	6558	0.97	1.30
	144"	85	6308	1.30	1.56
	96"	96	7816	0.33	0.67
	108"	84	7226	0.46	0.86
120"	120"	78	6755	0.63	1.06
	132"	70	6424	0.86	1.28
	144"	65	6093	1.12	1.52
	96"	80	7914	0.30	0.68
120"	108"	69	7173	0.42	0.86
	120"	62	6696	0.57	1.07
	132"	56	6295	0.76	1.26
	144"	51	5942	0.98	1.48
132"	84"	67	7808	0.28	0.88
	96"	58	7122	0.39	0.86
	108"	51	6526	0.52	1.05
	120"	47	6220	0.70	1.30
144"	144"	42	5762	0.89	1.48
	96"	58	7799	0.26	0.88
	108"	49	6994	0.36	0.85
	120"	44	6556	0.49	1.06
156"	132"	39	6010	0.64	1.30
	144"	35	5629	0.82	1.45
	96"	50	7698	0.25	0.88
	108"	43	7013	0.34	0.85
96"	120"	38	6482	0.46	1.06
	132"	34	6020	0.61	1.32
144"	31	5720	0.79	1.54	



NOTE: USE DEFLECTIONS PROVIDED WHEN DETERMINING MINIMUM SEPARATION TO GLASS  
THE DEFLECTION IN THE X DIRECTION CAN BE NEGLECTED ON NON-RETENSION SHUTTERS  
AND WHEN STORM-BARS ARE USED TO REDUCE SHUTTER DEFLECTIONS.



**TJW Engineering, LLC.**  
1186 ANJUN CREEK DRIVE, RIVERVIEW, FL 33559  
PH: (813) 784-7849; EM: TKJ@ENGINEERINGOVERZON.NET  
REGISTRATION NUMBER: 28582

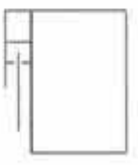
DATE: 12/20/11  
DRAWN BY: TKJ  
SCALE: N.T.S.  
PROJ. #: 11-0401

**ROLL-UP SHUTTER MULLIONS**

**ASSA**  
"Knowledge is Your Best Protection"  
AMERICAN SHUTTER SYSTEM ASSOCIATION, INC.  
4268 WESTROADS DRIVE, WEST PALM BEACH, FL 33407  
PHONE: 800.432.2264; FAX: 561.841.0852  
WWW.ASSASHUTTER.ORG

#	DATE	REVISIONS





MAXIMUM DESIGN PRESSURE OF AN  
END 4'X8'X1/4" MULLION (6061-16)

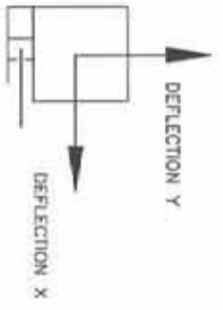
SPAN WIDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION X (IN)
96"	96"	150	11796	0.37	0.51
	108"	138	10740	0.52	0.64
	120"	123	9933	0.70	0.80
108"	132"	112	9323	0.94	0.97
	144"	103	8797	1.22	1.15
	96"	129	11692	0.34	0.51
120"	108"	111	10618	0.47	0.64
	120"	99	9983	0.64	0.80
	132"	88	9116	0.83	0.95
144"	144"	81	8647	1.06	1.14
	96"	107	11556	0.31	0.51
	108"	92	10529	0.43	0.64
120"	120"	81	9726	0.56	0.80
	132"	73	9101	0.77	0.97
	144"	66	8539	0.98	1.13
96"	96"	92	11574	0.30	0.51
	108"	78	10494	0.40	0.64
	120"	68	9581	0.54	0.80
132"	132"	61	8956	0.71	0.88
	144"	55	8370	0.91	1.17
	96"	80	11575	0.28	0.51
144"	108"	67	10356	0.38	0.65
	120"	58	9491	0.50	0.79
	132"	52	8986	0.66	0.99
144"	144"	47	8303	0.86	1.17
	96"	70	11491	0.27	0.51
	108"	59	10396	0.36	0.64
156"	120"	51	9478	0.48	0.80
	132"	45	8904	0.62	0.96
	144"	40	8193	0.78	1.10
96"	96"	62	11428	0.26	0.51
	108"	52	10277	0.35	0.65
	120"	45	9453	0.46	0.79
132"	132"	40	8794	0.60	0.88
	144"	36	8083	0.74	1.12

MAXIMUM DESIGN PRESSURE OF AN  
END 4'X6'X3/8" MULLION (6061-16)

SPAN WIDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION X (IN)
96"	96"	150	11113	0.35	0.68
	108"	139	10212	0.49	0.86
	120"	125	9498	0.67	1.07
108"	132"	114	8663	0.89	1.29
	144"	105	8463	1.16	1.52
	96"	128	10996	0.32	0.68
120"	108"	111	10025	0.44	0.86
	120"	99	9309	0.60	1.06
	132"	89	8696	0.79	1.27
144"	144"	83	8304	1.04	1.55
	96"	107	10814	0.29	0.68
	108"	92	9962	0.40	0.86
120"	120"	81	9149	0.54	1.06
	132"	74	8687	0.73	1.30
	144"	67	8126	0.93	1.54
96"	96"	91	10848	0.27	0.88
	108"	78	9876	0.38	0.86
	120"	68	9064	0.50	1.06
132"	132"	62	8590	0.67	1.30
	144"	56	8081	0.86	1.52
	96"	79	10869	0.26	0.67
144"	108"	67	9807	0.36	0.86
	120"	59	9095	0.48	1.07
	132"	53	8528	0.63	1.30
144"	144"	47	7859	0.79	1.52
	96"	89	10777	0.25	0.88
	108"	59	9804	0.34	0.87
156"	120"	51	8981	0.45	1.06
	132"	46	8477	0.59	1.30
	144"	41	7858	0.75	1.53
96"	96"	61	10715	0.24	0.88
	108"	52	9726	0.32	0.87
	120"	45	8939	0.43	1.06
132"	132"	40	8294	0.56	1.31
	144"	36	7626	0.71	1.53

MAXIMUM DESIGN PRESSURE OF AN  
END 4'X6'X1/2" MULLION (6061-16)

SPAN WIDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION X (IN)
108"	96"	150	13579	0.31	0.68
	108"	134	12381	0.43	0.86
	120"	119	11488	0.59	1.08
120"	132"	107	10795	0.77	1.28
	144"	98	10192	1.00	1.53
	96"	130	13481	0.29	0.88
120"	108"	112	12322	0.40	0.87
	120"	99	11439	0.54	1.07
	132"	88	10636	0.71	1.28
144"	144"	80	10038	0.91	1.53
	96"	111	13409	0.27	0.88
	108"	95	12210	0.38	0.87
132"	120"	83	11237	0.50	1.07
	132"	74	10474	0.65	1.30
	144"	67	9851	0.84	1.56
96"	96"	97	13412	0.26	0.88
	108"	82	12148	0.35	0.86
	120"	71	11118	0.47	1.06
132"	132"	63	10342	0.61	1.28
	144"	57	9715	0.78	1.55
	96"	85	13360	0.25	0.88
156"	108"	72	12085	0.34	0.87
	120"	62	11060	0.44	1.05
	132"	55	10297	0.58	1.28
144"	144"	49	9594	0.73	1.52
	96"	75	13220	0.24	0.87
	108"	64	12042	0.32	0.87
168"	120"	55	11045	0.43	1.06
	132"	48	10186	0.54	1.25
	144"	44	9672	0.71	1.57
96"	96"	69	13275	0.23	0.89
	108"	57	12005	0.31	0.86
	120"	49	10989	0.41	1.05
132"	132"	43	10145	0.52	1.27
	144"	38	9440	0.66	1.47



NOTE: USE DEFLECTIONS PROVIDED WHEN DETERMINING MINIMUM SEPARATION TO GLASS.  
THE DEFLECTION IN THE X DIRECTION CAN BE NEGLECTED ON NON-RETENSION SHUTTERS.  
AND WHEN STORM-BARS ARE USED TO REDUCE SHUTTER DEFLECTIONS.

#	DATE	REVISIONS

**ASSA**  
"Knowledge is Your Best Protection"  
AMERICAN SHUTTER SYSTEM ASSOCIATION, INC.  
4268 WESTROADS DRIVE, WEST PALM BEACH, FL, 33407  
PHONE: 800.432.2204; FAX: 561.841.0852  
WWW.AMSSHUTTER.ORG

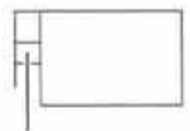
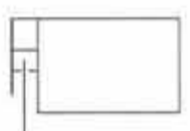
**ROLL-UP SHUTTER MULLIONS**

**TKJ Engineering, LLC.**  
11500 MAIN CREEK DRIVE, RIVERVIEW, FL 33569  
TEL: 813.764.7649; EMAIL: TKJENGINEERING@VERIZON.NET  
LICENSED PROFESSIONAL ENGINEER  
FLORIDA LICENSE NO. 28582

DATE: 12/20/11  
DRAWN BY: TKJ  
SCALE: N.T.S.  
PROJ. #: 11-0401

**TREVOR JOHNSON**  
LICENSE  
No 65624  
FLORIDA  
PROFESSIONAL ENGINEER  
FLORIDA LICENSE NO. 10000





MAXIMUM DESIGN PRESSURE OF AN  
END 4'x6'x1/8" MULLION (6061-16)

