

GENERAL NOTES: (IBC 2006 & IRC 2006 w/ 2006 TEXAS REVISIONS)

- 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 2006 SECTION 1703.5 IT SHALL BE PLACED ON A READILY VISIBLE LOCATION AND A MINIMUM OF ONE LABEL PER OPENING.
- 3- GLASS SEPARATION: 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 (LOCATIONS WITH WIND GUST GREATER THAN 140 MPH)
 - 3.2- ESSENTIAL FACILITIES AS DEFINED IN ASCE 7 FOR THE ABOVE LOCATIONS THE PRODUCT MUST BE SEPARATED 20" FROM GLAZING AREAS.
- 4- LOADS: DESIGNED LOAD CALCULATED BASED ON THE ASCE 7 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 AS SPECIFIED IN SECTION R325 (IRC 2006 TEXAS REVISIONS) AND CHAPTER 17 (IBC 2006 TEXAS REVISIONS). ANCHORS ARE TO BE SELECTED BASED ON AREA LOCATION (SEAWARD, INLAND I OR INLAND II).
- 7- REINFORCEMENTS SUCH AS MULLIONS WERE DESIGNED BY RATIONAL ANALYSIS AND ARE PART OF THESE DRAWINGS. DUE TO MANY VARIATIONS OF REINFORCEMENTS, LOADS AND SHUTTER DIMENSIONS BECOME IMPRACTICAL ADDRESSING ALL CONDITIONS IN ONE SET OF DRAWINGS. THE CONDITIONS ADDRESSED IN THE PROPOSED DRAWINGS HAVE CONSERVATIVE LIMITATIONS IN ORDER TO FACILITATE THE DESIGN. SITE SPECIFIC CONDITIONS CAN BE ADDRESSED ON A JOB BASIS PROVIDED PROPER ENGINEERING BASED ON THE ALUMINUM DESIGN MANUAL.
- 8- USE: IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR, ARCHITECT OR ENGINEER OF RECORD TO VERIFY THE FOLLOWING:
 - 8.1- THE STABILITY OF THE STRUCTURE WHERE THE PRODUCT IS TO BE ATTACHED INSURING PROPER ANCHORAGE.
 - 8.2- THE SITE SPECIFIC PROJECT CRITERIA, SUCH AS BUT NOT LIMITED TO, LOCAL CODE REQUIREMENTS, DESIGNED PRESSURES ETC.
 - 8.3- THAT THIS APPROVAL IS ADEQUATE TO THE SPECIFIC PROJECT.
- 9- INCREASE IN ALLOWABLE STRESS BY 33 1/3% HAVE NOT BEEN USED IN THE DESIGN OF THE ANCHORS FOR THIS PRODUCT APPROVAL.

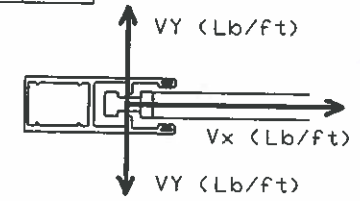
CODE AND STANDARD COMPLIANCE:
 INTERNATIONAL BUILDING CODE (IBC 2006) WITH TEXAS REVISIONS
 INTERNATIONAL RESIDENTIAL CODE (IRC 2006) WITH TEXAS REVISIONS
 ASTM E330, E1886, E1996 (LEVEL D MISSILE)

**TABLE 1
ALLOWABLE DESIGNED PRESSURE**

FW MAX. (IN)	TT MAX. (IN)	DESIGN RATING (PSF)
293 3/8	287 1/16	±30
278 1/16	271 3/4	±40
262 9/16	256 1/4	±50
246 15/16	240 5/8	±60
231	224 11/16	±70
222 5/16	216	±75
216 5/16	210	±79
210 5/16	204	±83
204 5/16	198	±87
198 5/16	192	±90
192 5/16	186	±94
186 5/16	180	±98
180 5/16	174	±102
174 5/16	168	±105
168 5/16	162	±109
162 5/16	156	±113
156 5/16	150	±116
150 5/16	144	±120

TABLE 2 - TRACK REACTION (LB/FT)

LOAD psf	TRACK TO TRACK (TT)											
	144		162		180		204		224-11/16		287-1/16	
	VX	VY	VX	VY	VX	VY	VX	VY	VX	VY	VX	VY
20	0	122	0	137	332	152	777	172	1104	189	0	241
30	0	183	373	205	796	228	1149	258	1428	283	998	361
40	254	243	691	273	1152	303	1306	343	1494	378		
50	448	304	897	342	1370	379	1410	429	1555	472		
60	603	365	1005	410	1439	455	1460	515	1599	567		
70	728	426	1001	478	1341	531	1533	601	1739	661		
80	832	487	998	547	1341	607	1592	687				
83	812	504	1007	567	1348	629	1672	712				
90	763	548	1029	615	1365	683						
98	722	596	1050	670	1431	743						
100	711	608	1055	683								
109	762	663	1149	745								
110	768	669										
120	818	730										



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

DESIGN SCHEDULE

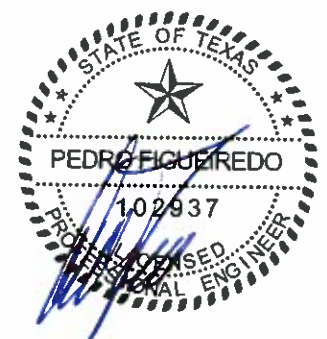
COMPONENT	SHEET
SLAT ALLOWABLE PRESSURE - TABLE 1	1
TRACK REACTION - TABLE 2	1
TRACK ANCHORAGE	4, 5, 6, 7 & 8
MULLION	9 & 10

- NOTES:
- 1- ALLOWABLE DESIGNED PRESSURE ARE FUNCTION OF THE LOWEST ALLOWABLE DESIGNED LOAD FOR EACH COMPONENT (SLATS, ANCHORAGE & MULLIONS)
 - 2- DESIGNED PRESSURES MUST NOT EXCEED 120 PSF.
 - 3- TRACK TO TRACK DIMENSION (TT) MUST NOT EXCEED 287 1/16"

Manufacturer:
CROCI NORTH AMERICA
 11600 ADELMO LANE
 FORT MYERS, FL 33966
 Tel.: (239) 278-3066
 Fax: (239) 278-5977

PRODUCT:
ES 55 SUP
Rolling Shutter
 LARGE & SMALL MISSILE
 IMPACT RATED

Engineering:
EngCo Inc.
 CR 11234
 5595 ORANGE DR. SUITE 201
 DAVIE - FLORIDA 333314
 www.engcoinc.com



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Engineer Seal
 Pedro De Figueiredo
 TEXAS - PE 102937

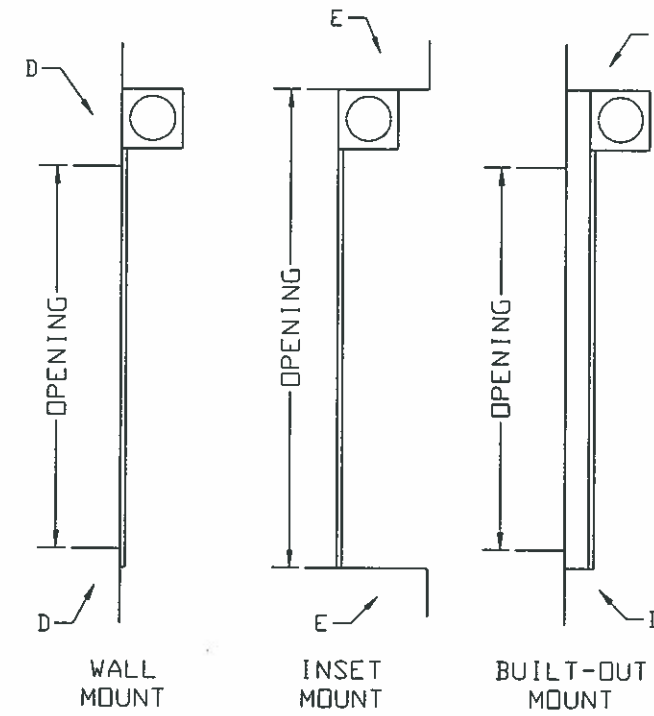
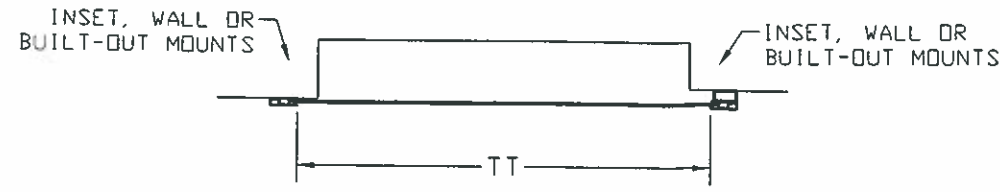
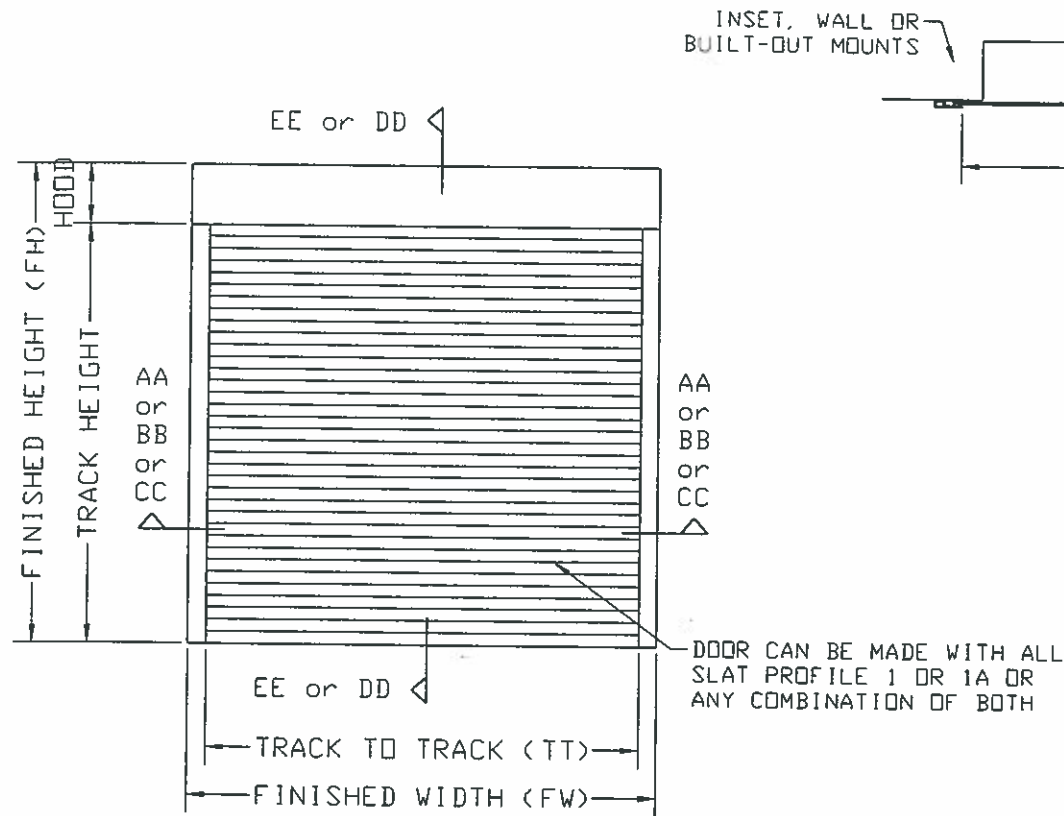
REVISIONS:
 1- REPLACES DWG 09-106

