

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 **2020 (7th 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 7-16** 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 7-16** SHALL BE FIRST REDUCED TO A.S.D. DESIGN WIND LOADS BY MULTIPLYING THEM BY 0.6 IN ORDER TO COMPARE THESE W/ 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. FASTENERS SPACING TO WOOD HAS BEEN DETERMINED IN ACCORDANCE WITH N.D.S. 2018.

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.

- 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 2015 ALUMINUM DESIGN MANUAL.
- ALL SELF DRILL SCREWS (EXCEPT COMPONENT (1)) TO BE CORROSION RESISTANT STEEL AS PER DIN 50018 AND SHALL COMPLY W/ FLORIDA BUILDING CODE SECTION 2411.3.3.4. TEK SCREWS SHALL BE AS MANUFACTURED BY ITW/BUILDEX. ALL SCREWS SHALL BE HEX HD HWH.
- BOLTS TO BE ASTM A-307, GALVANIZED OR AISI 304 OR 316 SERIES STAINLESS STEEL WITH 36 ksi MINIMUM YIELD STRENGTH.
- 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/ ELCO CONST. PRODUCTS *		
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"	2"	3.5 ksi

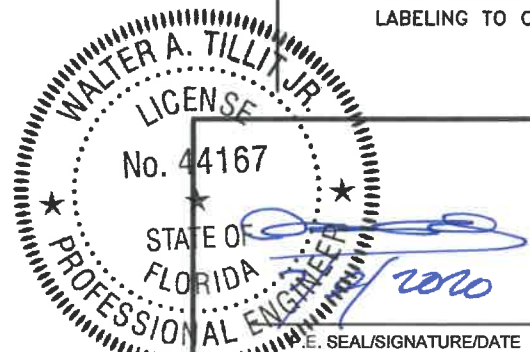
* THIS ANCHOR SHALL NOT BE USED W/ SLAT (3)

SUBSTRATE: GROUTED CONCRETE BLOCK (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/ ELCO CONST. PRODUCTS *	
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"	2 1/2"	2 1/4"

* THIS ANCHOR SHALL NOT BE USED W/ SLAT (3)

SUBSTRATE: WOOD (G=0.46)	
ANCHOR TYPE & MANUFACTURER	
1/4" MAXI SET/ ITW/BUILDEX	
MIN. E.D.	MIN. EMBED.
2 1/4"	2 3/4"

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



ANCHORS NOTES:

- NO EMBEDMENT INTO FINISH MATERIAL SHALL BE CONSIDERED AS PART OF THE REQUIRED EMBEDMENT.
- EDGE DISTANCE IS BEYOND ANY FINISH MATERIAL.
- 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 ABOVE MENTIONED ANCHORS SHALL BE AS INDICATED BELOW OR AT ABOVE MENTIONED SHEETS. EDGE DISTANCE AND EMBEDMENTS ARE BEYOND ANY FINISH MATERIAL.

ANCHOR	SPACING @ 100%	EDGE DISTANCE @ 100%	EMBEDMENT @ 100%	
			CONCRETE	CONCRETE BLOCK
3/4" KWIK BOLT TZ	27"	9"	4 3/4" (3000 psi)	NOT ALLOWED
1/2" KWIK BOLT TZ	22 1/2"	7 1/2"	3 1/4" (3000 psi)	NOT ALLOWED
3/8" KWIK BOLT TZ	6"	4 3/8"	2" (3000 psi)	NOT ALLOWED
3/8" 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

- 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.
- IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE SOUNDNESS OF THE STRUCTURE WHERE PRODUCT IS TO BE ATTACHED TO INSURE 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.
- PRODUCTS INSTALLATION SHALL COMPLY WITH SPECS INDICATED IN THIS DRAWING PLUS ANY BUILDING AND ZONING REGULATIONS PROVIDED BY THE JURISDICTION WHERE PERMIT IS APPLIED TO.
- PRODUCT LIFTING MECHANISM NOT PART OF THIS APPROVAL.
- (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) CONTRACTOR 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 WHICH 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.
- SHUTTER MANUFACTURER'S LABEL SHALL BE LOCATED ON A READILY VISIBLE LOCATION AT PRODUCT IN ACCORDANCE WITH SECTION 1709.9.3 OF FLORIDA BUILDING CODE. ONE LABEL SHALL BE PLACED FOR EVERY OPENING. LABELING TO COMPLY WITH SECTION 1709.9.2 OF THE FLORIDA BUILDING CODE.

FLORIDA BUILDING CODE (High Velocity Hurricane Zone)

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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
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2			4		

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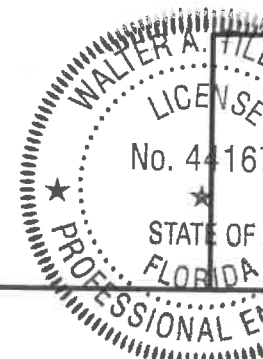
7/6/2020 DATE

20-173
DRAWING No

SHEET 1 OF 29

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7	INSTALLATION INTO WOOD FRAME STRUCTURES W/ SLATS ① & ③ & SLAT SCREW ⑪
8	INSTALLATION INTO WOOD FRAME STRUCTURES W/ SLATS ① & ③ & SLAT SCREW ⑪, SECTIONS D, E, D', E'
9	VERTICAL SECTIONS A, B, C FOR SLAT ①
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25	SLAT ① MULLION SCHEDULES, FLOOR TO CEILING & WALL MOUNTING, SCHEDULES 1 _c & 2 _c
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27	SLAT ① MULLION SCHEDULES, FLOOR TO CEILING & WALL MOUNTING, SCHEDULES 1 _{b'} & 2 _{b'}
28	SLAT ③ MULLION SCHEDULES, FLOOR TO CEILING & WALL MOUNTING, SCHEDULES 1 _a , 2 _a , 1 _c & 2 _c
29	SLAT ③ MULLION SCHEDULES, FLOOR TO CEILING & WALL MOUNTING, SCHEDULES 1 _{b'} & 2 _{b'}

FLORIDA BUILDING CODE (High Velocity Hurricane Zone)



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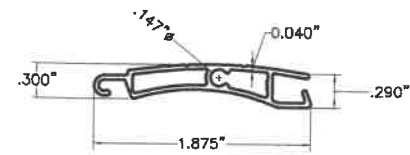
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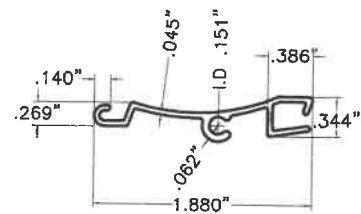
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 SHEET 2 OF 29

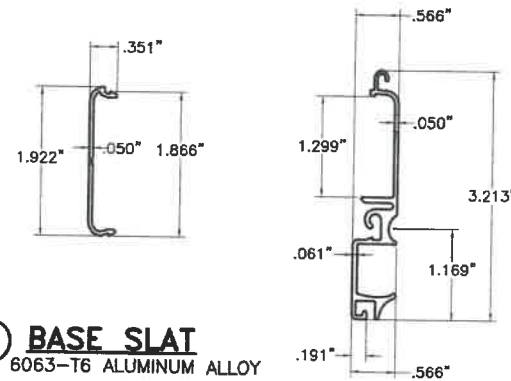
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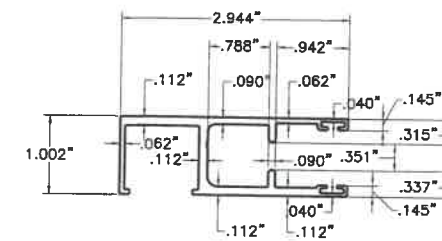
1 CLOSED SLAT
6063-T6 ALUMINUM ALLOY
SCALE 1 1/2"=1"



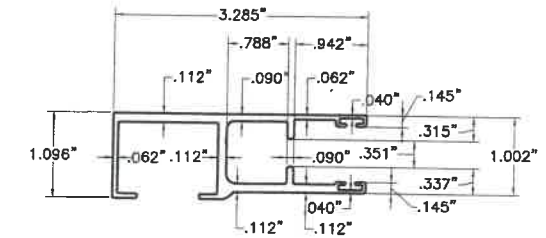
3 SLAT W/OPEN BACK W/SCREW BOSS
6063-T6 ALUMINUM ALLOY
SCALE 1 1/2"=1"



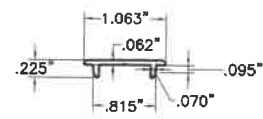
4 BASE SLAT
6063-T6 ALUMINUM ALLOY



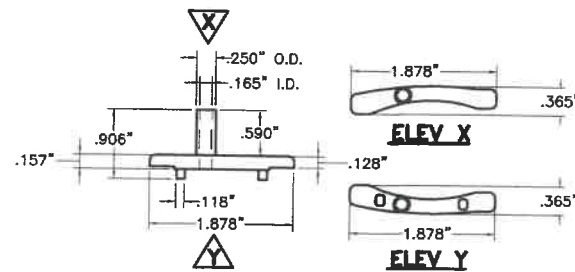
5 SIDE RAIL TYPE 1
6063-T6 ALUMINUM ALLOY



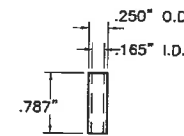
6 SIDE RAIL TYPE 2
6063-T6 ALUMINUM ALLOY



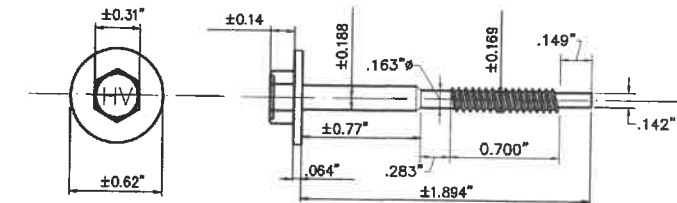
7 SNAP CAP
6063-T6 ALUMINUM ALLOY



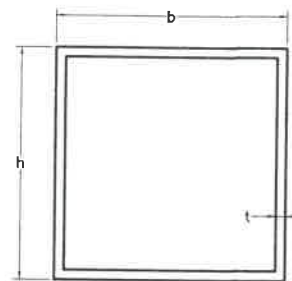
8 END CAP W/MONOLITHIC SCREW SLEEVE (LEFT SHOWN, RIGHT IS MIRROR)
RIGID NYLON, 76-78 TYPE "D" SHORE HARDNESS



