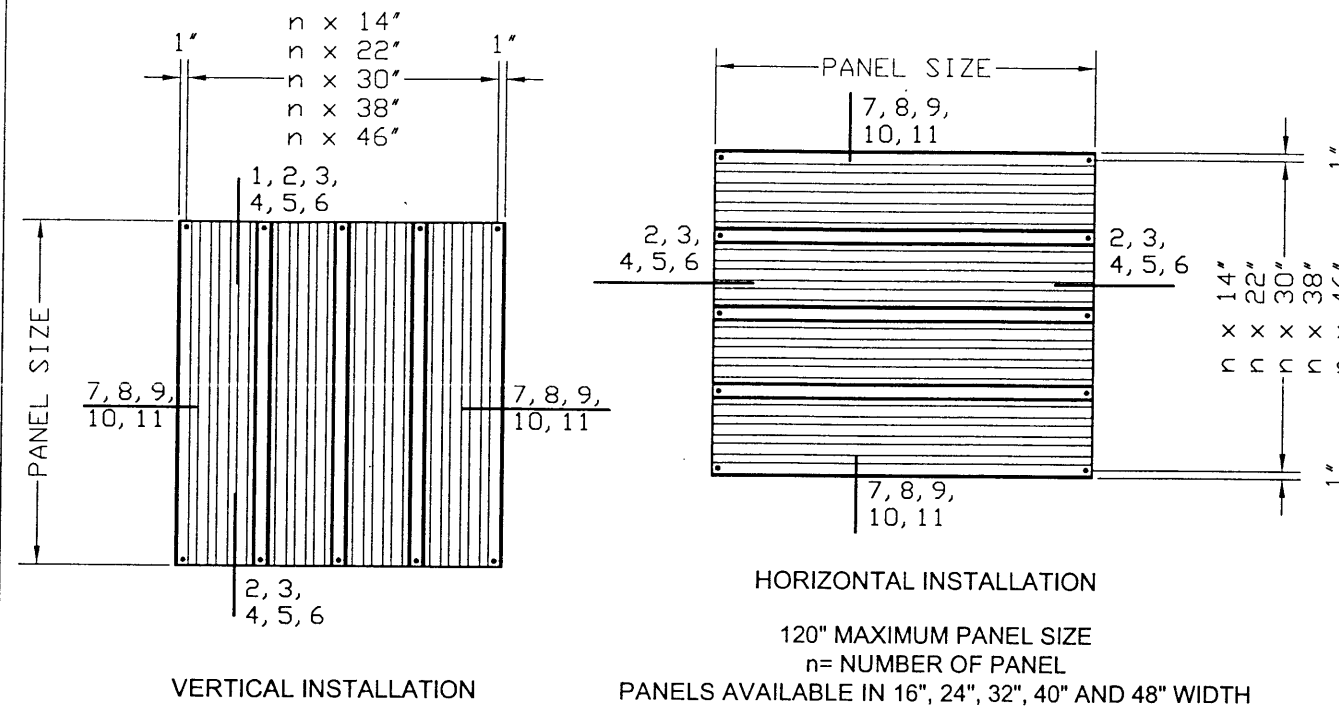


GENERAL NOTES: (IBC 2006 & IRC 2006 w/ 2006 TEXAS REVISIONS)

- 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
 - 3.3- PANELS SMALLER THAN 14' IN LENGTH (POROSITY >10%)
 FOR ALL ABOVE CONDITIONS THE PRODUCT MUST BE SEPARATED AT MINIMUM 15' 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:
 - 5.1 STORM PANELS SHALL BE MIN. 0.073" POLYCARBONATE CONFORMING TO ASTM D-638 WITH A MINIMUM $F_y = 9.36 \text{ KSI}$
 - 5.2 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- 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.
- 8- 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)

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



DESIGNED RATING Pd (+/- PSF)	PANEL SIZE (INCHES)
45	120
50	114
55	108
60	103
62	100
65	98
70	93
75	89
80	85
85	81
87	80
90	77
95	74
100	71
105	69
110	66
115	64
120	63
125	61
132	60

USER INSTRUCTION:

- 1- OBTAIN PROJECT WIND LOAD PRESSURES AS PER GENERAL NOTE 4.
- 2- COMPARE DESIGNED RATING PRESSURE (TABLE 1) BASED ON PANEL SIZE WITH PROJECT WIND LOAD PRESSURES. PROJECT PRESSURE MUST BE EQUAL OR LESS THAN PANEL RATING PRESSURE.
- 3- SELECT PROPER ANCHOR TYPE AND SPACING BASED ON TYPE OF MOUNT AND SUBSTRATE.
- 4- SELECT TYPE OF SIDE CLOSURE AS PER SHEET 6 OF 8.

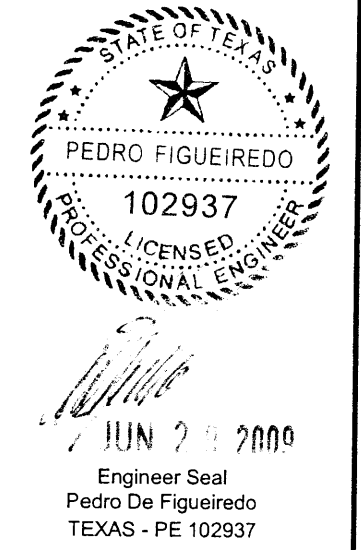
TABLE OF CONTENTS:

SHEET	DESCRIPTION
1	GENERAL NOTES, TYPICAL ELEVATIONS & ALLOWABLE DESIGN PRESSURES (TABLE 1)
2	PANEL DETAILS AND LAY-OUTS
3	MOUNT TYPES 1, 2 & 3 DETAILS
4	MOUNT TYPES 4, 5, 5A & 6 DETAILS
5	MOUNT TYPES 5E1 AND 5E2 DETAILS - ESCAPE PANELS
6	SIDE CLOSURES 7, 8, 9, 10, 11 DETAILS
7	ANCHOR SCHEDULE TABLE 2 AND HOLLOW BLOCK ANCHORS TABLES 3, 4 AND 5
8	COMPONENTS DETAILS