Date: 03/18/13
 Scale: NA
 Design by: PPMF

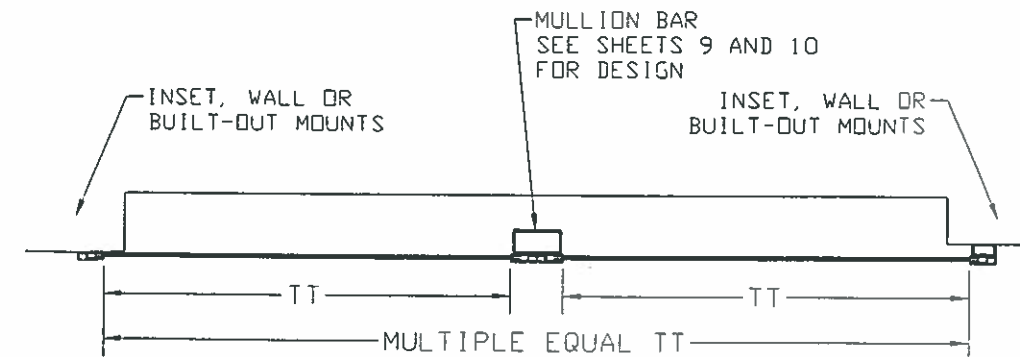
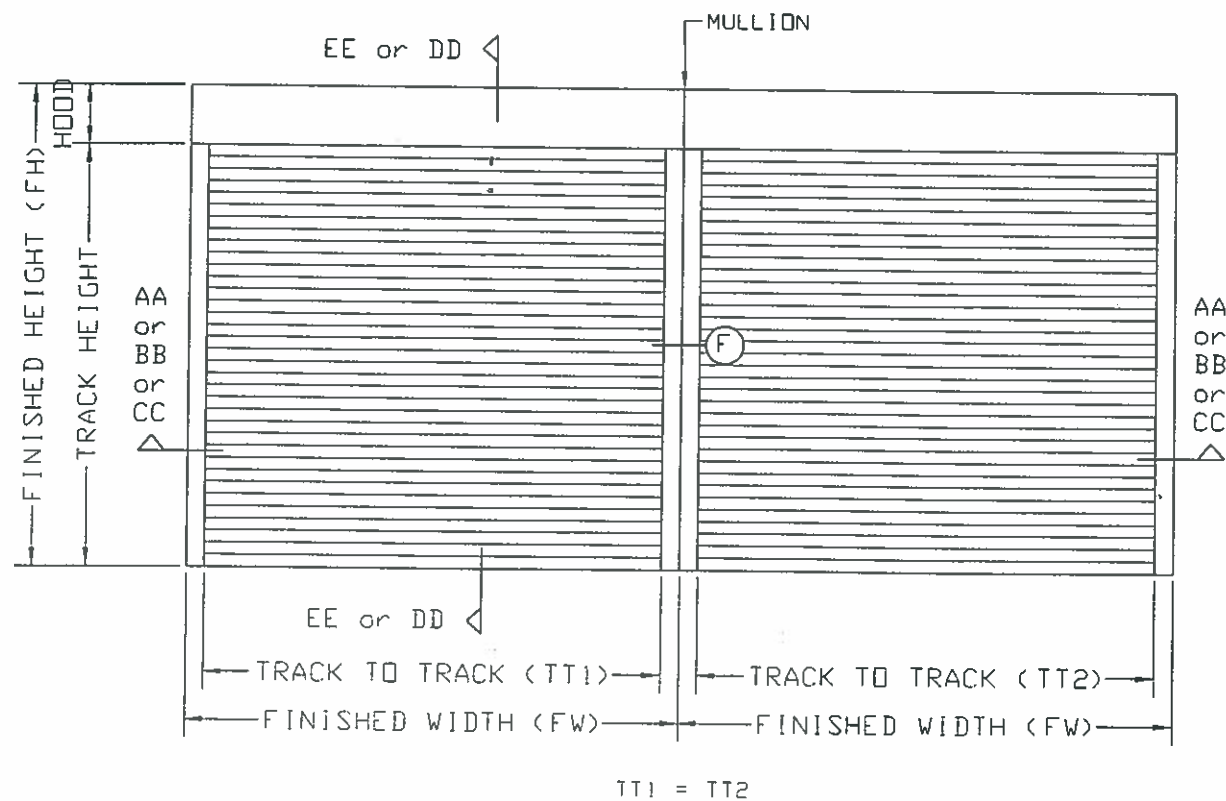
Drawing Number
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SHEET
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TYPICAL SINGLE UNIT ELEVATION



TYPICAL MULTIPLE UNITS ELEVATION



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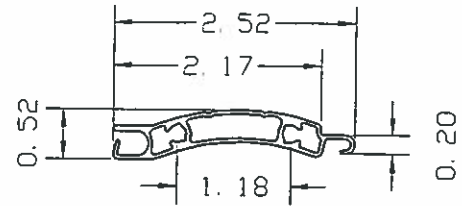
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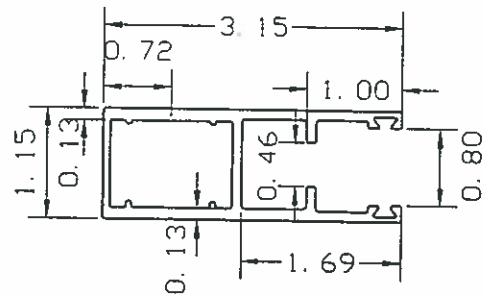
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SHEET
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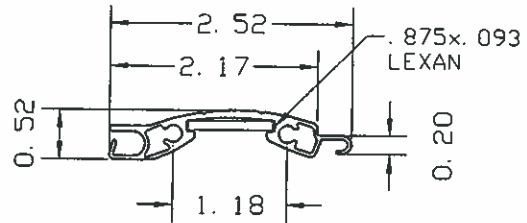
PRODUCT COMPONENTS



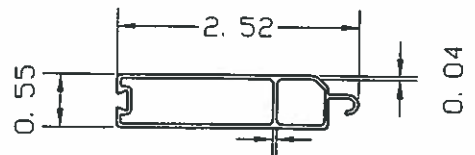
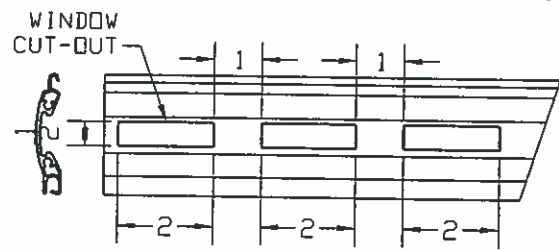
1- ES55 SUP SLAT
EXTRUDED ALUMINUM 6063-T6



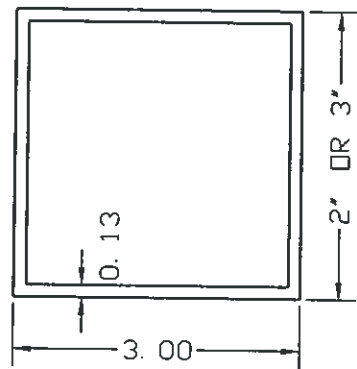
5- GE4580 SUP
3\"/>



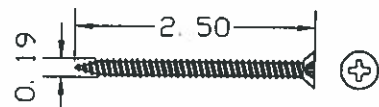
1A- ES55 LEX W/LEXAN INSERT
EXTRUDED ALUMINUM 6063-T6



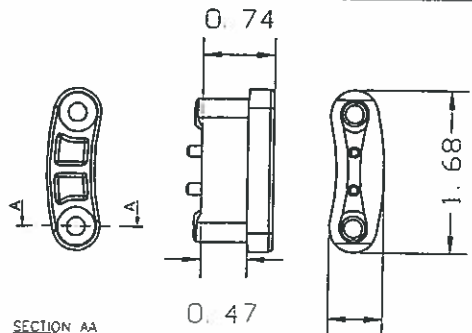
2- TE14X56U END SLAT
6063-T6 EXTRUDED ALUMINUM



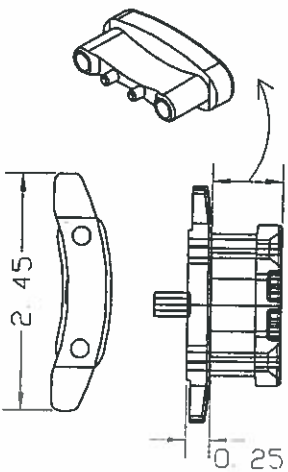
6- 1/8-3X3 TUBE OR
6A- 1/8-2X3 TUBE
EXTRUDED ALUMINUM 6063-T6



