

GENERAL NOTES: (SEE INDEX OF SHEETS ON SHEET 2)

1. 40mm ER SLAT BERTHA IMPACT PROTECTIVE ROLLING SYSTEM SHOWN ON THIS PRODUCT EVALUATION DOCUMENT (P.E.D.) HAS BEEN VERIFIED FOR COMPLIANCE IN ACCORDANCE WITH THE 2026 (9th EDITION) OF THE FLORIDA BUILDING CODE. THIS PRODUCT MAY BE INSTALLED AT HIGH VELOCITY HURRICANE ZONES.

DESIGN WIND LOADS SHALL BE DETERMINED AS PER SECTION 1620 OF THE ABOVE MENTIONED CODE, USING ASCE 7-22 AND SHALL NOT EXCEED THE MAXIMUM (A.S.D.) DESIGN PRESSURE RATINGS INDICATED ON SHEETS 7, 17 THRU 29.

ORDER TO VERIFY THE ABOVE CONDITION, ULTIMATE DESIGN WIND LOADS DETERMINED PER ASCE 7-22 SHALL FIRST BE REDUCED TO A.S.D. DESIGN WIND LOADS BY MULTIPLYING THEM BY 0.6 IN ORDER TO COMPARE THESE WITH MAX. (A.S.D.) DESIGN PRESSURE RATINGS INDICATED ON SHEETS 7, 17 THRU 29.

IN ORDER TO VERIFY THAT COMPONENTS AND ANCHORS ON THIS P.E.D. AS TESTED, WERE NOT OVER STRESSED, A 33% INCREASE IN ALLOWABLE STRESS FOR WIND LOADS WAS NOT USED IN THEIR ANALYSIS. FASTENER SPACING TO WOOD HAS BEEN DETERMINED IN ACCORDANCE WITH ANSI/AWC NDS-24.

40mm ER SLAT BERTHA IMPACT PROTECTIVE ROLLING SYSTEM'S ADEQUACY FOR IMPACT AND FATIGUE RESISTANCE HAS BEEN VERIFIED IN ACCORDANCE WITH SECTION 1626 OF THE ABOVE MENTIONED CODE AS PER:

- AMERICAN TESTING LAB OF SOUTH FLORIDA REPORTS # 0730.01-13 WITH ADDENDUM #1, DATED 8/5/14 , 0404.01-08, 0612.01-14, 0530.01-14 WITH ADDENDUM #1, DATED 10/12/14, 0917.01-14 & 1211.01-14. IMPACT MISSILE IS 9Lb, 2"x4", 50ft/Sec.

2. ALL ALUMINUM EXTRUSIONS SHALL BE ALUMINUM ASSOCIATION 6063-T6 ALLOY & TEMPER (UNLESS OTHERWISE NOTED). ALL ALUMINUM EXTRUSIONS IN CONTACT WITH DISSIMILAR MATERIALS SHALL COMPLY WITH SECTION III-6 OF THE 2020 ALUMINUM DESIGN MANUAL.

3. ALL SELF DRILL SCREWS (EXCEPT COMPONENT ①) SHALL BE CORROSION RESISTANT STEEL AS PER DIN 50018 AND SHALL COMPLY WITH FLORIDA BUILDING CODE SECTIONS 2411.3.3.4 & 1711. TEK SCREWS SHALL BE 410 SS AS MANUFACTURED BY ITW/BUILDEX. ALL SCREWS SHALL BE HEX HD HWH.

4. BOLTS TO BE ASTM A-307, GALVANIZED OR AISI 304 OR 316 SERIES STAINLESS STEEL WITH 36 ksi MINIMUM YIELD STRENGTH.

5. ANCHORS TO WALL FOR ⑤ & ⑥ SIDE RAILS SHALL BE AS FOLLOWS: SEE NOTE 8 FOR SUBSTRATE LIMITATIONS.

END RETENTION SYSTEM : SLATS ① & ③ △

SUBSTRATE: POURED CONCRETE											
ANCHOR TYPE & MANUFACTURER											
3/8" WEDGE BOLT/ DEWALT, INC.			5/16" TAPCON XL/ ITW/BUILDEX			5/16" TAPPER+XTREME/ DEWALT, INC. *			5/16" ULTRACON/ DEWALT, INC. OR 3/8" SS KWIK BOLT 3/ HILTI		
MIN. E.D.	MIN. EMBED.	MIN. f'c	MIN. E.D.	MIN. EMBED.	MIN. f'c	MIN. E.D.	MIN. EMBED.	MIN. f'c	MIN. E.D.	MIN. EMBED.	MIN. f'c
4 1/2"	3 1/2"	3 ksi	2 1/2"	2 1/4"	3 ksi	3 5/16"	2 1/2"	3 ksi	3 1/8"	3"	3.5 ksi

* THIS ANCHOR SHALL NOT BE USED W/ SLAT ③

SUBSTRATE: GROUTED CONCRETE BLOCK, GROUT=2ksi f'c (ASTM C-90)							
ANCHOR TYPE & MANUFACTURER							
3/8" KWIK HUS BOLT/ HILTI, INC.		5/16" TAPCON XL/ ITW/BUILDEX		5/16" TAPPER+XTREME/* DEWALT, INC.		5/16" ULTRACON/ DEWALT INC. OR 3/8" SS KWIK BOLT 3/ HILTI *	
MIN. E.D.	MIN. EMBED.	MIN. E.D.	MIN. EMBED.	MIN. E.D.	MIN. EMBED.	MIN. E.D.	MIN. EMBED.
4"	3 1/4"	4"	2 1/4"	4"	2 1/2"	3 3/4"	2 1/4"

* THIS ANCHOR SHALL NOT BE USED W/ SLAT ③

△ ONLY SS ANCHORS ARE ALLOWED AT INSTALLATIONS WITHIN 300 ft FROM COASTAL SHORELINE.

THIS DRAWING SHALL ONLY BE USED TO
OBTAIN PERMITS IN THE STATE OF FLORIDA

ANCHORS NOTES:

- (1) NO EMBEDMENT INTO FINISH MATERIAL SHALL BE CONSIDERED AS PART OF THE REQUIRED EMBEDMENT.
- (2) EDGE DISTANCE IS BEYOND ANY FINISH MATERIAL.
- (3) ANCHORS SHALL BE INSTALLED FOLLOWING ALL OF THE RECOMMENDATIONS AND SPECIFICATIONS OF THE ANCHOR'S MANUFACTURER.

6. ANCHORS REQUIRED FOR MULLION CONNECTIONS SHALL BE AS SPECIFIED ON APPLICABLE SECTIONS SHOWN ON SHEETS 12 THRU 15. *

- KWIK BOLT TZ EXPANSION ANCHOR MANUFACTURED BY HILTI, INC.
- KWIK HUS-H SCREW ANCHOR MANUFACTURED BY HILTI, INC.
- WEDGE-BOLT ANCHOR MANUFACTURED BY DEWALT, INC.

MINIMUM EDGE DISTANCE AND SPACING FOR THE ABOVE MENTIONED ANCHORS SHALL BE AS INDICATED BELOW OR AT THE ABOVE MENTIONED SHEETS. EDGE DISTANCE AND EMBEDMENTS ARE BEYOND ANY FINISH MATERIAL.

ANCHOR	SPACING ⑩ 100%	EDGE DISTANCE ⑩ 100%	EMBEDMENT ⑩ 100%	
			CONCRETE	CONCRETE BLOCK
3/4" SS KWIK BOLT TZ	27"	9"	4 3/4" (3000 psi)	NOT ALLOWED
1/2" SS KWIK BOLT TZ	22 1/2"	7 1/2"	3 1/4" (3000 psi)	NOT ALLOWED
3/8" SS KWIK BOLT TZ	6"	4 3/8"	2" (3000 psi)	NOT ALLOWED
3/8" SS KWIK HUS-H SCREW	4"	5"	2" (3000 psi)	NOT ALLOWED
3/8" WEDGE-BOLT	4 1/2"	4 1/2"	2 1/2" (3000 psi)	NOT ALLOWED
1/2" KWIK HUS-H SCREW OR WEDGE BOLT	6"	6"	3" (3000 psi)	NOT ALLOWED
5/8" KWIK HUS-H SCREW	7 1/2"	7 1/2"	2 1/2" (3000 psi)	NOT ALLOWED

* ONLY STAINLESS STEEL ANCHORS ARE ALLOWED AT INSTALLATIONS WITHIN 300 ft FROM COASTAL SHORELINE.

7. THE INSTALLATION CONTRACTOR IS TO SEAL/CAULK ALL PRODUCT COMPONENT EDGES WHICH REMAIN IN CONTINUOUS CONTACT WITH THE BUILDING TO PREVENT WIND/RAIN INTRUSION. CAULK AND SEAL PRODUCT TRACKS ALL AROUND FULL LENGTH.

8. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE SOUNDNESS OF THE STRUCTURE WHERE THE PRODUCT IS TO BE ATTACHED TO ENSURE PROPER ANCHORAGE. THIS PRODUCT SHALL ONLY BE ATTACHED TO CONCRETE, GROUT FILLED CELL CONCRETE BLOCK OR WOOD FRAME BUILDINGS. SEE SHEETS 7 THRU 15 FOR LIMITATIONS FOR SUBSTRATE.

9. PRODUCT'S INSTALLATION SHALL COMPLY WITH SPECS INDICATED IN THIS DRAWING PLUS ANY BUILDING AND ZONING REGULATIONS PROVIDED BY THE JURISDICTION WHERE A PERMIT IS APPLIED FOR.

10. PRODUCT LIFTING MECHANISM IS NOT PART OF THIS APPROVAL.

11. (a) THIS P.E.D. PREPARED BY THIS ENGINEER IS GENERIC AND DOES NOT PROVIDE INFORMATION FOR A SITE SPECIFIC PROJECT; I.E. WHERE THE SITE CONDITIONS DEViate FROM THE P.E.D.

(b) THE CONTRACTOR IS TO BE RESPONSIBLE FOR THE SELECTION, PURCHASE AND INSTALLATION INCLUDING LIFE SAFETY OF THIS PRODUCT, BASED ON THIS P.E.D., PROVIDED HE/SHE DOES NOT DEVIATE FROM THE CONDITIONS DETAILED ON THIS DOCUMENT. CONSTRUCTION SAFETY AT SITE IS THE CONTRACTOR'S RESPONSIBILITY.

(c) THIS P.E.D. WILL BE CONSIDERED INVALID IF ALTERED BY ANY MEANS.

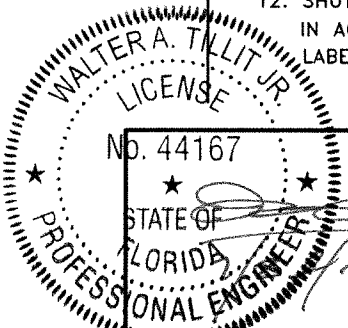
(d) SITE SPECIFIC PROJECTS SHALL BE PREPARED BY A REGISTERED ENGINEER OR ARCHITECT WHO WILL BECOME THE ENGINEER OF RECORD (E.O.R.) FOR THE PROJECT AND WHO WILL BE RESPONSIBLE FOR THE PROPER USE OF THE P.E.D. ENGINEER OF RECORD, ACTING AS A DELEGATED ENGINEER TO THE P.E.D. ENGINEER, SHALL SUBMIT TO THIS LATTER THE SITE SPECIFIC DRAWINGS FOR REVIEW.

(e) ORIGINAL P.E.D. SHALL BEAR THE DATE AND ORIGINAL SEAL AND SIGNATURE OF THE PROFESSIONAL ENGINEER OF RECORD THAT PREPARED IT.

12. SHUTTER MANUFACTURER'S LABEL SHALL BE LOCATED AT A READILY VISIBLE LOCATION ON THE PRODUCT.

IN ACCORDANCE WITH SECTION 1709.9.3 OF FLORIDA BUILDING CODE. ONE LABEL SHALL BE PLACED FOR EVERY OPENING. LABELING SHALL COMPLY WITH SECTION 1709.9.2 OF THE FLORIDA BUILDING CODE.

FLORIDA BUILDING CODE (High Velocity Hurricane Zone)



P.E. SEAL/SIGNATURE/DATE

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40mm ER SLAT BERTHA IMPACT PROTECTIVE ROLLING SYSTEM

AMERICAN SHUTTER SYSTEMS ASSOC., INC.

4268 WESTROADS DRIVE
WEST PALM BEACH, FL. 33407
PHONE: (877)999-2772
FAX: (561)209-8380

DRAWN BY:
W.H.

6/29/2026
DATE

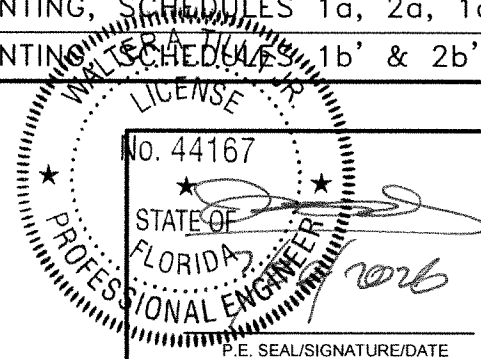
26-098
DRAWING No

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1	OLD 23-137	6/29/26	3		
2			4		

SHEET 1 OF 29

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26	SLAT ① MULLION SCHEDULES, FLOOR TO CEILING & WALL MOUNTING, SCHEDULES 1b & 2b
27	SLAT ① MULLION SCHEDULES, FLOOR TO CEILING & WALL MOUNTING, SCHEDULES 1b' & 2b'
28	SLAT ③ MULLION SCHEDULES, FLOOR TO CEILING & WALL MOUNTING, SCHEDULES 1a, 2a, 1c & 2c
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FLORIDA BUILDING CODE (High Velocity Hurricane Zone)



**40mm ER SLAT BERTHA IMPACT
PROTECTIVE ROLLING SYSTEM**

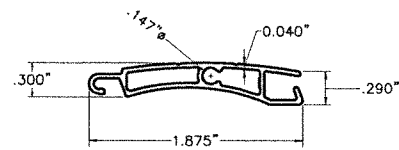
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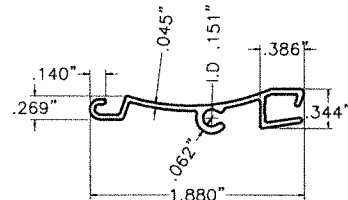
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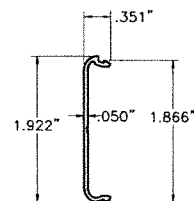
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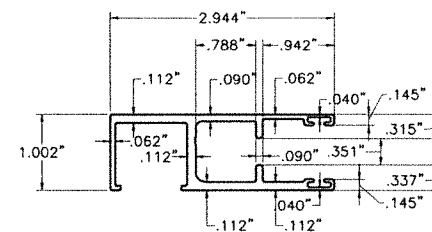
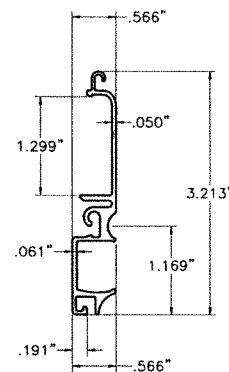
1 **CLOSED SLAT**
6063-T6 ALUMINUM ALLOY
SCALE 1 1/2"=1"



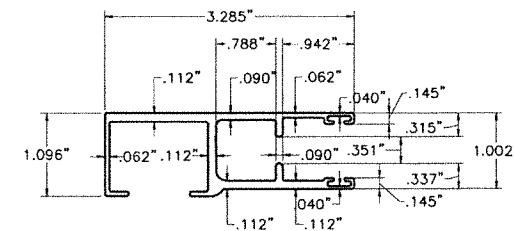
3 **SLAT W/OPEN BACK W/SCREW BOSS**
6063-T6 ALUMINUM ALLOY
SCALE 1 1/2"=1"



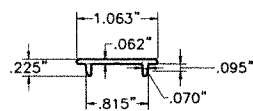
4 **BASE SLAT**
6063-T6 ALUMINUM ALLOY



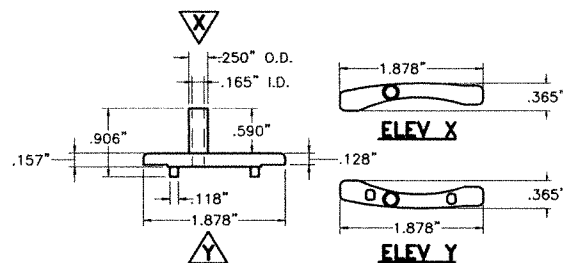
5 **SIDE RAIL TYPE 1**
6063-T6 ALUMINUM ALLOY



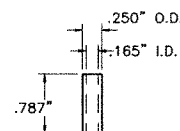
6 **SIDE RAIL TYPE 2**
6063-T6 ALUMINUM ALLOY



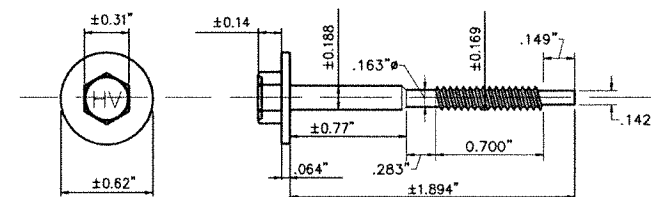
7 **SNAP CAP**
6063-T6 ALUMINUM ALLOY



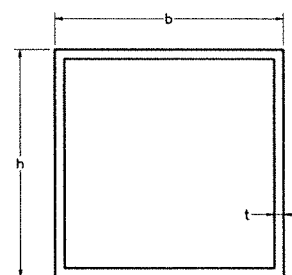
8 **END CAP W/MONOLITHIC SCREW SLEEVE (LEFT SHOWN, RIGHT IS MIRROR)**
RIGID NYLON, 76-78 TYPE "D" SHORE HARDNESS



9 **EXTENDED SCREW SLEEVE W/O END CAP**
RIGID NYLON, 76-78 TYPE "D" SHORE HARDNESS

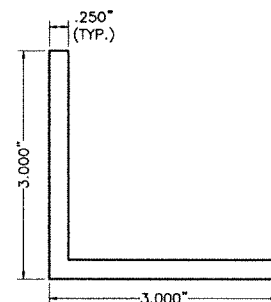


11 **SCREW @ EVERY OTHER SLAT, INCLUDING BASE SLAT FOR POURED CONCRETE, GROUTED BLOCK & WOOD INSTALLATIONS**
#8-32 x 1.894" AISI 410 S.S. SCREW W/ 0.31" Ø HV MARKED HEAD & t= 0.064"x 0.620" Ø MONOLITHIC WASHER W/ BERTHA H.V. DACROSHIELD COATING SYSTEM AS MANUFACTURED BY APPROVED COATING APPLICATORS REGISTERED WITH AMERICAN SHUTTER SYSTEM ASSOCIATION

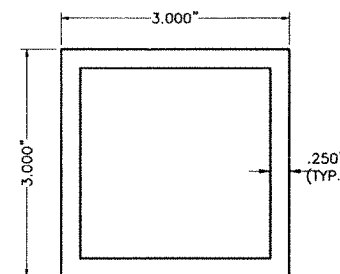


BUILD-OUT MOUNTED TUBES
6063-T6 ALUMINUM ALLOY

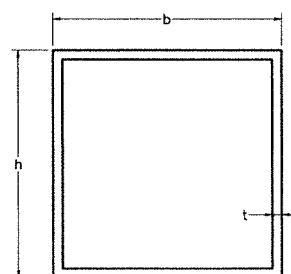
B.O TUBES	b	h	t
12 WOOD	3"	2" MAX.	0.125"
12A CONC./BLOCK	3"	4" MAX.	0.125"
15 CONC./BLOCK	4"	4" MAX.	0.25"



13 **TRAPPED ANGLE**
6063-T6 ALUMINUM ALLOY



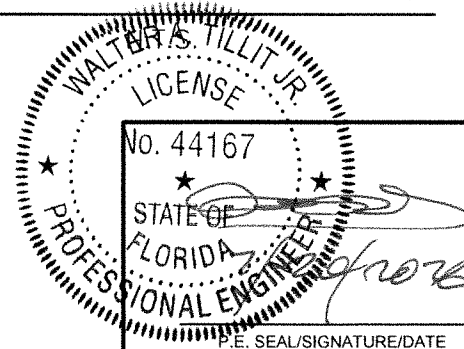
14 **OPTIONAL TRAPPED MOUNTED TUBE TO 13**
6063-T6 ALUMINUM ALLOY



MULLIONS
6061-T6 ALUMINUM ALLOY

MULLIONS	b	h	t
24	4"	6"	0.25"
25	4"	8"	0.25"

COMPONENTS



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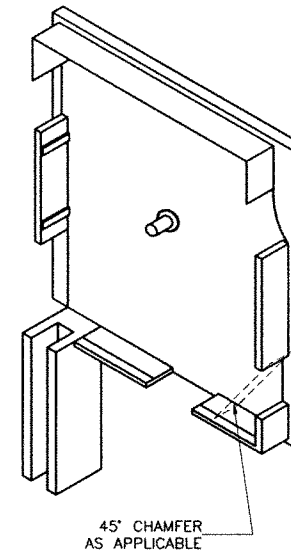
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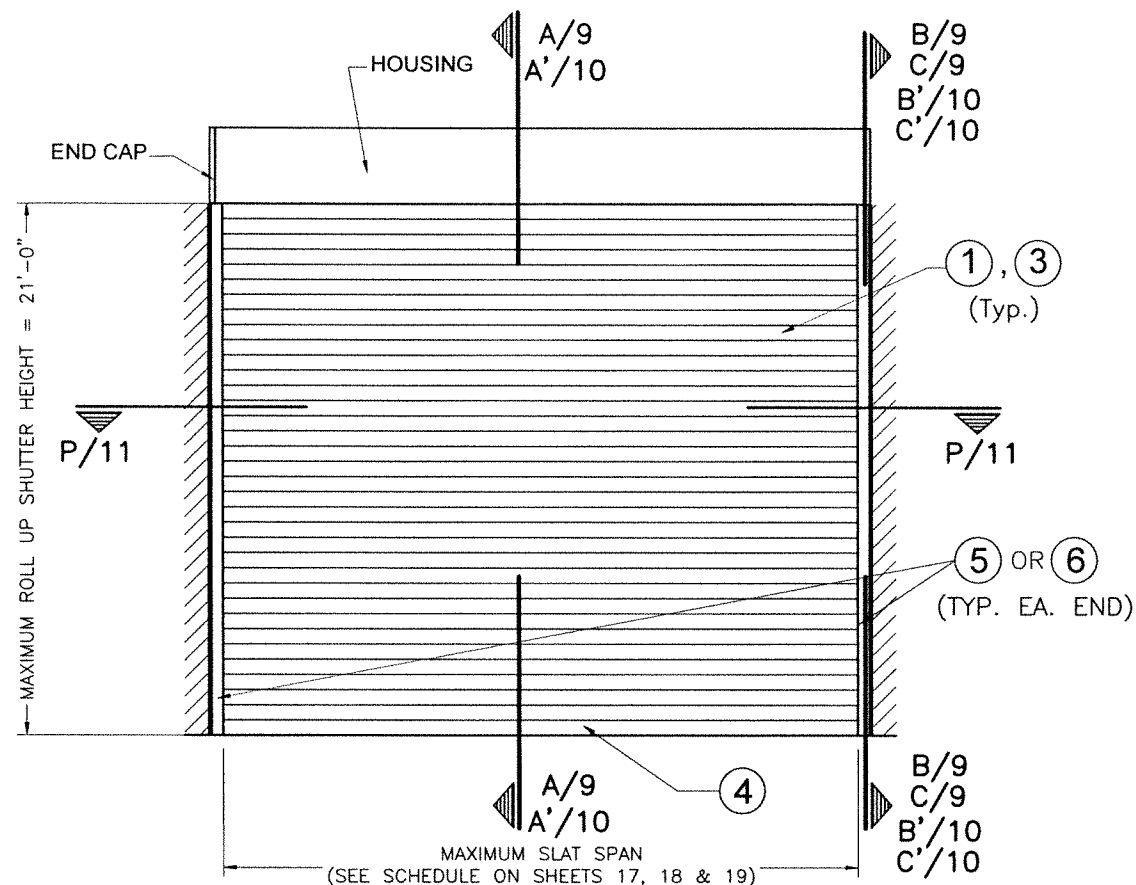
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SHEET 3 OF 29



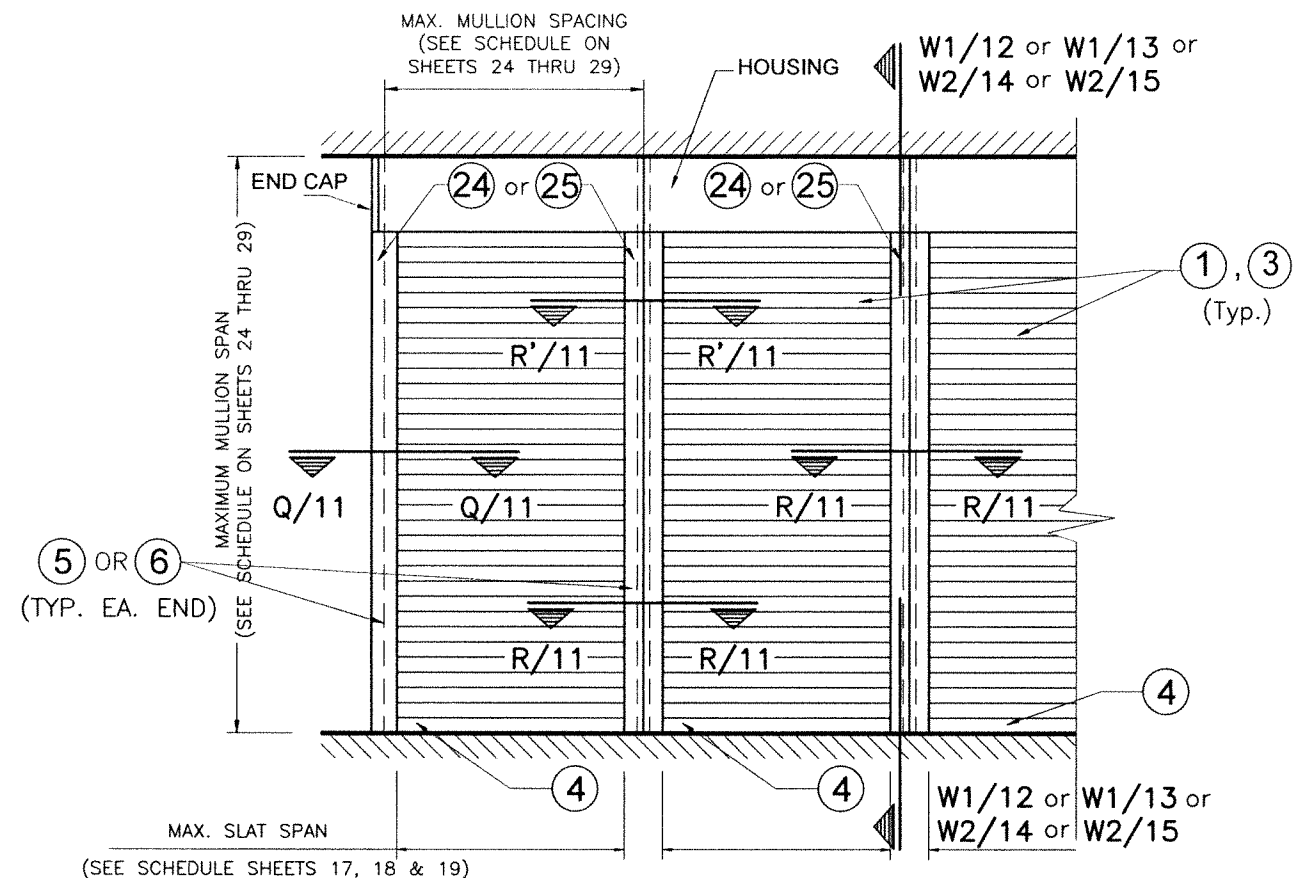
SHEET 4 OF 29

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TYPICAL SINGLE UNIT ELEVATION W/O MULLIONS

NOTE: SEE SHEETS 3 & 4 FOR COMPONENTS NOMENCLATURE.

