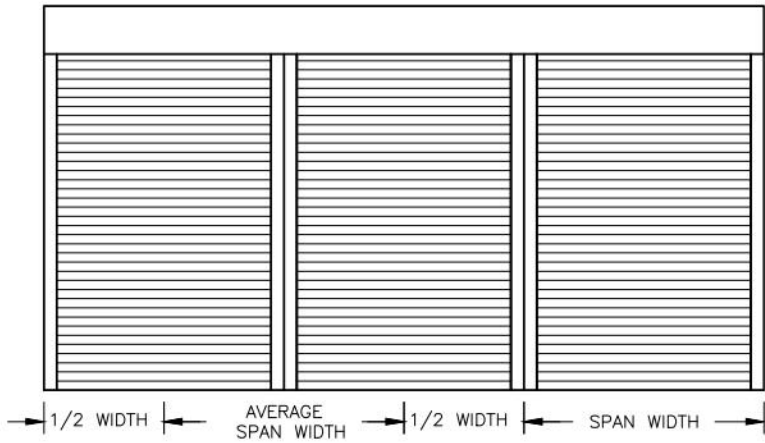
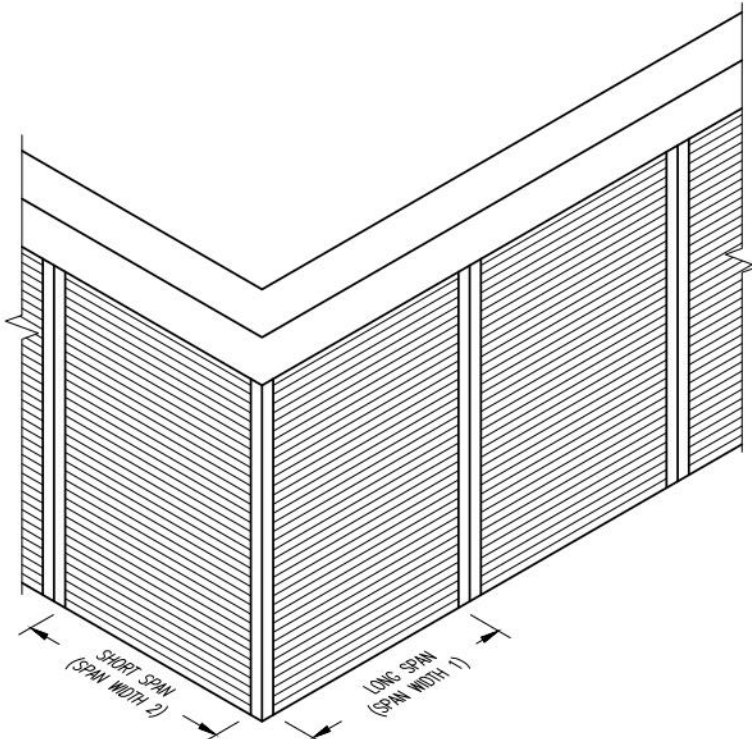




INTERMEDIATE AND END MULLION - ELEVATION
SINGLE OR MULTIPLE MULLION INSTALLATIONS - N.T.S.

- NOTES:
- THE DIFFERENCE IN ADJCENT 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



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

GENERAL NOTES:

- 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.
- THE ROLL-UP SHUTTER MULLIONS SHOWN ON THIS PRODUCT EVALUATION DOCUMENT HAS BEEN DESIGNED IN ACCORDANCE WITH THE 5TH EDITION (2014) FLORIDA BUILDING CODE (FBC). THESE ROLL-UP SHUTTER MULLIONS SHALL NOT BE INSTALLED IN HIGH VELOCITY HURRICANE ZONES (MIAMI-DADE COUNTY/BROWARD COUNTY). ROLL-UP SHUTTER MULLIONS INSTALLED IN WIND ZONE 4 (SEE FBC SECTION 1609.1.2.2), OR ESSENTIAL FACILITIES SHALL MEET THE MINIMUM SEPARATION TO GLASS. DESIGN WIND LOADS SHALL BE DETERMINED AS PER SECTION 1609 OF THE ABOVE REFERENCED CODE, IN ACCORDANCE WITH ASCE 7-10, 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 CODE AND AS PER TAS 201 AT FENESTRATION TESTING LABORATORY, INC. PER THEIR REPORTS (SEE LIST OF REPORTS).
- LIMITATIONS OF USE:
 - THIS PRODUCT SHALL NOT BE USED IN HIGH VELOCITY HURRICANE ZONES (SEE FBC SECTION 202).
 - IN WIND ZONE 4 REGIONS AND ESSENTIAL FACILITIES THE DEFLECTION FROM THE MULLIONS SHALL BE ACCOUNTED FOR IN THE SEPARATION TO GLASS FOR THE MULLION AND SHUTTER. SEE EQUATIONS ON THIS SHEET FOR SHUTTER DEFLECTION ADJUSTMENTS.
 - 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.
 - 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 0.6 (SEE FBC SECTION 1609.1.2.4).
 - SHUTTER SLAT LIMITS: MODULES OF ELASTICITY, $E < 11,000$ KSI
MOMENT OF INERTIA, $I > 0.045$ IN⁴/FT
SECTIONAL AREA, $A < 1.840$ IN²/FT
MINIMUM SLACK (SLIP), $Slack > 0.20$ IN
 - IMPACT LEVEL D; 9-1/4 LB LARGE MISSILE IMPACT.
 - ANCHORING OR LOADING CONDITIONS OTHER THAN THOSE SHOWN IN THESE DETAILS ARE NOT PART OF THIS APPROVAL
 - THIS PRODUCT SHALL ONLY BE USED IN CONJUNCTION WITH ADVANCED HURRICANE TECHNOLOGY ROLL SHUTTER SYSTEMS. OTHER PRODUCTS REQUIRE WRITTEN AUTHORIZATION FROM ADVANCED HURRICANE TECHNOLOGY AND SHALL BE EVALUATED AS A SITE SPECIFIC PROJECT. SEE NOTE 4 OF PRODUCT EVALUATION NOTES.
 - INCREASE IN ALLOWABLE STRESS (1.33) HAS NOT BEEN INCORPORATED INTO THE DESIGN OF THIS PRODUCT.
- 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.
- ALL ALUMINUM EXTRUSIONS SHALL BE 6063-T6 ALLOY (UNLESS OTHERWISE NOTED OR CAN BE REPLACED WITH 6061-T6 ALLOY).

PRODUCT EVALUATION NOTES:

- 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.
- 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.
- THIS PRODUCT EVALUATION DOCUMENT WILL BE CONSIDERED INVALID IF ALTERED BY ANY MEANS.
- 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.

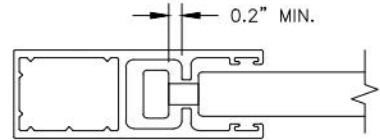
ANCHOR & FASTENING NOTES:

- 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.
- NO EMBEDMENT INTO NON-STRUCTURAL COMPONENTS SUCH AS, STUCCO, TILE, SIDING, ETC. SHALL BE CONSIDERED AS PART OF THE EMBEDMENT.
- THE ANCHOR SPACING AND DESIGN PRESSURES ARE VALID FOR EDGE DISTANCES AND MINIMUM EMBEDMENT BELOW.

ANCHOR	CONC. & FILLED CMU (3500 PSI)		HOLLOW CMU (1800 PSI)		WOOD (S.G. = .55)	
	MIN. EDG.	MIN. EMB.	MIN. EDG.	MIN. EMB.	MIN. EDG.	MIN. EMB.
1/4" ULTRAACON HFH	2"	2"	2"	1 1/4"	2"	2"
5/16" ULTRAACON HFH	3 1/2"	2"	3 1/2"	1 1/4"	2"	2"
3/8" CONFLX	3 3/4"	3 1/2"	-	-	-	-

LIST OF REPORTS:

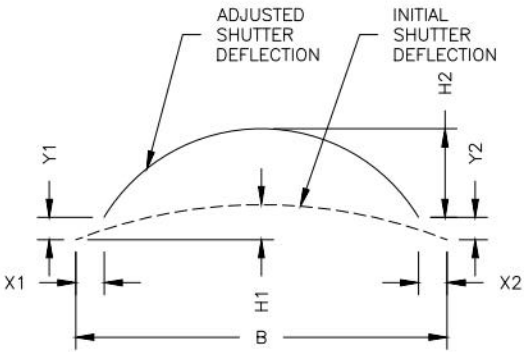
FENESTRATION TESTING LABORATORY, INC.
LABORATORY No. 5632
DATE: 5/19/2008
FILE No. 08-374
TEST PROTOCOL: TAS 201-94
MULLIONS: 3X4X1/8X288, 4X4X1/8X288,
4X4X1/4X288, 4X6X1/8X288, 4X6X1/4X240,



MINIMUM SLACK FOR END-RETENTION TRACKS



TYPICAL SLATS OR SIMILAR



ADJUSTED TOTAL DEFLECTION = $H2 + Y$

$H2 = \frac{\sqrt{4 \cdot H1^2 - 3 \cdot X^2} + 6 \cdot B \cdot X}{2}$

$X = X1 + X2$

$Y = \frac{Y1 + Y2}{2}$

ADJUSTED DEFLECTION EQUATIONS

NOTE: SEE MULLION TABLES FOR MULLION X AND Y DEFLECTIONS

ROLL-UP SHUTTER
MULLION

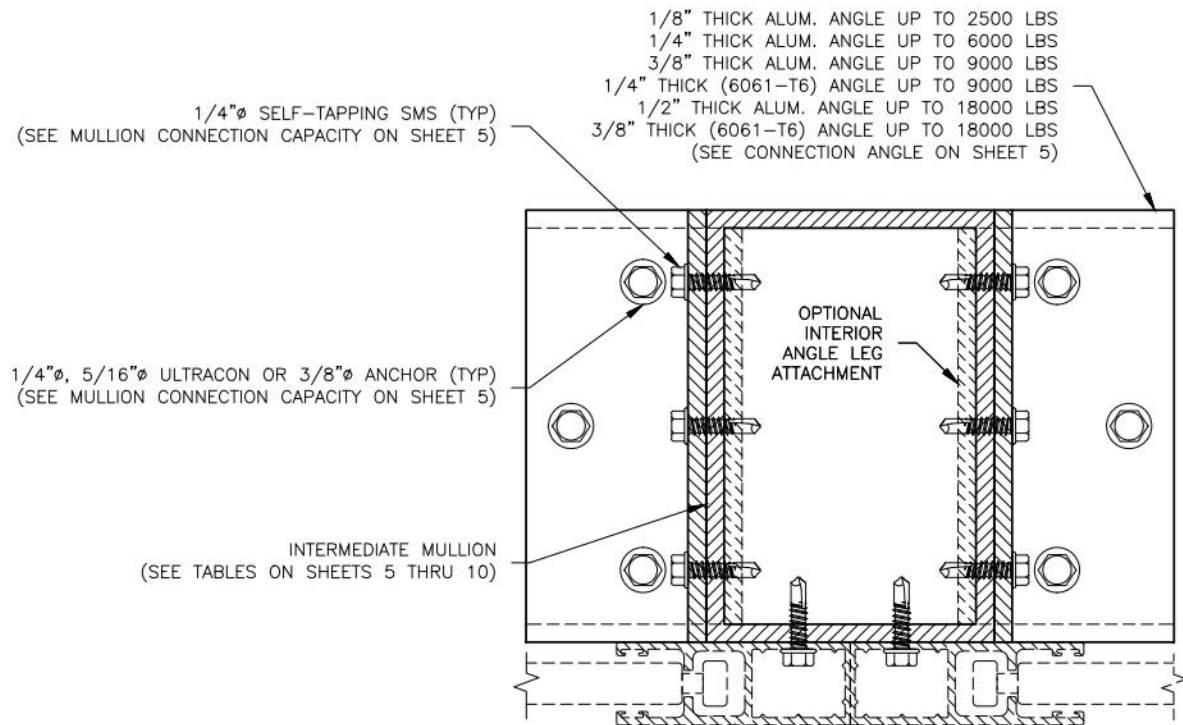
TKJ Engineering, LLC.

15335 AUTUMN CREEK DRIVE, RIVERVIEW, FL 33569
TEL: 813.404.7649; EM: TKJENGINEERING@VERIZON.NET
CERTIFICATE OF AUTHORIZATION NUMBER: 28582

DATE: 4/25/15
DRAWN BY: TKJ
SCALE: N.T.S.
PROJ. #: 15-0802

TREVOR JOHNSON
LICENSE
STATE OF FLORIDA
PROFESSIONAL ENGINEER
#20155
TREVOR JOHNSON
P.E. 6562

1
29

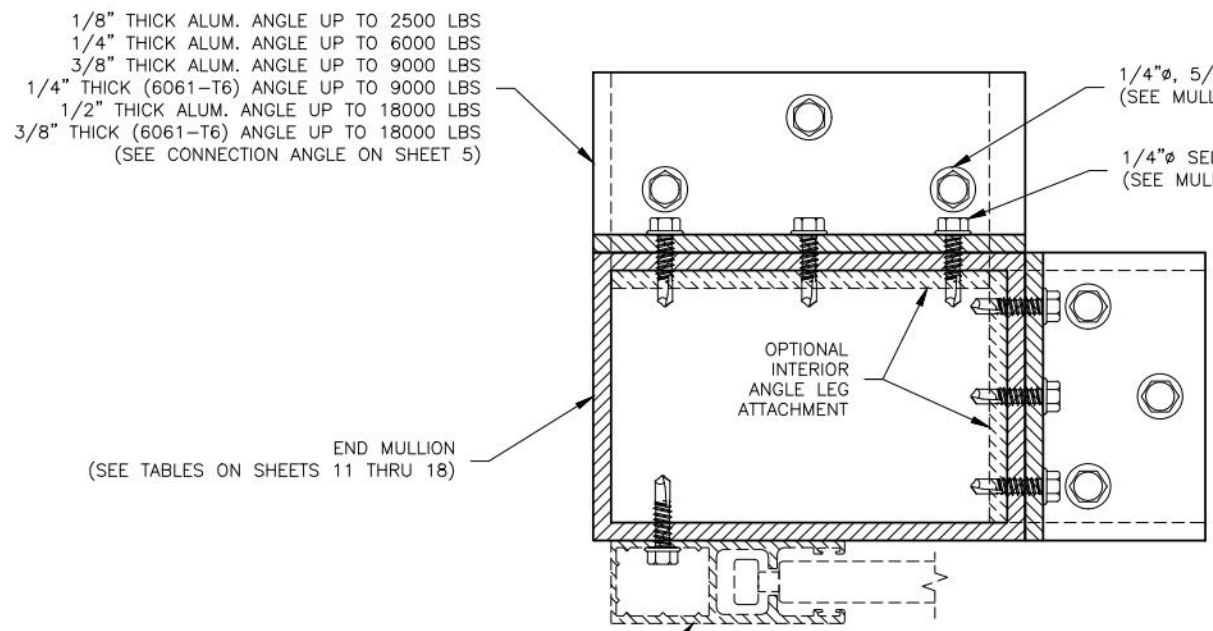


INTERMEDIATE MULLION CONNECTION

TYPICAL MULLION INSTALLATION - N.T.S.

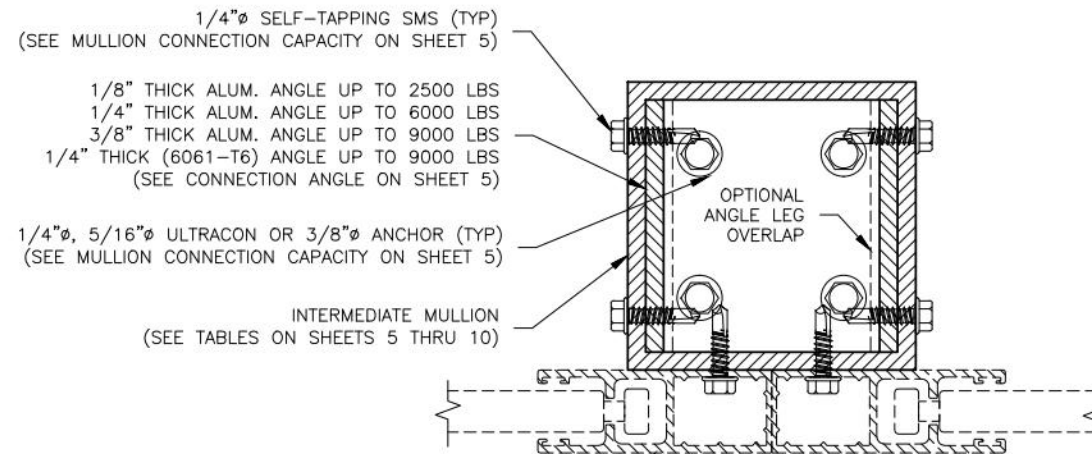
NOTES:

- ANCHOR AND FASTENER SPACING MUST MEET THE REQUIREMENTS SHOWN ON THE CONNECTION ANGLE DETAIL ON SHEET 5. THE CONNECTIONS AND OPTIONAL CONNECTIONS SHOWN ARE NOT APPLICABLE WHERE THE MINIMUM SPACING REQUIREMENTS ARE EXCEEDED
- INTERIOR ANGLE LEG ATTACHMENT CAN BE USED IN COMBINATION WITH INTERIOR ATTACHMENT



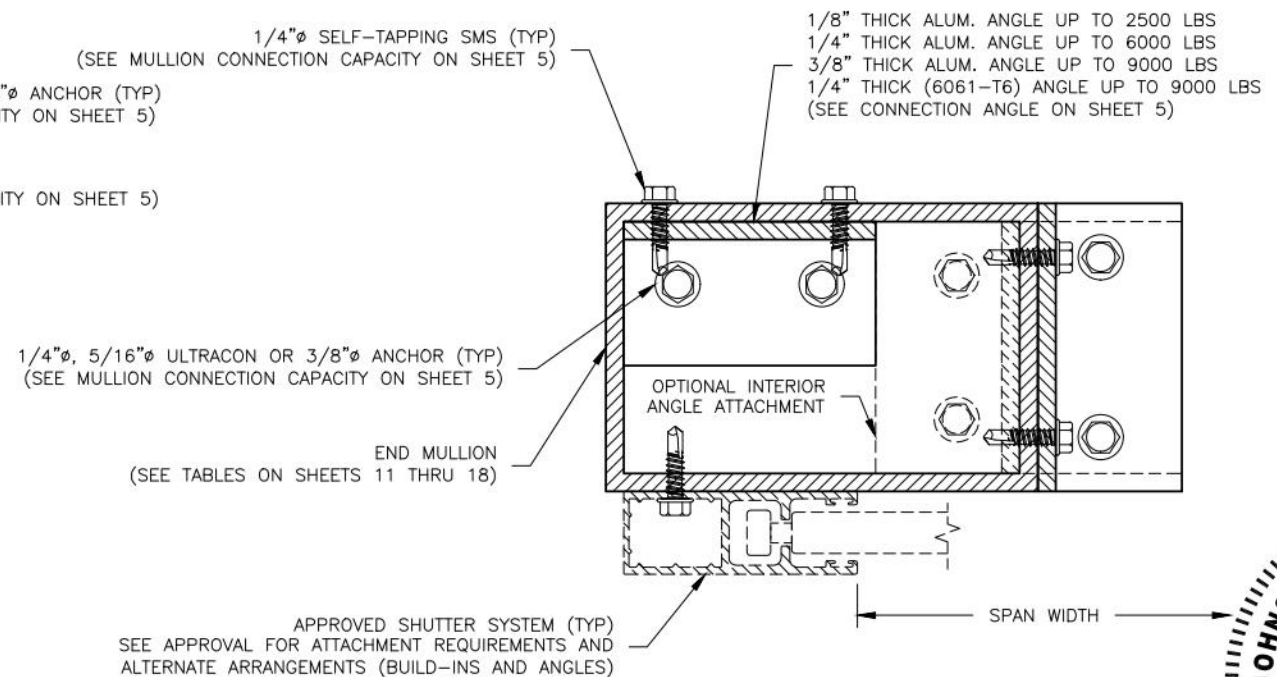
END MULLION CONNECTION

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.

REVISIONS	DATE	#



ROLL-UP SHUTTER MULLION

TEU Engineering, LLC.

