

FULLVIEW & ULTRAVIEW BAHAMA SHUTTER (HVHZ AND NON-HVHZ COMPLIANT)

PATENT #8126298 & 8136298B1

FRANK BENNARDO, PE
PE# 0046549 CA#9885



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REMARKS	DRWN	CHKD	DATE
INIT ISSUE	RKB	FLB	12/15/09
2010 FBC	CSL	KL	2/1/16/11
2014 FBC	RWN	CSL	4/04/15
2017 FBC	RWN	FLB	8/02/17
2020 FBC	CB	RWN	8/24/20

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GENERAL NOTES

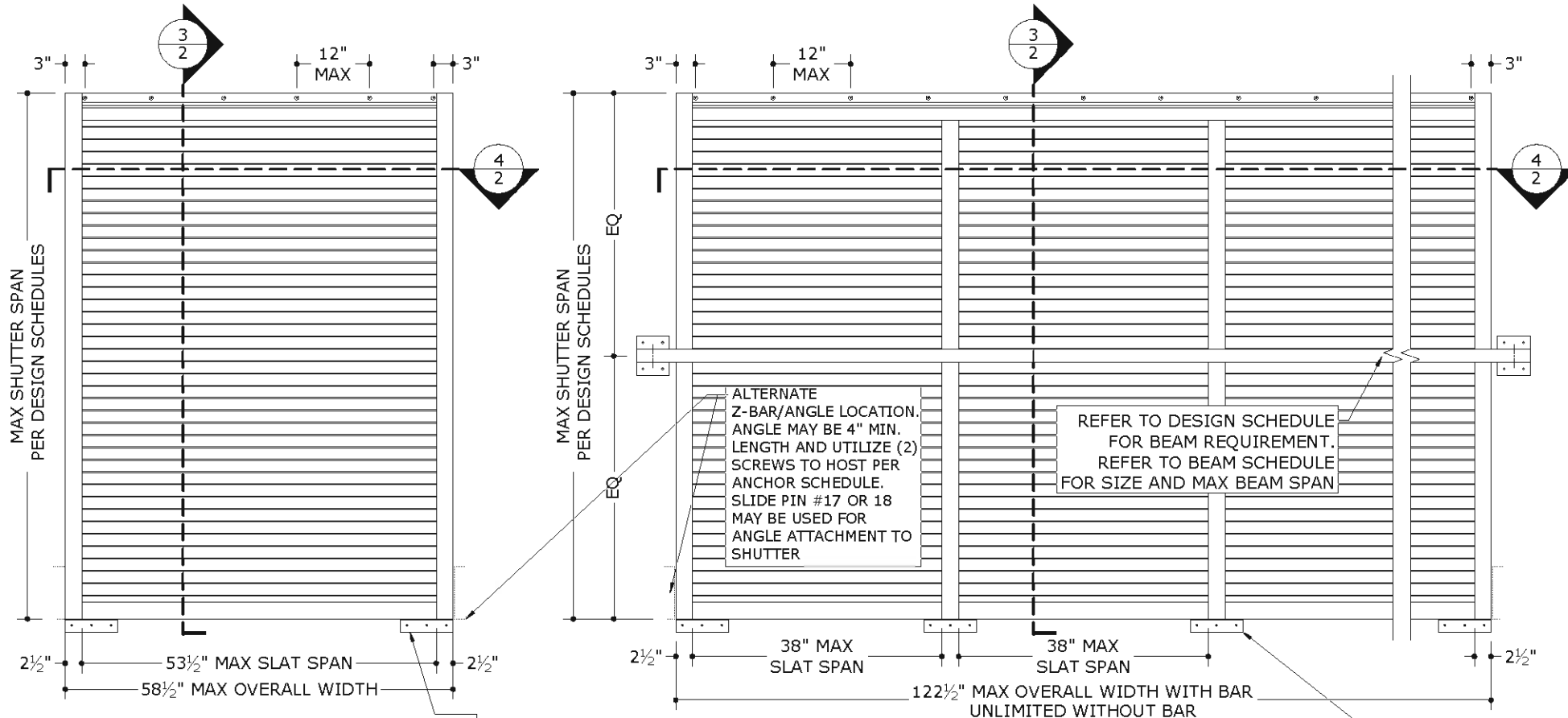
- THE SYSTEM DESCRIBED HEREIN HAS BEEN DESIGNED AND TESTED IN ACCORDANCE WITH THE FLORIDA BUILDING CODE SEVENTH EDITION (2020), FOR USE WITHIN THE HVHZ AND NON-HVHZ, AS WELL AS THE INTERNATIONAL BUILDING CODE (IBC) AND INTERNATIONAL RESIDENTIAL CODE (IRC). SEE PRODUCT EVALUATION REPORT FOR ADDITIONAL INFORMATION.
- NO 33-1/3% INCREASE IN ALLOWABLE STRESS HAS BEEN USED IN THE DESIGN OF THIS SYSTEM. WIND LOAD DURATION FACTOR Cd=1.6 HAS BEEN USED FOR WOOD ANCHOR DESIGN.
- POSITIVE AND NEGATIVE DESIGN PRESSURES CALCULATED FOR USE WITH THIS SYSTEM SHALL BE DETERMINED PER SEPARATE ENGINEERING IN ACCORDANCE WITH THE GOVERNING CODE. PRESSURE REQUIREMENTS AS DETERMINED IN ACCORDANCE WITH ASCE 7 AND CHAPTER 1609 OF THE FLORIDA BUILDING CODE SEVENTH EDITION (2020) SHALL BE LESS THAN OR EQUAL TO THE POSITIVE OR NEGATIVE DESIGN PRESSURE CAPACITY VALUES LISTED HEREIN FOR ANY ASSEMBLY AS SHOWN.
- DESIGN PRESSURES NOTED HEREIN ARE BASED ON MAXIMUM TESTED PRESSURES DIVIDED BY A 1.5 SAFETY FACTOR.
- THIS SYSTEM HAS BEEN DESIGNED WITH NO SEPARATION FROM GLAZING REQUIRED FOR ALL WIND ZONES, IN ACCORDANCE WITH ASTM 1996. IT IS ACCEPTABLE BY CODE UNLESS OPTIONAL CRITERIA IS INDEPENDENTLY ADOPTED BY THE AUTHORITY HAVING JURISDICTION.
- THE SYSTEM DETAILED HEREIN IS GENERIC AND DOES NOT PROVIDE INFORMATION FOR A SPECIFIC SITE. FOR SITE CONDITIONS DIFFERENT FROM THE CONDITIONS DETAILED HEREIN, A LICENSED ENGINEER OR REGISTERED ARCHITECT SHALL PREPARE SITE SPECIFIC DOCUMENTS FOR USE IN CONJUNCTION WITH THIS DOCUMENT.
- PERMIT HOLDER SHALL VERIFY THE ADEQUACY OF THE EXISTING STRUCTURE TO WITHSTAND SUPERIMPOSED LOADS. WOOD BUCKS (BY OTHERS) SHALL BE ANCHORED PROPERLY TO TRANSFER LOADS TO THE EXISTING STRUCTURE.
- SHUTTER MAY BE INSTALLED AS SINGLE PANEL OR AS MULTI-PANEL SPANS TO UNLIMITED WIDTH, SEE DETAIL 1/2 & 3/4 FOR MAXIMUM SLAT SPANS.
- ALL EXTRUSIONS SHALL BE 6063-T6 ALUMINUM ALLOY, UNLESS NOTED OTHERWISE. ALL TOLERANCES SHALL BE IN ACCORDANCE WITH ADM 2015.
- THIS SYSTEM MUST BE CLOSED AND LOCKED FOR WIND AND IMPACT PROTECTION. THIS SYSTEM HAS BEEN DESIGNED FOR A WIND PRESSURE OF 18 PSF IN THE OPEN POSITION. A PERMANENT LABEL MUST BE ADHERED TO THE UNDERSIDE OF EACH BAHAMA SHUTTER CONTAINING THE FOLLOWING:
SHUTTER AND LOUVERS TO BE CLOSED AND LOCKED WHEN HURRICANE WARNINGS ARE ISSUED
- BAHAMA SHUTTERS SHALL BE PERMANENTLY LABELED AS PRESCRIBED IN THE ABOVE-NOTED BUILDING CODE AND CONTAIN AT LEAST THE FOLLOWING:
**CROCI NORTH AMERICA
FT. MYERS, FL
ASTM E330, E1886, & E1996 9LB MISSILE LEVEL D
TAS 201, 202, & 203
FLORIDA PRODUCT APPROVAL NUMBER**
- ALL BOLTS & WASHERS SHALL BE ZINC COATED STEEL, GALVANIZED STEEL, STAINLESS STEEL, OR 2024-T6 ALUMINUM ALLOY WITH A MINIMUM TENSILE YIELD STRENGTH OF 33 KSI.
- ALL CONCRETE ANCHORS TO BE INSTALLED TO NON-CRACKED CONCRETE ONLY.
- ALL STEEL IN CONTACT WITH ALUMINUM SHALL BE PAINTED OR PLATED AS PRESCRIBED IN THE ABOVE-NOTED BUILDING CODE.

HVHZ (TABLE 1 & 2) NOTES:

- HIGH VELOCITY HURRICANE ZONE (HVHZ) IS DEFINED AS MIAMI-DADE COUNTY AND BROWARD COUNTY FLORIDA ONLY.
- TABLE 1 SHALL BE USED FOR INSTALLATIONS IN THE HIGH VELOCITY HURRICANE ZONE (HVHZ) TO DETERMINE THE MAXIMUM ALLOWABLE DESIGN PRESSURE FOR EACH SPAN.
- FOR SPANS BETWEEN TABULATED VALUES USE NEXT HIGHER SPAN.
- TABLE 2 SHALL BE USED TO DETERMINE MINIMUM SEPARATION FROM GLASS WITH IN THE HVHZ.

NON-HVHZ (TABLE 3 & 4) NOTES:

- NON-HVHZ IS DEFINED AS ALL LOCATIONS OTHER THAN MIAMI-DADE COUNTY AND BROWARD COUNTY FLORIDA.
- TABLE 2 MAY BE USED FOR INSTALLATIONS OUTSIDE THE HIGH VELOCITY HURRICANE ZONE (HVHZ).
- FOR SPANS BETWEEN TABULATED VALUES, USE NEXT HIGHER SPAN.
- FOR INSTALLATIONS OUTSIDE THE HVHZ SEPARATION FROM GLASS IS NOT REQUIRED UNLESS LOCAL MUNICIPALITY ADOPTS ADDITIONAL CRITERIA.