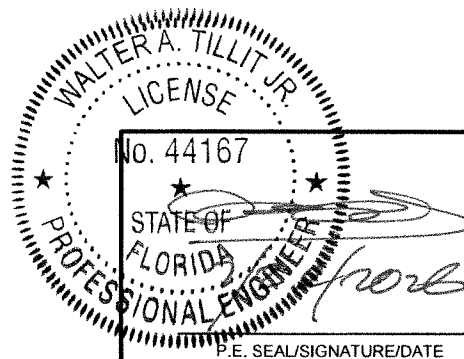


TYPICAL CONSECUTIVE SINGLE UNIT ELEVATION W/ MULLIONS

NOTE: SEE SHEET 3 & 4 FOR COMPONENTS NOMENCLATURE.

END RETENTION SYSTEM

INSTALLATION INTO CONCRETE/GROUTED CONCRETE BLOCK BUILDINGS



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SHEET 5 OF 29

Vx FORCES (Lb/FT) & Vy FORCES (Lb/FT) ACTING AT JAMBS FOR AN A.S.D. DESIGN LOAD RANGE,
SLAT SPAN RANGE FOR POURED CONCRETE OR GROUTED CONCRETE BLOCK WALL BUILDINGS
APPLICABLE TO INSTALLATIONS W/ SLATS ① & ③*
(USE MAXIMUM VALUE BETWEEN POSITIVE AND NEGATIVE A.S.D. LOAD)

SLAT TYPE ①

A.S.D. DESIGN PRESSURE RATING (p.s.f.)	SLAT SPAN RANGE													
	0'–4'		> 4'–5'		> 5'–6'		> 6'–7'		> 7'–9'		> 9'–12'		> 12'–16'	
	Vx	Vy	Vx	Vy	Vx	Vy	Vx	Vy	Vx	Vy	Vx	Vy	Vx	Vy
≤ 30.0	1164	60	1164	75	1164	90	1164	105	1164	135	1164	180	1164	240
>30–40	1524	80	1524	100	1524	120	1524	140	1524	180	1524	240	1524	320
>40–60	1909	120	1909	150	1909	180	1909	210	1909	270	1909	360	1909	429
>60–80	1972	160	1972	200	1972	240	1972	280	1972	360	1972	480	–	–
>80–105	1634	210	1634	263	1634	315	1634	368	1634	460	–	–	–	–
>105–120	1248	240	1248	300	1248	360	1248	410	–	–	–	–	–	–

SLAT TYPE ③

A.S.D. DESIGN PRESSURE RATING (p.s.f.)	SLAT SPAN RANGE									
	0'-4'		> 4'-5'		> 5'-6'		> 6'-7'		>7'-(8'-4")	
	Vx	Vy	Vx	Vy	Vx	Vy	Vx	Vy	Vx	Vy
≤ 30.0	434	125	434	125	434	125	434	125	434	125
>30-40	587	167	587	167	587	167	587	167	587	167
>40-60	883	250	883	250	883	250	883	250	883	250
>60-80	860	273	860	273	860	273	860	273	-	-

*
NOTE:
IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR OR PERMIT HOLDER TO VERIFY THAT EXISTING STRUCTURE IS DESIGNED TO SUPPORT Vx AND Vy FORCES IN POUNDS PER UNIT FOOT OF PRODUCT HEIGHT AT BOTH JAMBS. SEE THIS SHEET FOR Vx & Vy VALUES.

SIDE RAIL

Vy

Vy

Vx

WALTER A. TILLIT JR.

LICENSE

No. 44167

STATE OF FLORIDA

PROFESSIONAL ENGINEER

SEAL/SIGNATURE/DATE

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TILTECO INC.

TILLIT TESTING & ENGINEERING COMPANY

6355 N.W. 36th. St., Ste. 305 - VIRGINIA GARDENS, FL 33166

Phone : (305) 871-1530 , Fax : (305) 871-1531

e-mail: tilteco@aol.com

CA-0006719

WALTER A. TILLIT Jr., P.E.

FLORIDA Lic. # 44167

FLORIDA BUILDING CODE (High Velocity Hurricane Zone)

40mm ER SLAT BERTHA IMPACT PROTECTIVE ROLLING SYSTEM

AMERICAN SHUTTER SYSTEMS ASSOC., INC.

4268 WESTROADS DRIVE

WEST PALM BEACH, FL. 33407

PHONE: (877)999-2772

FAX: (561)209-8380

REV. No

DESCRIPTION

DATE

REV. No

DESCRIPTION

DATE

1

OLD 23-137

6/29/26

3

2

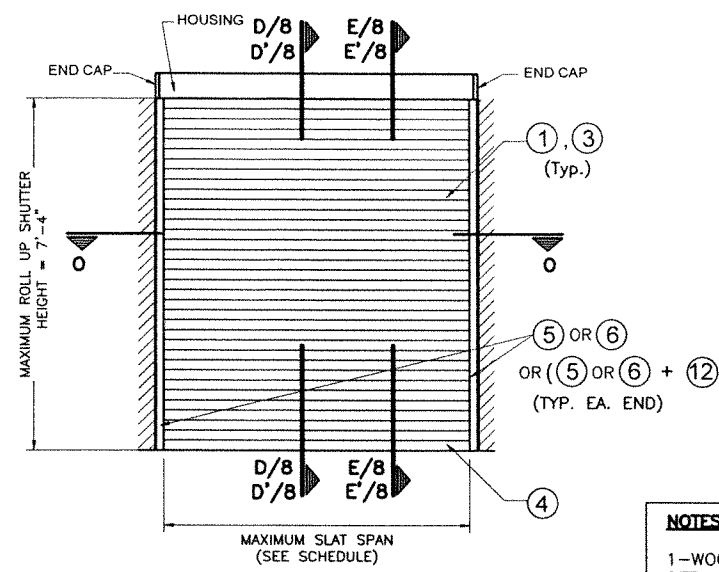
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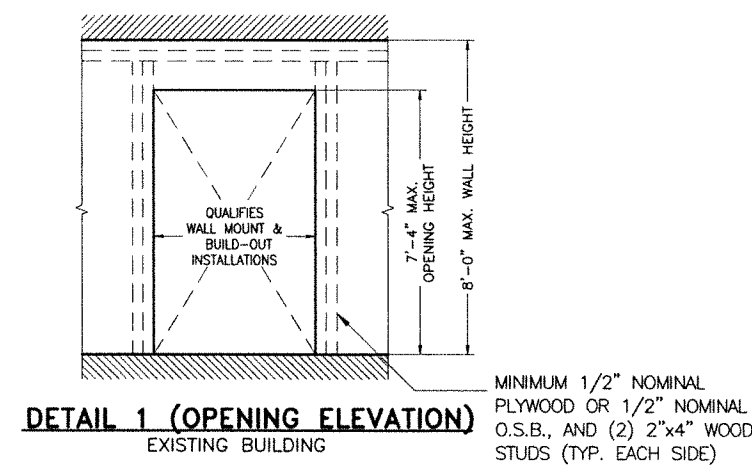
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DATE

26-098
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SHEET 6 OF 29



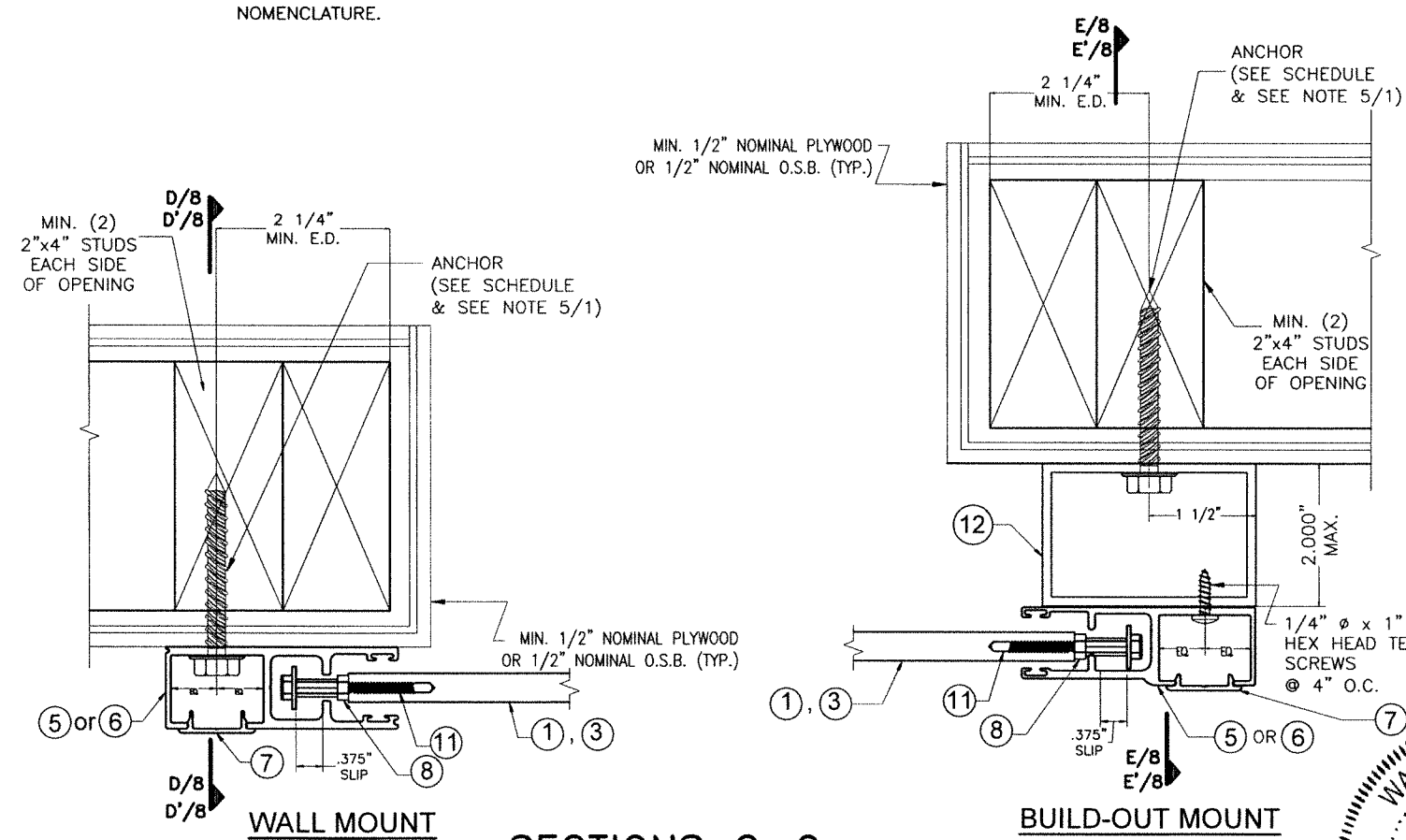
**TYPICAL SINGLE UNIT ELEVATION
W/O MULLIONS**
NOTE: SEE SHEETS 3 & 4 FOR COMPONENTS
NOMENCLATURE.



NOTES: FOR DETAIL 1
1-WOOD FRAME WALL TO BE STRICTLY BUILT IN ACCORDANCE WITH SPECS GIVEN ON
DETAIL 1 AND PROVISIONS FROM CHAPTER 23 OF THE FLORIDA BUILDING CODE. MINIMUM
LENGTH OF WALL AT EITHER SIDE OF OPENING SHALL BE 33".
2-VAILD ONLY FOR INSTALLATIONS INTO WOOD STUDS W/ (G=0.46 MIN.) STRUCTURES.

SLAT PERFORMANCE CHART IN WOOD
FOR A GIVEN MAXIMUM A.S.D. DESIGN PRESSURE RATING (p.s.f) AND PRODUCT
MOUNT CONDITION FOR INSTALLATIONS W/O STORM BARS PER
TYPICAL ELEVATION

MAX. A.S.D. DESIGN PRESSURE RATING (p.s.f.)	MAX. SLAT ① SPAN "LMAX." (ft)		REQUIRED MIN. SEPARATION TO GLASS MEASURED TO BACK OF SLAT (in)	MAX. SLAT ③ SPAN "LMAX." (ft)		REQUIRED MIN. SEPARATION TO GLASS MEASURED TO BACK OF SLAT (in)
	SLAT ①			SLAT ③		
	WALL MOUNT	BUILD-OUT MOUNT W/ ⑫		WALL MOUNT	BUILD-OUT MOUNT W/ ⑫A	
±30.0	12'-0"	12'-0"	8 1/2"	8'-4"	8'-4"	7 1/8"
±40.0	10'-0"	10'-0"	8 1/2"	8'-4"	8'-4"	7 1/8"
±45.0	9'-0"	9'-0"	8 1/2"	8'-4"	8'-4"	7 1/8"
±55.0	8'-0"	8'-0"	7 1/8"	8'-4"	8'-4"	7 1/8"



SECTIONS 0-0
N.T.S.

**END RETENTION SYSTEM
INSTALLATION INTO WOOD FRAME STRUCTURES**
(SEE DETAIL 1)

1/4" Ø MAXI SET ANCHORS		
MAX. ANCHORS SPACING SCHEDULE SLATS ① & ③		
MAX. A.S.D. DESIGN PRESSURE RATING (p.s.f.)	SIDE RAILS ⑤ & ⑥	
	WALL MOUNT	BUILD-OUT MOUNT
	W/ 2" B.O ⑫	
± 30.0 psf	3"	3"
>± 30.0 TO ±55.0	3"	3"

WALTER A. TILLIT JR.
LICENSE
No. 44167
STATE OF
FLORIDA
PROFESSIONAL ENGINEER
P.E. SEAL/SIGNATURE/DATE

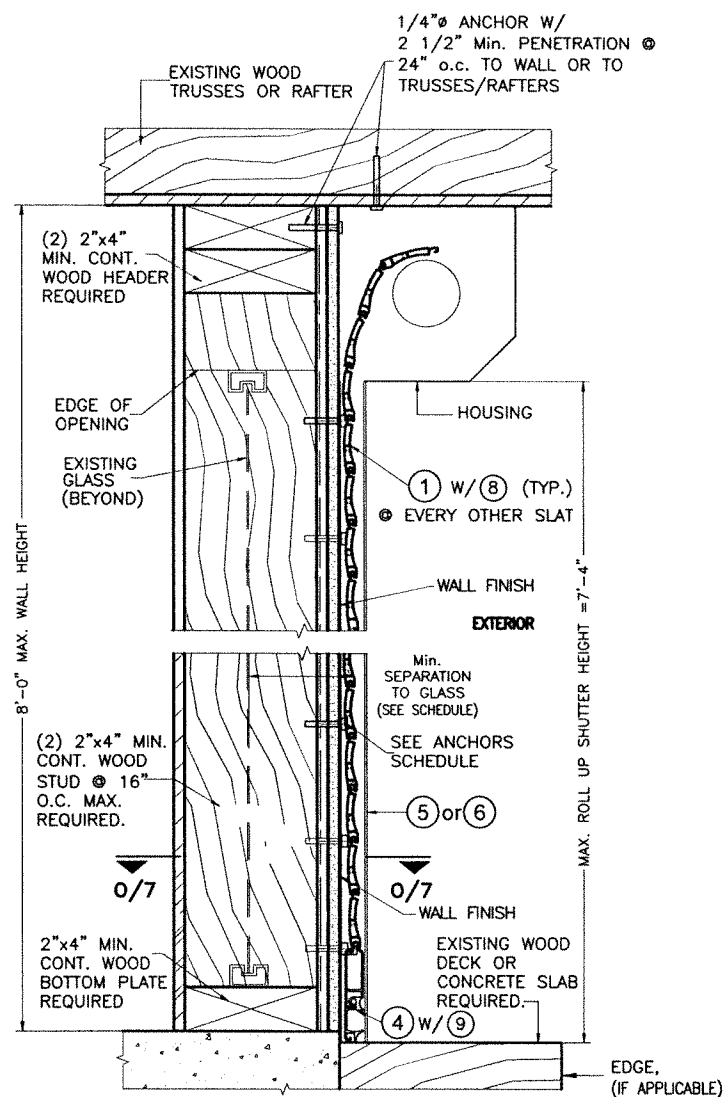
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WALTER A. TILLIT Jr., P.E.
FLORIDA Lic. # 44167

FLORIDA BUILDING CODE (High Velocity Hurricane Zone)

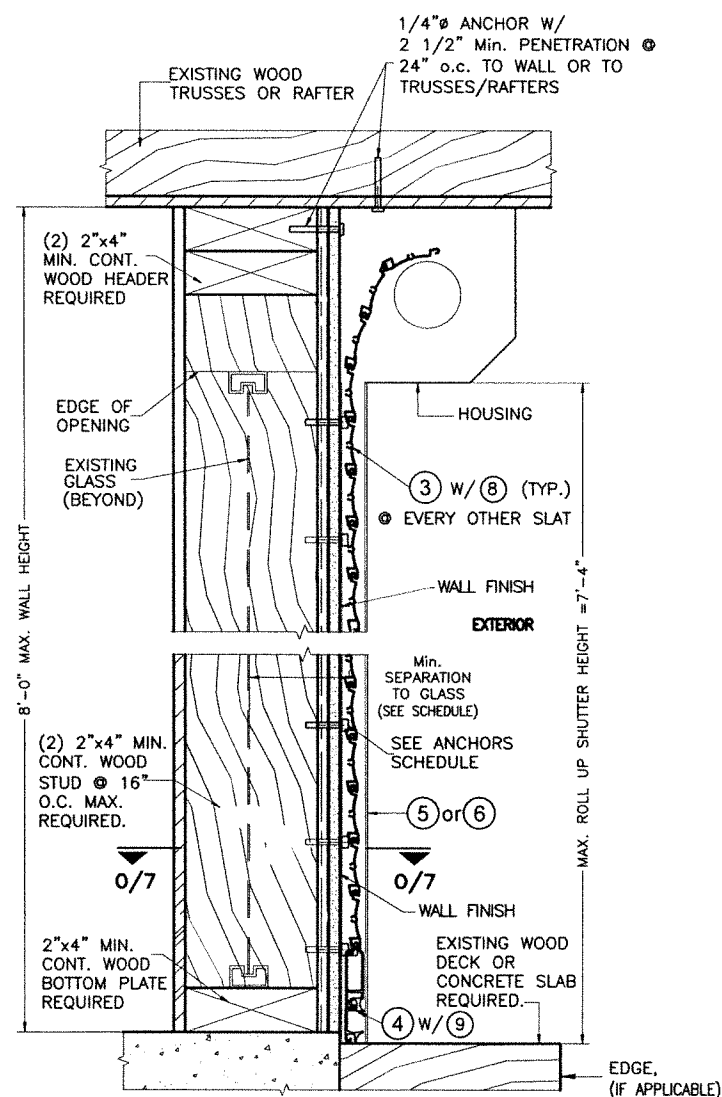
**40mm ER SLAT BERTHA IMPACT
PROTECTIVE ROLLING SYSTEM**
AMERICAN SHUTTER SYSTEMS ASSOC., INC.
4268 WESTROADS DRIVE
WEST PALM BEACH, FL. 33407
PHONE: (877)999-2772
FAX: (561)209-8380

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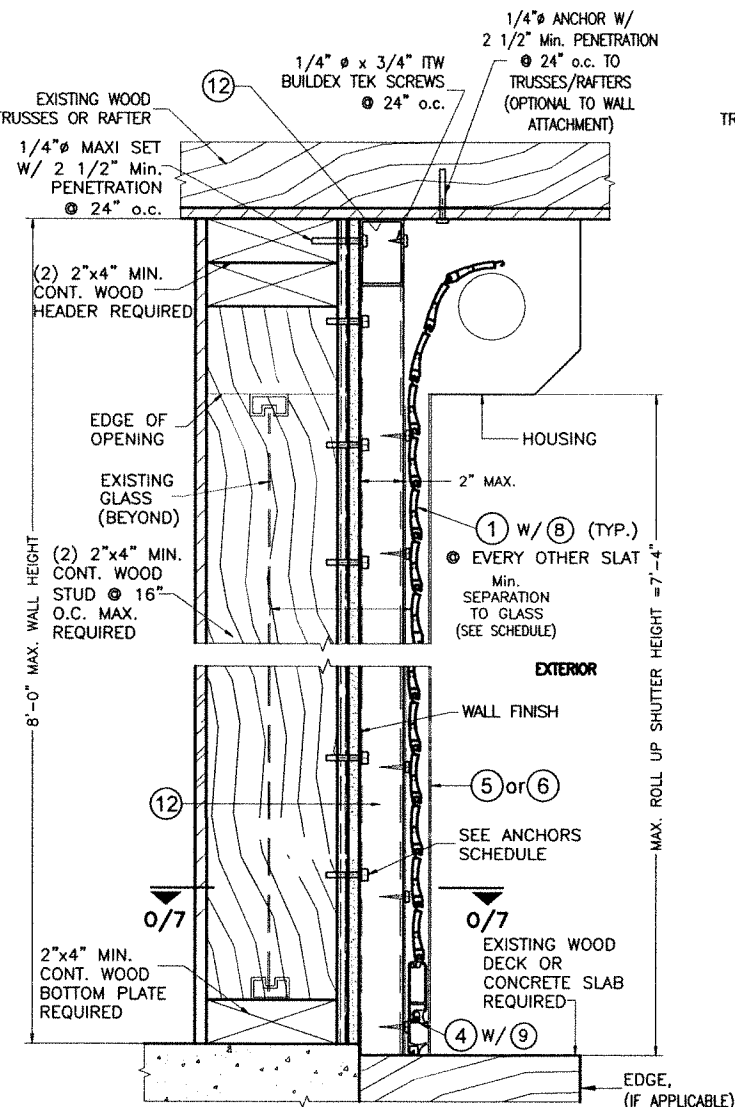
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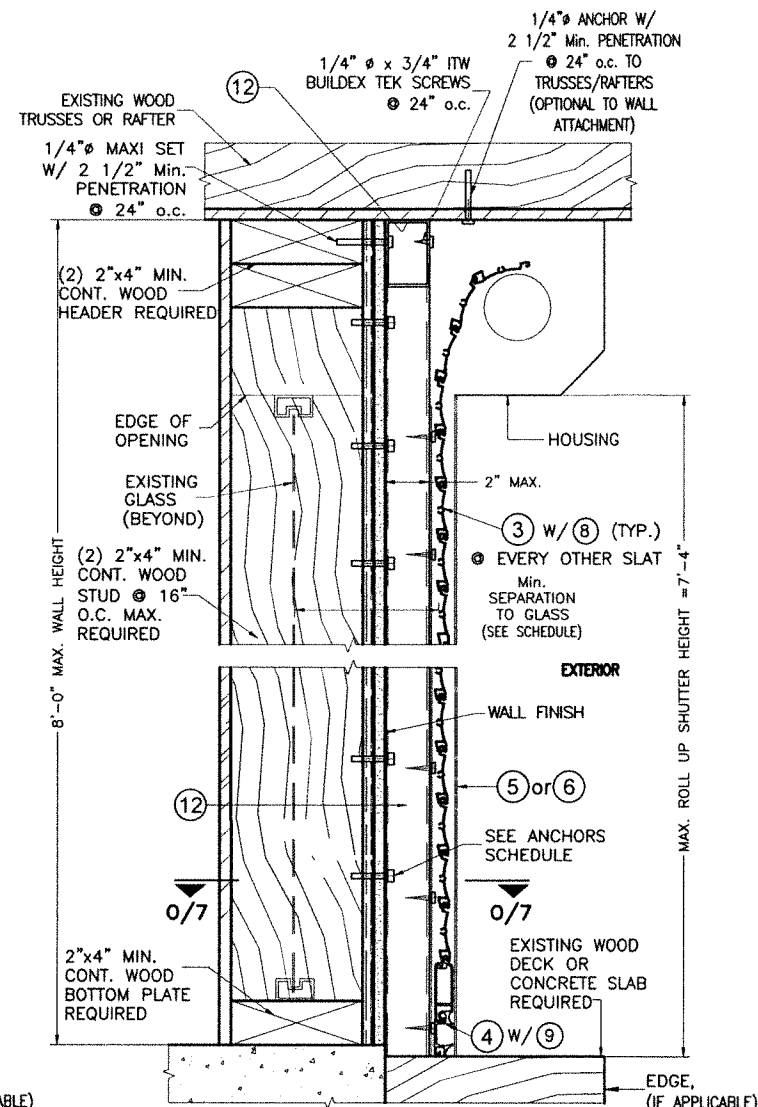
**WALL MOUNTING
SECTION D-D**
N.T.S.