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

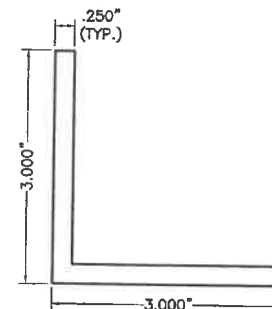


#8-32 x 1.894" AISI 410 S.S. SCREW W/ 0.31" ϕ HV MARKED HEAD & t= 0.064" x 0.620" ϕ MONOLITHIC WASHER W/ BERTHA H.V. DACROSHIELD COATING SYSTEM AS MANUFACTURED BY APPROVED COATING APPLICATORS REGISTERED WITH AMERICAN SHUTTER SYSTEM ASSOCIATION
11 SCREW EVERY OTHER SLAT, INCLUDING BASE SLAT FOR POURED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

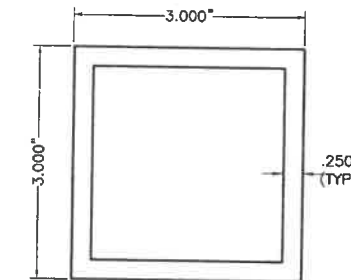


BUILD-OUT MOUNTED TUBES
6063-T6 ALUMINUM ALLOY

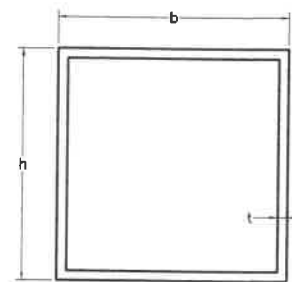
B.O TUBES	b	h	t
12 WOOD	3"	2" MAX.	0.125"
12A CONC./BLOCK	3"	4" MAX.	0.125"
15 CONC./BLOCK	4"	4" MAX.	0.25"



13 TRAPPED ANGLE
6063-T6 ALUMINUM ALLOY



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

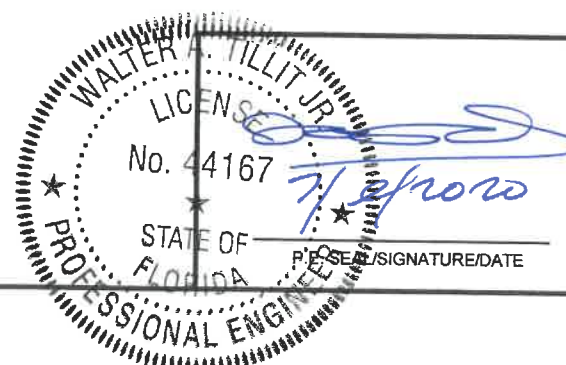


MULLIONS
6061-T6 ALUMINUM ALLOY

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

COMPONENTS

N.T.S.



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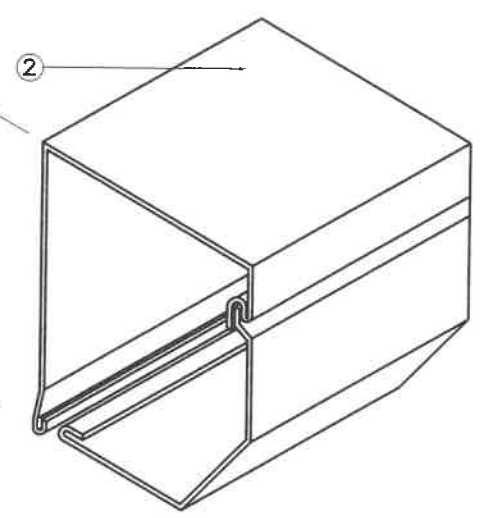
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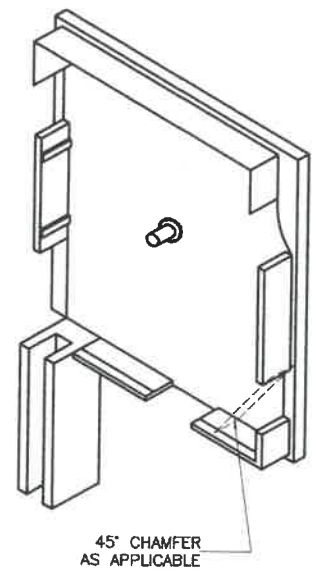
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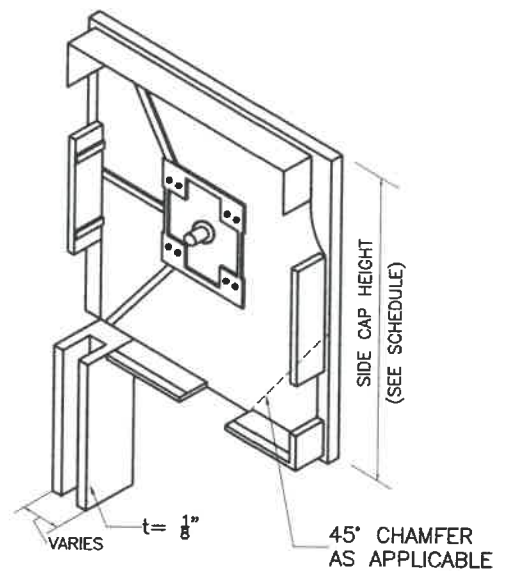
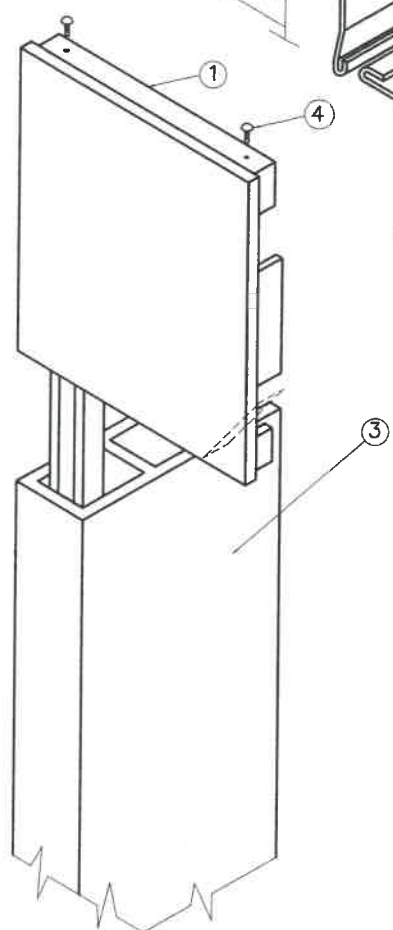
TYPE 10 : 12"
TYPE 9 : 10"
TYPE 8 : 9"
TYPE 7 : 8"
TYPE 6 : 7"
TYPE 5 : 6.5"
TYPE 4 : 6"
TYPE 3 : N/A
TYPE 2 : N/A
TYPE 1 : N/A



45 & 45/S HOUSINGS



90 HOUSING



1 END CAPS:

STRUCTURAL COMPONENTS FOR OPERATING SYSTEM

- ① - SIDE/END CAP (CAST ALUMINUM) *
 - ② - HOUSING, 0.040" THICK SHEET METAL (3105-H14 OR STRONGER)
 - ③ - SIDE RAIL
- FASTENERS**
- ④ - 3/16" ALUMINUM POP RIVETS (6 REQ'D EA. SIDE CAP) : 2 @ TOP, 2 @ REAR, 2 @ BOTTOM

* SHALL BE CAPABLE TO SUSTAIN SLAT'S WEIGHT AND ASSURE LIFTING MECHANISM (SEE NOTES 10/1 & 11(b)/1)

BOX STRUCTURAL COMPONENTS AND ASSEMBLY DETAIL

(SEE NOTES 10 & 11(b) ON SHEET 1)