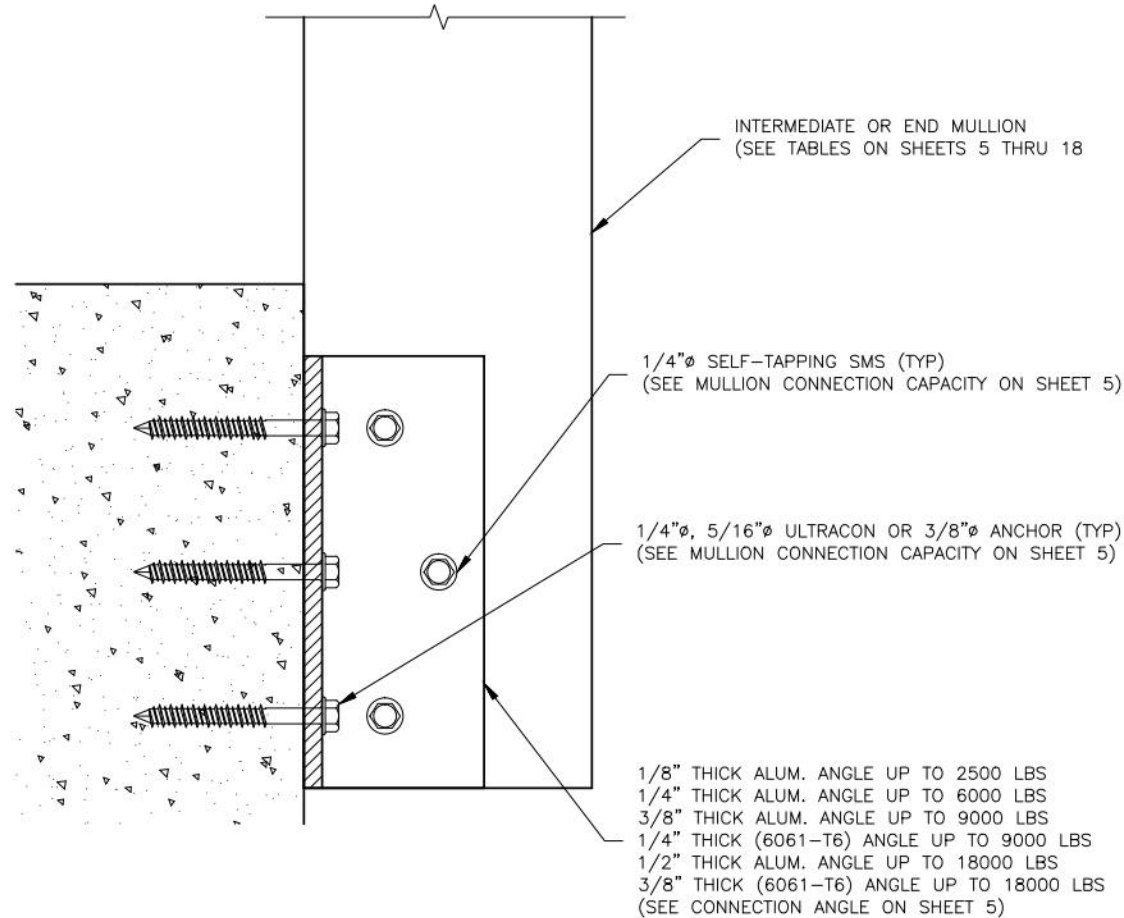
1515 AUTUMN CREEK DRIVE, RIVERVIEW, FL 33569
 TEL: 813.404.7649; EM: TKENGINEERING@VERIZON.NET
 CERTIFICATE OF AUTHORIZATION NUMBER: 28582

DATE: 4/25/15
 DRAWN BY: TKJ
 SCALE: N.T.S.
 PROJ. #: 15-0802

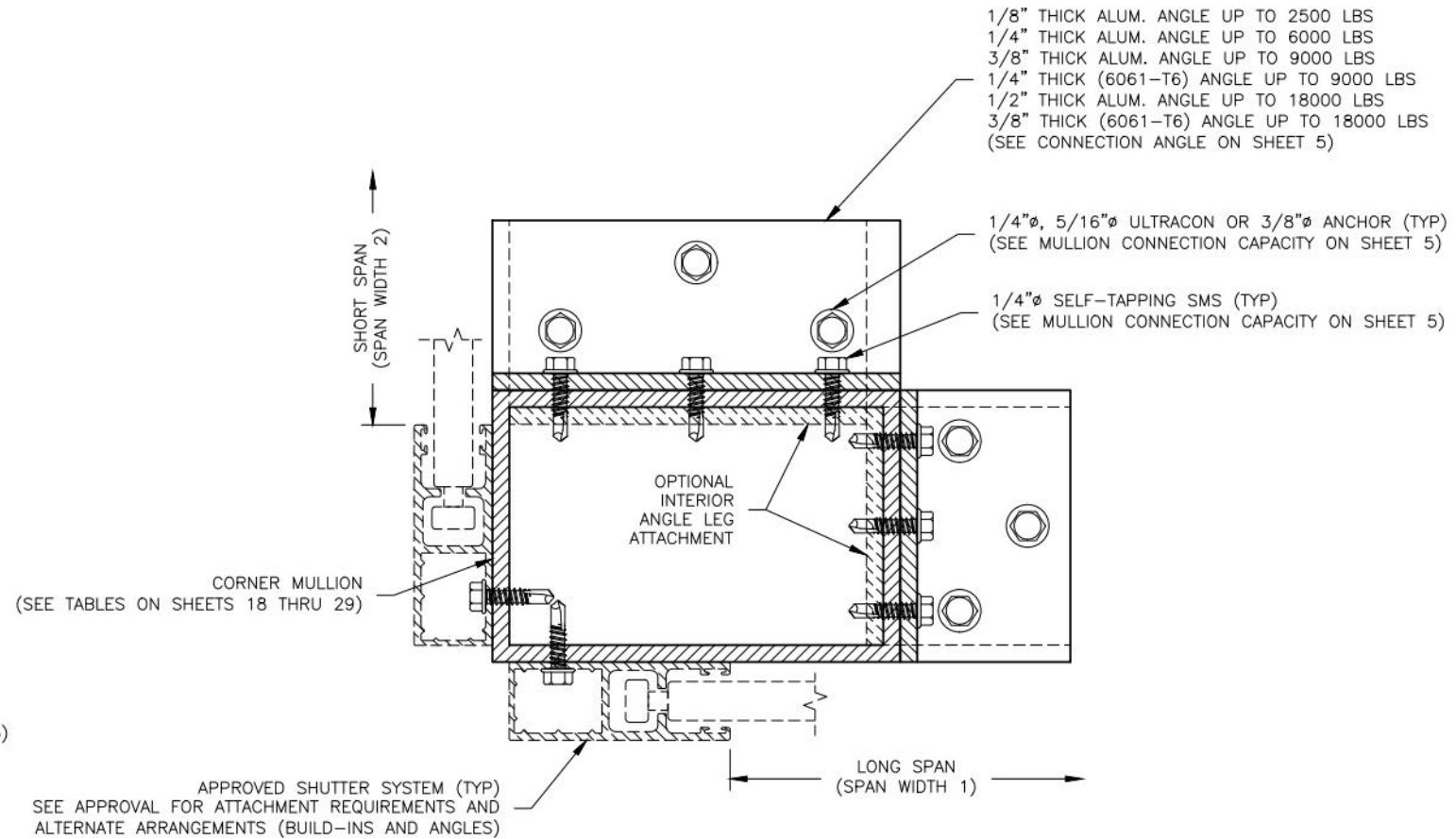


THIS IS TO CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE, THESE PLANS & SPECIFICATIONS ARE IN COMPLIANCE WITH THE BUILDING CODE REQUIREMENTS

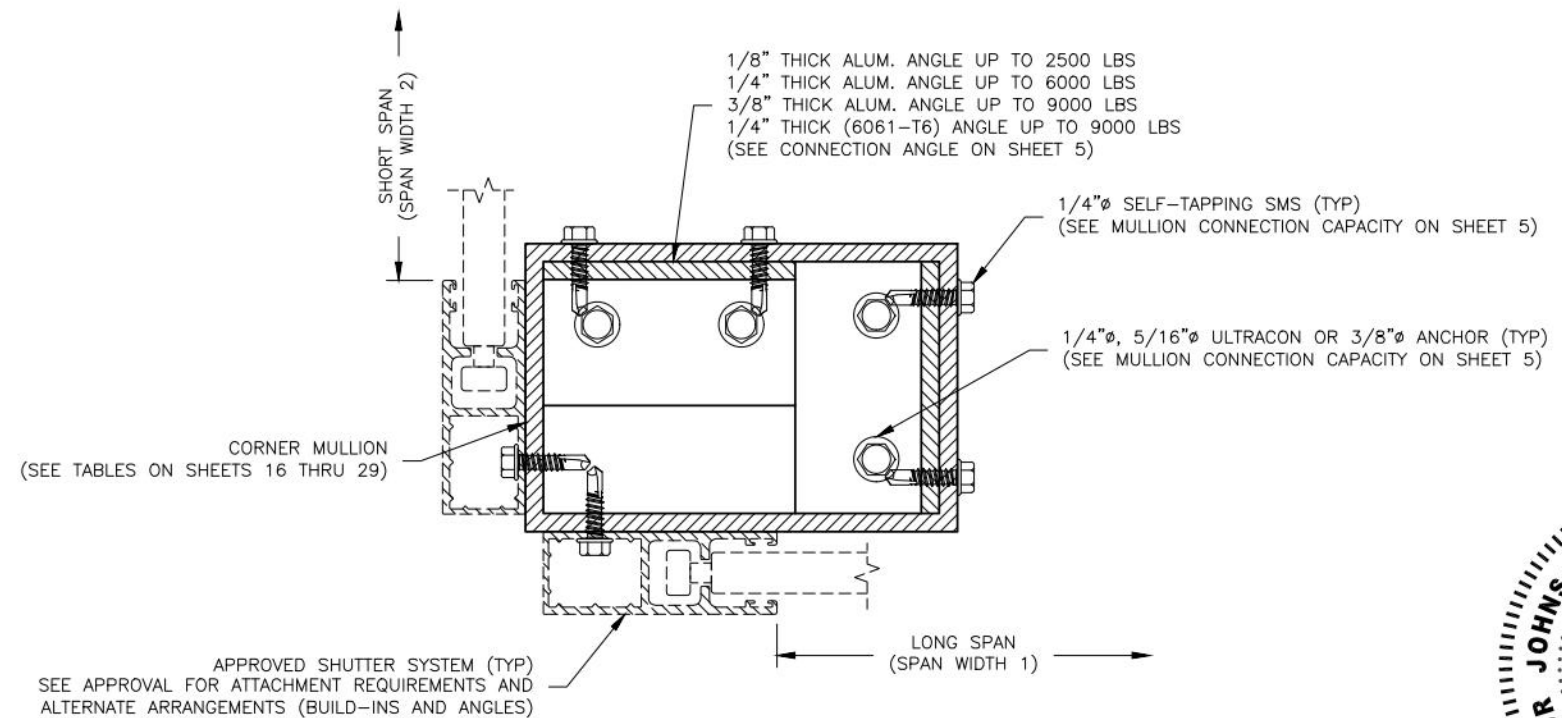
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WALL MOUNTED CONNECTION
OPTIONAL MULLION INSTALLATION - N.T.S.



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



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



ROLL-UP SHUTTER MULLION

TJ Engineering, LLC.

1335 AUTUMN CREEK DRIVE, RIVERVIEW, FL 33569
PH: 239.213.4047; FAX: 239.213.4048; EMAIL: TKENGINEERING@VERIZON.NET
CERTIFICATE OF AUTHORIZATION NUMBER: 28582

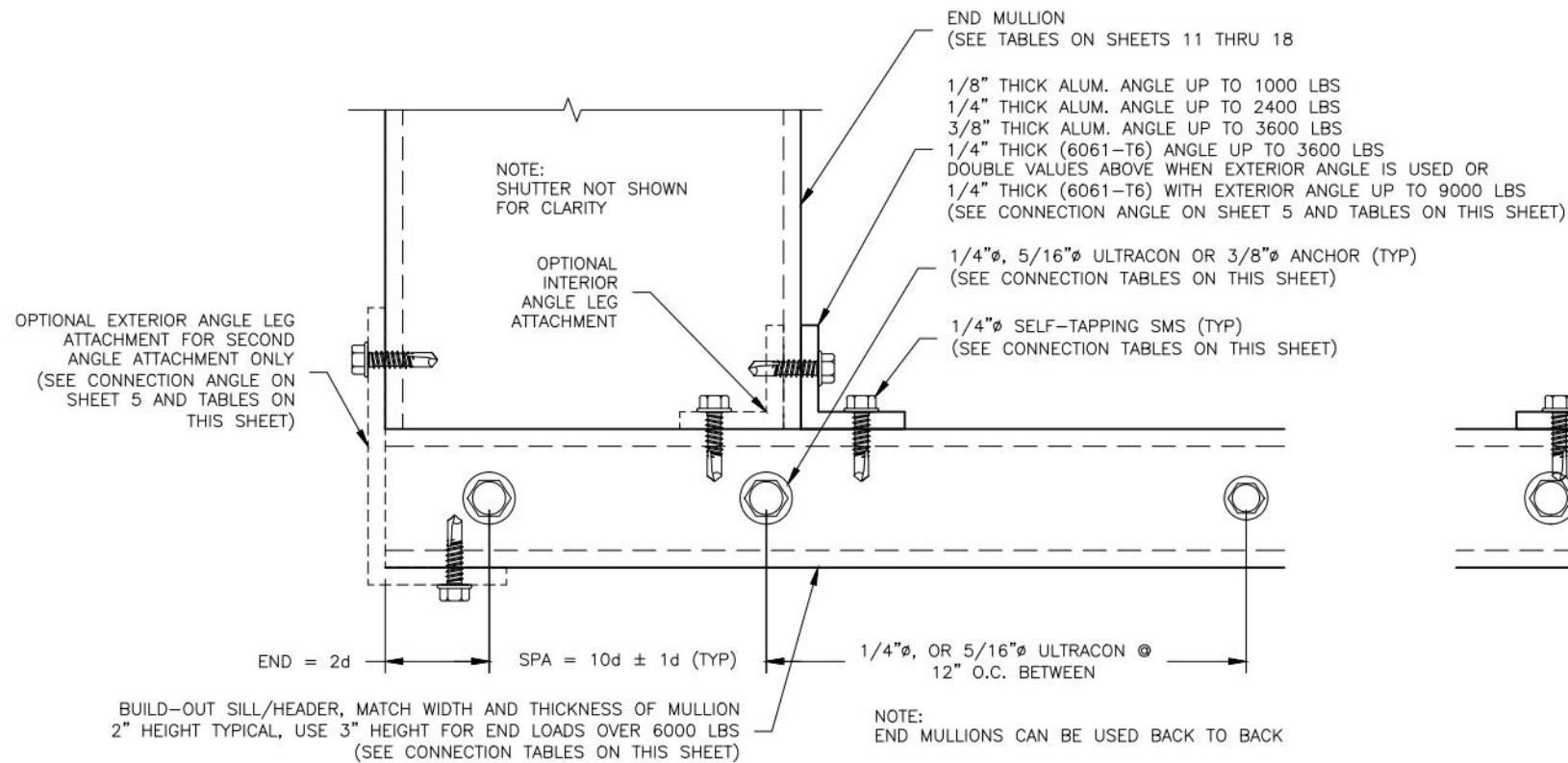
DATE:	4/25/15	PROJ. #:	15-0802
DRAWN BY:	TKJ	SCALE:	N.T.S.



THIS IS TO CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE, THESE PLANS & SPECIFICATIONS ARE IN COMPLIANCE WITH THE BUILDING CODE REQUIREMENTS

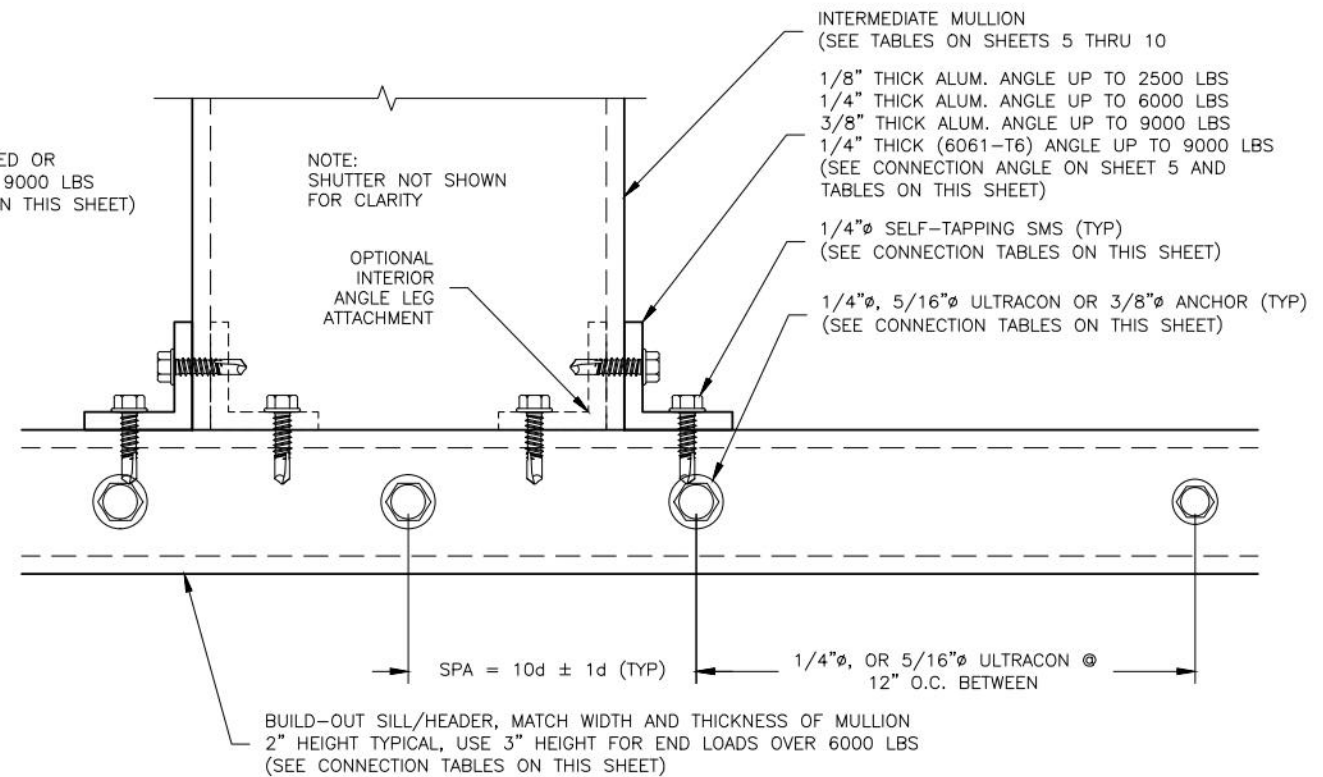
PROFESSIONAL ENGINEER

3 OF 29



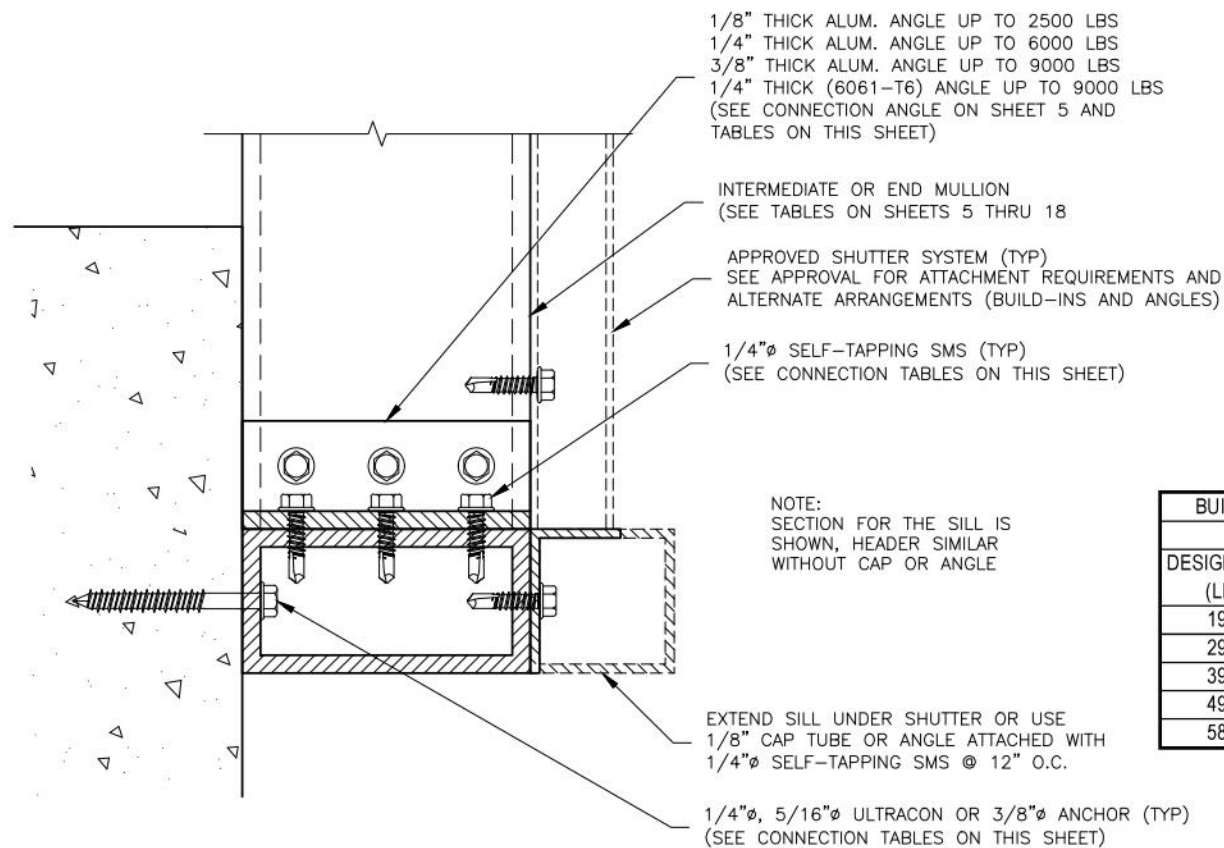
BUILD-OUT SILL/HEADER CONNECTION

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.