**WALL MOUNTING
SECTION D'-D'**
N.T.S.

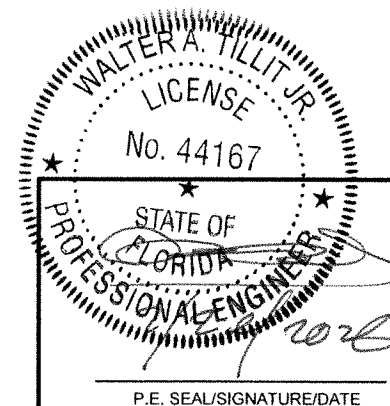


**BUILD-OUT MOUNTING
SECTION E-E**
N.T.S.



**BUILD-OUT MOUNTING
SECTION E'-E'**
N.T.S.

**END RETENTION SYSTEM
INSTALLATION INTO WOOD FRAME STRUCTURES**



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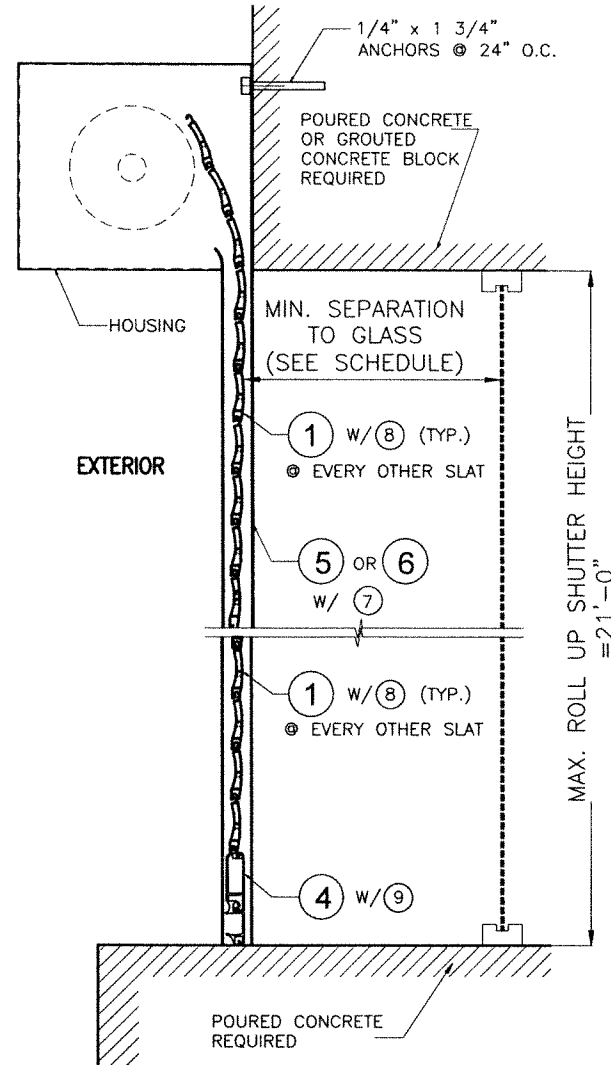
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6/29/2026
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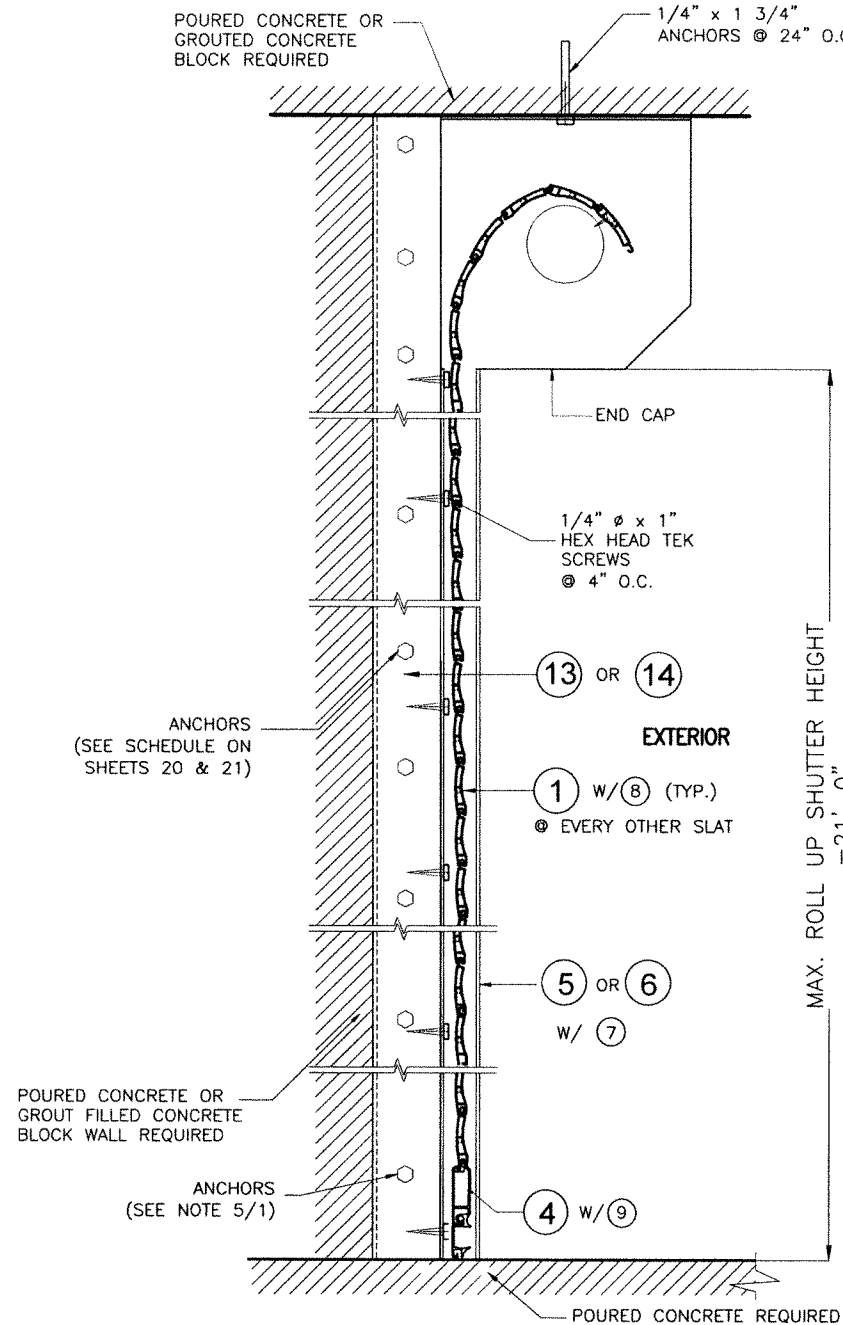
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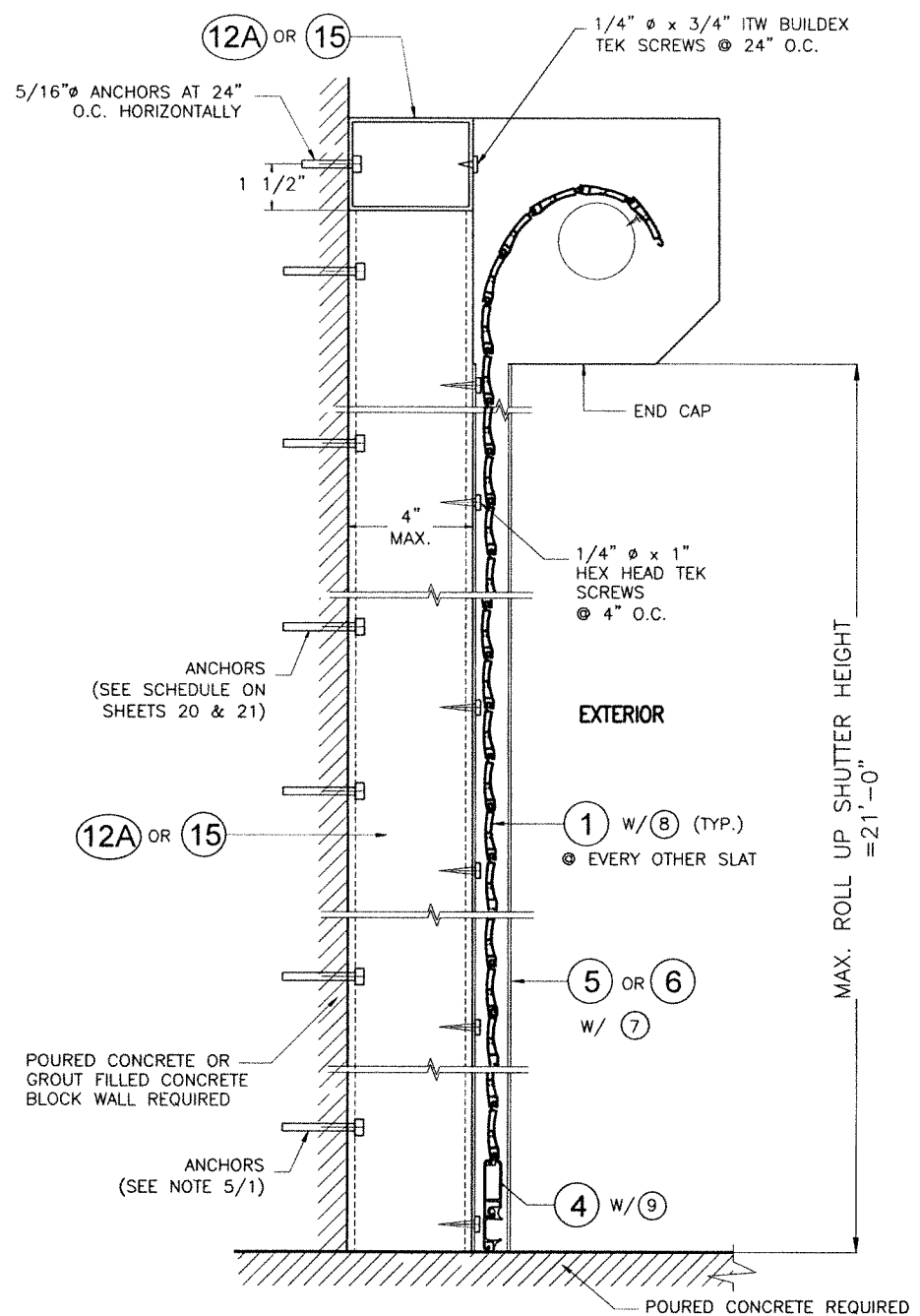
SHEET 8 OF 29



WALL MOUNTED
SECTION A-A



FLOOR/CEILING / TRAPPED MOUNTED
SECTION B-B



BUILD-OUT MOUNTED
SECTION C-C

INSTALLATION DETAILS ON EXISTING POURED CONCRETE OR GROUT FILLED CELL CONCRETE BLOCK
BUILDINGS FOR SINGLE UNIT END RETENTION SYSTEM AS APPLICABLE

FLORIDA BUILDING CODE (High Velocity Hurricane Zone)

N.T.S. LICENSE
No. 44167
STATE OF FLORIDA
PROFESSIONAL ENGINEER
WALTER A. TILLIT JR., P.E.
P.E. SEAL/SIGNATURE/DATE

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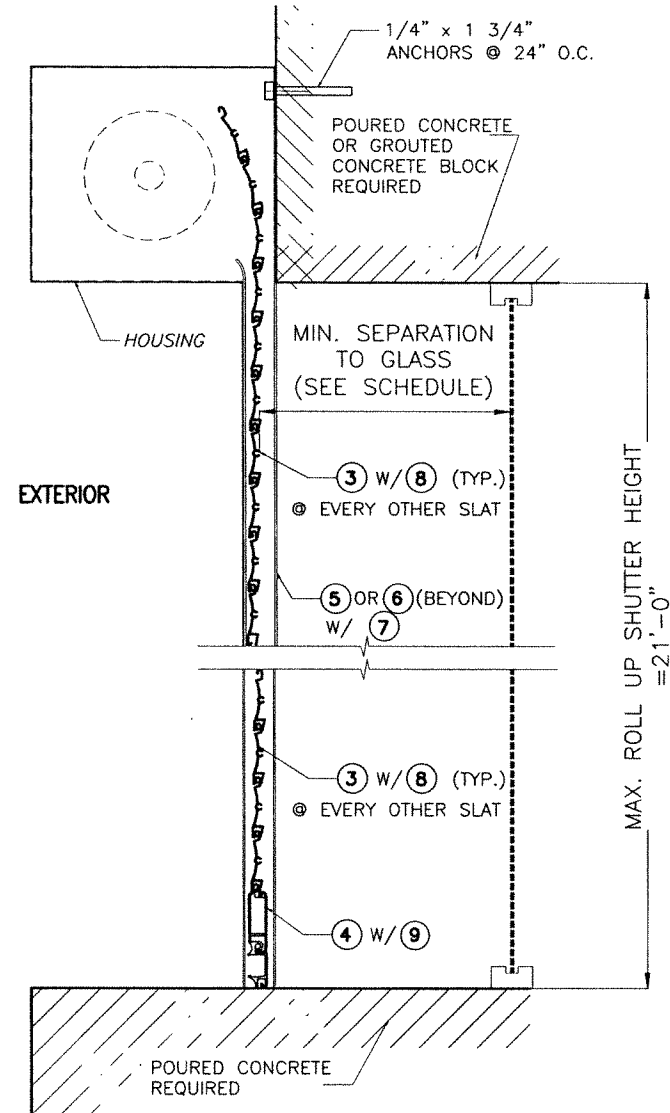
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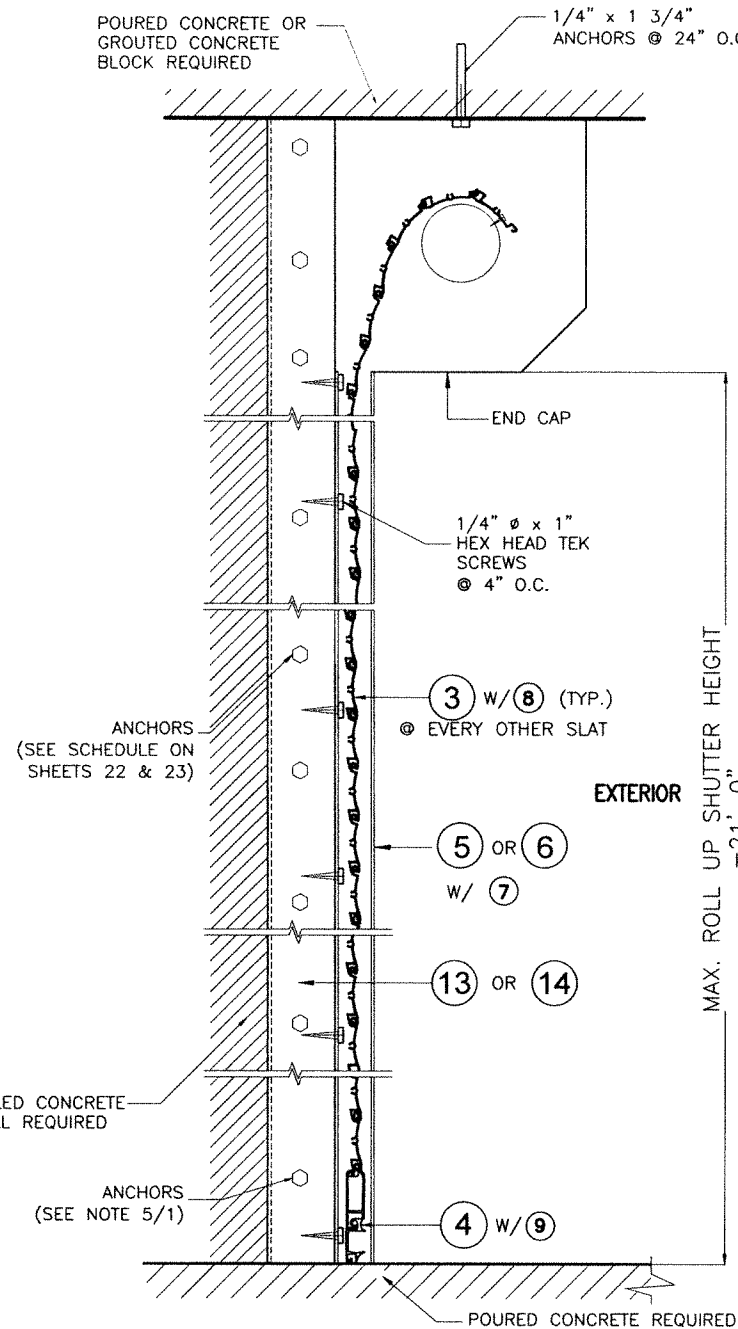
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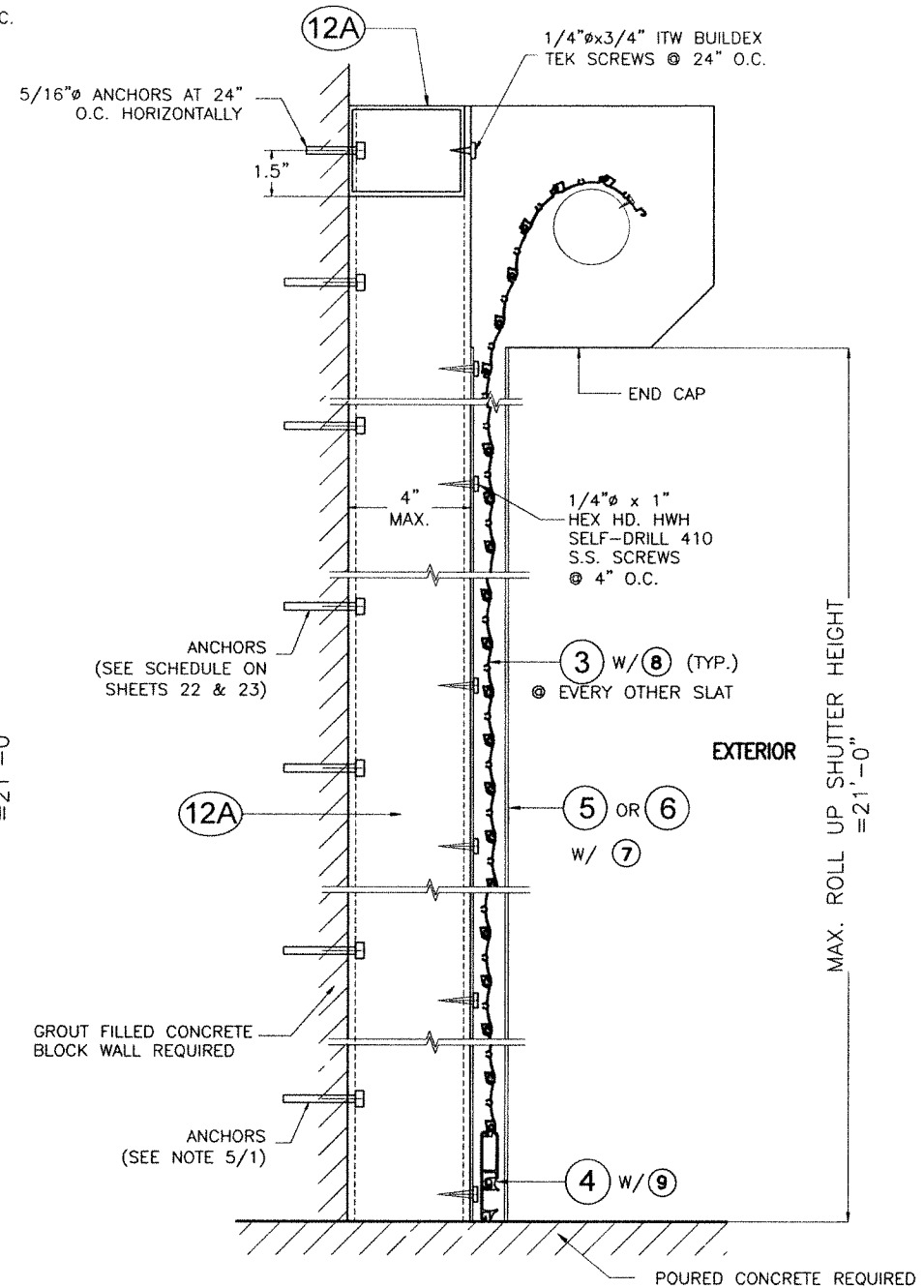
SHEET 9 OF 29



WALL MOUNTED
SECTION A'-A'



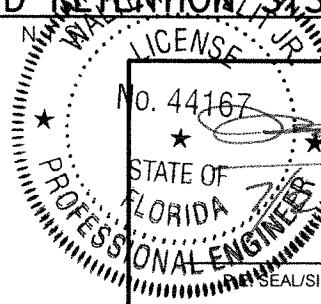
FLOOR/CEILING / TRAPPED MOUNTED
SECTION B'-B'



BUILD-OUT MOUNTED
SECTION C'-C'

INSTALLATION DETAILS ON EXISTING POURED CONCRETE OR GROUT FILLED CELL CONCRETE BLOCK
BUILDINGS FOR SINGLE UNIT END RETENTION SYSTEM AS APPLICABLE

FLORIDA BUILDING CODE (High Velocity Hurricane Zone)



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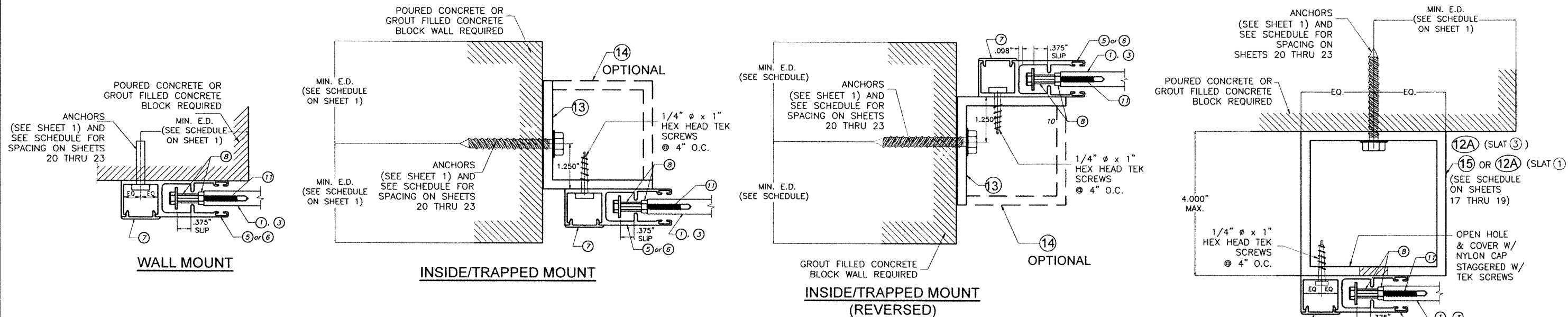
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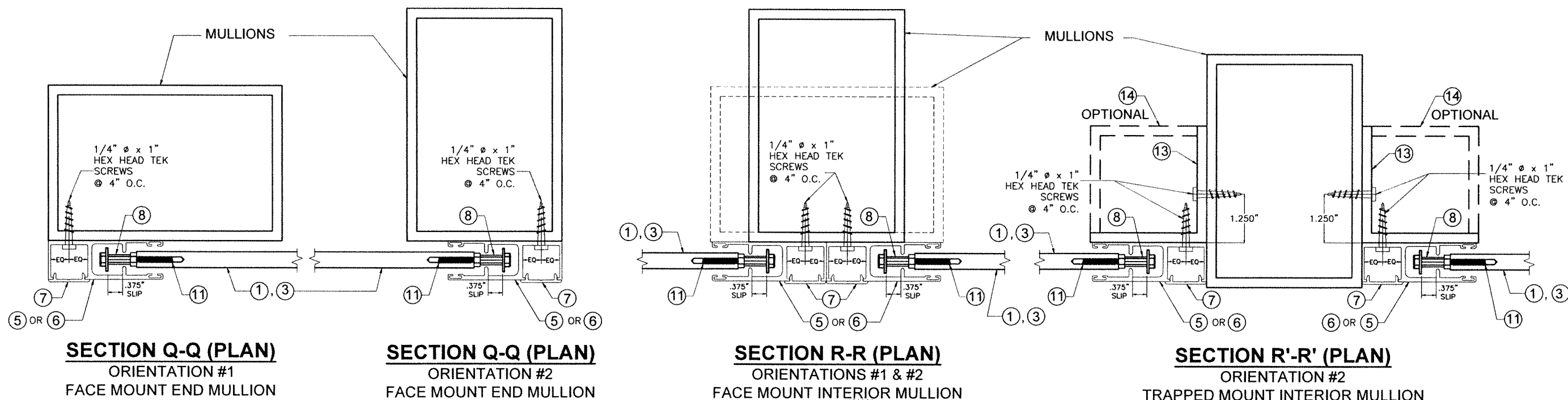
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2			4		

SHEET 10 OF 29



SECTIONS P-P (PLAN)
 SIDE RAIL CONNECTIONS INTO EXISTING POURED CONCRETE OR GROUT FILLED BLOCK (AS APPLICABLE)
 N.T.S.



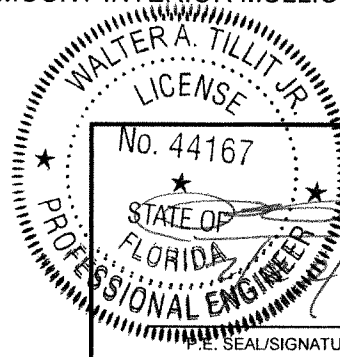
SECTION Q-Q (PLAN)
 ORIENTATION #1
 FACE MOUNT END MULLION

SECTION Q-Q (PLAN)
 ORIENTATION #2
 FACE MOUNT END MULLION

SECTION R-R (PLAN)
 ORIENTATIONS #1 & #2
 FACE MOUNT INTERIOR MULLION

SECTION R'-R' (PLAN)
 ORIENTATION #2
 TRAPPED MOUNT INTERIOR MULLION

END RETENTION SYSTEM



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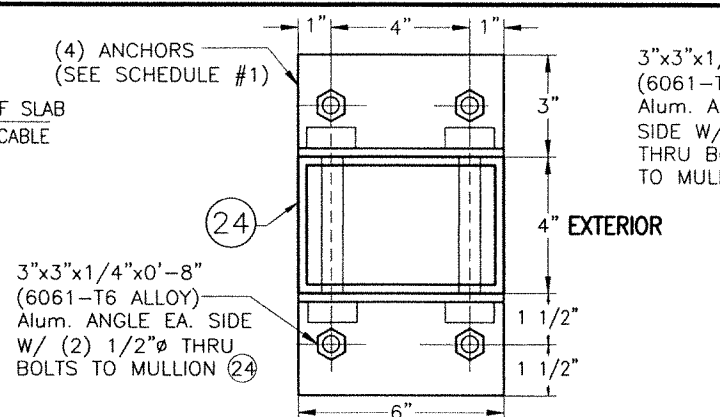
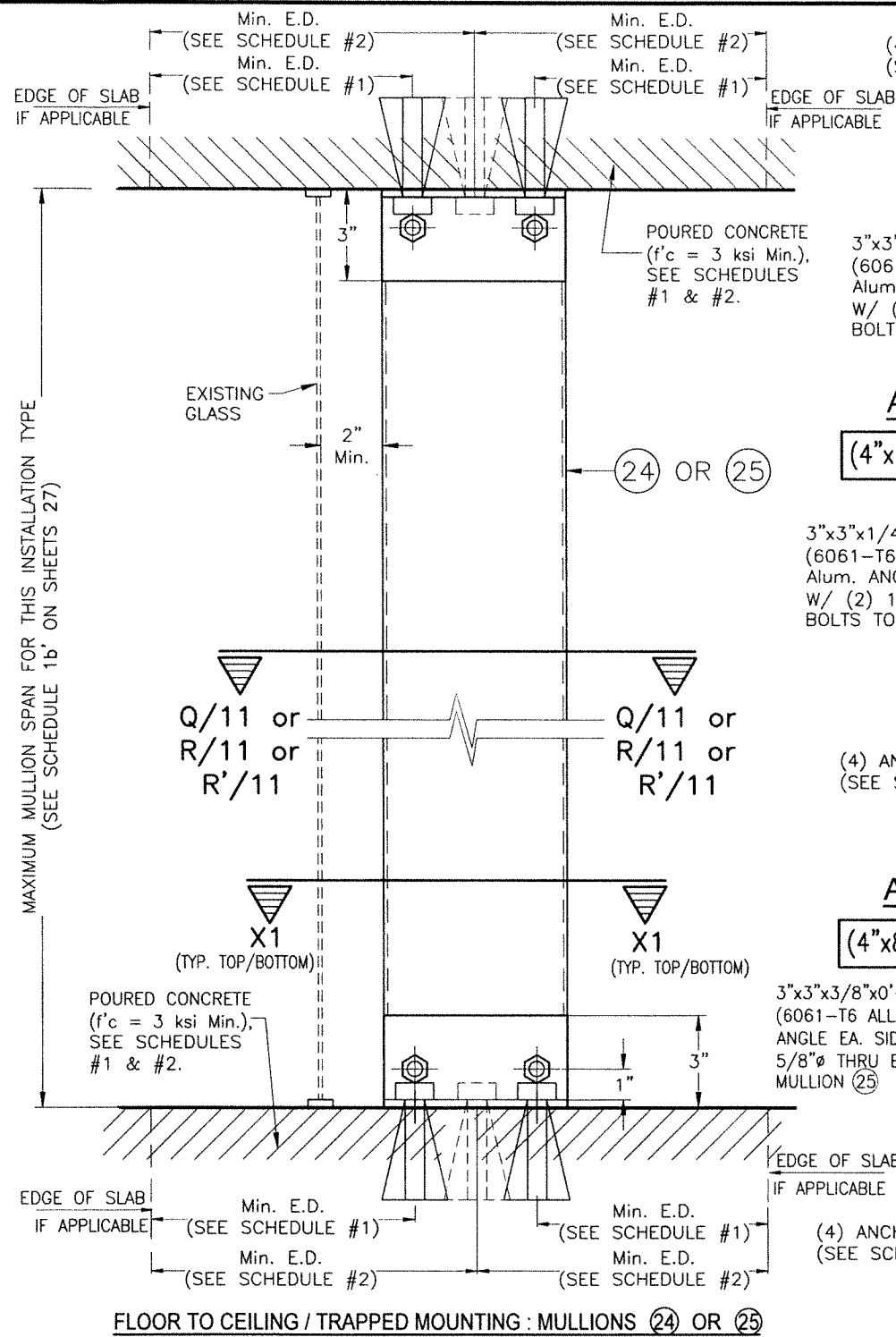
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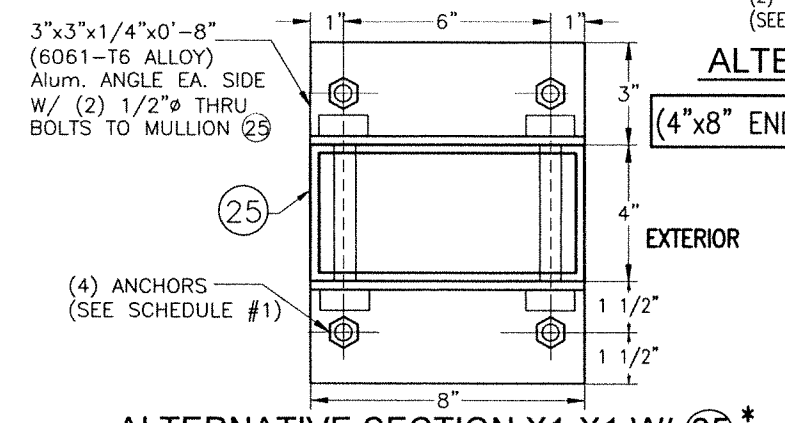
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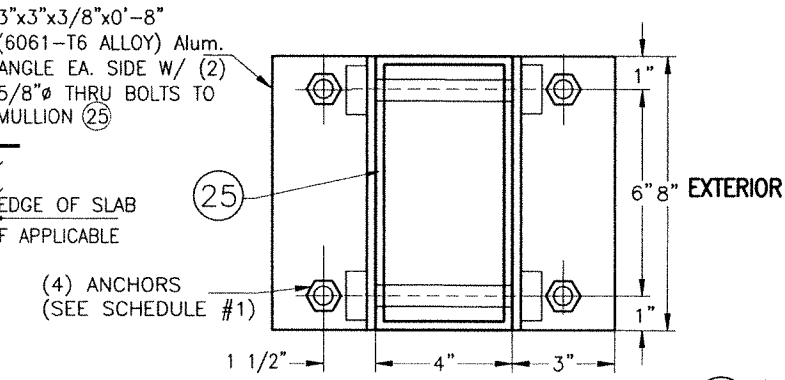
SHEET 11 OF 29



