

GENERAL NOTES:

1- THIS PRODUCT WAS TESTED UNDER ASTM E330-02, E1996, E1886 AND IS DESIGNED IN ACCORDANCE WITH THE THE FLORIDA BUILDING CODE 2007 EDITION, NOT APPLICABLE FOR USE IN HIGH VELOCITY HURRICANE ZONES.

2- PANELS SHALL BE LABELED WITH ONE LABEL PER OPENING OR A CERTIFICATE OF COMPLIANCE SHALL BE PROVIDED BY THE MANUFACTURER AND INSTALLER. LABEL SHALL READ AS FOLLOWS:

CLEAR STRENGTH USA, LLC
POLYCARBONATE HURRICANE SHUTTER PANELS
LEVEL D - LARGE MISSILE IMPACT RESISTANT

3- MATERIAL:

3.1 - STORM PANELS SHALL BE MIN. 0.073" POLYCARBONATE CONFORMING TO ASTM D-638 WITH A MINIMUM $F_y = 9.36$ Ksi.

3.2 - ALL ALUMINUM EXTRUSIONS SHALL BE 6063-T6 OR AS NOTED.

4- ANCHORS SHALL BE AS SHOWN ON THIS APPROVAL. ANCHOR EMBEDMENT TO BASE MATERIAL SHALL BE BEYOND WALL DRESSING.

5- LOADS: THE DESIGNED LOAD MUST BE CALCULATED BY A PROFESSIONAL ARCHITECT OR ENGINEER BASED ON ASCE 7. THE CALCULATED DESIGNED PRESSURE MUST NOT EXCEED THE ALLOWABLE PRESSURES FOR EACH SHUTTER COMPONENT TO BE USED.

6- THE CONTRACTOR MUST VERIFY THE ADEQUACY OF THE EXISTING STRUCTURE IN SUSTAINING THE SHUTTER IMPOSED LOADS.

7- PANELS CAN BE OVERLAPPED TO CREATE A 1/2 PANEL INSTALLATION.

8- THIS PRODUCT IS NOT DESIGNED FOR:

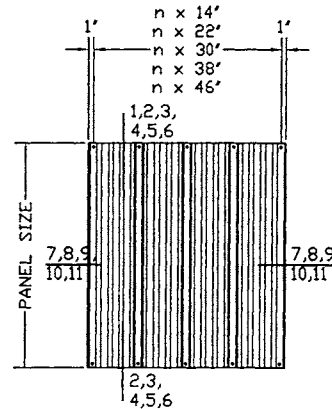
- 8.1- USE IN THE HIGH VELOCITY HURRICANE ZONES (HVHZ)
- 8.2- USE IN WIND ZONE 4 (WIND SPEED >140 mph)
- 8.3- PANEL SMALLER THAN 14" (POROSITY >10%)
- 8.4- ESSENTIAL FACILITIES IN ALL WIND ZONES.

9- IN 'NON HVHZ' - PRODUCT MEETS THE CLASSIFICATION OF ASTM E1996-05 FOR 'NON POROUS' PROTECTIVE DEVICE. SEPARATION FROM FENESTRATION ASSEMBLIES ARE NOT REQUIRED.

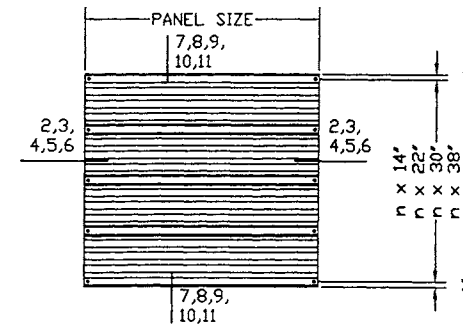
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TYPICAL ELEVATION
PANELS CAN BE INSTALLED VERTICALLY
OR HORIZONTALLY USING APPLICABLE
ANCHORING DETAILS



VERTICAL INSTALLATION



HORIZONTAL INSTALLATION

120" MAXIMUM PANEL SIZE
n= NUMBER OF PANEL
PANELS AVAILABLE IN 16", 24", 32", 40" AND 48" WIDTH

TABLE 1
ALLOWABLE DESIGNED
PRESSURES:

PANEL SIZE (inches)	Pd (+/-) (psf)
120	45
100	62
80	87
60	132

USER INSTRUCTION:

- 1- OBTAIN PROJECT WIND LOAD PRESSURES AS PER GENERAL NOTES 5.
- 2- COMPARE PANEL HEIGHT X ALLOWABLE PRESSURE (TABLE 1) WITH PROJECT WIND LOAD PRESSURES. PROJECT PRESSURE MUST BE EQUAL OR LESS THAN PANEL ALLOWABLE PRESSURE.
- 3- SELECT ANCHOR SPACING (TABLE 3) FUNCTION OF TYPE OF MOUNT, PRESSURE AND TYPE OF ANCHOR (TABLE 2).
- 4- SELECT TYPE OF SIDE CLOSURE AS PER SHEET 6 OF 8.