BUILD-OUT SILL/HEADER CONNECTION CAPACITY					
CONCRETE & FILLED CMU		HOLLOW CMU		WOOD	
DESIGN LOAD (LBS)	ANCHORS REQUIRED EACH ANGLE	DESIGN LOAD (LBS)	ANCHORS REQUIRED EACH ANGLE	DESIGN LOAD (LBS)	ANCHORS REQUIRED EACH ANGLE
2080	(2) 5/16" ULTRACON	1050	(3) 1/4" ULTRACON	900	(3) 1/4" ULTRACON
3120	(3) 5/16" ULTRACON	1400	(4) 1/4" ULTRACON	1200	(4) 1/4" ULTRACON
4160	(4) 5/16" ULTRACON	1290	(3) 5/16" ULTRACON	1770	(3) 5/16" ULTRACON
6240	(6) 5/16" ULTRACON	1720	(4) 5/16" ULTRACON	2360	(4) 5/16" ULTRACON
4500	(2) 3/8" ANCHOR	2150	(5) 5/16" ULTRACON	2950	(5) 5/16" ULTRACON
6750	(3) 3/8" ANCHOR	2580	(6) 5/16" ULTRACON	3540	(6) 5/16" ULTRACON
9000	(4) 3/8" ANCHOR	3440	(8) 5/16" ULTRACON	4720	(8) 5/16" ULTRACON

BUILD-OUT SILL/HEADER CONNECTION ANGLE CAPACITY (2 REQUIRED)			
1/8" MIN. ALUMINUM		1/4" MIN. ALUMINUM	
DESIGN LOAD (LBS)	ANCHORS REQUIRED EACH ANGLE	DESIGN LOAD (LBS)	ANCHORS REQUIRED EACH ANGLE
1960	(2) 1/4-14 DRIL-FLEX	3200	(2) 1/4-14 DRIL-FLEX
2940	(3) 1/4-14 DRIL-FLEX	4800	(3) 1/4-14 DRIL-FLEX
3920	(4) 1/4-14 DRIL-FLEX	6400	(4) 1/4-14 DRIL-FLEX
4900	(5) 1/4-14 DRIL-FLEX	9600	(6) 1/4-14 DRIL-FLEX
5880	(6) 1/4-14 DRIL-FLEX	12800	(8) 1/4-14 DRIL-FLEX

BUILD-OUT SILL/HEADER CONNECTION ANGLE CAPACITY (1 REQUIRED)			
1/8" MIN. ALUMINUM		1/4" MIN. ALUMINUM	
DESIGN LOAD (LBS)	ANCHORS REQUIRED EACH ANGLE	DESIGN LOAD (LBS)	ANCHORS REQUIRED EACH ANGLE
637	(2) 1/4-14 DRIL-FLEX	1040	(2) 1/4-14 DRIL-FLEX
956	(3) 1/4-14 DRIL-FLEX	1560	(3) 1/4-14 DRIL-FLEX
1274	(4) 1/4-14 DRIL-FLEX	2080	(4) 1/4-14 DRIL-FLEX
1593	(5) 1/4-14 DRIL-FLEX	3120	(6) 1/4-14 DRIL-FLEX
1911	(6) 1/4-14 DRIL-FLEX	4160	(8) 1/4-14 DRIL-FLEX
2548	(8) 1/4-14 DRIL-FLEX	5200	(10) 1/4-14 DRIL-FLEX

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

REVISIONS	DATE	#



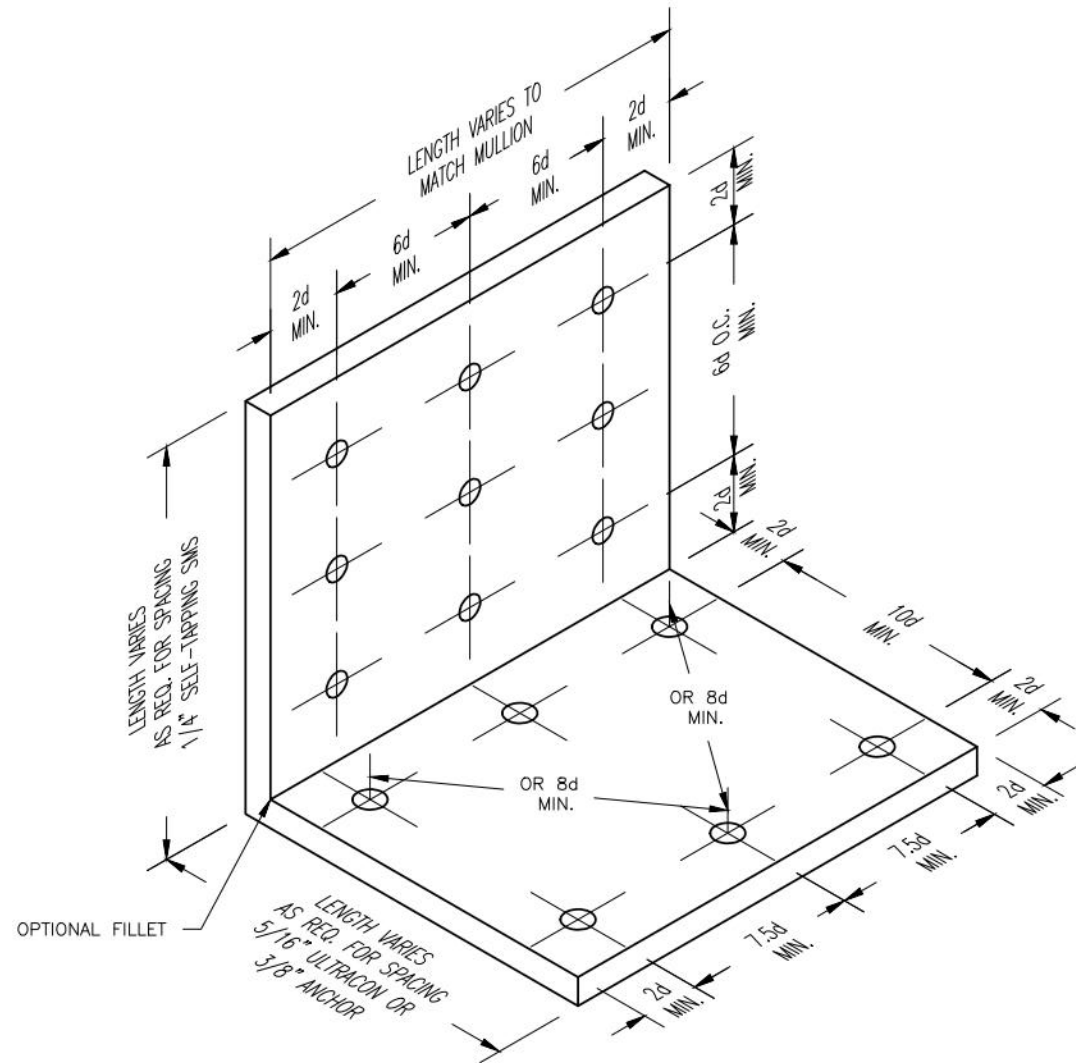
ROLL-UP SHUTTER MULLION

TJC Engineering, LLC.

15 AUTUMN CREEK DRIVE, RIVERVIEW, FL 33569
800.404.7649; EM: TKENGINEERING@VERIZON.NET
CERTIFICATE OF AUTHORIZATION NUMBER: 28582

PROJ. #: 15-0802
SCALE: N.T.S.
DRAWN BY: TKJ
DATE: 4/25/15



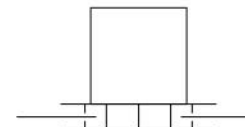


CONNECTION ANGLE
MULLION INSTALLATION - N.T.S.

NOTE: SEE MULLION CONNECTION CAPACITY TABLE FOR REQUIRED ANCHORS, USE CENTER ANCHOR SPACING AND LOCATIONS WHEN REQUIRED.

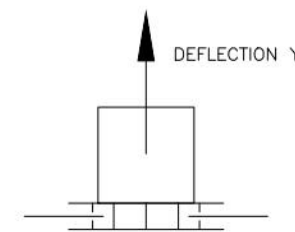
SEE MULLION END LOAD ON MAXIMUM DESIGN PRESSURE MULLION TABLES FOR THE REQUIRED MINIMUM CONNECTION CAPACITY

MULLION CONNECTION ANGLE CAPACITY (2 REQUIRED)											
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" ULTRAICON	1400	(2) 1/4" ULTRAICON	1200	(2) 1/4" ULTRAICON	2640	(2) 1/4-14 DRIL-FLEX	4240	(2) 1/4-14 DRIL-FLEX
7800	(2) 3/8" RAMSET G5	6240	(3) 5/16" ULTRAICON	2100	(3) 1/4" ULTRAICON	1800	(3) 1/4" ULTRAICON	3960	(3) 1/4-14 DRIL-FLEX	6360	(3) 1/4-14 DRIL-FLEX
11700	(3) 3/8" RAMSET G5	8320	(4) 5/16" ULTRAICON	1720	(2) 5/16" ULTRAICON	2360	(2) 5/16" ULTRAICON	5280	(4) 1/4-14 DRIL-FLEX	8480	(4) 1/4-14 DRIL-FLEX
7020	(1) 1/2" RAMSET G5	9000	(2) 3/8" ANCHOR	2580	(3) 5/16" ULTRAICON	3540	(3) 5/16" ULTRAICON	6600	(5) 1/4-14 DRIL-FLEX	12720	(6) 1/4-14 DRIL-FLEX
14040	(2) 1/2" RAMSET G5	13500	(3) 3/8" ANCHOR	3440	(4) 5/16" ULTRAICON	4720	(4) 5/16" ULTRAICON	7920	(6) 1/4-14 DRIL-FLEX	16960	(8) 1/4-14 DRIL-FLEX
21060	(3) 1/2" RAMSET G5	18000	(4) 3/8" ANCHOR	5160	(6) 5/16" ULTRAICON	7080	(6) 5/16" ULTRAICON	10560	(8) 1/4-14 DRIL-FLEX	21200	(10) 1/4-14 DRIL-FLEX



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)
60"	72"	93	1395	0.54
	84"	68	1190	0.73
	96"	52	1040	0.96
	108"	41	923	1.21
	120"	32	800	1.44
72"	60"	111	1665	0.37
	72"	77	1386	0.54
	84"	57	1197	0.74
	96"	43	1032	0.95
	108"	34	918	1.20
84"	60"	95	1663	0.37
	72"	66	1386	0.54
	84"	49	1201	0.74
	96"	37	1036	0.95
	108"	29	914	1.20
96"	48"	130	2080	0.24
	60"	83	1660	0.37
	72"	58	1392	0.54
	84"	43	1204	0.74
	96"	33	1056	0.97
108"	48"	116	2088	0.24
	60"	74	1665	0.37
	72"	51	1377	0.54
	84"	38	1197	0.74
	96"	29	1044	0.96
120"	48"	104	2080	0.24
	60"	67	1675	0.38
	72"	46	1380	0.54
	84"	34	1190	0.73
	96"	26	1040	0.96
132"	48"	95	2090	0.24
	60"	61	1678	0.38
	72"	42	1386	0.54
	84"	31	1194	0.74
	96"	24	1056	0.97

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)
60"	72"	135	2025	0.41
	84"	99	1733	0.55
	96"	76	1520	0.72
	108"	60	1350	0.91
	120"	49	1225	1.14
72"	72"	112	2016	0.40
	84"	83	1743	0.55
	96"	63	1512	0.72
	108"	50	1350	0.91
	120"	40	1200	1.11
84"	72"	96	2016	0.40
	84"	71	1740	0.55
	96"	54	1512	0.72
	108"	43	1355	0.92
	120"	35	1225	1.14
96"	72"	84	2016	0.40
	84"	62	1736	0.55
	96"	47	1504	0.71
	108"	37	1332	0.90
	120"	30	1200	1.11
108"	66"	89	2203	0.34
	78"	64	1872	0.48
	90"	48	1620	0.63
	102"	37	1415	0.81
	114"	30	1283	1.02
120"	60"	97	2425	0.28
	72"	67	2010	0.40
	84"	50	1750	0.56
	96"	38	1520	0.72
	108"	30	1350	0.91
132"	60"	88	2420	0.28
	72"	61	2013	0.40
	84"	45	1733	0.55
	96"	34	1496	0.71
	108"	27	1337	0.90



NOTE: USE DEFLECTIONS PROVIDED WHEN DETERMINING MINIMUM SEPARATION TO GLASS

ROLL-UP SHUTTER MULLION

Engineering, LLC.

1333 AUTUMN CREEK DRIVE, RIVERVIEW, FL 33569
TEL: 813.404.7649; EM: TKENGINEERING@VERIZON.NET
CERTIFICATE OF AUTHORIZATION NUMBER: 28582

PROJ. #:

15-0802

SCALE:

N.T.S.

DRAWN BY:

TKJ

DATE:

4/25/15

PROF. SEAL

4/25/15

5

OF

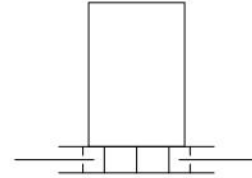
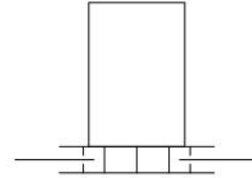
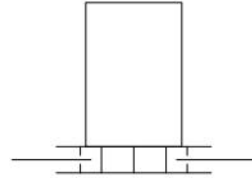
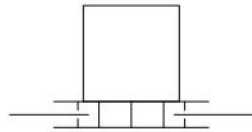
29

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ADVANCED HURRICANE TECHNOLOGY

6063 JAMES LANE, NAPLES, FL 34109
PHONE: 239.260.0020; FAX: 239.260.0023
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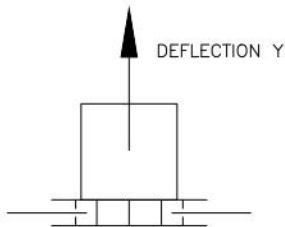


MAXIMUM DESIGN PRESSURE OF A INTERMEDIATE 4"x4"x1/4" MULLION (6063-T6)				
AVERAGE SPAN WIDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)
60"	96"	138	2760	0.72
	108"	109	2453	0.91
	120"	88	2200	1.12
	132"	73	2008	1.36
	144"	61	1830	1.61
72"	96"	115	2760	0.72
	108"	91	2457	0.91
	120"	74	2220	1.13
	132"	61	2013	1.37
	144"	51	1836	1.62
84"	96"	99	2772	0.72
	108"	78	2457	0.91
	120"	63	2205	1.12
	132"	52	2002	1.36
	144"	44	1848	1.63
96"	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
108"	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
120"	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
132"	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 (6063-T6)				
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
72"	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
84"	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"	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
108"	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
120"	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
132"	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"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)
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
132"	96"	111	4884	0.48
	108"	88	4356	0.61
	120"	71	3905	0.75
	132"	59	3570	0.91
	144"	49	3234	1.07
144"	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
156"	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
180"	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
192"	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
204"	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 (6063-T6)				
AVERAGE SPAN WIDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)
216"	96"	68	4896	0.48
	108"	54	4374	0.61
	120"	43	3870	0.74
	132"	36	3564	0.91
	144"	30	3240	1.07
228"	96"	64	4864	0.48
	108"	51	4361	0.61
	120"	41	3895	0.75
	132"	34	3553	0.91
	144"	29	3306	1.10
240"	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
252"	84"	76	5586	0.37
	96"	58	4872	0.48
	108"	46	4347	0.61
	120"	37	3885	0.74
	132"	31	3581	0.91
264"	84"	73	5621	0.37
	96"	56	4928	0.48
	108"	44	4356	0.61
	120"	36	3960	0.76
	132"	29	3509	0.90
276"	84"	69	5555	0.37
	96"	53	4876	0.48
	108"	42	4347	0.61
	120"	34	3910	0.75
	132"	28	3542	0.90
288"	84"	67	5628	0.37
	96"	51	4896	0.48
	108"	40	4320	0.60
	120"	33	3960	0.76
	132"	27	3564	0.91



NOTE: USE DEFLECTIONS PROVIDED WHEN DETERMINING MINIMUM SEPARATION TO GLASS

REVISIONS

DATE

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ADVANCED HURRICANE TECHNOLOGY
6063 JANES LANE, NAPLES, FL 34109
PHONE: 239.260.0020; FAX: 239.260.0023
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ROLL-UP SHUTTER
MULLION

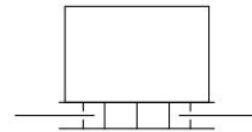
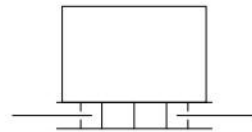
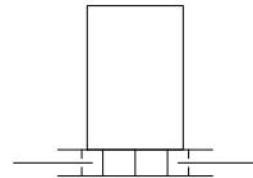
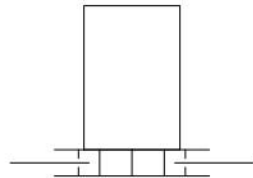
TEU Engineering, LLC.

11035 AUTUMN CREEK DRIVE, RIVERVIEW, FL 33569
TEL: 813.404.7649; EM: TKENGINEERING@VERIZON.NET
CERTIFICATE OF AUTHORIZATION NUMBER: 28582

DATE: 4/25/15
DRAWN BY: TKJ
SCALE: N.T.S.
PROJ. #: 15-0802

THIS IS TO CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE, THESE PLANS & SPECIFICATIONS ARE IN COMPLIANCE WITH THE BUILDING CODE REQUIREMENTS

TREVOR JOHNSON
LICENSE No 65624
FLORIDA PROFESSIONAL ENGINEER
6 OF 29

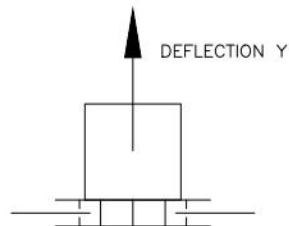


MAXIMUM DESIGN PRESSURE OF A INTERMEDIATE 4"x8"x1/4" MULLION (6063-T6)				
AVERAGE SPAN WIDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)
132"	96"	150	6600	0.32
	108"	134	6633	0.46
	120"	108	5940	0.56
	132"	89	5385	0.68
	144"	75	4950	0.81
144"	96"	150	7200	0.35
	108"	122	6588	0.45
	120"	99	5940	0.56
	132"	82	5412	0.68
	144"	69	4968	0.81
156"	96"	143	7436	0.36
	108"	113	6611	0.46
	120"	92	5980	0.57
	132"	76	5434	0.68
	144"	64	4992	0.82
168"	96"	133	7448	0.36
	108"	105	6615	0.46
	120"	85	5950	0.56
	132"	70	5390	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
	144"	55	4950	0.81
192"	96"	116	7424	0.36
	108"	92	6624	0.46
	120"	74	5920	0.56
	132"	61	5368	0.68
	144"	52	4992	0.82
204"	96"	109	7412	0.36
	108"	86	6579	0.45
	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
	144"	46	4968	0.81
228"	96"	98	7448	0.36
	108"	77	6584	0.45
	120"	63	5985	0.57
	132"	52	5434	0.68
	144"	44	5016	0.82
240"	96"	93	7440	0.36
	108"	73	6570	0.45
	120"	60	6000	0.57
	132"	49	5390	0.68
	144"	41	4920	0.80
252"	96"	89	7476	0.36
	108"	70	6615	0.46
	120"	57	5985	0.57
	132"	47	5429	0.68
	144"	39	4914	0.80
264"	96"	85	7480	0.36
	108"	67	6633	0.46
	120"	54	5940	0.56
	132"	45	5445	0.68
	144"	38	5016	0.82
276"	96"	81	7452	0.36
	108"	64	6624	0.46
	120"	52	5980	0.57
	132"	43	5440	0.68
	144"	36	4968	0.81
288"	96"	78	7488	0.36
	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
	144"	47	1410	1.63
72"	96"	88	2112	0.72
	108"	69	1863	0.91
	120"	56	1680	1.12
	132"	46	1518	1.35
	144"	39	1404	1.62
84"	96"	75	2100	0.72
	108"	59	1859	0.91
	120"	48	1680	1.12
	132"	40	1540	1.37
	144"	33	1386	1.60
96"	96"	66	2112	0.72
	108"	52	1872	0.91
	120"	42	1680	1.12
	132"	35	1540	1.37
	144"	29	1392	1.61
108"	84"	76	2394	0.55
	96"	58	2088	0.71
	108"	46	1863	0.91
	120"	37	1665	1.11
	132"	31	1535	1.37
120"	84"	69	2415	0.55
	96"	53	2120	0.73
	108"	42	1890	0.92
	120"	34	1700	1.14
	132"	28	1540	1.37
132"	72"	85	2805	0.41
	84"	62	2387	0.55
	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
	144"	54	2592	1.63
108"	96"	107	3852	0.72
	108"	85	3443	0.91
	120"	69	3105	1.13
	132"	57	2822	1.37
	144"	48	2592	1.63
120"	96"	96	3840	0.72
	108"	76	3420	0.91
	120"	62	3100	1.13
	132"	51	2805	1.36
	144"	43	2580	1.62
132"	96"	88	3872	0.72
	108"	69	3416	0.91
	120"	56	3080	1.12
	132"	46	2783	1.35
	144"	39	2574	1.62
144"	96"	80	3840	0.72
	108"	64	3456	0.92
	120"	51	3060	1.12
	132"	43	2838	1.38
	144"	36	2592	1.63
156"	96"	74	3848	0.72
	108"	59	3452	0.92
	120"	47	3055	1.11
	132"	39	2789	1.35
	144"	33	2574	1.62
168"	96"	69	3864	0.72
	108"	54	3402	0.90
	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



ADVANCED HURRICANE TECHNOLOGY
6063 JAMES LANE, NAPLES, FL 34109
PHONE: 239.260.0020; FAX: 239.260.0023
WWW.AHT-USA.NET

ROLL-UP SHUTTER MULLION



TJE Engineering, LLC.
1833 AUTUMN CREEK DRIVE, RIVERVIEW, FL 33569
TEL: 334.404.7649; EM: TKENGINEERING@VERIZON.NET
CERTIFICATE OF AUTHORIZATION NUMBER: 28582

DATE: 4/25/15

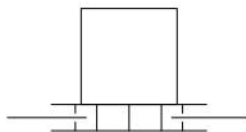
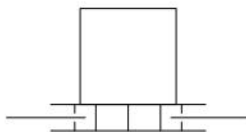
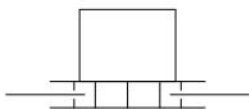
DRAWN BY: TKJ

SCALE: N.T.S.

PROJ. #: 15-0802



TREVOR JOHNSON
LICENSE NO. 65624
STATE OF FLORIDA
MECHANICAL ENGINEERING
THIS IS TO CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE, THESE PLANS & SPECIFICATIONS ARE IN COMPLIANCE WITH THE BUILDING CODE REQUIREMENTS

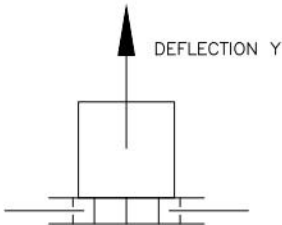


MAXIMUM DESIGN PRESSURE OF A INTERMEDIATE 4"x8"x1/4" MULLION (6063-T6)				
AVERAGE SPAN WIDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)
120"	96"	124	4960	0.72
	108"	98	4410	0.91
	120"	79	3950	1.12
	132"	66	3630	1.37
	144"	55	3300	1.62
132"	96"	113	4972	0.72
	108"	89	4406	0.91
	120"	72	3960	1.12
	132"	60	3630	1.37
	144"	50	3300	1.62
144"	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
156"	96"	95	4940	0.72
	108"	75	4388	0.91
	120"	61	3965	1.12
	132"	50	3575	1.35
	144"	42	3276	1.61
168"	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
180"	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
192"	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	1950	0.76
	84"	93	1628	1.00
	96"	62	1240	1.14
	108"	44	990	1.30
	120"	32	800	1.44
72"	60"	150	2250	0.51
	72"	108	1944	0.76
	84"	77	1617	1.00
	96"	52	1248	1.15
	108"	36	972	1.27
84"	60"	133	2328	0.52
	72"	93	1953	0.76
	84"	66	1617	1.00
	96"	44	1232	1.13
	108"	31	977	1.28
96"	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
108"	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
120"	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
132"	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	1550	1.44
	132"	46	1265	1.56
	144"	36	1080	1.73
72"	96"	88	2112	1.00
	108"	70	1890	1.28
	120"	51	1530	1.42
	132"	39	1287	1.59
	144"	30	1080	1.73
84"	84"	99	2426	0.77
	96"	76	2128	1.01
	108"	60	1890	1.28
	120"	44	1540	1.43
	132"	33	1271	1.57
96"	84"	87	2436	0.77
	96"	66	2112	1.00
	108"	52	1872	1.27
	120"	39	1560	1.45
	132"	29	1276	1.57
108"	72"	105	2835	0.57
	84"	77	2426	0.77
	96"	59	2124	1.01
	108"	47	1904	1.29
	120"	34	1530	1.42
120"	72"	94	2820	0.56
	84"	69	2415	0.77
	96"	53	2120	1.01
	108"	42	1890	1.28
	120"	31	1550	1.44
132"	72"	86	2838	0.57
	84"	63	2426	0.77
	96"	48	2112	1.00
	108"	38	1881	1.27
	120"	28	1540	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"	150	3375	1.25
	120"	112	2800	1.43
	132"	84	2310	1.57
	144"	65	1950	1.72
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
84"	96"	138	3864	1.01
	108"	109	3434	1.28
	120"	80	2800	1.43
	132"	60	2310	1.57
	144"	46	1932	1.70
96"	96"	121	3872	1.01
	108"	95	3420	1.27
	120"	70	2800	1.43
	132"	53	2332	1.58
	144"	41	1968	1.73
108"	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
120"	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
132"	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



NOTE: USE DEFLECTIONS PROVIDED WHEN DETERMINING MINIMUM SEPARATION TO GLASS

REVISIONS

DATE

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ADVANCED HURRICANE TECHNOLOGY
6063 JAMES LANE, NAPLES, FL 34109
PHONE: 239.260.0020; FAX: 239.260.0023
WWW.AHT-USA.NET