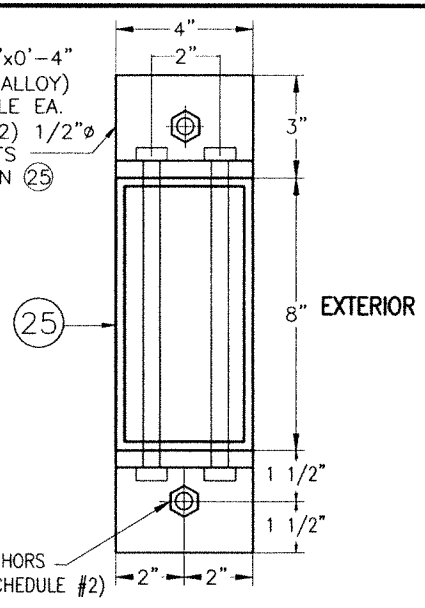
ALTERNATIVE SECTION X1-X1 W/ 24*
(4"x6" INTERIOR MULLION ONLY W/ ORIENTATION # 2)



ALTERNATIVE SECTION X1-X1 W/ 25*
(4"x8" INTERIOR MULLION ONLY W/ ORIENTATION # 2)



ALTERNATIVE SECTION X1-X1 W/ 25*
(4"x8" END & INTERIOR MULLION W/ ORIENTATION # 1)



ALTERNATIVE SECTION X1-X1 W/ 25*
(4"x8" END & INTERIOR MULLION W/ ORIENTATION # 1)

SEE MAXIMUM 24 (INTERIOR) & 25 (END & INTERIOR) TRAPPED MOUNTED MULLIONS SPAN COVERED BY SCHEDULE 1b' FOR INSTALLATION CASES I, Ia & II ON SHEET 27 (LIMITED LOAD, MULLION SPACING AND SPAN INSTALLATION):

INSTALLATION CASE I - RESIDENTIAL AND COMMERCIAL APPLICATIONS W/ MAXIMUM A.S.D. DESIGN LOAD, MAXIMUM MULLION SPACING. SEE SCHEDULES #1 & #2 FOR ANCHOR SPECS.

INSTALLATION CASE Ia - RESIDENTIAL AND COMMERCIAL APPLICATION W/ MAXIMUM A.S.D. DESIGN LOAD, MAXIMUM MULLION SPACING. SEE SCHEDULES #1 & #2 FOR ANCHOR SPECS.

INSTALLATION CASE II - COMMERCIAL APPLICATION FOR MAXIMUM A.S.D. DESIGN LOAD, MAXIMUM MULLION SPACING. SEE SCHEDULES #1 & #2 FOR ANCHOR SPECS.

* SIDE RAILS 5 & 6 AND BOX NOT SHOWN FOR CLARITY.

SCHEDULE #1				
INSTALLATION CASES	MIN. SLAB THICKNESS REQ'D.	ANCHOR TYPE & SIZE (TYP. TOP & BOTTOM)	MIN. ANCHOR EMBEDMENT	MIN. EDGE DISTANCE FOR ANCHOR
I	4"	3/8"Ø HILTI INC KWIK HUS-H SCREW & 3/8"Ø DEWALT, INC WEDGE-BOLT ANCHOR FOR 24 & 25 (INTERIOR) MULLIONS W/ ORIENTATION #2.	2 1/2"	5 1/2"
		1/2"Ø HILTI INC KWIK HUS-H SCREW & 1/2"Ø DEWALT, INC. WEDGE- BOLT ANCHOR FOR 25 (END & INTERIOR) MULLION W/ ORIENTATION #1.	3"	6"
Ia	4"	1/2"Ø HILTI INC KWIK BOLT TZ ONLY FOR 24 & 25 INTERIOR MULLIONS W/ ORIENTATION #2) & 25 (END MULLION W/ ORIENTATION #1).	2 1/2"	5 1/2"
		1/2"Ø HILTI INC KWIK HUS-H SCREW & 1/2"Ø DEWALT, INC. WEDGE- BOLT ANCHOR FOR 24 & 25 (END OR INTERIOR MULLION) W/ ORIENTATIONS #1 OR #2.	3"	6"
II	6"	1/2"Ø HILTI INC KWIK BOLT TZ ONLY FOR 24 & 25 INTERIOR MULLIONS W/ ORIENTATION #2) & 25 (END MULLION W/ ORIENTATION #1).	3 1/4"	7 1/2"
		1/2"Ø HILTI INC KWIK HUS-H SCREW OR 1/2"Ø DEWALT, INC WEDGE- BOLT ANCHOR SEE * NOTE ON SCHEDULE 1b' ON SHEET 25. VALID FOR END & INTERIOR MULLIONS 24 & 25 W/ ORIENTATIONS #1 OR #2.	3"	6"
SCHEDULE #2				
INSTALLATION CASES	MIN. SLAB THICKNESS REQ'D.	ANCHOR TYPE & SIZE (TYP. TOP & BOTTOM)	MIN. ANCHOR EMBEDMENT	MIN. EDGE DISTANCE FOR ANCHOR
I, Ia & II	4"	5/8"Ø HILTI INC KWIK HUS-H SCREW & 5/8"Ø DEWALT, INC. WEDGE-BOLT ANCHOR W/ ORIENTATION #1.	2 1/2"	7 1/2"

SECTIONS W-1

END RETENTION SYSTEM

END & INTERIOR TRAPPED MOUNTED MULLION INSTALLATION*
APPLICABLE TO A LIMITED LOAD, MULLION SPAN AND MULLION SPACING INSTALLATIONS

SCALE: 1/8" = 1"

WALTER A. TILLIT JR.
LICENSE
No. 44167
STATE OF FLORIDA
PROFESSIONAL ENGINEER
SIGNATURE/DATE

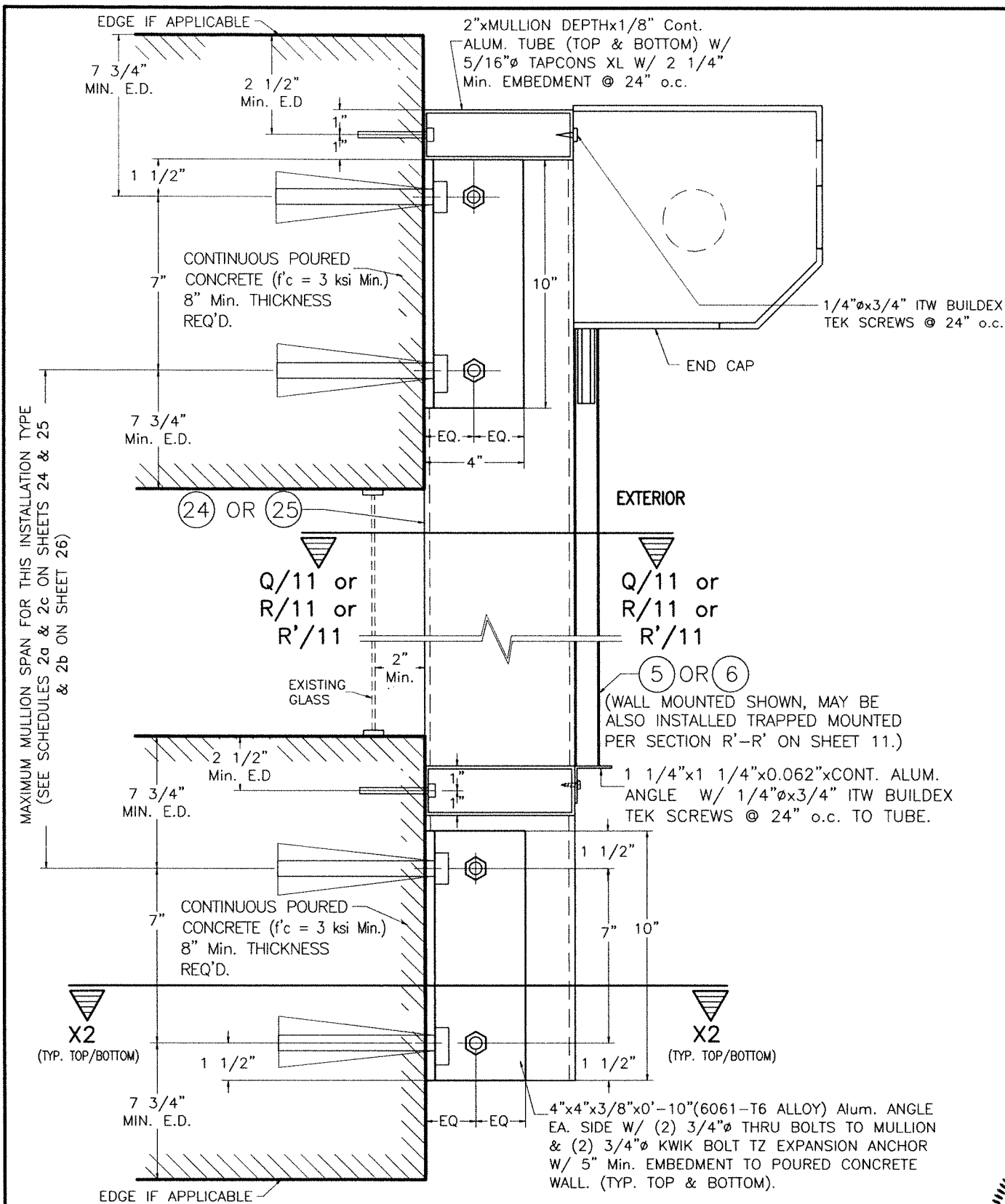
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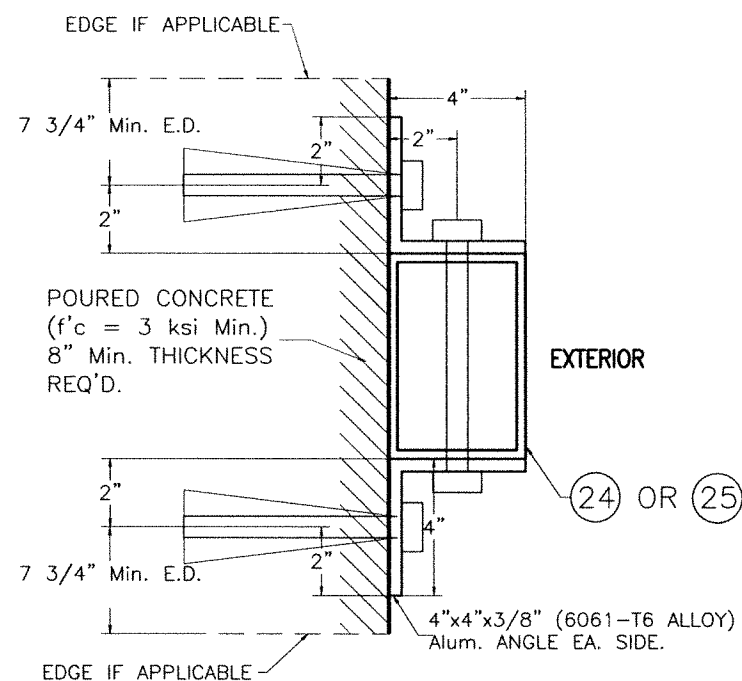
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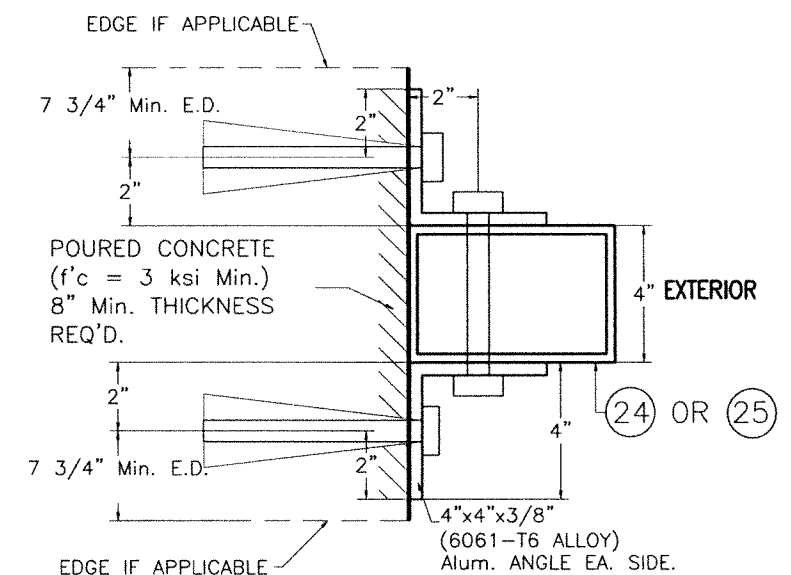


WALL MOUNTING : MULLIONS (24) OR (25)
POURED CONCRETE WALL

SECTION W-2



SECTION X2-X2 W/ (24) OR (25)*
(END & INTERIOR MULLION)
(W/ ORIENTATION # 1)
(6"x4" or 8"x4")

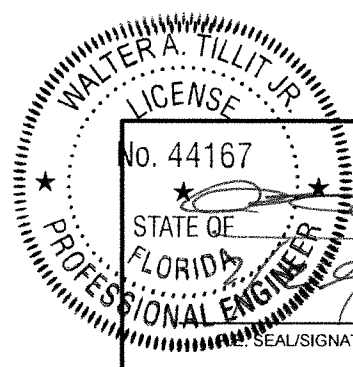


ALTERNATIVE SECTION X2-X2 W/ (24) OR (25)*
(END & INTERIOR MULLION)
(W/ ORIENTATION # 2)
(4"x6" or 4"x8")

END RETENTION SYSTEM

END & INTERIOR WALL MOUNTED MULLION INSTALLATION
APPLICABLE TO ALL INSTALLATIONS EXCEPT THOSE W/ LIMITATIONS COVERED ON SHEET 15

SCALE: 1/8" = 1"



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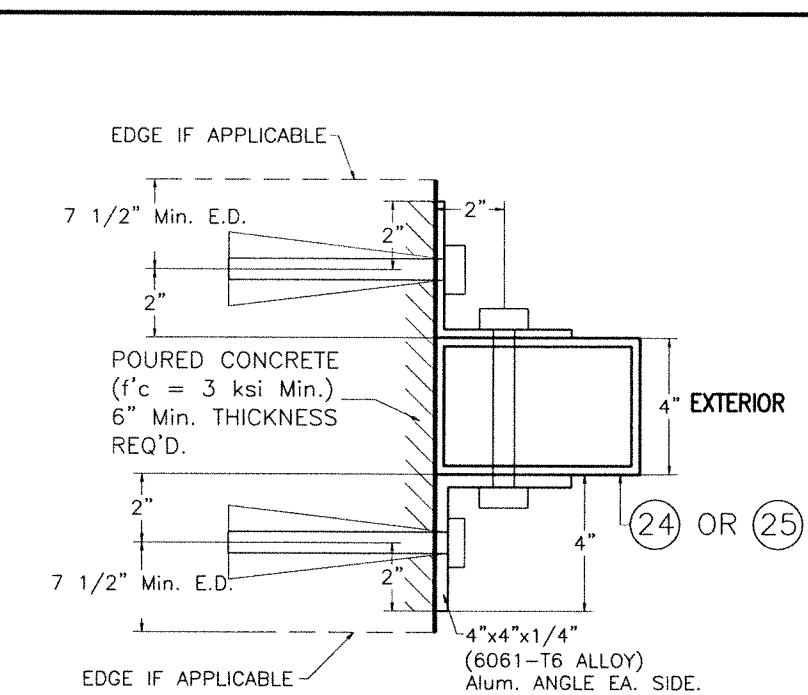
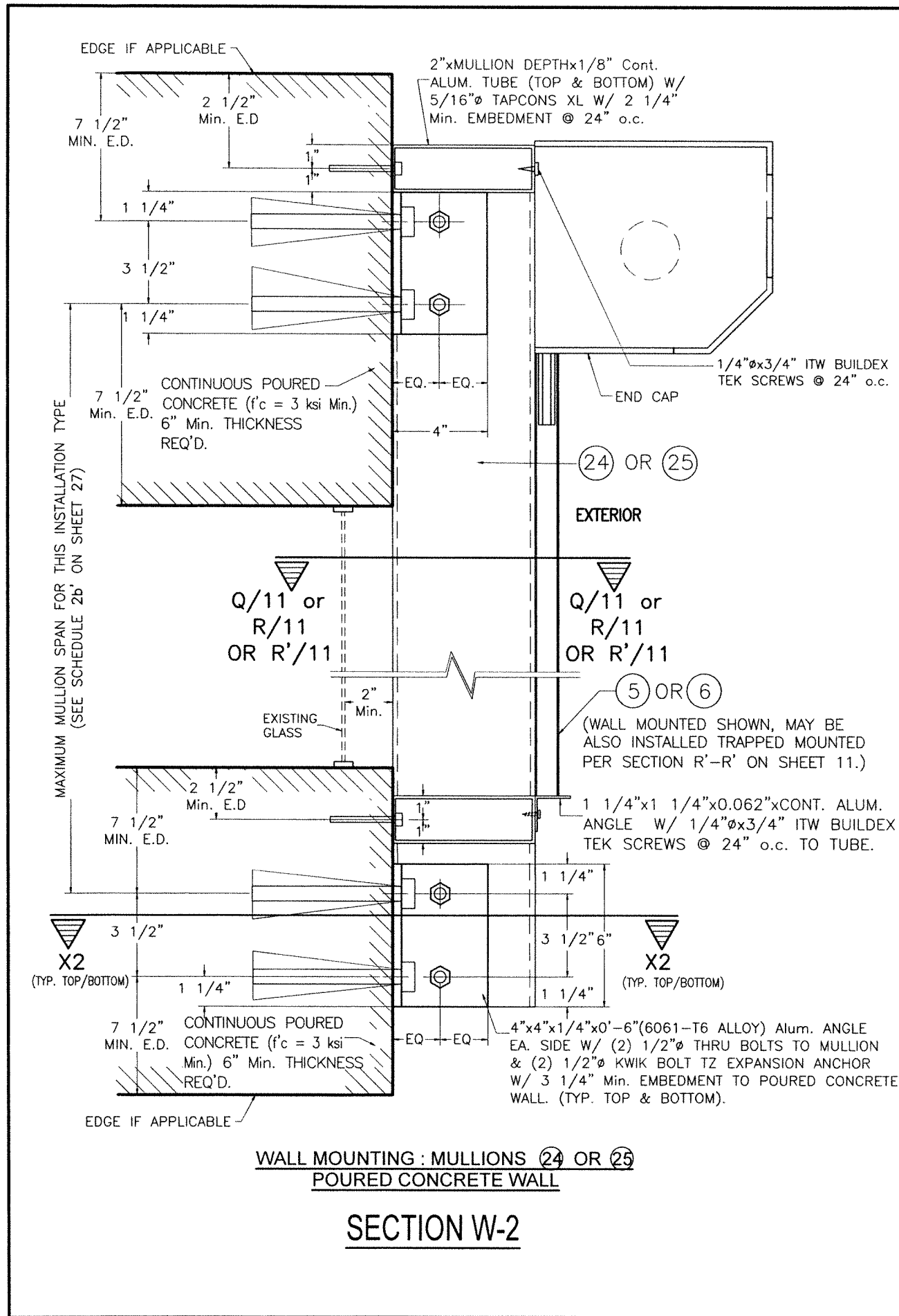
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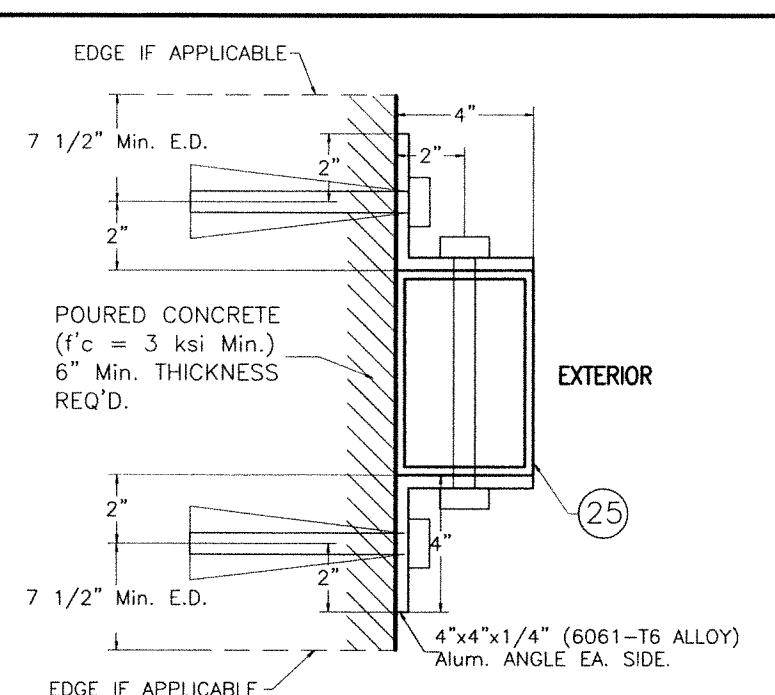
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2			4		

SHEET 14 OF 29



ALTERNATIVE SECTION X2-X2 W/ (24) OR (25) *
(INTERIOR MULLION)
(W/ ORIENTATION # 2)
(4"x6" or 4"x8")



ALTERNATIVE SECTION X2-X2 W/ (25) *
(END & INTERIOR MULLIONS)
(W/ ORIENTATION # 1)
(8"x4")

◇ SEE MAXIMUM (24) (INTERIOR) & (25) (END & INTERIOR) WALL MOUNTED MULLIONS SPAN COVERED BY SCHEDULE 2b' FOR INSTALLATION CASES I' & II' ON SHEET 27 (LIMITED LOAD, MULLION SPACING AND SPAN INSTALLATION):

INSTALLATION CASE I' - RESIDENTIAL AND COMMERCIAL APPLICATIONS W/ MAXIMUM A.S.D. DESIGN LOAD, MAXIMUM MULLION SPACING. VALID FOR CONNECTION TO CONCRETE W/ HILTI INC KWIK HUS-H OR POWER FASTENERS WEDGE-BOLT ANCHORS.

INSTALLATION CASE II' - COMMERCIAL APPLICATION FOR MAXIMUM A.S.D. DESIGN LOAD, MAXIMUM MULLION SPACING. VALID FOR CONNECTION TO CONCRETE W/ HILTI INC KWIK BOLT TZ ANCHORS.

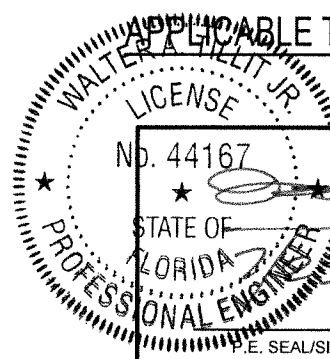
END RETENTION SYSTEM

◇ END & INTERIOR WALL MOUNTED MULLION INSTALLATION

APPLICABLE TO A LIMITED LOAD, MULLION SPAN AND MULLION SPACING INSTALLATIONS

SCALE: 1/8" = 1"

FLORIDA BUILDING CODE (High Velocity Hurricane Zone)



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TILTECO INC.

TILLIT TESTING & ENGINEERING COMPANY

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e-mail: tilteco@aol.com

CA-0006719

WALTER A. TILLIT Jr., P.E.

FLORIDA Lic. # 44167

40mm ER SLAT BERTHA IMPACT PROTECTIVE ROLLING SYSTEM

AMERICAN SHUTTER SYSTEMS ASSOC., INC.

4268 WESTROADS DRIVE

WEST PALM BEACH, FL. 33407

PHONE: (877)999-2772

FAX: (561)209-8380

DRAWN BY:
W.H.