Manufacturer:
**Clear
Strength
USA, LLC**

1414 COMMERCE PARK DR.
TIPP CITY, OHIO 45371
Tel.: (937) 677-4485
Fax.: (937) 667-3647

Product:
**Polycarbonate
Hurricane
Shutter Panel**

Engineering:
EngCo Inc.
CA 8116
6971 W. Sunrise Blvd. 104
Plantation, FL 33313
Tel.: (954) 585-0304
Fax: (954) 585-0305

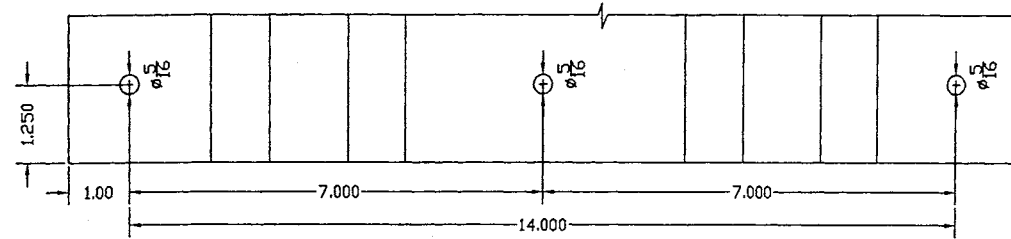
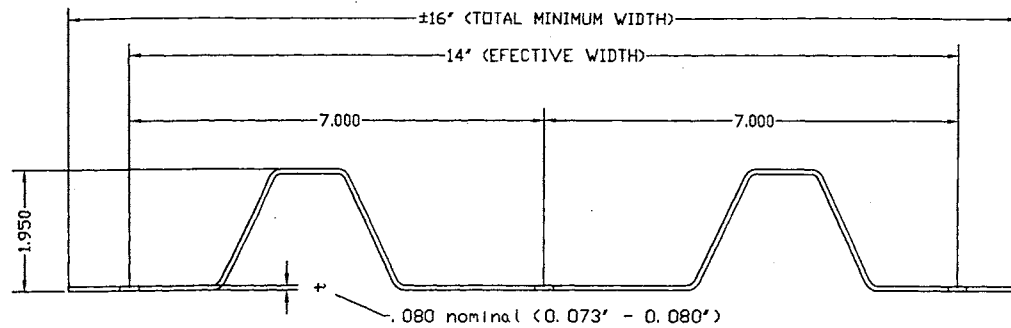


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PKDRAFTING & MORE

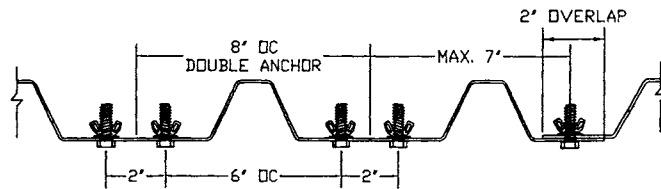
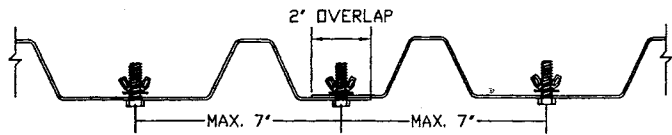
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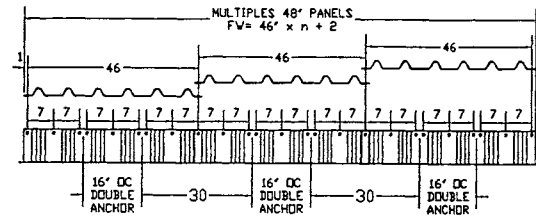
SHEET
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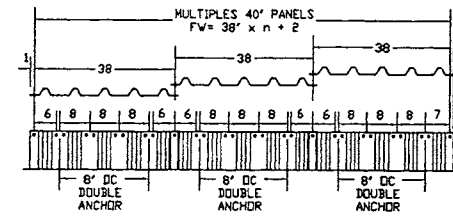
1- TYPICAL POLYCARBONATE HURRICANE SHUTTER PANEL



