

GENERAL NOTES:
(IBC 2018 & IRC 2018)

- 1- DEFINITION: THIS PRODUCT IS A HURRICANE PROTECTION DEVICE; DESIGNED, CONSTRUCTED AND ERECTED TO EASILY ENCLOSE AN AREA, PROVIDING PROTECTION FROM HURRICANE FORCE WINDS AND WIND BORNE DEBRIS WITHIN THE ALLOWABLE DESIGNED PRESSURES AND LIMITATIONS STATED IN THIS APPROVAL.
- 2- POSTING: A PERMANENT LABEL SHALL BE PROVIDED AS PER IBC 2018 SECTION 1703.5. IT SHALL BE PLACED ON A READILY VISIBLE LOCATION AND A MINIMUM OF ONE LABEL PER OPENING.
- 3- GLASS SEPARATION (GS): PRODUCT IS QUALIFIED AS "NON POROUS", THEREFORE GLAZING SEPARATION IS NOT REQUIRED WITH EXCEPTION FOR THE FOLLOWING LOCATIONS:
 - 3.1- WIND ZONE 4 AS DEFINED IN ASTM E 1996-14a
 - 3.2- ESSENTIAL FACILITIES AS DEFINED IN ASCE 7-16
 FOR THE ABOVE LOCATIONS THE PRODUCT MUST BE SEPARATED FROM GLAZING AREAS AS PER TABLE 2.
- 4- LOADS: DESIGNED LOAD TO BE CALCULATED BASED ON THE ASCE 7-16 AND PROVIDED BY A PROFESSIONAL ARCHITECT OR ENGINEER FOR EACH SPECIFIC PROJECT. THE CALCULATED DESIGNED PRESSURE MUST NOT EXCEED THE ALLOWABLE PRESSURES FOR EACH SHUTTER COMPONENT TO BE USED.
- 5- MATERIAL: ALL EXTRUDED ALUMINUM SHAPES SHALL BE MADE OF 6063-T6 OR AS NOTED.
- 6- FASTENERS: ASSEMBLY SCREWS AND ANCHORS SHALL BE CORROSION RESISTANT IN ACCORDANCE WITH 2018 IRC AND 2018 IBC.
- 7- USE: IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR, ARCHITECT OR ENGINEER OF RECORD TO VERIFY THE FOLLOWING:
 - 7.1- THE STABILITY OF THE STRUCTURE WHERE THE SHUTTER IS TO BE ATTACHED INSURING PROPER ANCHORAGE.
 - 7.2- THE SITE SPECIFIC PROJECT CRITERIA, SUCH AS BUT NOT LIMITED TO, WIND LOADS, LOCAL CODE REQUIREMENTS, DESIGNED PRESSURES ETC.
 - 7.3- THAT THIS APPROVAL IS ADEQUATE TO THE SPECIFIC PROJECT.

CODE AND STANDARD COMPLIANCE:
INTERNATIONAL BUILDING CODE (IBC 2018)
INTERNATIONAL RESIDENTIAL CODE (IRC 2018)
ASTM E330, E1996 (LEVEL D MISSILE), TAS 201, 202, 203
(LARGE & SMALL MISSILE), ASCE 7-16, ALUMINUM DESIGN MANUAL

DIGITALLY SIGNED FOR 13 PAGES

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Engineer Seal
Pedro De Figueiredo
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TABLE 1
ALLOWABLE DESIGNED PRESSURE

FW MAXIMUM (IN)	TT MAXIMUM (IN)	DESIGN RATING (PSF)
294 1/2	288	30
282 1/2	276	36
270 1/2	264	43
258 1/2	252	50
246 1/2	240	58
234 1/2	228	66
222 1/2	216	74
210 1/2	204	82
198 1/2	192	91
186 1/2	180	100
174 1/2	168	109
162 1/2	156	118
150 1/2	144	128
138 1/2	132	138
126 1/2	120	148
114 1/2	108	158
102 1/2	96	169
90 1/2	84	180

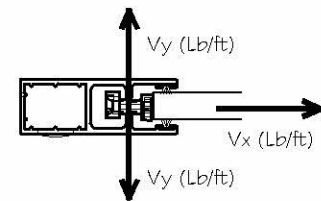
LINEAR INTERPOLATION BETWEEN ABOVE TABLE VALUES ARE ACCEPTABLE

TABLE 2 - GLASS SEPARATION "GS" (INCHES)

PD (PSF)	TT - TRACK TO TRACK DIMENSION IN INCHES										
	84	96	120	144	168	180	192	216	240	264	288
30	4.0	4.0	4.0	4.7	5.7	6.2	6.9	8.3	9.7	11.1	12.5
35	4.0	4.0	4.0	5.0	6.1	6.6	7.5	9.1	10.7	12.3	13.9
40	4.0	4.0	4.1	5.3	6.5	7.1	8.0	9.7	11.4	13.2	14.9
45	4.0	4.0	4.5	5.8	7.2	7.9	8.8	10.6	12.4	14.2	
50	4.0	4.0	4.8	6.4	7.9	8.7	9.6	11.5	13.4		
60	4.0	4.0	5.3	7.0	8.7	9.5	10.6	12.8	15.0		
70	4.0	4.0	5.7	7.4	9.2	10.1	11.4	14.0			
80	4.0	4.2	6.0	7.8	9.6	10.5	12.0	15.0			
90	4.0	4.6	6.4	8.2	10.0	10.9	12.6				
100	4.0	4.9	6.7	8.5	10.3	11.2					
110	4.3	5.2	7.0	8.9	10.7	11.6					
120	4.6	5.5	7.4	9.2	11.0	12.0					
130	4.9	5.8	7.6	9.5							
140	5.1	6.0	7.9								
150	5.7	6.6	8.3								
160	6.3	7.2									
180	7.3	8.1									

TABLE 3 - TRACK REACTIONS (LB/FT)

PD (PSF)	TT - TRACK TO TRACK DIMENSION IN INCHES																					
	84		96		120		144		168		180		192		216		240		264		288	
	Vx	Vy	Vx	Vy	Vx	Vy	Vx	Vy	Vx	Vy	Vx	Vy	Vx	Vy	Vx	Vy	Vx	Vy	Vx	Vy	Vx	Vy
30	-	105	-	120	-	150	-	180	-	210	-	225	-	240	445	270	890	300	1202	330	1397	360
35	-	123	-	140	-	175	-	210	-	245	-	263	220	280	706	315	1109	350	1395	385	1576	420
40	-	140	-	160	-	200	-	240	-	280	142	300	482	320	936	360	1318	400	1594	440	1774	480
45	-	158	-	180	-	225	-	270	295	315	372	338	677	360	1100	405	1467	450	1740	495		
50	-	175	-	200	-	250	50	300	618	350	553	375	834	400	1235	450	1592	500				
60	-	210	-	240	-	300	410	360	1103	420	898	450	1150	480	1511	540	1836	600				
70	-	245	-	280	-	350	719	420	1450	490	1216	525	1438	560	1755	630						
80	-	280	-	320	177	400	1003	480	1709	560	1526	600	1713	640	1977	720						
90	-	315	-	360	446	450	1251	540	1912	630	1807	675	1954	720								
100	-	350	-	400	683	500	1485	600	2073	700	2084	750										
110	-	385	-	440	896	550	1693	660	2205	770	2325	825										
120	-	420	174	480	1088	600	1887	720	2316	840	2554	900										
130	-	455	367	520	1271	650	2078	780														
140	67	490	540	560	1439	700																
150	216	525	661	600	1560	750																
160	332	560	755	640																		
180	514	630	926	720																		



CONTRACTOR TO VERIFY ADEQUACY OF STRUCTURE FOR MAXIMUM IMPOSED LOADS VY AND Vx

DESIGN SCHEDULE	
COMPONENT	SHEET
SLAT ALLOWABLE PRESSURE - TABLE 1	1
GLASS SEPARATION - TABLE 2	1
TRACK REACTION - TABLE 3	1
TRACK ANCHORAGE	6 THROUGH 10
MULLION DESIGN	11 & 12

- NOTES:
- 1- ALLOWABLE DESIGNED PRESSURE ARE FUNCTION OF THE LOWEST ALLOWABLE DESIGNED LOAD FOR EACH COMPONENT (SLATS, ANCHORAGE, STORM BARS & MULLIONS)
 - 2- DESIGNED PRESSURES MUST NOT EXCEED 180 PSF.
 - 3- FINISHED WIDTH (FW) MUST NOT EXCEED 294- 1/2".