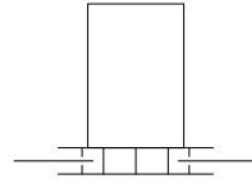
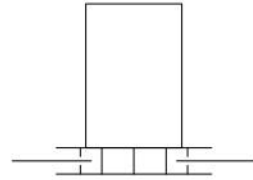
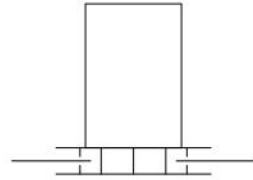
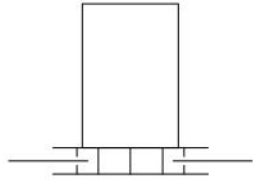
ROLL-UP SHUTTER
MULLION

TKJ Engineering, LLC.
1835 AUTUMN CREEK DRIVE, RIVERVIEW, FL 33569
TEL.: 813.404.7649; EM.: TKJENGINEERING@VERIZON.NET
CERTIFICATE OF AUTHORIZATION NUMBER: 28582

DATE: 4/25/15
DRAWN BY: TKJ
SCALE: N.T.S.
PROJ. #: 15-0802

THIS IS TO CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE, THESE PLANS & SPECIFICATIONS ARE IN COMPLIANCE WITH THE BUILDING CODE REQUIREMENTS

STATE OF FLORIDA
TREVOR JOHNSON
No 65624
PROFESSIONAL ENGINEER
29

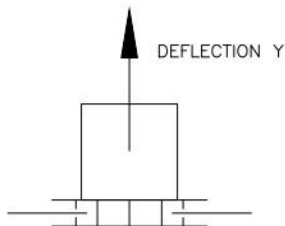


MAXIMUM DESIGN PRESSURE OF A INTERMEDIATE 4"x6"x1/8" MULLION (6061-T6)				
AVERAGE SPAN WDT UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)
60"	96"	150	3000	0.55
	108"	145	3263	0.85
	120"	118	2950	1.05
	132"	97	2668	1.27
	144"	82	2460	1.52
72"	96"	150	3600	0.66
	108"	121	3267	0.85
	120"	98	2940	1.05
	132"	81	2673	1.27
	144"	68	2448	1.51
84"	96"	131	3668	0.67
	108"	104	3276	0.85
	120"	84	2940	1.05
	132"	69	2657	1.26
	144"	58	2436	1.50
96"	96"	115	3680	0.67
	108"	91	3276	0.85
	120"	73	2920	1.04
	132"	61	2684	1.28
	144"	51	2448	1.51
108"	96"	102	3672	0.67
	108"	81	3281	0.85
	120"	65	2925	1.05
	132"	54	2673	1.27
	144"	45	2430	1.50
120"	96"	92	3680	0.67
	108"	73	3285	0.86
	120"	59	2950	1.05
	132"	49	2695	1.28
	144"	41	2460	1.52
132"	96"	83	3652	0.67
	108"	66	3267	0.85
	120"	53	2915	1.04
	132"	44	2662	1.27
	144"	37	2442	1.51

MAXIMUM DESIGN PRESSURE OF A INTERMEDIATE 4"x6"x1/4" MULLION (6061-T6)				
AVERAGE SPAN WDT UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)
132"	96"	150	6600	0.65
	108"	123	6089	0.85
	120"	100	5500	1.05
	132"	82	4961	1.27
	144"	69	4554	1.51
	156"	58	4147	1.75
144"	96"	143	6864	0.67
	108"	113	6102	0.85
	120"	91	5460	1.05
	132"	75	4950	1.26
	144"	63	4536	1.50
	156"	53	4128	1.75
156"	96"	132	6864	0.67
	108"	104	6084	0.85
	120"	84	5460	1.05
	132"	70	5005	1.28
	144"	59	4602	1.52
	168"	48	4194	1.75
168"	96"	122	6832	0.67
	108"	97	6111	0.85
	120"	78	5460	1.05
	132"	65	5005	1.28
	144"	54	4536	1.50
	180"	43	4128	1.75
180"	96"	114	6840	0.67
	108"	90	6075	0.85
	120"	73	5475	1.05
	132"	60	4950	1.26
	144"	51	4590	1.52
	204"	40	4182	1.75
192"	96"	107	6848	0.67
	108"	85	6120	0.86
	120"	68	5440	1.04
	132"	57	5016	1.28
	144"	48	4608	1.53
	204"	37	4200	1.75
204"	96"	101	6868	0.67
	108"	80	6120	0.86
	120"	64	5440	1.04
	132"	53	4956	1.26
	144"	45	4590	1.52
	228"	35	4182	1.75

MAXIMUM DESIGN PRESSURE OF A INTERMEDIATE 4"x6"x1/4" MULLION (6061-T6)				
AVERAGE SPAN WDT UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)
216"	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"	35	4128	1.75
228"	96"	90	6840	0.67
	108"	71	6071	0.85
	120"	58	5510	1.06
	132"	48	5016	1.28
	144"	40	4560	1.51
	168"	32	4152	1.75
240"	96"	86	6880	0.68
	108"	68	6120	0.86
	120"	55	5500	1.05
	132"	45	4950	1.26
	144"	38	4560	1.51
	168"	30	4140	1.75
252"	96"	82	6888	0.68
	108"	64	6048	0.85
	120"	52	5460	1.05
	132"	43	4967	1.27
	144"	36	4536	1.50
	180"	27	4128	1.75
264"	96"	78	6864	0.67
	108"	61	6039	0.84
	120"	50	5500	1.05
	132"	41	4961	1.27
	144"	35	4620	1.53
	180"	27	4128	1.75
276"	96"	74	6808	0.67
	108"	59	6107	0.85
	120"	48	5520	1.06
	132"	39	4934	1.26
	144"	33	4554	1.51
	180"	25	4120	1.75
288"	96"	71	6816	0.67
	108"	56	6048	0.85
	120"	46	5520	1.06
	132"	38	5016	1.28
	144"	32	4608	1.53
	216"	24	4200	1.75

MAXIMUM DESIGN PRESSURE OF A INTERMEDIATE 4"x8"x1/4" MULLION (6061-T6)				
AVERAGE SPAN WDT UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)
132"	96"	150	6600	0.32
	108"	150	7425	0.51
	120"	150	8250	0.78
	132"	125	7563	0.95
	144"	105	6930	1.13
	156"	88	6300	1.31
144"	96"	150	7200	0.35
	108"	150	8100	0.56
	120"	139	8340	0.79
	132"	115	7590	0.95
	144"	96	6912	1.13
	156"	80	6336	1.31
156"	96"	150	7800	0.38
	108"	150	8775	0.60
	120"	128	8320	0.79
	132"	106	7579	0.95
	144"	89	6942	1.13
	168"	71	6366	1.31
168"	96"	150	8400	0.41
	108"	147	9261	0.64
	120"	119	8330	0.79
	132"	98	7546	0.95
	144"	83	6972	1.14
	180"	64	6396	1.31
180"	96"	150	9000	0.44
	108"	137	9248	0.64
	120"	111	8325	0.79
	132"	92	7590	0.95
	144"	77	6930	1.13
	168"	60	6360	1.31
192"	96"	150	9600	0.46
	108"	129	9288	0.64
	120"	104	8320	0.79
	132"	86	7568	0.95
	144"	72	6912	1.13
	180"	55	6350	1.31
204"	96"	150	10200	0.49
	108"	121	9257	0.64
	120"	98	8330	0.79
	132"	81	7574	0.95
	144"	68	6936	1.13
	180"	51	6342	1.31



NOTE: USE DEFLECTIONS PROVIDED WHEN DETERMINING MINIMUM SEPARATION TO GLASS

ROLL-UP SHUTTER MULLION

Engineering, LLC.

THIS IS TO CERTIFY THAT, TO THE BEST
OF MY KNOWLEDGE, THESE PLANS &
SPECIFICATIONS ARE IN COMPLIANCE WITH
THE BUILDING CODE REQUIREMENTS

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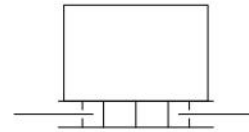
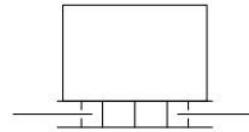
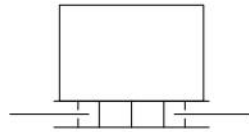
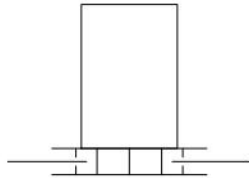
1000 AUTUMN CREEK DRIVE, RIVERVIEW, FL 33569
PH: 239.13.404.7649; EM: TKENGINEERING@VERIZON.NET
CERTIFICATE OF AUTHORIZATION NUMBER: 28582

DATE: 4/25/15
DRAWN BY: TKJ
SCALE: N.T.S.
PROJ. #: 15-0802

TREBOR JOHNSON
LICENSE
No 65624
FLORIDA REGISTERED PROFESSIONAL ENGINEER

#	DATE	REVISIONS

AHT
ADVANCED HURRICANE TECHNOLOGY
6063 JAMES LANE, NAPLES, FL 34109
PHONE: 239.260.0020; FAX: 239.260.0023
WWW.AHT-USA.NET

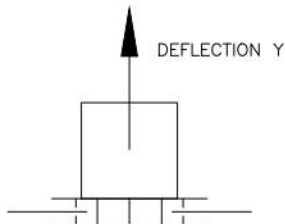


MAXIMUM DESIGN PRESSURE OF A INTERMEDIATE 4"x8"x1/4" MULLION (6061-T6)				
AVERAGE SPAN WIDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)
216"	96"	145	10440	0.51
	108"	114	9234	0.64
	120"	93	8370	0.79
	132"	77	7623	0.96
	144"	64	6912	1.13
228"	96"	137	10412	0.50
	108"	108	9234	0.64
	120"	88	8360	0.79
	132"	72	7524	0.95
240"	96"	130	10400	0.50
	108"	103	9270	0.64
	120"	83	8300	0.78
	132"	69	7590	0.95
252"	96"	124	10416	0.50
	108"	98	9261	0.64
	120"	79	8295	0.78
	132"	66	7623	0.96
264"	96"	118	10384	0.50
	108"	94	9306	0.64
	120"	76	8360	0.79
	132"	63	7623	0.96
276"	96"	113	10396	0.50
	108"	89	9212	0.63
	120"	72	8280	0.78
	132"	60	7590	0.95
288"	96"	109	10464	0.51
	108"	86	9288	0.64
	120"	69	8280	0.78
	132"	57	7524	0.95
	144"	48	6912	1.13

MAXIMUM DESIGN PRESSURE OF A INTERMEDIATE 4"x6"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"	147	2940	1.01
	108"	116	2610	1.27
	120"	85	2125	1.42
	132"	64	1760	1.57
	144"	49	1470	1.70
72"	96"	123	2952	1.01
	108"	97	2619	1.28
	120"	71	2130	1.42
	132"	54	1782	1.59
84"	96"	105	2940	1.01
	108"	83	2615	1.27
	120"	61	2135	1.43
	132"	46	1771	1.58
96"	96"	92	2944	1.01
	108"	73	2628	1.28
	120"	53	2120	1.42
	132"	40	1760	1.57
108"	96"	82	2952	1.01
	108"	65	2633	1.28
	120"	47	2115	1.41
	132"	36	1782	1.59
120"	96"	74	2960	1.01
	108"	58	2610	1.27
	120"	43	2150	1.44
	132"	32	1760	1.57
132"	96"	67	2948	1.01
	108"	53	2624	1.28
	120"	39	2145	1.43
	132"	29	1755	1.56

MAXIMUM DESIGN PRESSURE OF A INTERMEDIATE 4"x6"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)
96"	96"	150	4800	0.90
	108"	133	4788	1.27
	120"	98	3920	1.43
	132"	74	3256	1.58
	144"	57	2736	1.72
108"	96"	150	5400	1.01
	108"	119	4820	1.28
	120"	87	3915	1.43
	132"	65	3218	1.56
120"	96"	135	5400	1.01
	108"	107	4815	1.28
	120"	78	3900	1.42
	132"	59	3245	1.57
132"	96"	123	5412	1.01
	108"	97	4802	1.28
	120"	71	3905	1.42
	132"	54	3267	1.58
144"	96"	113	5424	1.01
	108"	89	4806	1.28
	120"	65	3900	1.42
	132"	49	3234	1.57
156"	96"	104	5408	1.01
	108"	82	4797	1.27
	120"	60	3900	1.42
	132"	45	3218	1.56
168"	96"	96	5376	1.00
	108"	76	4788	1.27
	120"	56	3920	1.43
	132"	42	3234	1.57
	144"	32	2688	1.69

MAXIMUM DESIGN PRESSURE OF A INTERMEDIATE 4"x8"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)
120"	96"	150	6000	0.87
	108"	137	6165	1.27
	120"	101	5050	1.43
	132"	76	4180	1.58
	144"	58	3480	1.71
132"	96"	150	6600	0.96
	108"	125	6188	1.28
	120"	92	5060	1.43
	132"	69	4175	1.58
144"	96"	145	6960	1.01
	108"	114	6156	1.27
	120"	84	5040	1.43
	132"	63	4158	1.57
156"	96"	134	6968	1.01
	108"	105	6143	1.27
	120"	78	5070	1.44
	132"	58	4147	1.57
168"	96"	124	6944	1.01
	108"	98	6174	1.28
	120"	72	5040	1.43
	132"	54	4158	1.57
180"	96"	116	6960	1.01
	108"	91	6143	1.27
	120"	67	5025	1.42
	132"	50	4125	1.56
192"	96"	108	6912	1.00
	108"	86	6192	1.28
	120"	63	5040	1.43
	132"	47	4136	1.56
	144"	36	3456	1.69



NOTE: USE DEFLECTIONS PROVIDED WHEN DETERMINING MINIMUM SEPARATION TO GLASS

ROLL-UP SHUTTER
MULLION

TKJ Engineering, LLC.

1335 AUTUMN CREEK DRIVE, RIVERVIEW, FL 33569
P.O. 813.404.7649; E.M.: TKENGINEERING@VERIZON.NET
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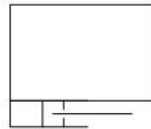
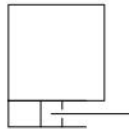
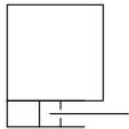
THIS IS TO CERTIFY THAT, TO THE BEST
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OF THE STATE OF FLORIDA
TREVOR JOHNSON
LICENSE No 65624
PROFESSIONAL ENGINEER
29
10 OF 29

ADVANCED HURRICANE TECHNOLOGY
6063 JAMES LANE, NAPLES, FL 34109
PHONE: 239.260.0020; FAX: 239.260.0023
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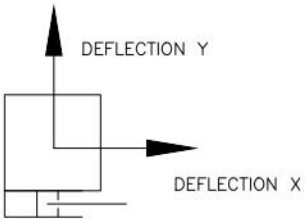
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MAXIMUM DESIGN PRESSURE OF AN END 4"x4"x1/8" MULLION (6063-T6)					
SPAN WIDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION X (IN)
60"	96"	135	1707	0.65	0.29
	108"	109	1474	0.84	0.17
	120"	71	1341	0.83	0.25
	132"	61	1164	1.05	0.18
	144"	37	1133	0.91	0.34
72"	96"	87	1724	0.50	0.46
	108"	80	1541	0.74	0.45
	120"	57	1333	0.81	0.29
	132"	49	1180	1.02	0.22
	144"	45	1028	1.33	0.27
84"	96"	60	1754	0.41	0.54
	108"	55	1556	0.60	0.58
	120"	53	1468	0.88	0.67
	132"	41	1182	1.00	0.27
	144"	39	1098	1.35	0.38
96"	96"	44	1796	0.34	0.60
	108"	41	1625	0.51	0.73
	120"	38	1429	0.72	0.84
	132"	35	1299	0.98	0.81
	144"	20	1151	0.81	0.31
108"	84"	38	2038	0.20	0.56
	96"	34	1802	0.30	0.70
	108"	30	1588	0.42	0.72
	120"	28	1420	0.60	0.86
	132"	27	1361	0.86	0.98
120"	60"	45	2906	0.07	0.30
	66"	40	2625	0.09	0.38
	72"	36	2397	0.11	0.44
	78"	33	2221	0.14	0.51
	84"	31	2141	0.18	0.55
132"	48"	53	3657	0.04	0.21
	54"	44	3223	0.05	0.25
	60"	38	2906	0.06	0.32
	66"	34	2686	0.08	0.39
	72"	30	2413	0.10	0.45

MAXIMUM DESIGN PRESSURE OF AN END 4"x4"x1/4" MULLION (6063-T6)					
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"	122	3316	0.39	0.63
	108"	112	2980	0.57	0.72
	120"	103	2691	0.80	0.75
	132"	96	2468	1.09	0.77
	144"	74	2025	1.19	0.31
84"	96"	86	3362	0.32	0.65
	108"	79	3028	0.47	0.83
	120"	73	2797	0.66	0.91
	132"	67	2534	0.89	0.94
	144"	64	2389	1.20	1.05
96"	96"	66	3431	0.28	0.74
	108"	59	3102	0.40	0.85
	120"	54	2779	0.56	1.04
	132"	49	2516	0.75	1.07
	144"	46	2339	0.99	1.17
108"	96"	52	3471	0.25	0.77
	108"	46	3089	0.35	0.93
	120"	42	2849	0.49	1.08
	132"	38	2575	0.65	1.16
	144"	35	2353	0.86	1.27
120"	96"	42	3478	0.22	0.76
	108"	38	3217	0.33	0.96
	120"	33	2828	0.43	1.06
	132"	31	2684	0.60	1.26
	144"	28	2373	0.77	1.44
132"	78"	47	4391	0.12	0.55
	84"	42	4032	0.14	0.62
	90"	38	3720	0.17	0.69
	96"	36	3577	0.21	0.82
	102"	33	3341	0.25	0.87
144"	66"	51	5135	0.07	0.40
	72"	45	4701	0.09	0.48
	78"	40	4356	0.11	0.55
	84"	36	4037	0.14	0.62
	90"	33	3770	0.16	0.73

MAXIMUM DESIGN PRESSURE OF AN END 4"x6"x1/8" MULLION (6063-T6)					
SPAN WDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION X (IN)
72"	96"	102	2698	0.42	0.37
	108"	91	2313	0.61	0.38
	120"	85	2082	0.86	0.41
	132"	78	1834	1.16	0.39
	144"	57	1657	1.21	0.22
84"	96"	73	2845	0.35	0.42
	108"	65	2466	0.51	0.47
	120"	59	2153	0.70	0.50
	132"	55	1928	0.96	0.56
	144"	52	1775	1.29	0.58
96"	96"	55	2929	0.31	0.45
	108"	48	2529	0.43	0.50
	120"	45	2324	0.62	0.62
	132"	40	2008	0.80	0.62
	144"	39	1912	1.11	0.74
108"	96"	43	2946	0.27	0.48
	108"	38	2646	0.38	0.54
	120"	34	2338	0.53	0.62
	132"	32	2157	0.73	0.76
	144"	30	1988	0.97	0.85
120"	84"	42	3544	0.17	0.39
	96"	35	3017	0.25	0.48
	108"	31	2705	0.35	0.59
	120"	28	2451	0.48	0.71
	132"	25	2116	0.64	0.83
132"	78"	39	3837	0.13	0.34
	84"	35	3528	0.16	0.39
	90"	32	3297	0.19	0.44
	96"	29	3037	0.23	0.49
	102"	27	2852	0.27	0.54
144"	60"	50	5010	0.06	0.21
	66"	43	4533	0.08	0.26
	72"	38	4213	0.10	0.30
	78"	34	3912	0.13	0.35
	84"	30	3562	0.15	0.40



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.