3- SLAT RETENTION SCREW
#10x2-1/2\"/>



4- NYLON SLAT LOCK



SLAT END RETENTION LAY-OUT

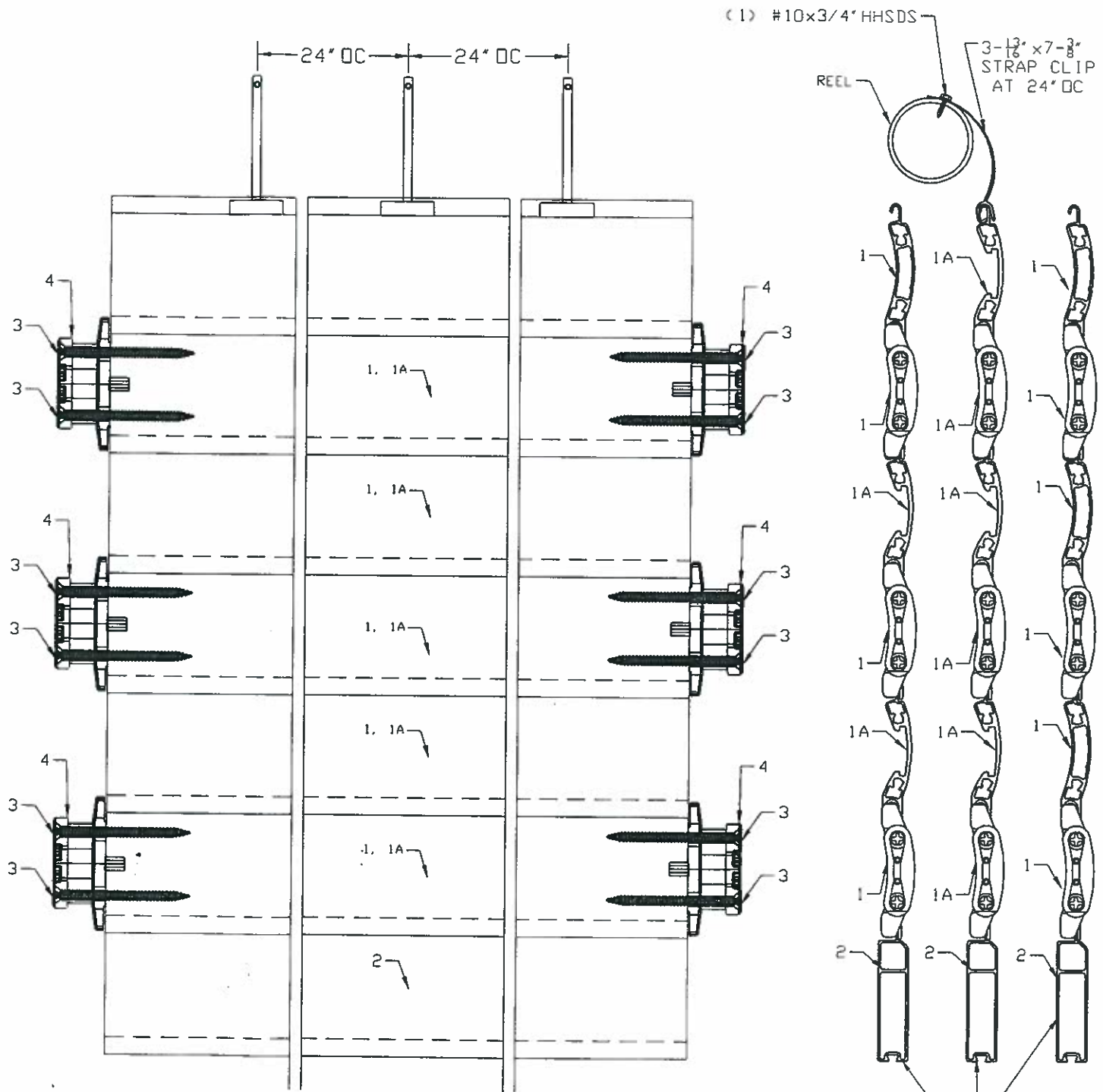


ILLUSTRATION ONLY
DOOR CAN BE MADE WITH ALL
SLAT PROFILE 1 OR 1A OR
ANY COMBINATION OF BOTH

Manufacturer:
CROCI NORTH AMERICA

11600 ADELMO LANE
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TYPICAL VERTICAL SECTIONS

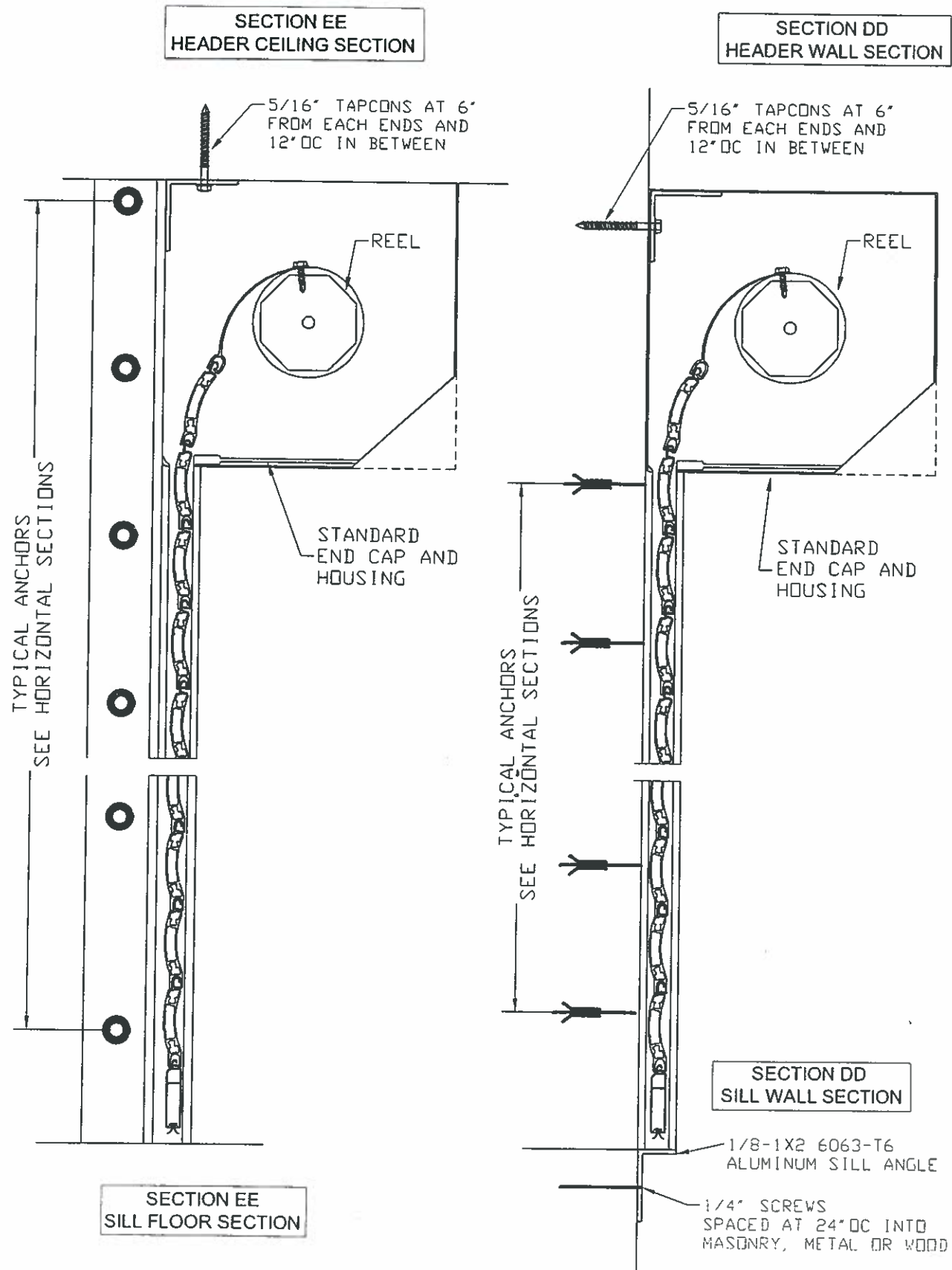


TABLE A1
SPACING ON CENTER FOR WALL MOUNT INSTALLATION

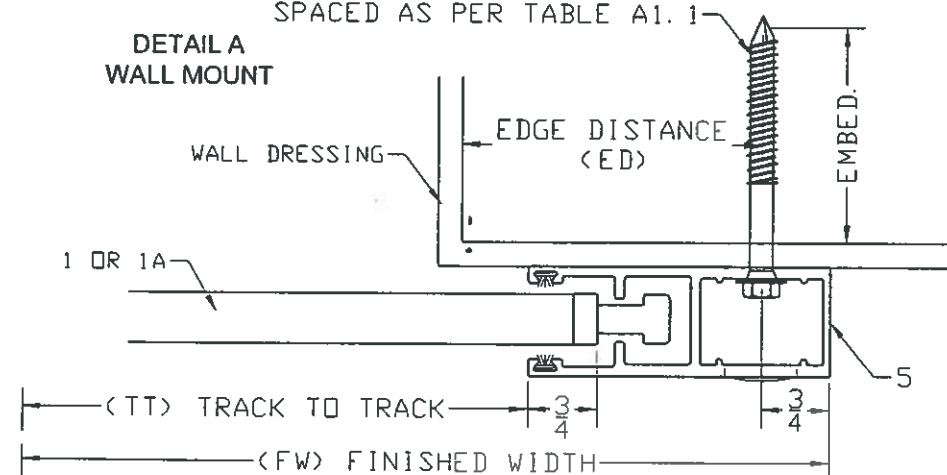
LOAD Psf	TRACK TO TRACK																							
	144				162				180				204				224-11/16				287-1/16			
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
20	6	6	6	6	6	6	6	6	6	6	6	6	6	6	4	5	6	6	3	3	4	4	4	4
30	6	6	6	6	6	6	6	6	6	4	5	6	6	3	3	5	5	-	-	4	4	-	-	
40	6	6	6	6	6	6	4	5	6	6	3	3	6	5	-	3	5	5	-	-	-	-	-	
50	6	6	5	6	6	6	3	4	5	5	-	-	5	5	-	-	5	4	-	-	-	-	-	
60	6	6	4	5	6	6	3	3	5	5	-	-	5	5	-	-	4	4	-	-	-	-	-	
70	6	6	3	4	6	6	3	3	5	5	-	-	4	4	-	-	4	4	-	-	-	-	-	
80	6	6	3	4	5	5	-	3	4	4	-	-	4	4	-	-	-	-	-	-	-	-	-	
83	6	6	3	4	5	5	-	3	4	4	-	-	4	4	-	-	4	4	-	-	-	-	-	
90	5	6	3	3	4	5	-	3	4	4	-	-	-	-	-	-	-	-	-	-	-	-	-	
98	5	5	3	3	4	4	-	3	4	4	-	-	-	-	-	-	-	-	-	-	-	-	-	
100	5	5	3	3	4	4	-	3	4	4	-	-	-	-	-	-	-	-	-	-	-	-	-	
109	4	5	-	3	4	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
120	4	5	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

TABLE A1.1
SPACING ON CENTER FOR WALL MOUNT INSTALLATION

LOAD PSF	TRACK TO TRACK																							
	144				162				180				204				224-11/16				287-1/16			
	A1	A2	C1	D1	A1	A2	C1	D1	A1	A2	C1	D1	A1	A2	C1	D1	A1	A2	C1	D1	A1	A2	C1	D1
20	6	6	6	6	6	6	6	6	6	6	6	6	6	6	3	6	6	4	-	4	4	4	-	
30	6	6	6	6	6	6	6	6	6	6	3	6	6	4	-	6	6	3	-	4	4	-	-	
40	6	6	5	6	6	6	6	3	6	6	4	-	6	6	3	-	6	6	3	-	-	-	-	
50	6	6	5	5	6	6	5	-	6	6	3	-	6	6	3	-	6	6	3	-	-	-	-	
60	6	6	4	3	6	6	4	-	6	6	3	-	6	6	3	-	5	6	3	-	-	-	-	
70	6	6	4	3	6	6	3	-	6	6	3	-	5	6	3	-	5	6	3	-	-	-	-	
80	6	6	3	-	6	6	3	-	5	6	-	-	5	6	-	-	-	-	-	-	-	-	-	
83	6	6	3	-	6	6	3	-	5	6	-	-	6	-	-	-	-	-	-	-	-	-	-	
90	6	6	3	-	5	6	-	-	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	
98	5	6	-	-	5	6	-	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
100	5	6	-	-	5	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
109	5	6	-	-	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
120	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

ANCHOR TYPE A, B, C OR D
SPACED AS PER TABLE A1
ANCHOR TYPE A1, A2, C1 OR D1
SPACED AS PER TABLE A1.1

DETAIL A
WALL MOUNT



ANCHOR SCHEDULE:

ANCHOR	DESCRIPTION	MATERIAL	EMBEDMENT	EDGE DISTANCE
A	5/16" ITW TAPCONS	MIN. 2899 psi CONCRETE	2 1/4"	3 1/8"
A1	3/8" SS DROP-IN	MIN. 3000 psi CONCRETE	1 9/16"	5 1/4"
A2	3/8" SS WEDGE BOLTS	MIN. 3000 psi CONCRETE	3 1/2"	4 1/2"
B	5/16" ITW TAPCONS	GROUT FILLED C-90 BLOCK	2 1/4"	4"
C	1/4"-14X1" GRADE 5 SELF DRILLING SCREWS	MIN. 1/4" 6063-T6 ALUM.		1/2"
C1	1/4"-14X1" SS SHEET METAL SCREWS	DR A36 1/8" STEEL		3/8"
D	5/16" X3" TAPCONS	WOOD WITH G>= .55	2 1/4"	2-1/2"
D1	5/16" X3" LAG SCREWS			
E	3/8" POWERS WEDGE BOLT	MIN. 3000 psi CONCRETE	3 1/2"	4-1/2"