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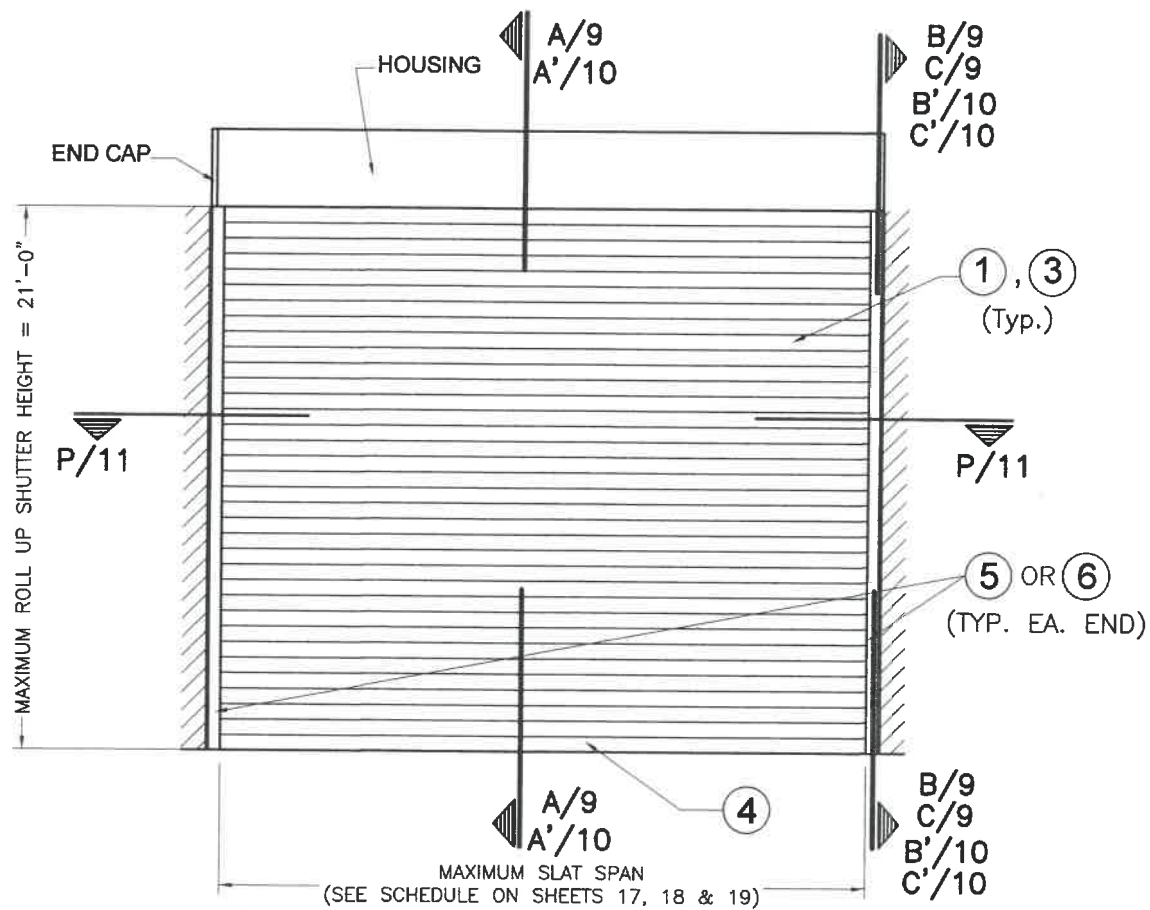
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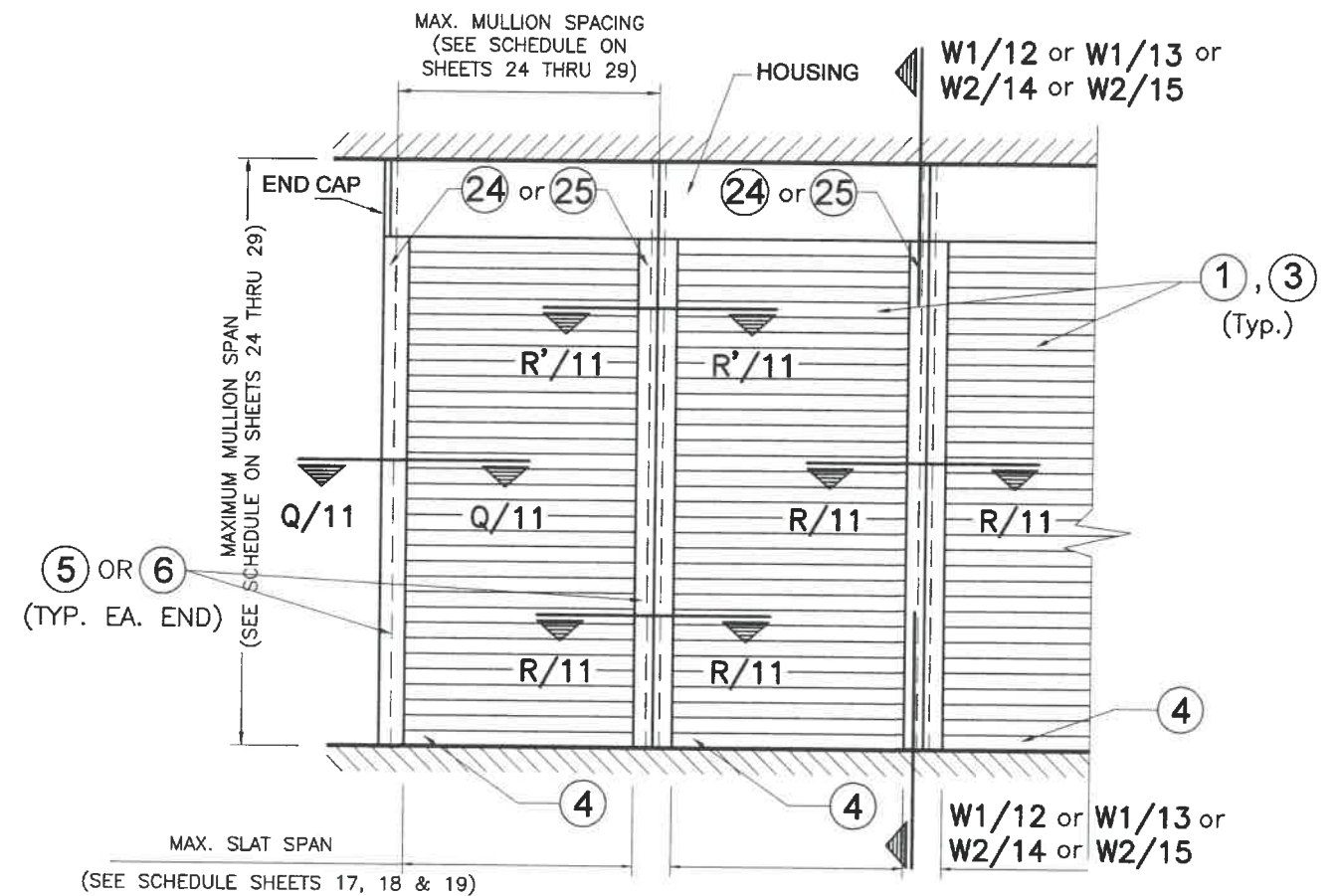
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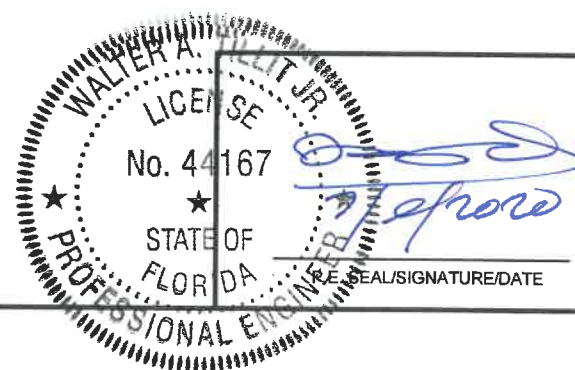
TYPICAL SINGLE UNIT ELEVATION W/O MULLIONS
 NOTE: SEE SHEETS 3 & 4 FOR COMPONENTS NOMENCLATURE.



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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 SEAL/SIGNATURE/DATE

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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:
M.P

7/6/2020
DATE

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1	OLD 17-225	7/6/2020	3		
2			4		

SHEET 5 OF 29

V_x FORCES (Lb/FT) & V_y 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)

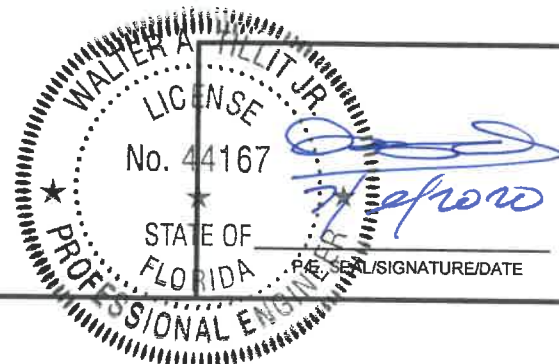
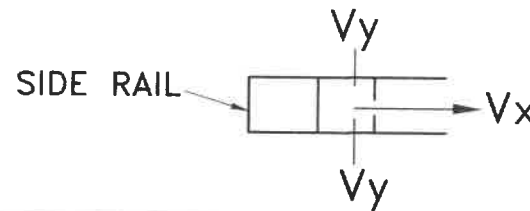
SLAT TYPE ①

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'	
	V _x	V _y	V _x	V _y	V _x	V _y	V _x	V _y	V _x	V _y	V _x	V _y	V _x	V _y
≤ 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")	
	V _x	V _y	V _x	V _y	V _x	V _y	V _x	V _y	V _x	V _y
≤ 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 V_x AND V_y FORCES IN POUNDS PER UNIT FOOT OF PRODUCT HEIGHT AT BOTH JAMBS. SEE THIS SHEET FOR V_x & V_y VALUES.



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

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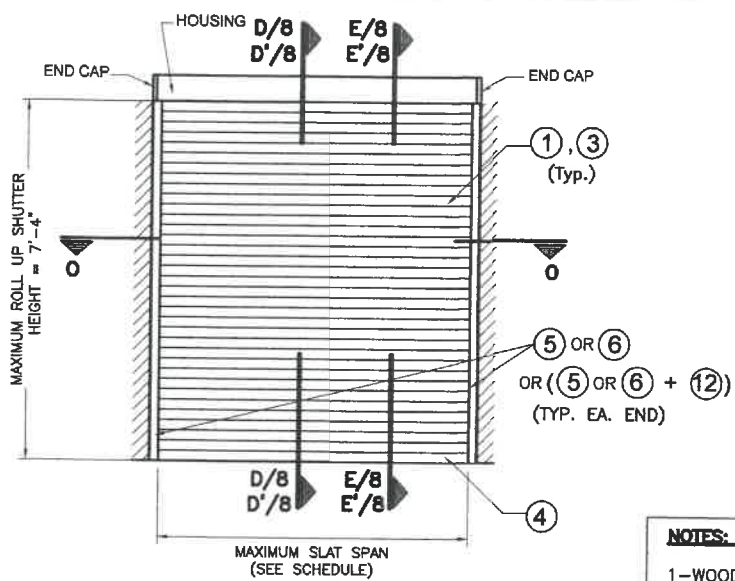
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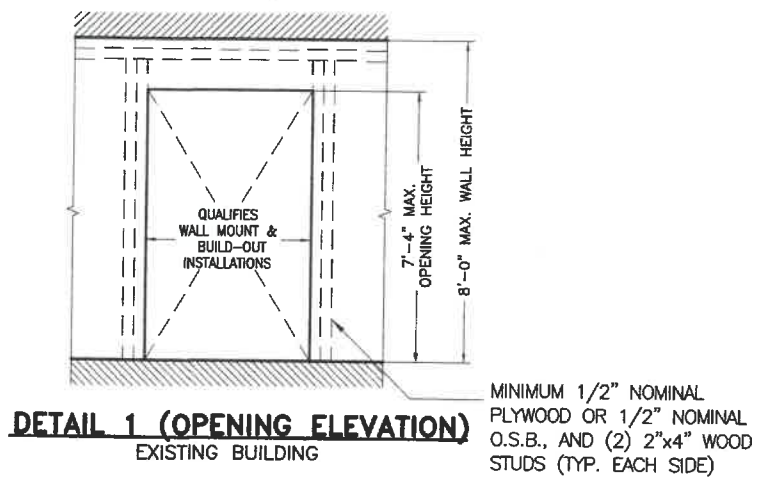
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1	OLD 17-225	7/6/2020	3		
2			4		

SHEET 6 OF 29



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



**DETAIL 1 (OPENING ELEVATION)
EXISTING BUILDING**

MINIMUM 1/2" NOMINAL PLYWOOD OR 1/2" NOMINAL O.S.B., AND (2) 2"x4" WOOD STUDS (TYP. EACH SIDE)