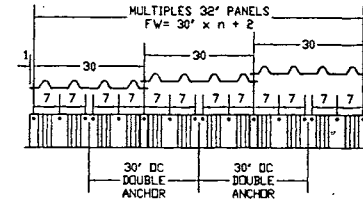
48" PANEL LAY OUT



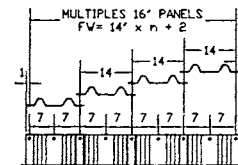
40" PANEL LAY OUT



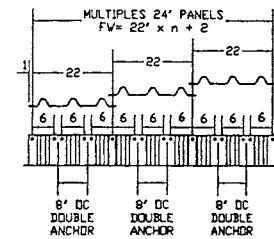
32" PANEL LAY OUT



16" PANEL LAY OUT



24" PANEL LAY OUT

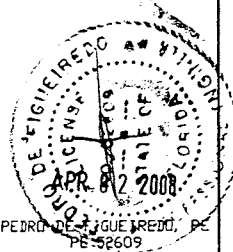


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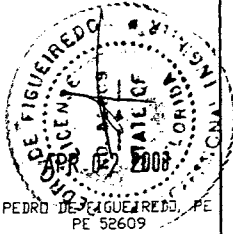
SHEET
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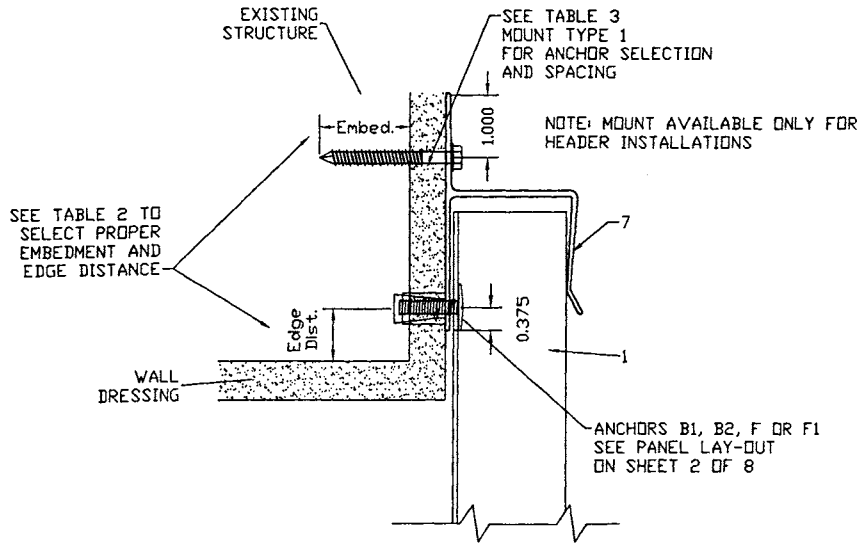
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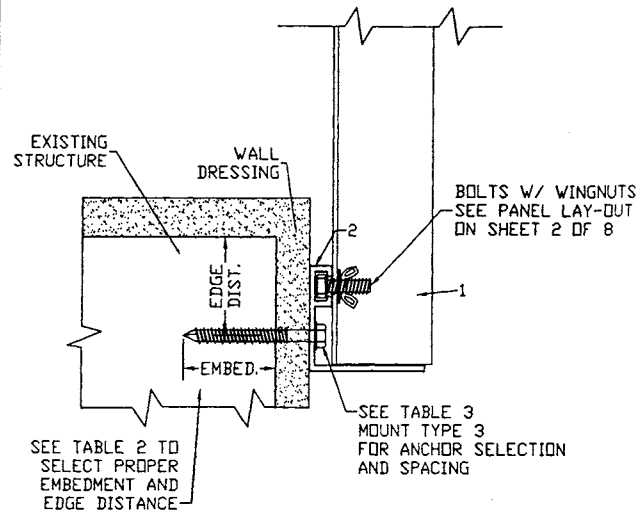
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MOUNT TYPE 1