ALTERNATE Z-BAR/ANGLE LOCATION. ANGLE MAY BE 4" MIN. LENGTH AND UTILIZE (2) SCREWS TO HOST PER ANCHOR SCHEDULE. SLIDE PIN #17 OR 18 MAY BE USED FOR ANGLE ATTACHMENT TO SHUTTER

REFER TO DESIGN SCHEDULE FOR BEAM REQUIREMENT. REFER TO BEAM SCHEDULE FOR SIZE AND MAX BEAM SPAN

1 SINGLE PANEL SPAN
N.T.S. EXTER. ELEVATION

2 MULTI PANEL SPAN
N.T.S. EXTER. ELEVATION

IN LIEU OF Z-BAR/ANGLE CLIPS, A 1"X2"X1/8" CONTINUOUS ALUM ANGLE MAY BE USED AT FULL LENGTH OF SHUTTER SILL ATTACHED TO HOST WITH SCREWS AT 12" O.C. PER ANCHOR NOTE 1 SCHEDULE. ANGLE SHALL ATTACH TO SHUTTER W/ #12 MIN. SAE GR 5 OR SS SMS AT 12" O.C., TYP

TABLE 1 HVHZ ALLOWABLE DESIGN PRESSURES			
MAX SHUTTER SPAN	CONFIGURATION		
	SINGLE PANEL SPAN	MULTI PANEL SPAN	
		W/O BEAM	W/ BEAM
69"	+60/-73 PSF	+60/-73 PSF*	+60/-73 PSF*
81 5/8"	+60/-73 PSF	-	+60/-73 PSF*
96 3/4"	+60/-73 PSF*	-	+60/-73 PSF*

*NOTE: LIMITED TO A MAX SLAT SPAN OF 38"

TABLE 2 HVHZ MINIMUM SEPARATION FROM GLASS				
MAX SHUTTER SPAN	DESIGN PRESSURE	CONFIGURATION		
		SINGLE PANEL SPAN	MULTI PANEL SPAN	
		W/O BEAM	W/ BEAM	
69"	+56/-73 PSF	2 3/8"	3"	2 3/8"
69"	+60/-73 PSF	2 3/8"	3 1/4"	2 3/8"
81 5/8"	+60/-73 PSF	2 3/8"	-	2 3/8"
96 3/4"	+60/-73 PSF	2 3/8"*	-	2 3/8"

*NOTE: LIMITED TO A MAX SLAT SPAN OF 38"

TABLE 3 NON-HVHZ ALLOWABLE DESIGN PRESSURES			
MAX SHUTTER SPAN	CONFIGURATION		
	SINGLE PANEL SPAN	MULTI PANEL SPAN	
		W/O BEAM	W/ BEAM
69"	+78/-95 PSF	+78/-95 PSF*	+78/-95 PSF*
81 5/8"	+78/-95 PSF	+50/-50 PSF†*	+78/-95 PSF*
96 3/4"	+78/-95 PSF*	+50/-50 PSF†*	+78/-95 PSF*

*NOTE: LIMITED TO A MAX SLAT SPAN OF 38"
†NOTE: NOT APPROVED FOR USE IN ESSENTIAL FACILITIES.

TABLE 4 NON-HVHZ NOT REQUIRED FOR WIND ZONES 1-3 MINIMUM SEPARATION FROM GLASS				
MAX SHUTTER SPAN	DESIGN PRESSURE	CONFIGURATION		
		SINGLE PANEL SPAN	MULTI PANEL SPAN	
		W/O BEAM	W/ BEAM	
69"	+78/-95 PSF	3 1/8"	4 3/8"	2 1/8"
81 5/8"	+78/-95 PSF	3 1/8"	-	2 1/8"
96 3/4"	+78/-95 PSF	2 1/8"*	-	2 1/8"

*NOTE: LIMITED TO A MAX SLAT SPAN OF 38"

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FOR SITE SPECIFIC DEVIATIONS & MORE INFORMATION ABOUT THIS DOCUMENT OR SCAN THIS QR CODE

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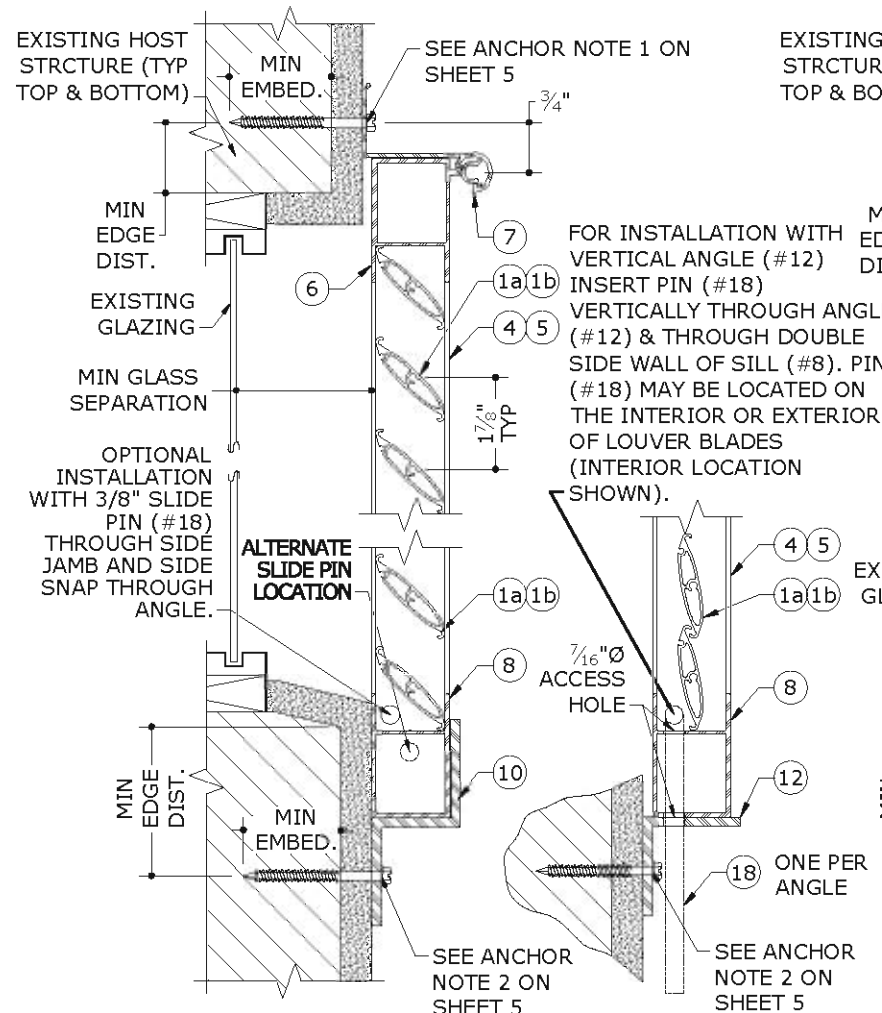
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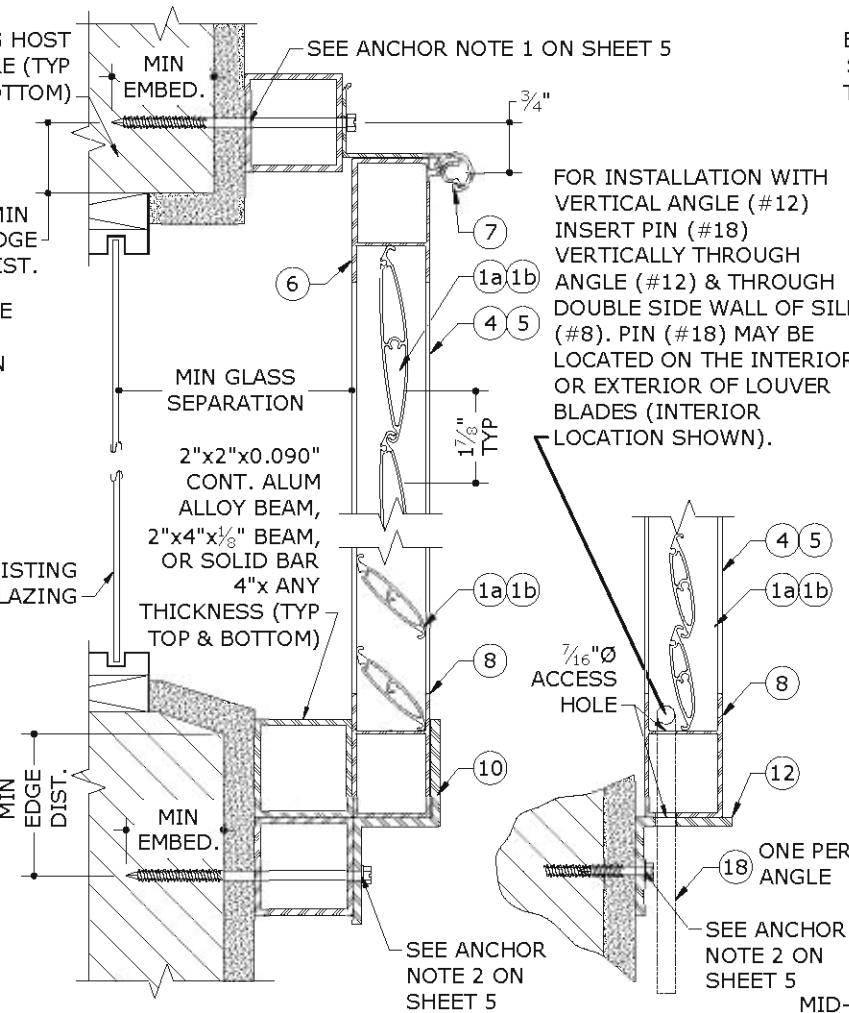
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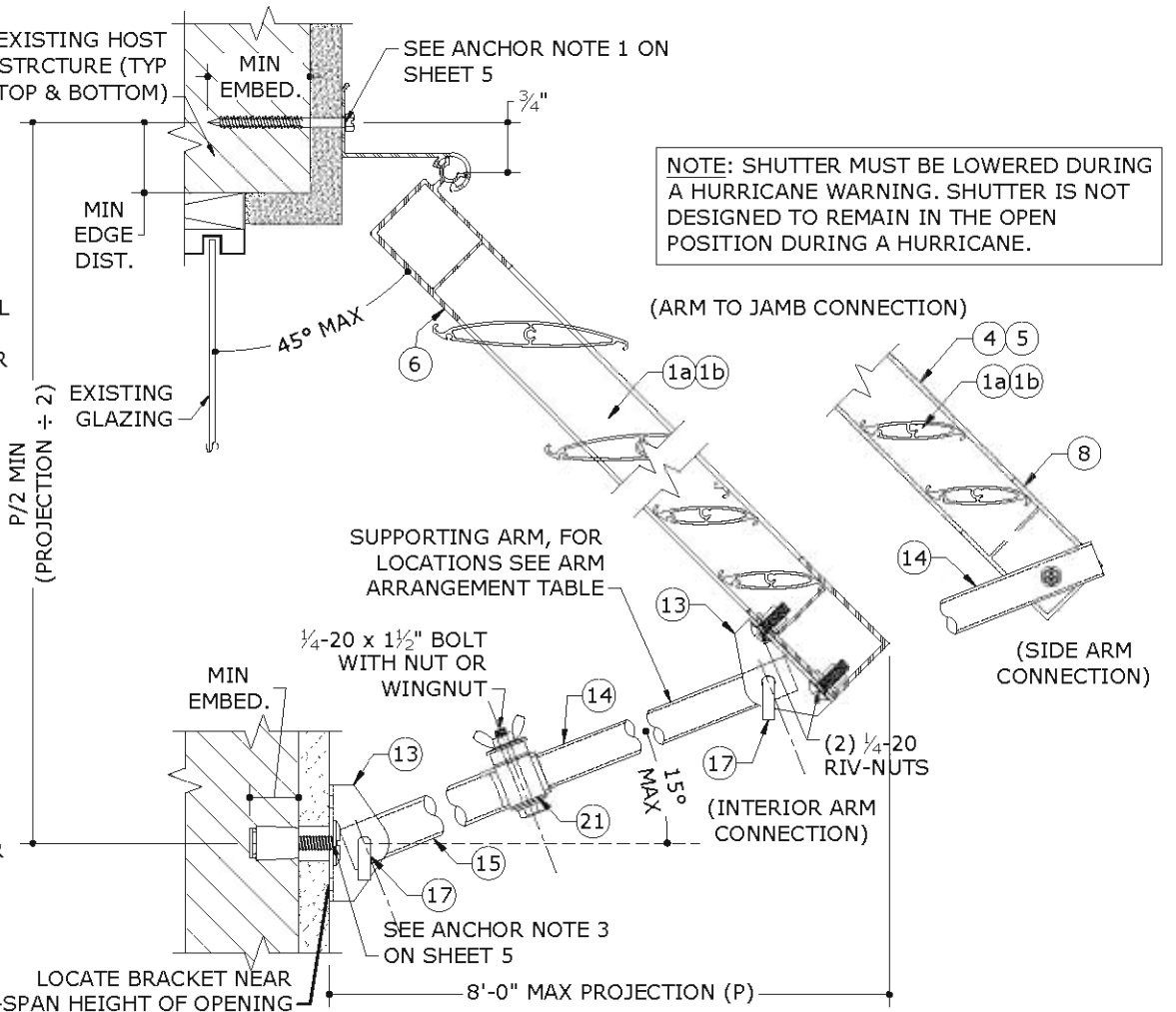
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3a TYPICAL CLOSED POSITION
2 N.T.S. VERTICAL SECTION