6/29/2026
DATE

26-098
DRAWING No

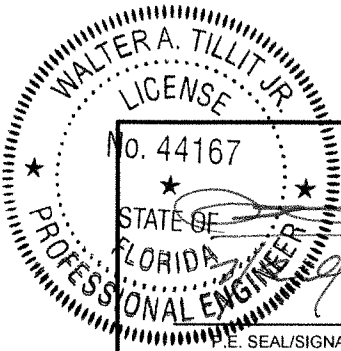
REV. No	DESCRIPTION	DATE	REV. No	DESCRIPTION	DATE
1	OLD 23-137	6/29/26	3		
2			4		

SHEET 15 OF 29

END RETENTION SYSTEM

TYPICAL MANDATORY PROCEDURE FOR VERIFYING PRODUCT CODE COMPLIANCE RELATED TO ITS INSTALLATION INTO EXISTING POURED CONCRETE OR GROUTED CONCRETE BLOCK STRUCTURES (VALID FOR SLATS ① & ③)

- STEP 1:** OBTAIN JOB SITE'S A.S.D. DESIGN LOAD (p.s.f.) FOR THE OPENING AND DESIRED PRODUCT SPAN "L" (ft) TO PROTECT (SEE GENERAL NOTE #1, SHEET 1).
- STEP 2:** ENTER TO CHARTS **Ia, Ib & Ic** ON SHEETS 17 & 18 FOR SLAT ①, AND TO CHARTS **Ia, Ib & Ic** ON SHEET 19 FOR SLAT ③ TO DETERMINE, BASED ON SUBSTRATE, ANCHOR TYPE AT SIDE RAILS & A.S.D. DESIGN LOAD (p.s.f.); THE MAXIMUM SLAT SPAN "LMAX" (ft) AND THE REQUIRED SEPARATION TO GLASS.
- STEP 3:** OBTAIN INFORMATION ON PRODUCT'S SIDE RAIL ANCHOR SPACING REQUIREMENTS FOR CONNECTION TO EXISTING STRUCTURE FROM ANCHOR SCHEDULES **Ila & Iib** ON SHEETS 20 & 21 FOR SLAT ① & FROM ANCHOR SCHEDULES **Ila & Iib** ON SHEETS 22 & 23 FOR SLAT ③. ENTER SCHEDULES WITH FINALLY DETERMINED ANCHOR TYPE, SUBSTRATE, MOUNTING TYPE, A.S.D. DESIGN LOAD & PRODUCT SPAN AND OBTAIN MAXIMUM ANCHOR SPACING (INCHES ON CENTERS). SEE GENERAL NOTE 5 ON SHEET 1 FOR ANCHOR SPECS.
- STEP 4:** IF PRODUCT INSTALLATION INCLUDES MULLIONS, THE FOLLOWING MANDATORY ADDITIONAL PROCEDURE IS APPLICABLE.
1. MINIMUM SEPARATION TO GLASS FOR SLATS IF MULLIONS ARE USED SHALL BE BASED ON INSTALLATIONS INDICATED ON CHARTS **Ic** ON SHEET 25 FOR SLAT ① & ON SHEET 28 FOR SLAT ③. IT SHALL BE MEASURED FROM BACK OF SLAT TO GLASS.
 2. ENTER SCHEDULES **1a, 2a, 1c, 2c, 1b, 2b, 1b' & 2b'** ON SHEETS 24 THRU 27 W/ A.S.D. DESIGN LOAD ; MAXIMUM MULLION SPACING (MAX., 12', 8', 7' OR 6'-10") FOR SLAT ① & SHEETS 28 & 29 FOR SLAT ③ , AND DETERMINE MAXIMUM MULLION SPAN (HEIGHT) W/ ALLOWABLE INTERPOLATION IN BETWEEN SPACINGS FOR A GIVEN (②④, ②⑤), MULLION TYPE & MULLION ORIENTATION.
 3. SEE SHEETS 12 THRU 15 FOR REQUIRED MULLION CONNECTION DETAILS AT TOP & BOTTOM FOR FLOOR TO CEILING (TRAPPED) OR WALL MOUNTINGS OF MULLIONS INTO CONCRETE FOR A GIVEN MULLION TYPE (②④, ②⑤)



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FLORIDA BUILDING CODE (High Velocity Hurricane Zone)

40mm ER SLAT BERTHA IMPACT
PROTECTIVE ROLLING SYSTEM

AMERICAN SHUTTER SYSTEMS ASSOC., INC.

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WEST PALM BEACH, FL. 33407
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FAX: (561)209-8380

REV. No	DESCRIPTION	DATE	REV. No	DESCRIPTION	DATE
1	OLD 23-137	6/29/26	3		
2			4		

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6/29/2026
DATE

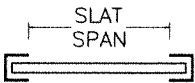
26-098
DRAWING No

SLAT ① PERFORMANCE CHART

POURED CONCRETE													
SLAT PERFORMANCE CHARTS Ia, Ib & Ic : (ONLY VALID FOR 3/8" SLIP) FOR A GIVEN A.S.D. DESIGN LOAD (p.s.f), PRODUCT MOUNT CONDITION INCLUDING ANCHOR TYPE													
CHART Ia							CHART Ib						CHART Ic
USE MAXIMUM VALUE BETWEEN POSITIVE AND NEGATIVE A.S.D. LOAD													USE MAXIMUM POSITIVE A.S.D. LOAD VALUE
<u>3/8"Ø WEDGE BOLT ANCHOR OR 3/8"Ø KWIK BOLT 3</u>							<u>5/16"Ø TAPCON XL, ULTRACON OR TAPPER +XTREME ANCHORS</u>						
A.S.D. DESIGN LOAD (psf)	MAX. SLAT SPAN "L _{max} " (FT)						MAX. SLAT SPAN "L _{max} " (FT)						REQUIRED MIN. SEPARATION TO GLASS MEASURED TO BACK OF SLAT (in) SEE NOTES *
	WALL MOUNT	TRAPPED MOUNT	2" BUILD-OUT MOUNT W/ (12A)	4" BUILD-OUT MOUNT W/ (12A)	2" BUILD-OUT MOUNT W/ (15)	4" BUILD-OUT MOUNT W/ (15)	WALL MOUNT	TRAPPED MOUNT	2" BUILD-OUT MOUNT W/ (12A)	4" BUILD-OUT MOUNT W/ (12A)	2" BUILD-OUT MOUNT W/ (15)	4" BUILD-OUT MOUNT W/ (15)	
	SEE NOTES *	SEE NOTES *	SEE NOTES *	SEE NOTES *	SEE NOTES *	SEE NOTES *	SEE NOTES *	SEE NOTES *	SEE NOTES *	SEE NOTES *	SEE NOTES *	SEE NOTES *	
30.0	16'-0"	16'-0"	8'-0"	8'-0"	16'-0"	16'-0"	16'-0"	16'-0"	8'-0"	8'-0"	12'-0"	10'-3"	7 1/4"
35.0	16'-0"	16'-0"	8'-0"	8'-0"	16'-0"	15'-3"	16'-0"	15'-0"	8'-0"	8'-0"	11'-0"	9'-3"	7 1/4"
40.0	16'-0"	16'-0"	8'-0"	8'-0"	16'-0"	14'-0"	16'-0"	13'-6"	8'-0"	8'-0"	10'-0"	8'-5"	7 1/4"
45.0	16'-0"	15'-6"	8'-0"	8'-0"	15'-0"	13'-0"	15'-0"	12'-6"	8'-0"	7'-10"	9'-6"	7'-10"	7 1/4"
50.0	15'-5"	14'-11"	8'-0"	8'-0"	14'-0"	12'-3"	14'-4"	11'-6"	8'-0"	7'-4"	8'-9"	7'-4"	8 1/4"
55.0	14'-10"	14'-4"	8'-0"	8'-0"	13'-3"	11'-4"	13'-6"	10'-9"	8'-0"	6'-10"	8'-3"	6'-10"	8 1/4"
60.0	14'-3"	13'-9"	8'-0"	8'-0"	12'-3"	10'-9"	12'-6"	10'-0"	7'-9"	6'-6"	7'-9"	6'-6"	9"
65.0	13'-9"	13'-3"	8'-0"	8'-0"	11'-6"	10'-3"	12'-0"	9'-3"	7'-6"	6'-3"	7'-6"	6'-3"	9"
70.0	13'-1"	12'-7"	8'-0"	8'-0"	10'-9"	9'-9"	11'-0"	8'-9"	7'-3"	6'-0"	7'-3"	6'-0"	9"
75.0	12'-7"	12'-1"	8'-0"	8'-0"	10'-3"	9'-3"	10'-9"	8'-3"	7'-0"	5'-10"	7'-0"	5'-10"	9"
80.0	12'-0"	11'-6"	8'-0"	8'-0"	9'-9"	8'-9"	10'-4"	7'-10"	6'-9"	5'-9"	6'-9"	5'-9"	9"
85.0	11'-4"	10'-10"	-	-	-	-	9'-9"	7'-4"	-	-	-	-	8 1/2"
90.0	10'-9"	10'-3"	-	-	-	-	9'-6"	7'-0"	-	-	-	-	8"
95.0	10'-0"	9'-5"	-	-	-	-	8'-9"	6'-9"	-	-	-	-	8"
100.0	9'-5"	8'-11"	-	-	-	-	8'-0"	6'-8"	-	-	-	-	7 1/2"
105.0	8'-9"	8'-3"	-	-	-	-	7'-6"	6'-6"	-	-	-	-	7"
110.0	8'-1"	7'-7"	-	-	-	-	7'-4"	6'-3"	-	-	-	-	7"
115.0	7'-6"	7'-0"	-	-	-	-	7'-0"	6'-0"	-	-	-	-	6 5/8"
120.0	6'-10"	6'-10"	-	-	-	-	6'-10"	5'-0"	-	-	-	-	6 5/8"

* NOTES:

1. ABOVE INDICATED MAX. SLAT SPANS MAY BE USED AS LONG AS ANCHOR SPACING SCHEDULES ON SHEET 20 INDICATE THAT AN ANCHOR SPACING IS AVAILABLE FOR THE CORRESPONDING SLAT SPAN AND A.S.D. DESIGN LOAD.
2. REQUIRES SIDE RAILS FASTENED TO EXISTING STRUCTURE WITH 3/8"Ø WEDGE BOLT, 5/16"Ø TAPCON XL, 5/16" Ø ULTRACON OR 5/16" Ø TAPPER+XTREME ANCHORS, OR 3/8" Ø SS KWIK BOLT 3 INTO POURED CONCRETE OR WITH 1/4"Ø HEX HEAD HWH SELF-DRILL TEK SCREWS AT MULLIONS CONNECTION. VALID FOR WALL MOUNTED, TRAPPED MOUNTED, AND BUILD-OUT MOUNTED.
3. MAXIMUM SLAT SPANS FOR INTERMEDIATE LOADS MAY BE DETERMINED BY LINEAR INTERPOLATION BETWEEN END VALUES.



SLAT SPAN DEFINITION

END RETENTION SYSTEM INTO POURED CONCRETE

WALTER A. TILLIT, JR.
LICENSED PROFESSIONAL ENGINEER
No. 44167
STATE OF FLORIDA
6/29/2026

E. SEAL/SIGNATURE/DATE

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TILTECO INC.

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WALTER A. TILLIT Jr., P.E.
FLORIDA Lic. # 44167

FLORIDA BUILDING CODE (High Velocity Hurricane Zone)

40mm ER SLAT BERTHA IMPACT PROTECTIVE ROLLING SYSTEM

AMERICAN SHUTTER SYSTEMS ASSOC., INC.
4268 WESTROADS DRIVE
WEST PALM BEACH, FL. 33407
PHONE: (877)999-2772
FAX: (561)209-8380

REV. No	DESCRIPTION	DATE	REV. No	DESCRIPTION	DATE
1	OLD 23-137	6/29/26	3		
2			4		

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DATE

26-098
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SHEET 17 OF 29

SLAT ① PERFORMANCE CHART

GROUTED CONCRETE BLOCK													
SLAT PERFORMANCE CHARTS Ia, Ib & Ic: (ONLY VALID FOR 3/8" SLIP) FOR A GIVEN A.S.D. DESIGN LOAD (p.s.f), PRODUCT MOUNT CONDITION INCLUDING ANCHOR TYPE													
CHART Ia							CHART Ib						CHART Ic
USE MAXIMUM VALUE BETWEEN POSITIVE AND NEGATIVE A.S.D. LOAD													USE MAXIMUM POSITIVE A.S.D. LOAD VALUE
<u>3/8"Ø HILTI KWIK HUS BOLT ANCHOR OR 3/8"Ø KWIK BOLT 3</u>							<u>5/16"Ø TAPCON XL, ULTRACON OR TAPPER+XTREME ANCHORS</u>						
A.S.D. DESIGN LOAD (psf)	MAX. SLAT SPAN "L _{MAX.} " (FT)						MAX. SLAT SPAN "L _{MAX.} " (FT)						REQUIRED MIN. SEPARATION TO GLASS MEASURED TO BACK OF SLAT (in) SEE NOTES *
	WALL MOUNT	TRAPPED MOUNT	2" BUILD-OUT MOUNT W/ (12A)	4" BUILD-OUT MOUNT W/ (12A)	2" BUILD-OUT MOUNT W/ (15)	4" BUILD-OUT MOUNT W/ (15)	WALL MOUNT	TRAPPED MOUNT	2" BUILD-OUT MOUNT W/ (12A)	4" BUILD-OUT MOUNT W/ (12A)	2" BUILD-OUT MOUNT W/ (15)	4" BUILD-OUT MOUNT W/ (15)	
	SEE NOTES *	SEE NOTES *	SEE NOTES *	SEE NOTES *	SEE NOTES *	SEE NOTES *	SEE NOTES *	SEE NOTES *	SEE NOTES *	SEE NOTES *	SEE NOTES *	SEE NOTES *	
30.0	14'-7"	14'-7"	8'-0"	8'-0"	11'-0"	9'-7"	10'-6"	8'-0"	7'-3"	6'-6"	7'-6"	6'-10"	7 1/4"
35.0	13'-7"	13'-7"	8'-0"	8'-0"	10'-0"	8'-8"	9'-6"	7'-4"	6'-8"	6'-1"	7'-0"	6'-4"	7 1/4"
40.0	13'-0"	12'-6"	8'-0"	7'-6"	9'-4"	8'-0"	9'-0"	6'-8"	6'-3"	5'-10"	6'-6"	5'-9"	7 1/4"
45.0	12'-0"	11'-6"	8'-0"	7'-0"	8'-10"	7'-7"	8'-6"	6'-3"	6'-0"	5'-6"	6'-3"	5'-7"	7 1/4"
50.0	11'-1"	10'-6"	7'-9"	6'-6"	8'-4"	7'-2"	8'-0"	6'-0"	5'-9"	5'-3"	5'-11"	5'-4"	8 1/4"
55.0	10'-0"	9'-9"	7'-2"	6'-4"	7'-10"	6'-7"	7'-4"	5'-8"	5'-6"	5'-1"	5'-9"	5'-2"	8 1/4"
60.0	9'-6"	9'-3"	6'-10"	6'-0"	7'-6"	6'-4"	7'-0"	5'-5"	5'-3"	4'-11"	5'-6"	5'-0"	7 1/2"
65.0	9'-0"	8'-9"	6'-8"	5'-8"	7'-0"	6'-3"	6'-6"	5'-3"	5'-1"	4'-10"	5'-3"	4'-11"	7 1/2"
70.0	8'-6"	8'-3"	6'-6"	5'-6"	6'-9"	6'-0"	6'-4"	5'-0"	5'-0"	4'-8"	5'-0"	4'-10"	7 1/2"
75.0	8'-0"	7'-9"	6'-3"	5'-5"	6'-6"	5'-9"	6'-3"	4'-10"	4'-10"	4'-7"	4'-11"	4'-8"	7 1/2"
80.0	7'-6"	7'-3"	6'-0"	5'-4"	6'-0"	5'-6"	6'-0"	4'-8"	4'-8"	4'-6"	4'-10"	4'-7"	7 1/2"
85.0	7'-3"	7'-0"	—	—	—	—	5'-6"	4'-6"	—	—	—	—	6 5/8"
90.0	7'-0"	6'-9"	—	—	—	—	5'-0"	4'-4"	—	—	—	—	6 5/8"
95.0	7'-0"	6'-6"	—	—	—	—	4'-11"	4'-3"	—	—	—	—	6 5/8"
100.0	6'-9"	6'-4"	—	—	—	—	4'-10"	4'-2"	—	—	—	—	6 5/8"
105.0	6'-6"	6'-0"	—	—	—	—	4'-9"	4'-0"	—	—	—	—	6 5/8"
110.0	6'-6"	5'-9"	—	—	—	—	4'-8"	3'-11"	—	—	—	—	6 5/8"
115.0	6'-5"	5'-6"	—	—	—	—	4'-7"	3'-10"	—	—	—	—	6 5/8"
120.0	6'-3"	5'-3"	—	—	—	—	4'-6"	3'-9"	—	—	—	—	6 5/8"

* NOTES:

1. ABOVE INDICATED MAX. SLAT SPANS MAY BE USED AS LONG AS ANCHOR SPACING SCHEDULES ON SHEET 21 INDICATE THAT AN ANCHOR SPACING IS AVAILABLE FOR THE CORRESPONDING SLAT SPAN AND A.S.D. DESIGN LOAD.
2. REQUIRES SIDE RAILS FASTENED TO EXISTING STRUCTURE WITH 3/8"Ø HILTI KWIK HUS BOLT, 5/16"Ø TAPCON XL, 5/16" Ø ULTRACON OR 5/16" Ø TAPPER+XTREME ANCHORS OR 3/8" Ø SS KWIK BOLT 3 INTO GROUTED CONCRETE BLOCK OR WITH 1/4"Ø HEX HD. HWH SELF-DRILL TEK SCREWS AT MULLIONS CONNECTION. VALID FOR WALL MOUNTED, TRAPPED MOUNTED, AND BUILD-OUT MOUNTED.
3. MAXIMUM SLAT SPANS FOR INTERMEDIATE LOADS MAY BE DETERMINED BY LINEAR INTERPOLATION BETWEEN END VALUES.



SLAT SPAN DEFINITION

END RETENTION SYSTEM INTO GROUTED CONCRETE BLOCK

FLORIDA BUILDING CODE (High Velocity Hurricane Zone)

WALTER A. TILLIT JR., P.E.
No. 44167
STATE OF FLORIDA
PROFESSIONAL ENGINEER
6/29/2026

SEAL/SIGNATURE/DATE

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40mm ER SLAT BERTHA IMPACT PROTECTIVE ROLLING SYSTEM

AMERICAN SHUTTER SYSTEMS ASSOC., INC.
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REV. No	DESCRIPTION	DATE	REV. No	DESCRIPTION	DATE
1	OLD 23-137	6/29/26	3		
2			4		

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6/29/2026
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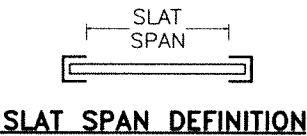
SHEET 18 OF 29

SLAT ③ PERFORMANCE CHARTS

POURED CONCRETE									
SLAT PERFORMANCE CHARTS Ia, Ib & Ic : (ONLY VALID FOR 3/8" SLIP) FOR A GIVEN A.S.D. DESIGN LOAD (p.s.f), PRODUCT MOUNT CONDITION INCLUDING ANCHOR TYPE									
CHART Ia					CHART Ib				CHART Ic
USE MAXIMUM VALUE BETWEEN POSITIVE AND NEGATIVE A.S.D. LOAD									USE MAXIMUM POSITIVE A.S.D. LOAD VALUE
<u>3/8"Ø WEDGE BOLTS ANCHOR OR 3/8"Ø SS KWIK BOLT 3</u>					<u>5/16"Ø TAPCON XL ANCHORS</u>				
A.S.D. DESIGN LOAD (psf)	MAX. SLAT SPAN "L _{MAX.} " (FT)				MAX. SLAT SPAN "L _{MAX.} " (FT)				REQUIRED MIN. SEPARATION TO GLASS MEASURED TO BACK OF SLAT (in)
	WALL MOUNT	TRAPPED MOUNT	2" BUILD-OUT MOUNT W/ (12A)	4" BUILD-OUT MOUNT W/ (12A)	WALL MOUNT	TRAPPED MOUNT	2" BUILD-OUT MOUNT W/ (12A)	4" BUILD-OUT MOUNT W/ (12A)	
	SEE NOTES *	SEE NOTES *	SEE NOTES *	SEE NOTES *	SEE NOTES *	SEE NOTES *	SEE NOTES *	SEE NOTES *	
30.0	8'-4"	8'-4"	8'-4"	8'-4"	8'-4"	8'-4"	8'-4"	8'-4"	7"
35.0	8'-4"	8'-4"	8'-4"	8'-4"	8'-4"	8'-4"	8'-4"	8'-4"	7"
40.0	8'-4"	8'-4"	8'-4"	8'-4"	8'-4"	8'-4"	8'-4"	8'-4"	7"
45.0	8'-4"	8'-4"	8'-4"	8'-4"	8'-4"	8'-4"	8'-4"	8'-0"	7"
50.0	8'-4"	8'-4"	8'-4"	8'-4"	8'-4"	8'-4"	8'-4"	7'-6"	7"
55.0	8'-4"	8'-4"	8'-4"	8'-4"	8'-4"	8'-4"	8'-4"	7'-0"	7"
60.0	8'-4"	8'-4"	8'-4"	8'-4"	8'-4"	8'-4"	8'-4"	6'-8"	7"
65.0	7'-9"	7'-9"	7'-9"	7'-9"	7'-9"	7'-9"	7'-9"	6'-5"	6 3/4"
70.0	7'-5"	7'-5"	7'-5"	7'-5"	7'-5"	7'-5"	7'-5"	6'-0"	6 1/2"
75.0	7'-0"	7'-0"	7'-0"	7'-0"	7'-0"	7'-0"	7'-0"	5'-10"	6 3/8"
80.0	6'-10"	6'-10"	6'-10"	6'-10"	6'-10"	6'-10"	6'-10"	5'-8"	6 1/4"

* NOTES:

1. ABOVE INDICATED MAX. SLAT SPANS MAY BE USED AS LONG AS ANCHOR SPACING SCHEDULES ON SHEET 22 INDICATE THAT AN ANCHOR SPACING IS AVAILABLE FOR THE CORRESPONDING SLAT SPAN AND A.S.D. DESIGN LOAD.
2. REQUIRES SIDE RAILS FASTENED TO EXISTING STRUCTURE WITH 3/8"Ø WEDGE BOLTS ANCHOR OR 5/16"Ø TAPCON XL ANCHOR OR 3/8"Ø SS KWIK BOLT 3, INTO POURED CONCRETE OR WITH 1/4"Ø HEX HD. HWH SELF-DRILL 410 S.S. SCREWS AT MULLIONS CONNECTION. VALID FOR WALL MOUNTED, TRAPPED MOUNTED, AND BUILD-OUT MOUNTED.
3. MAXIMUM SLAT SPANS FOR INTERMEDIATE LOADS MAY BE DETERMINED BY LINEAR INTERPOLATION BETWEEN END VALUES.

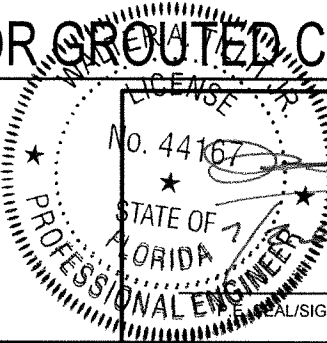


GROUTED CONCRETE BLOCK									
SLAT PERFORMANCE CHARTS Ia, Ib & Ic : (ONLY VALID FOR 3/8" SLIP) FOR A GIVEN A.S.D. DESIGN LOAD (p.s.f), PRODUCT MOUNT CONDITION INCLUDING ANCHOR TYPE									
CHART Ia					CHART Ib				CHART Ic
USE MAXIMUM VALUE BETWEEN POSITIVE AND NEGATIVE A.S.D. LOAD								USE MAXIMUM POSITIVE A.S.D. LOAD VALUE	
<u>3/8"Ø HILTI KWIK HUS BOLT ANCHOR OR 3/8"Ø SS KWIK BOLT 3</u>					<u>5/16"Ø TAPCON XL ANCHORS</u>				
A.S.D. DESIGN LOAD (psf)	MAX. SLAT SPAN "L _{max.} " (FT)				MAX. SLAT SPAN "L _{max.} " (FT)				REQUIRED MIN. SEPARATION TO GLASS MEASURED TO BACK OF SLAT (in)
	WALL MOUNT	TRAPPED MOUNT	2" BUILD-OUT MOUNT W/ (12A)	4" BUILD-OUT MOUNT W/ (12A)	WALL MOUNT	TRAPPED MOUNT	2" BUILD-OUT MOUNT W/ (12A)	4" BUILD-OUT MOUNT W/ (12A)	
	SEE NOTES *	SEE NOTES *	SEE NOTES *	SEE NOTES *	SEE NOTES *	SEE NOTES *	SEE NOTES *	SEE NOTES *	
30.0	8'-4"	8'-4"	8'-4"	8'-4"	8'-4"	8'-4"	7'-9"	6'-4"	7"
35.0	8'-4"	8'-4"	8'-4"	7'-7"	8'-4"	8'-4"	7'-0"	5'-10"	7"
40.0	8'-4"	8'-4"	8'-4"	7'-0"	8'-4"	8'-4"	6'-6"	5'-6"	7"
45.0	8'-4"	8'-4"	8'-0"	6'-6"	8'-4"	8'-4"	6'-0"	5'-2"	7"
50.0	8'-4"	8'-4"	7'-6"	6'-2"	8'-4"	8'-4"	5'-9"	4'-10"	7"
55.0	8'-4"	8'-4"	7'-0"	5'-10"	8'-4"	8'-4"	5'-5"	4'-9"	7"
60.0	8'-4"	8'-4"	6'-8"	5'-7"	8'-4"	8'-4"	5'-2"	4'-7"	7"
65.0	7'-9"	7'-9"	6'-4"	5'-4"	7'-9"	7'-9"	5'-0"	4'-5"	6 3/4"
70.0	7'-5"	7'-5"	6'-0"	5'-0"	7'-5"	7'-5"	4'-10"	4'-3"	6 1/2"
75.0	7'-0"	7'-0"	5'-10"	4'-11"	7'-0"	7'-0"	4'-7"	4'-2"	6 3/8"
80.0	6'-10"	6'-10"	5'-7"	4'-9"	6'-10"	6'-10"	4'-6"	4'-0"	6 1/4"

* NOTES:

1. ABOVE INDICATED MAX. SLAT SPANS MAY BE USED AS LONG AS ANCHOR SPACING SCHEDULES ON SHEET 23 INDICATE THAT AN ANCHOR SPACING IS AVAILABLE FOR THE CORRESPONDING SLAT SPAN AND A.S.D. DESIGN LOAD.
2. REQUIRES SIDE RAILS FASTENED TO EXISTING STRUCTURE WITH 3/8"Ø HILTI KWIK HUS BOLT ANCHOR OR 5/16"Ø TAPCON XL ANCHOR, OR 3/8"Ø SS KWIK BOLT 3 INTO GROUTED CONCRETE BLOCK OR WITH 1/4"Ø HEX HD. HWH SELF-DRILL 410 S.S. SCREWS AT MULLIONS CONNECTION. VALID FOR WALL MOUNTED, TRAPPED MOUNTED, AND BUILD-OUT MOUNTED.
3. MAXIMUM SLAT SPANS FOR INTERMEDIATE LOADS MAY BE DETERMINED BY LINEAR INTERPOLATION BETWEEN END VALUES.

END RETENTION SYSTEM
INTO CONCRETE OR GROUTED CONCRETE BLOCK



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TILTECO INC.

TILLIT TESTING & ENGINEERING COMPANY

6355 N.W. 36th. St., Ste. 305 - VIRGINIA GARDENS, FL. 33168

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CA-0006719

WALTER A. TILLIT Jr., P.E.

FLORIDA Lic. # 44167

FLORIDA BUILDING CODE (High Velocity Hurricane Zone)

40mm ER SLAT BERTHA IMPACT PROTECTIVE ROLLING SYSTEM

AMERICAN SHUTTER SYSTEMS ASSOC., INC.

4268 WESTROADS DRIVE

WEST PALM BEACH, FL. 33407

PHONE: (877)999-2772

FAX: (561)209-8380

DRAWN BY: W.H.

6/29/2026 DATE

26-098 DRAWING No

SHEET 19 OF 29

REV. No	DESCRIPTION	DATE	REV. No	DESCRIPTION	DATE
1	OLD 23-137	6/29/26	3		
2			4		

END RETENTION SYSTEM W/ SLAT ①

MAX. ANCHOR'S SPACING SCHEDULE IIa

FOR A GIVEN PRODUCT MOUNTING TYPE, W/ 3/8"Ø WEDGE BOLT ANCHORS OR 3/8"Ø SS KWIK BOLT 3 TO POURED CONCRETE WALL, A.S.D. DESIGN LOAD & SLAT SPAN RANGE †

WALL MOUNT

A.S.D. DESIGN LOAD RANGE (p.s.f.)	SLAT SPAN RANGE						
	0'-4' †	> 4'-5' †	> 5'-6' †	> 6'-7' †	> 7'-9' †	> 9'-12' †	> 12'-16' †
≤ 30.0	9"	9"	9"	9"	9"	9"	9"
>30-40	8"	8"	8"	8"	8"	8"	8"
>40-60	7"	7"	7"	7"	7"	7"	7"
>60-80	6 1/2"	6 1/2"	6 1/2"	6 1/2"	6 1/2"	6 1/2"	-
>80-105	7 1/2"	7 1/2"	7 1/2"	7 1/2"	7 1/2"	-	-
>105-120	9"	9"	9"	9"	-	-	-

TRAPPED MOUNT

A.S.D. DESIGN LOAD RANGE (p.s.f.)	SLAT SPAN RANGE						
	0'-4' †	> 4'-5' †	> 5'-6' †	> 6'-7' †	> 7'-9' †	> 9'-12' †	> 12'-16' †
≤ 30.0	6"	6"	6"	6"	6"	6"	6"
>30-40	6"	6"	6"	6"	6"	6"	6"
>40-60	4 1/2"	4 1/2"	4 1/2"	4 1/2"	4 1/2"	4 1/2"	4 1/2"
>60-80	4 1/2"	4 1/2"	4 1/2"	4 1/2"	4 1/2"	4 1/2"	-
>80-105	5"	5"	5"	5"	5"	-	-
>105-120	6"	6"	6"	6"	-	-	-



SLAT SPAN DEFINITION

† NOTE:
MAX. SLAT SPAN FOR A GIVEN A.S.D. DESIGN LOAD SHALL **NEVER** EXCEED MAX. SLAT SPAN INDICATED ON SLAT PERFORMANCE CHART ON SHEET 17.