Engineering:
EngCo Inc.
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9715 WEST BROWARD BLVD. 247
PLANTATION - FLORIDA - 33324

PRODUCT NAME:
**WIND ABATEMENT
SYSTEM - LARGE MISSILE**
55 MM ROLLING DOOR SYSTEM

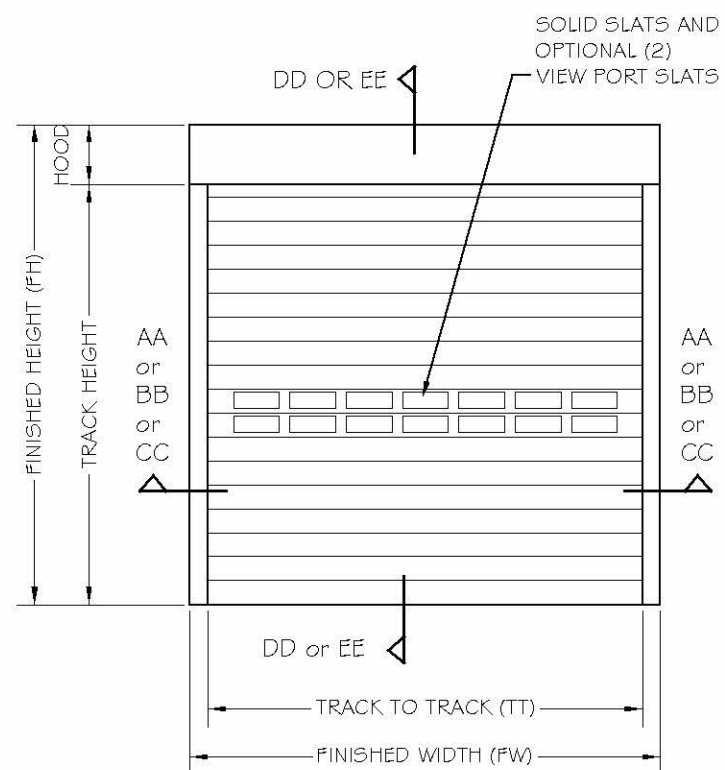
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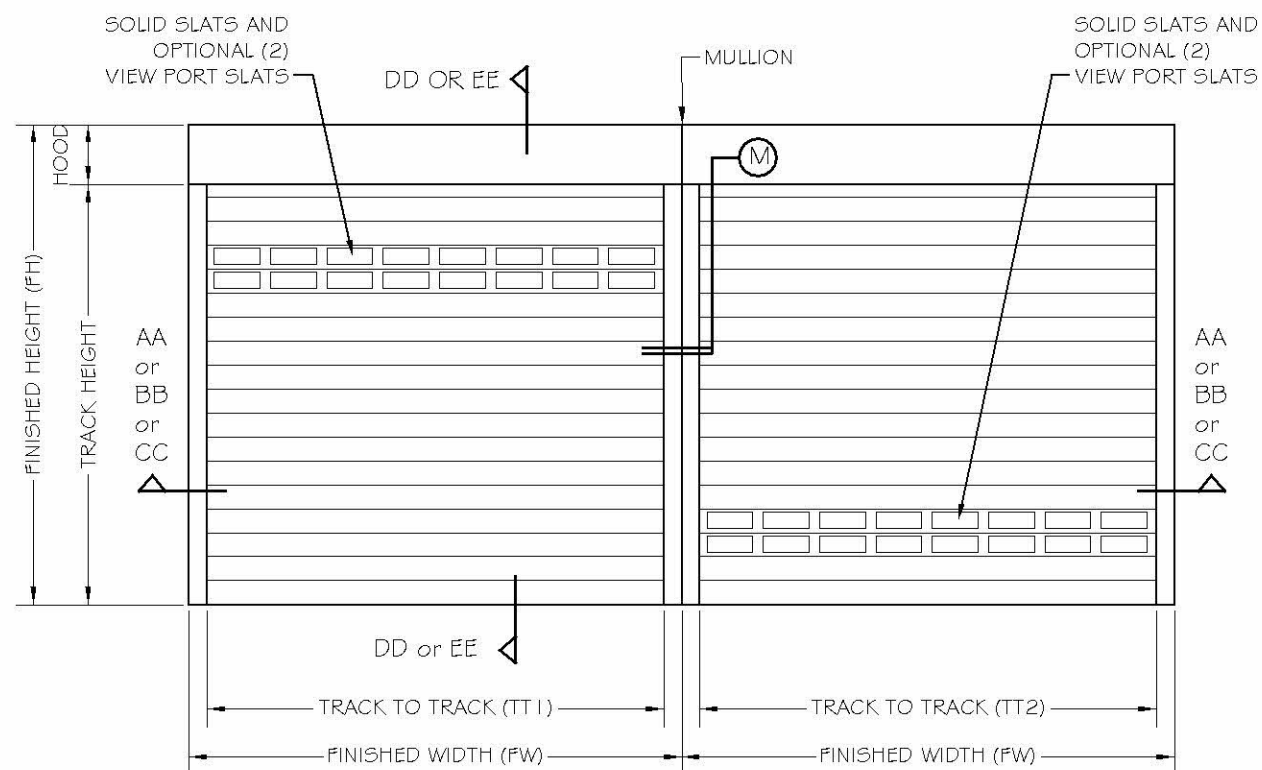
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TYPICAL ELEVATIONS

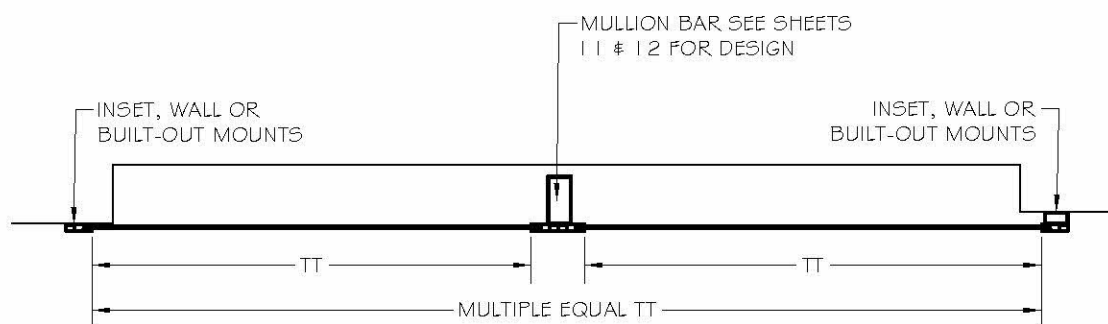
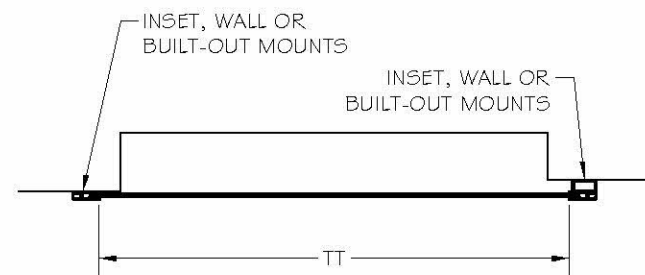
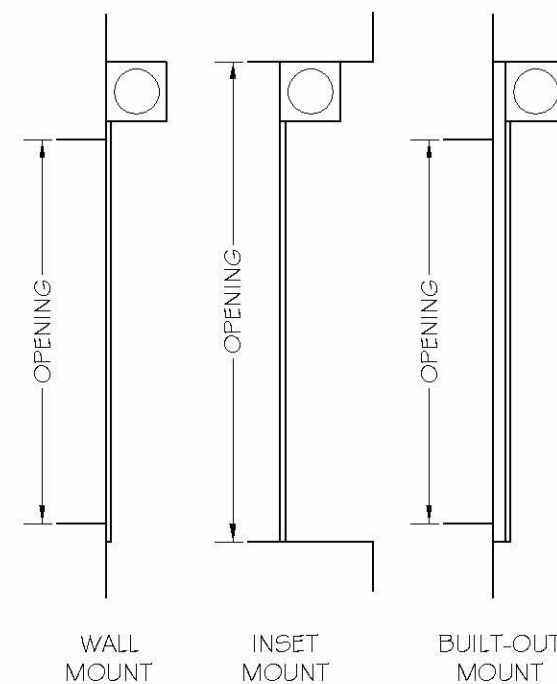
TYPICAL SINGLE UNIT ELEVATION