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 HURRICANE
 SHUTTER PANEL

Engineering:
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 CR 11234
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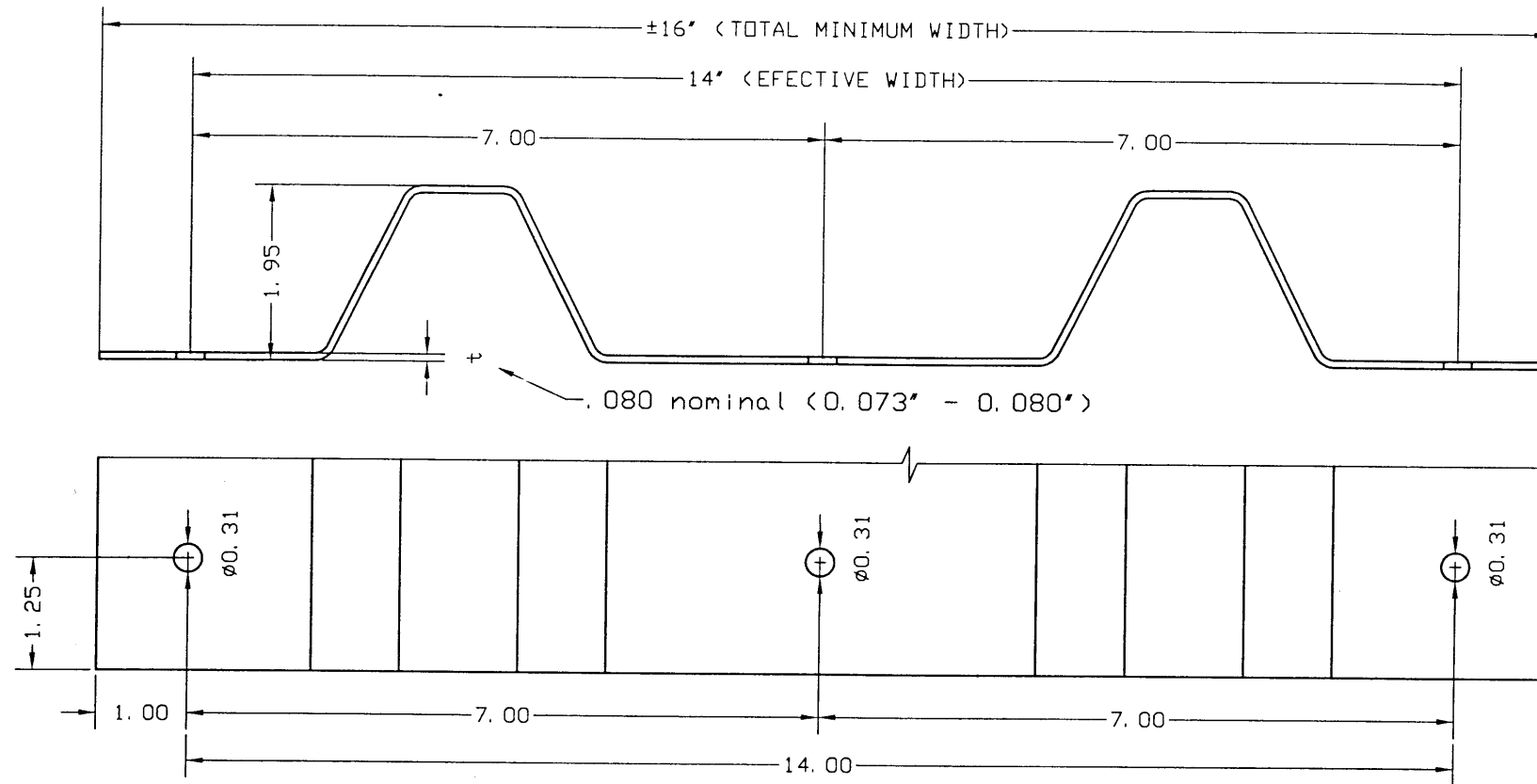
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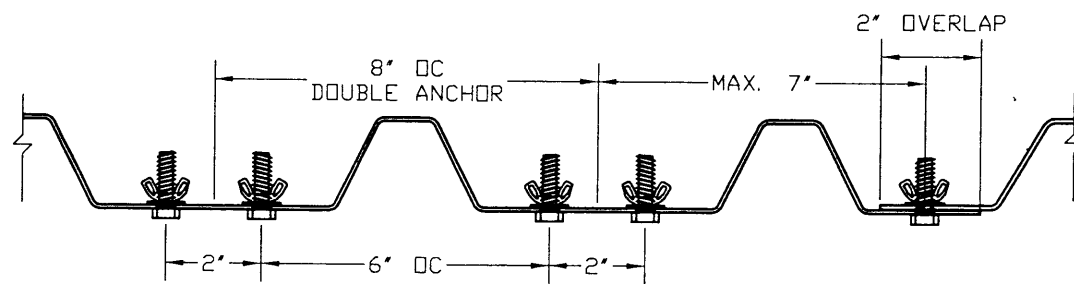
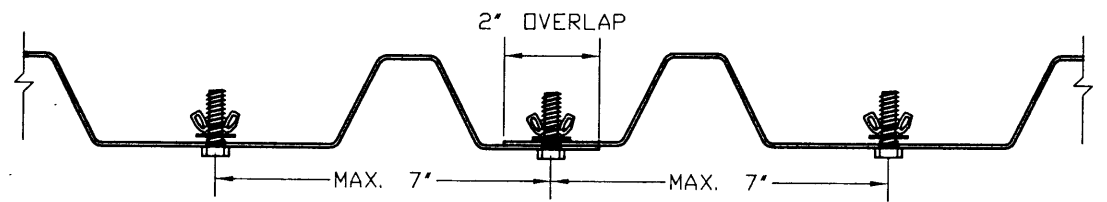
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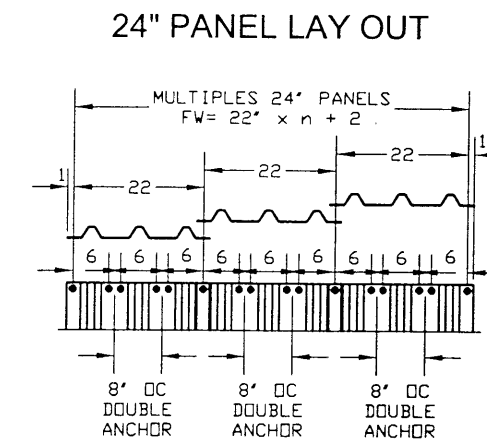
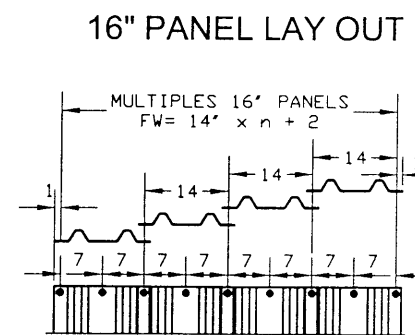
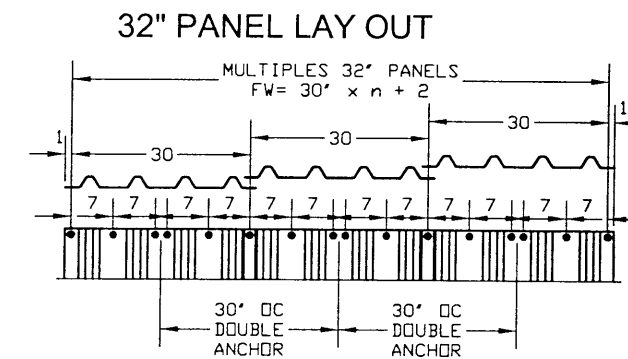
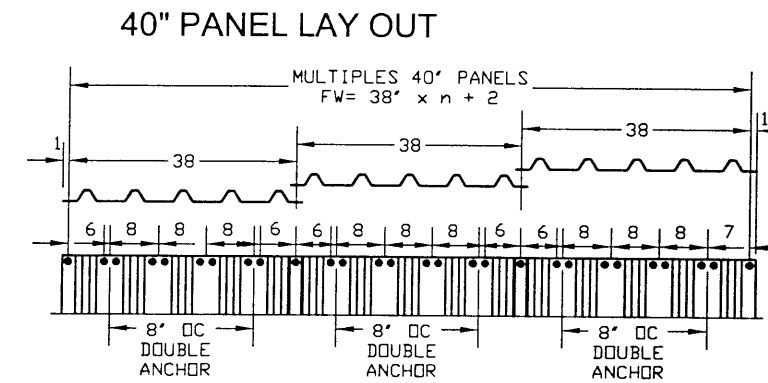
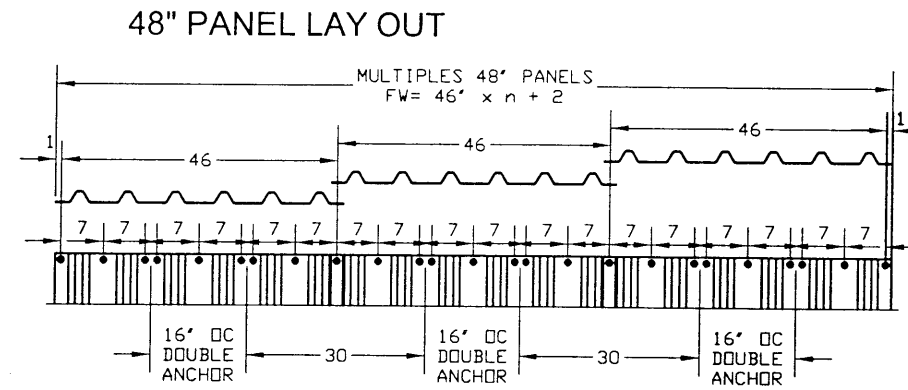
PANEL DETAILS



1- TYPICAL POLYCARBONATE HURRICANE SHUTTER PANEL



PANEL LAY-OUT OPTIONS



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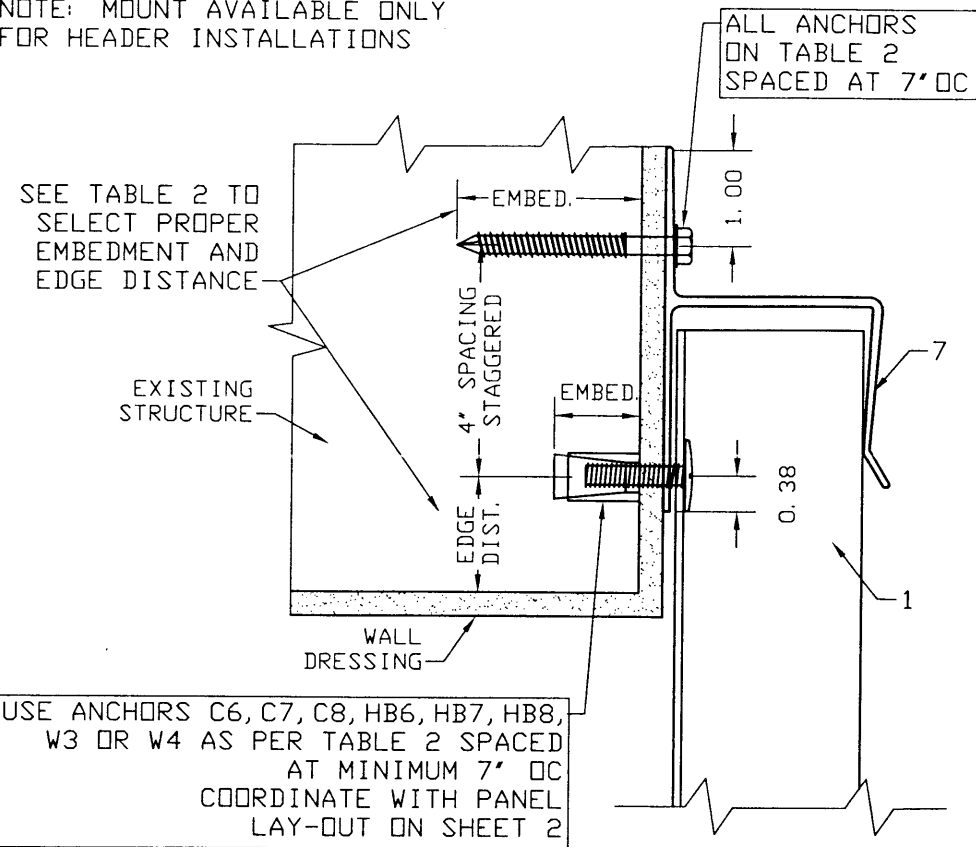
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MOUNT TYPE 1