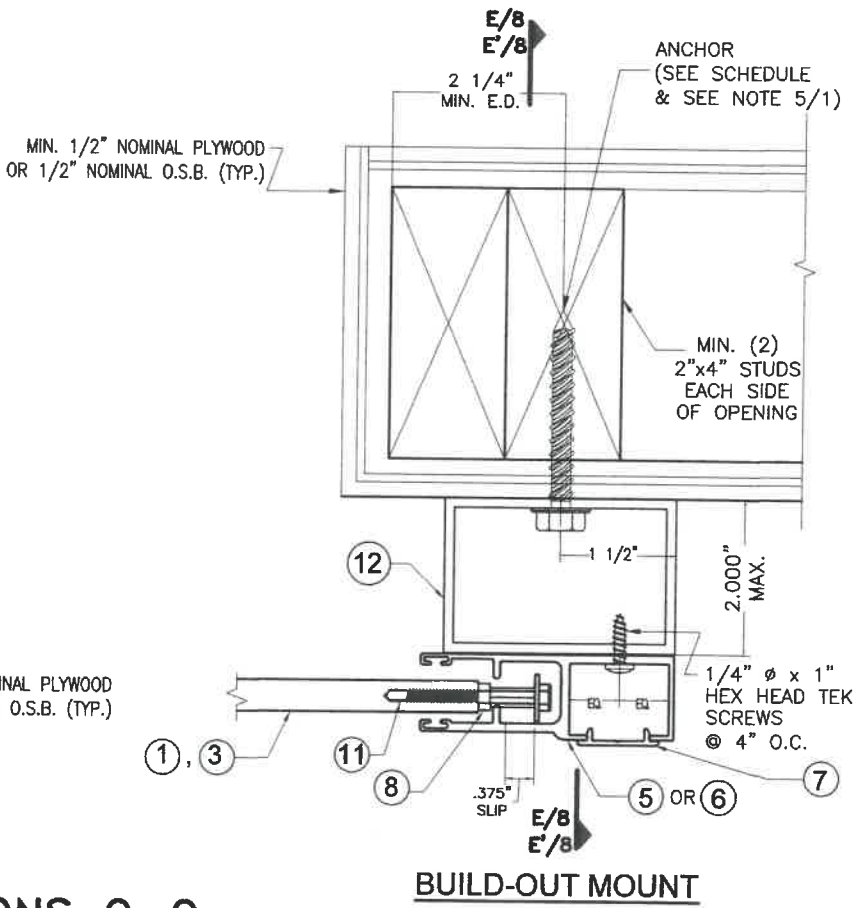
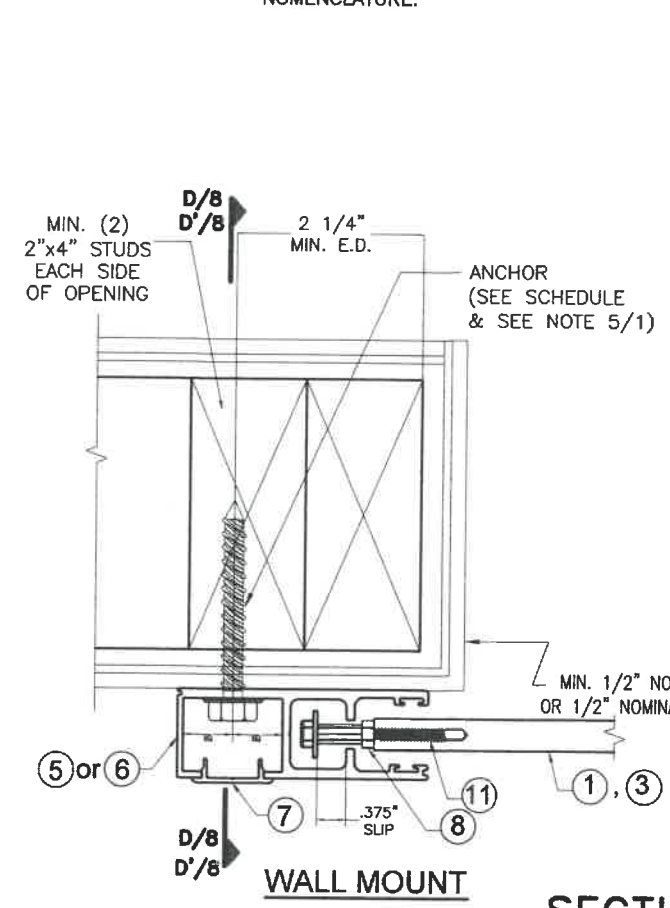
NOTES: FOR DETAIL 1

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-VALID 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.

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"

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

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

DATE/SIGNATURE/DATE

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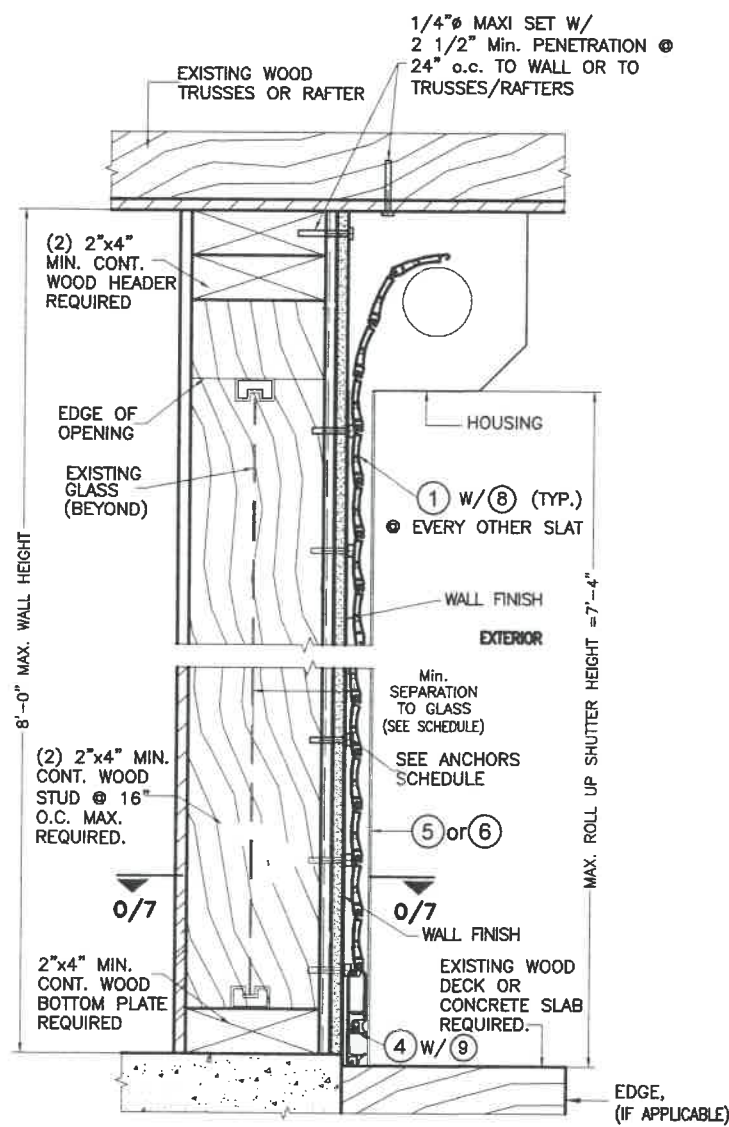
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WALTER A. TILLIT Jr., P.E.
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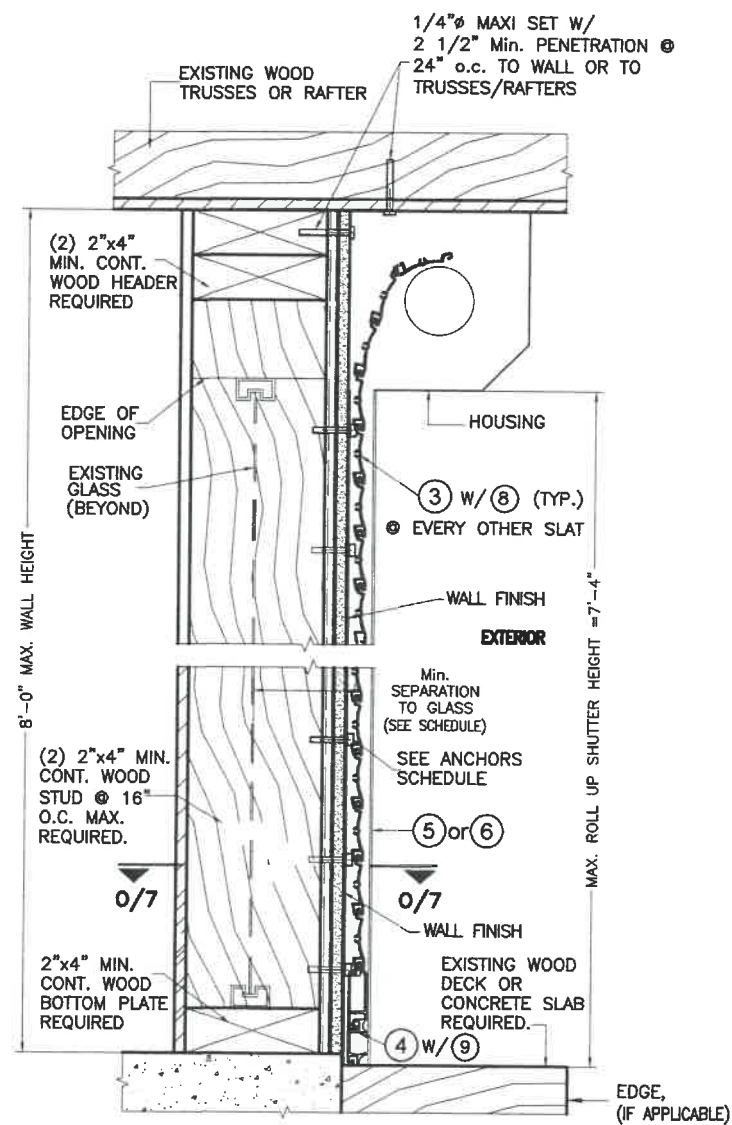
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40mm ER SLAT BERTHA IMPACT PROTECTIVE ROLLING SYSTEM			AMERICAN SHUTTER SYSTEMS ASSOC., INC.		
REV. No	DESCRIPTION	DATE	REV. No	DESCRIPTION	DATE
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2			4		