TYPICAL MULTIPLE UNITS ELEVATION



TT1 = TT2



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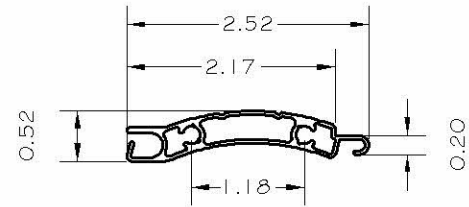
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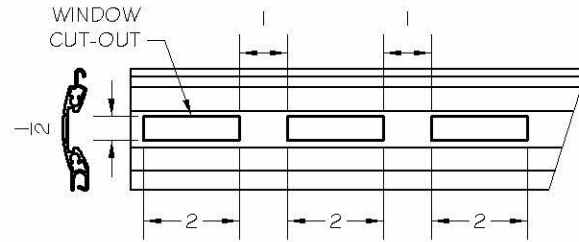


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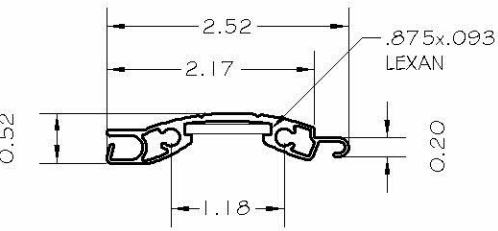
PRODUCT COMPONENTS



A- 55mm SLAT
EXTRUDED ALUMINUM 6060-T6



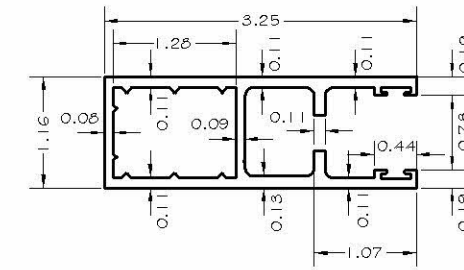
A2- POLYCARBONATE VIEWPORT WINDOW
10" MINIMUM 48" MAXIMUM



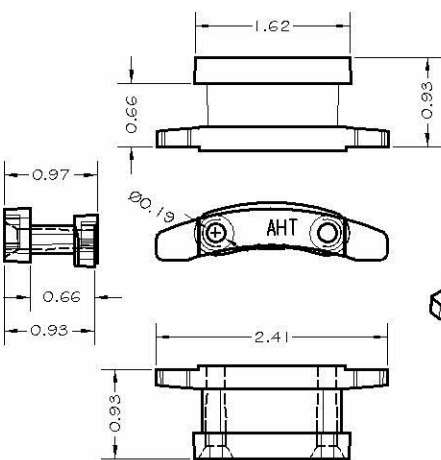
A1- 55mm W/LEXAN INSERT
EXTRUDED ALUMINUM 6060-T6

NOTES:

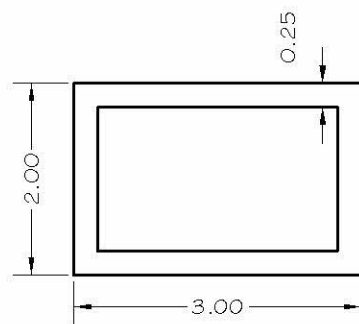
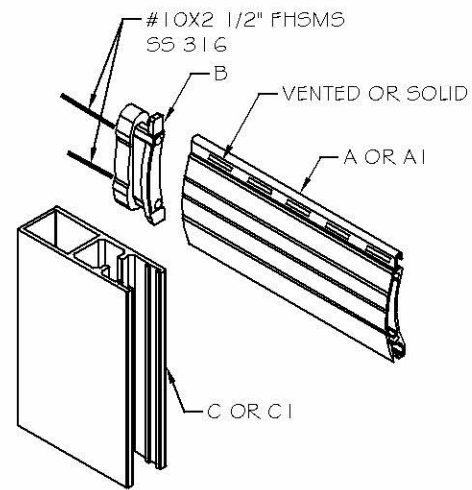
TENSILE YIELD STRENGTH	ASTM D638	9,500 PSI
FLEXURAL STRENGTH AT YIELD	ASTM D790	13,400 PSI
FLEXURAL MODULUS	ASTM D790	345,000 PSI
NOTCHED IZOD	ASTM D256	17 FT-LB/IN
SMOKE DENSITY	ASTM D2843	64.5% MAX
RATE OF BURNING	ASTM D635	C-1 CLASS
SELF IGNITION	ASTM D1929	980° F
TENSILE STRENGTH AFTER WEATHERING	ASTM D638	8,840 PSI
TENSILE STRENGTH BEFORE WEATHERING	ASTM D638	8,880 PSI
SPECIFIC GRAVITY	ASTM D792	0.043 LB/IN ³