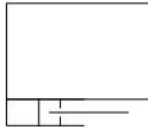
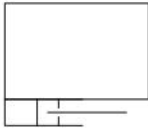
11 OF 29

TKJ Engineering, LLC.
1265 AUTUMN CREEK DRIVE, RIVERVIEW, FL 33569
PHONE: 813.704.7649; EMAIL: TKENGINEERING@VERIZON.NET
PROFESSIONAL ENGINEER
FLORIDA
4/25/15
TKJ
N.T.S.
SCALE:
DRAWN BY:
DATE:
PROJ. #:
15-0802

ROLL-UP SHUTTER
MULLION

AHT
ADVANCED HURRICANE TECHNOLOGY
6063 JAMES LANE, NAPLES, FL 34109
PHONE: 239.260.0020; FAX: 239.260.0023
WWW.AHT-USA.NET

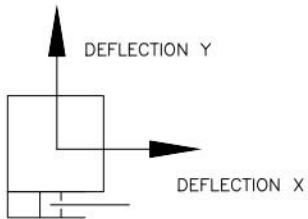
#	DATE	REVISIONS



MAXIMUM DESIGN PRESSURE OF AN END 4"x6"x1/4" MULLION (6063-T6)					
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	5436	0.34	0.45
	108"	135	4765	0.49	0.52
	120"	122	4255	0.67	0.58
	132"	113	3844	0.91	0.65
	144"	105	3499	1.20	0.69
84"	96"	113	5617	0.30	0.47
	108"	99	4950	0.42	0.56
	120"	88	4390	0.57	0.65
	132"	81	4003	0.77	0.74
	144"	75	3682	1.00	0.80
96"	96"	88	5729	0.27	0.48
	108"	77	5107	0.37	0.60
	120"	68	4552	0.50	0.71
	132"	62	4125	0.67	0.84
	144"	57	3797	0.88	0.93
108"	96"	72	5856	0.25	0.52
	108"	62	5196	0.34	0.64
	120"	55	4710	0.46	0.75
	132"	49	4239	0.60	0.87
	144"	45	3912	0.78	1.00
120"	96"	60	5951	0.23	0.51
	108"	51	5271	0.31	0.62
	120"	45	4734	0.42	0.79
	132"	40	4327	0.55	0.87
	144"	36	3934	0.70	0.99
132"	96"	51	5966	0.21	0.53
	108"	44	5396	0.30	0.66
	120"	38	4827	0.39	0.79
	132"	34	4421	0.51	0.94
	144"	31	4104	0.66	1.09
144"	84"	54	6867	0.14	0.42
	96"	44	5997	0.20	0.53
	108"	38	5429	0.28	0.69
	120"	32	4772	0.36	0.79
	132"	29	4417	0.48	0.98

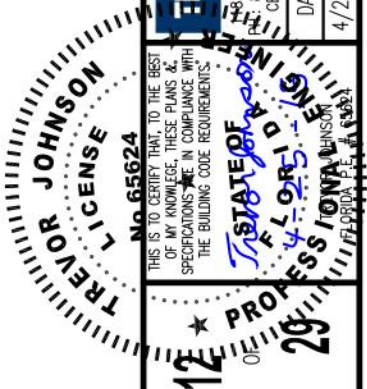
MAXIMUM DESIGN PRESSURE OF AN END 4"x8"x1/4" MULLION (6063-T6)					
SPAN WIDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION X (IN)
84"	96"	144	8261	0.29	0.35
	108"	124	7307	0.41	0.44
	120"	109	6509	0.55	0.51
	132"	97	5780	0.71	0.59
	144"	88	5222	0.92	0.67
96"	96"	115	8459	0.27	0.37
	108"	98	7515	0.37	0.45
	120"	86	6744	0.49	0.55
	132"	75	5987	0.63	0.62
	144"	69	5505	0.82	0.74
108"	96"	95	8642	0.25	0.38
	108"	80	7626	0.34	0.47
	120"	70	6906	0.45	0.57
	132"	62	6262	0.59	0.67
	144"	55	5633	0.74	0.76
120"	96"	81	8850	0.24	0.39
	108"	67	7751	0.32	0.48
	120"	58	6937	0.42	0.59
	132"	51	6292	0.54	0.70
	144"	46	5814	0.69	0.80
132"	96"	69	8866	0.22	0.39
	108"	58	7890	0.30	0.49
	120"	50	7109	0.40	0.61
	132"	44	6494	0.51	0.71
	144"	39	5886	0.65	0.84
144"	96"	60	8915	0.21	0.40
	108"	51	8011	0.29	0.51
	120"	43	7104	0.37	0.61
	132"	38	6539	0.49	0.74
	144"	34	6068	0.62	0.85
156"	84"	67	10393	0.15	0.32
	96"	54	9076	0.21	0.41
	108"	45	8120	0.28	0.51
	120"	38	7196	0.36	0.62
	132"	33	6559	0.46	0.72

MAXIMUM DESIGN PRESSURE OF AN END 4"x6"x3/8" MULLION (6063-T6)					
SPAN WDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION X (IN)
84"	96"	150	8143	0.29	0.50
	108"	129	7160	0.40	0.60
	120"	114	6407	0.53	0.71
	132"	103	5841	0.71	0.82
	144"	95	5363	0.92	0.94
96"	96"	119	8296	0.26	0.51
	108"	102	7362	0.36	0.64
	120"	89	6614	0.48	0.73
	132"	79	5961	0.62	0.84
	144"	73	5522	0.81	1.01
108"	96"	98	8451	0.24	0.53
	108"	83	7460	0.33	0.66
	120"	72	6714	0.44	0.77
	132"	65	6186	0.58	0.93
	144"	58	5601	0.73	1.06
120"	96"	83	8569	0.23	0.54
	108"	70	7601	0.31	0.68
	120"	60	6807	0.40	0.78
	132"	53	6194	0.52	0.92
	144"	48	5717	0.67	1.10
132"	96"	71	8599	0.21	0.55
	108"	60	7720	0.29	0.68
	120"	52	6980	0.39	0.82
	132"	45	6250	0.49	0.96
	144"	41	5861	0.63	1.14
144"	96"	62	8690	0.21	0.55
	108"	52	7750	0.28	0.68
	120"	45	6998	0.37	0.85
	132"	39	6334	0.47	0.98
	144"	35	5865	0.59	1.15
156"	84"	67	9876	0.14	0.43
	96"	55	8796	0.20	0.56
	108"	46	7853	0.27	0.68
	120"	39	6957	0.34	0.85
	132"	35	6534	0.45	1.02



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.



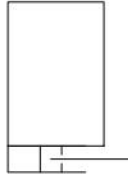
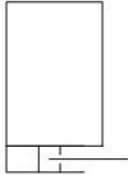
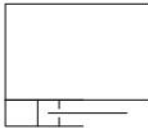
TKJ Engineering, LLC.
3335 AUTUMN CREEK DRIVE, RIVERVIEW, FL 33569
TEL: 813.404.7649; EM: TKJENGINEERING@VERIZON.NET
CERTIFICATE OF AUTHORIZATION NUMBER: 28582

DATE:	DRAWN BY:	SCALE:	PROJ. #:
4/25/15	TKJ	N.T.S.	15-0802

ROLL-UP SHUTTER MULLION

AHT
ADVANCED HURRICANE TECHNOLOGY
6063 JAMES LANE, NAPLES, FL 34109
PHONE: 239.260.0020; FAX: 239.260.0023
WWW.AHT-USA.NET

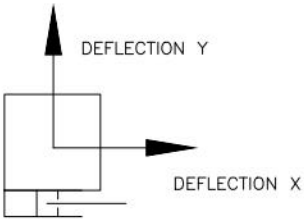
#	DATE	REVISIONS



MAXIMUM DESIGN PRESSURE OF AN END 4"x6"x1/2" MULLION (6063-T6)					
SPAN WDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION X (IN)
96"	96"	147	10578	0.26	0.53
	108"	124	9363	0.36	0.65
	120"	109	8490	0.48	0.78
	132"	96	7622	0.62	0.93
	144"	87	7063	0.79	1.05
108"	96"	121	10675	0.24	0.54
	108"	102	9505	0.33	0.66
	120"	89	8629	0.44	0.80
	132"	78	7769	0.56	0.95
	144"	70	7168	0.72	1.09
120"	96"	103	10849	0.23	0.55
	108"	86	9627	0.31	0.67
	120"	75	8776	0.41	0.82
	132"	66	7994	0.53	0.99
	144"	59	7367	0.67	1.13
132"	96"	89	10951	0.22	0.56
	108"	74	9701	0.29	0.69
	120"	64	8812	0.39	0.84
	132"	56	8006	0.50	1.02
	144"	50	7401	0.63	1.17
144"	96"	77	10946	0.21	0.56
	108"	65	9799	0.28	0.71
	120"	56	8939	0.37	0.86
	132"	49	8164	0.48	1.02
	144"	43	7431	0.59	1.18
156"	96"	69	11126	0.20	0.57
	108"	57	9821	0.27	0.70
	120"	49	8900	0.35	0.88
	132"	43	8203	0.45	1.03
	144"	38	7506	0.57	1.24
168"	84"	76	12600	0.14	0.45
	96"	62	11172	0.20	0.58
	108"	51	9882	0.26	0.71
	120"	44	8998	0.34	0.89
	132"	38	8209	0.43	1.04

MAXIMUM DESIGN PRESSURE OF AN END 4"x6"x1/8" MULLION (6063-T6)					
SPAN WDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION X (IN)
60"	108"	150	2467	0.47	0.52
	120"	118	1999	0.53	0.21
	132"	113	1927	0.75	0.30
	144"	76	1760	0.71	0.45
	156"	66	1534	0.85	0.36
72"	96"	109	2645	0.24	0.61
	108"	100	2421	0.36	0.64
	120"	97	2303	0.53	0.77
	132"	73	1825	0.58	0.27
	144"	77	1893	0.87	0.63
84"	96"	75	2625	0.19	0.65
	108"	70	2415	0.29	0.79
	120"	64	2190	0.41	0.80
	132"	62	2112	0.58	0.95
	144"	58	1946	0.77	0.94
96"	96"	56	2682	0.17	0.70
	108"	51	2382	0.24	0.88
	120"	46	2165	0.34	0.87
	132"	44	2040	0.47	1.04
	144"	41	1906	0.62	1.02
108"	84"	49	2981	0.10	0.58
	96"	43	2664	0.14	0.71
	108"	38	2341	0.21	0.83
	120"	36	2234	0.30	1.01
	132"	33	2012	0.40	1.10
120"	60"	61	4132	0.03	0.32
	66"	53	3729	0.04	0.38
	72"	48	3484	0.06	0.46
	78"	43	3193	0.07	0.51
	84"	39	2959	0.09	0.56
132"	48"	72	5118	0.02	0.21
	54"	60	4557	0.02	0.26
	60"	52	4176	0.03	0.32
	66"	45	3757	0.04	0.39
	72"	40	3467	0.05	0.45

MAXIMUM DESIGN PRESSURE OF AN END 4"x6"x1/4" MULLION (6063-T6)					
SPAN WDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION X (IN)
72"	96"	150	4997	0.19	0.72
	108"	141	4484	0.27	0.83
	120"	132	4169	0.38	0.98
	132"	124	3922	0.53	1.08
	144"	118	3713	0.71	1.20
84"	96"	113	4989	0.16	0.75
	108"	102	4557	0.23	0.91
	120"	93	4138	0.32	1.07
	132"	87	3900	0.43	1.23
	144"	82	3666	0.58	1.38
96"	96"	87	5037	0.14	0.79
	108"	77	4565	0.20	0.94
	120"	70	4155	0.27	1.16
	132"	64	3868	0.36	1.26
	144"	61	3669	0.49	1.54
108"	96"	70	5125	0.13	0.80
	108"	61	4578	0.18	0.98
	120"	55	4200	0.24	1.19
	132"	50	3905	0.32	1.32
	144"	46	3558	0.42	1.58
120"	84"	68	5785	0.08	0.63
	96"	57	5103	0.11	0.79
	108"	50	4611	0.16	1.01
	120"	44	4171	0.22	1.17
	132"	41	3939	0.29	1.46
132"	78"	63	6120	0.06	0.55
	84"	57	5754	0.07	0.62
	90"	52	5364	0.09	0.73
	96"	48	5068	0.11	0.83
	102"	45	4899	0.13	0.90
144"	78"	55	6178	0.06	0.57
	84"	49	5747	0.07	0.62
	90"	45	5416	0.08	0.73
	96"	41	5056	0.10	0.84
	102"	38	4822	0.12	0.92



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.

ROLL-UP SHUTTER
MULLION

Engineering, LLC.

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

13 OF 29

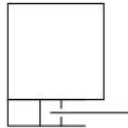
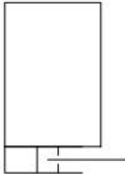
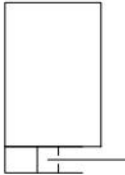
DATE: 4/25/15
DRAWN BY: TKJ
SCALE: N.T.S.
PROJ. #: 15-0802

ADVANCED HURRICANE TECHNOLOGY
6063 JAMES LANE, NAPLES, FL 34109
PHONE: 239.260.0020; FAX: 239.260.0023
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REVISIONS

DATE

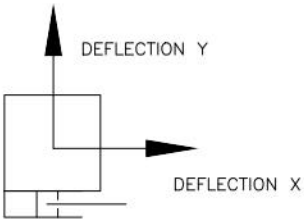
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MAXIMUM DESIGN PRESSURE OF AN END 4"x8"x1/4" MULLION (6063-T6)					
SPAN WDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION X (IN)
84"	96"	138	6584	0.09	0.78
	108"	124	6022	0.14	0.98
	120"	113	5544	0.19	1.17
	132"	104	5178	0.25	1.33
	144"	98	4871	0.34	1.57
96"	96"	107	6613	0.08	0.80
	108"	95	6027	0.12	1.00
	120"	86	5563	0.16	1.22
	132"	77	5074	0.22	1.36
	144"	72	4771	0.29	1.60
108"	96"	86	6607	0.08	0.82
	108"	75	5954	0.11	1.03
	120"	67	5452	0.14	1.25
	132"	61	5095	0.19	1.43
	144"	56	4841	0.26	1.69
120"	96"	71	6587	0.07	0.82
	108"	62	6026	0.10	1.02
	120"	55	5516	0.13	1.23
	132"	50	5145	0.18	1.47
	144"	43	4689	0.23	1.73
132"	96"	61	6696	0.07	0.84
	108"	52	5957	0.09	1.06
	120"	46	5458	0.12	1.30
	132"	41	5066	0.16	1.47
	144"	36	4680	0.20	1.70
144"	84"	63	7500	0.04	0.65
	96"	53	6731	0.06	0.85
	108"	45	6025	0.09	1.05
	120"	39	5443	0.11	1.27
	132"	35	5023	0.15	1.57
156"	72"	69	8573	0.03	0.48
	84"	55	7462	0.04	0.65
	96"	46	6695	0.06	0.85
	108"	39	5959	0.08	1.08
	120"	34	5469	0.11	1.29

MAXIMUM DESIGN PRESSURE OF AN END 4"x6"x3/8" MULLION (6063-T6)					
SPAN WDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION X (IN)
84"	96"	147	7106	0.15	0.80
	108"	129	6405	0.20	0.96
	120"	117	5862	0.28	1.17
	132"	107	5429	0.38	1.32
	144"	101	5111	0.51	1.59
96"	96"	115	7205	0.13	0.81
	108"	100	6443	0.18	1.01
	120"	89	5895	0.25	1.18
	132"	82	5484	0.33	1.44
	144"	76	5152	0.44	1.64
108"	96"	93	7218	0.12	0.83
	108"	81	6532	0.17	1.04
	120"	71	5930	0.22	1.21
	132"	65	5504	0.30	1.49
	144"	59	5075	0.38	1.71
120"	96"	77	7223	0.11	0.83
	108"	66	6483	0.15	1.03
	120"	59	5989	0.21	1.26
	132"	52	5428	0.27	1.46
	144"	45	5097	0.35	1.76
132"	96"	66	7276	0.10	0.85
	108"	57	6607	0.14	1.07
	120"	49	5939	0.19	1.26
	132"	44	5450	0.25	1.57
	144"	38	5076	0.32	1.85
144"	84"	69	8217	0.07	0.68
	96"	57	7278	0.10	0.86
	108"	49	6574	0.13	1.10
	120"	43	6046	0.18	1.32
	132"	37	5571	0.23	1.53
156"	72"	77	9525	0.05	0.50
	84"	61	8277	0.07	0.67
	96"	50	7297	0.09	0.86
	108"	43	6609	0.13	1.11
	120"	37	5995	0.17	1.32

MAXIMUM DESIGN PRESSURE OF AN END 4"x4"x1/8" MULLION (6061-T6)					
SPAN WDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION X (IN)
72"	96"	110	2510	0.63	0.75
	108"	101	2278	0.93	0.79
	120"	75	1800	1.06	0.26
	132"	61	1693	1.26	0.45
	144"	59	1587	2.05	0.67
84"	96"	78	2587	0.52	0.86
	108"	70	2298	0.76	0.91
	120"	65	2088	1.07	1.01
	132"	62	1992	1.50	1.09
	144"	50	1724	1.85	1.08
96"	96"	58	2617	0.45	0.93
	108"	52	2310	0.64	1.07
	120"	48	2156	0.91	1.13
	132"	44	1910	1.22	1.22
	144"	42	1863	1.65	1.25
108"	96"	45	2608	0.39	0.99
	108"	39	2301	0.55	1.03
	120"	37	2145	0.79	1.34
	132"	33	2022	1.10	1.54
	144"	32	1846	1.43	1.52
120"	72"	50	3451	0.15	0.60
	84"	42	2988	0.24	0.82
	96"	37	2709	0.36	1.02
	108"	32	2371	0.50	1.15
	120"	29	2222	0.72	1.46
132"	66"	48	3837	0.11	0.53
	72"	42	3468	0.14	0.61
	78"	38	3214	0.18	0.71
	84"	35	3018	0.22	0.81
	90"	32	2806	0.27	0.91
144"	54"	55	4623	0.06	0.37
	60"	48	4259	0.09	0.45
	66"	42	3899	0.11	0.54
	72"	37	3563	0.14	0.63
	78"	33	3258	0.17	0.74



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.

1835 AUTUMN CREEK DRIVE, RIVERVIEW, FL 33569
TEL.: 813.404.7649; EM.: TKJENGINEERING@VERIZON.NET
CERTIFICATE OF AUTHORIZATION NUMBER: 28582

DATE: 4/25/15

DRAWN BY: TKJ

SCALE: N.T.S.

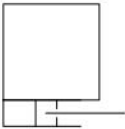
PROJ. #: 15-0802

ROLL-UP SHUTTER
MULLION

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6063 JAMES LANE, NAPLES, FL 34109
PHONE: 239.260.0020; FAX: 239.260.0023
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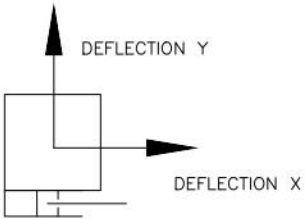
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MAXIMUM DESIGN PRESSURE OF AN END 4"x4"x1/4" MULLION (6061-T6)					
SPAN WDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION X (IN)
84"	96"	116	4853	0.43	0.97
	108"	104	4373	0.61	1.18
	120"	94	3980	0.85	1.31
	132"	87	3655	1.15	1.49
	144"	82	3423	1.54	1.69
96"	96"	90	4944	0.38	1.03
	108"	79	4430	0.54	1.23
	120"	68	4062	0.74	1.48
	132"	61	3717	1.00	1.74
	144"	55	3502	1.31	1.80
108"	96"	73	5054	0.35	1.07
	108"	62	4508	0.48	1.25
	120"	52	4117	0.67	1.56
	132"	44	3713	0.87	1.78
	144"	40	3494	1.14	1.90
120"	96"	60	5077	0.32	1.07
	108"	49	4555	0.44	1.31
	120"	40	4081	0.60	1.63
	132"	35	3734	0.78	1.79
	144"	31	3486	1.03	2.14
132"	84"	61	5788	0.21	0.89
	96"	51	5112	0.30	1.11
	108"	40	4507	0.40	1.31
	120"	32	4104	0.55	1.57
	132"	28	3848	0.74	1.95
144"	84"	52	5737	0.19	0.87
	90"	48	5436	0.24	1.02
	96"	44	5117	0.28	1.15
	102"	38	4904	0.34	1.27
	108"	33	4670	0.39	1.37
156"	78"	51	6217	0.15	0.75
	84"	46	5777	0.19	0.90
	90"	42	5447	0.23	1.03
	96"	38	5104	0.26	1.13
	102"	33	4826	0.31	1.26

MAXIMUM DESIGN PRESSURE OF AN END 4"x6"x1/8" MULLION (6061-T6)					
SPAN WDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION X (IN)
84"	96"	96	4121	0.46	0.60
	108"	85	3627	0.66	0.70
	120"	77	3229	0.91	0.80
	132"	71	2952	1.23	0.85
	144"	66	2672	1.63	0.93
96"	96"	74	4209	0.41	0.65
	108"	65	3729	0.58	0.77
	120"	59	3379	0.80	0.91
	132"	52	2965	1.04	0.92
	144"	49	2745	1.39	1.06
108"	96"	59	4295	0.37	0.65
	108"	52	3843	0.52	0.82
	120"	46	3413	0.71	0.95
	132"	41	3052	0.92	1.03
	144"	38	2817	1.22	1.16
120"	96"	49	4363	0.34	0.69
	108"	42	3853	0.47	0.81
	120"	38	3555	0.65	0.98
	132"	34	3177	0.86	1.16
	144"	31	2928	1.11	1.25
132"	84"	50	5063	0.23	0.55
	96"	42	4475	0.32	0.71
	108"	36	3970	0.45	0.87
	120"	32	3613	0.61	1.05
	132"	28	3193	0.78	1.19
144"	84"	43	5057	0.21	0.57
	90"	39	4723	0.25	0.65
	96"	36	4486	0.30	0.72
	102"	33	4178	0.36	0.82
	108"	31	4027	0.42	0.89
156"	78"	42	5460	0.17	0.50
	84"	38	5120	0.20	0.58
	90"	35	4878	0.25	0.65
	96"	31	4455	0.28	0.71
	102"	29	4258	0.34	0.81

MAXIMUM DESIGN PRESSURE OF AN END 4"x6"x1/4" MULLION (6061-T6)					
SPAN WDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION X (IN)
84"	96"	150	8030	0.41	0.66
	108"	135	7125	0.57	0.80
	120"	119	6372	0.77	0.93
	132"	108	5783	1.02	1.10
	144"	99	5286	1.32	1.26
96"	96"	124	8191	0.37	0.69
	108"	107	7337	0.52	0.84
	120"	94	6601	0.69	1.00
	132"	84	5967	0.91	1.18
	144"	77	5525	1.18	1.36
108"	96"	102	8323	0.35	0.71
	108"	87	7435	0.47	0.87
	120"	75	6646	0.62	1.01
	132"	68	6118	0.83	1.24
	144"	61	5549	1.05	1.44
120"	96"	86	8435	0.32	0.72
	108"	73	7519	0.44	0.90
	120"	63	6762	0.58	1.06
	132"	56	6163	0.76	1.27
	144"	51	5753	0.98	1.49
132"	96"	74	8528	0.31	0.74
	108"	63	7661	0.42	0.92
	120"	54	6846	0.55	1.10
	132"	47	6198	0.70	1.26
	144"	43	5836	0.91	1.49
144"	96"	65	8618	0.30	0.76
	108"	54	7618	0.39	0.92
	120"	47	6910	0.52	1.14
	132"	41	6263	0.67	1.35
	144"	36	5740	0.84	1.48
156"	96"	57	8615	0.28	0.75
	108"	48	7693	0.38	0.95
	120"	42	7099	0.51	1.15
	132"	36	6358	0.64	1.34
	144"	32	5848	0.81	1.57



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.

ROLL-UP SHUTTER
MULLION

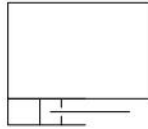
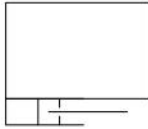
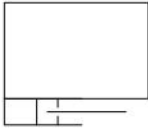
TE Engineering, LLC.