Manufacturer:
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11600 ADELMO LANE
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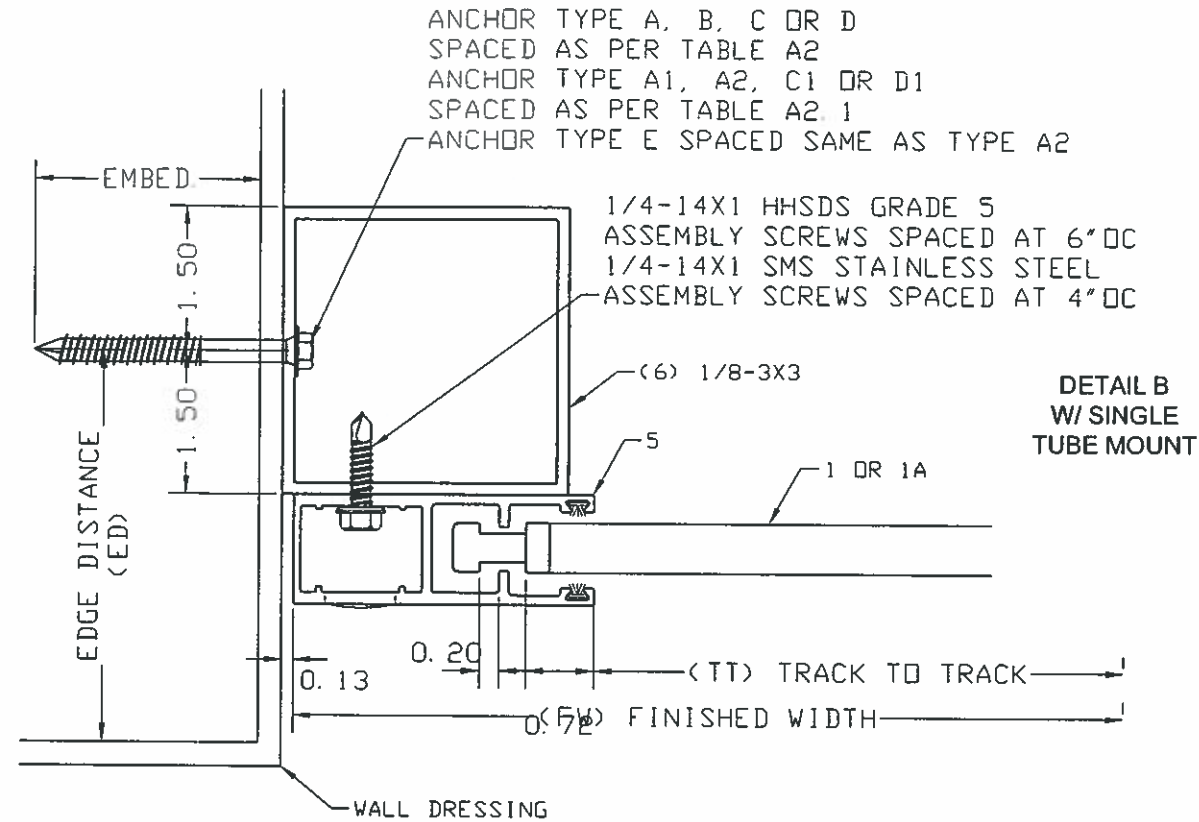
Date: 03/18/13
Scale: NA
Design by: PPMF

Drawing Number
13-068

SHEET
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TABLE A2
SPACING ON CENTER FOR ONE ANGLE INSET MOUNT INSTALLATION

LOAD Psf	TRACK TO TRACK																											
	144				162				180				204				224-11/16				287-1/16							
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
20	6	6	6	6	6	6	6	6	6	4	6	4	5	-	4	-	-	-	-	4	4	4	4	-	-	-	-	
30	6	6	6	6	6	6	3	6	4	4	-	4	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	
40	6	6	4	6	4	4	-	4	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
50	5	6	-	5	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
60	4	4	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
70	-	4	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
80	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
83	-	-	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
90	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
98	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
109	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
120	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	



ANCHOR TYPE A, B, C OR D
SPACED AS PER TABLE A2
ANCHOR TYPE A1, A2, C1 OR D1
SPACED AS PER TABLE A2.1
ANCHOR TYPE E SPACED SAME AS TYPE A2

1/4-14X1 HHS DS GRADE 5
ASSEMBLY SCREWS SPACED AT 6" OC
1/4-14X1 SMS STAINLESS STEEL
ASSEMBLY SCREWS SPACED AT 4" OC

DETAIL B
W/ SINGLE
TUBE MOUNT

TABLE A2.1
SPACING ON CENTER FOR ONE TUBE INSET MOUNT INSTALLATION

LOAD PSF	TRACK TO TRACK																											
	144				162				180				204				224-11/16				287-1/16							
	A1	A2	C1	D1	A1	A2	C1	D1	A1	A2	C1	D1	A1	A2	C1	D1	A1	A2	C1	D1	A1	A2	C1	D1	A1	A2	C1	D1
20	6	6	6	6	6	6	6	6	6	4	6	-	6	-	4	-	6	-	3	4	4	4	4	-	-	-	-	
30	6	6	6	6	6	6	3	6	-	6	-	4	-	6	-	3	-	6	-	-	4	4	4	4	-	-	-	-
40	6	6	4	6	-	6	-	4	-	6	-	-	6	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-
50	5	6	-	4	-	6	-	3	-	6	-	-	6	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-
60	-	6	-	3	-	6	-	-	-	5	-	-	5	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-
70	-	6	-	3	-	6	-	-	-	5	-	-	5	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-
80	-	6	-	-	-	6	-	-	-	5	-	-	5	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-
83	-	6	-	-	-	6	-	-	-	5	-	-	5	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-
90	-	6	-	-	-	6	-	-	-	5	-	-	5	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-
98	-	6	-	-	-	6	-	-	-	5	-	-	5	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-
100	-	6	-	-	-	6	-	-	-	5	-	-	5	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-
109	-	6	-	-	-	5	-	-	-	5	-	-	5	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-
120	-	6	-	-	-	5	-	-	-	5	-	-	5	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-

ANCHOR SCHEDULE:				
ANCHOR	DESCRIPTION	MATERIAL	EMBEDMENT	EDGE DISTANCE
A	5/16" ITW TAPCONS	MIN. 2899 psi CONCRETE	2 1/4"	3 1/8"
A1	3/8" SS DROP-IN	MIN. 3000 psi CONCRETE	1 9/16"	5 1/4"
A2	3/8" SS WEDGE BOLTS	MIN. 3000 psi CONCRETE	3 1/2"	4 1/2"
B	5/16" ITW TAPCONS	GROUT FILLED C-90 BLOCK	2 1/4"	4"
C	1/4"-14X1" GRADE 5 SELF DRILLING SCREWS	MIN. 1/4" 6063-T6 ALUM. OR A36 1/8" STEEL		1/2"
C1	1/4"-14X1" SS SHEET METAL SCREWS			3/8"
D	5/16" X3" TAPCONS	WOOD WITH G>= 55	2 1/4"	2-1/2"
D1	5/16" X3" LAG SCREWS			
E	3/8" POWERS WEDGE BOLT STAINLESS OR CARBON STEEL	MIN. 3000 psi CONCRETE	3 1/2"	4-1/2"

Manufacturer:
CROCI NORTH AMERICA
11600 ADELMO LANE
FORT MYERS, FL 33966
Tel.: (239) 278-3066
Fax: (239) 278-5977

PRODUCT:
ES 55 SUP
Rolling Shutter
LARGE & SMALL MISSILE
IMPACT RATED

Engineering:
EngCo Inc.
CR 11234
5595 ORANGE DR. SUITE 201
DAVIE - FLORIDA 333314
www.engcoinc.com



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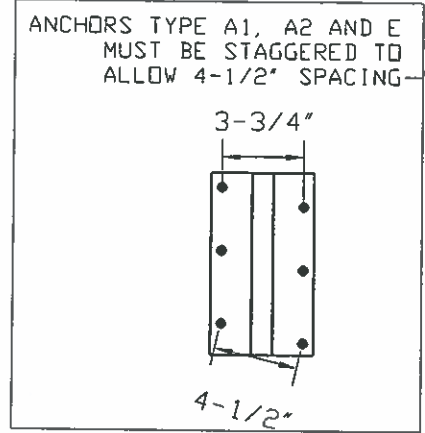
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Scale: NA
Design by: PPMF

Drawing Number
13-068

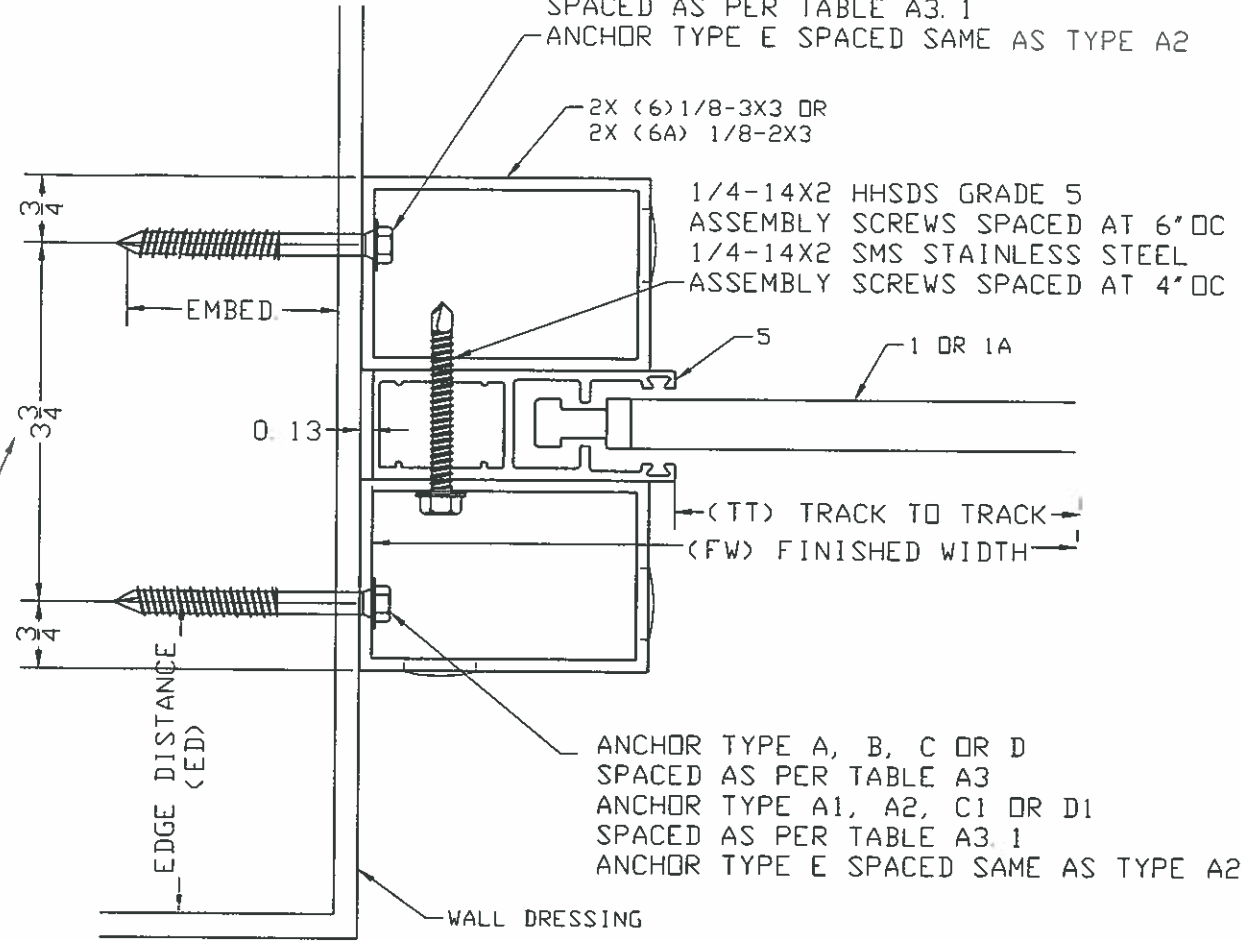
SHEET
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TABLE A3
SPACING ON CENTER FOR DOUBLE TUBES INSET MOUNT INSTALLATION