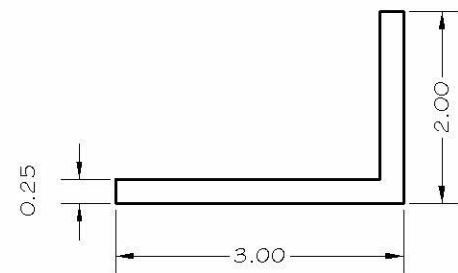
C- ROLLING WALL GUIDE RAIL
6063-T6 EXTRUDED ALUMINUM



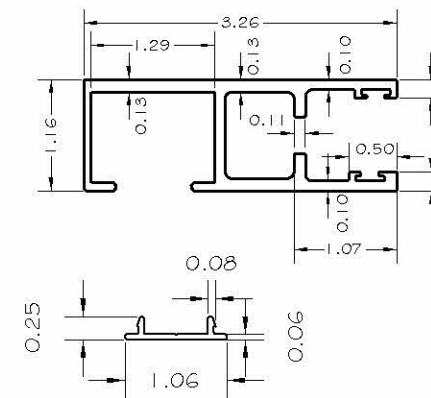
B- SLAT END LOCK
ACETAL



F- TUBE
EXTRUDED ALUMINUM
6063-T6



E- INSET SUPPORT ANGLE
EXTRUDED ALUMINUM
6063-T6



C1- ROLLING WALL GUIDE RAIL
WITH SNAP COVER
6063-T6 EXTRUDED ALUMINUM



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SLAT END RETENTION LAY-OUT

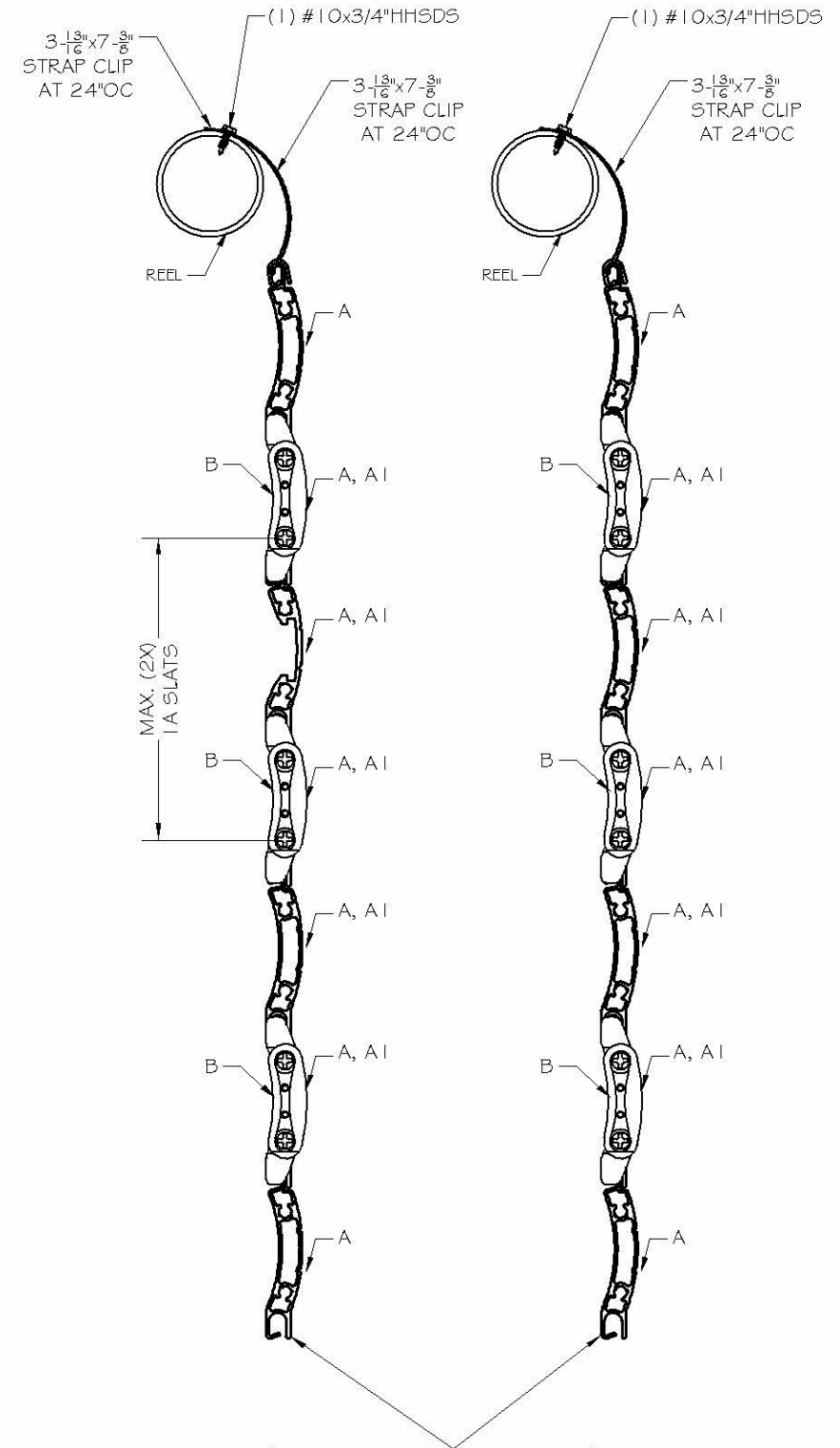
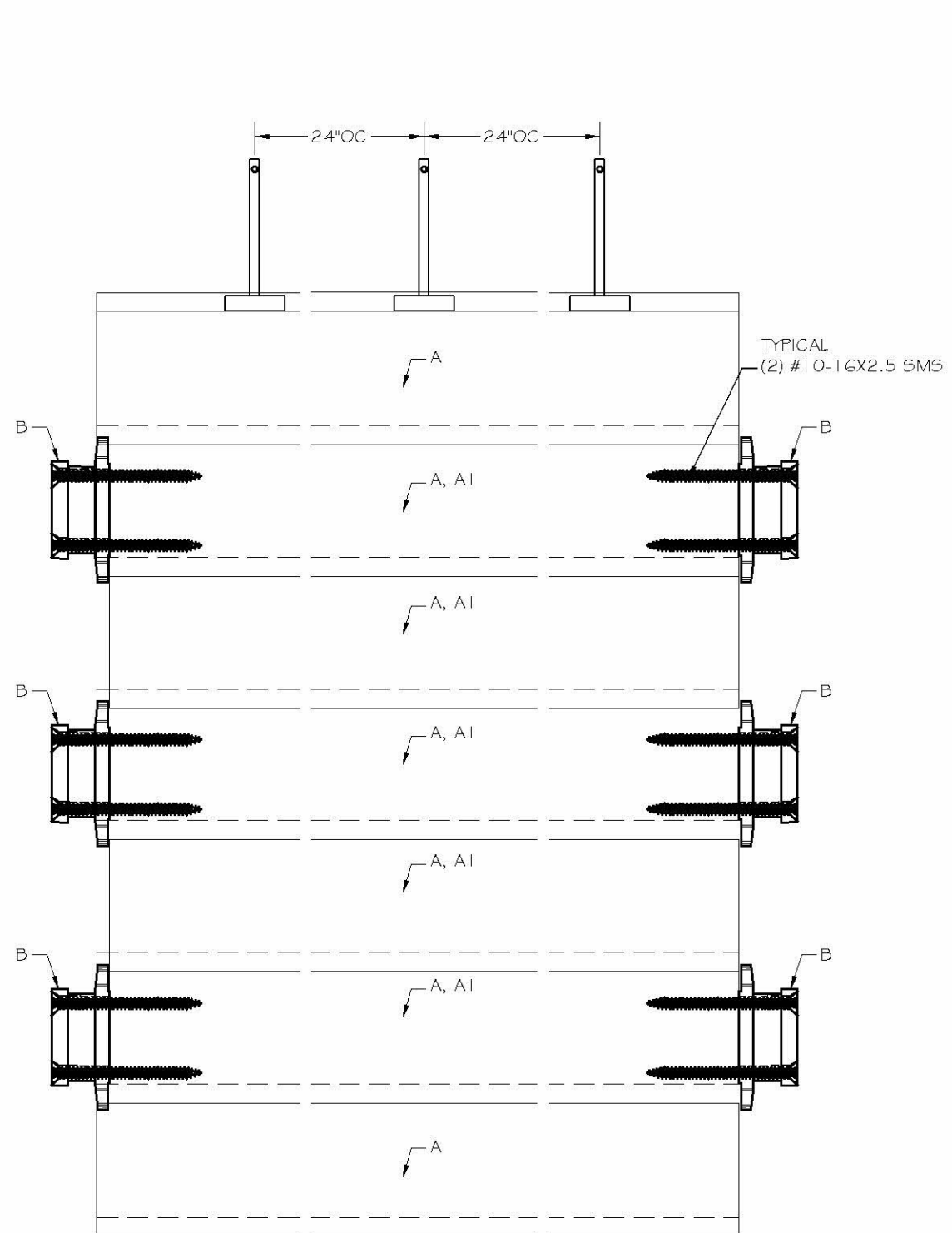