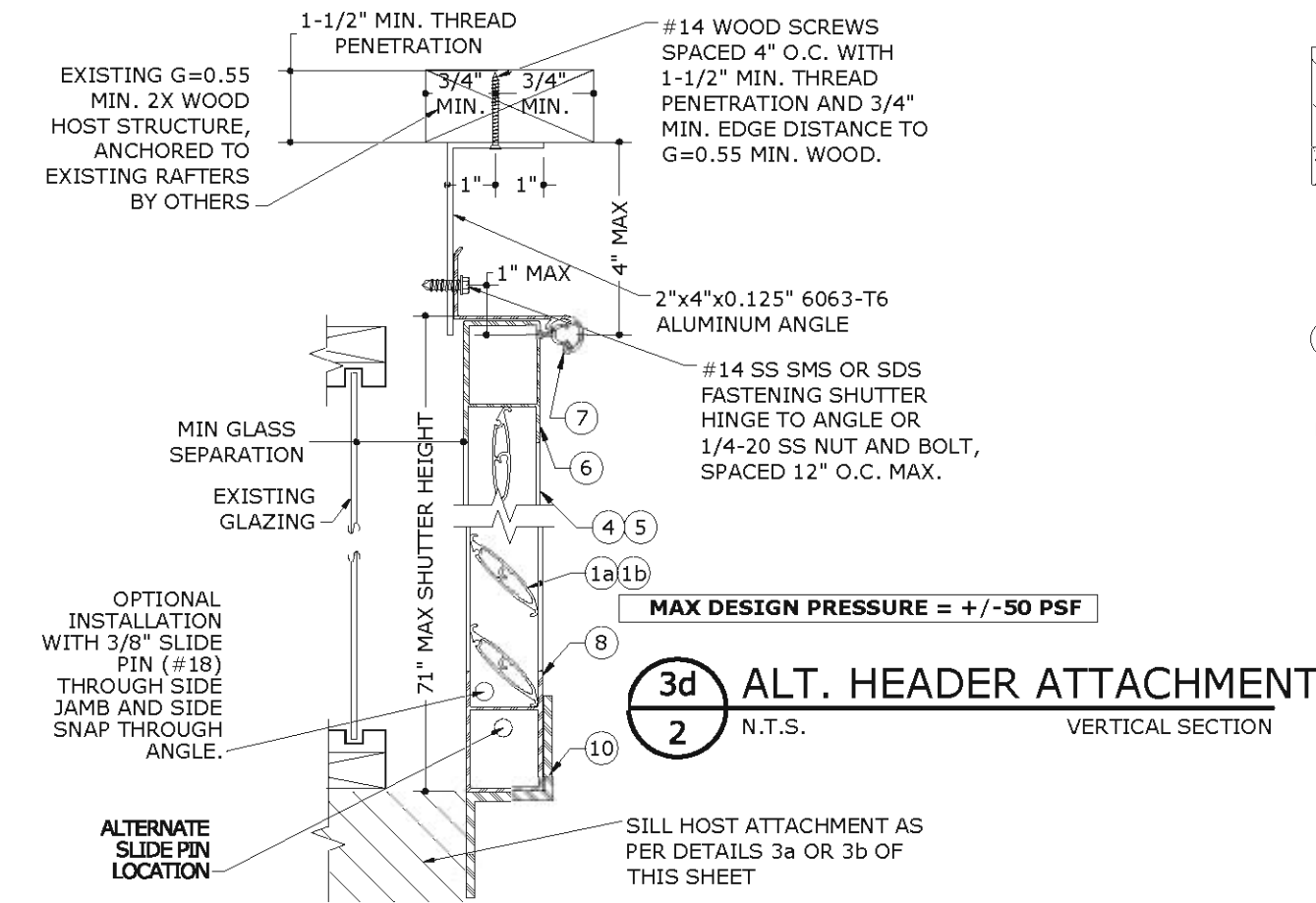


3b BUILD-OUT CLOSED POSITION
2 N.T.S. VERTICAL SECTION

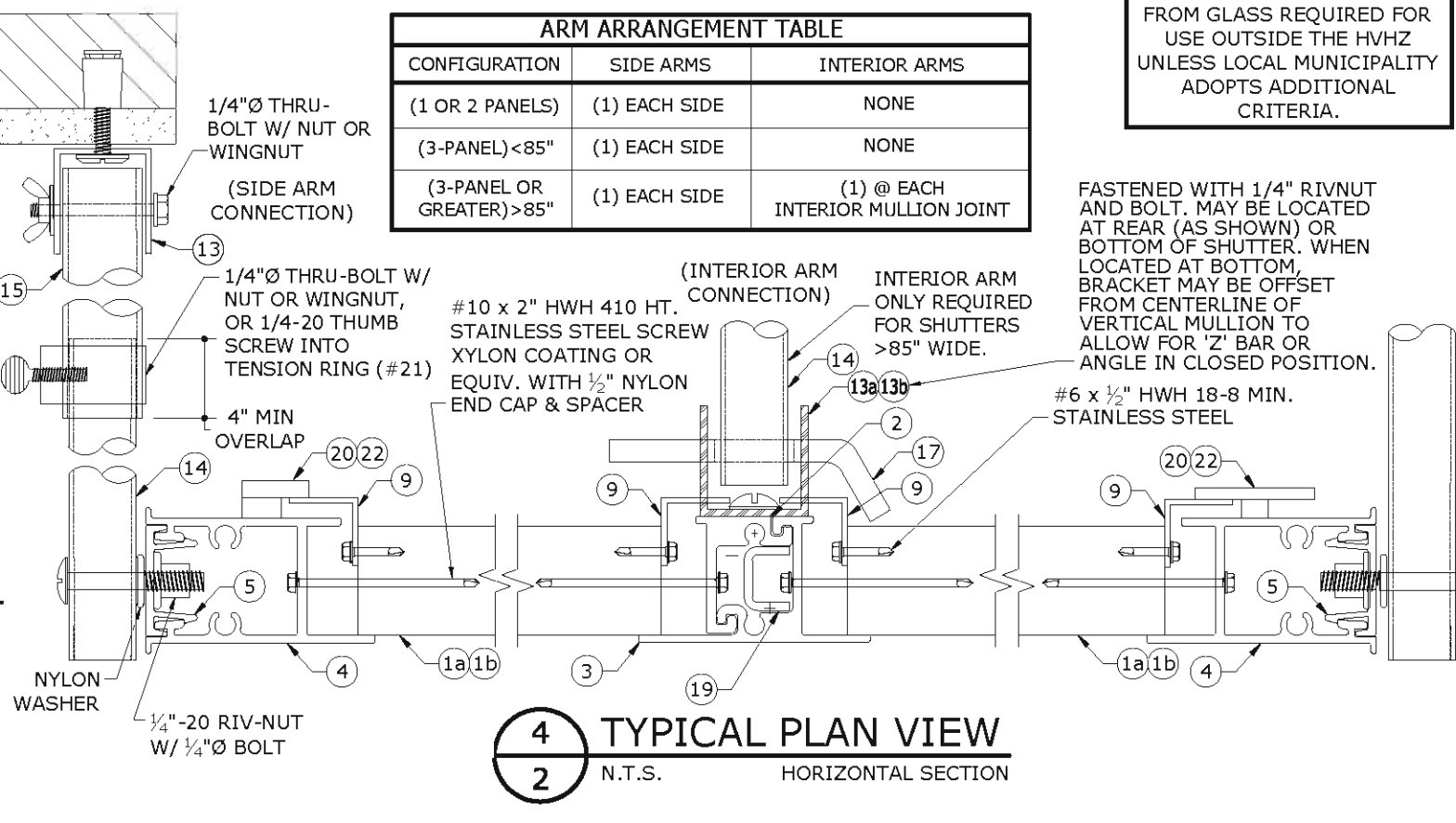


3c TYPICAL OPEN POSITION
2 N.T.S. VERTICAL SECTION

NOTE: SHUTTER MUST BE LOWERED DURING A HURRICANE WARNING. SHUTTER IS NOT DESIGNED TO REMAIN IN THE OPEN POSITION DURING A HURRICANE.