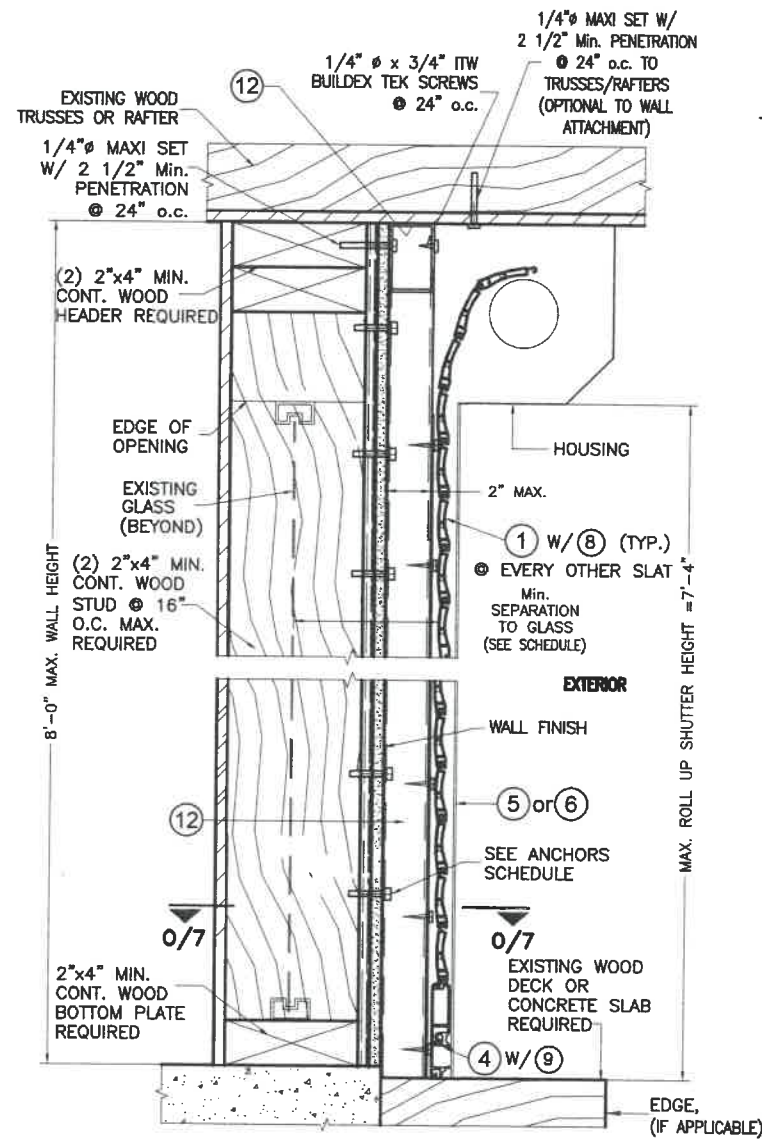
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SHEET 7 OF 29



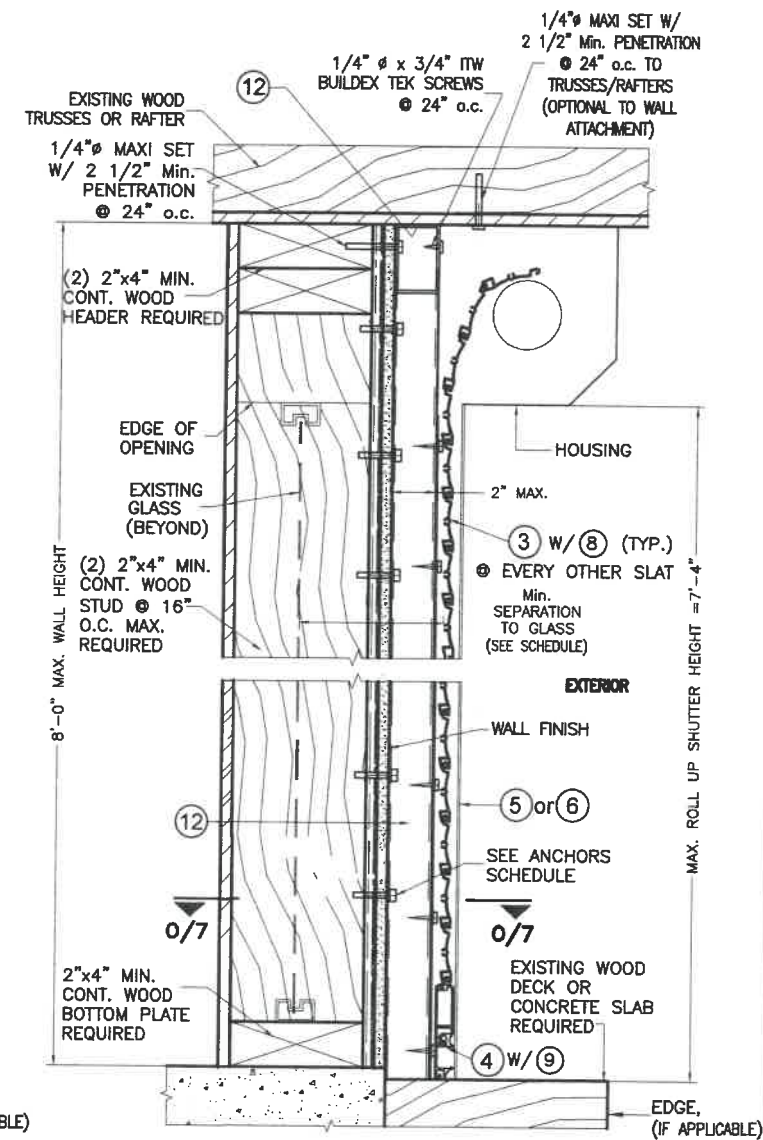
**WALL MOUNTING
SECTION D-D**
N.T.S.



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

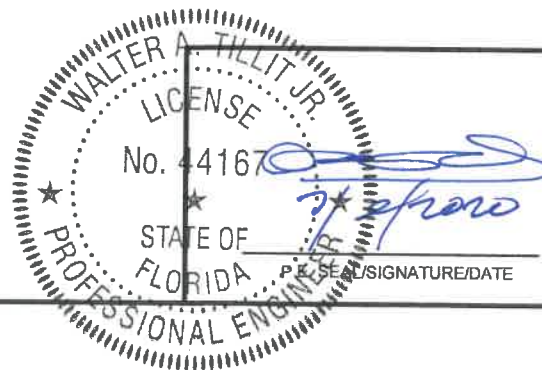


**BUILD-OUT MOUNTING
SECTION E-E**
N.T.S.



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

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



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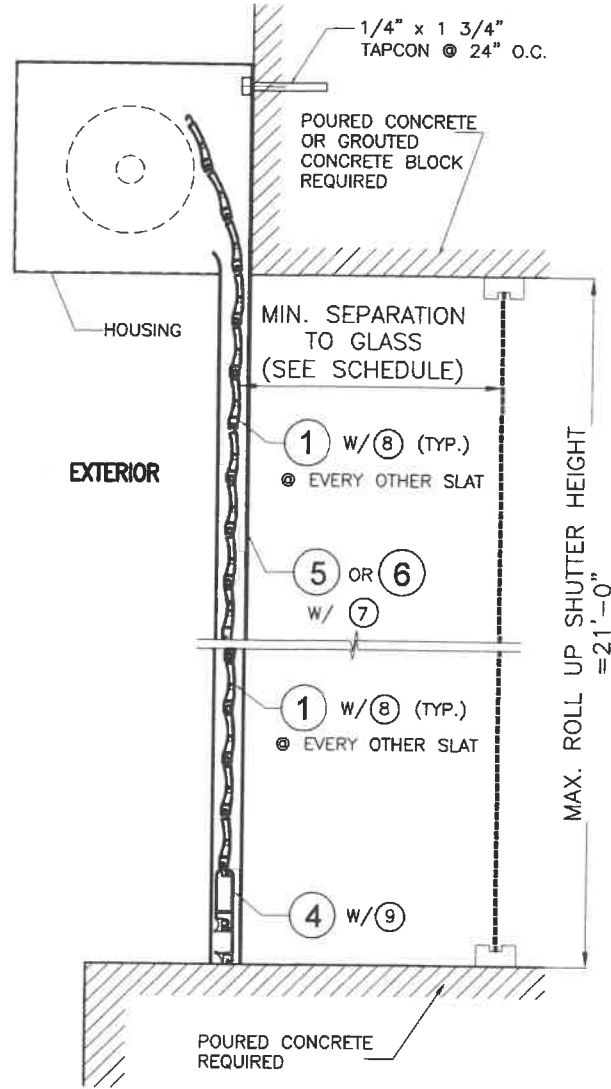
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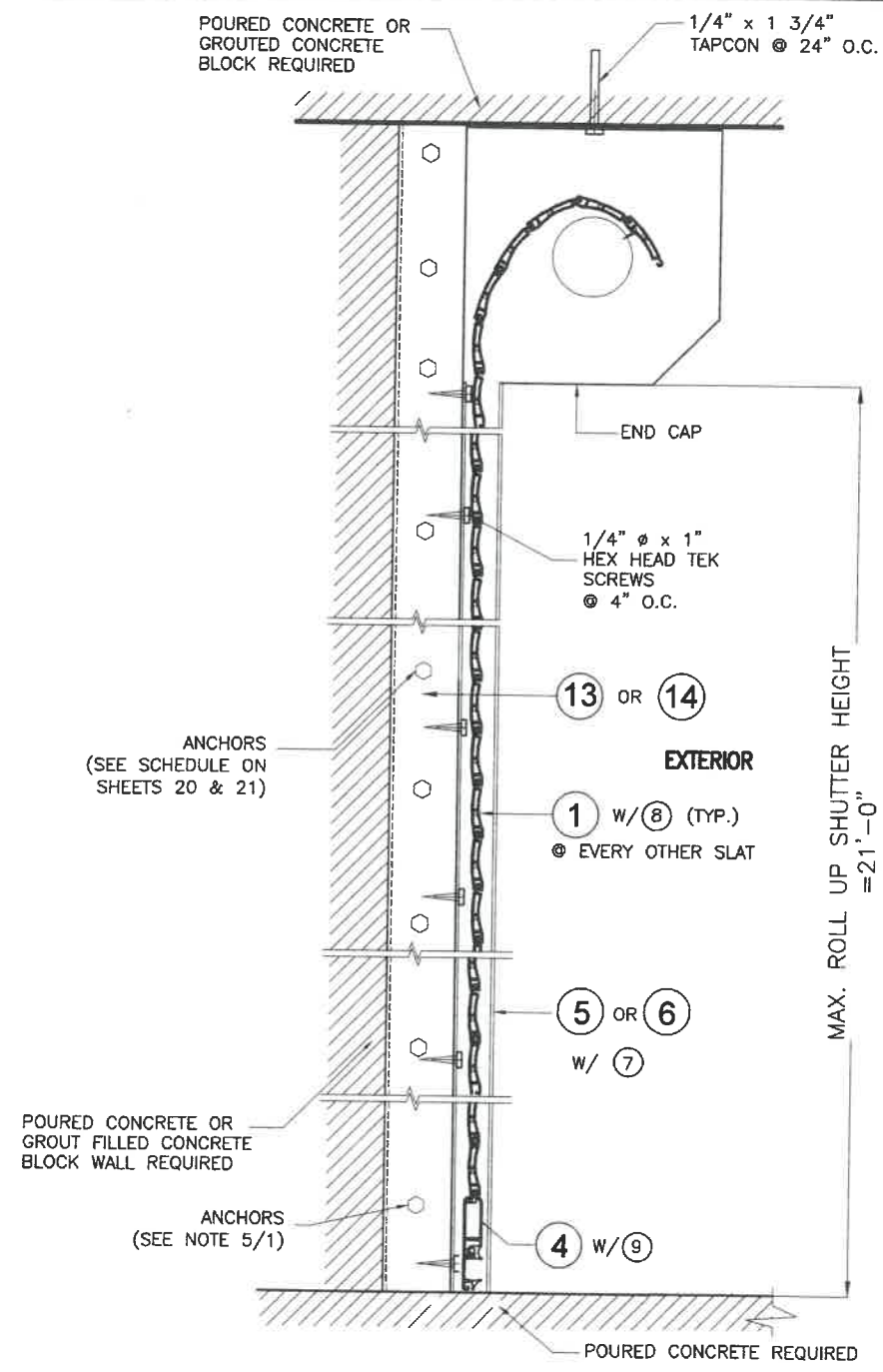
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DRAWING No