ILLUSTRATION ONLY
DOOR CAN BE MADE WITH ALL
SLAT PROFILE A AND
OPTIONAL (2X) A1



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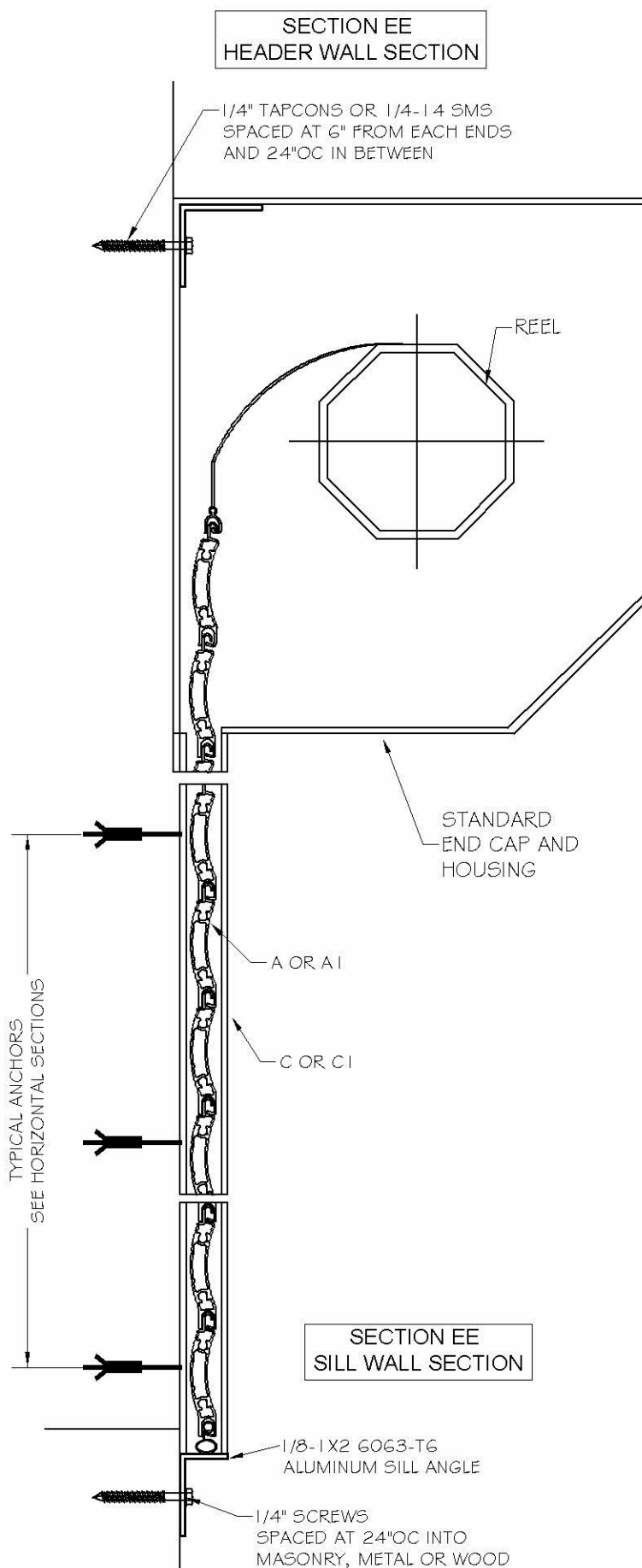
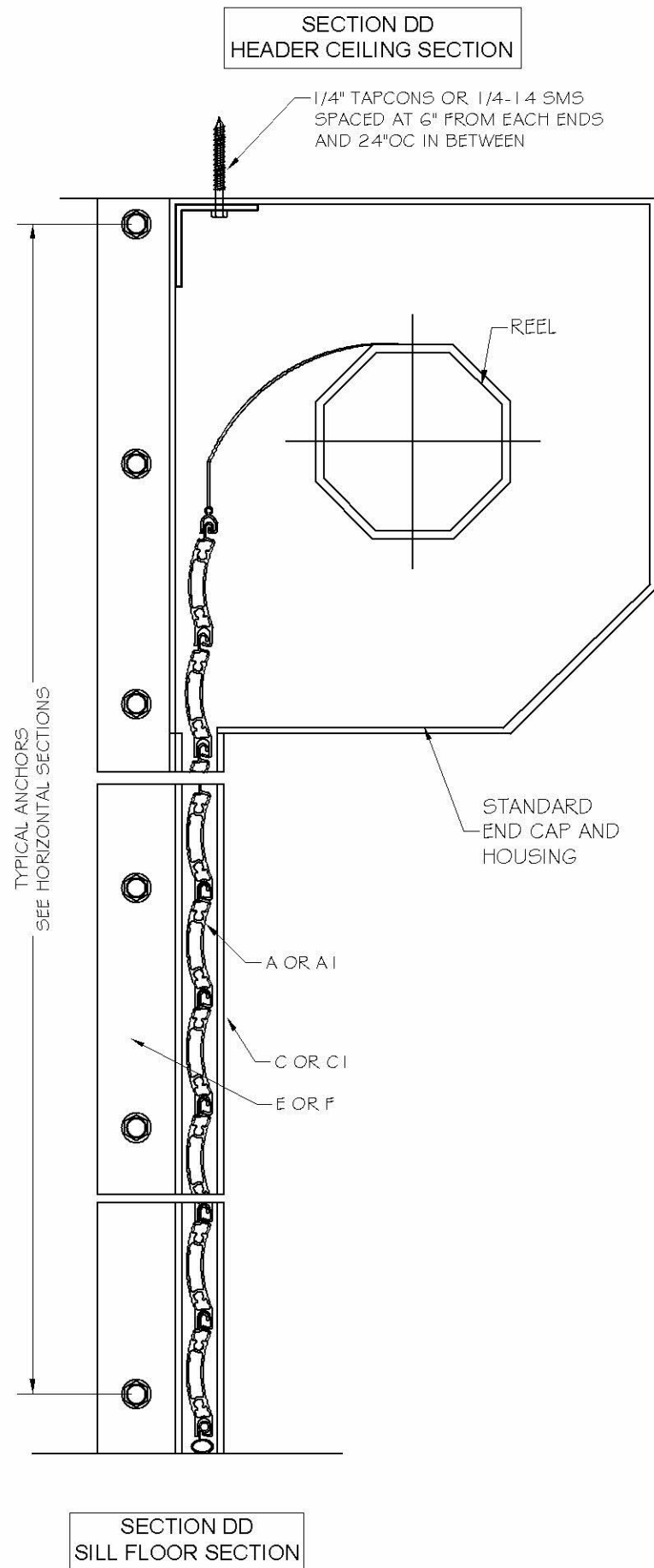
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TYPICAL VERTICAL SECTIONS



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 TEXAS - PE 102937

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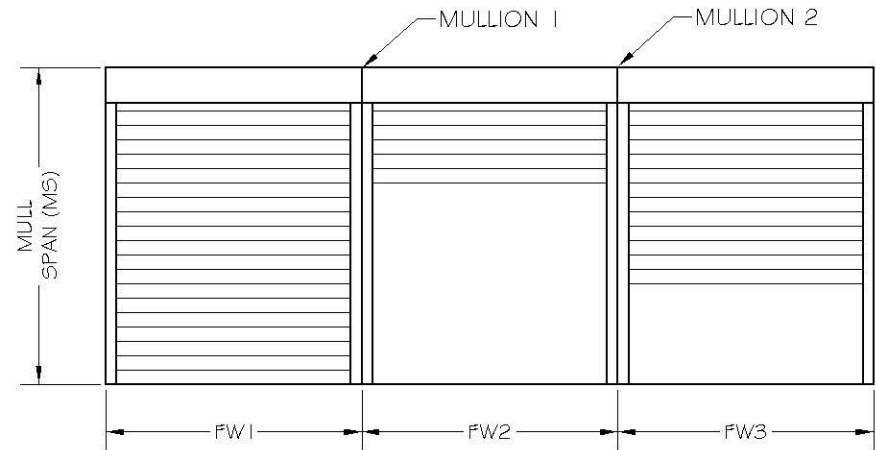
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MULLIONS SECTIONS