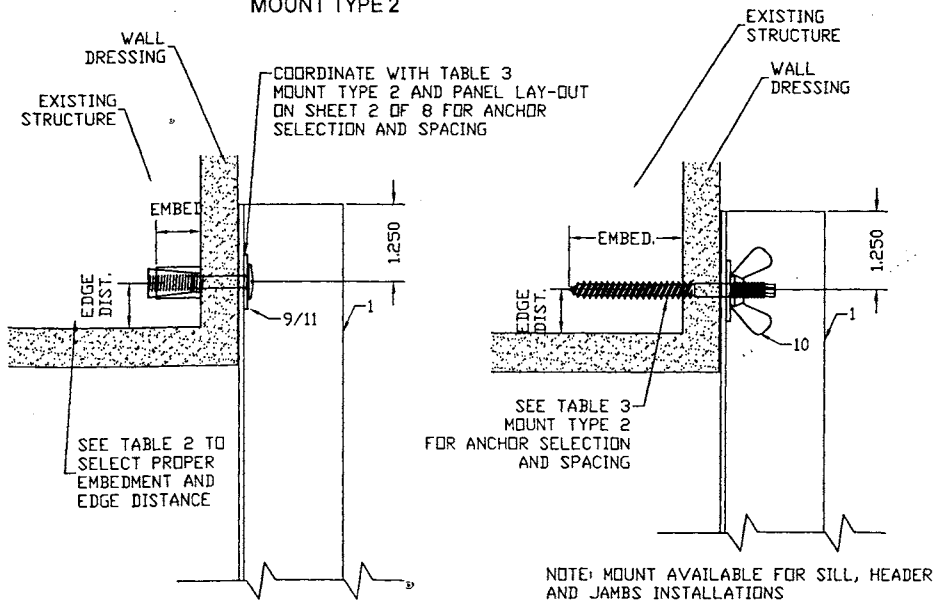


MOUNT TYPE 3

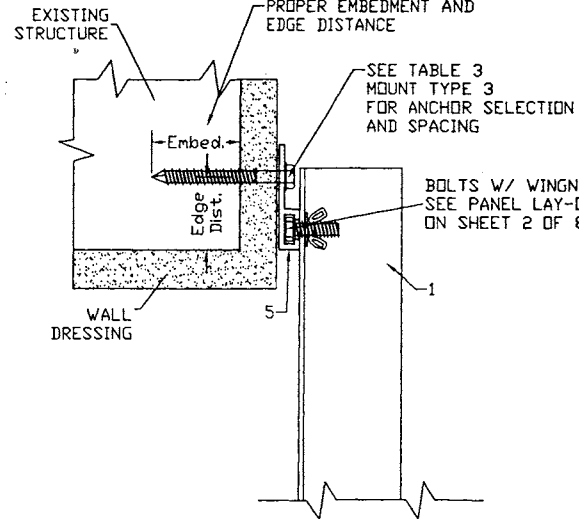


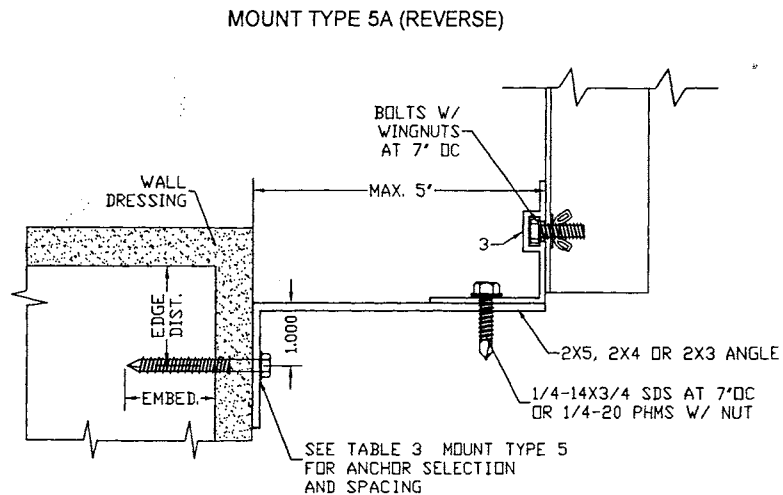
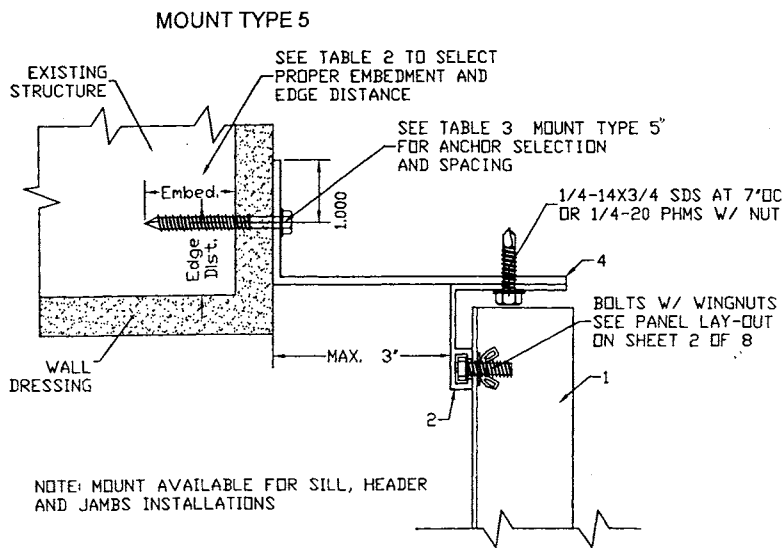
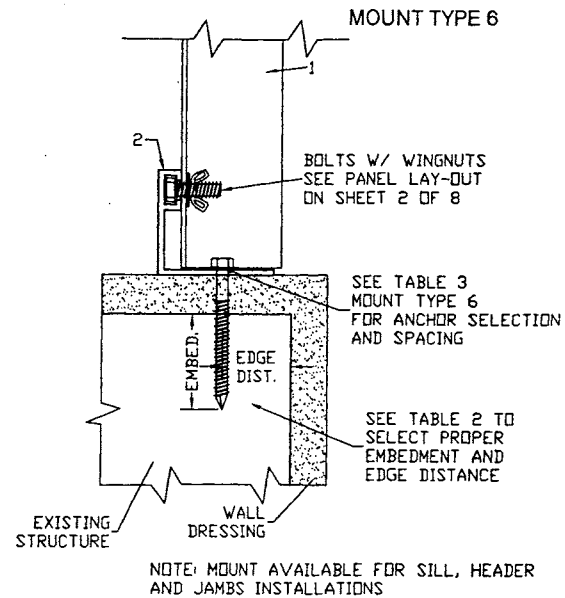
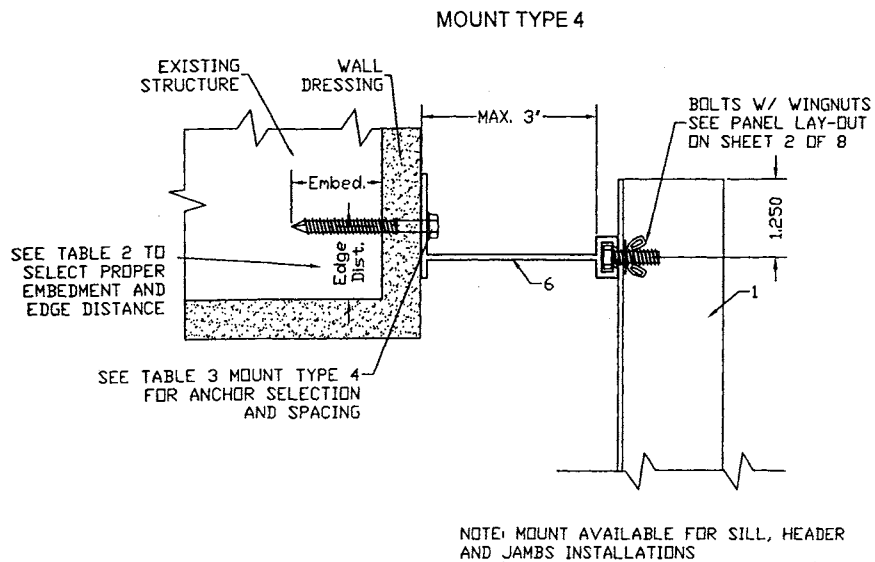
NOTE: MOUNT AVAILABLE FOR SILL, HEADER AND JAMBS INSTALLATIONS