BUILD-OUT MOUNT W/⑫A

A.S.D. DESIGN LOAD RANGE (p.s.f.)	SLAT SPAN RANGE									
	0'-4' †		> 4'-5' †		> 5'-6' †		> 6'-7' †		> 7'-8' †	
	2" B.O	4" B.O	2" B.O	4" B.O	2" B.O	4" B.O	2" B.O	4" B.O	2" B.O	4" B.O
≤ 30.0	6"	4 1/2"	6"	4 1/2"	6"	4 1/2"	6"	4 1/2"	6"	4 1/2"
>30-40	5"	4 1/2"	5"	4 1/2"	5"	4 1/2"	5"	4 1/2"	5"	4 1/2"
>40-60	5"	4"	5"	4"	5"	4"	5"	4"	5"	4"
>60-80	5"	4"	5"	4"	5"	4"	5"	4"	5"	4"

BUILD-OUT MOUNT W/⑮

A.S.D. DESIGN LOAD RANGE (p.s.f.)	SLAT SPAN RANGE													
	0'-4' †		> 4'-5' †		> 5'-6' †		> 6'-7' †		> 7'-9' †		> 9'-12' †		> 12'-16' †	
	2" B.O	4" B.O	2" B.O	4" B.O	2" B.O	4" B.O	2" B.O	4" B.O	2" B.O	4" B.O	2" B.O	4" B.O	2" B.O	4" B.O
≤ 30.0	5"	5"	5"	5"	5"	5"	5"	5"	5"	5"	5"	5"	5"	5"
>30-40	5"	5"	5"	5"	5"	5"	5"	5"	5"	5"	5"	5"	5"	5"
>40-60	5"	5"	5"	5"	5"	5"	5"	5"	5"	5"	5"	5"	5"	-
>60-80	5"	5"	5"	5"	5"	5"	5"	5"	5"	5"	5"	-	-	-

MAX. ANCHOR'S SPACING SCHEDULE IIa

FOR A GIVEN PRODUCT MOUNTING TYPE, W/ 5/16"Ø TAPCON XL, ULTRACON OR TAPPER+XTREME ANCHORS TO POURED CONCRETE WALL, A.S.D. DESIGN LOAD & SLAT SPAN RANGE †

WALL MOUNT

A.S.D. DESIGN LOAD RANGE (p.s.f.)	SLAT SPAN RANGE						
	0'-4' †	> 4'-5' †	> 5'-6' †	> 6'-7' †	> 7'-9' †	> 9'-12' †	> 12'-16' †
≤ 30.0	4 1/2"	4 1/2"	4 1/2"	4 1/2"	4 1/2"	4 1/2"	4 1/2"
>30-40	3 1/2"	3 1/2"	3 1/2"	3 1/2"	3 1/2"	3 1/2"	3 1/2"
>40-60	3 1/2"	3 1/2"	3 1/2"	3 1/2"	3 1/2"	3 1/2"	3 1/2"
>60-80	3 1/2"	3 1/2"	3 1/2"	3 1/2"	3 1/2"	3 1/2"	3 1/2"
>80-105	4"	4"	4"	4"	4"	-	-
>105-120	4"	4"	4"	4"	-	-	-

TRAPPED MOUNT

A.S.D. DESIGN LOAD RANGE (p.s.f.)	SLAT SPAN RANGE						
	0'-4' †	> 4'-5' †	> 5'-6' †	> 6'-7' †	> 7'-9' †	> 9'-12' †	> 12'-16' †
≤ 30.0	5"	5"	5"	5"	5"	5"	5"
>30-40	4"	4"	4"	4"	4"	4"	4"
>40-60	3 1/2"	3 1/2"	3 1/2"	3 1/2"	3 1/2"	3 1/2"	3 1/2"
>60-80	3 1/2"	3 1/2"	3 1/2"	3 1/2"	3 1/2"	3 1/2"	-
>80-105	4"	4"	4"	4"	4"	-	-
>105-120	4"	4"	4"	4"	-	-	-

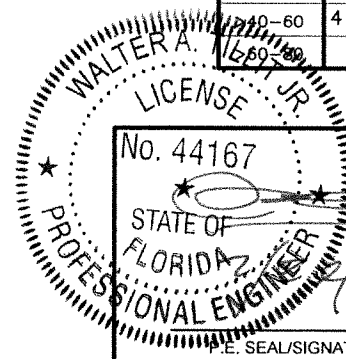
BUILD-OUT MOUNT W/⑫A

A.S.D. DESIGN LOAD RANGE (p.s.f.)	SLAT SPAN RANGE									
	0'-4' †		> 4'-5' †		> 5'-6' †		> 6'-7' †		> 7'-8' †	
	2" B.O	4" B.O	2" B.O	4" B.O	2" B.O	4" B.O	2" B.O	4" B.O	2" B.O	4" B.O
≤ 30.0	4"	3 1/2"	4"	3 1/2"	4"	3 1/2"	4"	3 1/2"	4"	3 1/2"
>30-40	4"	4"	4"	4"	4"	4"	4"	4"	4"	4"
>40-60	4"	4"	4"	4"	4"	4"	4"	4"	4"	-
>60-80	4"	4"	4"	4"	4"	4"	3 1/2"	-	-	-

BUILD-OUT MOUNT W/⑮

A.S.D. DESIGN LOAD RANGE (p.s.f.)	SLAT SPAN RANGE													
	0'-4' †		> 4'-5' †		> 5'-6' †		> 6'-7' †		> 7'-9' †		> 9'-12' †		> 12'-16' †	
	2" B.O	4" B.O	2" B.O	4" B.O	2" B.O	4" B.O	2" B.O	4" B.O	2" B.O	4" B.O	2" B.O	4" B.O	2" B.O	4" B.O
≤ 30.0	4 1/2"	4"	4 1/2"	4"	4 1/2"	4"	4 1/2"	4"	4 1/2"	4"	4 1/2"	4"	-	-
>30-40	4 1/2"	4 1/2"	4 1/2"	4 1/2"	4 1/2"	4 1/2"	4 1/2"	4 1/2"	4 1/2"	4 1/2"	4 1/2"	4 1/2"	-	-
>40-60	4 1/2"	4 1/2"	4 1/2"	4 1/2"	4 1/2"	4 1/2"	4 1/2"	4 1/2"	4 1/2"	4 1/2"	4 1/2"	-	-	-
>60-80	4"	4"	4"	4"	4"	4"	4"	-	-	-	-	-	-	-

FLORIDA BUILDING CODE (High Velocity Hurricane Zone)



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CA-0006719
WALTER A. TILLIT Jr., P.E.
FLORIDA Lic. # 44167

40mm ER SLAT BERTHA IMPACT PROTECTIVE ROLLING SYSTEM				DRAWN BY: W.H.	
AMERICAN SHUTTER SYSTEMS ASSOC., INC.				6/29/2026 DATE	
4268 WESTROADS DRIVE WEST PALM BEACH, FL. 33407 PHONE: (877)999-2772 FAX: (561)209-8380				26-098 DRAWING No	
REV. No	DESCRIPTION	DATE	REV. No	DESCRIPTION	DATE
1	OLD 23-137	6/29/26	3		
2			4		
SHEET 20 OF 29					

END RETENTION SYSTEM W/ SLAT ①

MAX. ANCHOR'S SPACING SCHEDULE I**ib**

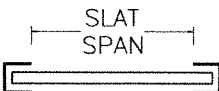
FOR A GIVEN PRODUCT MOUNTING TYPE, W/ 3/8"Ø HILTI KWIK HUS BOLT ANCHORS OR 3/8"Ø SS KWIK BOLT 3 TO GROUTED CONCRETE BLOCK WALL, A.S.D. DESIGN LOAD & SLAT †
SPAN RANGE

WALL MOUNT

A.S.D. DESIGN LOAD RANGE (p.s.f.)	SLAT SPAN RANGE						
	0'-4' †	> 4'-5' †	> 5'-6' †	> 6'-7' †	> 7'-9' †	> 9'-12' †	> 12'-16' †
≤ 30.0	6 1/2"	6 1/2"	6 1/2"	6 1/2"	6 1/2"	6 1/2"	6 1/2"
>30-40	6"	6"	6"	6"	6"	6"	6"
>40-60	6"	6"	6"	6"	6"	6"	—
>60-80	6"	6"	6"	6"	6"	—	—
>80-105	6 1/2"	6 1/2"	6 1/2"	6 1/2"	—	—	—
>105-120	6"	6"	6"	6"	—	—	—

TRAPPED MOUNT

A.S.D. DESIGN LOAD RANGE (p.s.f.)	SLAT SPAN RANGE						
	0'-4' †	> 4'-5' †	> 5'-6' †	> 6'-7' †	> 7'-9' †	> 9'-12' †	> 12'-16' †
≤ 30.0	6 1/2"	6 1/2"	6 1/2"	6 1/2"	6 1/2"	6 1/2"	6 1/2"
>30-40	6"	6"	6"	6"	6"	6"	6"
>40-60	6"	6"	6"	6"	6"	6"	—
>60-80	6"	6"	6"	6"	6"	—	—
>80-105	6"	6"	6"	—	—	—	—
>105-120	6 1/2"	6 1/2"	6 1/2"	—	—	—	—



SLAT SPAN DEFINITION

† NOTE:
MAX. SLAT SPAN FOR A GIVEN A.S.D. DESIGN LOAD SHALL **NEVER** EXCEED MAX. SLAT SPAN INDICATED ON SLAT PERFORMANCE CHART ON SHEET 18.

BUILD-OUT MOUNT W/ ⑫A

A.S.D. DESIGN LOAD RANGE (p.s.f.)	SLAT SPAN RANGE									
	0'-4' †		> 4'-5' †		> 5'-6' †		> 6'-7' †		> 7'-8' †	
	2" B.O	4" B.O	2" B.O	4" B.O	2" B.O	4" B.O	2" B.O	4" B.O	2" B.O	4" B.O
≤ 30.0	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"
>30-40	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"
>40-60	6"	6"	6"	6"	6"	6"	6"	—	—	—
>60-80	6"	6"	6"	6"	6"	6"	—	—	—	—

BUILD-OUT MOUNT W/ ⑮

A.S.D. DESIGN LOAD RANGE (p.s.f.)	SLAT SPAN RANGE													
	0'-4' †		> 4'-5' †		> 5'-6' †		> 6'-7' †		> 7'-9' †		> 9'-12' †		> 12'-16' †	
	2" B.O	4" B.O	2" B.O	4" B.O	2" B.O	4" B.O	2" B.O	4" B.O	2" B.O	4" B.O	2" B.O	4" B.O	2" B.O	4" B.O
≤ 30.0	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	—	—
>30-40	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	—	—
>40-60	6"	6"	6"	6"	6"	6"	6"	6"	6"	—	—	—	—	—
>60-80	6"	6"	6"	6"	6"	6"	6"	—	—	—	—	—	—	—

MAX. ANCHOR'S SPACING SCHEDULE I**ib**

FOR A GIVEN PRODUCT MOUNTING TYPE, W/ 5/16"Ø TAPCON XL, ULTRACON OR TAPPER+XTREME ANCHORS TO GROUTED CONCRETE BLOCK WALL, A.S.D. DESIGN LOAD & SLAT †
SPAN RANGE

WALL MOUNT

A.S.D. DESIGN LOAD RANGE (p.s.f.)	SLAT SPAN RANGE						
	0'-4' †	> 4'-5' †	> 5'-6' †	> 6'-7' †	> 7'-9' †	> 9'-12' †	> 12'-16' †
≤ 30.0	5 1/2"	5 1/2"	5 1/2"	5 1/2"	5 1/2"	5 1/2"	—
>30-40	5"	5"	5"	5"	5"	—	—
>40-60	5"	5"	5"	5"	—	—	—
>60-80	5"	5"	5"	—	—	—	—
>80-105	6"	6"	—	—	—	—	—
>105-120	6"	6"	—	—	—	—	—

TRAPPED MOUNT

A.S.D. DESIGN LOAD RANGE (p.s.f.)	SLAT SPAN RANGE						
	0'-4' †	> 4'-5' †	> 5'-6' †	> 6'-7' †	> 7'-9' †	> 9'-12' †	> 12'-16' †
≤ 30.0	5"	5"	5"	5"	5"	—	—
>30-40	5"	5"	5"	5"	—	—	—
>40-60	5"	5"	5"	—	—	—	—
>60-80	5"	5"	—	—	—	—	—
>80-105	5"	5"	—	—	—	—	—
>105-120	5 1/2"	—	—	—	—	—	—

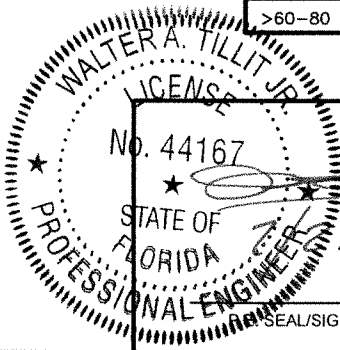
BUILD-OUT MOUNT W/ ⑫A

A.S.D. DESIGN LOAD RANGE (p.s.f.)	SLAT SPAN RANGE									
	0'-4' †		> 4'-5' †		> 5'-6' †		> 6'-7' †		> 7'-8' †	
	2" B.O	4" B.O	2" B.O	4" B.O	2" B.O	4" B.O	2" B.O	4" B.O	2" B.O	4" B.O
≤ 30.0	5"	5"	5"	5"	5"	5"	5"	5"	5"	—
>30-40	5"	5"	5"	5"	5"	5"	5"	—	—	—
>40-60	5"	5"	5"	5"	5"	—	—	—	—	—
>60-80	5"	5"	5"	5"	—	—	—	—	—	—

BUILD-OUT MOUNT W/ ⑮

A.S.D. DESIGN LOAD RANGE (p.s.f.)	SLAT SPAN RANGE													
	0'-4' †		> 4'-5' †		> 5'-6' †		> 6'-7' †		> 7'-9' †		> 9'-12' †		> 12'-16' †	
	2" B.O	4" B.O	2" B.O	4" B.O	2" B.O	4" B.O	2" B.O	4" B.O	2" B.O	4" B.O	2" B.O	4" B.O	2" B.O	4" B.O
≤ 30.0	5"	5"	5"	5"	5"	5"	5"	5"	5"	—	—	—	—	—
>30-40	5"	5"	5"	5"	5"	5"	5"	—	—	—	—	—	—	—
>40-60	5"	5"	5"	5"	5"	—	—	—	—	—	—	—	—	—
>60-80	5"	5"	5"	5"	—	—	—	—	—	—	—	—	—	—

FLORIDA BUILDING CODE (High Velocity Hurricane Zone)



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e-mail: tilteco@aol.com
CA-0006719
WALTER A. TILLIT Jr., P.E.
FLORIDA Lic. # 44167

40mm ER SLAT BERTHA IMPACT
PROTECTIVE ROLLING SYSTEM
AMERICAN SHUTTER SYSTEMS ASSOC., INC.
4268 WESTROADS DRIVE
WEST PALM BEACH, FL. 33407
PHONE: (877)999-2772
FAX: (561)209-8380

DRAWN BY:
W.H.

6/29/2026
DATE

26-098
DRAWING No

REV. No	DESCRIPTION	DATE	REV. No	DESCRIPTION	DATE
1	OLD 23-137	6/29/26	3		
2			4		

SHEET 21 OF 29

END RETENTION SYSTEM W SLAT ③

MAX. ANCHOR'S SPACING SCHEDULE IIa

FOR A GIVEN PRODUCT MOUNTING TYPE, W/ 3/8"Ø WEDGE BOLT ANCHORS OR 3/8"Ø SS KWIK BOLT 3 TO POURED CONCRETE WALL, A.S.D. DESIGN LOAD & SLAT SPAN RANGE †

WALL MOUNT

A.S.D. DESIGN LOAD RANGE (p.s.f.)	SLAT SPAN RANGE				
	0'-4' †	> 4'-5' †	> 5'-6' †	> 6'-7' †	> 7'-8' †
≤ 30.0	10"	10"	10"	10"	10"
>30-40	10"	10"	10"	10"	10"
>40-60	10"	10"	10"	10"	10"
>60-80	10"	10"	10"	10"	—

BUILD-OUT MOUNT W/ (12A)

A.S.D. DESIGN LOAD RANGE (p.s.f.)	SLAT SPAN RANGE									
	0'-4' †		> 4'-5' †		> 5'-6' †		> 6'-7' †		> 7'-8' †	
	2" B.O	4" B.O	2" B.O	4" B.O	2" B.O	4" B.O	2" B.O	4" B.O	2" B.O	4" B.O
≤ 30.0	9"	9"	9"	9"	9"	9"	9"	9"	9"	9"
>30-40	9"	9"	9"	9"	9"	9"	9"	9"	9"	9"
>40-60	8 1/2"	6 1/2"	8 1/2"	6 1/2"	8 1/2"	6 1/2"	8 1/2"	6 1/2"	8 1/2"	6 1/2"
>60-80	8 1/2"	6"	8 1/2"	6"	8 1/2"	6"	8 1/2"	6"	—	—

TRAPPED MOUNT

A.S.D. DESIGN LOAD RANGE (p.s.f.)	SLAT SPAN RANGE				
	0'-4' †	> 4'-5' †	> 5'-6' †	> 6'-7' †	> 7'-8' †
≤ 30.0	9"	9"	9"	9"	9"
>30-40	9"	9"	9"	9"	9"
>40-60	9"	9"	9"	9"	9"
>60-80	9"	9"	9"	9"	—



SLAT SPAN DEFINITION

† NOTE:
MAX. SLAT SPAN FOR A GIVEN A.S.D. DESIGN LOAD SHALL **NEVER** EXCEED MAX. SLAT SPAN INDICATED ON SLAT PERFORMANCE CHART ON SHEET 19.

MAX. ANCHOR'S SPACING SCHEDULE IIa

FOR A GIVEN PRODUCT MOUNTING TYPE, W/ 5/16"Ø TAPCON XL ANCHORS TO POURED CONCRETE WALL, A.S.D. DESIGN LOAD & SLAT SPAN RANGE †

WALL MOUNT

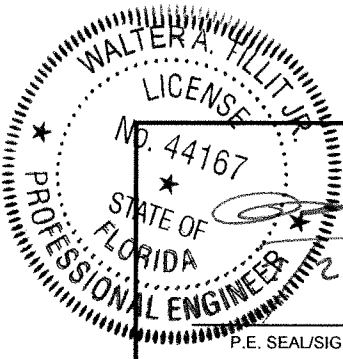
A.S.D. DESIGN LOAD RANGE (p.s.f.)	SLAT SPAN RANGE				
	0'-4' †	> 4'-5' †	> 5'-6' †	> 6'-7' †	> 7'-8' †
≤ 30.0	8"	8"	8"	8"	8"
>30-40	8"	8"	8"	8"	8"
>40-60	8"	8"	8"	8"	8"
>60-80	8"	8"	8"	8"	—

BUILD-OUT MOUNT W/ (12A)

A.S.D. DESIGN LOAD RANGE (p.s.f.)	SLAT SPAN RANGE									
	0'-4' †		> 4'-5' †		> 5'-6' †		> 6'-7' †		> 7'-8' †	
	2" B.O	4" B.O	2" B.O	4" B.O	2" B.O	4" B.O	2" B.O	4" B.O	2" B.O	4" B.O
≤ 30.0	6"	5 1/2"	6"	5 1/2"	6"	5 1/2"	6"	5 1/2"	6"	5 1/2"
>30-40	6"	4"	6"	4"	6"	4"	6"	4"	6"	4"
>40-60	4"	3 3/4"	4"	3 3/4"	4"	3 3/4"	4"	3 3/4"	4"	—
>60-80	4"	3 3/4"	4"	3 3/4"	4"	3 3/4"	4"	—	—	—

TRAPPED MOUNT

A.S.D. DESIGN LOAD RANGE (p.s.f.)	SLAT SPAN RANGE				
	0'-4' †	> 4'-5' †	> 5'-6' †	> 6'-7' †	> 7'-8' †
≤ 30.0	6"	6"	6"	6"	6"
>30-40	6"	6"	6"	6"	6"
>40-60	6"	6"	6"	6"	6"
>60-80	6"	6"	6"	6"	—



P.E. SEAL/SIGNATURE/DATE

FLORIDA BUILDING CODE (High Velocity Hurricane Zone)

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TILTECO INC.

TILLIT TESTING & ENGINEERING COMPANY
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WALTER A. TILLIT Jr., P.E.
FLORIDA Lic. # 44167

40mm ER SLAT BERTHA IMPACT PROTECTIVE ROLLING SYSTEM

AMERICAN SHUTTER SYSTEMS ASSOC., INC.
4268 WESTROADS DRIVE
WEST PALM BEACH, FL. 33407
PHONE: (877)999-2772
FAX: (561)209-8380

DRAWN BY:
W.H.

6/29/2026
DATE

26-098
DRAWING No

REV. No	DESCRIPTION	DATE	REV. No	DESCRIPTION	DATE
1	OLD 23-137	6/29/26	3		
2			4		

SHEET 22 OF 29

END RETENTION SYSTEM W/ SLAT ③

MAX. ANCHOR'S SPACING SCHEDULE IIb

FOR A GIVEN PRODUCT MOUNTING TYPE, W/ 3/8"Ø HILTI KWIK HUS BOLT ANCHORS OR 3/8"Ø SS KWIK BOLT 3 TO GROUTED CONCRETE BLOCK WALL, A.S.D. DESIGN LOAD & SLAT †
SPAN RANGE

WALL MOUNT

A.S.D. DESIGN LOAD RANGE (p.s.f.)	SLAT SPAN RANGE				
	0'-4' †	> 4'-5' †	> 5'-6' †	> 6'-7' †	> 7'-8' †
≤ 30.0	10"	10"	10"	10"	10"
>30-40	10"	10"	10"	10"	10"
>40-60	7 1/2"	7 1/2"	7 1/2"	7 1/2"	7 1/2"
>60-80	7 1/2"	7 1/2"	7 1/2"	7 1/2"	-

BUILD-OUT MOUNT W/ ⑫A

A.S.D. DESIGN LOAD RANGE (p.s.f.)	SLAT SPAN RANGE									
	0'-4' †		> 4'-5' †		> 5'-6' †		> 6'-7' †		> 7'-8' †	
	2" B.O	4" B.O	2" B.O	4" B.O	2" B.O	4" B.O	2" B.O	4" B.O	2" B.O	4" B.O
≤ 30.0	8 1/2"	6"	8 1/2"	6"	8 1/2"	6"	8 1/2"	6"	8 1/2"	6"
>30-40	6 1/2"	6"	6 1/2"	6"	6 1/2"	6"	6 1/2"	6"	6 1/2"	6"
>40-60	6"	6"	6"	6"	6"	6"	6"	-	-	-
>60-80	6"	6"	6"	6"	6"	-	-	-	-	-

TRAPPED MOUNT

A.S.D. DESIGN LOAD RANGE (p.s.f.)	SLAT SPAN RANGE				
	0'-4' †	> 4'-5' †	> 5'-6' †	> 6'-7' †	> 7'-8' †
≤ 30.0	9"	9"	9"	9"	9"
>30-40	9"	9"	9"	9"	9"
>40-60	7"	7"	7"	7"	7"
>60-80	6 1/2"	6 1/2"	6 1/2"	6 1/2"	-



SLAT SPAN DEFINITION

† NOTE:
MAX. SLAT SPAN FOR A
GIVEN A.S.D. DESIGN LOAD
SHALL **NEVER** EXCEED MAX.
SLAT SPAN INDICATED ON
SLAT PERFORMANCE CHART
ON SHEET 19.

MAX. ANCHOR'S SPACING SCHEDULE IIb

FOR A GIVEN PRODUCT MOUNTING TYPE, W/ 5/16"Ø TAPCON XL ANCHORS TO GROUTED CONCRETE BLOCK WALL,
A.S.D. DESIGN LOAD & SLAT SPAN RANGE †

WALL MOUNT

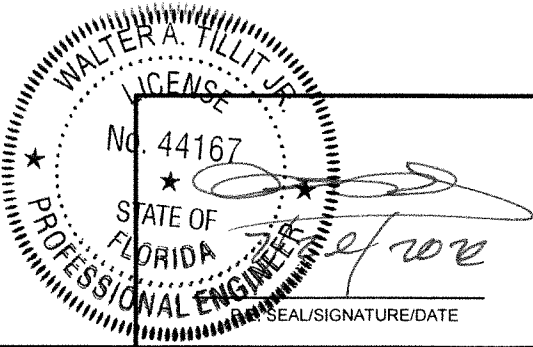
A.S.D. DESIGN LOAD RANGE (p.s.f.)	SLAT SPAN RANGE				
	0'-4' †	> 4'-5' †	> 5'-6' †	> 6'-7' †	> 7'-8' †
≤ 30.0	8"	8"	8"	8"	8"
>30-40	8"	8"	8"	8"	8"
>40-60	7"	7"	7"	7"	7"
>60-80	7"	7"	7"	7"	-

BUILD-OUT MOUNT W/ ⑫A

A.S.D. DESIGN LOAD RANGE (p.s.f.)	SLAT SPAN RANGE									
	0'-4' †		> 4'-5' †		> 5'-6' †		> 6'-7' †		> 7'-8' †	
	2" B.O	4" B.O	2" B.O	4" B.O	2" B.O	4" B.O	2" B.O	4" B.O	2" B.O	4" B.O
≤ 30.0	3 3/4"	3 3/4"	3 3/4"	3 3/4"	3 3/4"	3 3/4"	3 3/4"	-	3 3/4"	-
>30-40	3 3/4"	3 3/4"	3 3/4"	3 3/4"	3 3/4"	3 3/4"	3 3/4"	-	-	-
>40-60	3 3/4"	3 3/4"	3 3/4"	3 3/4"	3 3/4"	-	-	-	-	-
>60-80	3 3/4"	3 3/4"	3 3/4"	-	-	-	-	-	-	-

TRAPPED MOUNT

A.S.D. DESIGN LOAD RANGE (p.s.f.)	SLAT SPAN RANGE				
	0'-4' †	> 4'-5' †	> 5'-6' †	> 6'-7' †	> 7'-8' †
≤ 30.0	6"	6"	6"	6"	6"
>30-40	6"	6"	6"	6"	6"
>40-60	5 1/2"	5 1/2"	5 1/2"	5 1/2"	5 1/2"
>60-80	5 1/2"	5 1/2"	5 1/2"	5 1/2"	-



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e-mail: tilteco@aol.com
CA-0006719
WALTER A. TILLIT Jr., P.E.
FLORIDA Lic. # 44167

FLORIDA BUILDING CODE (High Velocity Hurricane Zone)

**40mm ER SLAT BERTHA IMPACT
PROTECTIVE ROLLING SYSTEM**

AMERICAN SHUTTER SYSTEMS ASSOC., INC.
4268 WESTROADS DRIVE
WEST PALM BEACH, FL. 33407
PHONE: (877)999-2772
FAX: (561)209-8380

DRAWN BY:
W.H.