EQUALLY SPACED MULLIONS SELECTION

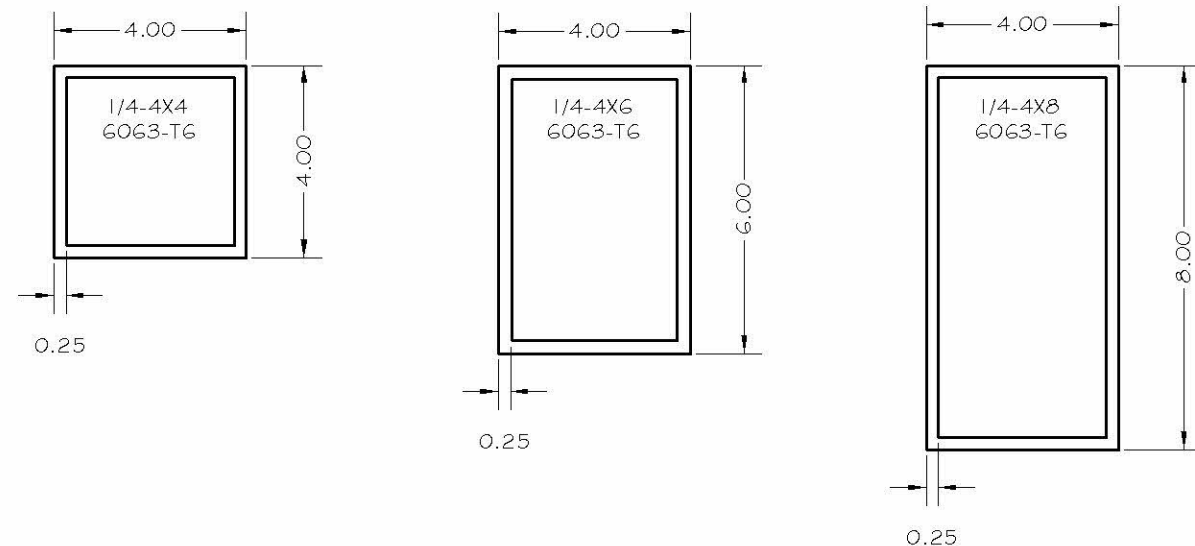
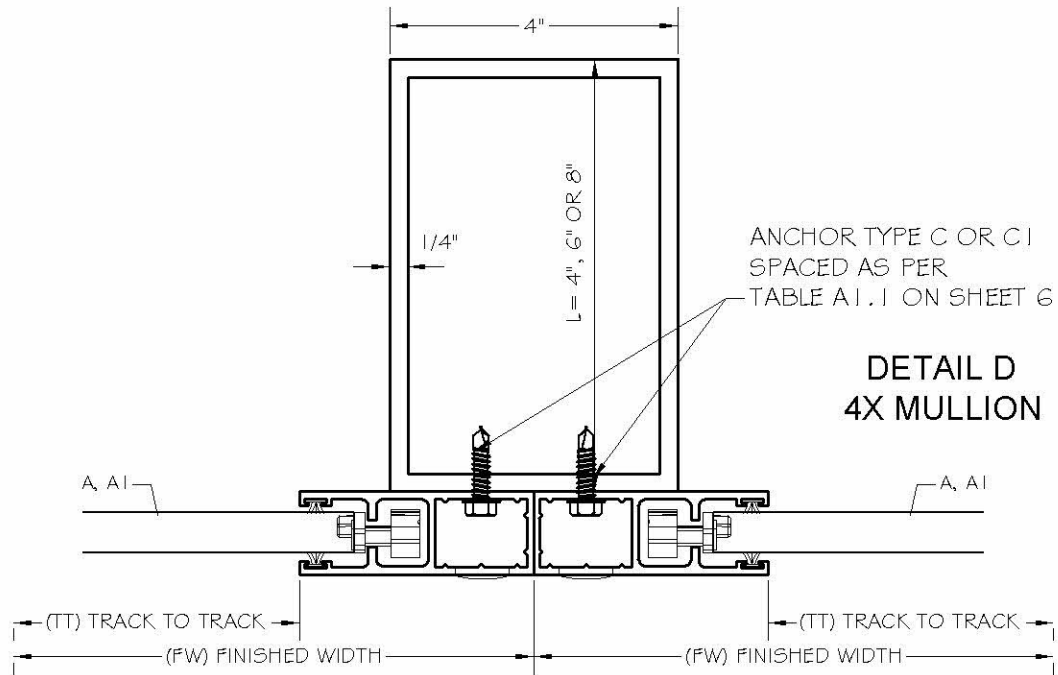


MULLION 1: $TM1 = (FW1 + FW2) / 2$
 MULLION 2: $TM2 = (FW2 + FW3) / 2$
 TM: TRIBUTARY MODULE

TABLE 4 - MULLIONS MAXIMUM DESIGNED PRESSURES (PSF)

DOOR TRIBUTARY MODULE (TM)	1/4-4x8 mullion span			1/4-4x6 mullion span			1/4-4x4 mullion span		
	144	132	120	120	108	96	96	84	72
294.5	30	30	30	27	30	30	25	30	30
270.5	32	38	42	30	39	43	27	36	43
246.5	36	41	46	33	43	54	30	39	51
222.5	39	46	50	36	47	60	33	44	56
210.5	42	49	53	38	50	63	35	46	59
186.5	47	55	60	43	56	71	40	52	67
162.5	54	63	69	50	65	82	46	60	77
150.5	58	68	75	54	70	88	49	64	83
126.5	69	81	89	64	83	105	58	77	99
102.5	86	100	110	79	102	129	72	95	122
90.5	97	113	124	89	116	146	82	107	138

- NOTES:
 1- MULLIONS WERE DESIGNED BY RATIONAL ANALYSIS BASED ON THE ALUMINUM DESIGN MANUAL.
 2- DEFLECTION CRITERIA: MAXIMUM MULL SPAN DIVIDED BY 120: (MS/120)
 3- VALUES ABOVE IS APPLICABLE ONLY FOR EQUAL MODULES FW1 =FW2 =FW3.
 4- UNEQUAL MODULES ARE TO BE DESIGNED BY RATIONAL ANALYSIS IN A CASE BY CASE BASIS.



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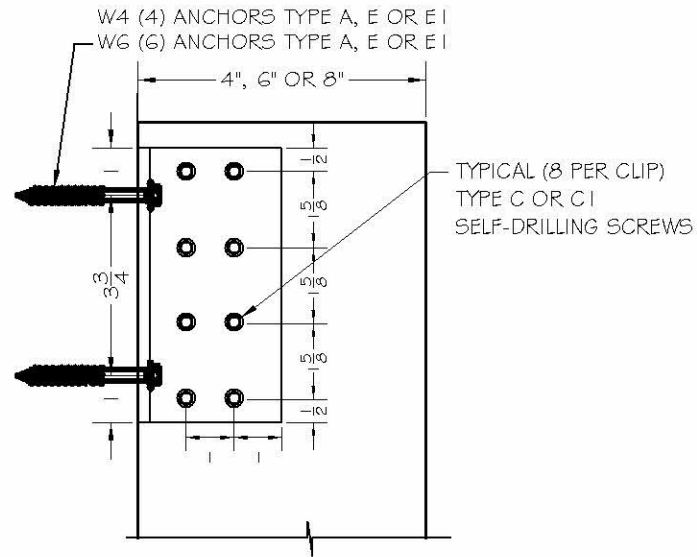
PRODUCT NAME:
 WIND ABATEMENT
 SYSTEM - LARGE MISSILE
 55 MM ROLLING DOOR SYSTEM

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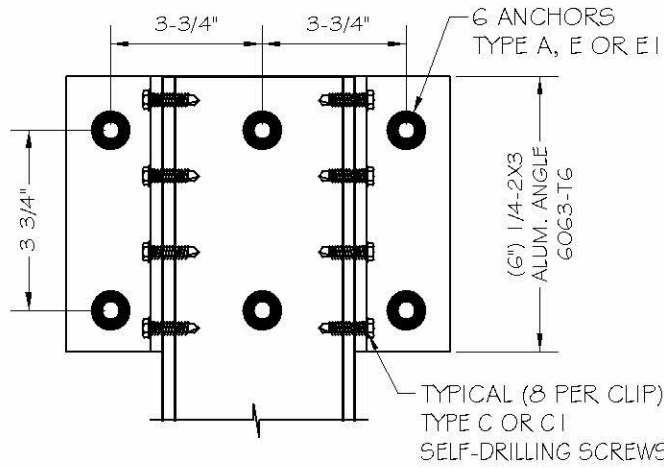