THIS IS TO CERTIFY THAT, TO THE BEST
OF MY KNOWLEDGE, THESE PLANS &
SPECIFICATIONS ARE IN COMPLIANCE WITH
THE BUILDING CODE REQUIREMENTS
OF THE STATE OF
FLORIDA
TREVOR JOHNSON
PROFESSIONAL ENGINEER
No 65624
DATE: 4/25/15
DRAWN BY: TKJ
SCALE: N.T.S.
PROJECT: 15-0802

15 OF 29

#	DATE	REVISIONS

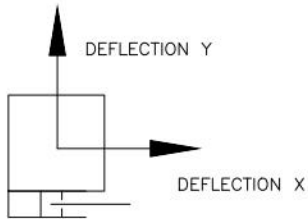
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MAXIMUM DESIGN PRESSURE OF AN END 4"x8"x1/4" MULLION (6061-T6)					
SPAN WDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION X (IN)
96"	96"	150	12005	0.38	0.51
	108"	138	10646	0.52	0.64
	120"	119	9535	0.68	0.76
	132"	105	8620	0.88	0.91
	144"	94	7884	1.12	1.02
108"	96"	137	12297	0.36	0.53
	108"	114	10837	0.48	0.65
	120"	98	9728	0.63	0.78
	132"	87	8932	0.82	0.93
	144"	77	8079	1.03	1.09
120"	96"	116	12378	0.34	0.54
	108"	97	11035	0.46	0.66
	120"	83	9907	0.60	0.80
	132"	73	9043	0.77	0.96
	144"	64	8205	0.96	1.09
132"	96"	101	12565	0.33	0.55
	108"	84	11162	0.43	0.68
	120"	72	10075	0.57	0.84
	132"	63	9220	0.73	0.99
	144"	55	8347	0.91	1.14
144"	96"	89	12738	0.31	0.55
	108"	74	11356	0.42	0.69
	120"	63	10191	0.54	0.84
	132"	55	9285	0.70	1.02
	144"	48	8466	0.86	1.16
156"	96"	79	12792	0.30	0.56
	108"	65	11316	0.40	0.70
	120"	56	10322	0.53	0.85
	132"	49	9482	0.67	1.02
	144"	43	8642	0.84	1.22
168"	96"	71	12911	0.29	0.57
	108"	59	11510	0.39	0.71
	120"	50	10350	0.51	0.88
	132"	43	9433	0.64	1.00
	144"	38	8638	0.80	1.23

MAXIMUM DESIGN PRESSURE OF AN END 4"x6"x3/8" MULLION (6061-T6)					
SPAN WDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION X (IN)
96"	96"	150	11772	0.37	0.72
	108"	144	10472	0.50	0.88
	120"	125	9411	0.67	1.06
	132"	111	8596	0.87	1.25
	144"	100	7878	1.11	1.45
108"	96"	141	11945	0.35	0.73
	108"	119	10649	0.47	0.90
	120"	103	9630	0.62	1.09
	132"	90	8706	0.79	1.27
	144"	81	8049	1.01	1.48
120"	96"	120	12107	0.33	0.75
	108"	101	10797	0.44	0.92
	120"	87	9761	0.58	1.11
	132"	76	8887	0.75	1.31
	144"	68	8178	0.95	1.55
132"	96"	104	12228	0.31	0.76
	108"	87	10874	0.42	0.94
	120"	75	9876	0.55	1.14
	132"	66	9071	0.71	1.37
	144"	58	8261	0.89	1.58
144"	96"	91	12275	0.30	0.76
	108"	76	10918	0.40	0.96
	120"	65	9873	0.52	1.17
	132"	57	9055	0.68	1.40
	144"	50	8316	0.84	1.57
156"	96"	81	12376	0.29	0.77
	108"	68	11131	0.39	0.97
	120"	58	10051	0.51	1.17
	132"	50	9079	0.64	1.41
	144"	45	8536	0.82	1.65
168"	96"	73	12499	0.28	0.78
	108"	61	11218	0.38	0.98
	120"	52	10136	0.49	1.19
	132"	45	9239	0.62	1.42
	144"	40	8580	0.79	1.67

MAXIMUM DESIGN PRESSURE OF AN END 4"x6"x1/2" MULLION (6061-T6)					
SPAN WDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION X (IN)
108"	96"	150	15125	0.35	0.75
	108"	148	13508	0.48	0.94
	120"	127	12190	0.62	1.11
	132"	111	11089	0.80	1.32
	144"	99	10197	1.01	1.55
120"	96"	150	15257	0.34	0.77
	108"	126	13656	0.45	0.96
	120"	108	12326	0.59	1.16
	132"	94	11257	0.75	1.35
	144"	84	10446	0.96	1.58
132"	96"	131	15449	0.32	0.78
	108"	109	13752	0.43	0.97
	120"	93	12431	0.56	1.18
	132"	81	11396	0.72	1.37
	144"	72	10493	0.90	1.65
144"	96"	115	15551	0.31	0.78
	108"	96	13935	0.41	0.98
	120"	82	12631	0.54	1.19
	132"	71	11496	0.69	1.41
	144"	63	10625	0.86	1.68
156"	96"	102	15578	0.30	0.79
	108"	85	13946	0.40	0.99
	120"	73	12735	0.52	1.22
	132"	63	11574	0.66	1.45
	144"	56	10795	0.83	1.69
168"	96"	92	15712	0.29	0.80
	108"	77	14193	0.39	1.00
	120"	65	12795	0.50	1.19
	132"	56	11594	0.63	1.46
	144"	50	10863	0.80	1.71
180"	96"	83	15782	0.28	0.80
	108"	69	14145	0.37	1.00
	120"	59	12884	0.49	1.22
	132"	51	11764	0.62	1.46
	144"	44	10883	0.78	1.76



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.

ROLL-UP SHUTTER MULLION

TKJ Engineering, LLC.

11835 AUTUMN CREEK DRIVE, RIVERVIEW, FL 33569
PH: 813.404.7649; EM: TKJENGINEERING@VERIZON.NET
CERTIFICATE OF AUTHORIZATION NUMBER: 28582

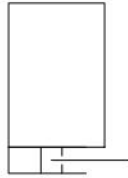
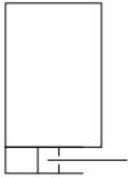
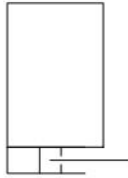
DATE: 4/25/15
DRAWN BY: TKJ
SCALE: N.T.S.
PROJ. #: 15-0802

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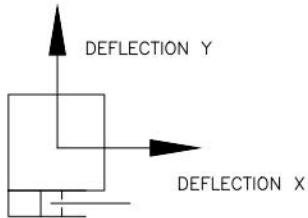
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MAXIMUM DESIGN PRESSURE OF AN END 4"x6"x1/8" MULLION (6061-T6)					
SPAN WIDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION X (IN)
72"	96"	140	3811	0.31	0.91
	108"	129	3495	0.46	1.07
	120"	120	3257	0.65	1.14
	132"	114	3076	0.90	1.30
	144"	99	2737	1.11	1.16
84"	96"	99	3791	0.26	0.97
	108"	90	3432	0.37	1.18
	120"	82	3148	0.52	1.26
	132"	79	2999	0.73	1.56
	144"	75	2886	0.99	1.62
96"	96"	75	3810	0.22	1.03
	108"	67	3443	0.32	1.23
	120"	59	3192	0.45	1.46
	132"	54	2949	0.61	1.60
	144"	50	2775	0.82	1.84
108"	96"	59	3815	0.20	1.07
	108"	52	3502	0.28	1.30
	120"	45	3198	0.39	1.53
	132"	39	2962	0.53	1.71
	144"	34	2767	0.70	1.91
120"	72"	68	4958	0.08	0.63
	84"	56	4332	0.12	0.82
	96"	48	3854	0.18	1.04
	108"	41	3522	0.26	1.34
	120"	34	3150	0.35	1.56
132"	72"	57	4932	0.07	0.63
	78"	52	4623	0.09	0.75
	84"	47	4290	0.11	0.86
	90"	43	4019	0.14	0.98
	96"	40	3810	0.17	1.11
144"	72"	50	4987	0.07	0.65
	78"	45	4655	0.09	0.76
	84"	41	4391	0.11	0.87
	90"	37	4065	0.13	0.97
	96"	34	3819	0.15	1.09

MAXIMUM DESIGN PRESSURE OF AN END 4"x6"x1/4" MULLION (6061-T6)					
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	7151	0.21	1.05
	108"	134	6448	0.30	1.26
	120"	115	5956	0.42	1.52
	132"	102	5581	0.57	1.80
	144"	92	5237	0.75	2.04
	156"	84	4958	0.90	2.30
96"	96"	121	7181	0.19	1.09
	108"	100	6558	0.27	1.36
	120"	84	5955	0.37	1.62
	132"	73	5573	0.49	1.89
	144"	65	5189	0.64	2.16
108"	96"	99	7288	0.18	1.12
	108"	78	6504	0.24	1.38
	120"	64	5996	0.33	1.68
	132"	55	5594	0.44	1.96
	144"	48	5156	0.57	2.34
120"	96"	82	7283	0.16	1.12
	108"	63	6591	0.23	1.42
	120"	51	6056	0.31	1.73
	132"	43	5541	0.40	2.03
	144"	38	5135	0.52	2.41
132"	84"	84	8234	0.11	0.89
	96"	68	7301	0.15	1.15
	108"	52	6618	0.21	1.41
	120"	42	5952	0.28	1.72
	132"	35	5529	0.37	2.11
144"	84"	73	8260	0.10	0.90
	93"	63	7508	0.13	1.09
	102"	51	6942	0.17	1.32
	111"	42	6454	0.21	1.52
	120"	36	6036	0.26	1.72
156"	84"	64	8225	0.10	0.90
	93"	55	7479	0.13	1.09
	102"	44	6942	0.16	1.33
	111"	36	6533	0.21	1.51
	120"	30	6128	0.26	1.80

MAXIMUM DESIGN PRESSURE OF AN END 4"x8"x1/4" MULLION (6061-T6)					
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	9421	0.13	1.11
	108"	150	8564	0.19	1.35
	120"	133	7891	0.25	1.64
	132"	116	7378	0.34	1.92
	144"	104	6863	0.44	2.16
	156"	96	6454	0.54	2.41
96"	96"	150	9424	0.12	1.13
	108"	120	8573	0.17	1.41
	120"	99	7851	0.22	1.72
	132"	83	7272	0.30	1.96
	144"	73	6870	0.39	2.29
108"	96"	123	9441	0.11	1.14
	108"	95	8569	0.15	1.40
	120"	77	7819	0.20	1.69
	132"	64	7266	0.27	2.06
	144"	56	6764	0.34	2.37
120"	96"	102	9408	0.10	1.14
	108"	77	8564	0.14	1.43
	120"	61	7829	0.19	1.73
	132"	52	7285	0.25	2.07
	144"	43	6843	0.32	2.49
132"	96"	86	9501	0.10	1.17
	108"	65	8562	0.13	1.48
	120"	52	7923	0.18	1.80
	132"	42	7235	0.23	2.16
	144"	36	6867	0.30	2.54
144"	96"	74	9464	0.09	1.17
	108"	56	8613	0.12	1.48
	120"	44	7827	0.16	1.79
	132"	36	7330	0.22	2.13
	144"	30	6692	0.27	2.51
156"	84"	82	10649	0.06	0.90
	96"	65	9500	0.09	1.18
	108"	48	8606	0.12	1.51
	120"	38	7883	0.16	1.78
	132"	30	7196	0.20	2.20



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.

ROLL-UP SHUTTER
MULLION

TK Engineering, LLC.

3333 CALTUM CREEK DRIVE, RIVERVIEW, FL 33569
TEL: 404.7649; EM: TKENGINEERING@VERIZON.NET
CERTIFICATE OF AUTHORIZATION NUMBER: 28582

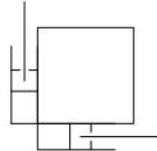
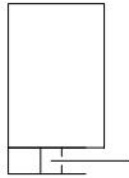
DATE: 4/25/15
DRAWN BY: TKJ
SCALE: N.T.S.
PROJ. #: 15-0802



THIS IS TO CERTIFY THAT, TO THE BEST
OF MY KNOWLEDGE, THESE PLANS &
SPECIFICATIONS ARE IN COMPLIANCE WITH
THE BUILDING CODE REQUIREMENTS
OF THE STATE OF FLORIDA
TREVOR JOHNSON
PROFESSIONAL ENGINEER
FLORIDA REG. NO. 65624

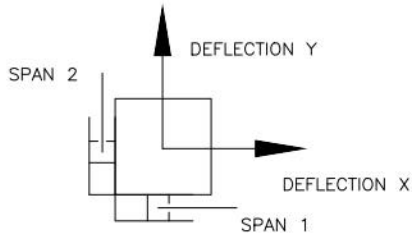
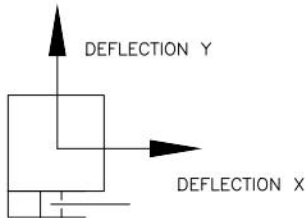
#	DATE	REVISIONS

TK
ADVANCED HURRICANE TECHNOLOGY
6063 JAMES LANE, NAPLES, FL 34109
PHONE: 239.260.0020; FAX: 239.260.0023
WWW.AHT-USA.NET



MAXIMUM DESIGN PRESSURE OF AN END 4"X6"X3/8" MULLION (6061-T6)					
SPAN WDTH UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION X (IN)
84"	96"	150	10170	0.20	1.11
	108"	150	9162	0.29	1.39
	120"	139	8445	0.39	1.66
	132"	120	7801	0.52	1.96
	144"	105	7338	0.68	2.27
96"	96"	150	10189	0.18	1.14
	108"	127	9209	0.26	1.41
	120"	103	8408	0.34	1.68
	132"	88	7787	0.45	2.00
108"	144"	76	7280	0.59	2.26
	96"	131	10268	0.17	1.16
	108"	100	9331	0.24	1.46
	120"	81	8469	0.31	1.76
120"	132"	67	7815	0.41	2.06
	144"	59	7288	0.53	2.44
	96"	108	10262	0.16	1.16
	108"	82	9296	0.22	1.45
132"	120"	66	8469	0.29	1.81
	132"	54	7908	0.38	2.08
	144"	45	7301	0.48	2.40
	96"	92	10388	0.15	1.18
144"	108"	69	9292	0.21	1.50
	120"	54	8599	0.28	1.80
	132"	45	7818	0.35	2.15
	144"	38	7357	0.45	2.50
156"	96"	79	10325	0.14	1.21
	108"	59	9435	0.20	1.49
	120"	46	8528	0.26	1.86
	132"	37	7957	0.34	2.17
	144"	31	7322	0.43	2.63
	84"	90	11647	0.10	0.93
	96"	69	10474	0.14	1.21
	108"	51	9369	0.19	1.53
	120"	40	8652	0.25	1.86
	132"	32	7806	0.31	2.14

MAXIMUM DESIGN PRESSURE OF A CORNER 4"X4"X1/8" MULLION (6063-T6)							
SPAN WDTH 1 UP TO	SPAN WDTH 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"	76	80	1760	0.42	0.46
		108"	61	64	1424	0.48	0.46
		120"	40	42	1432	0.56	0.68
		132"	31	33	1180	0.47	0.71
		144"	28	29	1067	0.75	0.71
72"	48"	96"	69	75	1665	0.44	0.40
		108"	46	50	1480	0.57	0.35
		120"	40	43	1319	0.66	0.41
		132"	26	28	1171	0.39	0.60
72"	60"	144"	17	19	1055	0.57	0.25
		96"	60	63	1774	0.45	0.45
		108"	46	48	1385	0.40	0.41
		120"	31	32	1404	0.54	0.68
96"	48"	132"	26	27	1251	0.63	0.71
		144"	19	20	1013	0.46	0.43
		84"	41	46	1925	0.21	0.48
		96"	37	42	1710	0.35	0.56
96"	72"	108"	34	38	1556	0.46	0.64
		120"	27	31	1241	0.45	0.45
		132"	27	31	1270	0.74	0.71
		84"	40	43	1911	0.21	0.50
120"	48"	96"	36	38	1680	0.26	0.58
		108"	27	29	1433	0.47	0.35
		120"	26	28	1380	0.67	0.61
		132"	17	18	1109	0.45	0.55
96"	96"	72"	35	35	2032	0.25	0.25
		84"	33	33	1842	0.39	0.39
		96"	31	31	1672	0.47	0.47
		108"	26	26	1354	0.40	0.40
120"	48"	120"	20	20	1481	0.56	0.56
		48"	57	66	3558	0.03	0.20
		54"	46	53	3087	0.05	0.24
		60"	41	47	2849	0.07	0.30
		66"	36	42	2569	0.09	0.37
		72"	33	38	2420	0.11	0.42



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.

ROLL-UP SHUTTER MULLION

TKJ Engineering, LLC.

111835 AUTUMN CREEK DRIVE, RIVERVIEW, FL 33569
PH.: 813.404.7649; EM.: TKENGINEERING@VERIZON.NET
CERTIFICATE OF AUTHORIZATION NUMBER: 28582

DATE: 4/25/15
DRAWN BY: TKJ
SCALE: N.T.S.
PROJ. #: 15-0802

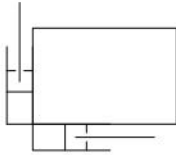
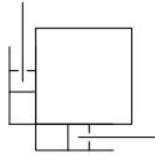


THIS IS TO CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE, THESE PLANS & SPECIFICATIONS ARE IN COMPLIANCE WITH THE BUILDING CODE REQUIREMENTS.

29

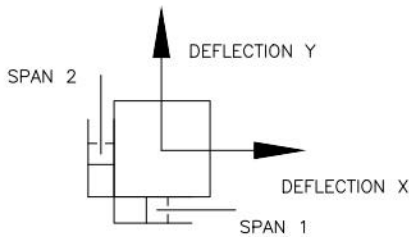
#	DATE	REVISIONS

AHT
ADVANCED HURRICANE TECHNOLOGY
6063 JAMES LANE, NAPLES, FL 34109
PHONE: 239.260.0020; FAX: 239.260.0023
WWW.AHT-USA.NET



MAXIMUM DESIGN PRESSURE OF A CORNER 4"x4"x1/4" MULLION (6063-T6)							
SPAN WIDTH 1 UP TO	SPAN WDTH 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	3321	0.23	0.68
		108"	51	58	2931	0.41	0.87
		120"	45	51	2736	0.60	0.94
		132"	42	47	2566	0.75	1.06
		144"	33	37	2045	0.55	0.76
96"	72"	96"	53	56	3338	0.29	0.67
		108"	48	51	2981	0.43	0.85
		120"	43	46	2693	0.52	0.91
		132"	38	40	2296	0.49	0.97
		144"	37	39	2238	0.81	1.14
96"	96"	96"	41	41	3088	0.50	0.50
		108"	39	39	2905	0.64	0.64
		120"	37	37	2691	0.78	0.78
		132"	29	29	2142	0.53	0.53
		144"	29	29	2200	0.80	0.80
120"	48"	72"	55	63	4518	0.08	0.46
		84"	44	51	3883	0.16	0.60
		96"	37	43	3411	0.21	0.71
		108"	33	38	3104	0.30	0.88
		120"	28	32	2617	0.28	1.06
120"	72"	66"	57	63	4735	0.10	0.36
		75"	49	54	4283	0.12	0.48
		84"	42	46	3825	0.15	0.56
		93"	38	42	3537	0.19	0.71
		102"	34	38	3209	0.21	0.86
120"	96"	60"	48	50	4499	0.16	0.23
		69"	41	43	4011	0.20	0.32
		78"	36	38	3662	0.24	0.39
		87"	32	34	3254	0.28	0.51
		96"	30	32	3073	0.37	0.62
120"	120"	60"	40	40	4423	0.20	0.20
		69"	34	34	3981	0.26	0.26
		78"	29	29	3518	0.31	0.31
		87"	26	26	3148	0.42	0.42
		96"	24	24	2921	0.51	0.51

MAXIMUM DESIGN PRESSURE OF A CORNER 4"x6"x1/8" MULLION (6063-T6)							
SPAN WIDTH 1 UP TO	SPAN WDTH 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"	46	52	2775	0.33	0.41
		108"	41	46	2483	0.43	0.46
		120"	35	40	2056	0.51	0.47
		132"	31	35	1810	0.48	0.46
		144"	32	36	1780	1.06	0.64
96"	72"	96"	45	48	2815	0.31	0.41
		108"	38	40	2310	0.30	0.44
		120"	37	39	2246	0.52	0.53
		132"	35	37	2045	0.72	0.64
		144"	26	28	1686	1.11	0.42
96"	96"	96"	35	35	2426	0.45	0.32
		108"	34	34	2317	0.61	0.42
		120"	29	29	1941	0.47	0.37
		132"	27	27	1763	0.74	0.35
		144"	21	21	1784	0.90	0.55
120"	48"	60"	60	69	4764	0.06	0.20
		72"	46	53	3994	0.12	0.28
		84"	36	42	3292	0.15	0.37
		96"	31	36	2894	0.23	0.48
		108"	26	30	2485	0.24	0.50
120"	72"	66"	50	55	4304	0.10	0.24
		75"	42	46	3782	0.12	0.31
		84"	37	41	3464	0.16	0.38
		93"	32	35	3038	0.19	0.45
		102"	27	30	2663	0.35	0.51
120"	96"	60"	41	43	3801	0.16	0.14
		69"	35	37	3401	0.21	0.20
		78"	31	33	3080	0.24	0.26
		87"	29	31	2939	0.32	0.35
		96"	27	28	2732	0.35	0.42
120"	120"	54"	38	38	3936	0.16	0.09
		63"	31	31	3414	0.21	0.13
		72"	27	27	3101	0.28	0.17
		81"	24	24	2800	0.38	0.22
		90"	22	22	2597	0.44	0.27



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.

ROLL-UP SHUTTER
MULLION

Engineering, LLC.

THIS IS TO CERTIFY THAT TO THE BEST
OF MY KNOWLEDGE, THESE PLANS &
SPECIFICATIONS ARE IN COMPLIANCE WITH
THE BUILDING CODES PRESENTLY IN
EFFECT IN THE JURISDICTION OF THE
STATE OF FLORIDA.