3d ALT. HEADER ATTACHMENT
2 N.T.S. VERTICAL SECTION



4 TYPICAL PLAN VIEW
2 N.T.S. HORIZONTAL SECTION

ARM ARRANGEMENT TABLE		
CONFIGURATION	SIDE ARMS	INTERIOR ARMS
(1 OR 2 PANELS)	(1) EACH SIDE	NONE
(3-PANEL) <85"	(1) EACH SIDE	NONE
(3-PANEL OR GREATER) >85"	(1) EACH SIDE	(1) @ EACH INTERIOR MULLION JOINT

NO MINIMUM SEPARATION FROM GLASS REQUIRED FOR USE OUTSIDE THE HVHZ UNLESS LOCAL MUNICIPALITY ADOPTS ADDITIONAL CRITERIA.

FASTENED WITH 1/4" RIVNUT AND BOLT. MAY BE LOCATED AT REAR (AS SHOWN) OR BOTTOM OF SHUTTER. WHEN LOCATED AT BOTTOM, BRACKET MAY BE OFFSET FROM CENTERLINE OF VERTICAL MULLION TO ALLOW FOR 'Z' BAR OR ANGLE IN CLOSED POSITION.



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2020 FBC	FLB	8/02/17	FLB	RWN	8/02/17
	CB	8/24/20	RWN	CB	8/24/20

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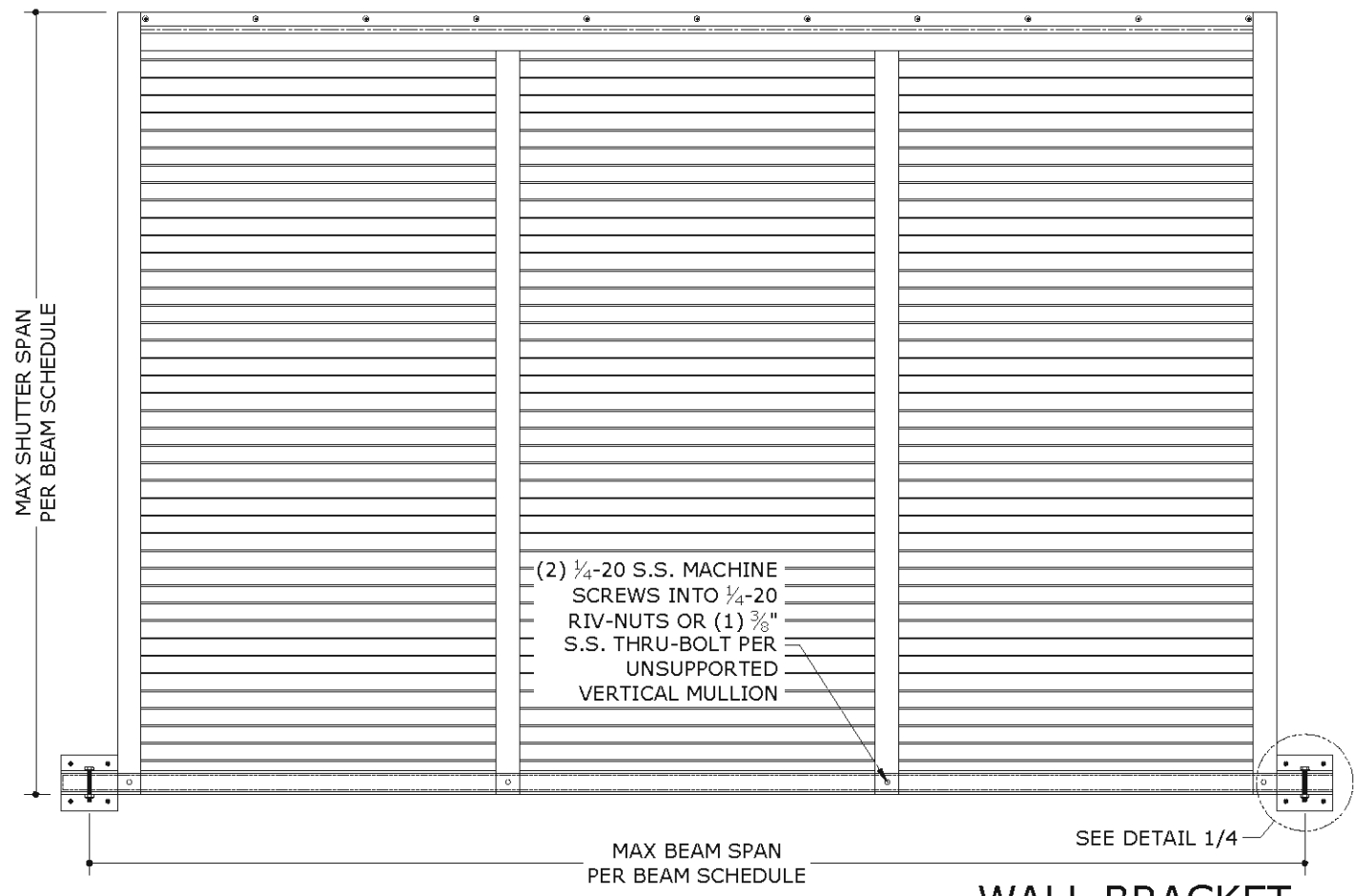
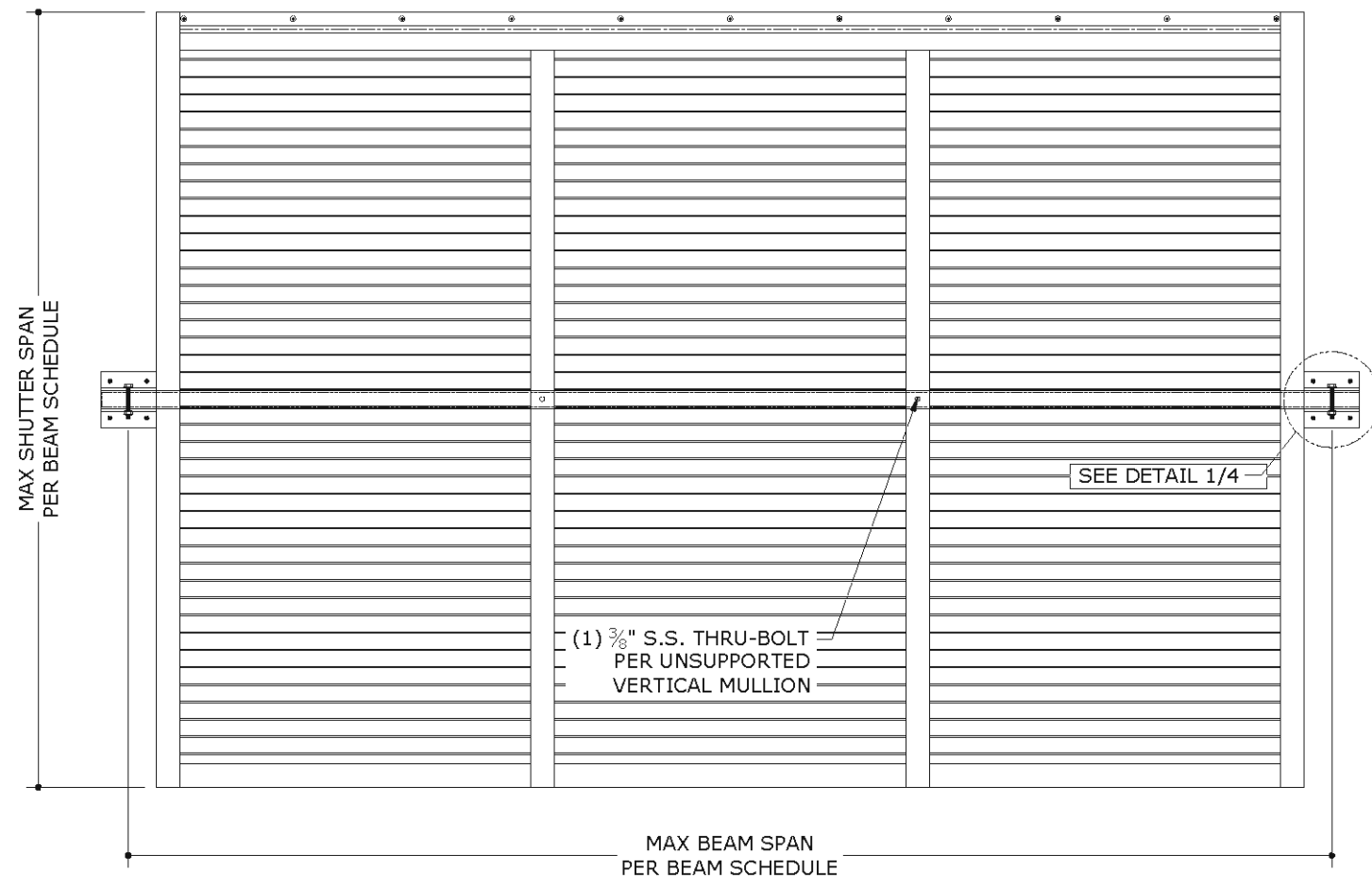
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1 MID-SPAN BEAM (AS REQUIRED)
3 N.T.S. EXTER. ELEVATION