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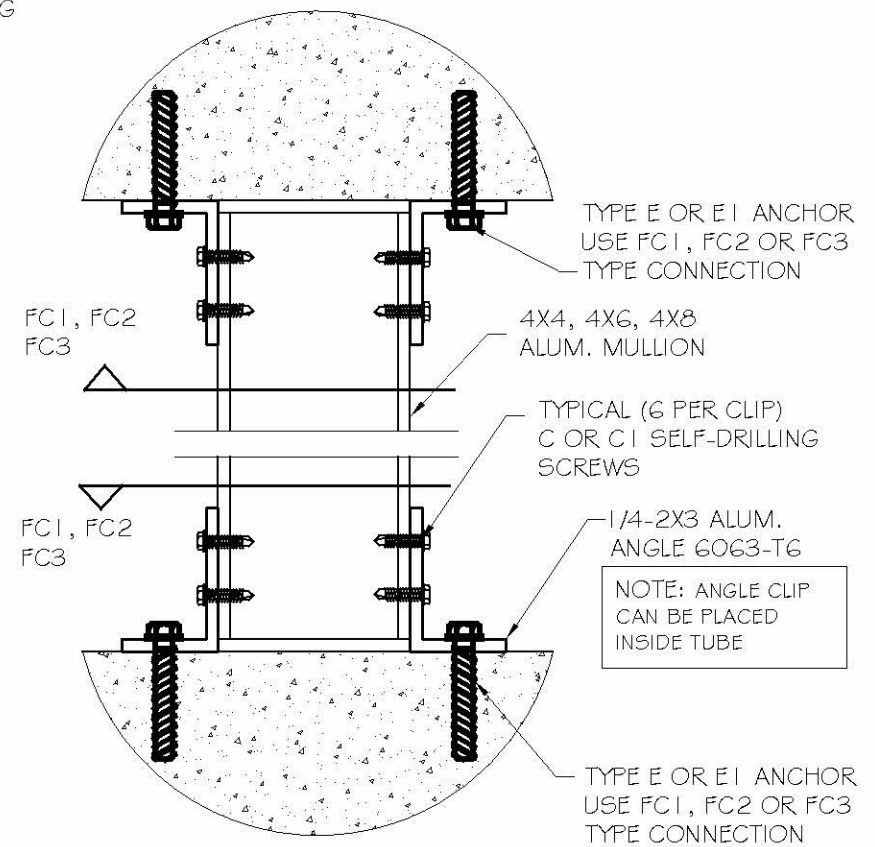
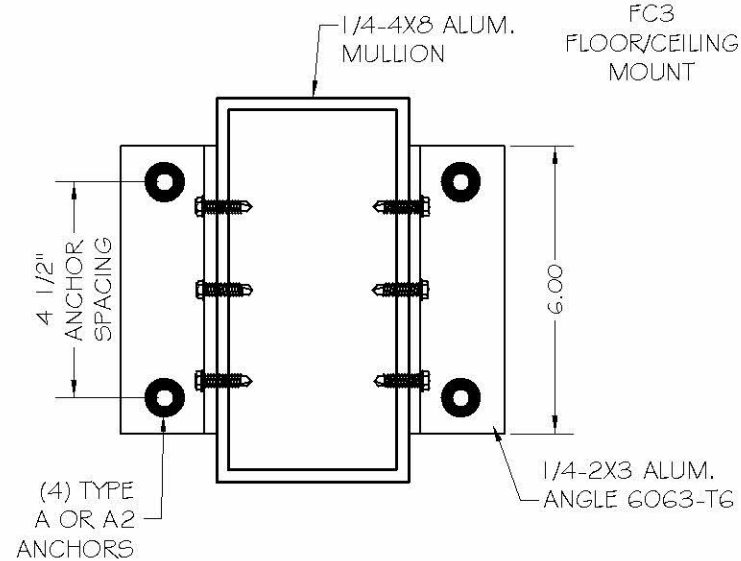
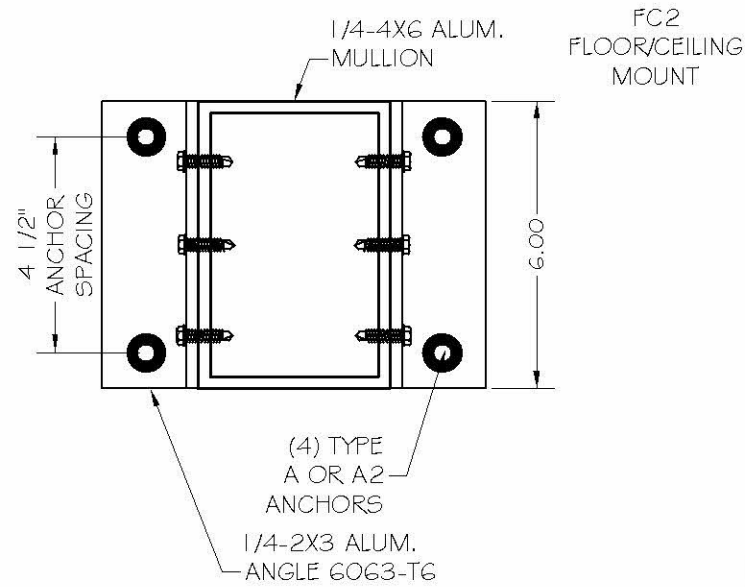
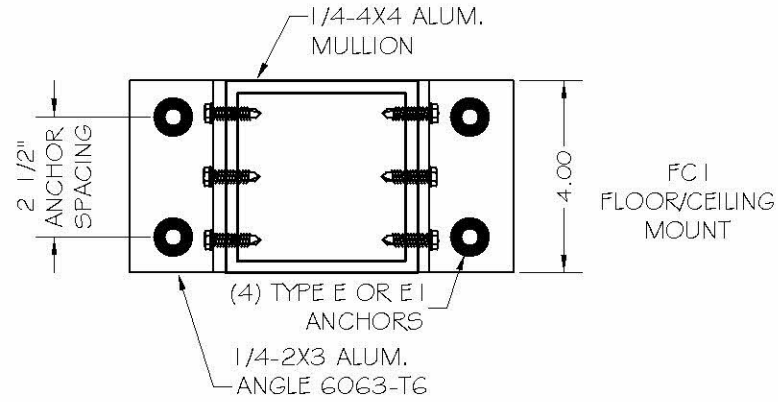
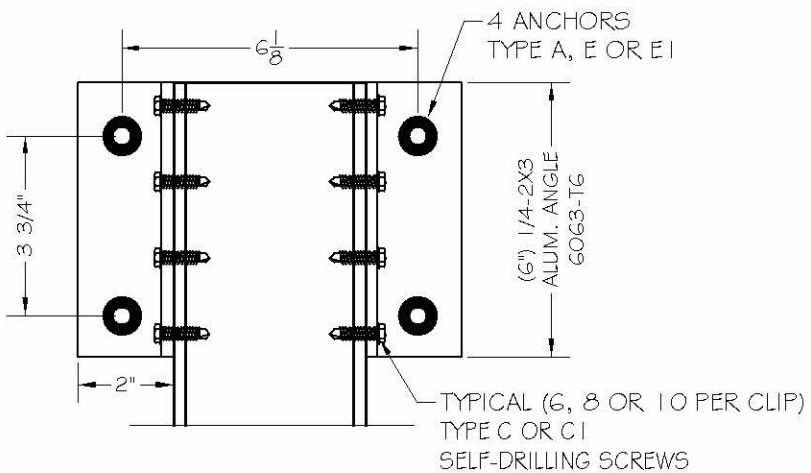
EQUALLY SPACED MULLIONS WALL AND FLOOR CONNECTIONS



W6 - WALL MOUNT MOUNT WITH (6) ANCHORS TYPE A OR E OR E1



W4 - WALL MOUNT MOUNT WITH (4) ANCHORS TYPE A, E OR E1



ANCHOR SCHEDULE:

ANCHOR	DESCRIPTION	MATERIAL	EMBEDMENT	EDGE DISTANCE
A	5/16" ITW TAPCONS XL	MIN. 3000 PSI CONCRETE	2 1/4"	2 3/16"
E	3/8" POWERS WEDGE BOLT	MIN. 3000 PSI CONCRETE	3 1/2"	4-1/2"
E1	3/8" SS POWERS WEDGE BOLT	MIN. 3000 PSI CONCRETE	3 1/2"	4-1/2"