LOAD Psf	TRACK TO TRACK																											
	144				162				180				204				224-11/16				287-1/16							
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
20	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	4	4	4	4	
30	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	6	4	6	6	6	4	6	4	4	4	
40	6	6	6	6	6	6	6	6	6	6	5	6	6	6	4	6	6	6	4	6	6	6	3	6				
50	6	6	6	6	6	6	6	6	6	4	6	6	6	4	6	6	6	3	6	6	6	3	6					
60	6	6	6	6	6	6	5	6	6	6	4	6	6	6	3	6	6	6	3	6	6	6	3	6				
70	6	6	6	6	6	6	5	6	6	6	4	6	6	6	3	6	6	6	3	6	6	6	3	5				
80	6	6	6	6	6	6	4	6	6	6	3	6	6	6	3	5	6	6	3	5	6	6	3	5				
83	6	6	6	6	6	6	4	6	6	6	3	6	6	6	3	6	6	6	3	6	6	6	3	6				
90	6	6	6	6	6	6	4	6	6	6	3	6	6	6	3	6	6	6	3	6	6	6	3	6				
98	6	6	6	6	6	6	4	6	6	6	3	5	6	6	3	5	6	6	3	5	6	6	3	5				
100	6	6	6	6	6	6	4	6	6	6	3	6	6	6	3	6	6	6	3	6	6	6	3	6				
109	6	6	6	6	6	6	3	6	6	6	3	6	6	6	3	6	6	6	3	6	6	6	3	6				
120	6	6	6	6	6	6	3	6	6	6	3	6	6	6	3	6	6	6	3	6	6	6	3	6				



DETAIL B
W/ DOUBLE
TUBE MOUNT



ANCHOR TYPE A, B, C OR D
SPACED AS PER TABLE A3
ANCHOR TYPE A1, A2, C1 OR D1
SPACED AS PER TABLE A3.1
ANCHOR TYPE E SPACED SAME AS TYPE A2

TABLE A3.1
SPACING ON CENTER FOR DOUBLE TUBES INSET MOUNT INSTALLATION

LOAD PSF	TRACK TO TRACK																											
	144				162				180				204				224-11/16				287-1/16							
	A1	A2	C1	D1	A1	A2	C1	D1	A1	A2	C1	D1	A1	A2	C1	D1	A1	A2	C1	D1	A1	A2	C1	D1	A1	A2	C1	D1
20	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	4	4	4	4	
30	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	6	6	6	4	6	6	6	4	6	4	4	4	
40	6	6	6	6	6	6	6	6	6	6	5	6	6	6	4	6	6	6	4	6	6	6	3	6				
50	6	6	6	6	6	6	6	6	6	6	4	6	6	6	4	6	6	6	3	6	6	6	3	6				
60	6	6	6	6	6	6	5	6	6	6	4	6	6	6	3	6	6	6	3	6	6	6	3	5				
70	6	6	6	6	6	6	4	6	6	6	4	6	6	6	3	5	6	6	3	4	6	6	3	4				
80	6	6	5	6	6	6	4	6	6	6	3	5	6	6	3	4	6	6	3	4	6	6	3	4				
83	6	6	5	6	6	6	4	6	6	6	3	5	6	6	3	4	6	6	3	4	6	6	3	4				
90	6	6	5	6	6	6	4	5	6	6	3	4	6	6	3	4	6	6	3	4	6	6	3	4				
98	6	6	5	6	6	6	4	5	6	6	3	4	6	6	3	4	6	6	3	4	6	6	3	4				
100	6	6	5	6	6	6	4	5	6	6	3	4	6	6	3	4	6	6	3	4	6	6	3	4				
109	6	6	4	5	6	6	3	4	6	6	3	4	6	6	3	4	6	6	3	4	6	6	3	4				
120	6	6	4	5	6	6	3	4	6	6	3	4	6	6	3	4	6	6	3	4	6	6	3	4				

ANCHOR	DESCRIPTION	MATERIAL	EMBEDMENT	EDGE DISTANCE
A	5/16" ITW TAPCONS	MIN. 2899 psi CONCRETE	2 1/4"	3 1/8"
A1	3/8" SS DROP-IN	MIN. 3000 psi CONCRETE	1 9/16"	5 1/4"
A2	3/8" SS WEDGE BOLTS	MIN. 3000 psi CONCRETE	3 1/2"	4 1/2"
B	5/16" ITW TAPCONS	GROUT FILLED C-90 BLOCK	2 1/4"	4"
C	1/4"-14X1" GRADE 5 SELF DRILLING SCREWS	MIN. 1/4" 6063-T6 ALUM. OR A36 1/8" STEEL		1/2"
C1	1/4"-14X1" SS SHEET METAL SCREWS			3/8"
D	5/16" X3" TAPCONS	WOOD WITH G>= .55	2 1/4"	2-1/2"
D1	5/16" X3" LAG SCREWS			
E	3/8" POWERS WEDGE BOLT STAINLESS OR CARBON STEEL	MIN 3000 psi CONCRETE	3 1/2"	4-1/2"

Manufacturer:
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Date: 03/18/13
Scale: NA
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Drawing Number
13-068

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TABLE A4
SPACING ON CENTER FOR 1/8-2X3 BUILT-OUT MOUNT INSTALLATION

LOAD Psf	TRACK TO TRACK																							
	144				162				180				204				224-11/16				287-1/16			
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
20	6	6	6	6	6	6	6	6	6	5	6	4	5	-	3	-	-	-	-	-	-	-	-	
30	6	6	6	6	6	6	4	6	4	4	-	3	-	-	-	-	-	-	-	-	-	-	-	
40	6	6	6	6	5	5	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
50	6	6	3	5	-	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
60	5	6	3	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
70	4	5	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
80	4	4	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
83	4	4	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
90	4	4	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
98	4	4	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
100	4	4	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
109	4	4	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
120	4	4	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

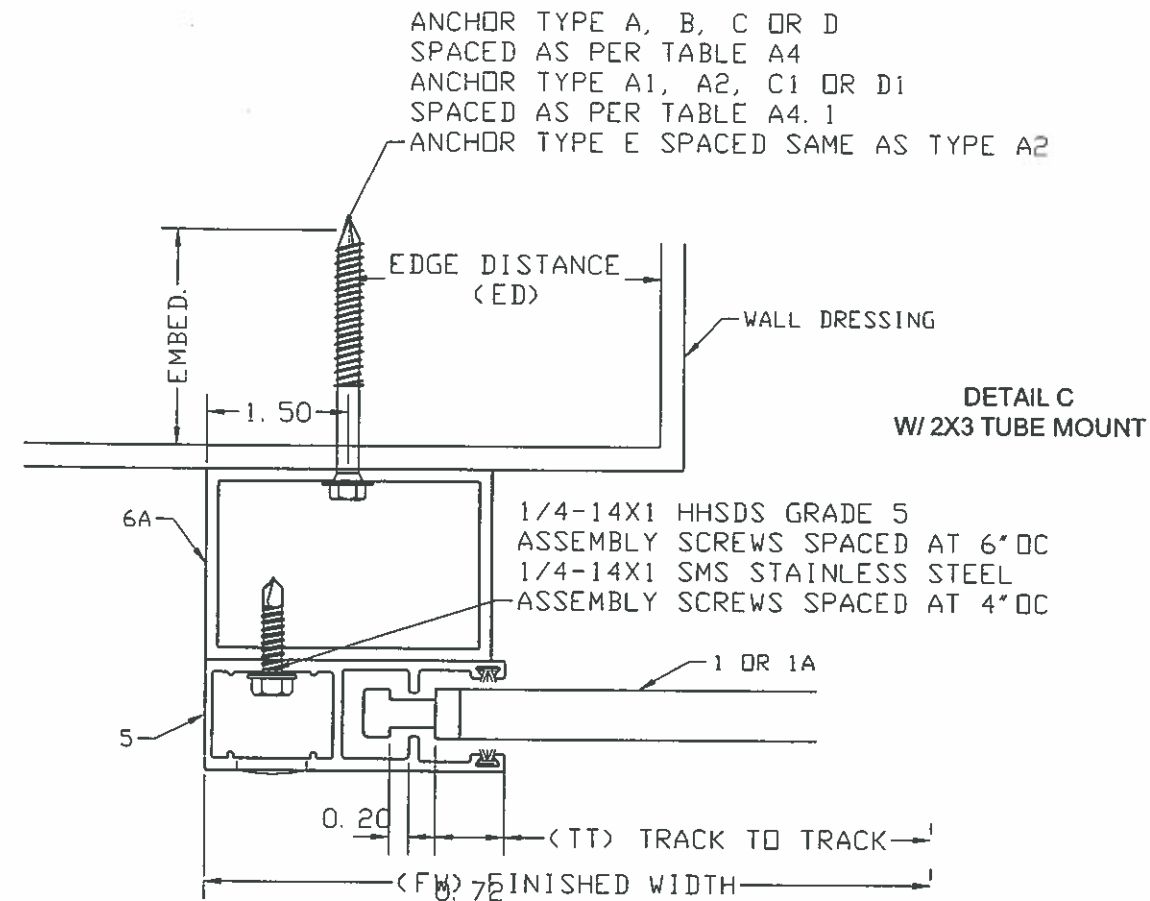


TABLE A4.1
SPACING ON CENTER FOR 1/8-2X3 BUILT-OUT MOUNT INSTALLATION

LOAD PSF	TRACK TO TRACK																							
	144				162				180				204				224-11/16				287-1/16			
	A1	A2	C1	D1	A1	A2	C1	D1	A1	A2	C1	D1	A1	A2	C1	D1	A1	A2	C1	D1	A1	A2	C1	D1
20	6	6	6	6	6	6	6	6	6	5	6	5	6	-	-	-	6	-	-	-	4	-	-	
30	6	6	6	6	6	6	4	5	-	6	-	-	6	-	-	-	5	-	-	-	4	-	-	
40	6	6	6	6	5	6	-	-	-	6	-	-	6	-	-	-	5	-	-	-	-	-	-	
50	6	6	3	4	-	6	-	-	-	6	-	-	5	-	-	-	5	-	-	-	-	-	-	
60	6	6	-	3	-	6	-	-	-	5	-	-	5	-	-	-	5	-	-	-	-	-	-	
70	5	6	-	-	-	6	-	-	-	5	-	-	5	-	-	-	5	-	-	-	-	-	-	
80	-	6	-	-	-	6	-	-	-	5	-	-	5	-	-	-	-	-	-	-	-	-	-	
83	-	6	-	-	-	6	-	-	-	5	-	-	5	-	-	-	-	-	-	-	-	-	-	
90	-	6	-	-	-	6	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	
98	-	6	-	-	-	6	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	
100	-	6	-	-	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
109	-	6	-	-	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
120	-	6	-	-	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