19 OF 29

DATE: 4/25/15
DRAWN BY: TKJ
SCALE: N.T.S.
PROJ. #: 15-0802

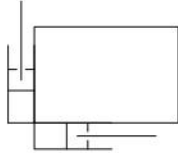
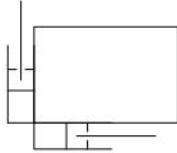
TREVOR JOHNSON
LICENSE
No 65624
PROFESSIONAL ENGINEER
FLORIDA P.E. # 65624

ADVANCED HURRICANE TECHNOLOGY
6063 JAMES LANE, NAPLES, FL 34109
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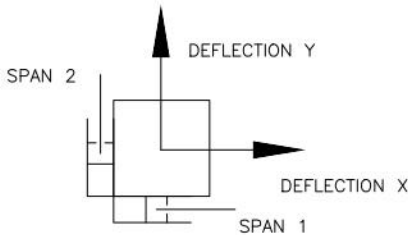
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MAXIMUM DESIGN PRESSURE OF A CORNER 4"X6"X1/4" MULLION (6063-T6)							
SPAN WDTH 1 UP TO	SPAN WDTH 2 UP TO	MULLION LENGTH UP TO	DESIGN PRESSURE 1 (PSF)	DESIGN PRESSURE 2 (PSF)	MULLION END LOAD (LB)	MULLION DEFLECTION Y (IN)	MULLION DEFLECTION X (IN)
96"	96"	96"	50	50	4583	0.52	0.31
		108"	46	46	4252	0.65	0.40
		120"	43	43	3947	0.79	0.50
		132"	41	41	3720	0.95	0.64
		144"	39	39	3460	1.10	0.75
120"	48"	96"	55	63	5887	0.19	0.52
		108"	45	52	5068	0.34	0.62
		120"	39	45	4532	0.40	0.75
		132"	35	40	4162	0.49	0.86
		144"	32	37	3857	0.69	0.96
120"	72"	96"	51	56	5696	0.25	0.50
		108"	43	47	4986	0.30	0.62
		120"	38	42	4522	0.39	0.73
		132"	34	38	4161	0.45	0.84
		144"	28	31	3570	0.72	0.89
120"	96"	96"	39	41	4900	0.39	0.39
		105"	36	38	4567	0.47	0.49
		114"	34	36	4404	0.52	0.57
		123"	32	34	4111	0.64	0.70
		132"	31	33	4055	0.69	0.81
120"	120"	84"	36	36	5083	0.38	0.23
		93"	32	32	4652	0.48	0.28
		102"	29	29	4253	0.57	0.36
		111"	27	27	4012	0.71	0.42
		120"	25	25	3718	0.82	0.48
144"	48"	84"	51	60	6874	0.14	0.42
		93"	42	49	6078	0.19	0.49
		102"	36	42	5401	0.22	0.58
		111"	32	38	4981	0.26	0.68
		120"	29	34	4644	0.35	0.76
144"	72"	78"	53	60	7144	0.14	0.35
		87"	43	49	6205	0.13	0.42
		96"	39	44	5829	0.20	0.53
		105"	33	37	5148	0.19	0.59
		114"	31	35	4974	0.26	0.72

MAXIMUM DESIGN PRESSURE OF A CORNER 4"X8"X1/4" MULLION (6063-T6)							
SPAN WDTH 1 UP TO	SPAN WDTH 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"	61	61	6395	0.53	0.23
		108"	54	54	5723	0.67	0.29
		120"	50	50	5341	0.82	0.37
		132"	46	46	4914	0.93	0.45
		144"	44	44	4741	1.06	0.53
120"	48"	96"	73	84	8633	0.24	0.38
		108"	62	71	7722	0.30	0.49
		120"	54	62	7000	0.38	0.59
		132"	43	50	5893	0.49	0.63
		144"	40	46	5583	0.69	0.76
120"	72"	96"	66	73	8197	0.29	0.36
		108"	59	65	7605	0.33	0.48
		120"	49	54	6683	0.45	0.54
		132"	43	47	6017	0.51	0.65
		144"	37	41	5324	0.52	0.70
120"	96"	96"	48	50	6735	0.43	0.27
		108"	43	45	6257	0.53	0.35
		120"	39	41	5836	0.63	0.45
		132"	36	38	5451	0.69	0.57
		144"	34	36	5220	0.87	0.68
120"	120"	96"	39	39	6282	0.54	0.22
		108"	34	34	5657	0.68	0.29
		120"	31	31	5313	0.84	0.36
		132"	28	28	4856	0.94	0.45
		144"	26	26	4523	1.10	0.54
144"	48"	84"	69	81	10047	0.15	0.31
		96"	56	66	8836	0.19	0.39
		108"	46	54	7816	0.31	0.48
		120"	38	45	6788	0.34	0.58
		132"	34	40	6278	0.50	0.71
144"	72"	84"	63	71	9505	0.20	0.29
		96"	53	60	8633	0.24	0.39
		108"	45	51	7855	0.31	0.48
		120"	38	43	6904	0.37	0.60
		132"	34	38	6391	0.44	0.73



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

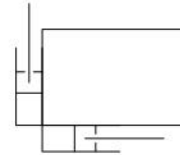
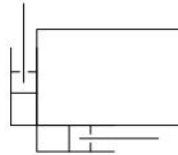


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ROLL-UP SHUTTER MULLION

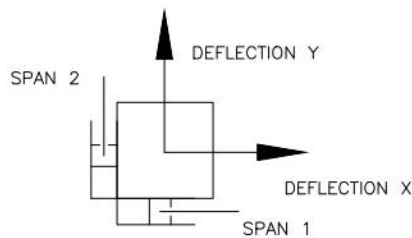
TK Engineering, LLC.
1835 AUTUMN CREEK DRIVE, RIVERVIEW, FL 33569
PH: 813.540.7649; EM: TKENGINEERING@VERIZON.NET
PROFESSIONAL ENGINEER
FLORIDA REG. NO. 65624
DATE: 4/25/15
DRAWN BY: TKJ
SCALE: N.T.S.
PROJ. #: 15-0802

THIS IS TO CERTIFY THAT, TO THE BEST
OF MY KNOWLEDGE, THESE PLANS &
SPECIFICATIONS ARE IN COMPLIANCE WITH
THE BUILDING CODE REQUIREMENTS



MAXIMUM DESIGN PRESSURE OF A CORNER 4"X6"X3/8" MULLION (6063-T6)							
SPAN WIDTH 1 UP TO	SPAN WDTH 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"	106	119	8169	0.22	0.52
		108"	88	99	7175	0.36	0.62
		120"	77	87	6403	0.47	0.74
		132"	69	78	5802	0.59	0.87
		144"	61	69	5177	0.60	0.95
96"	72"	96"	86	91	7312	0.38	0.43
		108"	78	83	6784	0.44	0.56
		120"	72	77	6327	0.52	0.72
		132"	64	68	5674	0.61	0.84
96"	96"	144"	57	61	5253	0.88	0.93
		96"	63	63	6497	0.52	0.32
		108"	57	57	5982	0.66	0.42
		120"	52	52	5454	0.84	0.52
120"	48"	132"	49	49	5161	1.00	0.64
		144"	46	46	4804	1.16	0.76
		96"	74	85	8305	0.22	0.53
		108"	63	73	7441	0.28	0.66
120"	72"	120"	55	63	6771	0.34	0.78
		132"	46	53	5934	0.55	0.89
		144"	41	47	5416	0.64	1.03
		96"	68	75	8039	0.29	0.50
120"	96"	108"	60	66	7360	0.32	0.66
		120"	50	55	6467	0.42	0.75
		132"	44	49	5901	0.48	0.89
		144"	38	42	5139	0.48	1.02
120"	120"	96"	49	52	6716	0.42	0.37
		108"	44	46	6173	0.55	0.49
		120"	41	43	5904	0.67	0.63
		132"	37	39	5367	0.78	0.76
120"	120"	144"	35	37	5184	0.87	0.91
		96"	41	41	6504	0.54	0.32
		108"	36	36	5894	0.68	0.42
		120"	32	32	5324	0.86	0.52
120"	120"	132"	29	29	4886	0.98	0.62
		144"	27	27	4607	1.21	0.68

MAXIMUM DESIGN PRESSURE OF A CORNER 4"X6"X3/8" MULLION (6063-T6)							
SPAN WDTH 1 UP TO	SPAN WDTH 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"	63	71	9128	0.19	0.40
		96"	54	61	8399	0.22	0.53
		108"	46	52	7590	0.29	0.67
		120"	40	45	6864	0.37	0.84
		132"	35	40	6272	0.41	1.01
144"	96"	84"	48	52	7823	0.29	0.31
		96"	41	45	7091	0.39	0.42
		108"	37	40	6668	0.44	0.56
		120"	33	36	6161	0.51	0.70
		132"	30	33	5688	0.63	0.89
144"	120"	84"	40	42	7400	0.37	0.27
		96"	34	35	6620	0.47	0.36
		108"	29	30	5872	0.60	0.45
		120"	26	27	5401	0.73	0.59
		132"	24	25	5144	0.80	0.74
144"	144"	72"	44	44	8344	0.31	0.17
		84"	35	35	7227	0.42	0.25
		96"	29	29	6380	0.54	0.31
		108"	25	25	5740	0.70	0.40
		120"	22	22	5209	0.82	0.51
168"	48"	78"	63	74	10500	0.10	0.37
		87"	53	63	9480	0.13	0.46
		96"	45	53	8599	0.21	0.55
		105"	39	46	7842	0.24	0.64
		114"	34	40	7115	0.28	0.76
168"	72"	72"	65	74	10668	0.13	0.29
		81"	56	64	9816	0.15	0.39
		90"	48	55	9000	0.17	0.49
		99"	41	47	8170	0.19	0.57
		108"	37	42	7697	0.23	0.69
168"	96"	72"	51	57	9263	0.20	0.24
		81"	44	49	8524	0.26	0.32
		90"	38	42	7760	0.30	0.40
		99"	34	38	7261	0.35	0.50
		108"	31	34	6875	0.40	0.60



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



ADVANCED HURRICANE TECHNOLOGY
6063 JANES LANE, NAPLES, FL 34109
PHONE: 239.260.0020; FAX: 239.260.0023
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ROLL-UP SHUTTER MULLION

TKJ Engineering, LLC.

11115 AUTUMN CREEK DRIVE, RIVERVIEW, FL 33569
PH: 813.404.7649; EM: TKJENGINEERING@VERIZON.NET
CERTIFICATE OF AUTHORIZATION NUMBER: 28582

DATE: 4/25/15

DRAWN BY: TKJ

SCALE: N.T.S.

PROJ. #: 15-0802

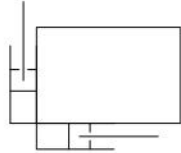
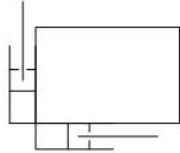
TREVOR JOHNSON
LICENSE
No. 55624

THIS IS TO CERTIFY THAT, TO THE BEST
OF MY KNOWLEDGE, THESE PLANS &
SPECIFICATIONS COMPLY WITH
THE BUILDING CODE REQUIREMENTS

4/25/15

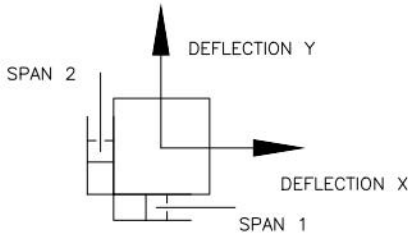
21 OF 29

PROFESSIONAL
ENGINEER
TREVOR JOHNSON
FLORIDA P.E. NO. 55624



MAXIMUM DESIGN PRESSURE OF A CORNER 4"x6"x1/2" MULLION (6063-T6)							
SPAN WDTH 1 UP TO	SPAN WDTH 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"	130	146	10456	0.25	0.52
		108"	109	123	9146	0.30	0.65
		120"	92	104	8141	0.48	0.75
		132"	81	91	7331	0.57	0.86
		144"	75	85	6891	0.78	1.04
96"	72"	96"	100	106	9049	0.41	0.43
		108"	90	96	8355	0.51	0.56
		120"	83	88	7809	0.59	0.71
		132"	76	81	7338	0.64	0.85
		144"	68	72	6604	0.72	1.00
96"	96"	96"	75	75	8179	0.56	0.33
		108"	66	66	7419	0.68	0.40
		120"	60	60	6830	0.87	0.50
		132"	55	55	6339	0.96	0.60
		144"	53	53	6131	1.24	0.76
120"	48"	96"	91	105	10514	0.23	0.54
		108"	78	90	9489	0.32	0.68
		120"	68	78	8643	0.40	0.84
		132"	58	67	7665	0.44	0.95
		144"	53	61	7208	0.58	1.12
120"	72"	96"	78	86	9626	0.31	0.48
		108"	71	78	9101	0.38	0.65
		120"	62	68	8248	0.39	0.80
		132"	54	60	7560	0.57	0.92
		144"	48	53	6926	0.66	1.05
120"	96"	96"	60	63	8592	0.46	0.37
		108"	52	55	7704	0.59	0.50
		120"	47	49	7140	0.69	0.61
		132"	44	46	6850	0.83	0.78
		144"	40	42	6320	0.93	0.89
120"	120"	96"	49	49	8074	0.55	0.33
		108"	42	42	7224	0.69	0.40
		120"	38	38	6703	0.88	0.52
		132"	34	34	6150	0.98	0.63
		144"	32	32	5864	1.28	0.74

MAXIMUM DESIGN PRESSURE OF A CORNER 4"x6"x1/2" MULLION (6063-T6)							
SPAN WDTH 1 UP TO	SPAN WDTH 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"	66	74	10435	0.26	0.54
		108"	58	65	9678	0.29	0.69
		120"	48	54	8537	0.39	0.82
		132"	42	47	7760	0.45	1.00
		144"	35	40	6755	0.39	1.11
144"	96"	96"	50	54	8923	0.41	0.42
		108"	43	47	8047	0.49	0.55
		120"	39	42	7540	0.58	0.71
		132"	35	38	7009	0.66	0.85
		144"	33	36	6729	0.81	1.08
144"	120"	96"	41	43	8287	0.50	0.37
		108"	35	37	7480	0.60	0.45
		120"	31	32	6826	0.71	0.57
		132"	28	29	6314	0.84	0.72
		144"	26	27	6009	1.04	0.85
144"	144"	96"	36	36	8145	0.56	0.32
		108"	30	30	7168	0.71	0.39
		120"	27	27	6705	0.90	0.51
		132"	24	24	6109	1.08	0.64
		144"	22	22	5755	1.23	0.77
156"	48"	96"	65	76	11064	0.20	0.58
		108"	54	64	9904	0.24	0.70
		120"	43	51	8467	0.33	0.81
		132"	39	46	7970	0.48	1.03
		144"	34	40	7261	0.58	1.16
156"	72"	96"	60	68	10613	0.24	0.54
		108"	50	57	9509	0.29	0.68
		120"	43	49	8671	0.34	0.81
		132"	38	43	7916	0.43	1.03
		144"	34	39	7372	0.51	1.23
156"	96"	96"	46	51	9119	0.40	0.44
		108"	40	44	8305	0.45	0.58
		120"	36	40	7782	0.57	0.74
		132"	33	36	7343	0.62	0.93
		144"	30	33	6869	0.68	1.13



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.

ROLL-UP SHUTTER
MULLION

TKJ Engineering, LLC.

12335 AUTUMN CREEK DRIVE, RIVERVIEW, FL 33569
TEL: 813.404.7649; EM: TKJENGINEERING@VERIZON.NET
CERTIFICATE OF AUTHORIZATION NUMBER: 28582

DATE: 4/25/15
DRAWN BY: TKJ
SCALE: N.T.S.
PROJ. #: 15-0802

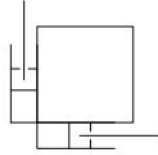
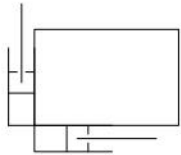


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22 OF 29

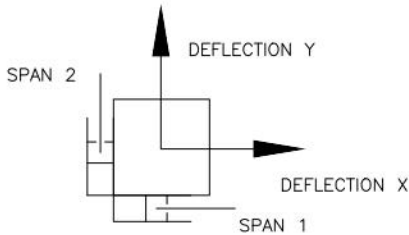
#	DATE	REVISIONS

AHT
ADVANCED HURRICANE TECHNOLOGY
6063 JANES LANE, NAPLES, FL 34109
PHONE: 239.260.0020; FAX: 239.260.0023
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MAXIMUM DESIGN PRESSURE OF A CORNER 4"x6"x1/2" MULLION (6063-T6)							
SPAN WDTH 1 UP TO	SPAN WDTH 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)
156"	120"	84"	46	49	9502	0.37	0.28
		96"	38	40	8379	0.48	0.37
		108"	33	35	7693	0.61	0.49
		120"	29	31	7050	0.74	0.61
		132"	25	27	6325	0.74	0.71
168"	48"	84"	72	85	12569	0.14	0.45
		96"	58	69	11033	0.19	0.58
		108"	49	58	9972	0.25	0.72
		120"	40	47	8736	0.34	0.86
		132"	35	41	8070	0.41	1.02
168"	72"	84"	65	74	11850	0.18	0.41
		96"	56	64	10933	0.21	0.57
		108"	45	52	9541	0.25	0.68
		120"	40	46	8887	0.35	0.88
		132"	33	38	7769	0.33	0.99
168"	96"	84"	51	57	10344	0.30	0.34
		96"	43	48	9342	0.37	0.46
		108"	37	41	8488	0.43	0.59
		120"	33	37	7926	0.50	0.75
		132"	30	33	7399	0.55	0.95
168"	120"	72"	54	58	10980	0.26	0.22
		84"	43	46	9624	0.35	0.30
		96"	35	38	8471	0.45	0.39
		108"	31	33	7855	0.58	0.51
		120"	27	29	7184	0.67	0.63
180"	48"	72"	84	100	14511	0.10	0.33
		84"	66	78	12697	0.14	0.45
		96"	52	62	10966	0.16	0.58
		108"	43	51	9842	0.27	0.71
		120"	37	44	8980	0.35	0.87
180"	72"	72"	74	85	13414	0.14	0.30
		84"	60	69	11989	0.17	0.43
		96"	50	58	10872	0.20	0.57
		108"	42	48	9736	0.26	0.72
		120"	35	40	8674	0.27	0.85

MAXIMUM DESIGN PRESSURE OF A CORNER 4"x4"x1/8" MULLION (6061-T6)							
SPAN WDTH 1 UP TO	SPAN WDTH 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"	117	123	2280	0.52	0.63
		108"	90	95	2026	0.87	0.59
		120"	68	71	1865	0.72	0.96
		132"	49	52	1672	1.09	0.60
		144"	35	37	1591	0.75	1.00
72"	48"	96"	89	97	2506	0.63	0.70
		108"	70	76	2045	0.58	0.64
		120"	51	55	1920	1.01	0.62
		132"	45	49	1752	1.07	0.84
		144"	37	40	1510	1.56	0.80
72"	72"	96"	71	71	2305	0.49	0.49
		108"	56	56	2122	0.70	0.70
		120"	49	49	1888	0.85	0.85
		132"	40	40	1507	0.76	0.76
		144"	29	29	1740	1.29	1.29
96"	48"	84"	57	64	2838	0.24	0.75
		96"	47	53	2475	0.43	0.82
		108"	44	50	2282	0.71	1.04
		120"	40	45	2094	0.88	1.11
		132"	34	38	1813	1.04	1.03
96"	72"	84"	52	55	2800	0.31	0.69
		96"	46	49	2469	0.43	0.88
		108"	40	43	2142	0.47	0.94
		120"	38	40	2024	0.68	1.00
		132"	27	29	1723	1.09	0.70
96"	96"	72"	45	45	2938	0.38	0.38
		84"	40	40	2561	0.50	0.50
		96"	38	38	2407	0.67	0.67
		108"	36	36	2221	0.83	0.83
		120"	29	29	1844	0.70	0.70
120"	48"	72"	45	52	3426	0.16	0.59
		78"	40	46	3108	0.19	0.67
		84"	37	43	2942	0.23	0.77
		90"	34	39	2750	0.26	0.83
		96"	32	37	2548	0.35	1.00



NOTE: USE DEFLECTIONS PROVIDED WHEN DETERMINING MINIMUM SEPARATION TO GLASS

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AND WHEN STORM-BARS ARE USED TO REDUCE SHUTTER DEFLECTIONS.

ROLL-UP SHUTTER MULLION

TKJ Engineering, LLC.

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SPECIFICATIONS ARE IN COMPLIANCE WITH
THE BUILDING CODE REQUIREMENTS.

23 OF 29

14335 AUTUMN CREEK DRIVE, RIVERVIEW, FL 33569
TEL: 813.404.7649; EM: TKENGINEERING@VERIZON.NET
CERTIFICATE OF AUTHORIZATION NUMBER: 28582

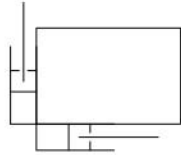
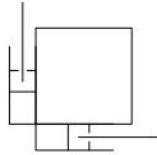
DATE: 4/25/15
DRAWN BY: TKJ
SCALE: N.T.S.
PROJ. #: 15-0802

AHT
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6063 JAMES LANE, NAPLES, FL 34109
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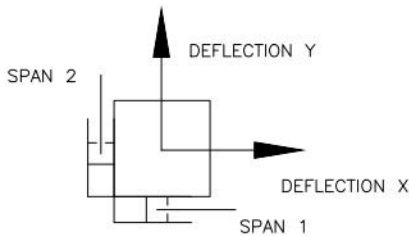
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REVISIONS



MAXIMUM DESIGN PRESSURE OF A CORNER 4\"X4\"X1/4\" MULLION (6061-T6)							
SPAN WDTH 1 UP TO	SPAN WDTH 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	4800	0.37	1.01
		108"	67	76	4261	0.48	1.18
		120"	59	67	3797	0.52	1.31
		132"	52	59	3626	0.82	1.70
		144"	48	54	3324	1.16	1.53
96"	72"	96"	71	76	4732	0.44	0.95
		108"	64	68	4310	0.52	1.21
		120"	56	60	3953	0.81	1.30
		132"	50	53	3575	1.01	1.52
		144"	45	48	3309	1.15	1.73
96"	96"	96"	52	52	4298	0.69	0.69
		108"	49	49	4070	0.90	0.90
		120"	46	46	3843	1.07	1.07
		132"	44	44	3650	1.29	1.29
		144"	41	41	3402	1.49	1.49
120"	48"	84"	64	74	5616	0.20	0.86
		96"	54	62	4969	0.27	1.06
		108"	44	51	4422	0.44	1.25
		120"	36	42	4021	0.60	1.50
		132"	31	36	3549	0.69	1.74
120"	72"	84"	60	66	5500	0.25	0.82
		96"	49	54	4786	0.32	1.00
		108"	43	47	4331	0.41	1.24
		120"	35	39	3811	0.43	1.48
		132"	30	33	3533	0.59	1.77
120"	96"	72"	53	56	5495	0.33	0.47
		84"	45	47	4865	0.41	0.62
		96"	40	42	4398	0.54	0.88
		108"	36	38	4013	0.65	1.09
		120"	34	36	3853	0.75	1.40
120"	120"	72"	44	44	5353	0.40	0.40
		84"	37	37	4713	0.55	0.55
		96"	32	32	4183	0.71	0.71
		108"	29	29	3920	0.84	0.84
		120"	26	26	3474	1.05	1.05

MAXIMUM DESIGN PRESSURE OF A CORNER 4\"X6\"X1/8\" MULLION (6061-T6)							
SPAN WDTH 1 UP TO	SPAN WDTH 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"	64	72	4075	0.37	0.61
		108"	57	64	3662	0.47	0.74
		120"	48	54	3195	0.78	0.81
		132"	44	50	2934	1.02	0.92
		144"	41	46	2688	1.40	1.02
96"	72"	96"	61	65	4103	0.41	0.61
		108"	51	54	3509	0.58	0.68
		120"	47	50	3225	0.83	0.82
		132"	40	43	2661	0.72	0.89
		144"	38	40	2504	0.86	0.97
96"	96"	96"	45	45	3568	0.69	0.44
		108"	42	42	3300	0.84	0.58
		120"	40	40	3088	1.06	0.73
		132"	37	37	2825	1.20	0.80
		144"	34	34	2732	1.51	0.90
120"	48"	84"	53	61	4884	0.20	0.53
		96"	43	50	4244	0.33	0.65
		108"	36	42	3663	0.40	0.75
		120"	33	38	3378	0.61	0.96
		132"	29	34	3027	0.69	1.03
120"	72"	84"	49	54	4744	0.24	0.51
		96"	42	46	4222	0.34	0.66
		108"	35	39	3602	0.35	0.81
		120"	33	36	3426	0.59	1.00
		132"	26	29	2910	0.83	0.94
120"	96"	72"	45	47	4660	0.32	0.30
		84"	38	40	4092	0.41	0.40
		96"	34	36	3710	0.54	0.56
		108"	31	33	3441	0.61	0.71
		120"	28	29	3138	0.58	0.85
120"	120"	72"	36	36	4347	0.39	0.24
		81"	31	31	3865	0.49	0.28
		90"	28	28	3532	0.60	0.38
		99"	26	26	3315	0.76	0.45
		108"	24	24	3082	0.85	0.53



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.