2 BOTTOM BEAM (OPTIONAL)
3 N.T.S. EXTER. ELEVATION

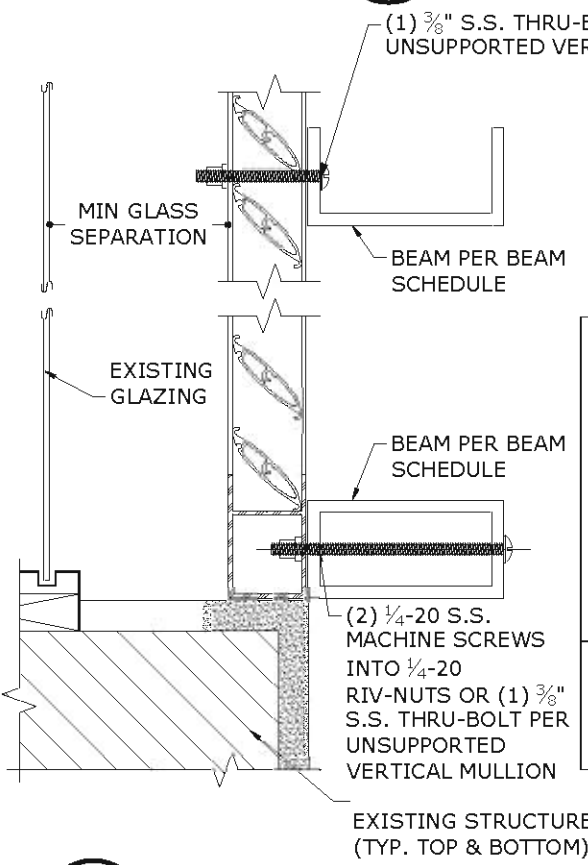
WALL BRACKET ANCHORS TYPES:

- TYPE A:** 1/4-20 ALL POINT SOLID SET ANCHORS:
 - IN CONCRETE (3.35KSI MIN) WITH 7/8" MIN EMBED. AND 3" MIN EDGE DIST.
 - IN HOLLOW CONCRETE BLOCK WITH 7/8" MIN EMBED. AND 3" MIN EDGE DIST.
- TYPE B:** 1/4-20 DEWALT PANELMATES (MALE/FEMALE):
 - IN CONCRETE (3.35KSI MIN) WITH 1 3/4" MIN EMBED. AND 2 1/2" MIN EDGE DIST.
 - IN HOLLOW CONCRETE BLOCK WITH 1 1/4" MIN EMBED. AND 2" MIN EDGE DIST.
 - IN WOOD (G=0.42 MIN) WITH 1 1/2" MIN EMBED. AND 3/4" MIN EDGE DIST.
- TYPE C:** 1/4" EYEWALL ARMOR MALE OR FEMALE BOLTS:
 - IN CONCRETE (3.0KSI MIN) WITH 1 3/4" MIN EMBED. AND 2 1/2" MIN EDGE DIST.
 - IN HOLLOW CONCRETE BLOCK WITH 1 1/4" MIN EMBED. AND 2" MIN EDGE DIST.
 - IN WOOD (G=0.42 MIN) WITH 1 1/8" MIN EMBED. AND 3/4" MIN EDGE DIST.
- TYPE D*:** 1/4" MILLENNIUM MILLFAST W/ T&C ULTRACOTE:
 - IN CONCRETE (3.275KSI MIN) WITH 1 3/4" EMBED AND 2 1/2" EDGE DIST.
 - IN HOLLOW CONCRETE BLOCK WITH 1 1/4" EMBED. AND 2 1/2" MIN EDGE DIST.
- TYPE E:** #12 SMS W/ 2" EYEWALL ARMOR NYLON INSERT:
 - IN CONCRETE (2KSI MIN) WITH 2" EMBED AND 2" EDGE DIST.
 - IN HOLLOW CONCRETE BLOCK WITH 1 1/4" EMBED AND 2" EDGE DIST.

BEAM SCHEDULE:

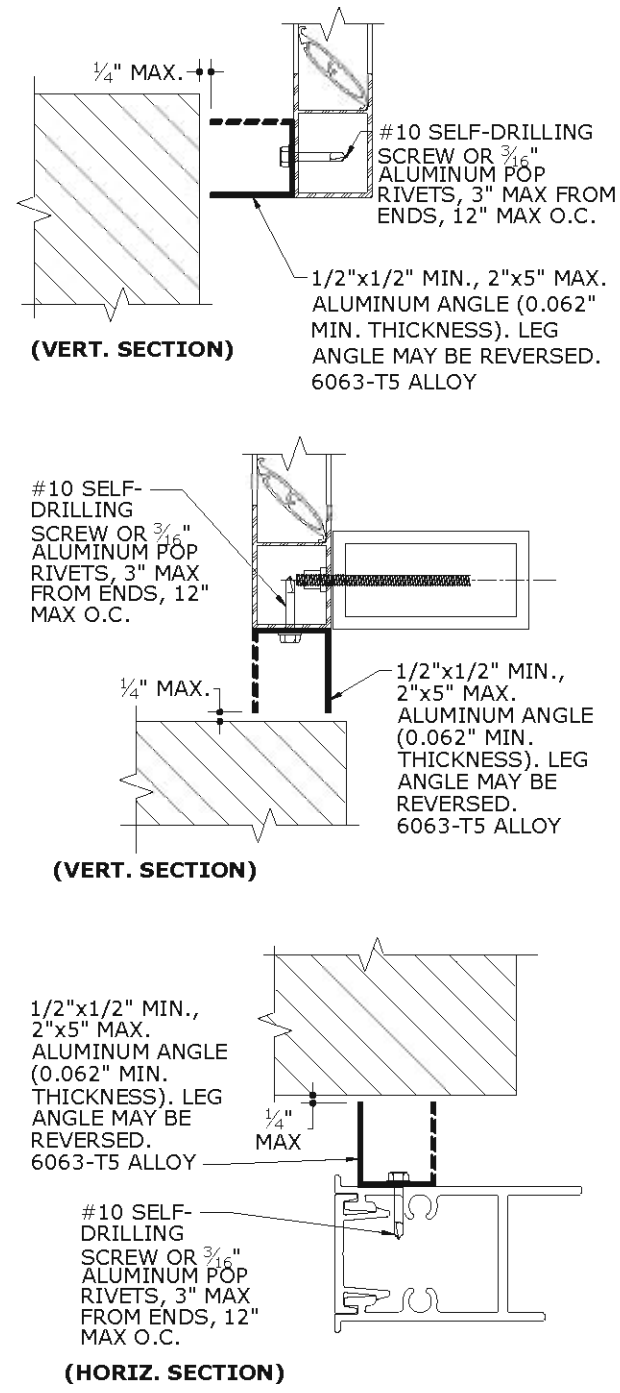
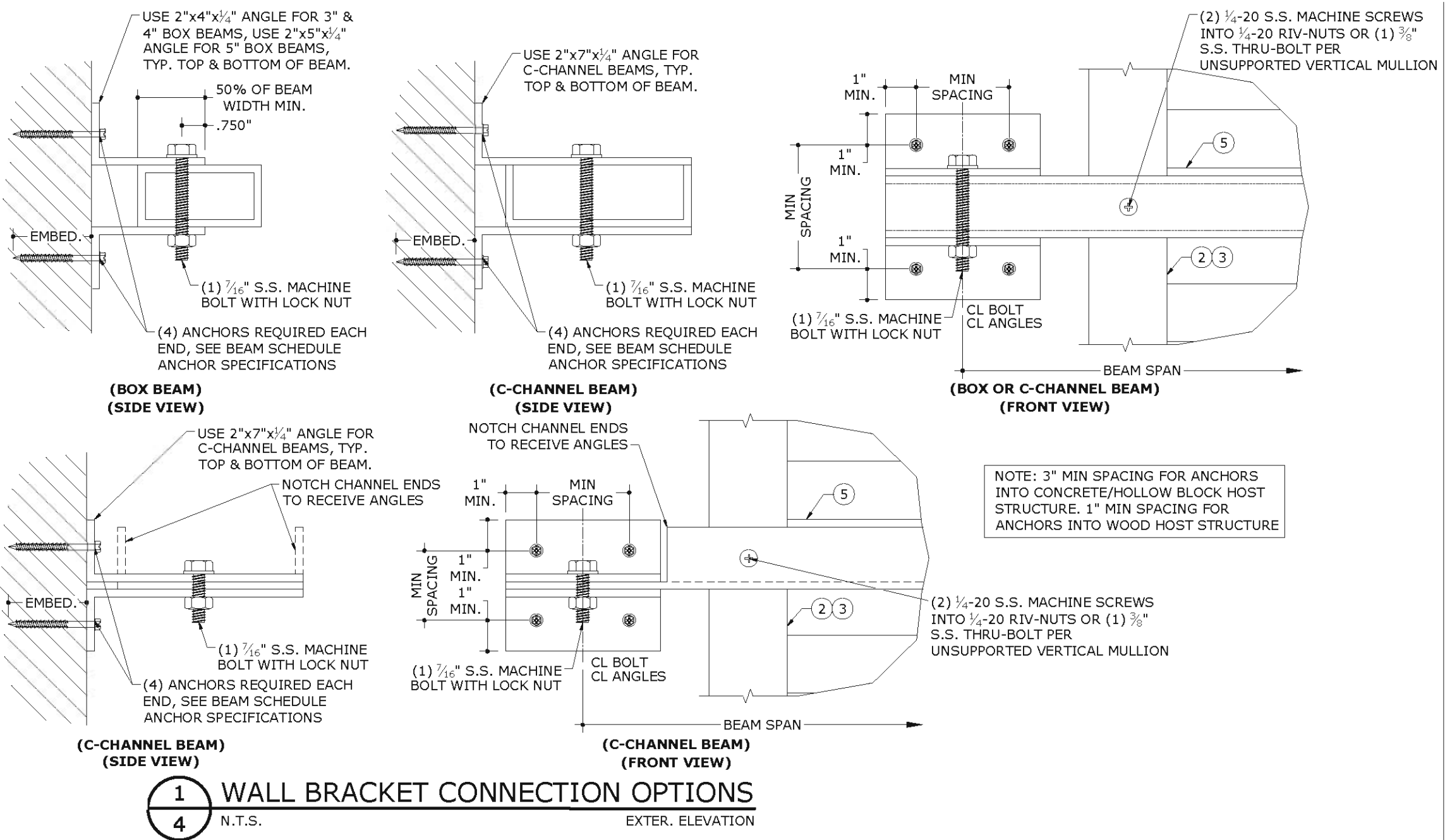
BEAM SIZE	ALUMINUM ALLOY	SHUTTER SPAN	BEAM SPAN (+/- 40 PSF MAX)	BEAM SPAN (+/- 50 PSF MAX)	BEAM SPAN (+/- 60 PSF MAX)	BEAM SPAN (+/- 95 PSF MAX)	WALL BRACKET ANCHOR TYPES (+/-95 PSF MAX)			WALL BRACKET ANCHOR TYPES (+/-50 PSF MAX)		
							CONCRETE	HOLLOW BLOCK	WOOD (G=0.42 MIN)	CONCRETE	HOLLOW BLOCK	WOOD (G=0.42 MIN)
2"x3"x1/8"	6063-T6	8'-0"	7'-9"	7'-0"	6'-4"	5'-1"	A,B,C,D,E	A,C	B,C	A,B,C,D,E	A,B,C,E	B,C
		6'-8"	8'-7"	7'-8"	7'-0"	5'-7"	A,B,C,D,E	A,C,E	B,C	A,B,C,D,E	A,B,C,E	B,C
		5'-10"	9'-2"	8'-2"	7'-6"	5'-11"	A,B,C,D,E	A,B,C,E	B,C	A,B,C,D,E	A,B,C,D,E	B,C
2"x4"x1/8"	6063-T6	8'-0"	9'-7"	8'-7"	7'-10"	6'-3"	A,B,C,D,E	A,C	B,C	A,B,C,D,E	A,C,E	B,C
		6'-8"	10'-6"	9'-5"	8'-7"	6'-10"	A,B,C,D,E	A,C	B,C	A,B,C,D,E	A,B,C,E	B,C
		5'-10"	11'-3"	10'-1"	9'-2"	7'-4"	A,B,C,D,E	A,C	B,C	A,B,C,D,E	A,B,C,E	B,C
2"x5"x1/8"	6063-T6	8'-0"	11'-5"	10'-2"	9'-4"	7'-5"	A,B,C,D,E	A,C		A,B,C,D,E	A,C	B,C
		6'-8"	12'-6"	11'-2"	10'-2"	8'-1"	A,B,C,D,E	A,C		A,B,C,D,E	A,C	B,C
		5'-10"	13'-4"	11'-11"	10'-11"	8'-8"	A,B,C,D,E	A,C	B,C	A,B,C,D,E	A,C,E	B,C
2"x4"x1/4"	6061-T6	8'-0"	14'-10"	13'-3"	12'-2"	9'-8"	A,B,C			A,B,C,D,E	A,C	
		6'-8"	16'-3"	14'-7"	13'-3"	10'-7"	A,B,C,D,E			A,B,C,D,E	A,C	
		5'-10"	17'-5"	15'-7"	14'-2"	11'-3"	A,B,C,D,E	A		A,B,C,D,E	A,C	B,C
4"x2"x0.23"x0.15"	6063-T6	8'-0"	9'-4"	8'-4"	7'-9"	6'-1"	A,B,C,D,E	A,C	B,C	A,B,C,D,E	A,B,C,E	B,C
		6'-8"	10'-3"	9'-2"	8'-4"	6'-8"	A,B,C,D,E	A,C	B,C	A,B,C,D,E	A,B,C,E	B,C
		5'-10"	10'-11"	9'-9"	8'-11"	7'-1"	A,B,C,D,E	A,C	B,C	A,B,C,D,E	A,B,C,E	B,C
6"x2"x0.29"x0.17"	6061-T6	8'-0"	17'-3"	15'-6"	14'-1"	11'-3"	A,B,C			A,B,C,D,E	A,C	