ANCHOR SCHEDULE:				
ANCHOR	DESCRIPTION	MATERIAL	EMBEDMENT	EDGE DISTANCE
A	5/16" ITW TAPCONS	MIN. 2899 psi CONCRETE	2 1/4"	3 1/8"
A1	3/8" SS DROP-IN	MIN. 3000 psi CONCRETE	1 9/16"	5 1/4"
A2	3/8" SS WEDGE BOLTS	MIN. 3000 psi CONCRETE	3 1/2"	4 1/2"
B	5/16" ITW TAPCONS	GROUT FILLED C-90 BLOCK	2 1/4"	4"
C	1/4"-14X1" GRADE 5 SELF DRILLING SCREWS	MIN. 1/4" 6063-T6 ALUM. OR A36 1/8" STEEL		1/2"
C1	1/4"-14X1" SS SHEET METAL SCREWS		3/8"	
D	5/16"X3" TAPCONS	WOOD WITH G>= .55	2 1/4"	2-1/2"
D1	5/16"X3" LAG SCREWS			
E	3/8" POWERS WEDGE BOLT STAINLESS OR CARBON STEEL	MIN. 3000 psi CONCRETE	3 1/2"	4-1/2"

Manufacturer:
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11600 ADELMO LANE
FORT MYERS, FL 33966
Tel.: (239) 278-3066
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PRODUCT:
ES 55 SUP
Rolling Shutter
LARGE & SMALL MISSILE
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Engineering:
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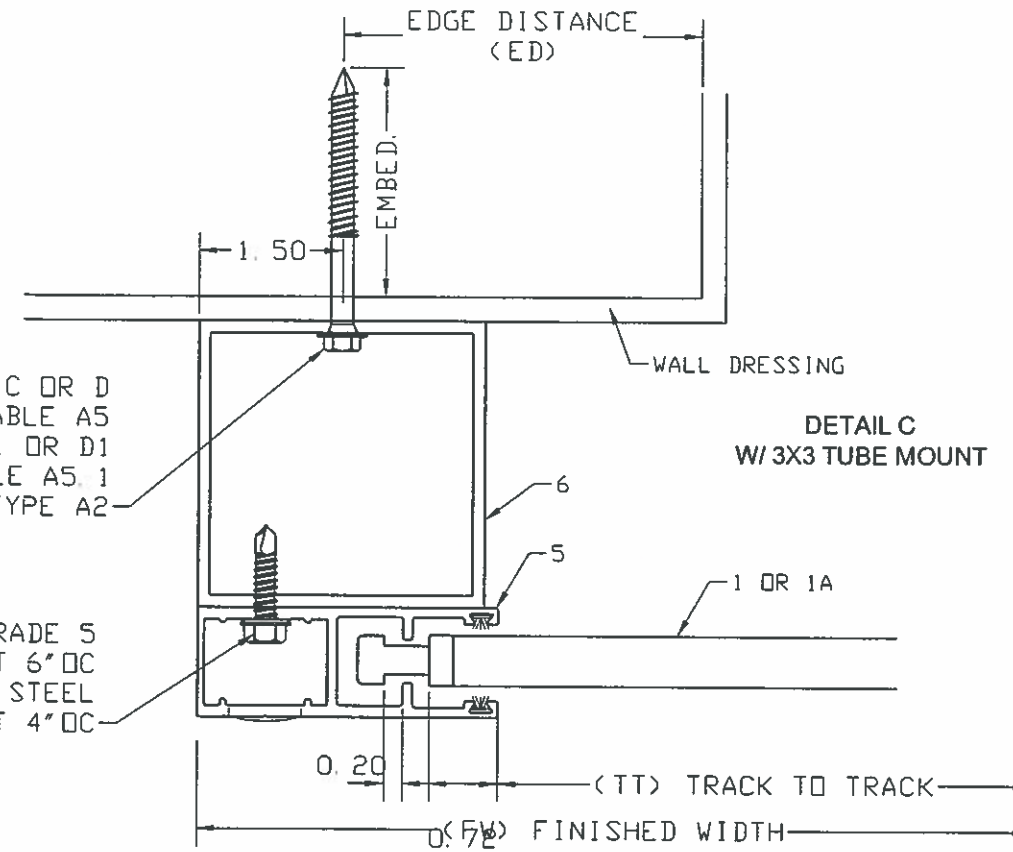
Date: 03/18/13
Scale: NA
Design by: PPMF

Drawing Number
13-068

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TABLE A5
SPACING ON CENTER FOR 1/8-3X3 BUILT-OUT MOUNT INSTALLATION

LOAD Psf	TRACK TO TRACK																							
	144				162				180				204				224-11/16				287-1/16			
	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D
20	6	6	6	6	6	6	6	6	6	6	4	6	-	4	-	3	-	-	-	-	-	-	-	
30	6	6	6	6	6	6	3	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
40	6	6	5	6	4	4	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
50	6	6	3	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
60	4	5	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
70	-	4	-	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
80	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
83	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
90	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
98	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
100	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
109	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
120	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	



ANCHOR TYPE A, B, C OR D
SPACED AS PER TABLE A5
ANCHOR TYPE A1, A2, C1 OR D1
SPACED AS PER TABLE A5.1
ANCHOR TYPE E SPACED SAME AS TYPE A2

1/4-14X1 HHSDS GRADE 5
ASSEMBLY SCREWS SPACED AT 6" OC
1/4-14X1 SMS STAINLESS STEEL
ASSEMBLY SCREWS SPACED AT 4" OC

TABLE A5.1
SPACING ON CENTER FOR 1/8-3X3 BUILT-OUT MOUNT INSTALLATION

LOAD PSF	TRACK TO TRACK																							
	144				162				180				204				224-11/16				287-1/16			
	A1	A2	C1	D1	A1	A2	C1	D1	A1	A2	C1	D1	A1	A2	C1	D1	A1	A2	C1	D1	A1	A2	C1	D1
20	6	6	6	6	6	6	6	6	6	6	4	5	-	6	-	-	-	6	-	-	-	4	-	-
30	6	6	6	6	6	6	3	4	-	6	-	-	-	6	-	-	-	-	-	-	-	-	-	-
40	6	6	5	6	-	6	-	-	-	6	-	-	-	5	-	-	-	-	-	-	-	-	-	-
50	6	6	3	4	-	6	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-
60	-	6	-	3	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
70	-	6	-	-	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
80	-	6	-	-	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
83	-	6	-	-	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
90	-	6	-	-	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
98	-	6	-	-	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
100	-	6	-	-	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
109	-	6	-	-	-	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
120	-	6	-	-	-	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-

ANCHOR SCHEDULE:				
ANCHOR	DESCRIPTION	MATERIAL	EMBEDMENT	EDGE DISTANCE
A	5/16" ITW TAPCONS	MIN. 2899 psi CONCRETE	2 1/4"	3 1/8"
A1	3/8" SS DROP-IN	MIN. 3000 psi CONCRETE	1 9/16"	5 1/4"
A2	3/8" SS WEDGE BOLTS	MIN. 3000 psi CONCRETE	3 1/2"	4 1/2"
B	5/16" ITW TAPCONS	GROUT FILLED C-90 BLOCK	2 1/4"	4"
C	1/4"-14X1" GRADE 5 SELF DRILLING SCREWS	MIN. 1/4" 6063-T6 ALUM. OR A36 1/8" STEEL		1/2"
C1	1/4"-14X1" SS SHEET METAL SCREWS		3/8"	
D	5/16" X3" TAPCONS	WOOD WITH G _v = 55	2 1/4"	2-1/2"
D1	5/16" X3" LAG SCREWS			
E	3/8" POWERS WEDGE BOLT	MIN. 3000 psi CONCRETE	3 1/2"	4-1/2"

Manufacturer:
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PRODUCT:
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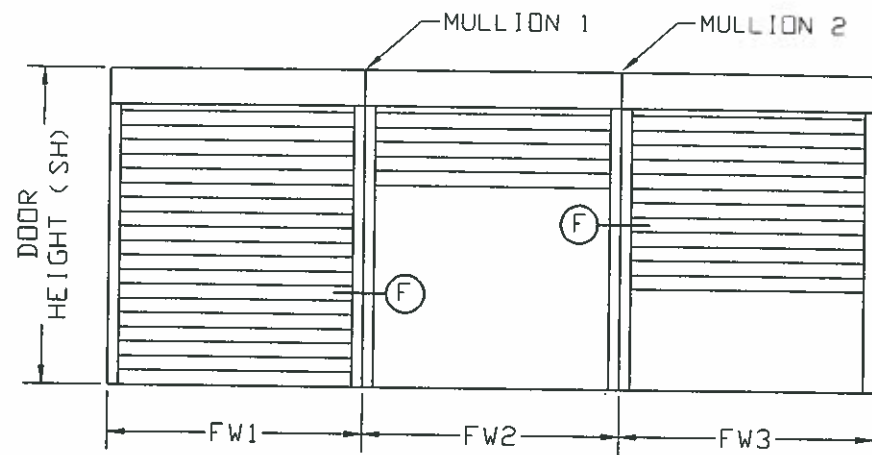
REVISIONS:
1- REPLACES DWG 09-106

Date: 03/18/13
Scale: NA
Design by: PPMF

Drawing Number
13-068

SHEET
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EQUALLY SPACED MULLIONS SELECTION