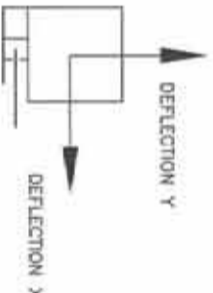
SPAN WIDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION X (IN)
72"	96"	150	4304	0.33	1.04
	108"	139	4233	0.51	1.33
	120"	128	4264	0.77	1.65
	132"	121	4321	1.11	1.97
84"	144"	108	4232	1.52	2.34
	96"	100	3954	0.26	0.99
	108"	93	3851	0.40	1.31
	120"	82	3740	0.58	1.52
96"	132"	75	3772	0.84	2.04
	144"	69	3943	1.18	2.43
	96"	73	3795	0.22	1.00
	108"	67	3644	0.33	1.31
108"	120"	58	3502	0.47	1.58
	132"	52	3388	0.65	1.89
	144"	48	3452	0.93	2.39
	96"	57	3745	0.19	1.03
120"	108"	51	3488	0.28	1.30
	120"	44	3350	0.40	1.62
	132"	39	3230	0.55	1.82
	144"	36	3048	0.73	2.07
132"	72"	60	4423	0.07	0.56
	84"	51	3959	0.11	0.77
	96"	45	3625	0.17	1.01
	108"	40	3323	0.24	1.23
144"	120"	34	3204	0.35	1.60
	72"	51	4445	0.07	0.57
	78"	46	4125	0.08	0.68
	84"	42	3883	0.10	0.77
156"	90"	40	3785	0.13	0.90
	96"	37	3570	0.15	1.01
	72"	43	4383	0.06	0.55
	78"	39	4089	0.08	0.66
144"	84"	36	3898	0.10	0.77
	84"	33	3544	0.12	0.91
	96"	31	3518	0.14	1.01

MAXIMUM DESIGN PRESSURE OF AN  
END 4'x6'x1/4" MULLION (6061-16)

SPAN WIDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION X (IN)
84"	96"	148	6876	0.20	1.03
	108"	132	6475	0.30	1.29
	120"	112	6183	0.43	1.59
	132"	99	6040	0.60	2.00
96"	144"	89	6816	0.60	2.29
	96"	112	6719	0.18	1.02
	108"	98	6258	0.26	1.29
	120"	82	5911	0.36	1.62
108"	132"	71	5614	0.48	1.89
	144"	63	5441	0.66	2.29
	96"	88	6556	0.16	1.01
	108"	77	6040	0.22	1.27
120"	120"	63	5681	0.31	1.54
	132"	53	5401	0.42	1.90
	144"	47	5287	0.57	2.31
	96"	73	6548	0.15	1.03
132"	108"	62	5926	0.20	1.26
	120"	51	5623	0.28	1.61
	132"	43	5295	0.38	1.98
	144"	38	5061	0.50	2.20
144"	84"	71	7087	0.09	0.77
	96"	61	6459	0.13	1.02
	108"	52	5961	0.19	1.31
	120"	42	5535	0.26	1.61
156"	132"	35	5243	0.35	1.96
	84"	61	7034	0.09	0.77
	93"	54	6537	0.11	0.96
	102"	48	6058	0.15	1.14
144"	111"	42	5771	0.19	1.34
	120"	36	5382	0.24	1.69
	84"	54	7089	0.08	0.79
	93"	47	6500	0.11	0.95
156"	102"	42	6066	0.14	1.15
	111"	36	5701	0.18	1.37
	120"	30	5427	0.22	1.61

MAXIMUM DESIGN PRESSURE OF AN  
END 4'x8'x1/4" MULLION (6061-16)

SPAN WIDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION X (IN)
84"	96"	150	8677	0.12	1.03
	108"	150	8112	0.17	1.30
	120"	129	7703	0.25	1.63
	132"	113	7413	0.34	1.98
96"	144"	100	7128	0.45	2.29
	96"	136	8527	0.11	1.02
	108"	119	7934	0.15	1.31
	120"	97	7382	0.21	1.61
108"	132"	82	7035	0.29	1.96
	144"	72	6811	0.38	2.29
	96"	108	8342	0.09	1.01
	108"	94	7732	0.14	1.30
120"	120"	76	7281	0.19	1.62
	132"	63	6821	0.25	1.92
	144"	55	6568	0.33	2.31
	96"	89	8249	0.09	1.00
132"	108"	76	7567	0.12	1.29
	120"	61	7074	0.17	1.60
	132"	51	6696	0.22	1.98
	144"	43	6270	0.29	2.25
144"	96"	75	8160	0.08	1.00
	108"	65	7531	0.11	1.32
	120"	51	6993	0.15	1.69
	132"	42	6585	0.21	1.95
156"	144"	34	6285	0.27	2.34
	96"	65	8125	0.08	1.03
	108"	55	7415	0.11	1.31
	120"	43	6976	0.14	1.58
144"	132"	36	6517	0.19	1.85
	144"	29	6143	0.25	2.32
	84"	68	9011	0.05	0.79
	96"	57	8120	0.07	1.04
156"	108"	48	7320	0.10	1.25
	120"	37	6895	0.14	1.60
	132"	30	6482	0.18	1.95



NOTE: USE DEFLECTIONS PROVIDED WHEN DETERMINING MINIMUM SEPARATION TO GLASS  
THE DEFLECTION IN THE X DIRECTION CAN BE NEGLECTED ON NON-RETENSION SHUTTERS  
AND WHEN STORM-BARS ARE USED TO REDUCE SHUTTER DEFLECTIONS.



**TKJ Engineering, LLC.**  
11150 WINDY CREEK DRIVE, RIVERVIEW, FL 33569  
TEL: 813.964.7649; EM: TKJENGINEERING@VERIZON.NET  
CERTIFICATE OF AUTHORIZATION NUMBER: 28582

DATE: 12/20/11  
DRAWN BY: TKJ  
SCALE: N.T.S.  
PROJ. #: 11-0401

**ROLL-UP SHUTTER MULLIONS**

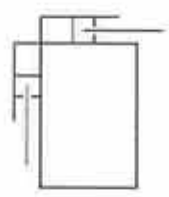
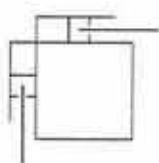
**ASSA**  
"Knowledge is Your Best Protection"  
AMERICAN SHUTTER SYSTEM ASSOCIATION, INC.  
4268 WESTCROSS DRIVE, WEST PALM BEACH, FL 33407  
PHONE: 800.432.2204; FAX: 561.641.0552  
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MAXIMUM DESIGN PRESSURE OF A CORNER 4"x4"x1/4" MULLION (6063-T6)

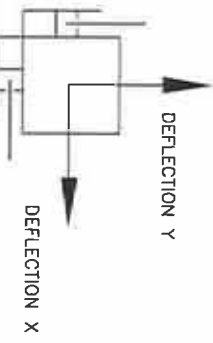
SPAN WIDTH 1 UP TO	SPAN WIDTH 2 UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE 1 (PSF)	DESIGN PRESSURE 2 (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION X (IN)
96"	48"	96"	57	64	3384	0.26	0.70
		108"	52	59	3158	0.32	0.86
		120"	49	55	2986	0.60	1.04
		132"	47	53	2862	0.90	1.26
		144"	46	52	2838	1.17	1.56
		144"	46	52	2838	1.32	1.71
96"	72"	108"	51	54	3423	0.46	0.93
		120"	46	49	3096	0.64	1.02
		132"	45	48	3121	0.94	1.27
		144"	43	46	3036	1.09	1.52
		144"	43	46	3036	1.24	1.67
		144"	43	46	3036	1.40	1.82
120"	48"	96"	53	53	4546	0.71	0.71
		108"	47	47	4040	0.83	0.83
		120"	45	45	3815	1.11	1.11
		132"	43	43	3663	1.30	1.30
		144"	41	41	3470	1.52	1.52
		144"	41	41	3470	1.67	1.67
120"	72"	96"	41	47	3625	0.15	0.66
		108"	36	42	3371	0.20	0.70
		120"	32	37	3037	0.28	0.90
		120"	29	34	2798	0.46	1.04
		120"	29	34	2798	0.61	1.19
		120"	29	34	2798	0.76	1.34
120"	72"	75"	45	50	3995	0.12	0.43
		84"	40	44	3652	0.15	0.56
		93"	36	39	3291	0.20	0.64
		102"	33	36	3186	0.21	0.79
		60"	59	62	5723	0.20	0.28
		69"	48	50	4897	0.25	0.36
120"	96"	78"	42	44	4421	0.32	0.49
		87"	37	39	3970	0.38	0.61
		96"	34	36	3721	0.43	0.73
		60"	58	58	6614	0.28	0.28
		69"	47	47	5722	0.37	0.37
		78"	41	41	5229	0.48	0.48
120"	120"	87"	36	36	4708	0.61	0.61
		96"	33	33	4446	0.73	0.73

MAXIMUM DESIGN PRESSURE OF A CORNER 4"x6"x1/8" MULLION (6063-T6)

SPAN WIDTH 1 UP TO	SPAN WIDTH 2 UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE 1 (PSF)	DESIGN PRESSURE 2 (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION X (IN)
96"	48"	96"	51	58	3117	0.27	0.48
		108"	47	53	2863	0.50	0.63
		120"	44	50	2919	0.81	0.72
		132"	43	49	2915	1.09	0.93
		144"	41	46	2831	1.33	1.03
		144"	41	46	2831	1.48	1.18
96"	72"	108"	49	52	3266	0.36	0.48
		120"	45	48	3018	0.55	0.61
		132"	42	45	2875	0.69	0.72
		144"	40	43	2734	0.95	0.90
		144"	36	38	2433	0.83	0.93
		144"	36	38	2433	0.98	1.08
120"	48"	96"	45	45	3680	0.72	0.45
		108"	43	43	3568	0.94	0.58
		120"	40	40	3241	1.16	0.71
		132"	36	36	2817	1.13	0.84
		144"	31	31	2415	1.28	0.68
		144"	31	31	2415	1.43	0.83
120"	72"	60"	56	65	4456	0.06	0.19
		72"	44	51	3851	0.12	0.27
		84"	36	42	3328	0.18	0.36
		96"	32	37	3063	0.26	0.48
		108"	28	32	2718	0.37	0.59
		108"	28	32	2718	0.42	0.64
120"	72"	75"	40	44	3646	0.12	0.29
		84"	35	39	3298	0.17	0.38
		93"	31	34	2981	0.19	0.44
		102"	29	32	2832	0.24	0.56
		60"	53	56	5198	0.23	0.19
		69"	43	45	4400	0.28	0.25
120"	96"	78"	37	39	3899	0.34	0.32
		87"	33	35	3649	0.41	0.41
		96"	29	31	3130	0.45	0.46
		54"	53	53	5685	0.23	0.13
		63"	43	43	4989	0.31	0.19
		72"	36	36	4384	0.41	0.25
120"	120"	81"	32	32	4058	0.51	0.31
		90"	29	29	3750	0.66	0.39

SPAN 2

DEFLECTION Y



SPAN 1

DEFLECTION X

NOTE: USE DEFLECTIONS PROVIDED WHEN DETERMINING MINIMUM SEPARATION TO GLASS

THE DEFLECTION IN THE X DIRECTION CAN BE NEGLECTED ON NON-RETENSION SHUTTERS AND WHEN STORM-BARS ARE USED TO REDUCE SHUTTER DEFLECTIONS.