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2			4		

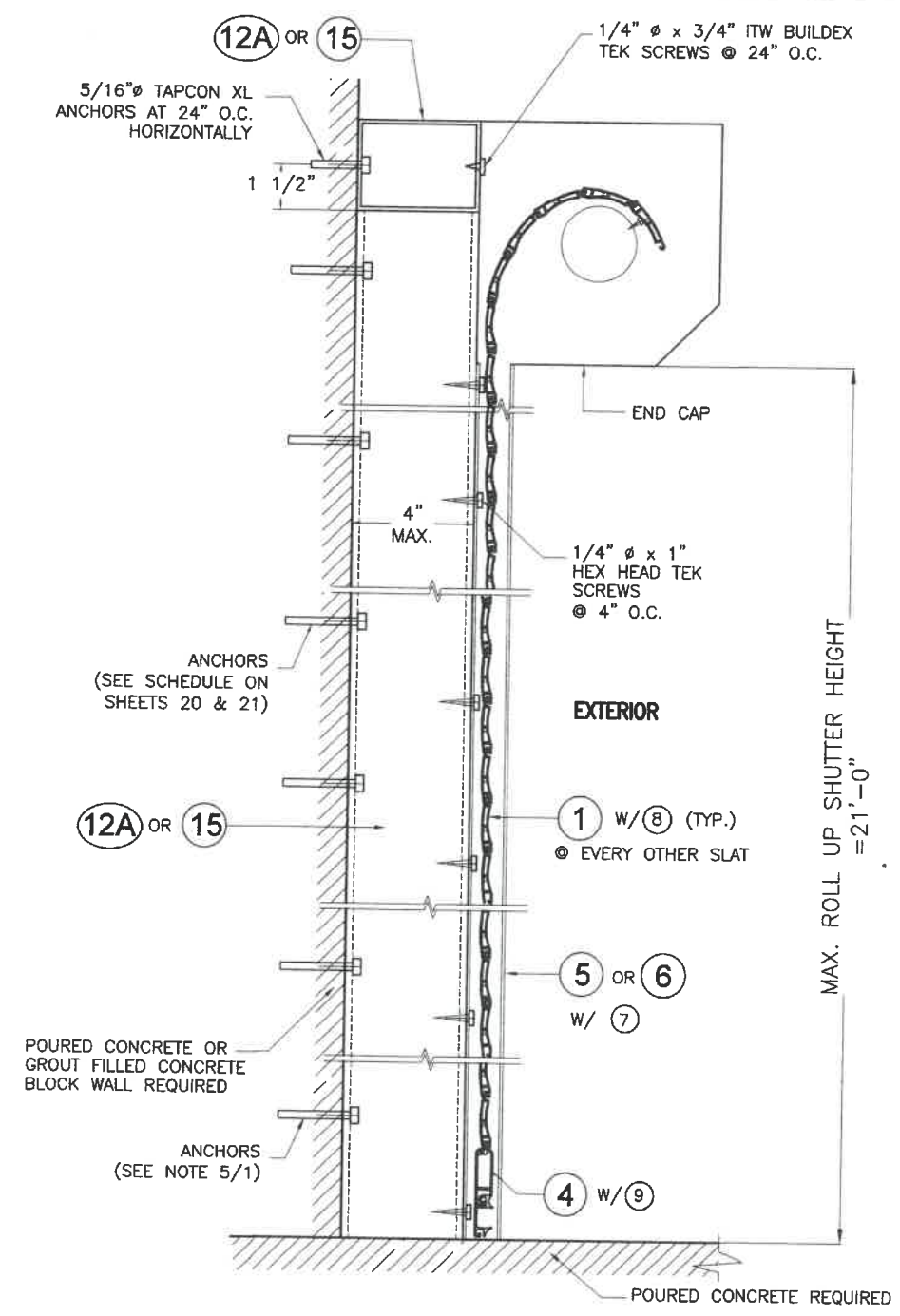
SHEET 8 OF 29



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

N.T.S.

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

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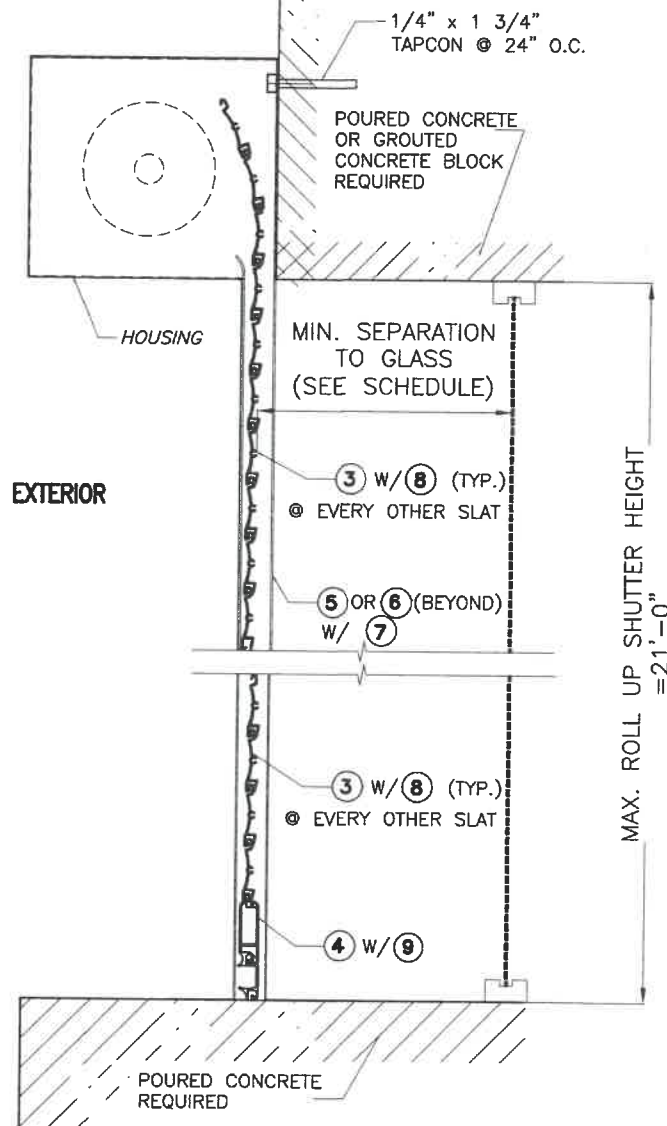
TILTECO INC.
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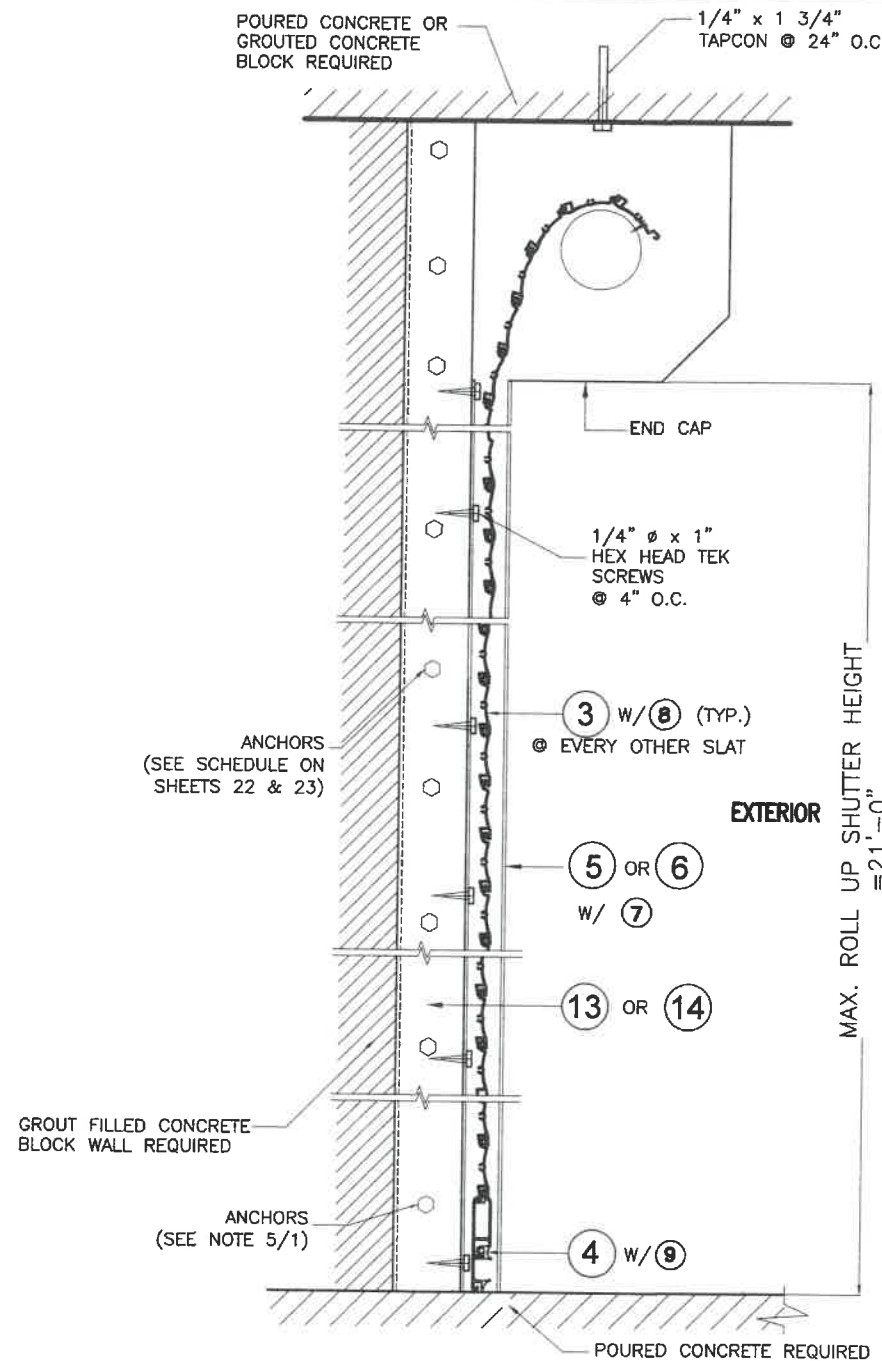
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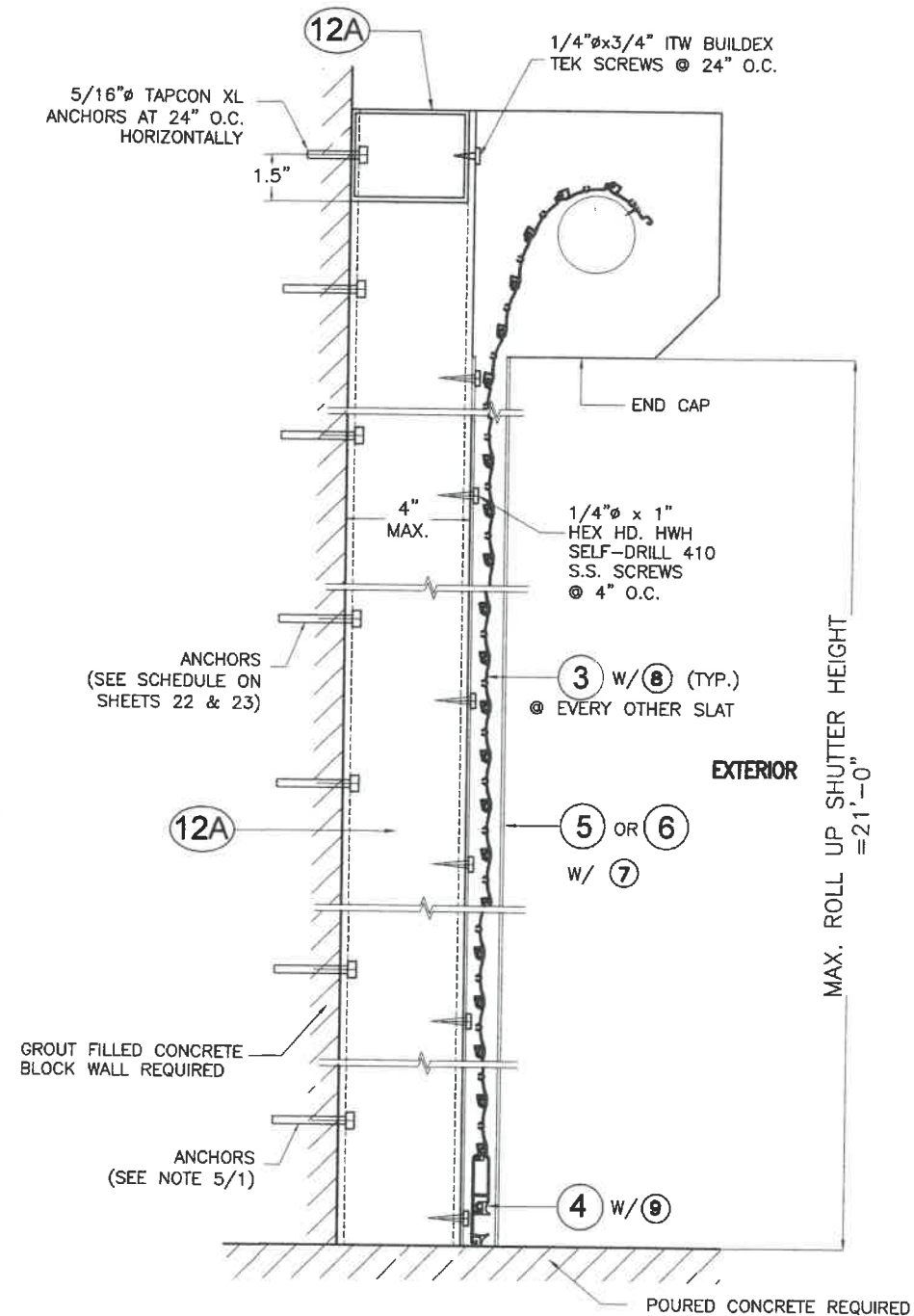
REV. No	DESCRIPTION	DATE	REV. No	DESCRIPTION	DATE
1	OLD 17-225	7/6/2020	3		
2			4		