*MILLENNIUM MILLFAST ANCHORS MUST BE SPACED AT 4" O.C. MINIMUM



3 BEAM CONNECTION TO SHUTTER
3 N.T.S. VERTICAL SECTION

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- SIDE CLOSURE NOTES**
- FOR INSTALLATIONS WITHIN THE HVHZ, IN LIEU OF SIDE CLOSURE ANGLE, SHUTTER MAY OVERLAP OPENING BY 1.5 X SHUTTER BUILD OUT DISTANCE.
 - ANCHORS MAY BE ANY ANCHOR FROM ANCHOR NOTE 1, ON SHEET 5, INSTALLED 3" MAX FROM EACH END, AND 12" O.C. MAX, OR 1/4" ITW TAPCONS WITH 1 1/2" MIN EDGE DISTANCE AND FULL THREAD ENGAGEMENT TO 1/16" MIN PLYWOOD INSTALLED 3" MAX FROM EACH END AND 7" O.C. MAX.
 - ANCHORS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS' RECOMMENDATIONS.
 - ALL CONCRETE ANCHORS SHALL BE INSTALLED TO NON-CRACKED CONCRETE ONLY.
 - MINIMUM EMBEDMENT SHALL BE AS NOTED IN ANCHOR NOTE 1 ON SHEET 5. MINIMUM EMBEDMENT AND EDGE DISTANCE EXCLUDES STUCCO, FOAM, BRICK, AND OTHER WALL FINISHES.
 - WHERE EXISTING STRUCTURE IS WOOD FRAMING, EXISTING CONDITIONS MAY VARY. FIELD VERIFY THAT FASTENERS ARE INTO ADEQUATE WOOD FRAMING MEMBERS, NOT INTO PLYWOOD.

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ANCHOR NOTE 1: UNLESS NOTED OTHERWISE BELOW, ANCHORS AT 3" FROM ENDS AND 12" O.C. MAX

(CHOOSE ONE FROM BELOW)

- CONNECTION IN CONCRETE:
 - 1/4" ITW TAPCON WITH 1 3/4" MIN EMBED. AND 2 1/2" MIN EDGE DIST. (3.19KSI MIN CONC.)
 - 1/4" DEWALT ULTRACON W/ 1 3/4" EMBED AND 2 1/2" MIN. EDGE DIST. (3.0KSI MIN CONC.)
 - 1/4" DEWALT PANELMATES (MALE/FEMALE) WITH 1 3/4" MIN EMBED. AND 2 1/2" MIN EDGE DIST. (3.32KSI MIN CONC.)
 - 1/4"-20 ALL POINTS SOLID SET ANCHOR WITH 7/8" MIN EMBED. AND 2" MIN EDGE DIST. (3.0KSI MIN CONC.)
 - 1/4" MILLENIUM MILLFAST (W/ T&C ULTRACOTE) WITH 1 3/4" EMBED AND 2 1/2" EDGE DIST. (3.275KSI MIN)
 - #12 SMS W/ 2" EYEWALL ARMOR NYLON INSERT W/ 2" EMBED AND 2" EDGE DIST (2 KSI MIN)
- CONNECTION IN HOLLOW CONCRETE BLOCK:
 - 1/4" ITW TAPCON WITH 1 1/4" MIN EMBED. AND 2 1/2" MIN EDGE DIST., SPACED AT 4" O.C. MAX.
 - 1/4" DEWALT ULTRACON W/ 1 1/4" EMBED AND 2 1/2" MIN. EDGE DIST.
 - 1/4" DEWALT PANELMATES (MALE/FEMALE) WITH 1 1/4" MIN EMBED. AND 2 1/2" MIN EDGE DIST., SPACED AT 6 1/2" O.C. MAX.
 - 1/4"-20 ALL POINTS SOLID SET ANCHOR WITH 7/8" MIN EMBED. AND 2" MIN EDGE DIST., SPACED AT 8 7/8" O.C. MAX.
 - 1/4" MILLENIUM MILLFAST (W/ T&C ULTRACOTE) WITH 1 1/4" EMBED AND 2 1/2" EDGE DIST., SPACED AT 4 1/2" O.C. MAX
 - #12 SMS W/ 2" EYEWALL ARMOR NYLON INSERT W/ 1 1/4" EMBED AND 2" EDGE DIST., SPACED AT 7" O.C. MAX
- CONNECTION IN WOOD (G=0.42 MIN):
 - 1/4" LAG SCREW WITH 1 1/2" MIN EMBED. AND 3/4" MIN EDGE DIST.
 - #14 SHEET METAL SCREW WITH 1 1/2" MIN EMBED. AND 3/4" MIN EDGE DIST.

ANCHOR NOTE 2: CHOOSE ONE ANCHOR TYPE FROM BELOW, INSTALL QTY SHOWN

- CONNECTION IN CONCRETE:
 - (2) 1/4" ITW TAPCON WITH 1 3/4" MIN EMBED. AND 2 1/2" MIN EDGE DIST. (3.19KSI MIN CONC.)
 - (2) 1/4" DEWALT PANELMATES (MALE/FEMALE) WITH 1 3/4" MIN EMBED. AND 2 1/2" MIN EDGE DIST. (3.32KSI MIN CONC.)
 - (2) 1/4"-20 ALL POINTS SOLID SET ANCHOR WITH 7/8" MIN EMBED. AND 2" MIN EDGE DIST. (3.0KSI MIN CONC.)
 - (2) 1/4" MILLENIUM MILLFAST (W/ T&C ULTRACOTE) WITH 1 3/4" EMBED AND 2 1/2" EDGE DIST. (3.275KSI MIN)
 - (2) #12 SMS W/ 2" EYEWALL ARMOR NYLON INSERT W/ 2" EMBED AND 2" EDGE DIST (2 KSI MIN)

NOTE: ALL 69" MAXIMUM SHUTTER SPAN INSTALLATIONS WITH MULTI-PANEL SPANS WITHOUT STORM BARS AT -95PSF REQUIRE A QUANTITY OF (3) ANCHORS FROM THE OPTIONS ABOVE
- CONNECTION IN WOOD (G=0.42 MIN):
 - (2) 1/4" EYEWALL ARMOR MALE OR FEMALE BOLT WITH 1 7/8" MIN EMBED. AND 3/4" MIN EDGE DIST.
 - (3) 1/4" DEWALT PANELMATE (MALE/FEMALE) WITH 1 7/8" MIN EMBED. AND 3/4" MIN EDGE DIST.
 - (2) 1/4" STAINLESS STEEL HANGER BOLT WITH 1 1/4" MIN EMBED. AND 3/4" MIN EDGE DIST.