#	DATE	REVISIONS

**ASSA**  
 "Knowledge is Your Best Protection"  
 AMERICAN SHUTTER SYSTEM ASSOCIATION, INC.  
 4268 WESTROADS DRIVE, WEST PALM BEACH, FL, 33407  
 PHONE: 800.432.2204; FAX: 561.841.0852  
 WWW.AMSSHUTTER.ORG

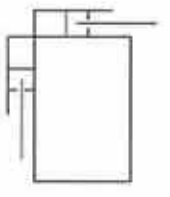
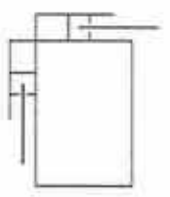
**ROLL-UP SHUTTER MULLIONS**

**TKJ Engineering, LLC.**  
 35 AUTUMN CREEK DRIVE, RIVERVIEW, FL 33569  
 813.404.7849; EM.: TKJENGINEERING@VERIZON.NET  
 CERTIFICATE OF AUTHORIZATION NUMBER: 28582

DATE:	DRAWN BY:	SCALE:	PROJ. #:
12/20/11	TKJ	N.T.S.	:11-0401

**TREVOR JOHNSON**  
 LICENSE  
 No 65624  
 PROFESSIONAL ENGINEER  
 STATE OF FLORIDA



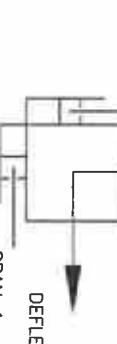


MAXIMUM DESIGN PRESSURE OF A  
CORNER 4'x6'x1/4" MULLION (6063-T6)

SPAN WIDTH 1 UP TO	SPAN WIDTH 2 UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE 1 (PSF)	DESIGN PRESSURE 2 (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION X (IN)
96"	96"	96"	65	65	6491	0.72	0.44
108"	96"	108"	59	59	6027	0.90	0.58
120"	96"	120"	54	54	5578	1.07	0.72
132"	96"	132"	50	50	5166	1.26	0.86
144"	96"	144"	48	48	4963	1.56	1.05
96"	48"	96"	51	59	5479	0.20	0.48
108"	48"	108"	44	51	5032	0.33	0.60
120"	48"	120"	39	45	4596	0.44	0.74
132"	48"	132"	37	43	4489	0.63	0.93
144"	48"	144"	34	39	4205	0.70	1.09
96"	72"	96"	49	54	5545	0.23	0.49
108"	72"	108"	43	47	5063	0.34	0.61
120"	72"	120"	38	42	4636	0.41	0.73
132"	72"	132"	35	39	4355	0.52	0.91
144"	72"	144"	32	35	4040	0.54	1.07
96"	96"	96"	48	50	6282	0.53	0.48
105"	96"	105"	43	45	5705	0.65	0.59
114"	96"	114"	39	41	5253	0.70	0.69
123"	96"	123"	36	38	4911	0.74	0.81
132"	96"	132"	34	36	4705	0.86	0.89
84"	96"	84"	49	49	7135	0.56	0.33
93"	96"	93"	43	43	6494	0.69	0.40
102"	120"	102"	39	39	6083	0.79	0.50
111"	120"	111"	36	36	5733	0.97	0.60
120"	120"	120"	33	33	5347	1.07	0.70
84"	120"	84"	44	52	6103	0.14	0.37
93"	120"	93"	38	45	5545	0.18	0.45
102"	120"	102"	34	40	5135	0.23	0.56
111"	120"	111"	31	36	4888	0.25	0.65
120"	120"	120"	28	33	4494	0.34	0.77
78"	120"	78"	48	54	6537	0.12	0.32
87"	120"	87"	41	46	5880	0.15	0.40
96"	120"	96"	35	40	5306	0.18	0.47
105"	120"	105"	32	36	5003	0.20	0.59
114"	120"	114"	29	33	4687	0.27	0.68

MAXIMUM DESIGN PRESSURE OF A  
CORNER 4'x8'x1/4" MULLION (6063-T6)

SPAN WIDTH 1 UP TO	SPAN WIDTH 2 UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE 1 (PSF)	DESIGN PRESSURE 2 (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION X (IN)
96"	96"	96"	78	78	8618	0.73	0.30
108"	96"	108"	70	70	8028	0.93	0.39
120"	96"	120"	63	63	7360	1.13	0.49
132"	96"	132"	58	58	6869	1.32	0.60
144"	96"	144"	55	55	6551	1.63	0.74
96"	48"	96"	68	78	8096	0.21	0.36
108"	48"	108"	59	68	7411	0.29	0.46
120"	48"	120"	52	60	6801	0.37	0.57
132"	48"	132"	46	53	6174	0.59	0.70
144"	48"	144"	42	48	5869	0.69	0.81
96"	72"	96"	66	73	8257	0.31	0.36
108"	72"	108"	57	63	7454	0.31	0.46
120"	72"	120"	50	55	6919	0.49	0.57
132"	72"	132"	44	49	6288	0.61	0.67
144"	72"	144"	40	44	5860	0.66	0.80
96"	96"	96"	64	67	8275	0.65	0.35
108"	96"	108"	55	58	7623	0.76	0.47
120"	96"	120"	48	50	7046	0.87	0.57
132"	96"	132"	43	45	6666	0.98	0.66
144"	96"	144"	39	41	6292	1.17	0.78
96"	120"	96"	51	51	8445	0.72	0.29
108"	120"	108"	44	44	7628	0.88	0.38
120"	120"	120"	40	40	7199	1.13	0.48
132"	120"	132"	37	37	6820	1.40	0.61
144"	120"	144"	34	34	6405	1.65	0.72
84"	120"	84"	62	73	9118	0.14	0.28
96"	120"	96"	50	59	7962	0.17	0.36
108"	120"	108"	43	50	7348	0.27	0.47
120"	120"	120"	37	43	6679	0.34	0.56
132"	120"	132"	33	39	6200	0.51	0.68
84"	120"	84"	60	68	9149	0.20	0.27
96"	120"	96"	49	55	8051	0.22	0.36
108"	120"	108"	42	47	7362	0.29	0.46
120"	120"	120"	36	41	6825	0.37	0.56
132"	120"	132"	32	36	6139	0.38	0.68



NOTE: USE DEFLECTIONS PROVIDED WHEN DETERMINING MINIMUM SEPARATION TO GLASS  
THE DEFLECTION IN THE X DIRECTION CAN BE NEGLECTED ON NON-RETENSION SHUTTERS  
AND WHEN STORM-BARS ARE USED TO REDUCE SHUTTER DEFLECTIONS.

#	DATE	REVISIONS

**ASSA**  
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AMERICAN SHUTTER SYSTEM ASSOCIATION, INC.  
4268 WESTROADS DRIVE, WEST PALM BEACH, FL, 33407  
PHONE: 800.432.2204; FAX: 561.841.0852  
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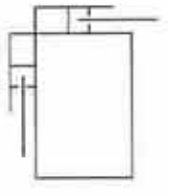
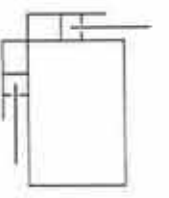
**ROLL-UP SHUTTER MULLIONS**

**TKJ Engineering, LLC.**  
235 AUTUMN CREEK DRIVE, RIVERVIEW, FL 33569  
TEL: 813.404.7649; EM.: TKJENGINEERING@VERIZON.NET  
CERTIFICATE OF AUTHORIZATION NUMBER: 28562

DATE:	DRAWN BY:	SCALE:	PROJ. #:
12/20/11	TKJ	N.T.S.	:11-0401

**TREVOR JOHNSON**  
LICENSE  
No 65624  
PROFESSIONAL ENGINEER  
STATE OF FLORIDA  
12/20/11



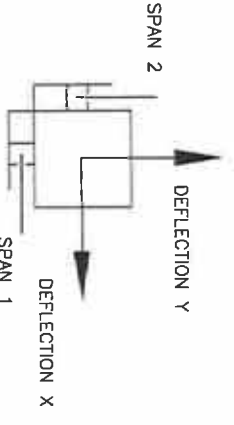


**MAXIMUM DESIGN PRESSURE OF A CORNER 4'x6'x3/8" MULLION (6063-16)**

SPAN WIDTH 1 UP TO	SPAN WIDTH 2 UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE 1 (PSF)	DESIGN PRESSURE 2 (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION X (IN)
96"	48"	96"	99	112	7703	0.20	0.49
		108"	87	98	7179	0.38	0.61
		120"	78	88	6641	0.48	0.75
		132"	72	81	6218	0.67	0.93
		144"	67	76	5929	0.80	1.09
		96"	95	101	8398	0.47	0.49
		108"	83	88	7453	0.53	0.61
		120"	74	79	6739	0.68	0.74
		132"	68	72	6285	0.73	0.89
		144"	63	67	6030	0.78	1.04
		96"	82	82	8897	0.72	0.43
		108"	73	73	8190	0.91	0.55
		120"	66	66	7572	1.11	0.67
		132"	61	61	7086	1.34	0.84
		144"	57	57	6672	1.55	1.02
		96"	67	77	7601	0.19	0.48
		108"	56	67	6881	0.27	0.62
		120"	52	60	6431	0.34	0.76
		132"	47	54	5976	0.56	0.93
		144"	43	50	5827	0.65	1.10
		96"	65	72	7760	0.29	0.49
		108"	56	62	6941	0.29	0.61
		120"	49	54	6456	0.41	0.73
		132"	44	49	5983	0.57	0.88
		144"	41	45	5686	0.73	1.09
		96"	63	66	8913	0.60	0.48
		108"	54	57	7906	0.71	0.61
		120"	48	50	7143	0.87	0.77
		132"	43	45	6517	0.97	0.93
		144"	39	41	6013	1.04	1.07
		96"	54	54	8738	0.72	0.43
		108"	47	47	7970	0.91	0.54
		120"	42	42	7348	1.13	0.69
		132"	38	38	6837	1.40	0.80
		144"	35	35	6445	1.62	0.95