MOUNT TYPE 2



SEE TABLE 2 TO SELECT PROPER EMBEDMENT AND EDGE DISTANCE

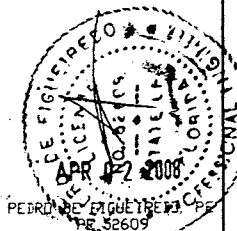




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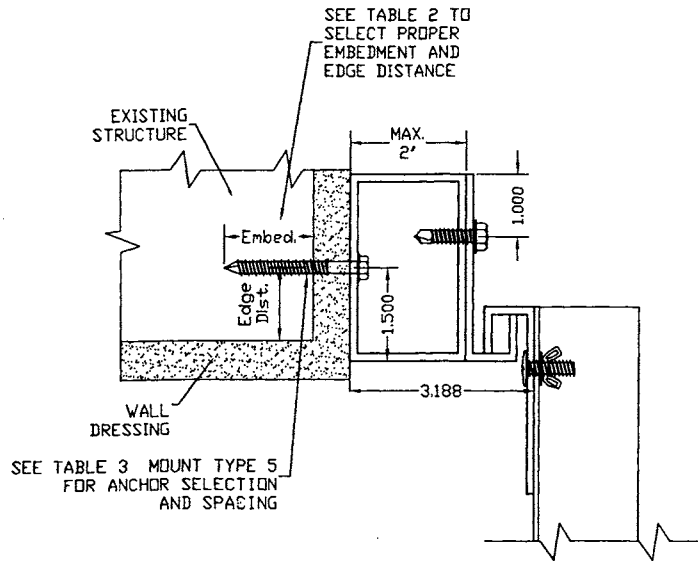
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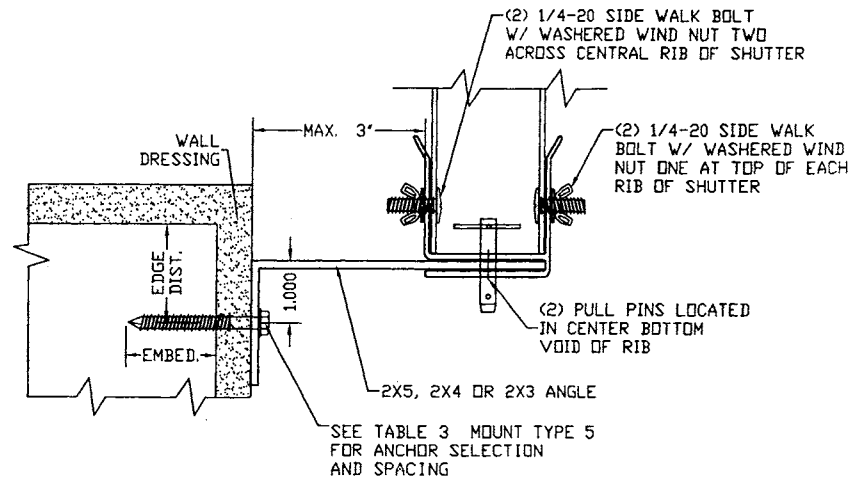
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ESCAPE PANELS DETAILS

MOUNT TYPE 5E1



MOUNT TYPE 5E2

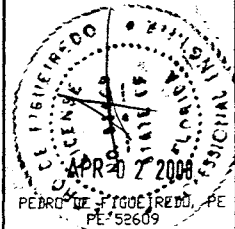


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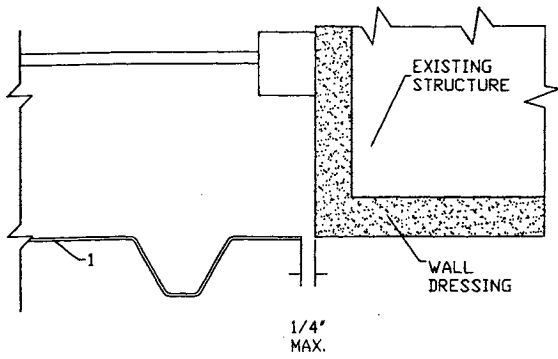
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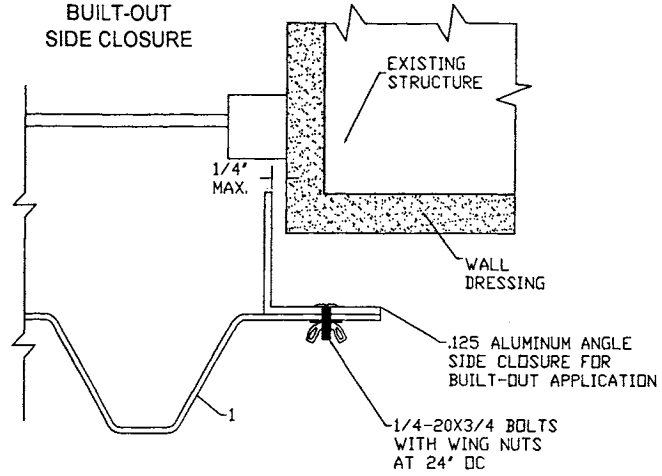
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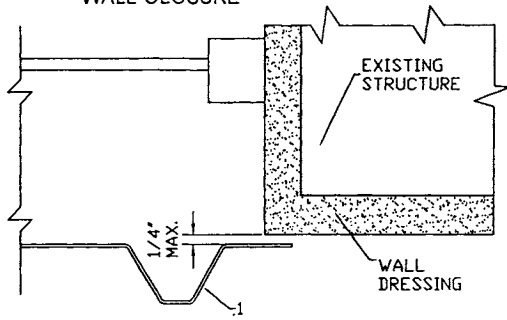
DETAIL 8
INSET CLOSURE