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

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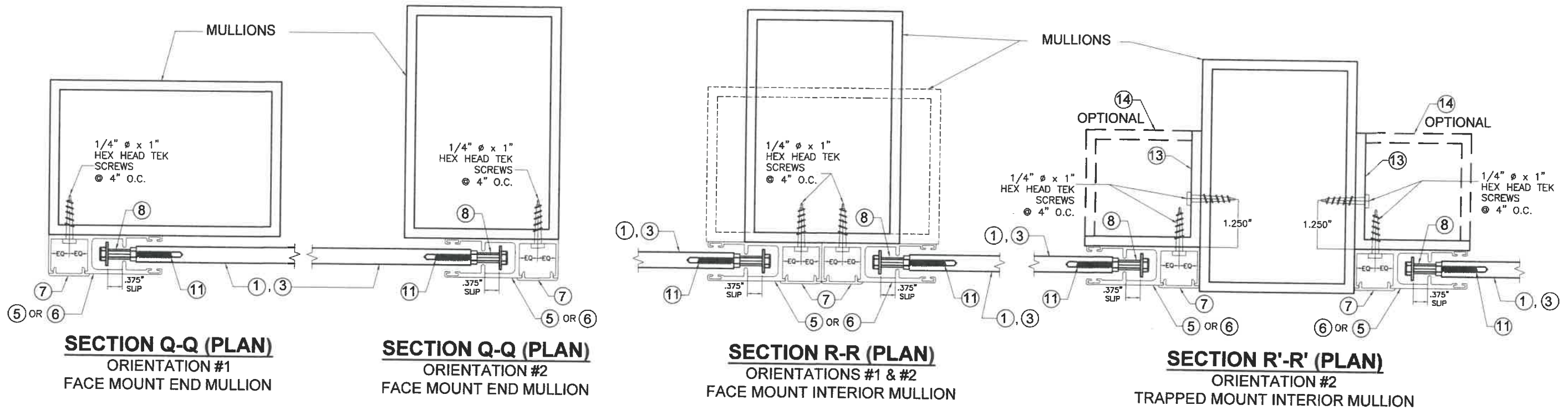
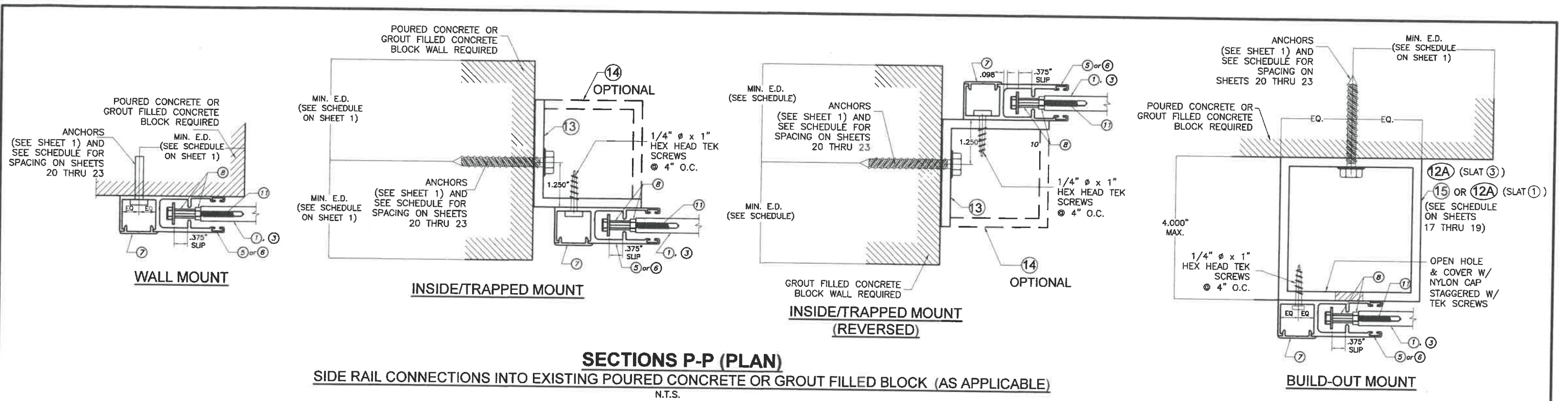
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1	OLD 17-225	7/6/2020	3		
2			4		



SIDE RAIL CONNECTIONS INTO MULLIONS
N.T.S.

END RETENTION SYSTEM

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No. 44 67
STATE OF FLORIDA
PROFESSIONAL ENGINEER
P.E. SEAL/SIGNATURE/DATE