**MAXIMUM DESIGN PRESSURE OF A CORNER 4'x6'x3/8" MULLION (6063-16)**

SPAN WIDTH 1 UP TO	SPAN WIDTH 2 UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE 1 (PSF)	DESIGN PRESSURE 2 (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION X (IN)
144"	72"	84"	58	65	8459	0.17	0.36
		96"	48	54	7562	0.21	0.48
		108"	41	46	6831	0.27	0.61
		120"	35	40	6140	0.32	0.71
		132"	32	36	5767	0.36	0.93
		144"	27	32	5344	0.37	1.09
		96"	47	51	8209	0.44	0.49
		108"	40	43	7263	0.53	0.62
		120"	35	38	6574	0.63	0.77
		132"	31	34	5988	0.66	0.93
		144"	26	28	5492	0.66	1.09
		96"	46	48	9066	0.66	0.48
		108"	39	41	8103	0.82	0.62
		120"	34	35	7354	0.93	0.72
		132"	30	31	6655	1.12	0.89
		144"	26	27	6050	1.41	1.03
		96"	47	47	9661	0.55	0.32
		108"	39	39	8616	0.73	0.42
		120"	34	34	7937	0.89	0.56
		132"	30	30	7314	1.14	0.67
		144"	26	26	6706	1.41	0.82
		96"	45	46	7558	0.13	0.40
		108"	39	40	6903	0.17	0.48
		120"	34	36	6398	0.22	0.59
		132"	30	30	5952	0.36	0.69
		144"	26	26	5557	0.42	0.77
		96"	49	56	8763	0.13	0.34
		108"	41	47	7841	0.14	0.42
		120"	36	41	7215	0.18	0.52
		132"	32	37	6710	0.22	0.62
		144"	28	34	6279	0.24	0.71
		96"	48	53	9325	0.29	0.35
		108"	41	45	8472	0.33	0.42
		120"	35	39	7564	0.37	0.50
		132"	31	34	6920	0.39	0.60
		144"	27	29	6320	0.42	0.67



NOTE: USE DEFLECTIONS PROVIDED WHEN DETERMINING MINIMUM SEPARATION TO GLASS  
 THE DEFLECTION IN THE X DIRECTION CAN BE NEGLECTED ON NON-RETENSION SHUTTERS  
 AND WHEN STORM-BARS ARE USED TO REDUCE SHUTTER DEFLECTIONS.

DATE	REVISIONS

**ASSA**  
 "Knowledge is Your Best Protection"  
 AMERICAN SHUTTER SYSTEM ASSOCIATION, INC.  
 4268 WESTROADS DRIVE, WEST PALM BEACH, FL, 33407  
 PHONE: 800.432.2204; FAX: 561.841.0852  
 WWW.ASSA-SHUTTER.ORG

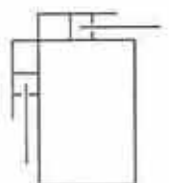
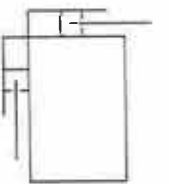
**ROLL-UP SHUTTER MULLIONS**

**Engineering, LLC.**  
 6355 AUTUMN CREEK DRIVE, RIVERVIEW, FL 33569  
 813.404.7549; EM.: TKJENGINEERING@VERIZON.NET  
 CERTIFICATE OF AUTHORIZATION NUMBER: 28582

DATE:	DRAWN BY:	SCALE:	PROJ. #:
12/20/11	TKJ	N.T.S.	11-0401

**TREVOR JOHNSON**  
 LICENSE  
 No 65624  
 STATE OF FLORIDA  
 PROFESSIONAL ENGINEER  
 FLORIDA P.E. # 55624



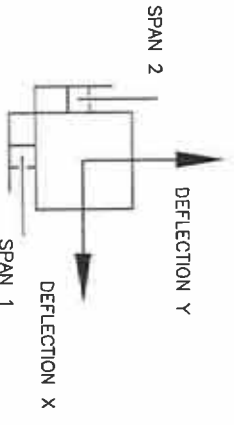


**MAXIMUM DESIGN PRESSURE OF A CORNER 4'X6'X1/2" MULLION (8083-10)**

SPAN WIDTH 1 UP TO	SPAN WIDTH 2 UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE 1 (PSF)	DESIGN PRESSURE 2 (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION X (IN)
96"	48"	96"	118	133	9627	0.23	0.49
108"	48"	108"	103	116	8645	0.31	0.62
120"	48"	120"	92	104	8000	0.40	0.75
132"	48"	132"	84	95	7739	0.65	0.92
144"	48"	144"	77	87	7215	0.84	1.09
96"	72"	96"	113	120	10521	0.51	0.48
108"	72"	108"	98	104	9398	0.59	0.60
120"	72"	120"	87	93	8512	0.66	0.74
132"	72"	132"	80	85	7894	0.75	0.91
144"	72"	144"	73	78	7385	0.90	1.05
96"	96"	96"	96	96	10852	0.73	0.42
108"	96"	108"	84	84	9879	0.91	0.54
120"	96"	120"	76	76	9195	1.16	0.67
132"	96"	132"	69	69	8490	1.34	0.83
144"	96"	144"	65	65	8130	1.65	1.00
96"	48"	96"	81	93	9428	0.20	0.49
108"	48"	108"	70	81	8619	0.29	0.61
120"	48"	120"	61	70	7827	0.36	0.75
132"	48"	132"	55	63	7317	0.42	0.92
144"	48"	144"	50	59	6837	0.66	1.09
96"	72"	96"	79	87	9836	0.33	0.48
108"	72"	108"	67	74	8696	0.36	0.61
120"	72"	120"	59	65	7924	0.36	0.77
132"	72"	132"	52	57	7213	0.55	0.88
144"	72"	144"	48	53	7027	0.66	1.09
96"	96"	96"	76	80	11055	0.62	0.47
108"	96"	108"	65	68	9850	0.76	0.62
120"	96"	120"	57	60	8957	0.91	0.76
132"	96"	132"	51	54	8220	1.06	0.93
144"	96"	144"	46	48	7512	1.21	1.08
96"	120"	96"	64	64	10675	0.73	0.42
108"	120"	108"	55	55	9652	0.91	0.53
120"	120"	120"	49	49	8934	1.13	0.68
132"	120"	132"	44	44	8297	1.40	0.79
144"	120"	144"	40	40	7767	1.57	0.94

**MAXIMUM DESIGN PRESSURE OF A CORNER 4'X6'X1/2" MULLION (8083-10)**

SPAN WIDTH 1 UP TO	SPAN WIDTH 2 UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE 1 (PSF)	DESIGN PRESSURE 2 (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION X (IN)
144"	72"	96"	59	67	9430	0.24	0.49
108"	72"	108"	50	56	8495	0.27	0.62
120"	72"	120"	44	50	7905	0.37	0.76
132"	72"	132"	38	43	7122	0.40	0.90
144"	72"	144"	35	40	6792	0.54	1.09
96"	96"	96"	58	63	10434	0.50	0.48
108"	96"	108"	49	53	9282	0.58	0.61
120"	96"	120"	42	46	8265	0.70	0.76
132"	96"	132"	38	41	7701	0.80	0.92
144"	96"	144"	34	37	7068	0.81	1.12
96"	120"	96"	56	58	11272	0.69	0.48
108"	120"	108"	47	49	10041	0.84	0.60
120"	120"	120"	41	43	9151	1.04	0.76
132"	120"	132"	37	39	8600	1.27	0.92
144"	120"	144"	33	34	7841	1.35	1.12
96"	144"	96"	47	47	10579	0.72	0.42
108"	144"	108"	40	40	9532	0.93	0.54
120"	144"	120"	35	35	8802	1.12	0.66
132"	144"	132"	31	31	8059	1.39	0.82
144"	144"	144"	28	28	7586	1.55	0.95
96"	48"	96"	53	62	9220	0.14	0.49
108"	48"	108"	45	53	8357	0.25	0.61
120"	48"	120"	39	46	7737	0.33	0.75
132"	48"	132"	35	41	7261	0.40	0.92
144"	48"	144"	31	37	6759	0.45	1.05
96"	72"	96"	52	59	9292	0.19	0.48
108"	72"	108"	44	50	8417	0.24	0.62
120"	72"	120"	38	43	7655	0.31	0.77
132"	72"	132"	33	38	6993	0.40	0.89
144"	72"	144"	30	34	6595	0.39	1.07
96"	96"	96"	51	56	10083	0.43	0.49
108"	96"	108"	43	47	9019	0.50	0.61
120"	96"	120"	37	41	8116	0.59	0.75
132"	96"	132"	33	36	7449	0.65	0.91
144"	96"	144"	30	33	6889	0.88	1.10