NOTE: MOUNT AVAILABLE ONLY FOR HEADER INSTALLATIONS

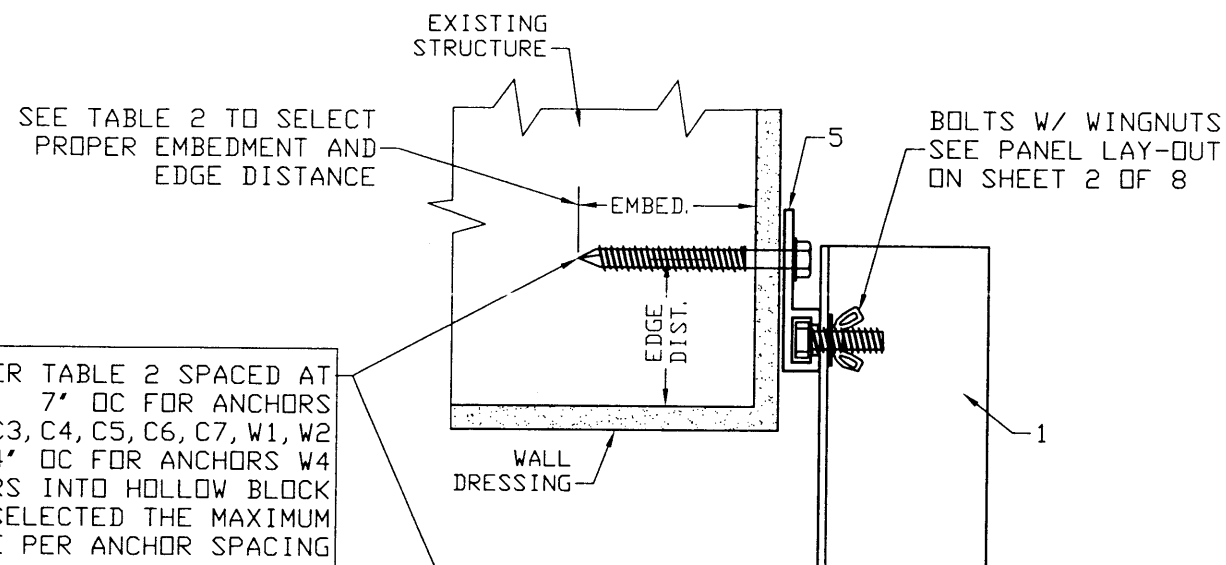


USE ANCHORS C6, C7, C8, HB6, HB7, HB8, W3 OR W4 AS PER TABLE 2 SPACED AT MINIMUM 7' OC COORDINATE WITH PANEL LAY-OUT ON SHEET 2

ALL ANCHORS ON TABLE 2 SPACED AT 7' OC

MOUNT TYPE 3

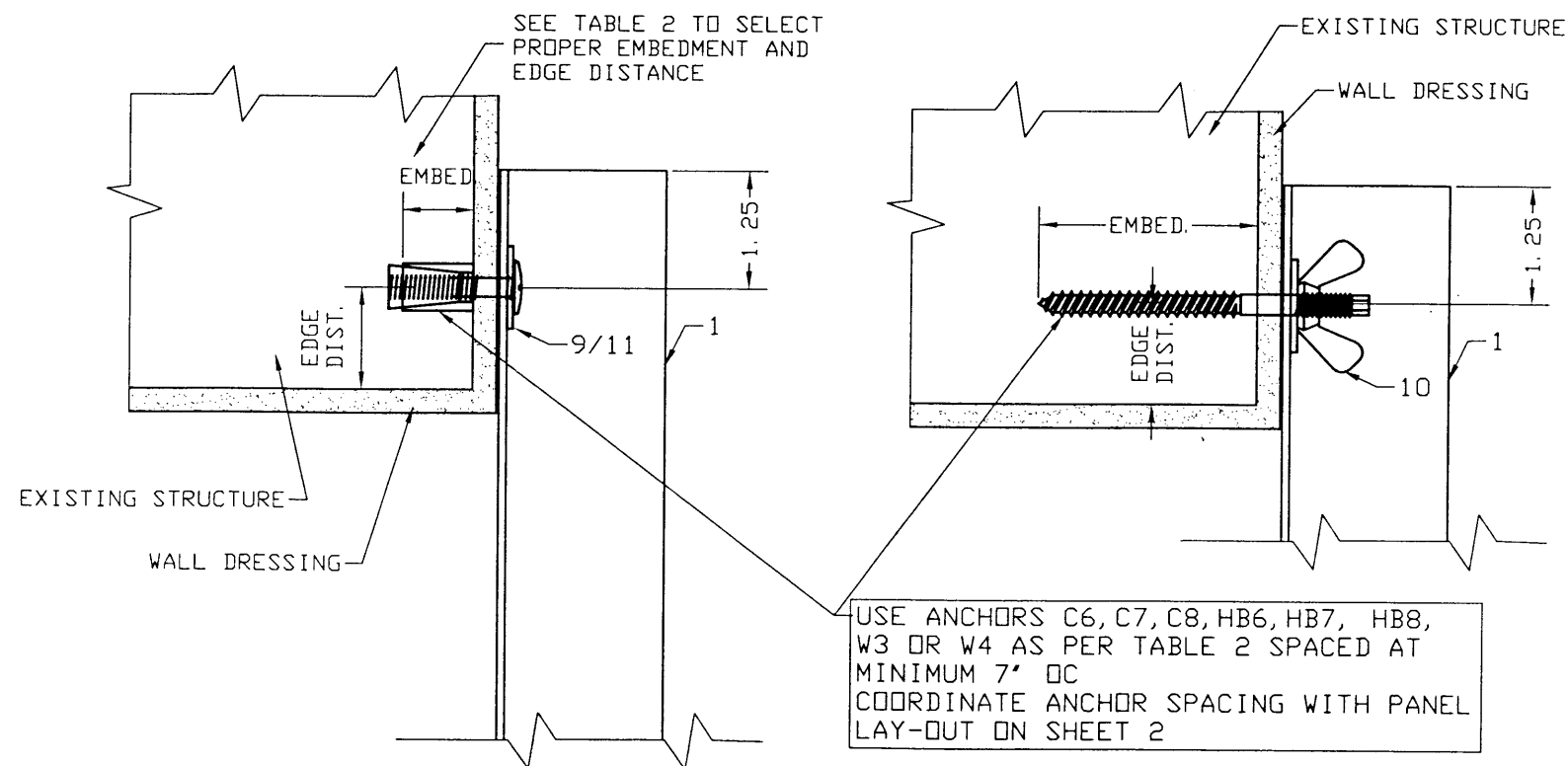
NOTE: MOUNT AVAILABLE FOR SILL, HEADER AND JAMBS INSTALLATIONS



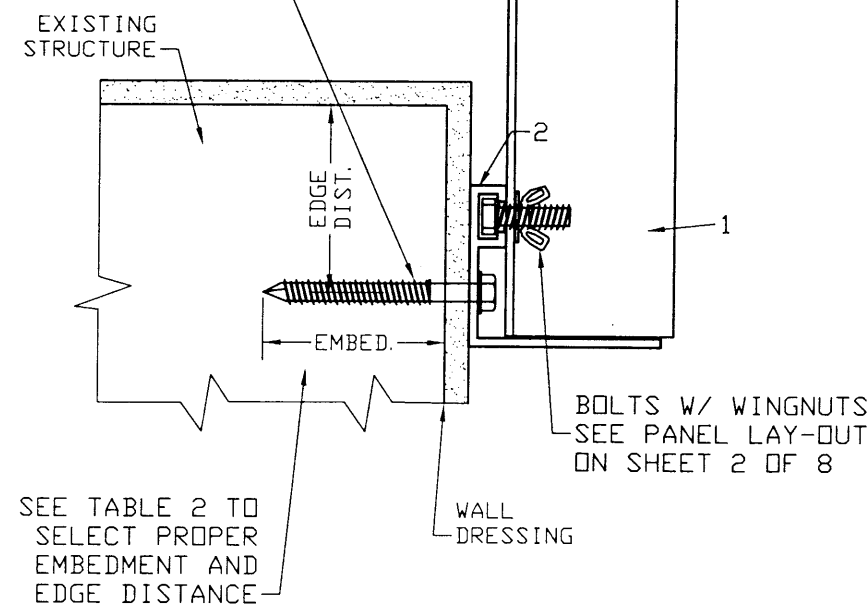
USE ANCHORS AS PER TABLE 2 SPACED AT 7' OC FOR ANCHORS C1, C2, C3, C4, C5, C6, C7, W1, W2 4' OC FOR ANCHORS W4 FOR ANCHORS INTO HOLLOW BLOCK USE TABLE 3 TO SELECTED THE MAXIMUM ALLOWABLE PRESSURE PER ANCHOR SPACING

MOUNT TYPE 2

NOTE: MOUNT AVAILABLE FOR SILL, HEADER AND JAMBS INSTALLATIONS



USE ANCHORS C6, C7, C8, HB6, HB7, HB8, W3 OR W4 AS PER TABLE 2 SPACED AT MINIMUM 7' OC COORDINATE ANCHOR SPACING WITH PANEL LAY-OUT ON SHEET 2