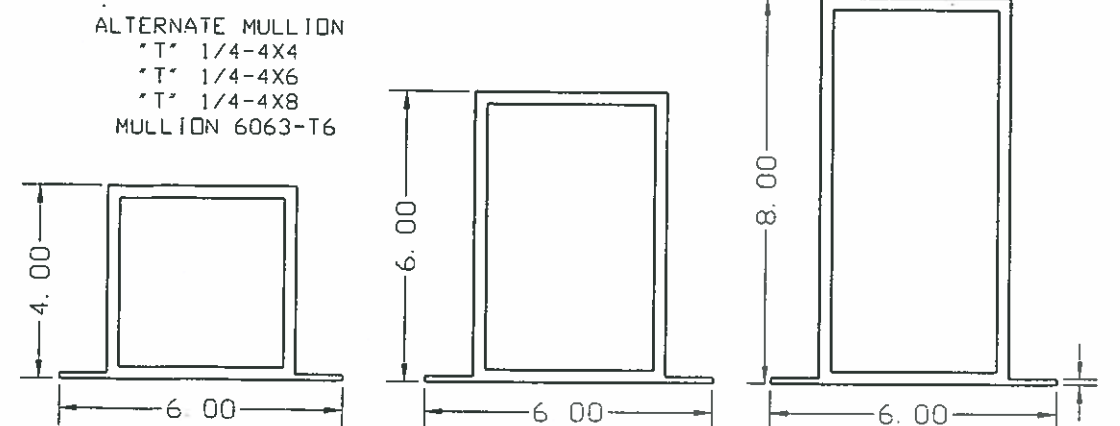
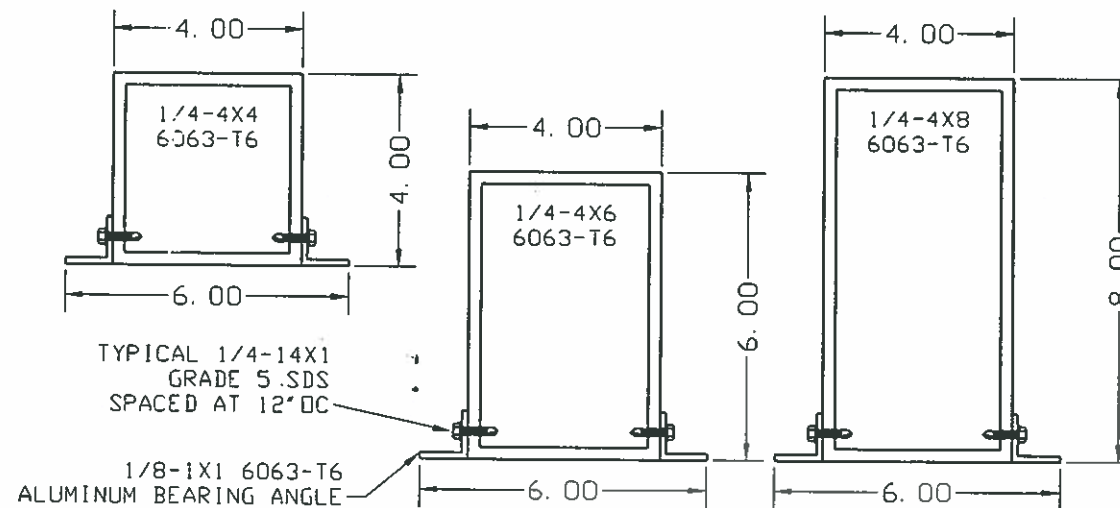
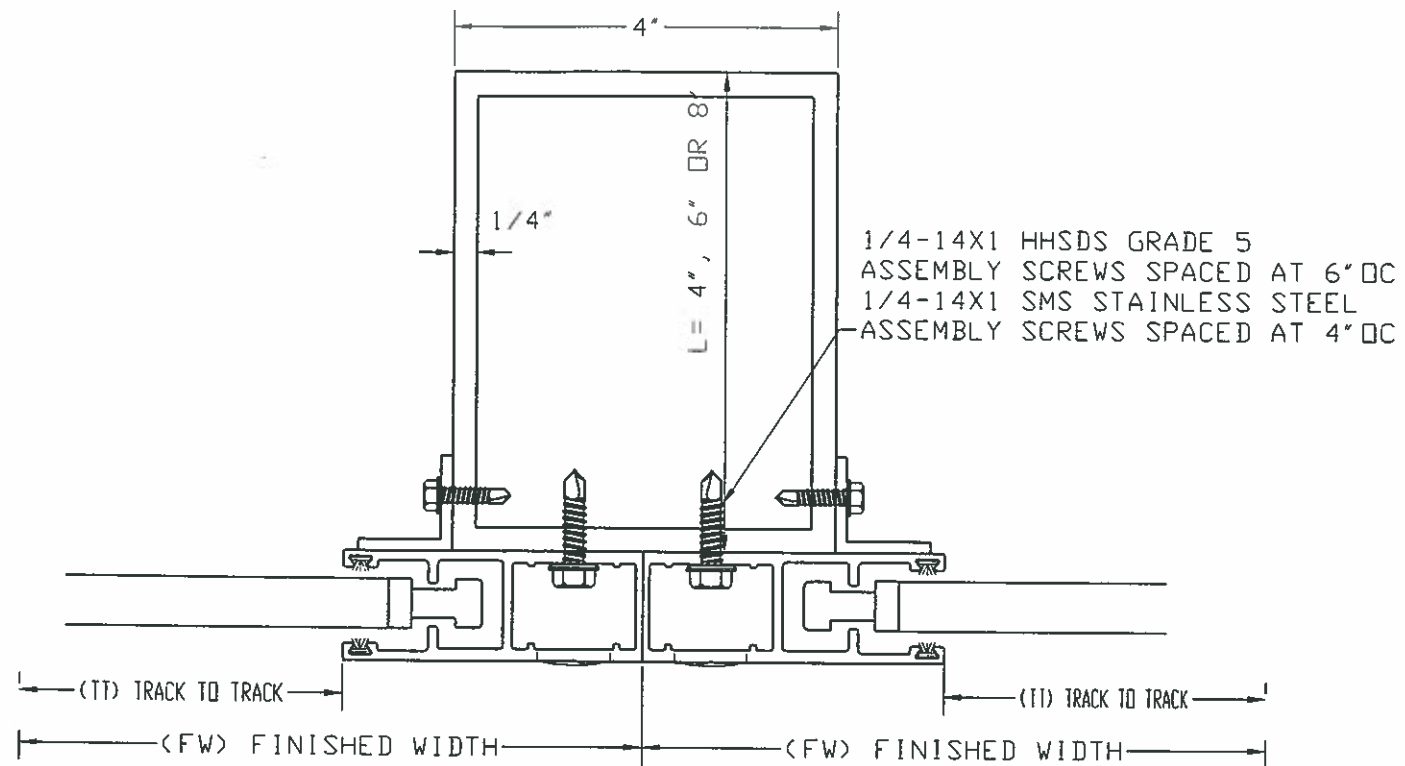
MULLION 1: $TM1 = (FW1 + FW2) / 2$
 MULLION 2: $TM2 = (FW2 + FW3) / 2$
 TM: TRIBUTARY MODULE

MULLION BARS SELECTION TABLES (PSF)

DOOR MODULE	MULLION TYPE & MAX. HEIGHT								
	1/4-4x8			1/4-4x6			1/4-4x4		
231	51	61	70	40	50	63	28	35	46
211	55	67	83	44	54	69	30	39	51
199	59	71	88	47	58	73	32	41	54
181	65	78	97	51	64	81	36	45	59
169	69	84	104	55	68	86	38	48	63
157	75	90	112	59	73	93	41	52	68
151	78	94	116	62	76	97	43	54	71

NOTES:
 1- MULLIONS WERE DESIGNED BY RATIONAL ANALYSIS BASED ON THE ALUMINUM DESIGN MANUAL 2005 ED.
 2- DEFLECTION CRITERIA: MAXIMUM SPAN /180
 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.

MULLIONS SECTIONS (DETAIL F)



Manufacturer:
CROCI NORTH AMERICA

11600 ADELMO LANE
 FORT MYERS, FL 33966
 Tel.: (239) 278-3066
 Fax: (239) 278-5977

PRODUCT:
ES 55 SUP
 Rolling Shutter
 LARGE & SMALL MISSILE
 IMPACT RATED

Engineering:
EngCo Inc.
 CR 11234
 5595 ORANGE DR. SUITE 201
 DAVIE - FLORIDA 333314
 www.engcoinc.com



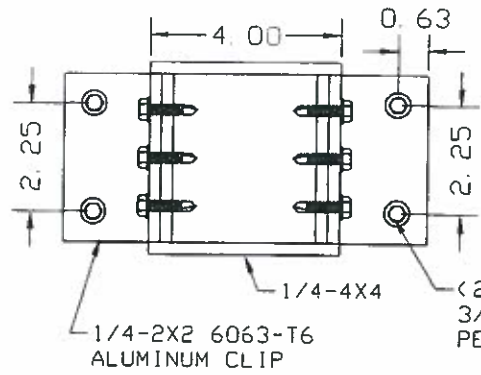
REVISIONS:
 1- REPLACES DWG 09-106

Date: 03/18/13
 Scale: NA
 Design by: PPMF

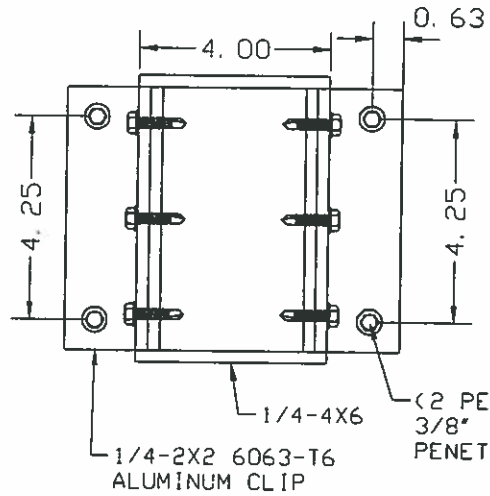
Drawing Number
13-068

SHEET
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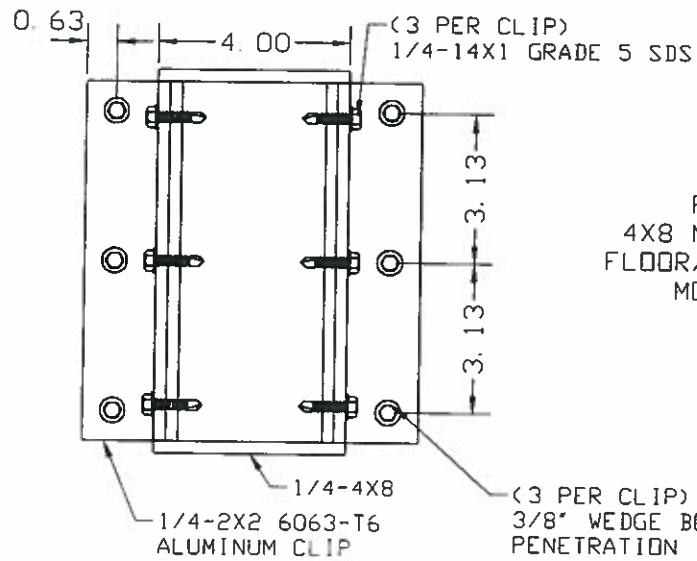
EQUALLY SPACED MULLIONS WALL AND INSET CONNECTIONS