6/29/2026
DATE

26-098
DRAWING No

REV. No	DESCRIPTION	DATE	REV. No	DESCRIPTION	DATE
1	OLD 23-137	6/29/26	3		
2			4		

SHEET 23 OF 29

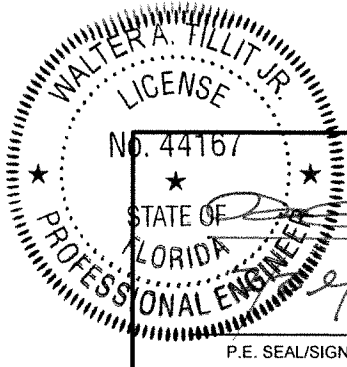
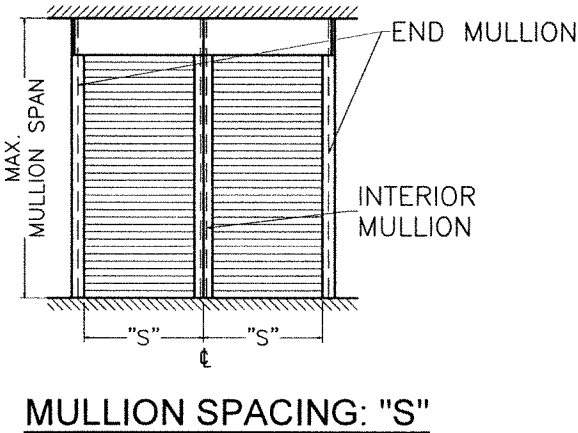
MULLION SCHEDULE FOR END RETENTION SYSTEM W/ SLAT①

SCHEDULE 1a									
FLOOR TO CEILING (TRAPPED) MOUNTING									
MAX. SPAN (ft) FOR END AND INTERIOR MULLIONS FOR A GIVEN A.S.D. DESIGN LOAD (psf), AND A MAX. MULLION SPACING (ft) *									
A.S.D. DESIGN LOAD (p.s.f.)	MAXIMUM MULLION SPACING (ft)*	MAXIMUM MULLION SPAN (ft)							
		②4 4"x6"x1/4" MULLION				②5 4"x8"x1/4" MULLION			
		ORIENTATION #1 (☐) ☐		ORIENTATION #2 (☐) ☐		ORIENTATION #1 (☐) ☐		ORIENTATION #2 (☐) ☐	
		END	INTERIOR	END	INTERIOR	END	INTERIOR	END	INTERIOR
30	16'-0"	6' - 6"	9' - 4"	5' - 11"	11' - 6"	7' - 8"	9' - 7"	6' - 9"	12' - 0"
35	16'-0"	6' - 0"	8' - 10"	5' - 6"	10' - 11"	7' - 2"	8' - 11"	6' - 4"	12' - 0"
40	16'-0"	5' - 8"	8' - 5"	5' - 2"	10' - 5"	6' - 5"	8' - 0"	5' - 11"	12' - 0"
45	16'-0"	5' - 8"	8' - 4"	5' - 2"	10' - 4"	6' - 4"	8' - 1"	5' - 11"	12' - 0"
50	15'-5"	5' - 6"	8' - 2"	5' - 1"	9' - 10"	6' - 1"	7' - 10"	5' - 10"	12' - 0"
55	14'-10"	5' - 6"	8' - 1"	5' - 0"	9' - 5"	5' - 11"	7' - 9"	5' - 9"	12' - 0"
60	14'-3"	5' - 6"	8' - 0"	5' - 1"	9' - 3"	5' - 11"	7' - 10"	5' - 9"	12' - 0"
65	13'-9"	5' - 6"	7' - 11"	5' - 0"	9' - 0"	5' - 11"	7' - 7"	5' - 8"	12' - 0"
70	13'-2"	5' - 5"	7' - 11"	5' - 0"	8' - 7"	5' - 10"	7' - 5"	5' - 7"	12' - 0"
75	12'-6"	5' - 6"	7' - 10"	5' - 1"	8' - 7"	5' - 11"	7' - 5"	5' - 8"	12' - 0"
80	12'-0"	5' - 5"	7' - 10"	5' - 0"	8' - 6"	5' - 9"	7' - 2"	5' - 7"	12' - 0"
85	11'-4"	5' - 6"	7' - 10"	5' - 1"	8' - 7"	6' - 0"	7' - 4"	5' - 9"	12' - 0"
90	10'-9"	5' - 8"	7' - 10"	5' - 3"	8' - 9"	6' - 2"	7' - 7"	6' - 0"	12' - 0"
95	10'-0"	5' - 10"	7' - 11"	5' - 5"	9' - 0"	6' - 7"	8' - 0"	6' - 2"	12' - 0"
100	9'-5"	6' - 0"	8' - 1"	5' - 7"	9' - 4"	7' - 0"	8' - 6"	6' - 5"	12' - 0"
105	8'-9"	6' - 4"	8' - 2"	5' - 11"	9' - 10"	7' - 6"	8' - 6"	6' - 9"	12' - 0"
110	8'-1"	6' - 2"	8' - 1"	5' - 10"	9' - 6"	7' - 5"	8' - 6"	6' - 8"	12' - 0"
115	7'-5"	6' - 0"	8' - 0"	5' - 9"	9' - 2"	7' - 2"	8' - 3"	6' - 7"	12' - 0"
120	6'-10"	6' - 0"	7' - 11"	5' - 8"	8' - 10"	6' - 11"	7' - 10"	6' - 6"	12' - 0"

SCHEDULE 2a									
WALL MOUNTING									
MAX. SPAN (ft) FOR END AND INTERIOR MULLIONS FOR A GIVEN A.S.D. DESIGN LOAD (psf), AND A MAX. MULLION SPACING (ft) *									
A.S.D. DESIGN LOAD (p.s.f.)	MAXIMUM MULLION SPACING (ft)*	MAXIMUM MULLION SPAN (ft)							
		②4 4"x6"x1/4" MULLION				②5 4"x8"x1/4" MULLION			
		ORIENTATION #1 (☐) ☐		ORIENTATION #2 (☐) ☐		ORIENTATION #1 (☐) ☐		ORIENTATION #2 (☐) ☐	
		END	INTERIOR	END	INTERIOR	END	INTERIOR	END	INTERIOR
30	16'-0"	6' - 5"	9' - 3"	5' - 11"	11' - 6"	7' - 8"	9' - 7"	5' - 7"	12' - 0"
35	16'-0"	6' - 0"	8' - 10"	5' - 6"	10' - 11"	7' - 2"	8' - 11"	4' - 10"	12' - 0"
40	16'-0"	5' - 8"	8' - 5"	5' - 2"	10' - 5"	6' - 9"	8' - 5"	4' - 4"	12' - 0"
45	16'-0"	5' - 8"	8' - 4"	5' - 2"	10' - 4"	6' - 9"	8' - 8"	4' - 3"	12' - 0"
50	15'-5"	5' - 6"	8' - 2"	5' - 1"	10' - 2"	6' - 7"	8' - 8"	4' - 2"	12' - 0"
55	14'-10"	5' - 6"	8' - 1"	5' - 0"	10' - 0"	6' - 6"	8' - 8"	4' - 1"	12' - 0"
60	14'-3"	5' - 6"	8' - 0"	5' - 1"	9' - 11"	6' - 6"	8' - 7"	4' - 1"	12' - 0"
65	13'-9"	5' - 6"	7' - 11"	5' - 0"	9' - 10"	6' - 5"	8' - 6"	4' - 1"	12' - 0"
70	13'-2"	5' - 6"	7' - 10"	5' - 0"	9' - 9"	6' - 6"	8' - 5"	4' - 0"	12' - 0"
75	12'-6"	5' - 6"	7' - 10"	5' - 1"	9' - 9"	6' - 6"	8' - 5"	4' - 1"	12' - 0"
80	12'-0"	5' - 6"	7' - 9"	5' - 0"	9' - 8"	6' - 6"	8' - 4"	4' - 1"	12' - 0"
85	11'-4"	5' - 6"	7' - 10"	5' - 1"	9' - 8"	6' - 7"	8' - 4"	4' - 2"	12' - 0"
90	10'-9"	5' - 7"	7' - 10"	5' - 3"	9' - 9"	6' - 9"	8' - 5"	4' - 5"	12' - 0"
95	10'-0"	5' - 10"	7' - 11"	5' - 5"	9' - 10"	6' - 11"	8' - 5"	4' - 8"	12' - 0"
100	9'-5"	6' - 0"	8' - 0"	5' - 7"	10' - 0"	7' - 2"	8' - 6"	5' - 1"	12' - 0"
105	8'-9"	6' - 4"	8' - 2"	5' - 11"	10' - 2"	7' - 6"	8' - 6"	6' - 9"	12' - 0"
110	8'-1"	6' - 3"	8' - 1"	5' - 10"	10' - 0"	7' - 5"	8' - 6"	5' - 6"	12' - 0"
115	7'-5"	6' - 2"	8' - 0"	5' - 9"	9' - 11"	7' - 3"	8' - 5"	5' - 4"	12' - 0"
120	6'-10"	6' - 0"	7' - 11"	5' - 8"	9' - 10"	7' - 2"	8' - 5"	5' - 2"	12' - 0"

* MAXIMUM MULLION SPACING SHALL BE SUCH THAT MAX. ALLOWABLE SLAT SPAN FOR THAT A.S.D. DESIGN LOAD SHALL NOT BE EXCEEDED.

† MULLION ORIENTATION IS AS SEEN FROM THE OUTSIDE (EXTERIOR) OF PRODUCT.



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DRAWN BY:
W.H.

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26-098
DRAWING No

REV. No	DESCRIPTION	DATE	REV. No	DESCRIPTION	DATE
1	OLD 23-137	6/29/26	3		
2			4		

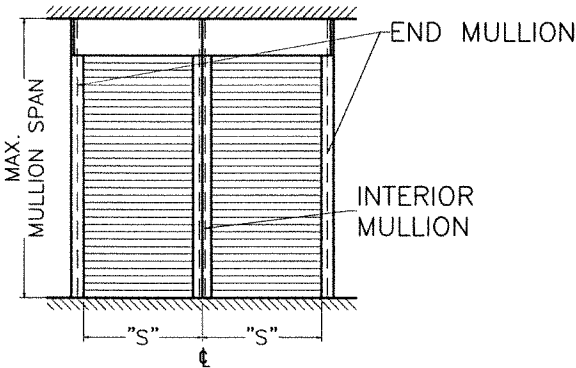
SHEET 24 OF 29

MULLION SCHEDULE FOR END RETENTION SYSTEM W/ SLAT①

SCHEDULE 1c									
FLOOR TO CEILING (TRAPPED) MOUNTING									
MAX SPAN (ft) FOR END AND INTERIOR MULLIONS FOR A GIVEN A.S.D. DESIGN LOAD (psf), AND A 7'-0" MAX MULLION SPACING (ft) *									
DESIGN LOAD (p.s.f.)	MAXIMUM MULLION SPACING (ft)*	MAXIMUM MULLION SPAN (ft)							
		②4 4"x6"x1/4" MULLION				②5 4"x8"x1/4" MULLION			
		ORIENTATION #1 (⇐)		ORIENTATION #2 (⇐)		ORIENTATION #1 (⇐)		ORIENTATION #2 (⇐)	
		END	INTERIOR	END	INTERIOR	END	INTERIOR	END	INTERIOR
30.0	7'-0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"
35.0	7'-0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"
40.0	7'-0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"
45.0	7'-0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"
50.0	7'-0"	12' - 0"	11' - 7"	11' - 8"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"
55.0	7'-0"	12' - 0"	11' - 3"	10' - 11"	12' - 0"	12' - 0"	12' - 0"	11' - 11"	12' - 0"
60.0	7'-0"	12' - 0"	10' - 11"	10' - 4"	12' - 0"	12' - 0"	11' - 11"	11' - 3"	12' - 0"
65.0	7'-0"	11' - 4"	10' - 8"	9' - 11"	12' - 0"	12' - 0"	11' - 7"	10' - 9"	12' - 0"
70.0	7'-0"	10' - 9"	10' - 5"	9' - 6"	12' - 0"	12' - 0"	11' - 3"	10' - 4"	12' - 0"
75.0	7'-0"	10' - 3"	10' - 2"	9' - 2"	12' - 0"	12' - 0"	11' - 0"	9' - 11"	12' - 0"
80.0	7'-0"	9' - 10"	9' - 11"	8' - 10"	12' - 0"	11' - 6"	10' - 10"	9' - 8"	12' - 0"
85.0	7'-0"	9' - 5"	9' - 9"	8' - 7"	12' - 0"	11' - 1"	10' - 7"	9' - 4"	12' - 0"
90.0	7'-0"	9' - 1"	9' - 7"	8' - 5"	11' - 10"	10' - 8"	10' - 5"	9' - 1"	12' - 0"
95.0	7'-0"	8' - 9"	9' - 5"	8' - 2"	11' - 7"	10' - 4"	10' - 2"	8' - 11"	12' - 0"
100.0	7'-0"	8' - 6"	9' - 3"	8' - 0"	11' - 5"	10' - 0"	10' - 0"	8' - 8"	12' - 0"
105.0	7'-0"	8' - 3"	9' - 1"	7' - 9"	11' - 3"	9' - 9"	9' - 10"	8' - 6"	12' - 0"
110.0	7'-0"	8' - 0"	8' - 11"	7' - 7"	11' - 1"	9' - 6"	9' - 9"	8' - 4"	12' - 0"
115.0	7'-0"	7' - 10"	8' - 10"	7' - 4"	10' - 11"	9' - 3"	9' - 7"	8' - 2"	12' - 0"
120.0	6'-10"	7' - 8"	8' - 8"	7' - 2"	10' - 9"	9' - 0"	9' - 5"	8' - 1"	12' - 0"

* MAXIMUM MULLION SPACING SHALL BE SUCH THAT MAX. ALLOWABLE SLAT SPAN FOR THAT A.S.D. DESIGN LOAD SHALL NOT BE EXCEEDED.

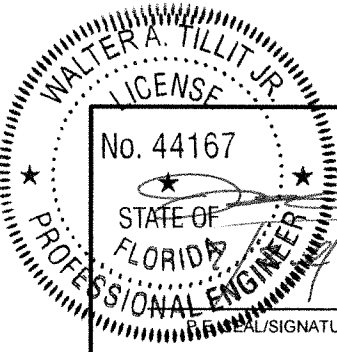
† MULLION ORIENTATION IS AS SEEN FROM THE OUTSIDE (EXTERIOR) OF PRODUCT.



MULLION SPACING: "S"

SCHEDULE 2c									
WALL MOUNTING									
MAX SPAN (ft) FOR END AND INTERIOR MULLIONS FOR A GIVEN A.S.D. DESIGN LOAD (psf), AND A 7'-0" MAX MULLION SPACING (ft) *									
A.S.D. DESIGN LOAD (p.s.f.)	MAXIMUM MULLION SPACING (ft)*	MAXIMUM MULLION SPAN (ft)							
		②4 4"x6"x1/4" MULLION				②5 4"x8"x1/4" MULLION			
		ORIENTATION #1 (⇐)		ORIENTATION #2 (⇐)		ORIENTATION #1 (⇐)		ORIENTATION #2 (⇐)	
		END	INTERIOR	END	INTERIOR	END	INTERIOR	END	INTERIOR
30.0	7'-0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"
35.0	7'-0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"
40.0	7'-0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"
45.0	7'-0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"
50.0	7'-0"	12' - 0"	11' - 7"	11' - 8"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"
55.0	7'-0"	12' - 0"	11' - 3"	10' - 11"	12' - 0"	12' - 0"	12' - 0"	11' - 11"	12' - 0"
60.0	7'-0"	12' - 0"	10' - 11"	10' - 4"	12' - 0"	12' - 0"	11' - 11"	11' - 3"	12' - 0"
65.0	7'-0"	11' - 4"	10' - 8"	9' - 11"	12' - 0"	12' - 0"	11' - 7"	10' - 9"	12' - 0"
70.0	7'-0"	10' - 9"	10' - 5"	9' - 6"	12' - 0"	12' - 0"	11' - 3"	10' - 4"	12' - 0"
75.0	7'-0"	10' - 3"	10' - 2"	9' - 2"	12' - 0"	12' - 0"	11' - 0"	9' - 11"	12' - 0"
80.0	7'-0"	9' - 10"	9' - 11"	8' - 10"	12' - 0"	11' - 6"	10' - 10"	9' - 8"	12' - 0"
85.0	7'-0"	9' - 5"	9' - 9"	8' - 7"	12' - 0"	11' - 1"	10' - 7"	9' - 4"	12' - 0"
90.0	7'-0"	9' - 1"	9' - 7"	8' - 5"	11' - 10"	10' - 8"	10' - 5"	9' - 1"	12' - 0"
95.0	7'-0"	8' - 9"	9' - 5"	8' - 2"	11' - 7"	10' - 4"	10' - 2"	8' - 11"	12' - 0"
100.0	7'-0"	8' - 6"	9' - 3"	8' - 0"	11' - 5"	10' - 0"	10' - 0"	8' - 8"	12' - 0"
105.0	7'-0"	8' - 3"	9' - 1"	7' - 9"	11' - 3"	9' - 9"	9' - 10"	8' - 6"	12' - 0"
110.0	7'-0"	8' - 0"	8' - 11"	7' - 7"	11' - 1"	9' - 6"	9' - 9"	8' - 4"	12' - 0"
115.0	7'-0"	7' - 10"	8' - 10"	7' - 4"	10' - 11"	9' - 3"	9' - 7"	8' - 2"	12' - 0"
120.0	6'-10"	7' - 8"	8' - 8"	7' - 2"	10' - 9"	9' - 0"	9' - 5"	8' - 1"	12' - 0"

FLORIDA BUILDING CODE (High Velocity Hurricane Zone)



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CA-0006719
WALTER A. TILLIT Jr., P.E.
FLORIDA Lic. # 44167

40mm ER SLAT BERTHA IMPACT
PROTECTIVE ROLLING SYSTEM

AMERICAN SHUTTER SYSTEMS ASSOC., INC.
4268 WESTROADS DRIVE
WEST PALM BEACH, FL 33407
PHONE: (877)999-2772
FAX: (561)209-8380

REV. No	DESCRIPTION	DATE	REV. No	DESCRIPTION	DATE
1	OLD 23-137	6/29/26	3		
2			4		

DRAWN BY:
W.H.

6/29/2026
DATE

26-098
DRAWING No

SHEET 25 OF 29

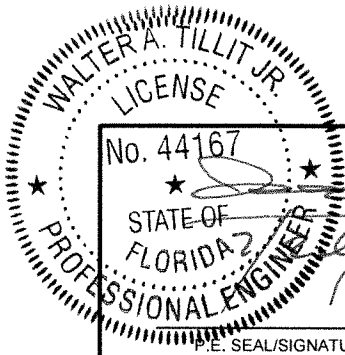
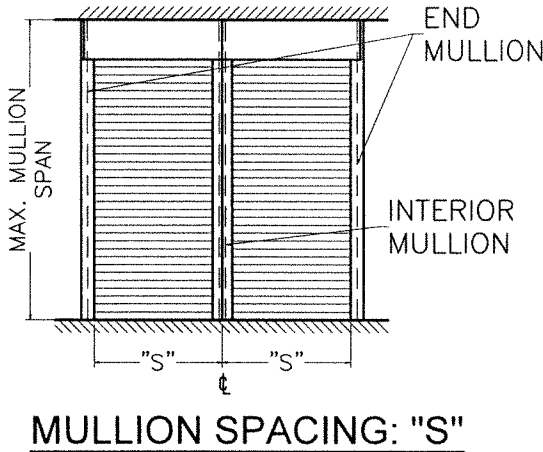
MULLION SCHEDULE FOR END RETENTION SYSTEM W/ SLAT①

SCHEDULE 1b FLOOR TO CEILING (TRAPPED) MOUNTING									
MAX. SPAN (ft) FOR END AND INTERIOR MULLIONS FOR A GIVEN DESIGN LOAD (psf), AND A 12'-0" MAX. MULLION SPACING (ft) *									
DESIGN LOAD (p.s.f.)	MAXIMUM MULLION SPACING (ft)*	MAXIMUM MULLION SPAN (ft)							
		②4"x6"x1/4" MULLION				②5"x8"x1/4" MULLION			
		ORIENTATION #1 (▢) ▢		ORIENTATION #2 (▢) ▢		ORIENTATION #1 (▢) ▢		ORIENTATION #2 (▢) ▢	
		END	INTERIOR	END	INTERIOR	END	INTERIOR	END	INTERIOR
30.0	12'-0"	10' - 1"	11' - 6"	8' - 8"	12' - 0"	12' - 0"	12' - 0"	9' - 5"	12' - 0"
35.0	12'-0"	9' - 4"	10' - 11"	8' - 2"	12' - 0"	11' - 1"	11' - 11"	8' - 11"	12' - 0"
40.0	12'-0"	8' - 8"	10' - 5"	7' - 10"	12' - 0"	10' - 4"	11' - 4"	8' - 6"	12' - 0"
45.0	12'-0"	8' - 2"	10' - 1"	7' - 6"	12' - 0"	9' - 9"	10' - 11"	8' - 2"	12' - 0"
50.0	12'-0"	7' - 9"	9' - 8"	7' - 2"	12' - 0"	9' - 2"	10' - 7"	7' - 11"	12' - 0"
55.0	12'-0"	7' - 5"	9' - 5"	6' - 10"	11' - 8"	8' - 9"	10' - 3"	7' - 8"	12' - 0"
60.0	12'-0"	7' - 1"	9' - 2"	6' - 7"	11' - 4"	8' - 5"	9' - 11"	7' - 5"	12' - 0"
65.0	12'-0"	6' - 10"	8' - 11"	6' - 4"	11' - 0"	8' - 1"	9' - 8"	7' - 3"	12' - 0"
70.0	12'-0"	6' - 7"	8' - 8"	6' - 1"	10' - 9"	7' - 10"	9' - 5"	7' - 0"	12' - 0"
75.0	12'-0"	6' - 4"	8' - 6"	5' - 11"	10' - 6"	7' - 6"	9' - 3"	6' - 9"	12' - 0"
80.0	12'-0"	6' - 2"	8' - 4"	5' - 8"	10' - 3"	7' - 4"	9' - 0"	6' - 6"	12' - 0"

SCHEDULE 2b WALL MOUNTING									
MAX. SPAN (ft) FOR END AND INTERIOR MULLIONS FOR A GIVEN DESIGN LOAD (psf), AND A 12'-0" MAX. MULLION SPACING (ft) *									
DESIGN LOAD (p.s.f.)	MAXIMUM MULLION SPACING (ft)*	MAXIMUM MULLION SPAN (ft)							
		②4"x6"x1/4" MULLION				②5"x8"x1/4" MULLION			
		ORIENTATION #1 (▢) ▢		ORIENTATION #2 (▢) ▢		ORIENTATION #1 (▢) ▢		ORIENTATION #2 (▢) ▢	
		END	INTERIOR	END	INTERIOR	END	INTERIOR	END	INTERIOR
30.0	12'-0"	8' - 8"	11' - 6"	8' - 8"	12' - 0"	12' - 0"	12' - 0"	9' - 5"	12' - 0"
35.0	12'-0"	8' - 2"	10' - 11"	8' - 2"	12' - 0"	11' - 1"	11' - 11"	8' - 11"	12' - 0"
40.0	12'-0"	7' - 10"	10' - 5"	7' - 10"	12' - 0"	10' - 4"	11' - 4"	8' - 6"	12' - 0"
45.0	12'-0"	7' - 6"	10' - 1"	7' - 6"	12' - 0"	9' - 9"	10' - 11"	8' - 2"	12' - 0"
50.0	12'-0"	7' - 2"	9' - 8"	7' - 2"	12' - 0"	9' - 2"	10' - 7"	7' - 11"	12' - 0"
55.0	12'-0"	6' - 10"	9' - 5"	6' - 10"	11' - 8"	8' - 9"	10' - 3"	7' - 8"	12' - 0"
60.0	12'-0"	6' - 7"	9' - 2"	6' - 7"	11' - 4"	8' - 5"	9' - 11"	7' - 5"	12' - 0"
65.0	12'-0"	6' - 4"	8' - 11"	6' - 4"	11' - 0"	8' - 1"	9' - 8"	7' - 3"	12' - 0"
70.0	12'-0"	6' - 1"	8' - 8"	6' - 1"	10' - 9"	7' - 10"	9' - 5"	7' - 0"	12' - 0"
75.0	12'-0"	5' - 11"	8' - 6"	5' - 11"	10' - 6"	7' - 6"	9' - 3"	5' - 7"	12' - 0"
80.0	12'-0"	5' - 8"	8' - 4"	5' - 8"	10' - 3"	7' - 4"	9' - 0"	5' - 3"	12' - 0"

* MAXIMUM MULLION SPACING SHALL BE SUCH THAT MAX. ALLOWABLE SLAT SPAN FOR THAT DESIGN LOAD SHALL NOT BE EXCEEDED.

† MULLION ORIENTATION IS AS SEEN FROM THE OUTSIDE (EXTERIOR) OF PRODUCT.



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WALTER A. TILLIT Jr., P.E.

FLORIDA Lic. # 44167

FLORIDA BUILDING CODE (High Velocity Hurricane Zone)

40mm ER SLAT BERTHA IMPACT
PROTECTIVE ROLLING SYSTEM

AMERICAN SHUTTER SYSTEMS ASSOC., INC.

4268 WESTROADS DRIVE
WEST PALM BEACH, FL. 33407
PHONE: (877)999-2772
FAX: (561)209-8380

REV. No DESCRIPTION DATE REV. No DESCRIPTION DATE

1	OLD 23-137	6/29/26	3		
2			4		

DRAWN BY: W.H.