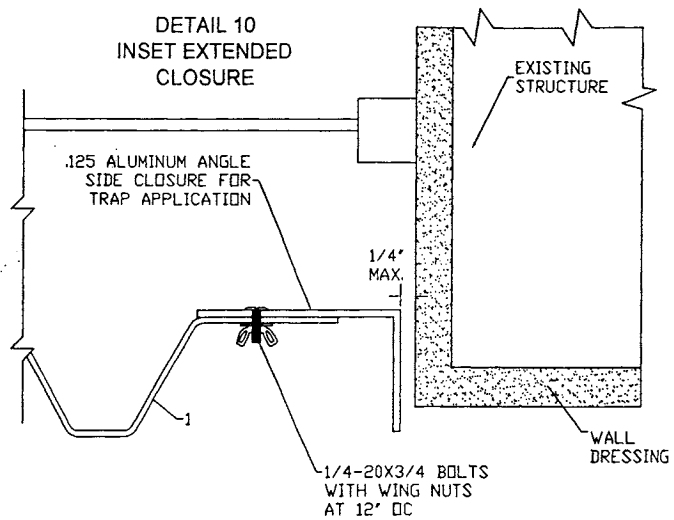
DETAIL 9
BUILT-OUT
SIDE CLOSURE



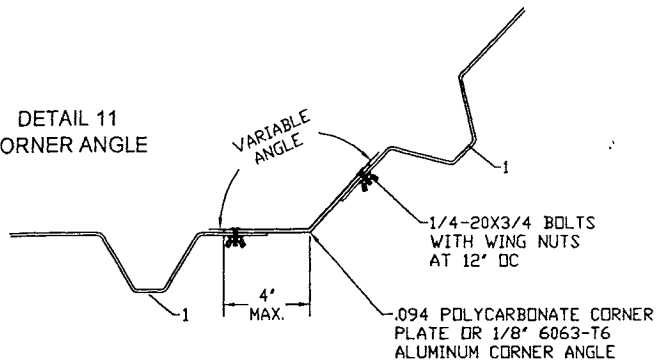
DETAIL 7
WALL CLOSURE



DETAIL 10
INSET EXTENDED
CLOSURE



DETAIL 11
CORNER ANGLE



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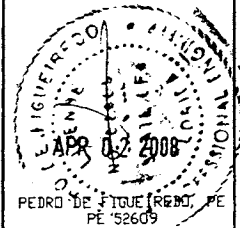
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Date: 04/02/08

Scale: na

Design by: PPMF

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**SHEET
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TABLE 3 ANCHOR SPACING

PANEL HEIGHT (INCHES)	ANCHOR TYPE	45 PSF						62 PSF						87 PSF						132 PS									
		1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6				
60	A		7.0						7.0							7.0						7.0							
	A1		7.0						7.0							7.0						7.0							
	A2		7.0							7.0							7.0						7.0						
	B		7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	7.0	6.0	7.0		7.0	5.0	7.0	4.0	6.0			
	B1		7.0	7.0	7.0	7.0	7.0	7.0		7.0	7.0	7.0	5.0	7.0		7.0	5.0	7.0	3.0	6.0		7.0	3.0	5.0		4.0			
	D	7.0		7.0	7.0	7.0	7.0		7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	7.0	7.0	7.0		7.0		7.0	7.0			
	D1	7.0		7.0	7.0	7.0	7.0	7.0		7.0		7.0	7.0	6.0	7.0	7.0		7.0	7.0	6.0	7.0	7.0		7.0		7.0	7.0		
	D2	7.0		7.0	7.0	7.0	7.0	7.0		7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	7.0	7.0	7.0		7.0		7.0	7.0		
	E	7.0		7.0	7.0	7.0	7.0	7.0		7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	7.0	7.0	7.0		7.0		7.0	7.0		
	E1	7.0		7.0	7.0	7.0	7.0	7.0		7.0		7.0	7.0	4.0	7.0	7.0		7.0	7.0	4.0	7.0	7.0		7.0		7.0	7.0		
	C/E2	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	6.0	5.0		
	F		7.0	7.0	7.0	7.0	7.0		7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	7.0	7.0	7.0		7.0		7.0	7.0	6.0	7.0	
F1		7.0	7.0	7.0	7.0	7.0		7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	7.0	5.0	7.0		7.0		7.0	4.0	7.0	3.0	5.0	
80	A		7.0						7.0							7.0						7.0							
	A1		7.0						7.0							7.0						7.0							
	A2		7.0							7.0							7.0						7.0						
	B		7.0	7.0	7.0	7.0	7.0		7.0	7.0	7.0	6.0	7.0		7.0	6.0	7.0	4.0	7.0			7.0	5.0	7.0	4.0				
	B1		7.0	7.0	7.0	7.0	7.0		7.0	5.0	7.0		6.0		7.0	3.0	5.0					7.0	3.0	5.0		4.0			
	D	7.0		7.0	7.0	7.0	7.0	7.0		7.0		7.0	7.0	7.0	7.0		7.0	7.0	7.0	7.0	7.0		7.0		7.0	7.0			
	D1	7.0		7.0	7.0	7.0	6.0	7.0	7.0		7.0		6.0	7.0	5.0	7.0	7.0		7.0	5.0	7.0		7.0		7.0	7.0			
	D2	7.0		7.0	7.0	7.0	7.0	7.0		7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	7.0	7.0	7.0		7.0		7.0	7.0		
	E	7.0		7.0	7.0	7.0	7.0	7.0		7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	5.0	7.0		7.0		7.0	7.0			
	E1	7.0		7.0	7.0	7.0	4.0	7.0	7.0		7.0		4.0	6.0		7.0			4.0				7.0		7.0	7.0			
	C/E2	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	6.0	6.0			
	F		7.0	7.0	7.0	7.0	7.0		7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	7.0	7.0	7.0		7.0		7.0	7.0	6.0	7.0	
F1		7.0	7.0	7.0	7.0	7.0		7.0		7.0	7.0	7.0	5.0	7.0		7.0	5.0	7.0	3.0	5.0		7.0		7.0	4.0	7.0	3.0		
100	A		7.0						7.0							7.0						7.0							
	A1		7.0						7.0							7.0						7.0							
	A2		7.0							7.0							7.0						7.0						
	B		7.0	7.0	7.0	7.0	7.0		7.0	7.0	7.0	5.0	7.0		7.0	7.0	7.0	5.0	7.0			7.0	6.0	7.0	5.0				
	B1		7.0	5.0	7.0	4.0	7.0		7.0	4.0	6.0		5.0		7.0								7.0	5.0	7.0		4.0		
	D	7.0		7.0	7.0	7.0	7.0	7.0		7.0		7.0	7.0	7.0	7.0		7.0	7.0	7.0	7.0	7.0		7.0		7.0	7.0			
	D1	7.0		7.0	7.0	7.0	5.0	7.0	7.0		7.0		5.0	7.0		7.0							7.0		7.0	7.0			
	D2	7.0		7.0	7.0	7.0	7.0	7.0		7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	7.0	7.0	7.0		7.0		7.0	7.0		
	E	7.0		7.0	7.0	7.0	7.0	7.0		7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	5.0	7.0		7.0		7.0	7.0			
	E1	7.0		7.0	7.0	7.0	6.0	7.0		7.0		7.0		5.0		7.0			4.0				7.0		7.0	7.0			
	C/E2	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	6.0	6.0			
	F		7.0	7.0	7.0	7.0	7.0		7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	7.0	7.0	7.0		7.0		7.0	7.0	6.0	7.0	
F1		7.0	7.0	7.0	7.0	5.0	7.0		7.0		7.0	6.0	7.0	4.0	6.0		7.0	6.0	7.0	4.0	6.0		7.0		7.0	6.0	7.0		
120	A		7.0						7.0							7.0						7.0							
	A1		7.0						7.0							7.0						7.0							
	A2		7.0							7.0							7.0						7.0						
	B		7.0	7.0	7.0	5.0	7.0		7.0	7.0	7.0	5.0	7.0		7.0	7.0	7.0	5.0	7.0			7.0	6.0	7.0	5.0				
	B1		7.0	4.0	7.0		6.0		7.0		7.0	7.0	7.0	7.0		7.0							7.0	6.0	7.0		4.0		
	D	7.0		7.0	7.0	7.0	7.0	7.0		7.0		7.0	7.0	7.0	7.0		7.0	7.0	7.0	7.0	7.0		7.0		7.0	7.0			
	D1	7.0		7.0	7.0	7.0	7.0	7.0		7.0		7.0	7.0	7.0	7.0		7.0	7.0	7.0	7.0	7.0		7.0		7.0	7.0			
	D2	7.0		7.0	7.0	7.0	7.0	7.0		7.0		7.0	7.0	7.0	7.0		7.0	7.0	7.0	7.0	7.0		7.0		7.0	7.0			
	E	7.0		7.0	7.0	7.0	7.0	7.0		7.0		7.0	7.0	7.0	7.0		7.0	7.0	7.0	7.0	7.0		7.0		7.0	7.0			
	E1	7.0		7.0	7.0	7.0	7.0	7.0		7.0		7.0	7.0	7.0	7.0		7.0	7.0	7.0	7.0	7.0		7.0		7.0	7.0			
	C/E2	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	6.0	6.0			
	F		7.0	7.0	7.0	7.0	7.0		7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	7.0	7.0	7.0		7.0		7.0	7.0	6.0	7.0	
F1		7.0	6.0	7.0	4.0	7.0		7.0		7.0	7.0	7.0	7.0	7.0		7.0	7.0	7.0	7.0	7.0		7.0		7.0	7.0	6.0	7.0		