SEE TABLE 2 TO SELECT PROPER EMBEDMENT AND EDGE DISTANCE

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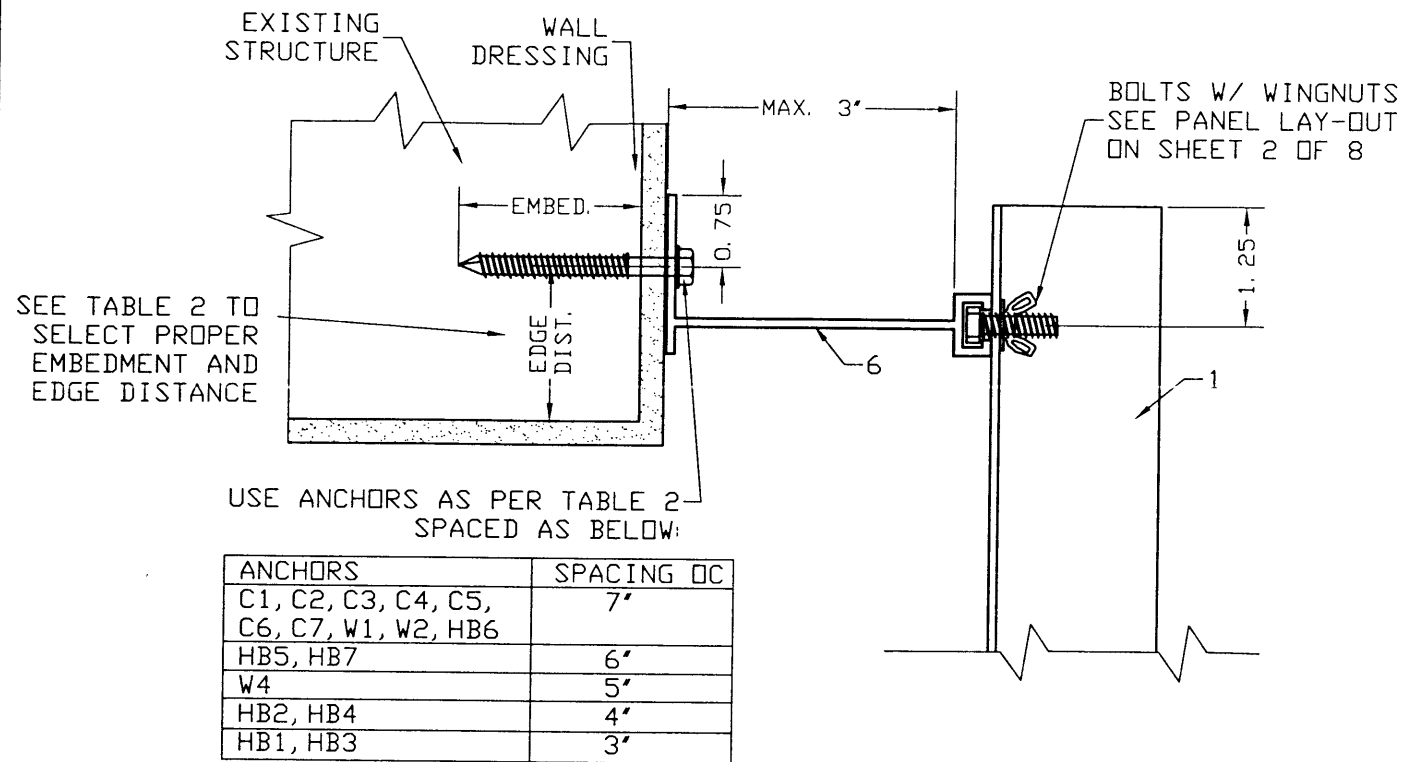
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Sheet
3 of 8

MOUNT TYPE 4

NOTE: MOUNT AVAILABLE FOR SILL, HEADER AND JAMBS INSTALLATIONS

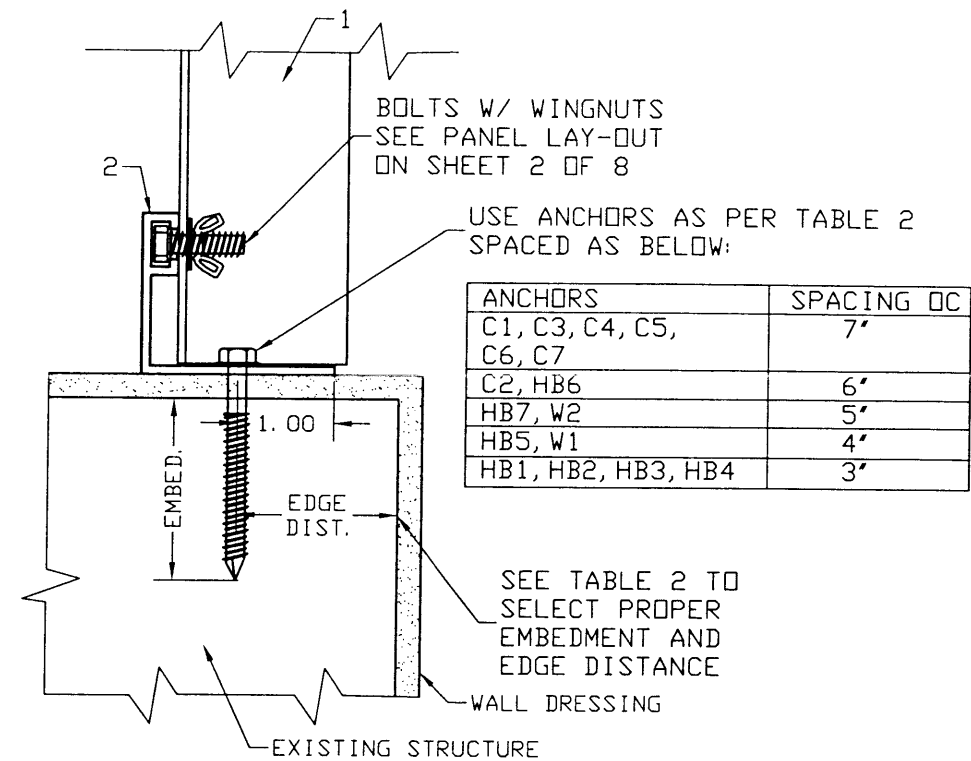


USE ANCHORS AS PER TABLE 2 SPACED AS BELOW:

ANCHORS	SPACING OC
C1, C2, C3, C4, C5, C6, C7, W1, W2, HB6	7'
HB5, HB7	6'
W4	5'
HB2, HB4	4'
HB1, HB3	3'

MOUNT TYPE 6

NOTE: MOUNT AVAILABLE FOR SILL, HEADER AND JAMBS INSTALLATIONS



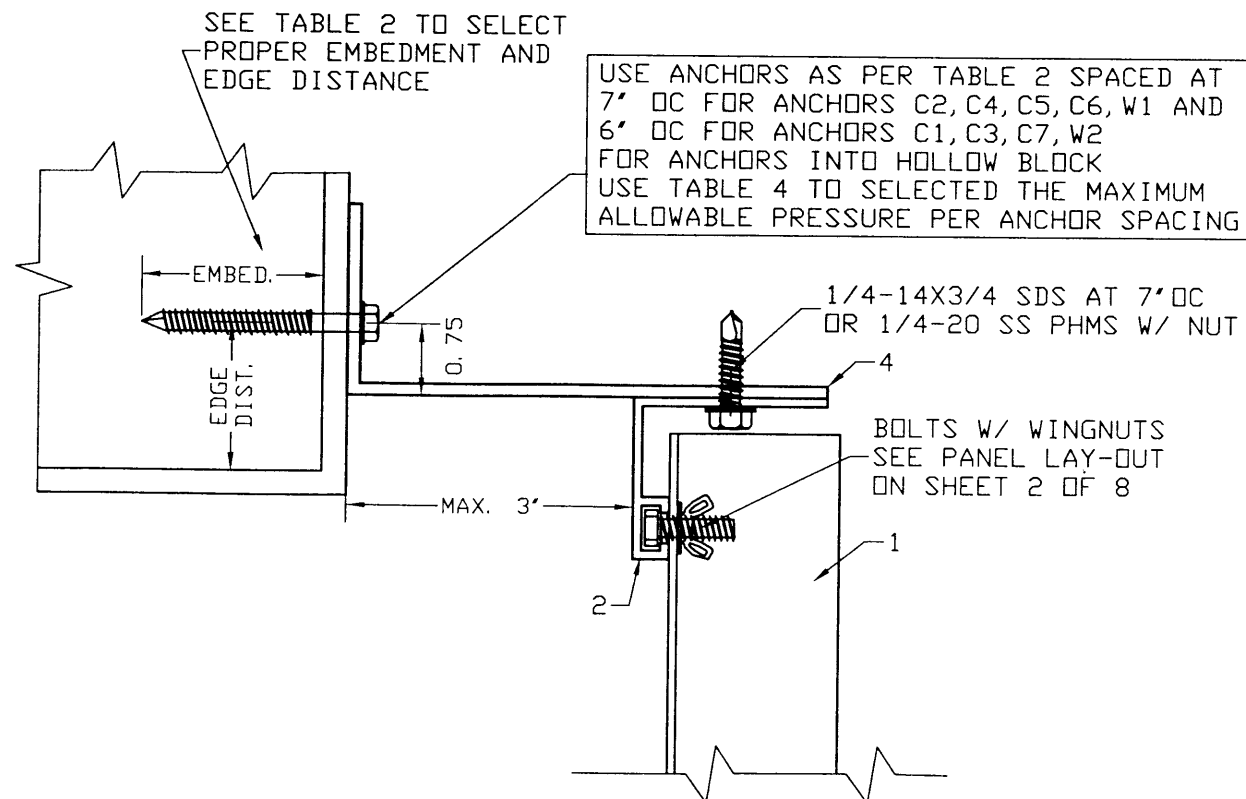
USE ANCHORS AS PER TABLE 2 SPACED AS BELOW:

ANCHORS	SPACING OC
C1, C3, C4, C5, C6, C7	7'
C2, HB6	6'
HB7, W2	5'
HB5, W1	4'
HB1, HB2, HB3, HB4	3'