NOTE: USE DEFLECTIONS PROVIDED WHEN DETERMINING MINIMUM SEPARATION TO GLASS  
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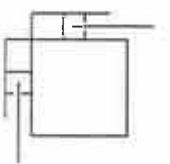
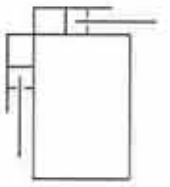
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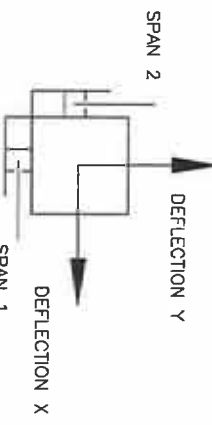


**MAXIMUM DESIGN PRESSURE OF A  
CORNER 4'x6'x1/2" MULLION (6063-16)**

SPAN WIDTH 1 UP TO	SPAN WIDTH 2 UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE 1 (PSF)	DESIGN PRESSURE 2 (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION X (IN)
168"	120"	84"	61	65	12450	0.49	0.37
		96"	50	53	11007	0.63	0.48
		108"	42	44	9748	0.76	0.62
168"	96"	120"	36	38	8771	0.94	0.76
		132"	32	34	8121	1.08	0.93
		144"	28	29	7471	1.22	1.08
168"	72"	120"	34	39	7679	0.27	0.77
		132"	30	34	7096	0.29	0.94
		144"	26	30	6513	0.32	1.11
168"	48"	120"	40	47	8365	0.23	0.62
		132"	35	41	7791	0.28	0.76
		144"	31	37	7218	0.41	0.92
168"	24"	120"	57	65	10527	0.16	0.37
		132"	46	53	9224	0.18	0.49
		144"	39	45	8383	0.24	0.61
168"	12"	120"	34	39	7679	0.27	0.77
		132"	30	34	7096	0.29	0.94
		144"	26	30	6513	0.32	1.11
168"	6"	120"	45	50	9802	0.39	0.48
		132"	38	42	8722	0.47	0.62
		144"	33	37	7984	0.54	0.75
168"	3"	120"	29	32	7269	0.62	0.90
		132"	21	26	6182	0.84	1.22
		144"	15	19	5297	1.11	1.54
168"	1.5"	120"	55	59	12198	0.45	0.37
		132"	45	48	10742	0.59	0.48
		144"	37	40	9458	0.68	0.60
168"	0.75"	120"	33	35	8803	0.82	0.76
		132"	27	29	8121	0.94	0.93
		144"	21	23	7471	1.08	1.08
168"	0.375"	120"	67	79	14923	0.08	0.27
		132"	53	63	10491	0.10	0.37
		144"	43	51	8340	0.17	0.48
168"	0.1875"	120"	36	43	8363	0.22	0.62
		132"	31	37	7860	0.29	0.75
		144"	26	29	7269	0.32	0.84
168"	0.09375"	120"	66	76	12094	0.12	0.27
		132"	51	59	10367	0.13	0.37
		144"	42	48	9285	0.17	0.49
168"	0.046875"	120"	35	40	8313	0.20	0.60
		132"	30	35	7532	0.24	0.77
		144"	26	30	6939	0.28	0.84

**MAXIMUM DESIGN PRESSURE OF A  
CORNER 4'x4'x1/8" MULLION (6061-16)**

SPAN WIDTH 1 UP TO	SPAN WIDTH 2 UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE 1 (PSF)	DESIGN PRESSURE 2 (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION X (IN)
60"	48"	96"	150	150	3729	0.95	0.97
		108"	128	134	2973	1.00	1.18
		120"	86	90	2605	1.38	1.10
72"	48"	132"	63	66	2103	1.57	1.28
		144"	43	45	2273	1.40	1.98
		156"	106	115	3177	0.58	0.96
72"	48"	108"	98	106	3147	0.88	1.26
		120"	77	84	3025	1.43	1.41
		132"	48	52	2418	1.53	1.24
72"	48"	144"	37	40	2199	1.74	1.76
		156"	100	100	3862	1.00	1.00
		168"	84	84	3473	1.22	1.22
72"	48"	120"	65	65	3004	1.47	1.47
		132"	49	49	2736	1.59	1.59
		144"	39	39	2423	1.81	1.81
96"	48"	84"	58	65	2997	0.28	0.75
		96"	53	60	2757	0.42	1.01
		108"	48	54	2634	0.73	1.28
96"	48"	120"	44	50	2577	1.15	1.49
		132"	38	43	2515	1.64	1.96
		144"	26	30	2080	0.32	0.76
96"	48"	84"	56	60	3080	0.52	1.02
		96"	51	54	2889	0.52	1.02
		108"	47	50	2873	0.74	1.34
96"	48"	120"	42	45	2861	1.06	1.40
		132"	34	36	2615	1.50	1.74
		144"	26	26	2432	0.59	0.58
96"	48"	84"	61	61	4432	0.75	0.75
		96"	53	53	3938	0.75	0.75
		108"	49	49	3622	1.05	1.05
96"	48"	120"	45	45	3413	1.30	1.30
		132"	39	39	3265	1.62	1.62
		144"	43	50	3311	0.15	0.57
96"	48"	84"	39	45	3071	0.18	0.66
		96"	36	42	2907	0.21	0.76
		108"	35	40	2859	0.28	0.90
96"	48"	120"	32	37	2666	0.32	0.95



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#	DATE	REVISIONS

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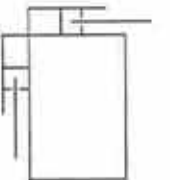
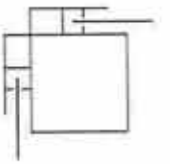
**ROLL-UP SHUTTER  
MULLIONS**

**Engineering, LLC.**  
355 AUTUMN CREEK DRIVE, RIVERVIEW, FL 33569  
813.404.7649; EM.: TKJENGINEERING@VERIZON.NET  
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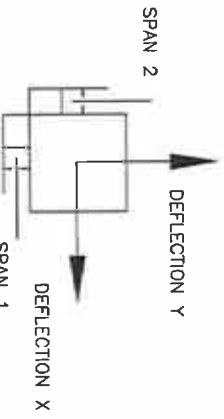


**MAXIMUM DESIGN PRESSURE OF A  
CORNER 4'x4'x1/4" MULLION (8061-16)**

SPAN WIDTH 1 UP TO	SPAN WIDTH 2 UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE 1 (PSF)	DESIGN PRESSURE 2 (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION X (IN)
96"	48"	96"	77	87	4894	0.37	1.03
108"	48"	108"	69	78	4550	0.54	1.30
120"	48"	120"	58	65	4337	0.70	1.57
132"	48"	132"	52	59	4201	0.84	1.84
144"	48"	144"	46	52	4133	1.06	2.34
96"	72"	96"	73	78	5029	0.48	1.00
108"	72"	108"	66	70	4694	0.56	1.28
120"	72"	120"	55	59	4504	0.71	1.58
132"	72"	132"	49	52	4100	1.03	1.86
144"	72"	144"	45	48	4105	1.47	2.37
96"	96"	96"	70	70	6343	1.01	1.01
108"	96"	108"	62	62	5914	1.30	1.30
120"	96"	120"	53	53	5539	1.57	1.57
132"	96"	132"	45	46	5190	1.88	1.88
144"	96"	144"	41	41	5053	2.28	2.28
96"	48"	84"	58	57	5142	0.16	0.79
96"	48"	96"	50	58	4594	0.27	1.03
108"	48"	108"	44	51	4355	0.48	1.24
120"	48"	120"	36	42	4191	0.58	1.61
132"	48"	132"	31	36	3875	0.88	1.84
84"	48"	84"	56	62	5171	0.22	0.79
96"	48"	96"	48	53	4710	0.33	1.03
108"	48"	108"	42	46	4296	0.42	1.23
120"	48"	120"	34	38	4094	0.57	1.60
132"	48"	132"	29	32	3838	0.80	1.94
72"	48"	72"	66	69	6999	0.42	0.57
84"	48"	84"	54	57	6049	0.55	0.77
96"	48"	96"	47	49	5406	0.69	1.02
108"	48"	108"	40	42	4773	0.84	1.31
120"	48"	120"	33	35	4507	1.02	1.62
72"	96"	72"	64	64	7944	0.58	0.58
84"	96"	84"	52	52	6895	0.77	0.77
96"	96"	96"	45	45	6239	1.01	1.01
108"	96"	108"	39	39	5738	1.29	1.29
120"	96"	120"	32	32	5318	1.53	1.53

**MAXIMUM DESIGN PRESSURE OF A  
CORNER 4'x6'x1/8" MULLION (8061-16)**

SPAN WIDTH 1 UP TO	SPAN WIDTH 2 UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE 1 (PSF)	DESIGN PRESSURE 2 (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION X (IN)
96"	48"	96"	67	76	4433	0.39	0.86
108"	48"	108"	61	69	4059	0.59	0.85
120"	48"	120"	58	65	3953	0.73	1.08
132"	48"	132"	54	61	3727	0.98	1.25
144"	48"	144"	42	47	3546	1.56	1.59
96"	72"	96"	65	69	4529	0.45	0.68
108"	72"	108"	59	63	4239	0.59	0.86
120"	72"	120"	54	57	3832	0.89	1.05
132"	72"	132"	51	54	3920	1.30	1.27
144"	72"	144"	43	46	3804	1.84	1.53
96"	96"	96"	59	59	5229	1.00	0.65
108"	96"	108"	53	53	4829	1.25	0.83
120"	96"	120"	46	46	4613	1.56	1.03
132"	96"	132"	40	40	4356	1.86	1.21
144"	96"	144"	34	34	3834	2.06	1.39
84"	96"	84"	51	59	4723	0.21	0.53
96"	48"	96"	44	51	4365	0.38	0.68
108"	48"	108"	38	44	3942	0.45	0.81
120"	48"	120"	35	40	3695	0.62	1.04
132"	48"	132"	33	38	3602	0.83	1.24
84"	48"	84"	49	54	4819	0.25	0.52
96"	48"	96"	42	45	4301	0.34	0.67
108"	48"	108"	37	41	3865	0.49	0.87
120"	48"	120"	34	38	3672	0.65	1.05
132"	48"	132"	31	34	3364	0.79	1.26
72"	96"	72"	57	60	6157	0.45	0.37
84"	96"	84"	47	49	5303	0.58	0.50
96"	96"	96"	41	43	4769	0.71	0.68
108"	96"	108"	36	38	4238	0.82	0.85
120"	96"	120"	32	34	3782	0.95	0.99
72"	120"	72"	51	51	6361	0.58	0.34
81"	120"	81"	44	44	5746	0.73	0.43
90"	120"	90"	39	39	5244	0.90	0.55
99"	120"	99"	36	36	5002	1.08	0.67
108"	120"	108"	32	32	4656	1.24	0.82