6/29/2026
DATE

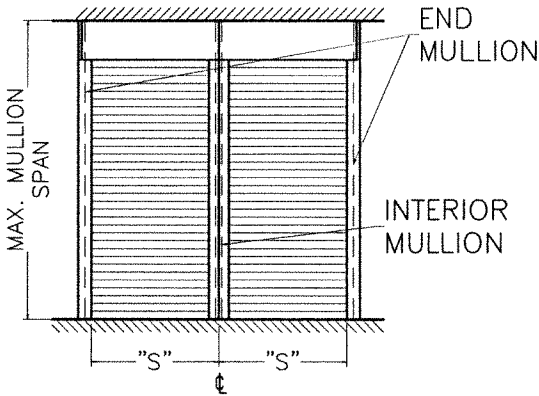
26-098
DRAWING No

SHEET 26 OF 29

MULLION SCHEDULE FOR END RETENTION SYSTEM W/ SLAT①

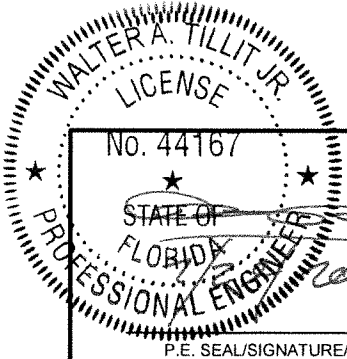
SCHEDULE 1b' (LIMITED LOAD, MULLION SPACING & SPAN INSTALLATION)							
FLOOR TO CEILING (TRAPPED) MOUNTING							
MAX. SPAN (ft) FOR END AND INTERIOR MULLIONS FOR A GIVEN DESIGN LOAD (psf), AND FOR 12'-0" (CASE I) & 8'-0" (CASES Ia & II) MAX. MULLION SPACING (ft) *							
INSTALLATION CASES	A.S.D. DESIGN LOAD (p.s.f.)	MAXIMUM MULLION SPACING (ft)*	MAXIMUM MULLION SPAN (ft)				
			②4 4"x6"x1/4" MULLION		②5 4"x8"x1/4" MULLION		
			ORIENTATION #1	ORIENTATION #2	ORIENTATION #1	ORIENTATION #1	ORIENTATION #2
			(□) □	(□) □	(□) □	(□) □	(□) □
CASE I	30.0	12'-0"	-	12' - 0"	12' - 0"	12' - 0"	12' - 0"
	35.0	12'-0"	-	12' - 0"	11' - 1"	11' - 11"	12' - 0"
	40.0	12'-0"	-	12' - 0"	10' - 4"	11' - 4"	12' - 0"
	45.0	12'-0"	-	12' - 0"	9' - 9"	10' - 11"	12' - 0"
	50.0	12'-0"	-	12' - 0"	8' - 11"	10' - 7"	12' - 0"
	55.0	12'-0"	-	11' - 8"	8' - 2"	10' - 3"	12' - 0"
	60.0	12'-0"	-	11' - 4"	7' - 6"	9' - 11"	12' - 0"
	60.8	12'-0"	-	11' - 3"	7' - 4"	9' - 11"	12' - 0"
CASE Ia	30.0	8'-0"	-	12' - 0"	12' - 0"	12' - 0"	12' - 0"
	35.0	8'-0"	-	12' - 0"	12' - 0"	12' - 0"	12' - 0"
	40.0	8'-0"	-	12' - 0"	12' - 0"	12' - 0"	12' - 0"
	45.0	8'-0"	-	12' - 0"	12' - 0"	12' - 0"	12' - 0"
	50.0	8'-0"	-	12' - 0"	12' - 0"	12' - 0"	12' - 0"
	55.0	8'-0"	-	12' - 0"	12' - 0"	11' - 8"	12' - 0"
	60.0	8'-0"	-	12' - 0"	11' - 10"	11' - 4"	12' - 0"
	60.8	8'-0"	-	12' - 0"	11' - 9"	11' - 4"	12' - 0"
CASE II	30.0	8'-0"	-	9' - 0"	9' - 0"	9' - 0"	9' - 0"
	35.0	8'-0"	-	9' - 0"	9' - 0"	9' - 0"	9' - 0"
	40.0	8'-0"	-	9' - 0"	9' - 0"	9' - 0"	9' - 0"
	45.0	8'-0"	-	9' - 0"	9' - 0"	9' - 0"	9' - 0"
	50.0	8'-0"	-	9' - 0"	9' - 0"	9' - 0"	9' - 0"
	55.0	8'-0"	-	9' - 0"	9' - 0"	9' - 0"	9' - 0"
	60.0	8'-0"	-	9' - 0"	9' - 0"	9' - 0"	9' - 0"
	65.0	8'-0"	-	9' - 0"	9' - 0"	9' - 0"	9' - 0"
	70.0	8'-0"	-	9' - 0"	9' - 0"	9' - 0"	9' - 0"
	75.0	8'-0"	-	9' - 0"	9' - 0"	9' - 0"	9' - 0"
	80.0	8'-0"	-	9' - 0"	9' - 0"	9' - 0"	9' - 0"
	85.0	8'-0"	-	9' - 0"	8' - 6"Δ	8' - 6"Δ	9' - 0"
	90.0	8'-0"	-	9' - 0"	8' - 0"Δ	8' - 0"Δ	9' - 0"
	95.0	8'-0"	-	9' - 0"	7' - 7"Δ	7' - 7"Δ	9' - 0"
	100.0	8'-0"	-	9' - 0"	7' - 2"Δ	7' - 3"Δ	9' - 0"
Δ NOTE: USE 9'-0" SPAN IF ANCHOR CONSISTS OF HILTI, INC KWIK HUS-H SCREW, DEWALT, INC OR WEDGE-BOLT ANCHOR IN LIEU OF HILTI KWIK BOLT TZ OR KWIK BOLT 3, SEE SCHEDULES 1 & 2 ON SHEET 11.							

SCHEDULE 2b' (LIMITED LOAD, MULLION SPACING & SPAN INSTALLATION)							
WALL MOUNTED							
MAX. SPAN (ft) FOR END AND INTERIOR MULLIONS FOR A GIVEN DESIGN LOAD (psf), AND FOR 12'-0" (CASE I) & 8'-0" (CASE II) MAX. MULLION SPACING (ft) *							
INSTALLATION CASES	A.S.D. DESIGN LOAD (p.s.f.)	MAXIMUM MULLION SPACING (ft)*	MAXIMUM MULLION SPAN (ft)				
			②4 4"x6"x1/4" MULLION		②5 4"x8"x1/4" MULLION		
			ORIENTATION #1	ORIENTATION #2	ORIENTATION #1	ORIENTATION #1	ORIENTATION #2
			(□) □	(□) □	(□) □	(□) □	(□) □
CASE I	30.0	12'-0"	-	12' - 0"	12' - 0"	12' - 0"	12' - 0"
	35.0	12'-0"	-	12' - 0"	11' - 1"	11' - 11"	12' - 0"
	40.0	12'-0"	-	12' - 0"	10' - 4"	11' - 4"	12' - 0"
	45.0	12'-0"	-	12' - 0"	9' - 9"	10' - 11"	12' - 0"
	50.0	12'-0"	-	12' - 0"	9' - 2"	10' - 7"	12' - 0"
	55.0	12'-0"	-	11' - 8"	7' - 3"	10' - 3"	12' - 0"
	60.0	12'-0"	-	11' - 4"	6' - 7"	9' - 11"	12' - 0"
	60.8	12'-0"	-	11' - 3"	6' - 6"	9' - 11"	12' - 0"
CASE II	30.0	8'-0"	-	9' - 0"	9' - 0"	9' - 0"	9' - 0"
	35.0	8'-0"	-	9' - 0"	9' - 0"	9' - 0"	9' - 0"
	40.0	8'-0"	-	9' - 0"	9' - 0"	9' - 0"	9' - 0"
	45.0	8'-0"	-	9' - 0"	9' - 0"	9' - 0"	9' - 0"
	50.0	8'-0"	-	9' - 0"	9' - 0"	9' - 0"	9' - 0"
	55.0	8'-0"	-	9' - 0"	9' - 0"	9' - 0"	9' - 0"
	60.0	8'-0"	-	9' - 0"	9' - 0"	9' - 0"	9' - 0"
	65.0	8'-0"	-	9' - 0"	9' - 0"	9' - 0"	9' - 0"
	70.0	8'-0"	-	9' - 0"	9' - 0"	9' - 0"	9' - 0"
	75.0	8'-0"	-	9' - 0"	9' - 0"	9' - 0"	9' - 0"
	80.0	8'-0"	-	9' - 0"	9' - 0"	9' - 0"	9' - 0"
	85.0	8'-0"	-	9' - 0"	9' - 0"	9' - 0"	9' - 0"
	90.0	8'-0"	-	9' - 0"	9' - 0"	9' - 0"	9' - 0"
	95.0	8'-0"	-	9' - 0"	9' - 0"	9' - 0"	9' - 0"
	100.0	8'-0"	-	9' - 0"	8' - 10"	9' - 0"	9' - 0"



MULLION SPACING: "S"

- * MAXIMUM MULLION SPACING SHALL BE SUCH THAT MAX. ALLOWABLE SLAT SPAN FOR THAT DESIGN LOAD SHALL NOT BE EXCEEDED.
- † MULLION ORIENTATION IS AS SEEN FROM THE OUTSIDE (EXTERIOR) OF PRODUCT.



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CA-0006719

WALTER A. TILLIT Jr., P.E.

FLORIDA Lic. # 44167

FLORIDA BUILDING CODE (High Velocity Hurricane Zone)

40mm ER SLAT BERTHA IMPACT
PROTECTIVE ROLLING SYSTEM

AMERICAN SHUTTER SYSTEMS ASSOC., INC.

4268 WESTROADS DRIVE
WEST PALM BEACH, FL. 33407

PHONE: (877)999-2772
FAX: (561)209-8380

DRAWN BY:
W.H.

6/29/2026
DATE

26-098
DRAWING No

REV. No	DESCRIPTION	DATE	REV. No	DESCRIPTION	DATE
1	OLD 23-137	6/29/26	3		
2			4		

MULLION SCHEDULE FOR END RETENTION SYSTEM W/ SLAT③

SCHEDULE 1a
FLOOR TO CEILING (TRAPPED) MOUNTING

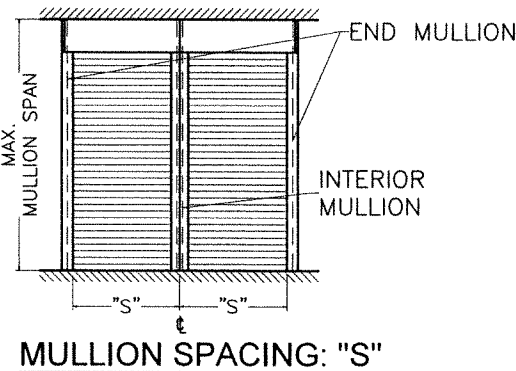
MAX. SPAN (ft) FOR END AND INTERIOR MULLIONS FOR A GIVEN A.S.D. DESIGN LOAD (psf), AND A MAX. MULLION SPACING (ft) *

A.S.D. DESIGN LOAD (p.s.f.)	MAXIMUM MULLION SPACING (ft)*	MAXIMUM MULLION SPAN (ft)							
		②4 4"x6"x1/4" MULLION				②5 4"x8"x1/4" MULLION			
		ORIENTATION #1 (☐) ☐		ORIENTATION #2 (☐) ☐		ORIENTATION #1 (☐) ☐		ORIENTATION #2 (☐) ☐	
		END	INTERIOR	END	INTERIOR	END	INTERIOR	END	INTERIOR
30	8'-4"	12' - 0"	12' - 0"	10' - 10"	12' - 0"	12' - 0"	12' - 0"	11' - 9"	12' - 0"
35	8'-4"	12' - 0"	12' - 0"	10' - 3"	12' - 0"	12' - 0"	12' - 0"	11' - 2"	12' - 0"
40	8'-4"	11' - 9"	11' - 10"	9' - 9"	12' - 0"	12' - 0"	12' - 0"	10' - 8"	12' - 0"
45	8'-4"	11' - 0"	11' - 4"	9' - 5"	12' - 0"	12' - 0"	12' - 0"	10' - 3"	12' - 0"
50	8'-4"	10' - 6"	11' - 0"	9' - 1"	12' - 0"	12' - 0"	11' - 11"	9' - 10"	12' - 0"
55	8'-4"	10' - 0"	10' - 7"	8' - 9"	12' - 0"	11' - 9"	11' - 7"	9' - 7"	12' - 0"
60	8'-4"	9' - 7"	10' - 4"	8' - 6"	12' - 0"	11' - 3"	11' - 3"	9' - 3"	12' - 0"
65	7'-9"	9' - 8"	10' - 3"	8' - 8"	12' - 0"	11' - 5"	11' - 2"	9' - 5"	12' - 0"
70	7'-5"	9' - 7"	10' - 2"	8' - 7"	12' - 0"	11' - 4"	11' - 1"	9' - 4"	12' - 0"
75	7'-0"	9' - 8"	10' - 2"	8' - 8"	12' - 0"	11' - 5"	11' - 0"	9' - 5"	12' - 0"
80	6'-10"	9' - 6"	10' - 0"	8' - 7"	12' - 0"	11' - 3"	10' - 11"	9' - 4"	12' - 0"

SCHEDULE 1c
FLOOR TO CEILING (TRAPPED) MOUNTING

MAX. SPAN (ft) FOR END AND INTERIOR MULLIONS FOR A GIVEN A.S.D. DESIGN LOAD (psf), AND A 6'-10" MAX. MULLION SPACING (ft) *

DESIGN LOAD (p.s.f.)	MAXIMUM MULLION SPACING (ft)*	MAXIMUM MULLION SPAN (ft)							
		②4 4"x6"x1/4" MULLION				②5 4"x8"x1/4" MULLION			
		ORIENTATION #1 (☐) ☐		ORIENTATION #2 (☐) ☐		ORIENTATION #1 (☐) ☐		ORIENTATION #2 (☐) ☐	
		END	INTERIOR	END	INTERIOR	END	INTERIOR	END	INTERIOR
30.0	6'-10"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"
35.0	6'-10"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"
40.0	6'-10"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"
45.0	6'-10"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"
50.0	6'-10"	12' - 0"	11' - 7"	11' - 8"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"
55.0	6'-10"	12' - 0"	11' - 3"	10' - 11"	12' - 0"	12' - 0"	12' - 0"	11' - 11"	12' - 0"
60.0	6'-10"	12' - 0"	10' - 11"	10' - 4"	12' - 0"	12' - 0"	11' - 11"	11' - 3"	12' - 0"
65.0	6'-10"	11' - 4"	10' - 8"	9' - 11"	12' - 0"	12' - 0"	11' - 7"	10' - 9"	12' - 0"
70.0	6'-10"	10' - 9"	10' - 5"	9' - 6"	12' - 0"	12' - 0"	11' - 3"	10' - 4"	12' - 0"
75.0	6'-10"	10' - 3"	10' - 2"	9' - 2"	12' - 0"	12' - 0"	11' - 0"	9' - 11"	12' - 0"
80.0	6'-10"	9' - 6"	10' - 0"	8' - 7"	12' - 0"	11' - 3"	10' - 11"	9' - 4"	12' - 0"



MULLION SPACING: "S"

SCHEDULE 2a
WALL MOUNTING

MAX. SPAN (ft) FOR END AND INTERIOR MULLIONS FOR A GIVEN A.S.D. DESIGN LOAD (psf), AND A MAX. MULLION SPACING (ft) *

A.S.D. DESIGN LOAD (p.s.f.)	MAXIMUM MULLION SPACING (ft)*	MAXIMUM MULLION SPAN (ft)							
		②4 4"x6"x1/4" MULLION				②5 4"x8"x1/4" MULLION			
		ORIENTATION #1 (☐) ☐		ORIENTATION #2 (☐) ☐		ORIENTATION #1 (☐) ☐		ORIENTATION #2 (☐) ☐	
		END	INTERIOR	END	INTERIOR	END	INTERIOR	END	INTERIOR
30	8'-4"	12' - 0"	12' - 0"	10' - 10"	12' - 0"	12' - 0"	12' - 0"	11' - 9"	12' - 0"
35	8'-4"	12' - 0"	12' - 0"	10' - 3"	12' - 0"	12' - 0"	12' - 0"	11' - 2"	12' - 0"
40	8'-4"	11' - 9"	11' - 10"	9' - 9"	12' - 0"	12' - 0"	12' - 0"	10' - 8"	12' - 0"
45	8'-4"	11' - 0"	11' - 4"	9' - 5"	12' - 0"	12' - 0"	12' - 0"	10' - 3"	12' - 0"
50	8'-4"	10' - 6"	11' - 0"	9' - 1"	12' - 0"	12' - 0"	11' - 11"	9' - 10"	12' - 0"
55	8'-4"	10' - 0"	10' - 7"	8' - 9"	12' - 0"	11' - 9"	11' - 7"	9' - 7"	12' - 0"
60	8'-4"	9' - 7"	10' - 4"	8' - 6"	12' - 0"	11' - 3"	11' - 3"	9' - 3"	12' - 0"
65	7'-9"	9' - 8"	10' - 3"	8' - 8"	12' - 0"	11' - 5"	11' - 2"	9' - 5"	12' - 0"
70	7'-5"	9' - 7"	10' - 2"	8' - 7"	12' - 0"	11' - 4"	11' - 1"	9' - 4"	12' - 0"
75	7'-0"	9' - 8"	10' - 2"	8' - 8"	12' - 0"	11' - 5"	11' - 0"	9' - 5"	12' - 0"
80	6'-10"	9' - 6"	10' - 0"	8' - 7"	12' - 0"	11' - 3"	10' - 11"	9' - 4"	12' - 0"

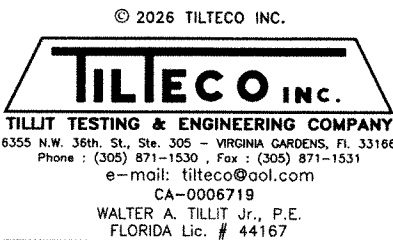
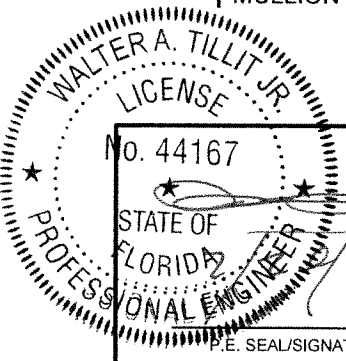
SCHEDULE 2c
WALL MOUNTING

MAX. SPAN (ft) FOR END AND INTERIOR MULLIONS FOR A GIVEN A.S.D. DESIGN LOAD (psf), AND A 6'-10" MAX. MULLION SPACING (ft) *

A.S.D. DESIGN LOAD (p.s.f.)	MAXIMUM MULLION SPACING (ft)*	MAXIMUM MULLION SPAN (ft)							
		②4 4"x6"x1/4" MULLION				②5 4"x8"x1/4" MULLION			
		ORIENTATION #1 (☐) ☐		ORIENTATION #2 (☐) ☐		ORIENTATION #1 (☐) ☐		ORIENTATION #2 (☐) ☐	
		END	INTERIOR	END	INTERIOR	END	INTERIOR	END	INTERIOR
30.0	6'-10"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"
35.0	6'-10"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"
40.0	6'-10"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"
45.0	6'-10"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"
50.0	6'-10"	12' - 0"	11' - 7"	11' - 8"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"
55.0	6'-10"	12' - 0"	11' - 3"	10' - 11"	12' - 0"	12' - 0"	12' - 0"	11' - 11"	12' - 0"
60.0	6'-10"	12' - 0"	10' - 11"	10' - 4"	12' - 0"	12' - 0"	11' - 11"	11' - 3"	12' - 0"
65.0	6'-10"	11' - 4"	10' - 8"	9' - 11"	12' - 0"	12' - 0"	11' - 7"	10' - 9"	12' - 0"
70.0	6'-10"	10' - 9"	10' - 5"	9' - 6"	12' - 0"	12' - 0"	11' - 3"	10' - 4"	12' - 0"
75.0	6'-10"	10' - 3"	10' - 2"	9' - 2"	12' - 0"	12' - 0"	11' - 0"	9' - 11"	12' - 0"
80.0	6'-10"	9' - 6"	10' - 0"	8' - 7"	12' - 0"	11' - 3"	10' - 11"	9' - 4"	12' - 0"

* MAXIMUM MULLION SPACING SHALL BE SUCH THAT MAX. ALLOWABLE SLAT SPAN FOR THAT A.S.D. DESIGN LOAD SHALL NOT BE EXCEEDED.

† MULLION ORIENTATION IS AS SEEN FROM THE OUTSIDE (EXTERIOR) OF PRODUCT.



FLORIDA BUILDING CODE (High Velocity Hurricane Zone)

40mm ER SLAT BERTHA IMPACT
PROTECTIVE ROLLING SYSTEM
AMERICAN SHUTTER SYSTEMS ASSOC., INC.
4268 WESTROADS DRIVE
WEST PALM BEACH, FL. 33407
PHONE: (877)999-2772
FAX: (561)209-8380

DRAWN BY:
W.H.

6/29/2026
DATE

26-098
DRAWING No

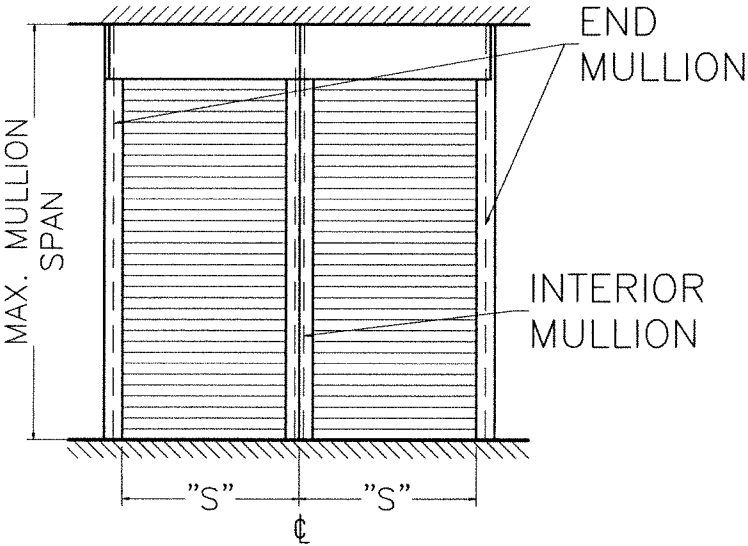
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1	OLD 23-137	6/29/26	3		
2			4		

SHEET 28 OF 29

MULLION SCHEDULE FOR END RETENTION SYSTEM W/ SLAT③

SCHEDULE 1b' (LIMITED LOAD, MULLION SPACING & SPAN INSTALLATION)							
FLOOR TO CEILING (TRAPPED) MOUNTING							
MAX. SPAN (ft) FOR END AND INTERIOR MULLIONS FOR A GIVEN DESIGN LOAD (psf), AND FOR 8'-0" (CASES Ia & II) MAX MULLION SPACING (ft) *							
INSTALLATION CASES	A.S.D. DESIGN LOAD (p.s.f.)	MAXIMUM MULLION SPACING (ft)*	MAXIMUM MULLION SPAN (ft)				
			②4 4"x6"x1/4" MULLION		②5 4"x8"x1/4" MULLION		
			ORIENTATION #1	ORIENTATION #2	ORIENTATION #1	ORIENTATION #1	ORIENTATION #2
			(□) ▣	(□) ▣	(□) ▣	(□) ▣	(□) ▣
			END	INTERIOR	END	INTERIOR	INTERIOR
CASE Ia	30.0	8'-0"	-	12 ' - 0 "	12 ' - 0 "	12 ' - 0 "	12 ' - 0 "
	35.0	8'-0"	-	12 ' - 0 "	12 ' - 0 "	12 ' - 0 "	12 ' - 0 "
	40.0	8'-0"	-	12 ' - 0 "	12 ' - 0 "	12 ' - 0 "	12 ' - 0 "
	45.0	8'-0"	-	12 ' - 0 "	12 ' - 0 "	12 ' - 0 "	12 ' - 0 "
	50.0	8'-0"	-	12 ' - 0 "	12 ' - 0 "	12 ' - 0 "	12 ' - 0 "
	55.0	8'-0"	-	12 ' - 0 "	12 ' - 0 "	11 ' - 8 "	12 ' - 0 "
	60.0	8'-0"	-	12 ' - 0 "	11 ' - 10 "	11 ' - 4 "	12 ' - 0 "
	60.8	8'-0"	-	12 ' - 0 "	11 ' - 9 "	11 ' - 4 "	12 ' - 0 "
CASE II	30.0	8'-0"	-	9 ' - 0 "	9 ' - 0 "	9 ' - 0 "	9 ' - 0 "
	35.0	8'-0"	-	9 ' - 0 "	9 ' - 0 "	9 ' - 0 "	9 ' - 0 "
	40.0	8'-0"	-	9 ' - 0 "	9 ' - 0 "	9 ' - 0 "	9 ' - 0 "
	45.0	8'-0"	-	9 ' - 0 "	9 ' - 0 "	9 ' - 0 "	9 ' - 0 "
	50.0	8'-0"	-	9 ' - 0 "	9 ' - 0 "	9 ' - 0 "	9 ' - 0 "
	55.0	8'-0"	-	9 ' - 0 "	9 ' - 0 "	9 ' - 0 "	9 ' - 0 "
	60.0	8'-0"	-	9 ' - 0 "	9 ' - 0 "	9 ' - 0 "	9 ' - 0 "
	65.0	8'-0"	-	9 ' - 0 "	9 ' - 0 "	9 ' - 0 "	9 ' - 0 "
	70.0	8'-0"	-	9 ' - 0 "	9 ' - 0 "	9 ' - 0 "	9 ' - 0 "
	75.0	8'-0"	-	9 ' - 0 "	9 ' - 0 "	9 ' - 0 "	9 ' - 0 "
	80.0	8'-0"	-	9 ' - 0 "	9 ' - 0 "	9 ' - 0 "	9 ' - 0 "

SCHEDULE 2b' (LIMITED LOAD, MULLION SPACING & SPAN INSTALLATION)							
WALL MOUNTED							
MAX. SPAN (ft) FOR END AND INTERIOR MULLIONS FOR A GIVEN DESIGN LOAD (psf), AND FOR 8'-0" (CASE II) MAX. MULLION SPACING (ft) *							
INSTALLATION CASES	A.S.D. DESIGN LOAD (p.s.f.)	MAXIMUM MULLION SPACING (ft)*	MAXIMUM MULLION SPAN (ft)				
			24 4"x6"x1/4" MULLION		25 4"x8"x1/4" MULLION		
			ORIENTATION #1	ORIENTATION #2	ORIENTATION #1	ORIENTATION #1	ORIENTATION #2
			(□) ▣	(□) ▣	(□) ▣	(□) ▣	(□) ▣
			END	INTERIOR	END	INTERIOR	INTERIOR
CASE II	30.0	8'-0"	-	9' - 0 "	9' - 0 "	9' - 0 "	9' - 0 "
	35.0	8'-0"	-	9' - 0 "	9' - 0 "	9' - 0 "	9' - 0 "
	40.0	8'-0"	-	9' - 0 "	9' - 0 "	9' - 0 "	9' - 0 "
	45.0	8'-0"	-	9' - 0 "	9' - 0 "	9' - 0 "	9' - 0 "
	50.0	8'-0"	-	9' - 0 "	9' - 0 "	9' - 0 "	9' - 0 "
	55.0	8'-0"	-	9' - 0 "	9' - 0 "	9' - 0 "	9' - 0 "
	60.0	8'-0"	-	9' - 0 "	9' - 0 "	9' - 0 "	9' - 0 "
	65.0	8'-0"	-	9' - 0 "	9' - 0 "	9' - 0 "	9' - 0 "
	70.0	8'-0"	-	9' - 0 "	9' - 0 "	9' - 0 "	9' - 0 "
	75.0	8'-0"	-	9' - 0 "	9' - 0 "	9' - 0 "	9' - 0 "
	80.0	8'-0"	-	9' - 0 "	9' - 0 "	9' - 0 "	9' - 0 "

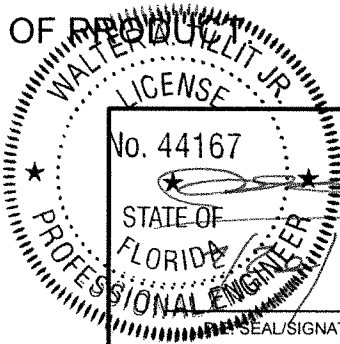


MULLION SPACING: "S"

* MAXIMUM MULLION SPACING SHALL BE SUCH THAT MAX. ALLOWABLE SLAT SPAN FOR THAT DESIGN LOAD SHALL NOT BE EXCEEDED.

† MULLION ORIENTATION IS AS SEEN FROM THE OUTSIDE (EXTERIOR) OF PRODUCT

FLORIDA BUILDING CODE (High Velocity Hurricane Zone)



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40mm ER SLAT BERTHA IMPACT
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AMERICAN SHUTTER SYSTEMS ASSOC., INC.
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PHONE: (877)999-2772
FAX: (561)209-8380

DRAWN BY:
W.H.

6/29/2026
DATE

26-098
DRAWING No

REV. No	DESCRIPTION	DATE	REV. No	DESCRIPTION	DATE
1	OLD 23-137	6/29/26	3		
2			4		

SHEET 29 OF 29