SEE TABLE 2 TO SELECT PROPER EMBEDMENT AND EDGE DISTANCE

MOUNT TYPE 5

NOTE: MOUNT AVAILABLE FOR SILL, HEADER AND JAMBS INSTALLATIONS



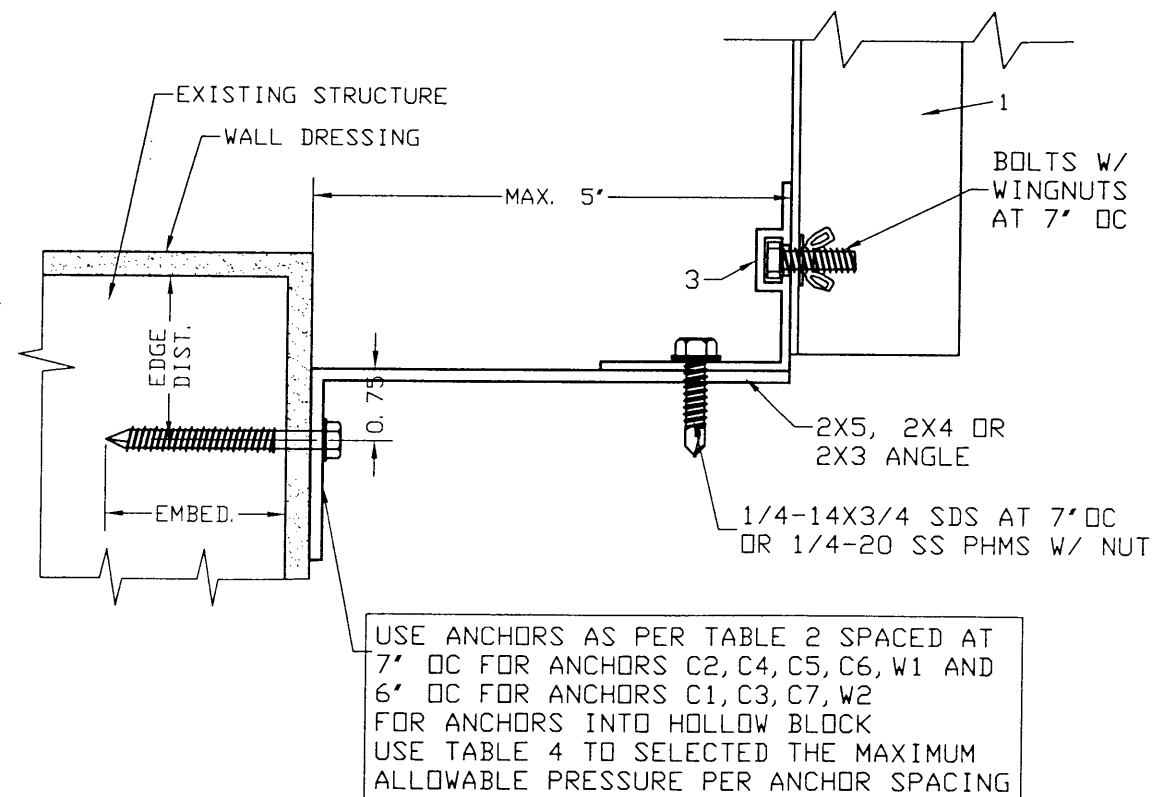
USE ANCHORS AS PER TABLE 2 SPACED AT 7' OC FOR ANCHORS C2, C4, C5, C6, W1 AND 6' OC FOR ANCHORS C1, C3, C7, W2 FOR ANCHORS INTO HOLLOW BLOCK USE TABLE 4 TO SELECTED THE MAXIMUM ALLOWABLE PRESSURE PER ANCHOR SPACING

1/4-14X3/4 SDS AT 7' OC OR 1/4-20 SS PHMS W/ NUT

BOLTS W/ WINGNUTS SEE PANEL LAY-OUT ON SHEET 2 OF 8

MOUNT TYPE 5A (REVERSE)

NOTE: MOUNT AVAILABLE FOR SILL, HEADER AND JAMBS INSTALLATIONS



USE ANCHORS AS PER TABLE 2 SPACED AT 7' OC FOR ANCHORS C2, C4, C5, C6, W1 AND 6' OC FOR ANCHORS C1, C3, C7, W2 FOR ANCHORS INTO HOLLOW BLOCK USE TABLE 4 TO SELECTED THE MAXIMUM ALLOWABLE PRESSURE PER ANCHOR SPACING

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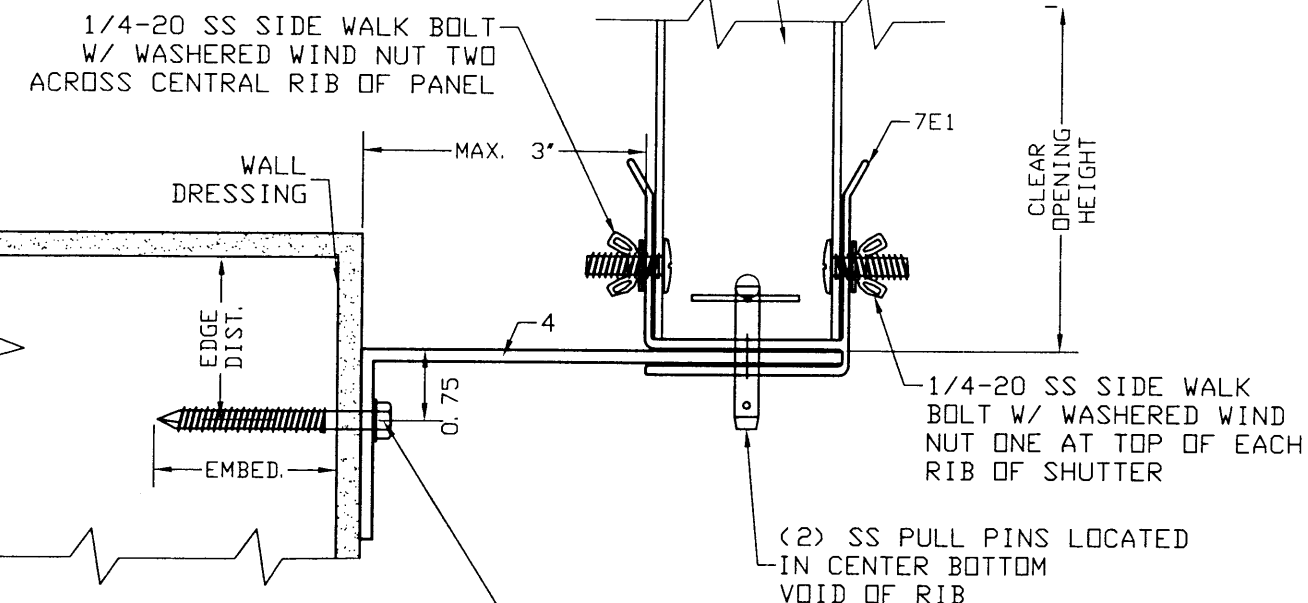
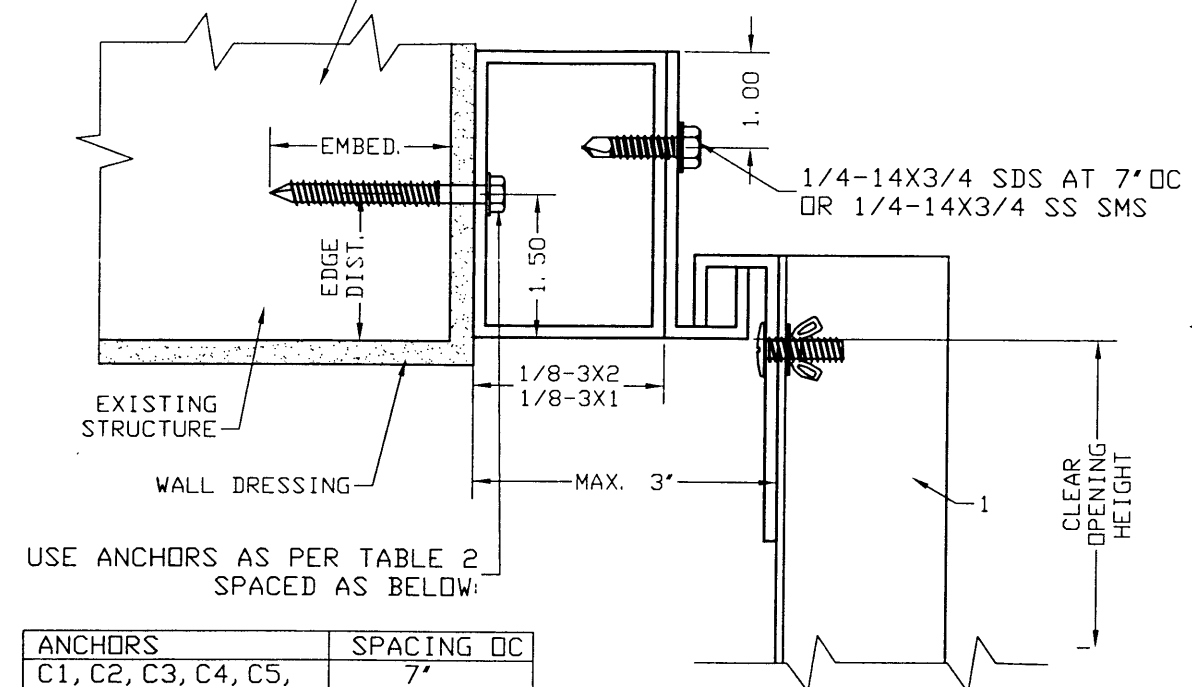
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ESCAPE PANELS DETAILS

MOUNT TYPE 5E1
HEADER INSTALLATION

MOUNT TYPE 5E2
SILL INSTALLATION

SEE TABLE 2 TO SELECT
PROPER EMBEDMENT AND
EDGE DISTANCE

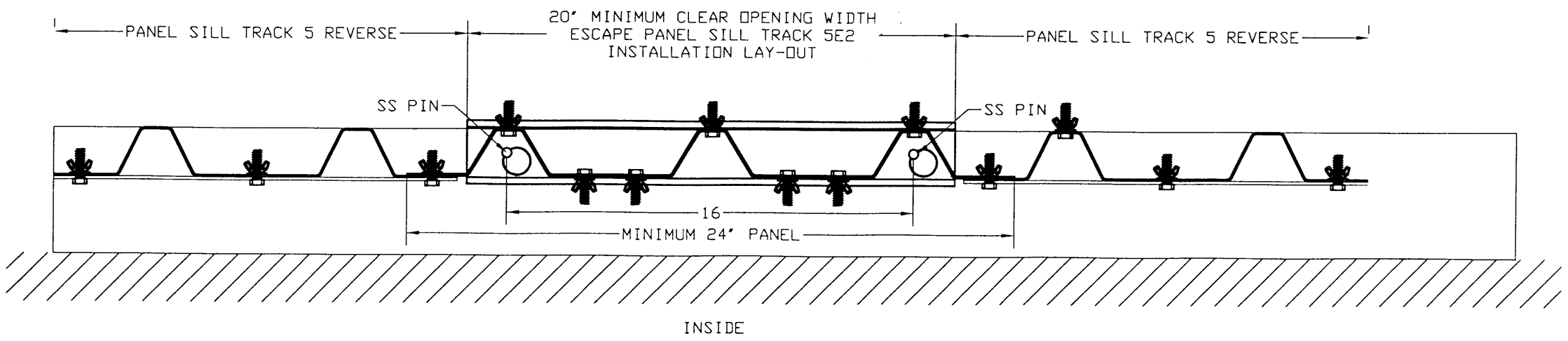


ANCHORS	SPACING OC
C1, C2, C3, C4, C5, C6, C7, W1, W2, HB6	7'
HB5, HB7	6'
W4	5'
HB2, HB4	4'
HB1, HB3	3'

EMERGENCY ESCAPE OPENING: (AS PER IBC 2006 SECTION 1026.2):
SHALL HAVE A MINIMUM NET CLEAR OPENING OF 5.7 SQ. FEET.
THE MINIMUM NET CLEAR OPENING HEIGHT (OH) SHALL BE 24".
THE MINIMUM NET CLEAR OPENING WIDTH (OW) SHALL BE 20".