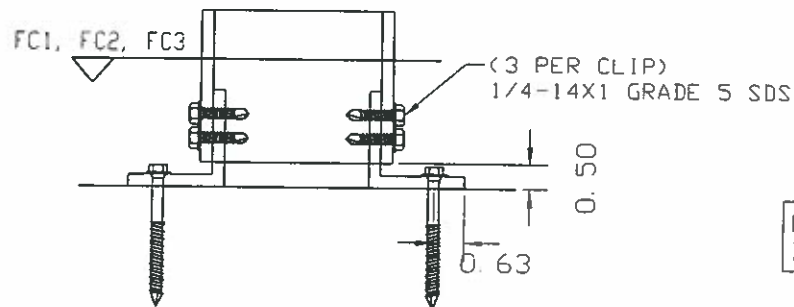
FC1
4X4 MULLION
FLOOR/CEILING
MOUNT



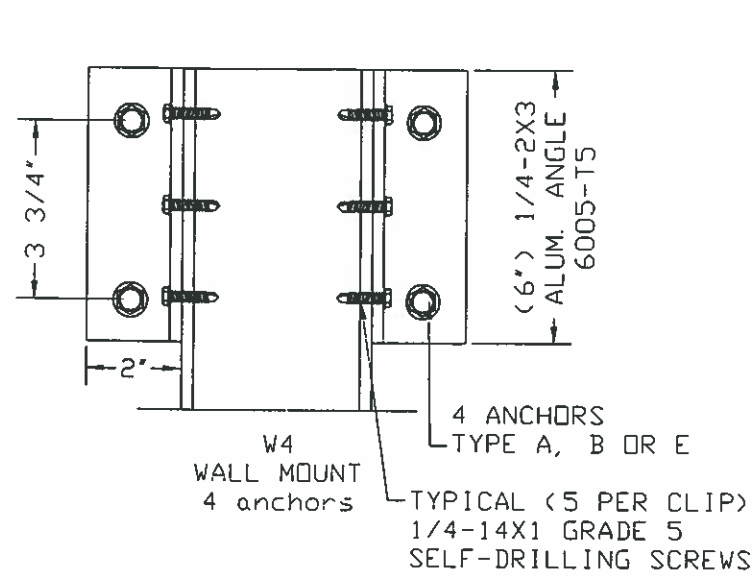
FC2
4X6 MULLION
FLOOR/CEILING
MOUNT



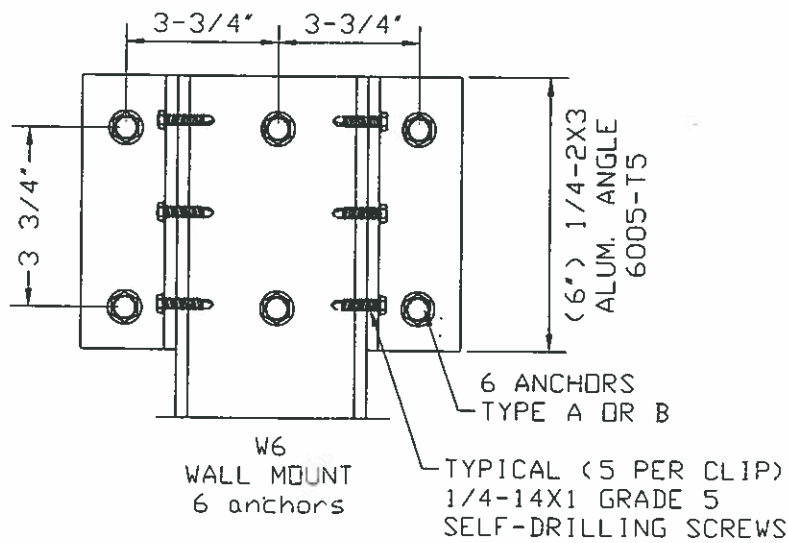
FC3
4X8 MULLION
FLOOR/CEILING
MOUNT



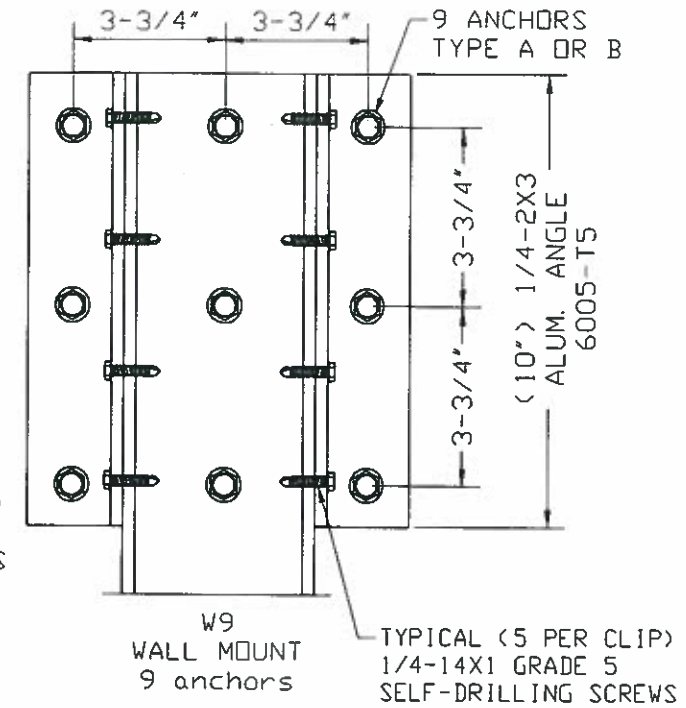
NOTE: ANGLE CLIP TO
BE PLACED INSIDE TUBE



W4
WALL MOUNT
4 anchors



W6
WALL MOUNT
6 anchors



W9
WALL MOUNT
9 anchors

WALL MOUNT ANCHOR SELECTION

ANCHOR TYPE	MULLION TYPE	4X4	4X6	4X8
A		W4	W9	W9
B		W4	W6	W9
E		W4	W4	W4

ANCHOR SCHEDULE:				
ANCHOR	DESCRIPTION	MATERIAL	EMBEDMENT	EDGE DISTANCE
A	5/16" X3" TAPCONS	MIN 2899 psi CONCRETE	2 1/4"	3 1/8"
B	5/16" X3" TAPCONS	GROUT FILLED C-90 BLOCK	2 1/4"	4"
E	3/8" X4" WEDGE BOLT	MIN 3000 psi CONCRETE	3 1/2"	4-1/2"

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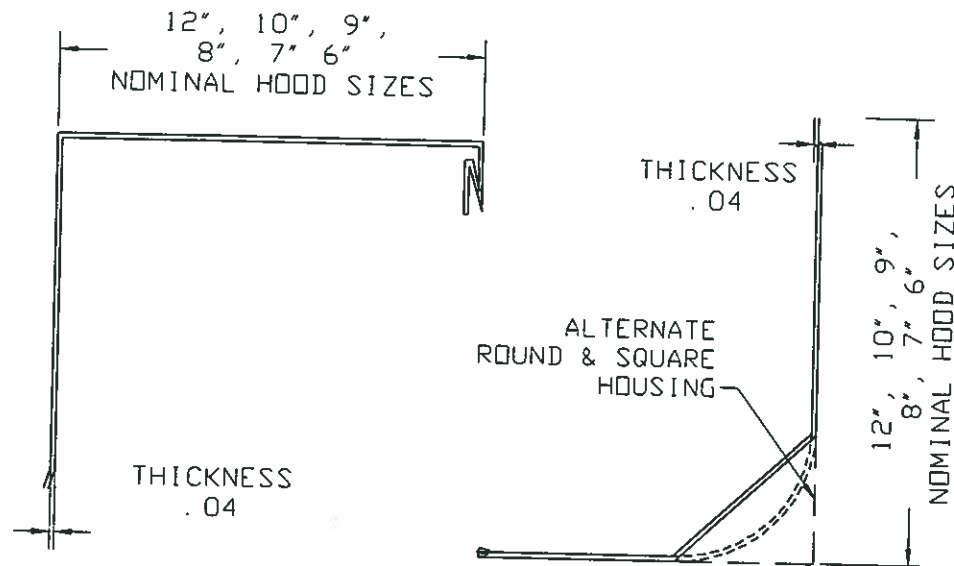
REVISIONS:
1- REPLACES DWG 09-106

Date: 03/18/13
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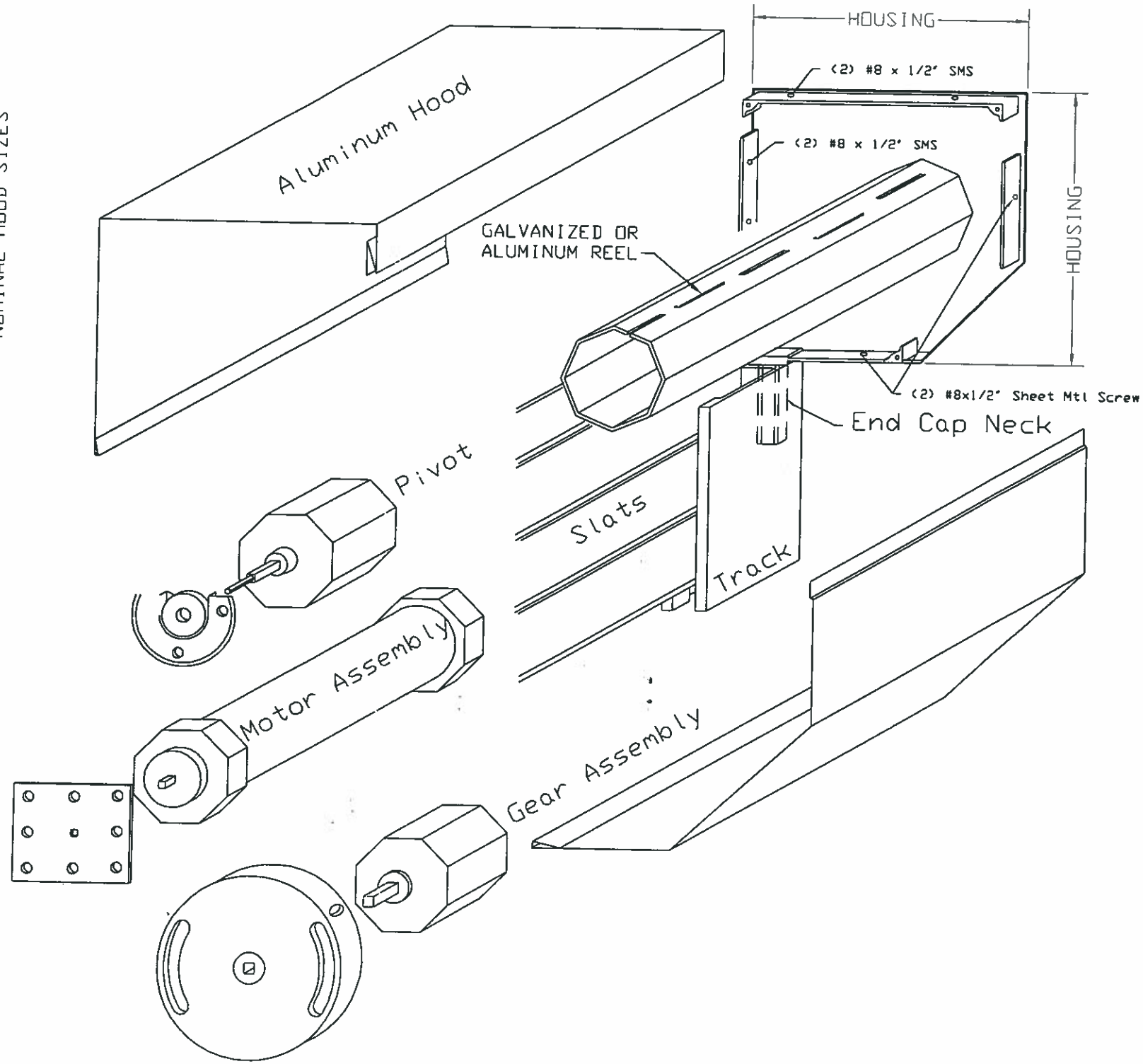
Drawing Number
13-068

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HOOD ASSEMBLY



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.



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