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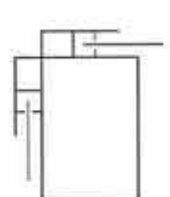
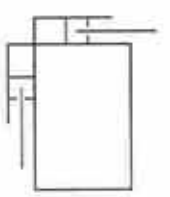
**ROLL-UP SHUTTER  
MULLIONS**

**Engineering, LLC.**  
835 AUTUMN CREEK DRIVE, RIVERVIEW, FL 33569  
813.404.7849; EM.: TKJENGINEERING@VERIZON.NET  
CERTIFICATE OF AUTHORIZATION NUMBER: 28582

DATE:	DRAWN BY:	SCALE:	PROJ. #:
12/20/11	TKJ	N.T.S.	:11-0401

**TREVOR JOHNSON**  
LICENSE  
No 65624  
FLORIDA  
PROFESSIONAL ENGINEER



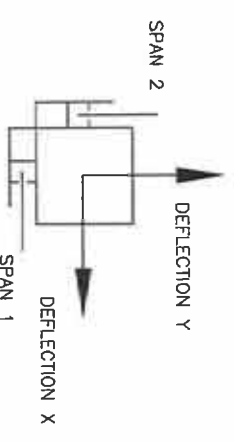


MAXIMUM DESIGN PRESSURE OF A  
CORNER 4'x6'x1/4" MULLION (6061-16)

SPAN WIDTH 1 UP TO	SPAN WIDTH 2 UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE 1 (PSF)	DESIGN PRESSURE 2 (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION X (IN)
96"	96"	96"	89	89	9241	1.01	0.61
		108"	79	79	8460	1.28	0.79
		120"	64	64	8058	1.62	0.96
		132"	55	55	7496	1.91	1.20
120"	48"	144"	49	49	7037	2.18	1.40
		96"	73	84	7904	0.31	0.67
		108"	63	73	7142	0.39	0.87
		120"	55	63	6500	0.48	1.02
120"	72"	132"	50	58	6083	0.71	1.24
		144"	47	54	5839	1.08	1.55
		96"	70	77	7960	0.42	0.68
		108"	61	67	7227	0.47	0.86
120"	96"	120"	54	60	6634	0.58	1.09
		132"	48	53	6261	0.81	1.24
		144"	45	50	6010	1.15	1.55
		96"	68	71	9073	0.84	0.88
120"	96"	108"	59	62	8223	1.00	0.86
		120"	52	55	7493	1.18	1.04
		132"	46	48	6696	1.33	1.23
		144"	43	45	6312	1.60	1.57
120"	120"	96"	59	59	9112	1.01	0.62
		108"	51	51	8288	1.27	0.75
		120"	41	41	7730	1.56	0.97
		132"	34	34	7218	1.94	1.21
144"	48"	144"	29	29	6678	2.26	1.39
		96"	53	62	7630	0.24	0.67
		108"	46	54	6980	0.33	0.85
		120"	40	47	6473	0.52	1.05
144"	72"	132"	36	42	6034	0.65	1.31
		144"	33	39	5747	0.92	1.53
		96"	52	59	7696	0.28	0.68
		108"	44	50	6988	0.41	0.84
144"	144"	120"	39	44	6451	0.50	1.08
		132"	35	40	6045	0.64	1.28
		144"	32	36	5701	0.70	1.53

MAXIMUM DESIGN PRESSURE OF A  
CORNER 4'x6'x1/4" MULLION (6061-16)

SPAN WIDTH 1 UP TO	SPAN WIDTH 2 UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE 1 (PSF)	DESIGN PRESSURE 2 (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION X (IN)
144"	96"	96"	51	55	8476	0.66	0.68
		108"	43	47	7509	0.75	0.85
		120"	38	41	6802	0.85	1.08
		132"	34	37	6274	0.99	1.28
144"	120"	144"	30	33	5695	1.06	1.49
		84"	60	63	10568	0.73	0.52
		96"	49	51	9192	0.92	0.67
		108"	42	44	8338	1.10	0.85
144"	144"	120"	37	39	7648	1.37	1.05
		132"	32	33	6970	1.54	1.31
		72"	64	64	11486	0.57	0.33
		84"	51	51	10012	0.76	0.46
144"	48"	108"	43	43	9046	1.01	0.60
		120"	29	29	8219	1.28	0.77
		72"	64	76	9778	0.12	0.38
		84"	51	60	8625	0.15	0.52
168"	48"	96"	42	50	7723	0.24	0.69
		108"	35	41	6882	0.31	0.84
		120"	31	37	6399	0.47	1.05
		72"	63	72	9968	0.18	0.38
168"	72"	84"	49	56	8547	0.18	0.51
		96"	41	47	7718	0.25	0.68
		108"	35	40	7002	0.35	0.86
		120"	30	34	6295	0.33	1.07
168"	96"	72"	61	68	10623	0.33	0.38
		81"	51	57	9512	0.40	0.48
		90"	44	49	8621	0.47	0.61
		99"	38	42	7786	0.54	0.73
168"	120"	108"	34	38	7209	0.61	0.88
		72"	61	65	11662	0.47	0.38
		81"	50	54	10217	0.57	0.48
		90"	43	46	9282	0.69	0.59
168"	168"	99"	37	40	8419	0.82	0.71
		108"	33	35	7774	0.91	0.85



NOTE: USE DEFLECTIONS PROVIDED WHEN DETERMINING MINIMUM SEPARATION TO GLASS  
THE DEFLECTION IN THE X DIRECTION CAN BE NEGLECTED ON NON-RETENSION SHUTTERS  
AND WHEN STORM-BARS ARE USED TO REDUCE SHUTTER DEFLECTIONS.

#	DATE	REVISIONS

**ASSA**  
"Knowledge is Your Best Protection"  
AMERICAN SHUTTER SYSTEM ASSOCIATION, INC.  
4268 WESTROADS DRIVE, WEST PALM BEACH, FL, 33407  
PHONE: 800.432.2204; FAX: 561.841.0852  
WWW.ASSA-SHUTTER.ORG

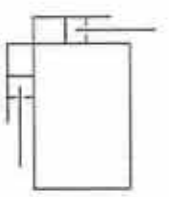
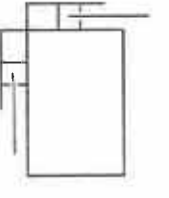
**ROLL-UP SHUTTER MULLIONS**

**Engineering, LLC.**  
535 AUTUMN CREEK DRIVE, RIVERVIEW, FL 33569  
813.404.7648; EM: TKJENGINEERING@VERIZON.NET  
CERTIFICATE OF AUTHORIZATION NUMBER: 28582

DATE:	DRAWN BY:	SCALE:	PROJ. #:
12/20/11	TKJ	N.T.S.	:11-0401

**TREVOR JOHNSON**  
LICENSE  
No 65624  
PROFESSIONAL ENGINEER  
FLORIDA



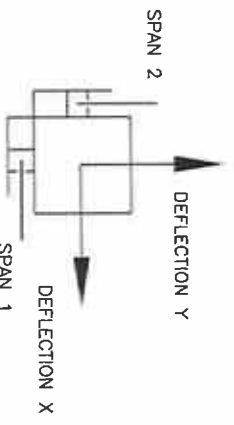


MAXIMUM DESIGN PRESSURE OF A  
CORNER 4"x8"x1/4" MULLION (9061-16)

SPAN WIDTH 1 UP TO	SPAN WIDTH 2 UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE 1 (PSF)	DESIGN PRESSURE 2 (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION X (IN)
96"	96"	96"	109	109	12327	1.01	0.42
108"	96"	108"	93	93	11201	1.29	0.55
120"	96"	120"	77	77	10488	1.61	0.68
132"	96"	132"	64	64	9719	1.93	0.84
144"	96"	144"	57	57	9178	2.21	1.00
108"	48"	108"	84	97	10516	0.47	0.85
120"	48"	120"	74	86	9713	0.59	0.81
132"	48"	132"	65	75	8932	0.71	0.94
144"	48"	144"	60	69	8508	0.80	1.15
96"	72"	96"	95	105	12010	0.56	0.51
108"	72"	108"	81	89	10702	0.62	0.65
120"	72"	120"	71	78	9743	0.67	0.80
132"	72"	132"	63	69	9008	0.83	0.96
144"	72"	144"	57	63	8449	1.00	1.12
96"	96"	96"	93	96	13476	0.96	0.51
108"	96"	108"	79	83	12071	1.18	0.64
120"	96"	120"	69	73	11061	1.36	0.78
132"	96"	132"	58	61	9988	1.63	0.97
144"	96"	144"	51	54	9294	1.84	1.12
96"	120"	96"	73	73	12051	1.02	0.42
108"	120"	108"	62	62	11026	1.27	0.53
120"	120"	120"	49	49	10200	1.63	0.67
132"	120"	132"	41	41	9457	1.88	0.81
144"	120"	144"	34	34	8807	2.36	1.00
96"	48"	96"	74	87	11469	0.30	0.50
108"	48"	108"	63	74	10436	0.36	0.64
120"	48"	120"	54	63	9433	0.46	0.79
132"	48"	132"	48	56	8728	0.57	0.97
144"	48"	144"	44	52	8515	0.66	1.16
96"	72"	96"	72	81	11629	0.41	0.50
108"	72"	108"	61	69	10402	0.41	0.65
120"	72"	120"	53	60	9561	0.53	0.79
132"	72"	132"	46	52	8803	0.71	0.95
144"	72"	144"	42	47	8313	0.83	1.17