MINIMUM OPENING WIDTH (OW)	20"	24"	36"	48"
MINIMUM OPENING HEIGHT (OH)	42"	34"	24"	24"

USE ANCHORS AS PER TABLE 2 SPACED AT
7' OC FOR ANCHORS C1, C2, C3, C4, C5, C6, C7, W1, W2
AND 4' OC FOR ANCHOR W4
FOR ANCHORS INTO HOLLOW BLOCK
USE TABLE 5 TO SELECTED THE MAXIMUM
ALLOWABLE PRESSURE PER ANCHOR SPACING



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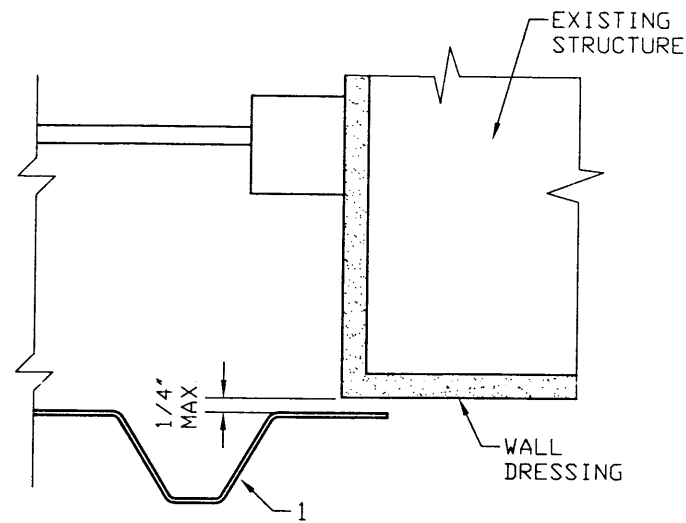
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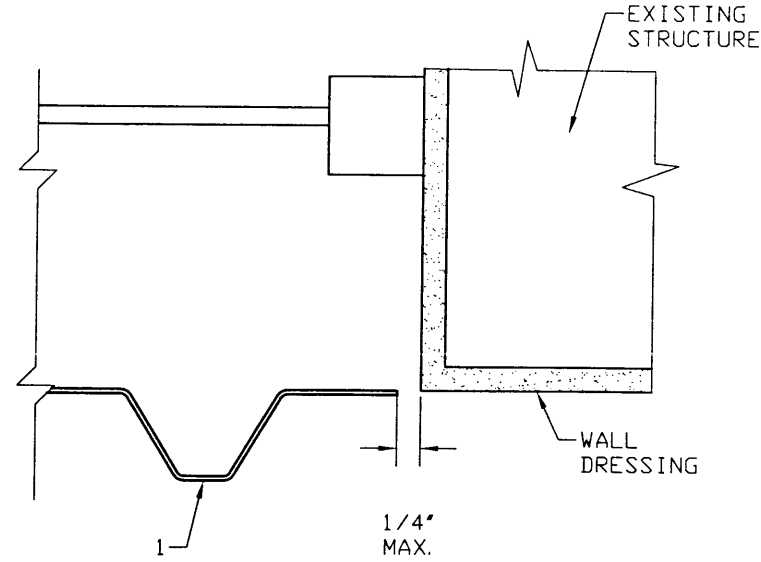
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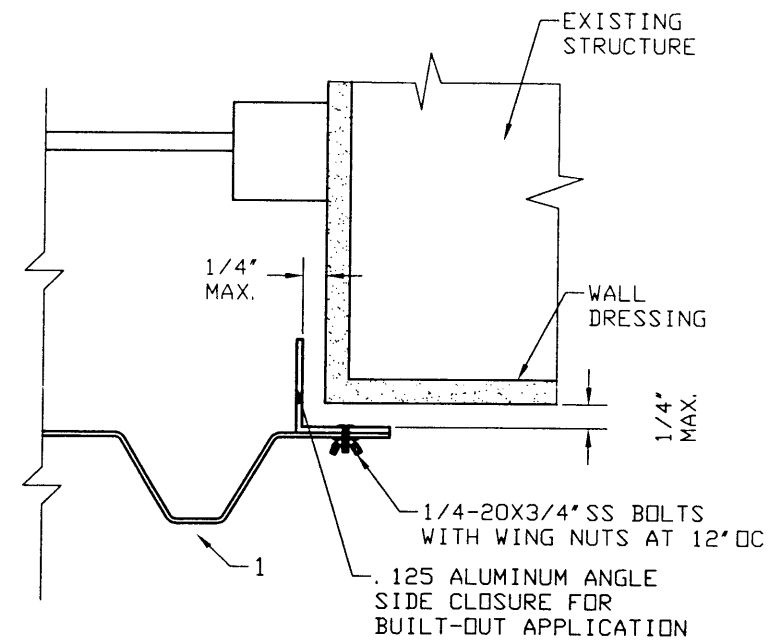
DETAIL 7
WALL CLOSURE