NOTE: ALL 69" MAXIMUM SHUTTER SPAN INSTALLATIONS WITH MULTI-PANEL SPANS WITHOUT STORM BARS AT -95PSF REQUIRE A QUANTITY OF (3) ANCHORS FROM THE OPTIONS ABOVE
- CONNECTION IN HOLLOW CONCRETE BLOCK**:

- SEE ANCHOR SCHEDULE BELOW FOR APPLICABILITY OF ANCHORS TO BE INSTALLED. EACH HOLLOW CONCRETE BLOCK ANCHOR IS CLASSIFIED WITH A LETTER AS SHOWN BELOW ACCOMPANIED BY A NUMBER INDICATING THE QUANTITY OF ANCHORS REQUIRED FOR INSTALLATION. THE DESIGN TABLE ILLUSTRATED BELOW APPLIES TO HOLLOW CONCRETE BLOCK ANCHORS ONLY.
 - TYPE (w) : 1/4" ITW TAPCON WITH 1 1/4" MIN EMBED. AND 2 1/2" MIN EDGE DIST.
 - TYPE (x) : 1/4" EYEWALL ARMOR MALE OR FEMALE BOLT W/ 1 1/4" MIN EMBED. AND 2 1/2" MIN EDGE DIST.
 - TYPE (y) : 1/4" DEWALT PANELMATES (MALE/FEMALE) WITH 1 1/4" MIN EMBED. AND 2 1/2" MIN EDGE DIST.
 - TYPE (z) : 1/4"-20 ALL POINTS SOLID SET ANCHOR WITH 7/8" MIN EMBED. AND 2" MIN EDGE DIST.
 - TYPE (u) : 1/4" MILLENIUM MILLFAST (W/ T&C ULTRACOTE) WITH 1 1/4" EMBED AND 2 1/2" EDGE DIST.
 - TYPE (v) : #12 SMS W/ 2" EYEWALL ARMOR NYLON INSERT W/ 1 1/4" EMBED AND 2" EDGE DIST

MAX (-) PRESSURE	69" MAXIMUM SHUTTER SPAN			81-5/8" MAXIMUM SHUTTER SPAN			96-3/4" MAXIMUM SHUTTER SPAN		
	SINGLE PANEL SPAN	MULTI-PANEL SPAN		SINGLE PANEL	MULTI-PANEL SPAN		SINGLE PANEL	MULTI-PANEL SPAN	
		W/O BAR	W/BAR		W/O BAR	W/BAR		W/O BAR	W/BAR
-50 PSF	(w3) (x2) (y2) (z2) (u3) (v2)	(x2) (y3) (z2) (v2)	(w2) (x2) (y2) (z2) (u2) (v2)	(x2) (y2) (z2) (u3) (v2)	(x2) (y3) (z2) (v3)	(w3) (x2) (y2) (z2) (u2) (v2)	(w3) (x2) (y2) (z2) (u3) (v2)	(x2) (z3) (v3)	(w3) (x2) (y2) (z2) (u3) (v2)
-60 PSF	(x2) (y3) (z2) (u3) (v2)	(x2) (y3) (z2) (v3)	(w3) (x2) (y2) (z2) (u2) (v2)	(x2) (y3) (z2) (v3)	N/A	(w3) (x2) (y2) (z2) (u3) (v2)	(w3) (x2) (y2) (z2) (u3) (v2)	N/A	(w3) (x2) (y2) (z2) (u3) (v2)
-70 PSF	(x2) (y3) (z2) (v3)	(x2) (z3) (v3)	(w3) (x2) (y2) (z2) (u3) (v2)	(x2) (y3) (z3) (v3)	N/A	(w3) (x2) (y2) (z2) (u3) (v2)	(x2) (y3) (z2) (v2)	N/A	(x2) (y3) (z2) (v2)
-95 PSF	(x2) (z3) (v3)	(x3)	(x2) (y3) (z2) (u3) (v2)	(x3) (z3)	N/A	(x2) (y3) (z2) (v3)	(x2) (y3) (z3) (v3)	N/A	(x2) (y3) (z3) (v3)

**HOLLOW BLOCK ANCHOR SCHEDULE KEY: w3 = ANCHOR TYPE "w" WITH "3" ANCHORS.

ANCHOR NOTE 3: CHOOSE ONE ANCHOR TYPE FROM BELOW, INSTALL QTY SHOWN

- CONNECTION IN CONCRETE:
 - (1) 1/4" ITW TAPCON WITH 1 3/4" MIN EMBED. AND 2 1/2" MIN EDGE DIST. (3.19KSI MIN CONC.)
 - (1) 1/4" DEWALT ULTRACON WITH 1 3/4" MIN EMBED. AND 2 1/2" MIN EDGE DIST. (3.0KSI MIN CONC.)
 - (1) 1/4"-20 ALL POINTS SOLID SET ANCHOR WITH 7/8" MIN EMBED. AND 3" MIN EDGE DIST. (3.0KSI MIN CONC.)
 - (1) 1/4" MILLENIUM MILLFAST (W/ T&C ULTRACOTE) WITH 1 3/4" EMBED AND 2 1/2" EDGE DIST. (3.275KSI MIN)
 - (1) #12 SMS W/ 2" EYEWALL ARMOR NYLON INSERT W/ 2" EMBED AND 2" EDGE DIST (2 KSI MIN)
- CONNECTION IN HOLLOW CONCRETE BLOCK:
 - (2) 1/4" DEWALT ULTRACONS WITH 1 1/4" MIN EMBED. AND 2 1/2" MIN EDGE DIST.
 - (2) 1/4"-20 ALL POINTS SOLID SET ANCHOR WITH 7/8" MIN EMBED. AND 3" MIN EDGE DIST.
 - (2) 1/4" MILLENIUM MILLFAST (W/ T&C ULTRACOTE) WITH 1 1/4" EMBED AND 2 1/2" EDGE DIST. (3.275KSI MIN)
 - (2) #12 SMS W/ 2" EYEWALL ARMOR NYLON INSERT W/ 2" EMBED AND 2" EDGE DIST (2 KSI MIN)
- CONNECTION IN WOOD (G=0.42 MIN):
 - (1) 1/4" LAG SCREW WITH 1 1/2" MIN EMBED. AND 3/4" MIN EDGE DIST.
 - (1) #14 SHEET METAL SCREW WITH 1 1/2" MIN EMBED. AND 3/4" MIN EDGE DIST.



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REMARKS	DRWN	CHKD	DATE
INIT ISSUE	RKB	FLB	12/15/09
2010 FBC	CSL	KL	21/16/11
2014 FBC	RWN	CSL	4/04/15
2017 FBC	RWN	FLB	8/02/17
2020 FBC	CB	RWN	8/24/20

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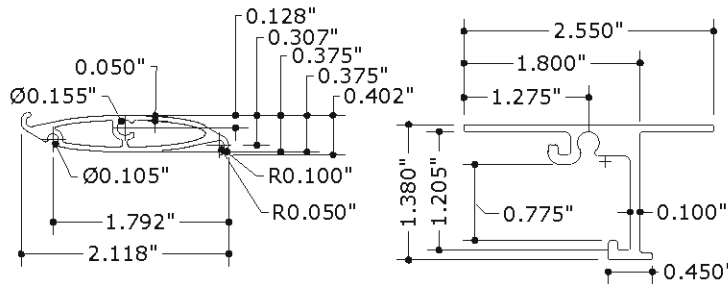
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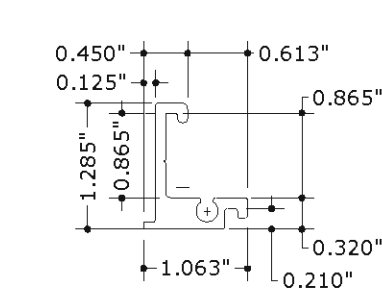
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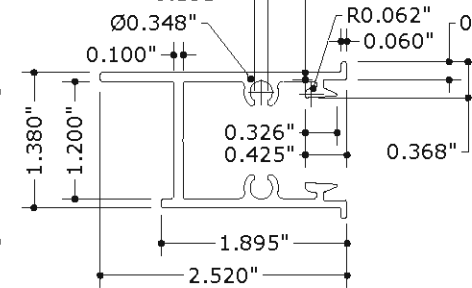
EXTRUSIONS



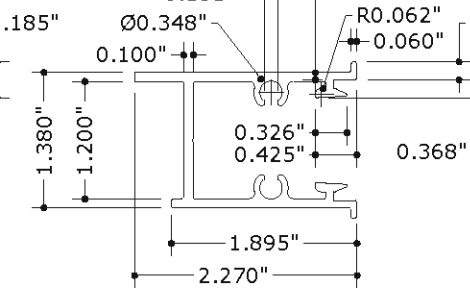
1a 2" BLADE
6" = 1'-0"



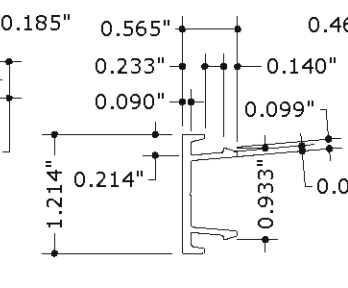
2 FEMALE MULLION
6" = 1'-0"



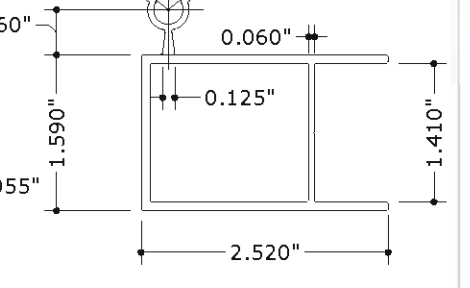
3 MALE MULLION
6" = 1'-0"



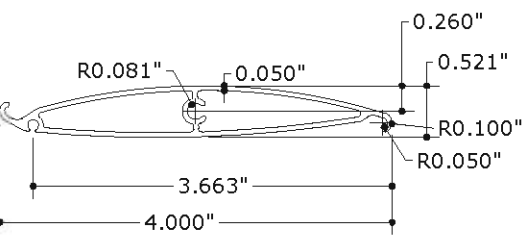
4a JAMB
6" = 1'-0"



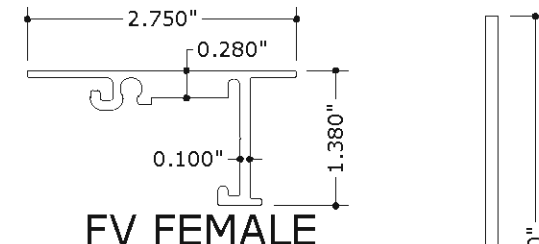
5 JAMB SNAP
6" = 1'-0"



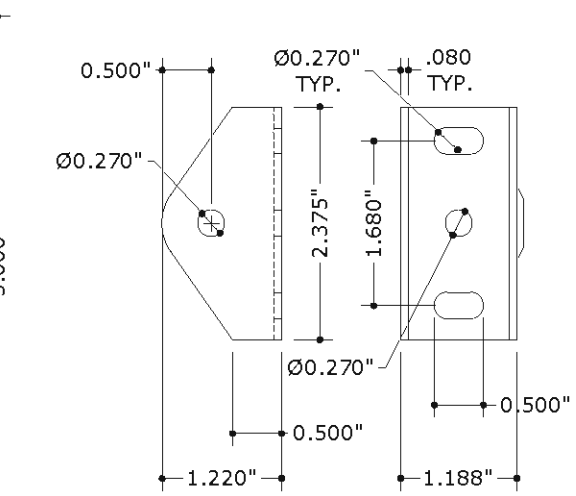
6 HEADER
6" = 1'-0"