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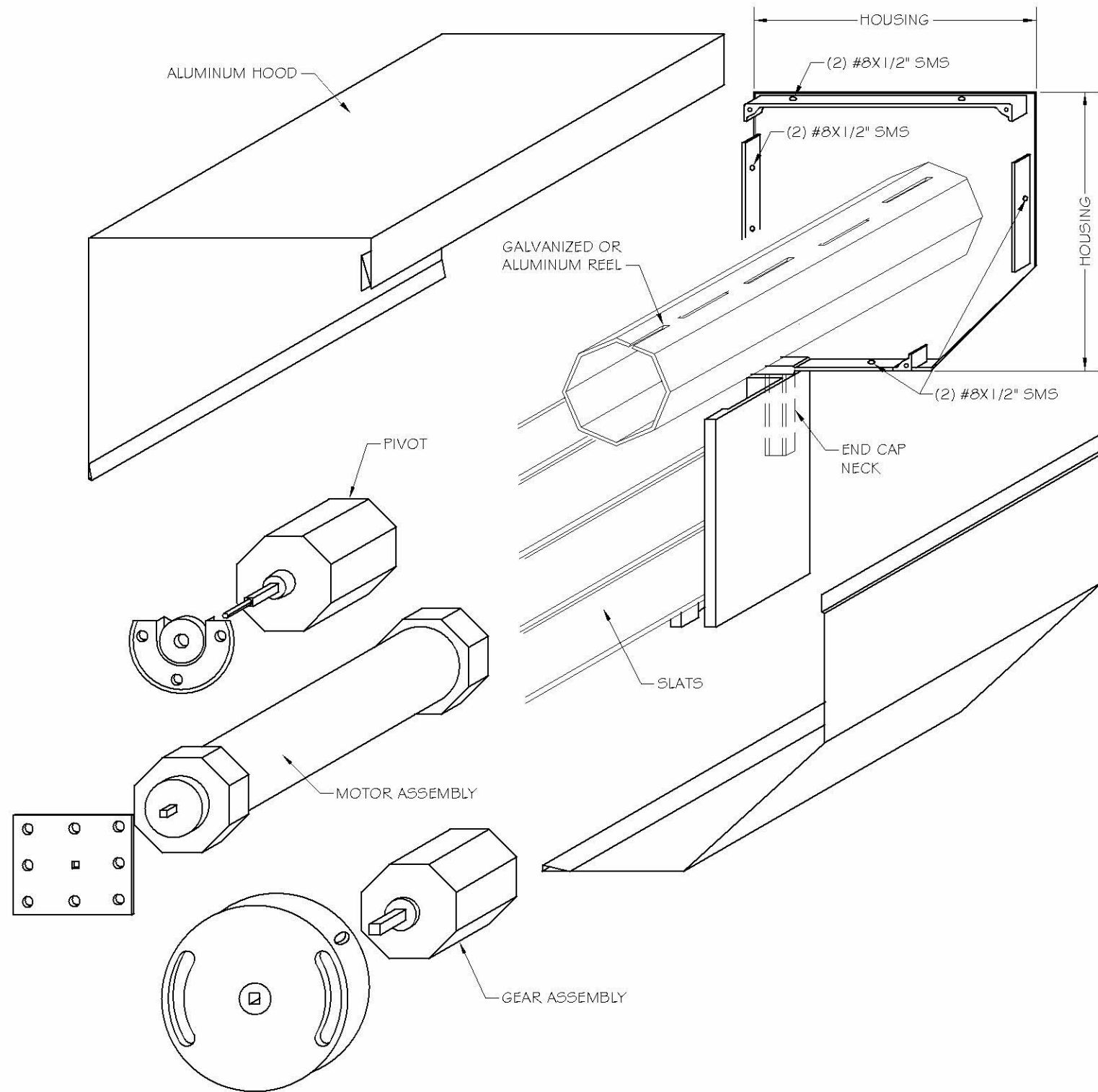
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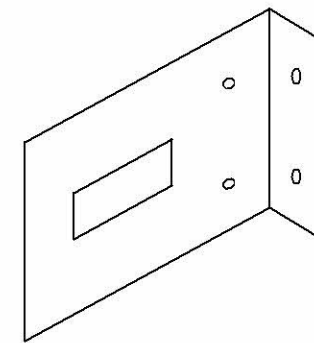
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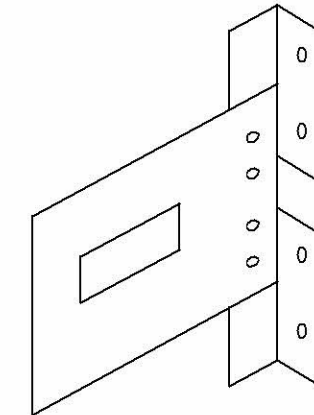
HOOD ASSEMBLY



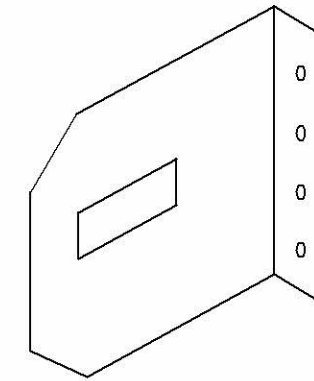
OPTIONAL STEEL BRACKET



UP TO 100 LBS SHUTTER WEIGHT
 (2) 5/16" TAPCON OR
 (3) 1/4"Øx1" SMS

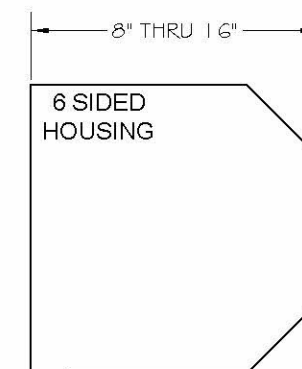
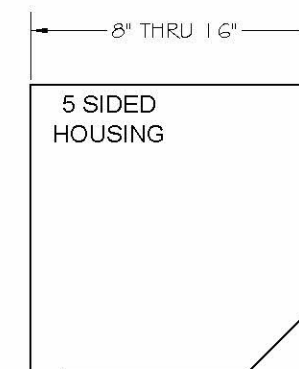
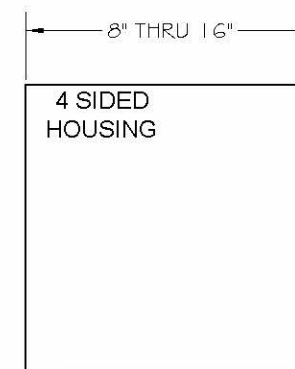


UP TO 200 LBS SHUTTER WEIGHT
 (3) 5/16"Ø TAPCONS OR
 (4) 1/4"Øx1" SMS



UP TO 350 LBS SHUTTER WEIGHT
 (4) 5/16" TAPCON OR
 (6) 1/4"Øx1" SMS

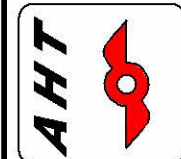
NOTE: THE ROLL-UP MECHANISM (GEARS, MOTORS, SUPPORTING END PLATES) ARE NOT PART OF THIS APPROVAL. MANUFACTURER IS RESPONSIBLE TO SPECIFY THESE COMPONENTS FOR PROPER SHUTTER OPERATION.



Engineering:
Eng'Co Inc.
 CR 11234
 9715 WEST BROWARD BLVD. 247
 PLANTATION - FLORIDA - 33324

PRODUCT NAME:
**WIND ABATEMENT
 SYSTEM - LARGE MISSILE
 55 MM ROLLING DOOR SYSTEM**

MANUFACTURER:
**ADVANCED HURRICANE
 TECHNOLOGIES**
 6063 JAMES LANE
 NAPLES, FLORIDA 34109
 TEL: (239) 260-0020



SCALE:
 NA
 DATE:
 04/13/2020
 DRAWING #
 19-044.1
 SHEET
 13 OF 13