MAXIMUM DESIGN PRESSURE OF A  
CORNER 4"x8"x1/4" MULLION (9061-16)

SPAN WIDTH 1 UP TO	SPAN WIDTH 2 UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE 1 (PSF)	DESIGN PRESSURE 2 (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION X (IN)
144"	96"	96"	70	76	12598	0.76	0.50
108"	96"	108"	59	64	11217	0.92	0.65
120"	96"	120"	51	55	10159	1.05	0.79
132"	96"	132"	45	49	9315	1.20	0.95
144"	96"	144"	41	45	8797	1.29	1.15
96"	120"	96"	68	71	13559	1.01	0.50
108"	120"	108"	58	60	12249	1.28	0.65
120"	120"	120"	46	48	11113	1.56	0.80
132"	120"	132"	37	39	10236	1.86	0.95
144"	120"	144"	33	34	9660	2.16	1.15
84"	48"	84"	65	65	13356	0.79	0.32
96"	48"	96"	54	54	12011	1.02	0.41
108"	48"	108"	45	45	10856	1.31	0.54
120"	48"	120"	35	35	9942	1.58	0.67
132"	48"	132"	29	29	9132	1.83	0.79
144"	48"	144"	29	29	8728	2.05	0.91
96"	72"	96"	58	69	11301	0.25	0.51
108"	72"	108"	49	58	10262	0.29	0.64
120"	72"	120"	43	51	9624	0.53	0.80
132"	72"	132"	37	44	8728	0.66	0.95
144"	72"	144"	33	39	8123	0.79	1.13
96"	96"	96"	57	65	11391	0.30	0.50
108"	96"	108"	48	55	10320	0.38	0.65
120"	96"	120"	41	47	9393	0.48	0.78
132"	96"	132"	37	42	8861	0.63	0.97
144"	96"	144"	33	38	8281	0.79	1.16
84"	48"	84"	69	77	13898	0.52	0.39
96"	48"	96"	56	62	12152	0.62	0.51
108"	48"	108"	47	52	10870	0.74	0.64
120"	48"	120"	41	46	10004	0.89	0.80
132"	48"	132"	35	39	8884	0.95	0.94
144"	48"	144"	31	35	8463	1.08	1.16
96"	120"	96"	55	59	13047	0.87	0.51
108"	120"	108"	46	49	11579	1.08	0.65
120"	120"	120"	39	42	10454	1.23	0.78
132"	120"	132"	35	38	9905	1.52	0.96



NOTE: USE DEFLECTIONS PROVIDED WHEN DETERMINING MINIMUM SEPARATION TO GLASS  
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AND WHEN STORM-BARS ARE USED TO REDUCE SHUTTER DEFLECTIONS.

#	DATE	REVISIONS

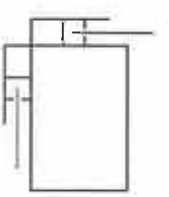
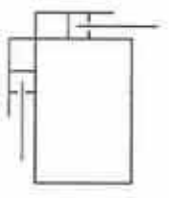
**ASSA**  
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AMERICAN SHUTTER SYSTEM ASSOCIATION, INC.  
4268 WESTROADS DRIVE, WEST PALM BEACH, FL, 33407  
PHONE: 800.432.2204; FAX: 561.841.0852  
WWW.AMSSHUTTER.ORG

**ROLL-UP SHUTTER MULLIONS**

**Engineering, LLC.**  
355 AUTUMN CREEK DRIVE, RIVERVIEW, FL 33569  
813.404.7649; EM.: TKJENGINEERING@VERIZON.NET  
CERTIFICATE OF AUTHORIZATION NUMBER: 28582

DATE:	DRAWN BY:	SCALE:	PROJ. #:
12/20/11	TKJ	N.T.S.	:11-0401

**TREVOR JOHNSON**  
LICENSE  
No 65624  
FLORIDA  
PROFESSIONAL ENGINEER  
THIS IS TO CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE, THESE PLANS SPECIFICALLY APPEARED IN CONFORMANCE WITH THE BUILDING CODE REQUIREMENTS.

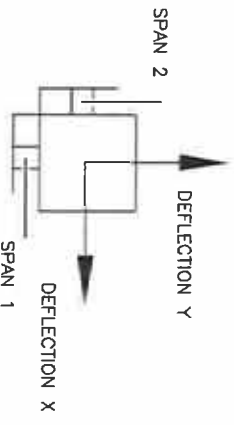


**MAXIMUM DESIGN PRESSURE OF A CORNER 4'x6'x3/8" MULLION (6061-16)**

SPAN WIDTH 1 UP TO	SPAN WIDTH 2 UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE 1 (PSF)	DESIGN PRESSURE 2 (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION X (IN)
96"	48"	96"	141	150	11124	0.36	0.68
		108"	122	137	10084	0.45	0.86
		120"	109	123	9293	0.63	1.08
		132"	99	112	8766	0.71	1.27
96"	72"	144"	91	103	8202	1.18	1.52
		96"	134	142	12230	0.74	0.67
		108"	116	123	10958	0.88	0.85
		120"	103	110	10011	0.95	1.05
96"	96"	132"	94	100	9234	1.11	1.28
		144"	86	91	8672	1.35	1.51
		96"	114	114	12578	1.01	0.60
		108"	98	98	11518	1.29	0.77
96"	48"	120"	80	80	10686	1.60	0.97
		132"	68	68	10012	1.94	1.15
		144"	59	59	9355	2.21	1.36
		96"	98	113	10857	0.25	0.88
120"	48"	108"	84	97	9895	0.44	0.85
		120"	74	85	9219	0.54	1.07
		132"	66	76	8532	0.65	1.31
		144"	60	69	8021	0.73	1.56
120"	72"	96"	94	104	11394	0.51	0.67
		108"	81	89	10186	0.59	0.87
		120"	71	78	9297	0.61	1.05
		132"	63	69	8575	0.74	1.26
120"	96"	144"	57	63	8008	0.94	1.50
		96"	91	96	12782	0.88	0.88
		108"	78	82	11515	1.10	0.86
		120"	68	71	10395	1.29	1.07
120"	96"	132"	61	64	9672	1.47	1.28
		144"	54	57	8954	1.71	1.50
		96"	78	78	12557	1.02	0.61
		108"	66	66	11402	1.27	0.77
120"	120"	120"	52	52	10470	1.62	0.95
		132"	43	43	9763	1.93	1.15
		144"	36	36	9079	2.29	1.40

**MAXIMUM DESIGN PRESSURE OF A CORNER 4'x6'x3/8" MULLION (6061-16)**

SPAN WIDTH 1 UP TO	SPAN WIDTH 2 UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE 1 (PSF)	DESIGN PRESSURE 2 (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION X (IN)
144"	72"	96"	71	80	10915	0.38	0.68
		108"	60	68	9734	0.39	0.86
		120"	52	59	8899	0.49	1.05
		132"	47	53	8532	0.65	1.29
144"	96"	144"	41	46	7749	0.78	1.46
		96"	69	75	11957	0.70	0.88
		108"	59	64	10766	0.88	0.87
		120"	51	55	9699	1.02	1.07
144"	120"	132"	45	49	8887	1.14	1.30
		144"	41	45	8372	1.34	1.54
		96"	68	71	13172	0.97	0.88
		108"	57	59	11704	1.16	0.86
144"	120"	120"	49	51	10775	1.42	1.08
		132"	39	41	9890	1.76	1.28
		144"	34	35	9104	1.99	1.51
		96"	57	57	12317	1.03	0.59
144"	144"	108"	48	48	11271	1.31	0.76
		120"	38	38	10405	1.60	0.97
		132"	30	30	9613	1.93	1.14
		144"	25	25	8913	2.21	1.39
168"	48"	96"	57	67	10582	0.24	0.67
		108"	49	58	9726	0.27	0.86
		120"	42	50	8877	0.48	1.07
		132"	37	44	8249	0.61	1.27
168"	72"	144"	33	39	7723	0.74	1.47
		96"	56	64	10634	0.26	0.68
		108"	47	54	9659	0.36	0.85
		120"	41	47	8907	0.45	1.05
168"	96"	120"	36	41	8166	0.58	1.30
		132"	32	37	7612	0.71	1.51
		144"	27	31	7150	0.87	1.67
		108"	47	52	10416	0.68	0.86
168"	120"	120"	40	44	9243	0.81	1.07
		132"	35	39	8424	0.90	1.30
		144"	31	34	7716	0.94	1.50



NOTE: USE DEFLECTIONS PROVIDED WHEN DETERMINING MINIMUM SEPARATION TO GLASS  
 THE DEFLECTION IN THE X DIRECTION CAN BE NEGLECTED ON NON-RETENSION SHUTTERS  
 AND WHEN STORM-BARS ARE USED TO REDUCE SHUTTER DEFLECTIONS.