1b 4" BLADE
6" = 1'-0"

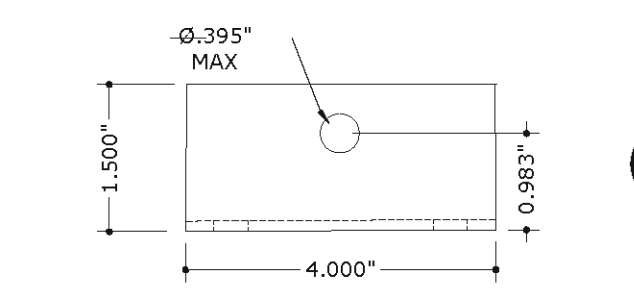


2a FV FEMALE MULLION
6" = 1'-0"

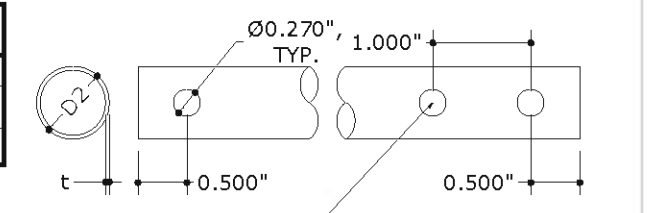


13a L CAMEL BACK HINGE
6" = 1'-0"

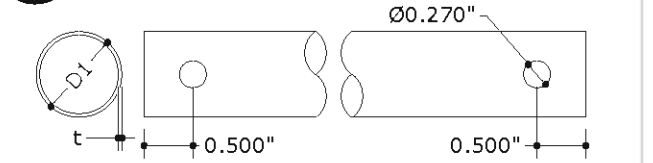
PIPE (ARM) SCHEDULE					
OUTER TUBE			INNER TUBE		
OUTSIDE DIAM.	INSIDE DIAM.	WALL	OUTSIDE DIAM.	INSIDE DIAM.	WALL
1.000"	0.900"	0.050"	0.875"	0.775"	0.050"



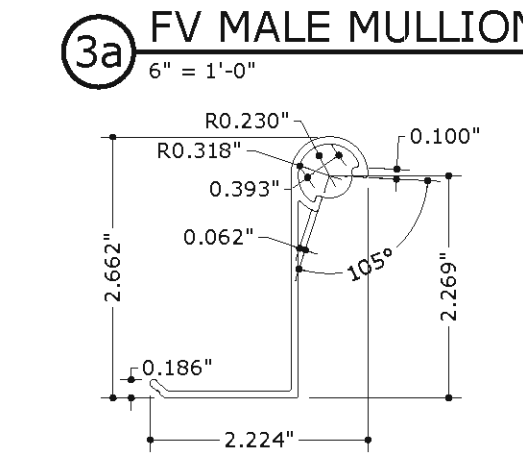
13b "U" WALL BRACKET



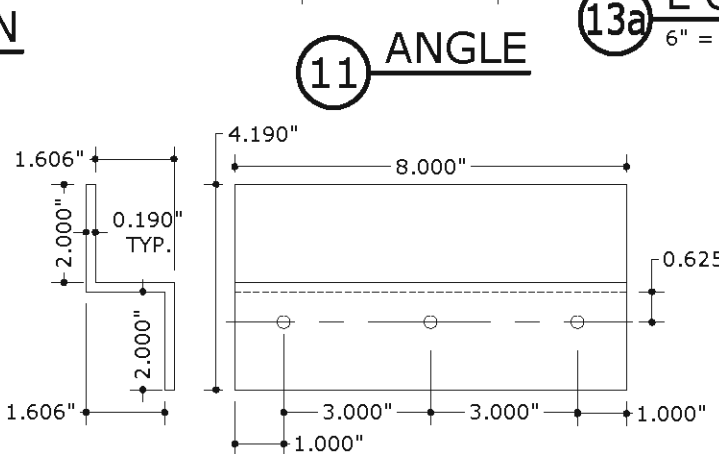
14 ALUMINUM PIPE (INNER)
6" = 1'-0"



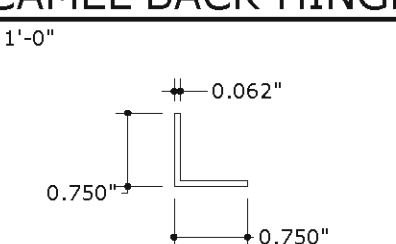
15 ALUMINUM PIPE (OUTER)
6" = 1'-0"



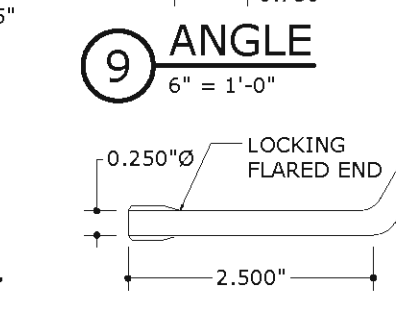
3a FV MALE MULLION
6" = 1'-0"



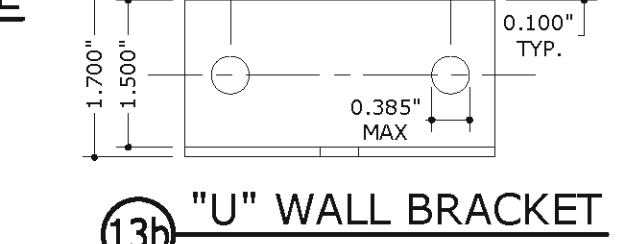
10 "Z" BAR - PROFILE & LAYOUT
3" = 1'-0"



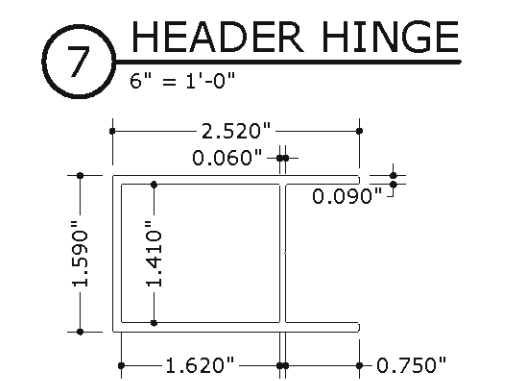
9 ANGLE
6" = 1'-0"



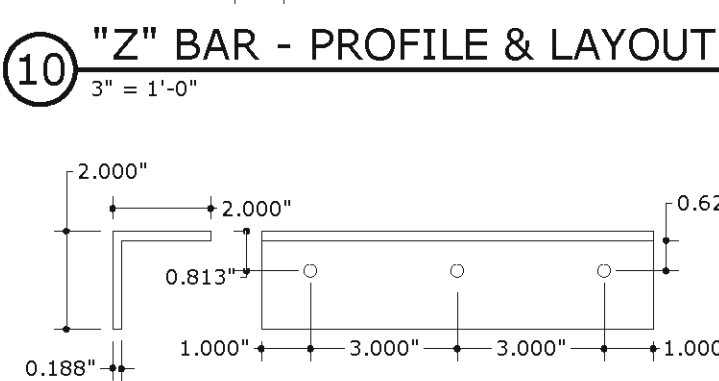
17 L-PIN - 1/4"Ø
6" = 1'-0"



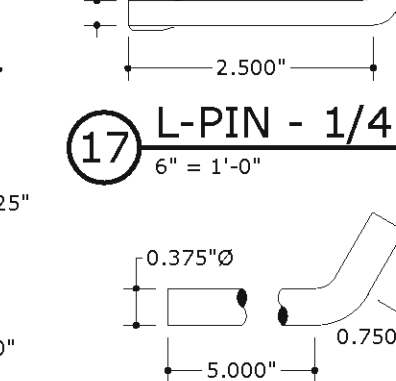
19 GALV. STEEL BENT PLATE INSERT FOR MULLION
6" = 1'-0"



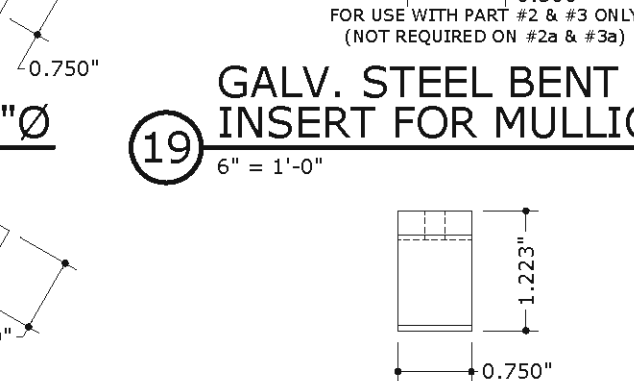
7 HEADER HINGE
6" = 1'-0"



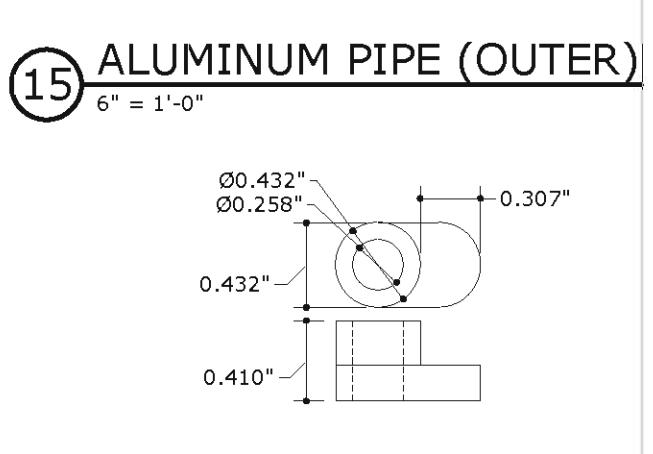
12 ANGLE - PROFILE & LAYOUT
3" = 1'-0"



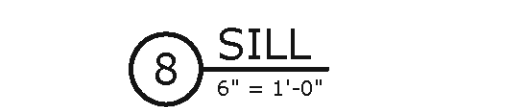
18 L-PIN - 3/8"Ø
6" = 1'-0"



21 TENSION RING
6" = 1'-0"



20 TAB STOP
6" = 1'-0"



8 SILL
6" = 1'-0"



22 ALT. TAB STOP
6" = 1'-0"

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DRWN	CHKD	DATE
RKB	FLB	12/15/09
CSL	KL	2/1/16/11
RWN	CSL	4/04/15
RWN	FLB	8/02/17
CB	RWN	8/24/20

REMARKS
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OF 6