EXAMPLE:
 PANEL HEIGHT: 80'
 DESIGNED PRESSURE: Pd= 87 PSF
 MOUNT TYPE: 6 (SHEET 4 of 8)
 ANCHOR TYPE D - SEE TABLE 2
 ANCHOR SPACING: 7' OC
 EDGE DISTANCE - 3 1/8"
 EMBEDMENT: 2"

EXAMPLE:
 PANEL HEIGHT: 100'
 DESIGNED PRESSURE: Pd= 45 PSF
 MOUNT TYPE: 5 (SHEET 4 of 8)
 SE1, SE2 OR SE3 (SHEET 6 OF 8)
 ANCHOR TYPE F - SEE TABLE 2
 ANCHOR SPACING: 7' OC
 EDGE DISTANCE - 3"
 EMBEDMENT: 1 1/4"

TABLE 2 - ANCHOR SCHEDULE

TYPE	DESCRIPTION	STRUCTURE	EMBED.	EDGE DIST.
A	1/4" Panelmate	Conc. (fc' = 3350psi)	2"	2 1/2"
A1	1/4" Panelmate	ASTM C-90 CMU	1 1/4"	2 1/2"
A2	1/4" Panelmate	Wood (SG)= 54)	1 3/4"	3/4"
B1	1/4-20 Lead shields	ASTM C-90 CMU	7/8"	3"
B2	1/4-20 Lead shields	Conc. (fc' = 2500psi)	7/8"	3"
C	1/4" Lag Screws	Wood (SG)= 55)	2"	3/4"
D	5/16" Ultracon	Conc. (fc' = 3500psi)	2"	3 1/8"
D1	5/16" Ultracon	ASTM C-90 CMU	1 1/4"	3 1/8"
D2	5/16" Ultracon	Wood (SG)= 55)	2 1/2"	7/8"
E	1/4" Ultracon	Conc. (fc' = 2700psi)	1 3/4"	2 1/2"
E1	1/4" Ultracon	ASTM C-90 CMU	1 1/4"	2 1/2"
E2	1/4" Ultracon	Wood (SG)= 55)	2"	3/4"
F	1/4" Panelmate Insert	Conc. (fc' = 2500psi)	1 1/4"	3"
F1	1/4" Panelmate Insert	ASTM C-90 CMU	1 1/4"	3"

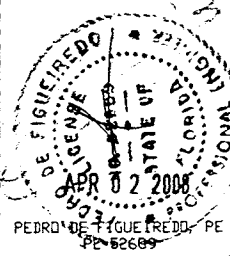
Notes:
 1- EMBEDMENT IS BEYOND WALL DRESSING.
 2- ANCHORS TYPE A, PANELMATE BY ELCO, CAN BE USED WITH *PLUS, PRO, MALE' STILES.
 3- ANCHORS TYPE E, 1/4" ULTRACON, ARE MADE BY ELCO.
 4- 1/4-20 LEAD SHIELDS ANCHORS ARE MADE BY ALLPOINTS OR BY POWERS FASTENERS (*CALK-IN").