#	DATE	REVISIONS

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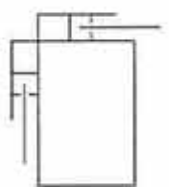
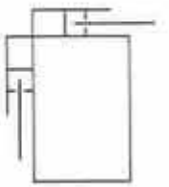
**ROLL-UP SHUTTER  
 MULLIONS**

**TKJ Engineering, LLC.**  
 2555 AUTUMN CREEK DRIVE, RIVERVIEW, FL 33569  
 813.404.7649; EM: TKJENGINEERING@VERIZON.NET  
 CERTIFICATE OF AUTHORIZATION NUMBER: 28582

DATE: 12/20/11	DRAWN BY: TKJ	SCALE: N.T.S.	PROJ. #: 11-0401
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**TREVOR JOHNSON**  
 LICENSE  
 No 65624  
 PROFESSIONAL ENGINEER  
 STATE OF FLORIDA



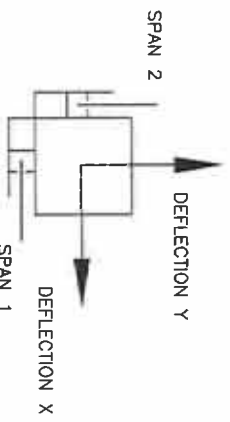


**MAXIMUM DESIGN PRESSURE OF A  
CORNER 4'x6'x1/2" MULLION (6061-T6)**

SPAN WIDTH 1 UP TO	SPAN WIDTH 2 UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE 1 (PSF)	DESIGN PRESSURE 2 (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION X (IN)
96"	48"	96"	150	150	13696	0.31	0.88
108"	48"	108"	147	150	12680	0.50	0.86
120"	48"	120"	130	146	11576	0.64	1.08
132"	48"	132"	116	131	10720	0.79	1.27
144"	48"	144"	107	121	10133	1.02	1.55
96"	72"	96"	150	150	15388	0.80	0.88
108"	72"	108"	140	149	13852	0.96	0.86
120"	72"	120"	123	131	12669	1.13	1.06
132"	72"	132"	111	118	11586	1.29	1.28
144"	72"	144"	101	107	10671	1.40	1.54
96"	96"	96"	135	135	16363	1.02	0.80
108"	96"	108"	116	116	14003	1.27	0.75
120"	96"	120"	93	93	13039	1.59	0.96
132"	96"	132"	78	78	12036	1.91	1.13
144"	96"	144"	66	66	11395	2.32	1.40
96"	120"	96"	119	137	13433	0.29	0.88
108"	120"	108"	102	117	12202	0.38	0.87
120"	120"	120"	89	103	11399	0.55	1.08
132"	120"	132"	79	91	10524	0.75	1.30
144"	120"	144"	71	82	9831	0.92	1.53
96"	120"	96"	115	127	14359	0.57	0.88
108"	120"	108"	98	108	12814	0.68	0.85
120"	120"	120"	85	94	11601	0.74	1.05
132"	120"	132"	76	84	10688	0.82	1.29
144"	120"	144"	69	76	10082	0.98	1.55
96"	120"	96"	112	118	16090	0.93	0.88
108"	120"	108"	94	99	14330	1.11	0.85
120"	120"	120"	83	87	13184	1.40	1.07
132"	120"	132"	70	74	12014	1.64	1.30
144"	120"	144"	60	63	11181	1.83	1.56
96"	120"	96"	93	93	15267	1.03	0.60
108"	120"	108"	78	78	13956	1.30	0.76
120"	120"	120"	61	61	12795	1.60	0.95
132"	120"	132"	49	49	11840	1.93	1.12
144"	120"	144"	42	42	11098	2.21	1.35

**MAXIMUM DESIGN PRESSURE OF A  
CORNER 4'x6'x1/2" MULLION (6061-T6)**

SPAN WIDTH 1 UP TO	SPAN WIDTH 2 UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE 1 (PSF)	DESIGN PRESSURE 2 (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION X (IN)
144"	72"	108"	74	83	12346	0.49	0.85
144"	72"	120"	64	72	11170	0.52	1.06
144"	72"	132"	57	64	10485	0.59	1.29
144"	72"	144"	50	56	9697	0.82	1.51
96"	96"	96"	85	92	14966	0.76	0.68
108"	96"	108"	72	78	13516	0.89	0.86
120"	96"	120"	62	67	12166	1.08	1.07
132"	96"	132"	55	60	11262	1.24	1.31
144"	96"	144"	49	53	10395	1.41	1.50
96"	120"	96"	83	87	16329	0.97	0.88
108"	120"	108"	70	73	14663	1.21	0.87
120"	120"	120"	57	59	13307	1.49	1.05
132"	120"	132"	46	48	12239	1.74	1.30
144"	120"	144"	39	41	11296	2.07	1.51
96"	144"	96"	69	69	15107	1.03	0.59
108"	144"	108"	58	58	13814	1.31	0.74
120"	144"	120"	45	45	12626	1.59	0.93
132"	144"	132"	35	36	11677	1.92	1.12
144"	144"	144"	29	29	11094	2.33	1.33
96"	168"	96"	71	84	13236	0.25	0.67
108"	168"	108"	60	71	11992	0.31	0.87
120"	168"	120"	52	61	11013	0.38	1.08
132"	168"	132"	45	53	10058	0.59	1.27
144"	168"	144"	41	49	9735	0.73	1.54
96"	168"	96"	69	79	13362	0.33	0.67
108"	168"	108"	59	68	12134	0.37	0.86
120"	168"	120"	51	58	11114	0.44	1.07
132"	168"	132"	44	50	10173	0.60	1.30
144"	168"	144"	39	45	9492	0.68	1.51
96"	168"	96"	68	75	14365	0.53	0.88
108"	168"	108"	57	63	12869	0.75	0.85
120"	168"	120"	49	54	11659	0.85	1.05
132"	168"	132"	43	48	10676	1.00	1.30
144"	168"	144"	38	42	9799	1.08	1.51



NOTE: USE DEFLECTIONS PROVIDED WHEN DETERMINING MINIMUM SEPARATION TO GLASS  
THE DEFLECTION IN THE X DIRECTION CAN BE NEGLECTED ON NON-RETENSION SHUTTERS  
AND WHEN STORM-BARS ARE USED TO REDUCE SHUTTER DEFLECTIONS.

#	DATE	REVISIONS

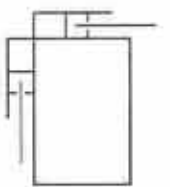
**ASSA**  
"Knowledge is Your Best Protection"  
AMERICAN SHUTTER SYSTEM ASSOCIATION, INC.  
4268 WESTROADS DRIVE, WEST PALM BEACH, FL, 33407  
PHONE: 800.432.2204; FAX: 561.841.0852  
WWW.AMSHUTTER.ORG

**ROLL-UP SHUTTER  
MULLIONS**

**Engineering, LLC.**  
35 AUTUMN CREEK DRIVE, RIVERVIEW, FL 33569  
813.404.7649; EM.: TKJENGINEERING@VERIZON.NET  
CERTIFICATE OF AUTHORIZATION NUMBER: 28582

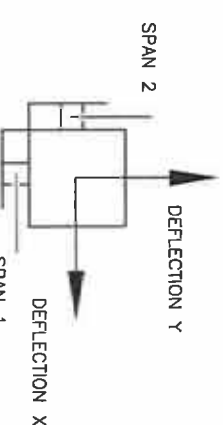
DATE:	DRAWN BY:	SCALE:	PROJ. #:
12/20/11	TKJ	N.T.S.	:11-0401

**TREVOR JOHNSON**  
LICENSE  
No 65624  
FLORIDA  
PROFESSIONAL ENGINEER



MAXIMUM DESIGN PRESSURE OF A  
CORNER 4'x6'x1/2" MULLION (8061-16)

SPAN WIDTH 1 UP TO	SPAN WIDTH 2 UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE 1 (PSF)	DESIGN PRESSURE 2 (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION X (IN)
168"	120"	96"	67	72	15528	0.85	0.88
		108"	56	60	13852	1.04	0.87
192"	120"	120"	48	52	12647	1.25	1.05
		132"	42	45	11520	1.48	1.30
		144"	36	39	10611	1.76	1.51
		96"	58	69	13087	0.21	0.68
192"	48"	108"	49	58	11921	0.29	0.86
		120"	42	50	10944	0.42	1.07
		132"	37	44	10206	0.55	1.28
		144"	33	39	9661	0.64	1.53
192"	72"	96"	57	66	13227	0.27	0.67
		108"	48	56	11982	0.34	0.87
		120"	41	48	10943	0.43	1.05
		132"	36	42	10101	0.52	1.31
192"	96"	144"	32	37	9425	0.51	1.56
		96"	56	63	13969	0.52	0.69
		108"	47	53	12555	0.65	0.86
		120"	40	45	11257	0.72	1.07
192"	120"	132"	35	40	10390	0.84	1.27
		144"	31	35	9566	0.86	1.51
		96"	55	60	14824	0.73	0.68
		108"	46	50	13260	0.90	0.87
192"	120"	120"	39	43	11990	1.08	1.05
		132"	35	38	11237	1.28	1.29
		144"	31	34	10402	1.53	1.54
		84"	60	72	14647	0.15	0.52
216"	48"	96"	49	59	13152	0.18	0.69
		108"	41	49	11937	0.30	0.85
		120"	35	42	10876	0.39	1.05
		132"	31	37	10189	0.48	1.29
216"	72"	84"	59	69	14783	0.20	0.51
		96"	48	56	13129	0.24	0.69
		108"	40	47	11812	0.30	0.87
		120"	34	40	10724	0.35	1.07
216"	132"	132"	30	35	9984	0.41	1.31



NOTE: USE DEFLECTIONS PROVIDED WHEN DETERMINING MINIMUM SEPARATION TO GLASS  
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AND WHEN STORM-BARS ARE USED TO REDUCE SHUTTER DEFLECTIONS.

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MULLIONS**

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813.404.7649; EM: TKJENGINEERING@VERIZON.NET  
CERTIFICATE OF AUTHORIZATION NUMBER: 28582

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