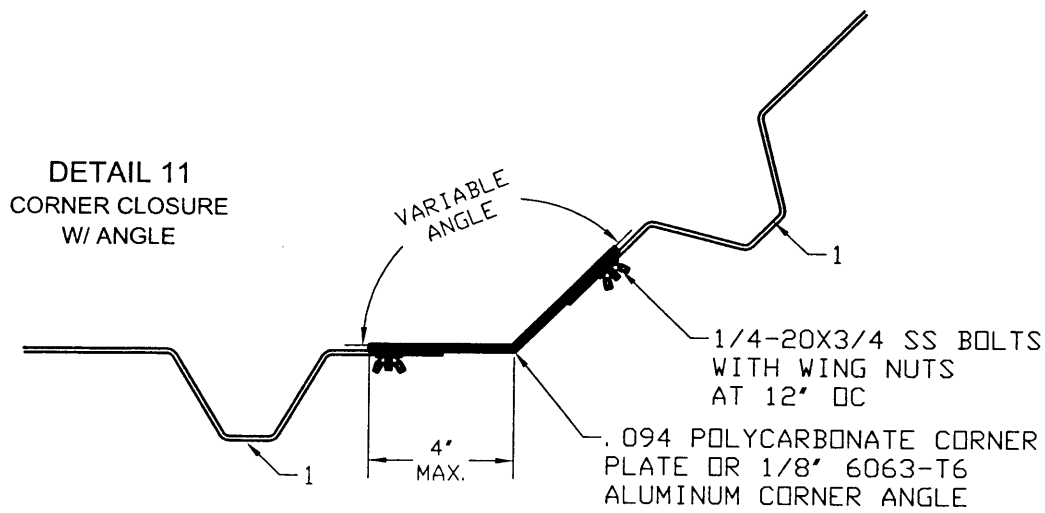
DETAIL 8
INSET CLOSURE



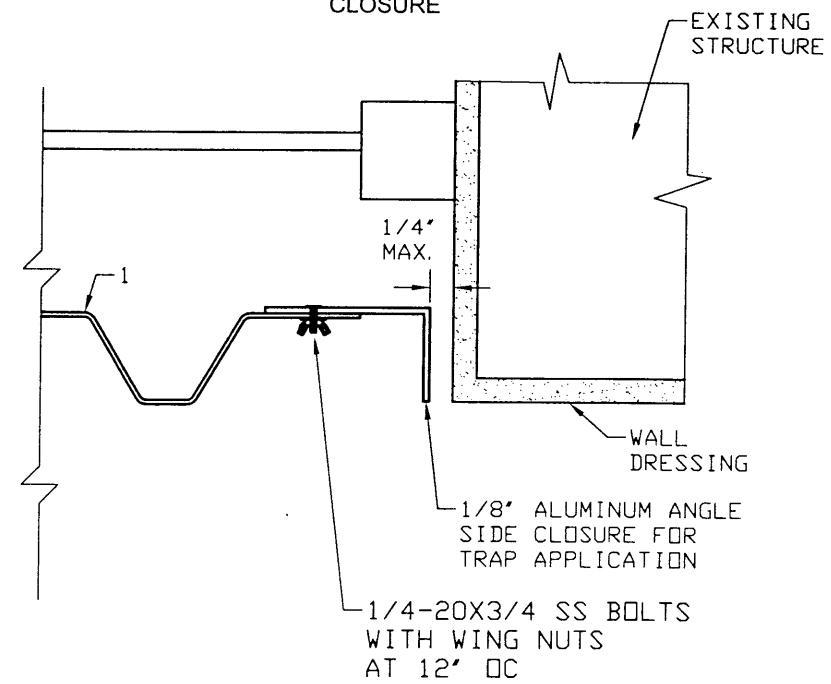
DETAIL 9
BUILT-OUT
SIDE CLOSURE



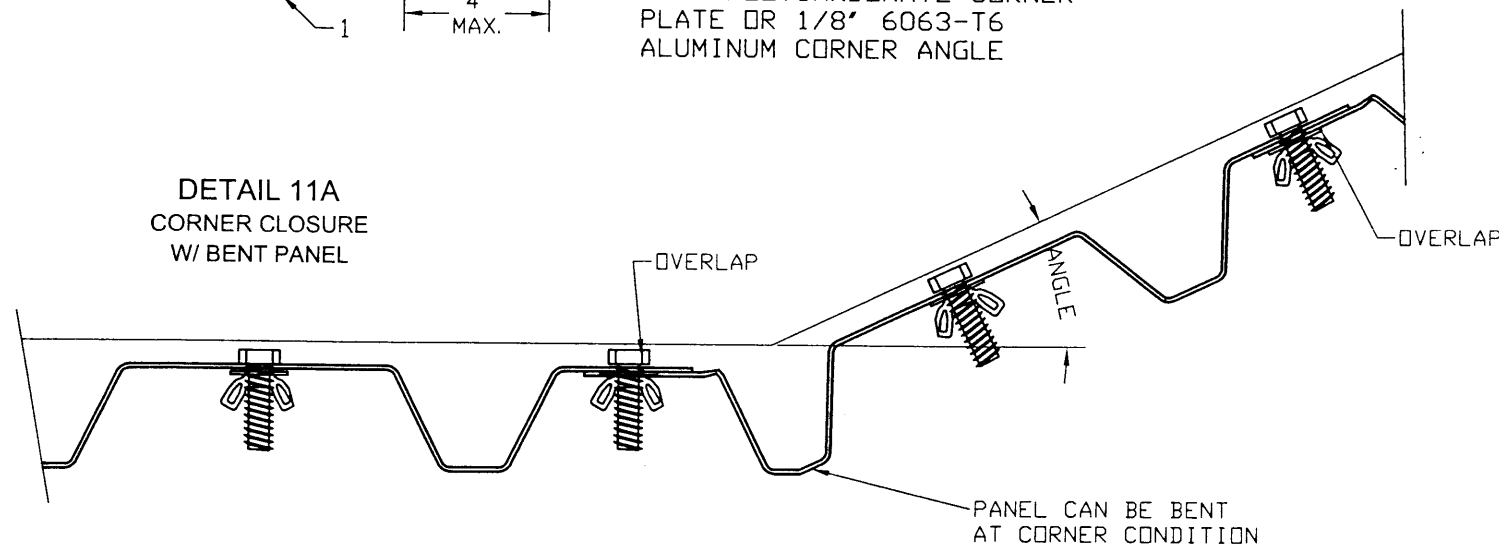
DETAIL 11
CORNER CLOSURE
W/ ANGLE



DETAIL 10
INSET EXTENDED
CLOSURE



DETAIL 11A
CORNER CLOSURE
W/ BENT PANEL



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TABLE 2 - ANCHORS SCHEDULE

	TYPE	DESCRIPTION	EMBED.	ED
3000 PSI CONCRETE	C1	1/4" ULTRACON BY ELCO	1.750	2.500
	C2	1/4" TAPCON BY ITW BUILDEX	1.750	2.500
	C3	1/4" SS TAPCON BY ITW BUILDEX	1.750	2.500
	C4	1/4" SS AGGRE-GATOR BY ELCO	1.750	3.000
	C5	1/4" CRETE-FLEXX SS4 BY ELCO	1.750	2.500
	C6	1/4-20 SS INTO LEAD SHIELD BY ALL POINTS	0.875	3.000
	C7	1/4-20 SS INTO PANELMATE INSERT BY ELCO	1.625	4.000
	C8	1/4" PANELMATE PLUS BY ELCO	2.000	2.500
HOLLOW BLOCK	HB1	1/4" ULTRACON BY ELCO	1.250	2.50
	HB2	1/4" TAPCON BY ITW BUILDEX	1.250	2.50
	HB3	1/4" SS TAPCON BY ITW BUILDEX	1.250	2.50
	HB4	1/4" SS AGGRE-GATOR BY ELCO	1.250	4.00
	HB5	1/4" CRETE-FLEX SS4 BY ELCO	1.250	2.50
	HB6	1/4-20 SS INTO LEAD SHIELD BY ALL POINTS	0.875	3.00
	HB7	1/4-20 SS INTO PANELMATE INSERT BY ELCO	1.250	4.00
	HB8	1/4" PANELMATE PLUS BY ELCO	1.250	3.00
WOOD G>=0.55	W1	1/4" LAG SCREWS	1.500	0.75
	W2	1/4" ULTRACON, TAPCON OR #14 SS WOOD SCREWS	1.500	0.75
	W3	1/4" PANELMATE PLUS BY ELCO	1.875	0.75
	W4	1/4-20 SS INTO PANELMATE INSERT BY ELCO	1.625	0.75

NOTES:
 1- EMBEDMENT AND EDGE DISTANCE ARE BEYOND WALL DRESSING.
 2- ON TABLES 3, 4 AND 5, PRESSURE VALUES ARE IN PSF (-/+) AND PANEL SIZE IN INCHES.
 3- ANCHOR SELECTION MUST BE IN COMPLIANCE WITH GENERAL NOTE 6 ON SHEET 1.

EXAMPLE:
 PANEL HEIGHT: 108"
 MAXIMUM PRESSURE: Pd= ±44 PSF
 MOUNT TYPE: 3 (SHEET 3 of 8)
 ANCHOR TYPE HB3 - SEE TABLE 2
 ANCHOR SPACING: 4' OC
 EDGE DISTANCE - 2.5'
 EMBEDMENT: 1 1/4"

TABLE 3 - MOUNT TYPE 3 INTO HOLLOW BLOCK - MAXIMUM ALLOWABLE PRESSURE PER ANCHOR SPACING

PANEL	7' OC							6' OC							5' OC							4' OC							3' OC						
	HB1	HB2	HB3	HB4	HB5	HB6	HB7	HB1	HB2	HB3	HB4	HB5	HB6	HB7	HB1	HB2	HB3	HB4	HB5	HB6	HB7	HB1	HB2	HB3	HB4	HB5	HB7	HB1	HB2	HB3	HB4				
120	25	28	23	31	43	45	45	29	32	26	36	45	45	45	35	39	32	44	45	45	45	43	45	40	45	45	45	45	45	45	45	45	45	45	45
108	27	31	25	35	48	55	50	32	36	29	40	55	55	55	38	43	35	48	55	55	55	48	53	44	55	55	55	55	55	55	55	55	55	55	55
98	30	34	28	38	53	65	56	35	39	32	45	62	65	65	42	47	39	54	65	65	65	53	59	48	65	65	65	65	65	65	65	65	65	65	65
85	35	39	32	44	61	79	64	41	46	37	52	71	80	75	49	55	45	62	80	80	80	61	68	56	77	80	80	80	80	80	80	80	80	75	80
80	37	41	34	47	65	84	69	43	48	40	55	76	87	80	52	58	48	66	87	87	87	65	73	60	82	87	87	87	87	87	87	87	87	79	87
71	42	46	38	53	73	94	77	49	54	44	61	85	100	89	58	65	53	74	100	100	100	73	81	67	92	100	100	97	100	89	100	100	100	100	100
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60	50	55	45	63	86	112	91	58	64	53	73	101	130	106	69	77	63	88	121	132	128	87	97	79	109	132	132	116	129	106	132	132	132	132	132

TABLE 4 - MOUNT TYPE 5 & 5A INTO HOLLOW BLOCK - MAXIMUM ALLOWABLE PRESSURE PER ANCHOR SPACING

PANEL	7' OC							6' OC							5' OC							4' OC							3' OC						
	HB1	HB2	HB3	HB4	HB5	HB6	HB7	HB1	HB2	HB3	HB4	HB5	HB6	HB7	HB1	HB2	HB3	HB4	HB5	HB6	HB7	HB1	HB2	HB3	HB4	HB5	HB7	HB1	HB2	HB3	HB4				
120	22	25	20	28	39	45	41	26	29	24	33	45	45	45	31	35	29	40	45	45	45	39	44	36	45	45	45	45	45	45	45	45	45	45	45
108	25	28	23	31	43	55	46	29	32	26	36	50	55	53	35	39	32	44	55	55	55	43	48	40	55	55	55	55	55	55	55	55	55	53	55
98	27	31	25	35	48	62	50	32	36	29	40	56	65	59	38	43	35	48	65	65	65	48	53	44	61	65	65	64	65	58	65	65	65	58	65
85	32	35	29	40	55	71	58	37	41	34	47	64	80	68	44	49	41	56	77	80	80	55	62	51	70	80	80	74	80	68	80	80	80	68	80
80	34	38	31	43	59	76	62	39	44	36	50	68	87	72	47	53	43	60	82	87	87	59	66	54	74	87	87	79	87	72	87	87	87	72	87
71	38	42	34	48	66	85	69	44	49	40	55	77	99	81	53	59	48	67	92	100	97	66	73	60	83	100	100	88	98	80	100	100	100	100	100
64	42	46	38	53	73	94	77	49	54	44	61	85	110	89	58	65	53	74	102	115	107	73	81	67	92	115	115	97	108	89	115	115	115	115	115
60	45	50	41	57	78	101	82	52	58	48	66	91	118	96	63	70	57	79	109	132	115	78	87	72	99	132	132	104	116	96	132	132	132	132	132