Manufacturer:
Clear Strength USA, LLC

1414 COMMERCE PARK DR.
 TIPP CITY, OHIO 45371
 Tel.: (937) 677-4485
 Fax.: (937) 667-3647

Product:
Polycarbonate Hurricane Shutter Panel

Engineering:
EngCo Inc.
 CA 8116
 6971 W. Sunrise Blvd. 104
 Plantation, FL 33313
 Tel.: (954) 585-0304
 Fax: (954) 585-0305



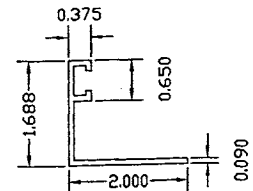
DRAFTING:
PK DRAFTING & MORE

Date: 04/02/08
 Scale: na
 Design by: PPMF

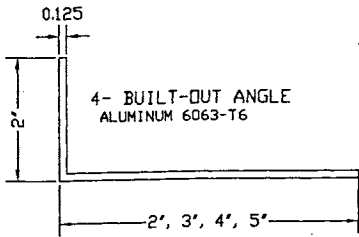
Drawing Number
08-073

SHEET
 7 of 8

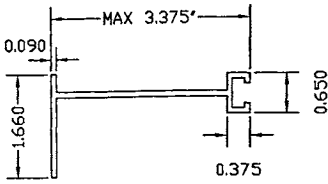
COMPONENTS DETAILS



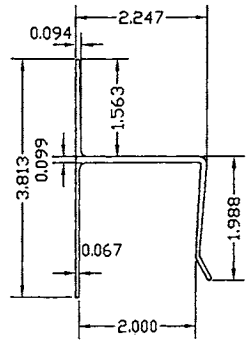
2- 'F' ANGLE TRACK
ALUMINUM 6063-T6



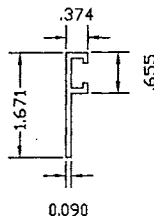
4- BUILT-OUT ANGLE
ALUMINUM 6063-T6



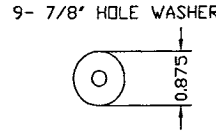
6- 1', 2', 3'
'F' BUILT-OUT TRACK
ALUMINUM 6063-T6



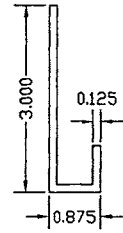
7- 'H' HEADER TRACK
ALUMINUM 6063-T6



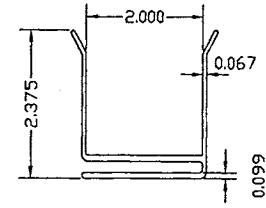
5- 'F' TRACK
ALUMINUM 6063-T6



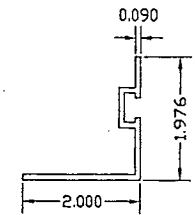
9- 7/8' HOLE WASHER



7E- HOOK TRACK
ALUMINUM 6063-T6

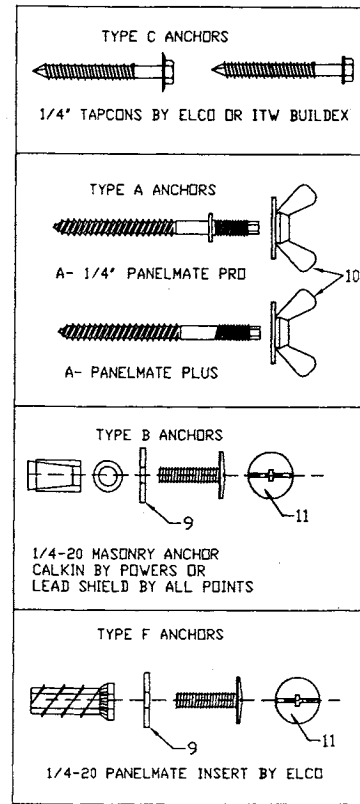


7E1- Y TRACK
ALUMINUM 6063-T6



3- REVERSE
'F' ANGLE TRACK
ALUMINUM 6063-T6

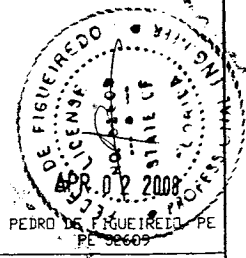
COMPONENTS SCHEDULE		
PART	DESCRIPTION	MATERIAL
1	POLYCARBONATE PANEL	POLYCARBONATE
2	'F' ANGLE TRACK	6063-T6
3	REVERSE 'F' ANGLE TRACK	6063-T6
4	1/8-2X BUILT-OUT ANGLE	6063-T6
5	'F' TRACK	6063-T6
6	'F' BUILT-OUT TRACK	6063-T6
7	'h' HEADER TRACK	6063-T6
7E	HOOK TRACK	6063-T6
7E1	Y TRACK	6063-T6
8	1/4-14X3/4 SDS	GRADE 5 STEEL
9	7/8' WASHER	STAINLESS STEEL
10	1/4-20 WASHERED WINGNUT	ZINC ALLOY
11	1/4-20 SS SIDEWALK SCREWS	STAINLESS STEEL
12	1/4-20 SS HH MACHINE SCREWS	STAINLESS STEEL
13	1/4-20 SS HH NUT	STAINLESS STEEL
14	PULL PIN SS 1/4X 1 1/2"	STAINLESS STEEL



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