ROLL-UP SHUTTER
MULLION

TK Engineering, LLC.

1235 AUTUMN CREEK DRIVE, RIVERVIEW, FL 33569

PHONE: 813-404-7649; EMAIL: TKENGINEERING@VERIZON.NET

PROFESSIONAL ENGINEER'S CERTIFICATE OF AUTHORIZATION NUMBER: 28582

DATE: 4/25/15

PROJ. #: 15-0802

SCALE: N.T.S.

DRAWN BY: TKJ

THIS IS TO CERTIFY THAT, TO THE BEST OF MY KNOWLEDGE, THESE PLANS & SPECIFICATIONS ARE IN COMPLIANCE WITH THE BUILDING CODE REQUIREMENTS

STATE OF FLORIDA

PROFESSIONAL ENGINEER

TRAVOR JOHNSON

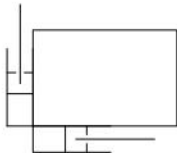
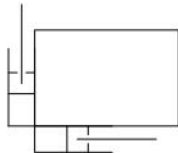
FLORIDA REG. NO. 65624

DATE: 4/25/15

PROJ. #: 15-0802

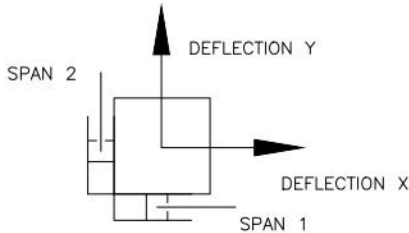
SCALE: N.T.S.

DRAWN BY: TKJ



MAXIMUM DESIGN PRESSURE OF A CORNER 4"X6"X1/4" 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"	96"	96"	67	67	6642	0.72	0.44
		108"	60	60	6068	0.90	0.54
		120"	55	55	5558	1.14	0.68
		132"	52	52	5321	1.36	0.81
		144"	49	49	4925	1.59	1.04
120"	48"	96"	78	90	8369	0.33	0.71
		108"	65	75	7325	0.40	0.88
		120"	57	66	6652	0.51	1.07
		132"	48	55	5940	0.76	1.18
120"	72"	144"	43	50	5480	0.88	1.35
		96"	71	78	8001	0.39	0.68
		108"	62	68	7313	0.44	0.85
		120"	52	57	6436	0.60	1.01
120"	96"	132"	46	51	5891	0.73	1.17
		144"	43	47	5595	1.00	1.41
		96"	52	55	6803	0.59	0.52
		108"	47	49	6296	0.74	0.68
120"	120"	120"	43	45	5874	0.89	0.88
		132"	40	42	5568	1.05	1.07
		144"	37	39	5254	1.07	1.24
		96"	43	43	6530	0.73	0.44
144"	48"	108"	38	38	5959	0.93	0.56
		120"	34	34	5428	1.17	0.69
		132"	31	31	5006	1.40	0.83
		144"	29	29	4722	1.60	1.04
144"	72"	96"	59	69	8412	0.24	0.73
		108"	50	59	7544	0.40	0.91
		120"	42	49	6727	0.53	1.11
		132"	36	42	6006	0.65	1.26
144"	96"	144"	32	38	5571	0.73	1.42
		96"	57	64	8355	0.30	0.74
		108"	48	54	7509	0.43	0.92
		120"	40	45	6588	0.48	1.07
144"	120"	132"	35	40	6069	0.46	1.23
		144"	32	36	5610	0.69	1.52

MAXIMUM DESIGN PRESSURE OF A CORNER 4"X6"X1/4" 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"	96"	96"	43	47	7069	0.51	0.59
		108"	38	41	6504	0.60	0.75
		120"	35	38	6163	0.76	0.99
		132"	32	35	5802	0.86	1.20
		144"	29	32	5416	0.90	1.47
144"	120"	84"	42	44	7426	0.50	0.37
		96"	35	37	6586	0.62	0.49
		108"	31	32	5992	0.82	0.63
		120"	28	29	5580	0.97	0.83
		132"	26	27	5338	1.18	1.00
144"	144"	72"	45	45	8186	0.42	0.24
		84"	36	36	7117	0.57	0.33
		96"	30	30	6288	0.72	0.44
		108"	26	26	5714	0.94	0.52
		120"	23	23	5244	1.05	0.67
168"	48"	72"	75	89	11289	0.13	0.43
		84"	59	70	9805	0.19	0.59
		96"	46	54	8344	0.27	0.74
		108"	39	46	7566	0.38	0.92
		120"	34	40	6981	0.49	1.10
168"	72"	72"	67	77	10536	0.19	0.40
		84"	57	65	9711	0.22	0.58
		96"	45	52	8398	0.26	0.73
		108"	38	44	7577	0.33	0.90
		120"	33	38	6889	0.38	1.13
168"	96"	72"	53	59	9252	0.29	0.33
		81"	45	50	8386	0.34	0.43
		90"	40	44	7794	0.40	0.56
		99"	36	40	7314	0.47	0.69
		108"	32	36	6764	0.50	0.83
168"	120"	72"	45	48	8679	0.33	0.29
		81"	38	41	7836	0.42	0.38
		90"	33	35	7152	0.52	0.47
		99"	29	31	6581	0.60	0.57
		108"	26	28	6083	0.69	0.70



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.

ROLL-UP SHUTTER
MULLION

TEU Engineering, LLC.

1335 AUTUMN CREEK DRIVE, RIVERVIEW, FL 33569
PH: 813.404.7649; EM: TKENGINEERING@VERIZON.NET
CERTIFICATE OF AUTHORIZATION NUMBER: 28582

DATE: 4/25/15
DRAWN BY: TKJ
SCALE: N.T.S.
PROJ. #: 15-0802



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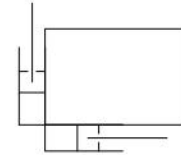
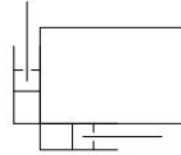
25 OF 29

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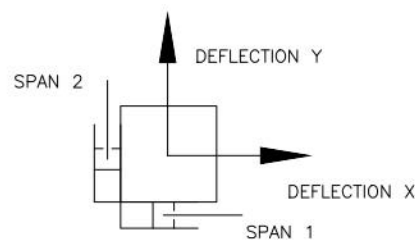
DATE

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MAXIMUM DESIGN PRESSURE OF A CORNER 4"x8"x1/4" MULLION (6061-T6)							
SPAN WDTH 1 UP TO	SPAN WDTH 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"	82	82	9014	0.73	0.32
		108"	73	73	8274	0.95	0.40
		120"	66	66	7649	1.17	0.50
		132"	61	61	7162	1.40	0.61
		144"	57	57	6707	1.61	0.76
120"	48"	96"	106	122	12231	0.30	0.54
		108"	87	100	10834	0.47	0.65
		120"	74	85	9630	0.57	0.80
		132"	65	75	8811	0.71	0.94
		144"	57	66	7975	0.78	1.09
120"	72"	96"	88	97	11040	0.48	0.47
		108"	79	87	10362	0.55	0.62
		120"	70	77	9533	0.64	0.79
		132"	62	68	8795	0.78	0.92
		144"	53	58	7861	0.96	1.05
120"	96"	96"	66	69	9467	0.64	0.37
		108"	58	61	8726	0.81	0.48
		120"	52	55	8066	0.95	0.61
		132"	48	50	7568	1.17	0.77
		144"	45	47	7279	1.29	0.92
120"	120"	96"	54	54	8880	0.74	0.31
		108"	47	47	8101	0.95	0.40
		120"	41	41	7310	1.12	0.48
		132"	38	38	6899	1.45	0.62
		144"	35	35	6499	1.73	0.73
144"	48"	96"	80	94	12321	0.30	0.54
		108"	68	80	11137	0.41	0.69
		120"	57	67	9949	0.46	0.81
		132"	50	59	9081	0.71	0.99
		144"	42	49	8094	0.88	1.08
144"	72"	96"	74	83	11882	0.39	0.52
		108"	64	72	10882	0.43	0.67
		120"	54	61	9754	0.60	0.82
		132"	47	53	8909	0.69	0.96
		144"	42	47	8250	0.89	1.14

MAXIMUM DESIGN PRESSURE OF A CORNER 4"x8"x1/4" MULLION (6061-T6)							
SPAN WDTH 1 UP TO	SPAN WDTH 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"	55	60	9902	0.56	0.41
		108"	49	53	9277	0.71	0.55
		120"	43	47	8501	0.83	0.67
		132"	40	43	8108	1.00	0.87
		144"	37	40	7708	1.14	1.06
144"	120"	96"	46	48	9270	0.70	0.35
		108"	39	41	8313	0.87	0.44
		120"	35	37	7836	1.00	0.56
		132"	31	32	7054	1.16	0.70
		144"	29	30	6789	1.44	0.84
144"	144"	84"	48	48	10028	0.59	0.24
		96"	39	39	8746	0.75	0.31
		108"	34	34	8062	0.96	0.41
		120"	29	29	7170	1.15	0.50
		132"	26	26	6644	1.38	0.61
168"	48"	96"	67	79	12842	0.29	0.57
		108"	55	65	11347	0.32	0.70
		120"	45	53	9991	0.52	0.83
		132"	39	46	9150	0.67	0.97
		144"	35	41	8540	0.79	1.18
168"	72"	96"	63	72	12477	0.33	0.55
		108"	52	60	11093	0.41	0.69
		120"	45	52	10204	0.52	0.85
		132"	39	45	9287	0.62	1.01
		144"	34	39	8438	0.72	1.18
168"	96"	84"	57	63	11579	0.42	0.33
		96"	48	53	10438	0.51	0.45
		108"	42	47	9698	0.63	0.59
		120"	37	41	8974	0.74	0.73
		132"	34	38	8589	0.84	0.92
168"	120"	84"	48	52	10741	0.49	0.29
		96"	40	43	9610	0.63	0.39
		108"	34	37	8719	0.74	0.50
		120"	30	32	7980	0.96	0.63
		132"	27	29	7525	1.05	0.76



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

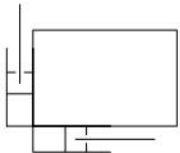
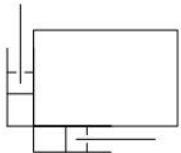
ADVANCED HURRICANE TECHNOLOGY
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ROLL-UP SHUTTER MULLION

TEU Engineering, LLC.
1555 AUTUMN CREEK DRIVE, RIVERVIEW, FL 33569
PH: 813.404.7649; EM: TKENGINEERING@VERIZON.NET
CERTIFICATE OF AUTHORIZATION NUMBER: 28582

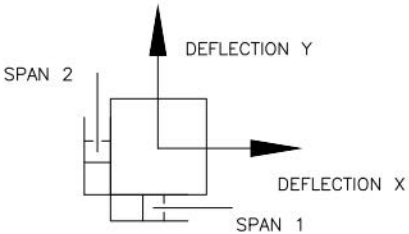
DATE: 4/25/15
DRAWN BY: TKJ
SCALE: N.T.S.
PROJ. #: 15-0802

PROFESSOR
26 OF 29



MAXIMUM DESIGN PRESSURE OF A CORNER 4"x6"x3/8" 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"	147	150	11513	0.36	0.70
		108"	123	139	10133	0.40	0.86
		120"	109	123	9230	0.54	1.05
		132"	94	106	8359	0.92	1.21
		144"	84	95	7639	1.06	1.39
96"	72"	96"	114	121	10150	0.57	0.57
		108"	102	108	9355	0.69	0.74
		120"	94	100	8823	0.80	0.93
		132"	86	91	8188	0.94	1.16
		144"	77	82	7466	1.12	1.33
96"	96"	96"	86	86	9235	0.75	0.45
		108"	76	76	8442	0.93	0.57
		120"	69	69	7850	1.15	0.69
		132"	64	64	7351	1.42	0.85
		144"	60	60	6911	1.68	1.06
120"	48"	96"	110	127	12034	0.30	0.75
		108"	89	103	10511	0.44	0.90
		120"	77	89	9552	0.56	1.08
		132"	67	77	8601	0.66	1.29
		144"	60	69	7956	0.72	1.52
120"	72"	96"	90	99	10768	0.46	0.65
		108"	80	88	9999	0.54	0.85
		120"	72	79	9337	0.60	1.07
		132"	63	69	8475	0.73	1.25
		144"	55	61	7741	1.03	1.45
120"	96"	96"	69	73	9623	0.66	0.53
		108"	61	64	8857	0.81	0.68
		120"	54	57	8105	0.92	0.84
		132"	49	52	7546	1.11	1.00
		144"	47	49	7341	1.35	1.25
120"	120"	96"	57	57	9175	0.75	0.44
		108"	49	49	8232	0.94	0.56
		120"	44	44	7637	1.20	0.70
		132"	40	40	7098	1.46	0.88
		144"	37	37	6753	1.64	1.03

MAXIMUM DESIGN PRESSURE OF A CORNER 4"x6"x3/8" 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"	96"	75	85	11503	0.38	0.71
		108"	67	76	10797	0.44	0.93
		120"	58	65	9788	0.54	1.17
		132"	48	54	8611	0.65	1.33
		144"	43	49	8005	0.83	1.59
144"	96"	96"	57	62	9885	0.55	0.58
		108"	50	54	9105	0.70	0.73
		120"	45	49	8540	0.79	0.94
		132"	41	45	8067	0.89	1.16
		144"	37	40	7421	0.96	1.39
144"	120"	96"	48	50	9399	0.68	0.50
		108"	41	43	8454	0.87	0.63
		120"	36	38	7757	1.03	0.78
		132"	33	34	7252	1.26	0.97
		144"	30	31	6747	1.43	1.20
144"	144"	96"	41	41	8987	0.76	0.44
		108"	35	35	8116	0.94	0.55
		120"	31	31	7478	1.20	0.69
		132"	28	28	6986	1.41	0.88
		144"	25	25	6443	1.58	0.99
168"	48"	96"	67	79	12189	0.27	0.76
		108"	56	66	10909	0.30	0.97
		120"	48	57	9888	0.49	1.19
		132"	41	49	9059	0.63	1.38
		144"	35	41	8090	0.73	1.58
168"	72"	96"	63	72	11856	0.29	0.74
		108"	54	62	10877	0.41	0.96
		120"	45	52	9677	0.48	1.14
		132"	39	45	8806	0.58	1.36
		144"	35	40	8235	0.64	1.62
168"	96"	96"	50	55	10418	0.51	0.63
		108"	43	48	9531	0.61	0.80
		120"	39	43	8999	0.73	1.03
		132"	35	39	8388	0.80	1.29
		144"	32	36	7967	0.90	1.53



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.

ROLL-UP SHUTTER
MULLION

TKO Engineering, LLC.

1181 ALUMINUM CREEK DRIVE, RIVERVIEW, FL 33569
PH: 239.260.0020; FAX: 239.260.0023
WWW.TKO-ENGINEERING.COM

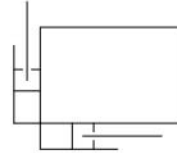
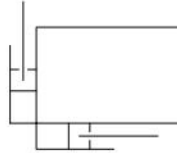
STATE OF FLORIDA
PROFESSIONAL ENGINEER
No. 65624
TREVOR JOHNSON
LICENSE

THIS IS TO CERTIFY THAT, TO THE BEST
OF MY KNOWLEDGE, THESE PLANS &
SPECIFICATIONS ARE IN COMPLIANCE WITH
THE BUILDING CODE REQUIREMENTS

DATE: 11/25/15
DRAWN BY: TKJ
SCALE: N.T.S.
PROJ. #: 15-0802

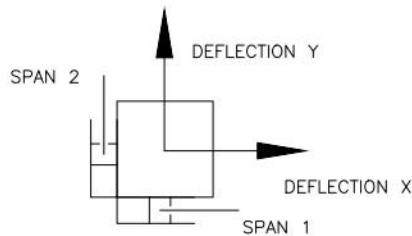
#	DATE	REVISIONS

27 OF 29



MAXIMUM DESIGN PRESSURE OF A CORNER 4"X6"X1/2" MULLION (6061-T6)							
SPAN WDTH 1 UP TO	SPAN WDTH 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	14763	0.33	0.73
		108"	150	150	12990	0.50	0.89
		120"	134	150	11836	0.65	1.10
		132"	119	134	10854	0.80	1.30
		144"	107	121	9974	0.95	1.54
96"	72"	96"	135	144	12633	0.62	0.57
		108"	119	127	11515	0.75	0.73
		120"	108	115	10728	0.86	0.93
		132"	101	107	10230	1.06	1.14
		144"	92	98	9523	1.18	1.38
96"	96"	96"	103	103	11602	0.77	0.45
		108"	90	90	10534	0.96	0.57
		120"	81	81	9748	1.19	0.71
		132"	74	74	9061	1.47	0.86
		144"	67	67	8594	1.73	1.01
120"	48"	96"	135	150	15046	0.32	0.76
		108"	114	131	13511	0.42	0.95
		120"	95	109	12082	0.59	1.11
		132"	82	94	10895	0.72	1.31
		144"	74	85	10167	0.89	1.57
120"	72"	96"	108	119	13370	0.52	0.64
		108"	95	105	12338	0.63	0.83
		120"	86	95	11588	0.71	1.07
		132"	77	85	10762	0.81	1.30
		144"	67	74	9771	0.84	1.47
120"	96"	96"	84	88	12091	0.67	0.53
		108"	72	76	10905	0.83	0.67
		120"	65	68	10198	1.01	0.83
		132"	59	62	9548	1.21	1.02
		144"	54	57	8928	1.40	1.25
120"	120"	96"	70	70	11597	0.77	0.45
		108"	60	60	10449	1.00	0.57
		120"	53	53	9620	1.24	0.70
		132"	47	47	8812	1.41	0.85
		144"	41	41	8247	1.72	1.02

MAXIMUM DESIGN PRESSURE OF A CORNER 4"X6"X1/2" MULLION (6061-T6)							
SPAN WDTH 1 UP TO	SPAN WDTH 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"	89	100	13941	0.43	0.69
		108"	78	88	12914	0.49	0.90
		120"	71	80	12254	0.59	1.17
		132"	61	69	11126	0.65	1.37
		144"	52	59	10009	0.88	1.56
144"	96"	96"	70	76	12438	0.59	0.57
		108"	61	66	11411	0.74	0.75
		120"	53	58	10449	0.83	0.92
		132"	49	53	9922	1.06	1.18
		144"	44	48	9253	1.16	1.35
144"	120"	96"	59	62	11888	0.69	0.49
		108"	50	52	10582	0.86	0.64
		120"	44	46	9788	1.05	0.79
		132"	39	41	8997	1.25	0.98
		144"	36	38	8555	1.54	1.20
144"	144"	96"	51	51	11388	0.77	0.45
		108"	44	44	10422	1.01	0.57
		120"	38	38	9485	1.24	0.69
		132"	34	34	8774	1.51	0.88
		144"	30	30	8337	1.70	1.04
168"	48"	96"	85	100	15477	0.29	0.78
		108"	71	84	13912	0.39	0.98
		120"	61	72	12676	0.48	1.23
		132"	53	63	11661	0.56	1.45
		144"	44	52	10317	0.73	1.66
168"	72"	96"	77	88	14728	0.38	0.74
		108"	67	77	13564	0.43	0.97
		120"	57	65	12311	0.53	1.15
		132"	50	57	11444	0.67	1.42
		144"	43	49	10292	0.72	1.67
168"	96"	96"	60	67	12807	0.54	0.62
		108"	52	58	11752	0.67	0.80
		120"	46	51	10919	0.81	1.00
		132"	41	46	10181	0.89	1.22
		144"	38	42	9725	1.08	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.

ROLL-UP SHUTTER MULLION

Engineering, LLC.

1335 AUTUMN CREEK DRIVE, RIVERVIEW, FL 33569

PH: 813.404.7649; EM: TKENGINEERING@VERIZON.NET

CERTIFICATE OF AUTHORIZATION NUMBER: 28582

DATE: 4/25/15

DRAWN BY: TKJ

SCALE: N.T.S.

PROJ. #: 15-0802

THIS IS TO CERTIFY THAT, TO THE BEST

OF MY KNOWLEDGE, THESE PLANS &

SPECIFICATIONS ARE IN COMPLIANCE WITH

THE BUILDING CODE REQUIREMENTS

FOR THE STATE OF FLORIDA

DATE: 4/25/15

PROF. #:

28

OF

29

FLORIDA P.E. # 65624



ADVANCED HURRICANE TECHNOLOGY

6063 JAMES LANE, NAPLES, FL 34109

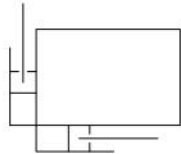
PHONE: 239.260.0020; FAX: 239.260.0023

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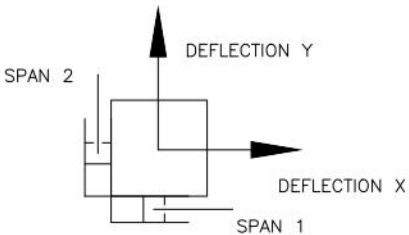
REVISIONS

DATE

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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)
168"	120"	96"	51	55	12082	0.66	0.54
		108"	44	47	11048	0.80	0.71
		120"	38	41	10049	0.96	0.88
		132"	34	37	9405	1.22	1.06
		144"	31	33	8824	1.36	1.28
192"	48"	96"	71	85	15646	0.26	0.79
		108"	59	70	14006	0.34	0.99
		120"	51	61	12915	0.42	1.23
		132"	42	50	11457	0.64	1.39
		144"	37	44	10589	0.68	1.68
192"	72"	96"	67	78	15248	0.32	0.77
		108"	57	66	13892	0.36	0.99
		120"	48	56	12529	0.50	1.22
		132"	41	48	11388	0.55	1.42
		144"	35	41	10264	0.54	1.64
192"	96"	96"	53	60	13301	0.50	0.65
		108"	46	52	12247	0.62	0.86
		120"	40	45	11211	0.70	1.07
		132"	36	41	10573	0.81	1.33
		144"	33	37	10083	0.90	1.59
192"	120"	96"	45	49	12328	0.61	0.57
		108"	38	42	11135	0.74	0.74
		120"	33	36	10217	0.85	0.90
		132"	30	33	9682	1.04	1.16
		144"	27	30	9087	1.30	1.36
216"	48"	84"	75	90	17785	0.19	0.62
		96"	61	73	15848	0.25	0.81
		108"	51	61	14315	0.33	1.02
		120"	42	50	12688	0.46	1.24
		132"	36	43	11561	0.60	1.48
216"	72"	84"	69	81	16980	0.24	0.59
		96"	58	68	15452	0.25	0.80
		108"	48	56	13831	0.36	1.00
		120"	41	48	12665	0.43	1.21
		132"	35	41	11511	0.44	1.44



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MULLION

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STATE OF FLORIDA
PROFESSIONAL ENGINEER
No. 14925
T. JOHNSON

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