TABLE 5 - MOUNT TYPE 5E2 INTO HOLLOW BLOCK - MAXIMUM ALLOWABLE PRESSURE PER ANCHOR SPACING

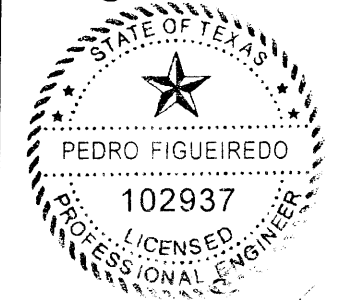
PANEL	7' OC							6' OC							5' OC							4' OC							3' OC						
	HB1	HB2	HB3	HB4	HB5	HB6	HB7	HB1	HB2	HB3	HB4	HB5	HB6	HB7	HB1	HB2	HB3	HB4	HB5	HB6	HB7	HB1	HB2	HB3	HB4	HB5	HB7	HB1	HB2	HB3	HB4				
120	26	29	24	33	45	45	45	30	34	28	38	45	45	45	36	40	33	45	45	45	45	45	45	41	45	45	45	45	45	45	45	45	45	45	45
108	29	32	26	36	50	55	53	33	37	31	42	55	55	55	40	45	37	51	55	55	55	50	55	46	55	55	55	55	55	55	55	55	55	55	55
98	32	35	29	40	55	65	58	37	41	34	47	65	65	65	44	49	41	56	65	65	65	56	62	51	65	65	65	65	65	65	65	65	65	65	65
85	37	41	34	46	64	80	68	43	48	39	54	75	80	79	51	57	47	65	80	80	80	64	72	59	80	80	80	80	80	80	80	80	80	78	80
80	39	43	36	49	68	87	72	45	51	42	57	79	87	84	55	61	50	69	87	87	87	68	76	62	86	87	87	87	87	83	87	87	87	83	87
71	44	49	40	55	76	98	80	51	57	47	64	89	100	94	61	68	56	77	100	100	100	76	85	70	96	100	100	100	100	93	100	100	100	100	100
64	48	54	44	61	84	109	89	56	63	52	71	98	115	104	68	75	62	85	115	115	115	84	94	77	107	115	115	113	115	103	115	115	115	115	115
60	52	58	47	66	90	117	95	61	67	55	76	105	132	111	73	81	66	92	127	132	132	91	101	83	115	132	132	121	132	111	132	132	132	132	132

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.
 CR 11234
 6971 W. Sunrise Blvd. 104
 Plantation, Fl. 33313
 ENGCO@AOL.COM



[Signature]
 JUN 29 2009

Engineer Seal
 Pedro De Figueiredo
 TEXAS - PE 102937

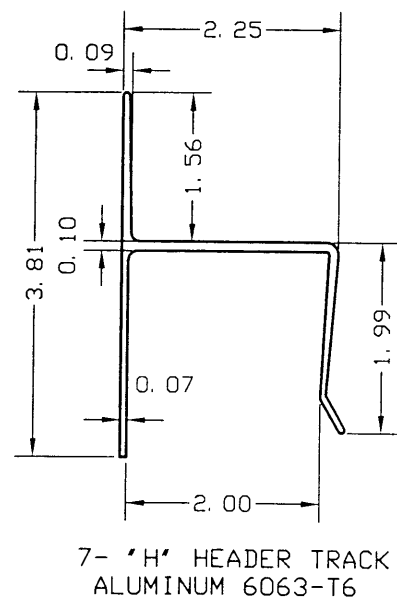
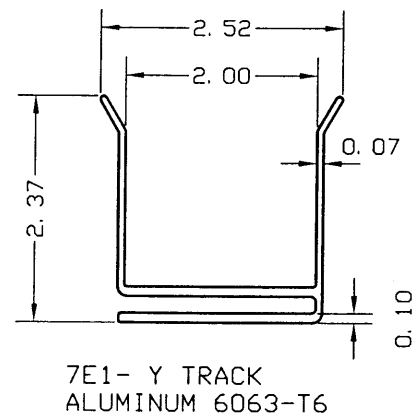
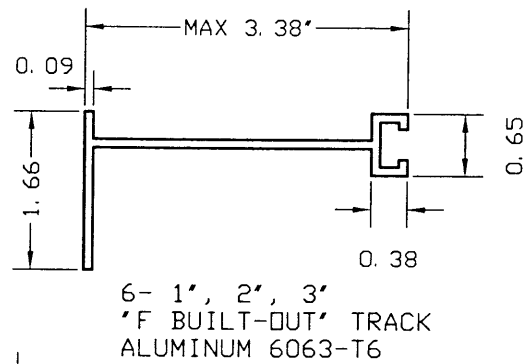
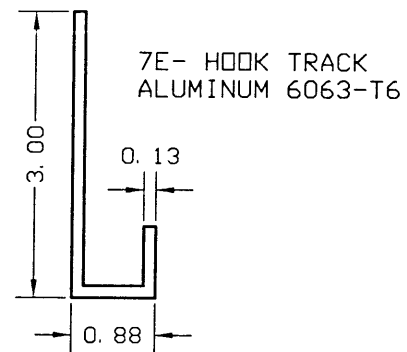
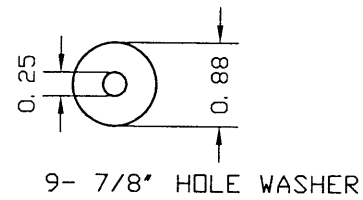
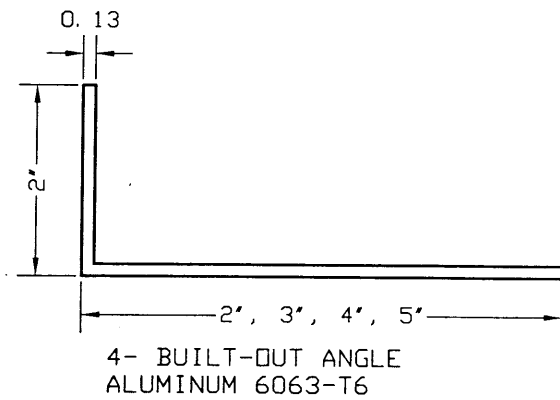
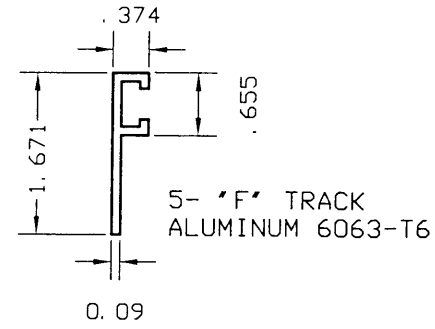
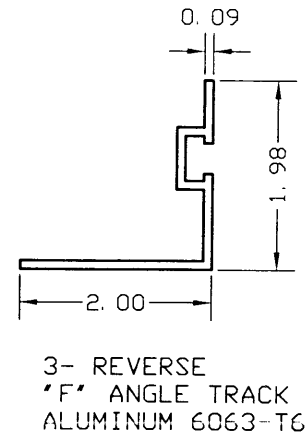
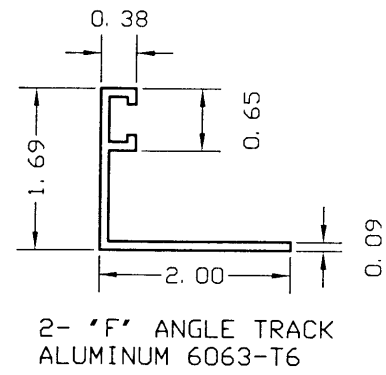
Date: 06/24/09
 Scale: NA
 Design by: PPMF

DRAFTING:
PK DRAFTING & MORE

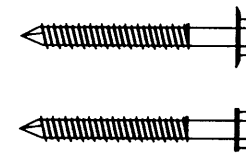
Drawing Number
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Sheet
7 of 8

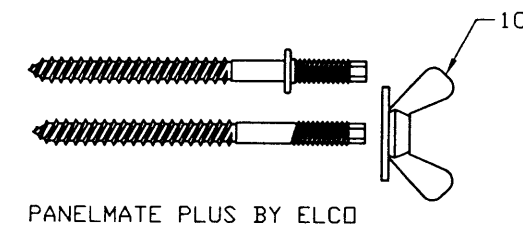
COMPONENTS DETAILS



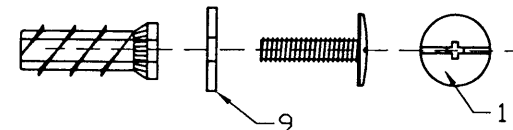
COMPONENTS SCHEDULE		
PART	DESCRIPTION	MATERIAL
1	POLYCARBONATE PANEL	POLYCARBONATE
2	'F' ANGLE TRACK	6063-T6
3	REVERSE 'F' ANGLE TRACK	6063-T6
4	1/8-2X BUILT-OUT ANGLE	6063-T6
5	'F' TRACK	6063-T6
6	'F' BUILT-OUT' TRACK	6063-T6
7	'h' HEADER TRACK	6063-T6
7E	HOOK TRACK	6063-T6
7E1	Y TRACK	6063-T6
8	1/4-14X3/4 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



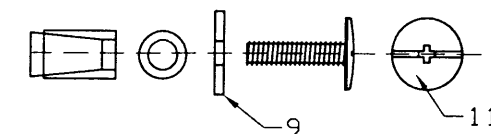
1/4' ULTRACON BY ELCO
1/4' TAPCONS BY ITW BUILDEX
1/4' SS TAPCONS BY ITW BUILDEX
1/4' SS AGGRE-GATORS BY ELCO
1/4' CRETE-FLEX SS4 BY ELCO



PANELMATE PLUS BY ELCO



1/4-20 SS INTO PANELMATE
INSERT BY ELCO



1/4-20 SS INTO SOLID-SET
ANCHORS BY ALL POINTS

MANUFACTURER:
**CLEAR STRENGTH
USA, LLC**

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JUN 29 2009

Engineer Seal
Pedro De Figueiredo
TEXAS - PE 102937

Date: 06/24/09
Scale: NA
Design by: PPMF

DRAFTING:
PK DRAFTING & MORE

Drawing Number
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Sheet
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