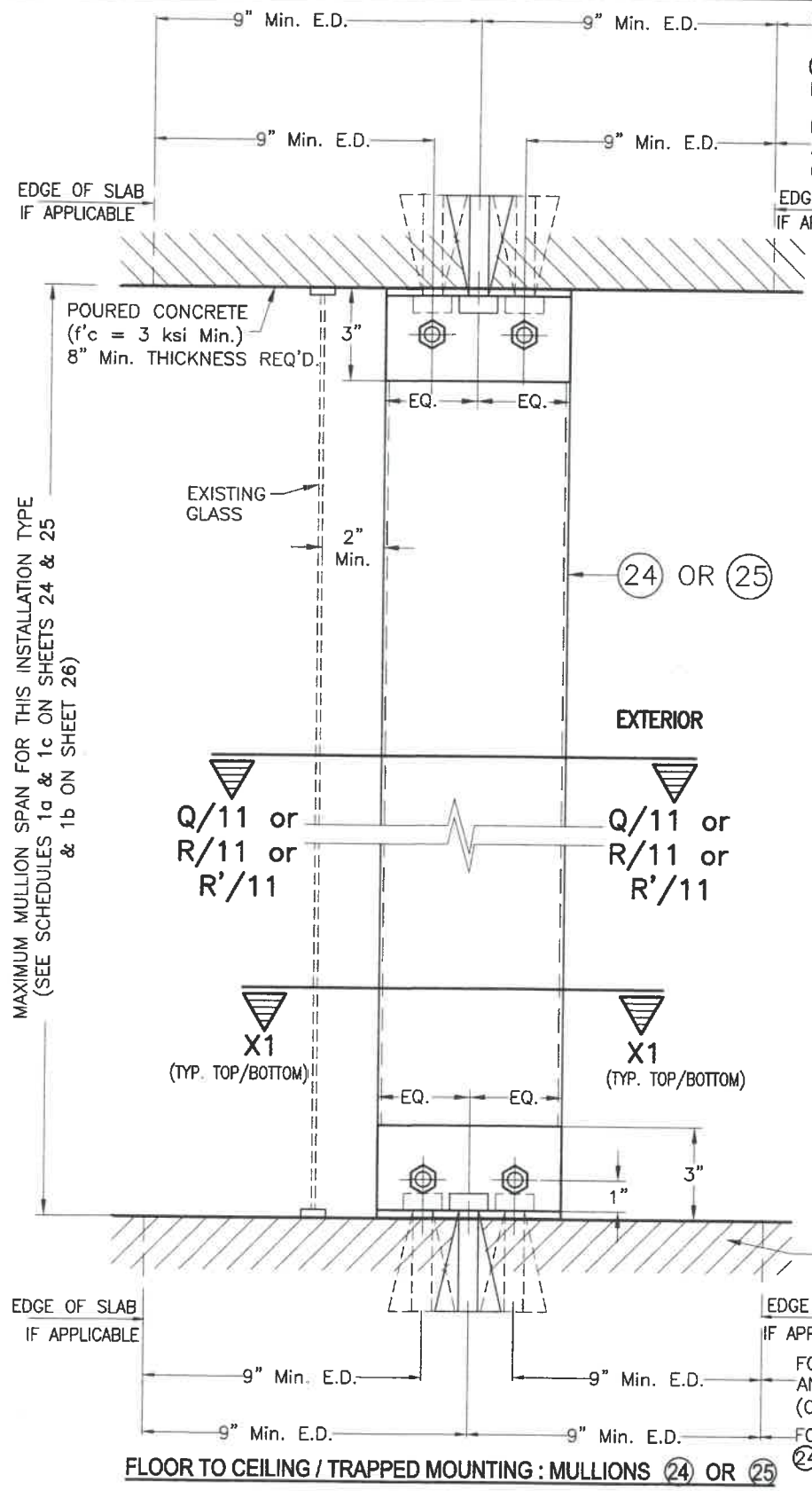
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SHEET 11 OF 29

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1	OLD 17-225	7/8/2020	3		
2			4		



FOR (1) 3/4" KWIK BOLT TZ EXPANSION ANCHORS @ END AND INTERIOR MULLIONS 24 & 25 (ORIENTATION #1) AND END MULLIONS 24 & 25 (ORIENTATION #2)

FOR (2) 3/4" KWIK BOLT TZ EXPANSION ANCHORS @ INTERIOR MULLION 25 (ORIENTATION #2).

POURED CONCRETE (f'c = 3 ksi Min.) 8" Min. THICKNESS REQ'D.

EDGE OF SLAB IF APPLICABLE

EDGE OF SLAB IF APPLICABLE

EXISTING GLASS

POURED CONCRETE (f'c = 3 ksi Min.) 8" Min. THICKNESS REQ'D.

EDGE OF SLAB IF APPLICABLE

EDGE OF SLAB IF APPLICABLE

FOR (2) 3/4" KWIK BOLT TZ EXPANSION ANCHORS @ INTERIOR MULLION 25 (ORIENTATION #2).

FOR (1) 3/4" KWIK BOLT TZ EXPANSION ANCHORS @ END AND INTERIOR MULLIONS 24 & 25 (ORIENTATION #1 & #2) AND END MULLION 25 (ORIENTATION #2)

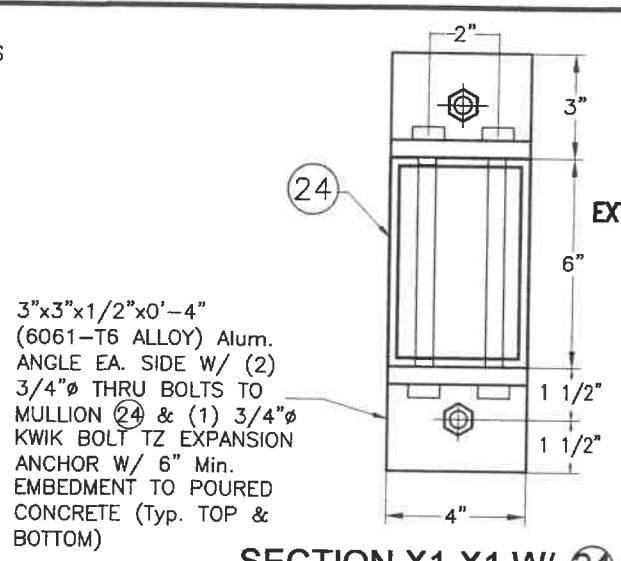
MAXIMUM MULLION SPAN FOR THIS INSTALLATION TYPE (SEE SCHEDULES 1a & 1c ON SHEETS 24 & 25 & 1b ON SHEET 26)

SECTIONS W-1

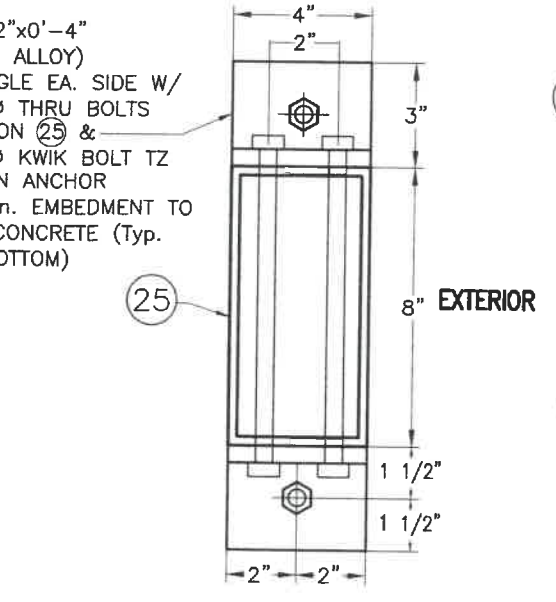
END & INTERIOR TRAPPED MOUNTED MULLION INSTALLATION *

APPLICABLE TO ALL INSTALLATIONS EXCEPT THOSE W/ LIMITATIONS COVERED ON SHEET 13

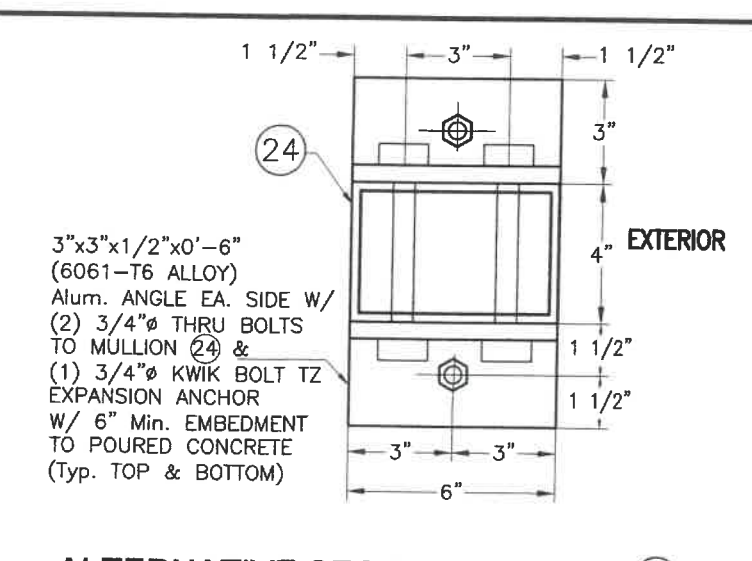
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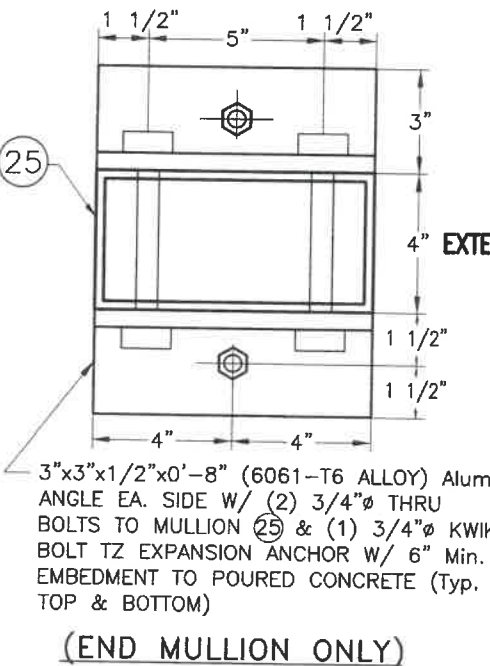
SECTION X1-X1 W/ 24 *
(4"x6" END & INTERIOR MULLION W/ ORIENTATION #1)



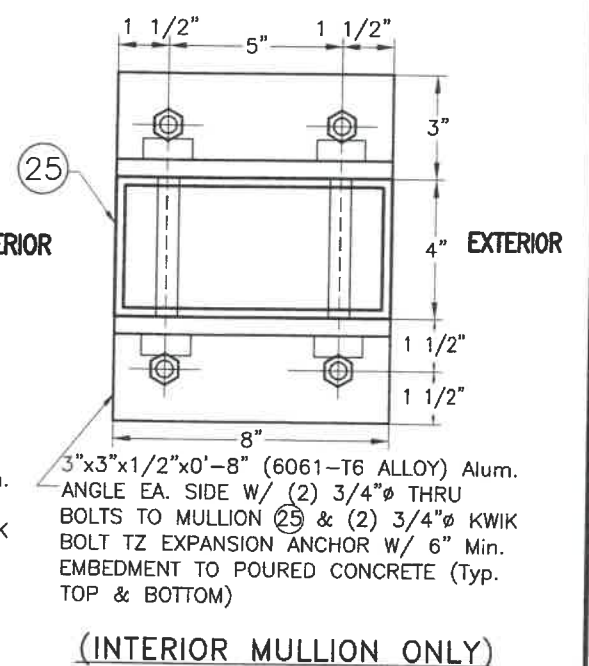
SECTION X1-X1 W/ 25 *
(4"x8" END & INTERIOR MULLION W/ ORIENTATION #1)



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



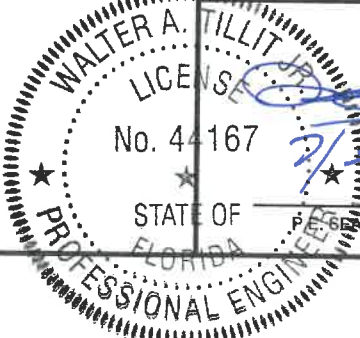
ALTERNATIVES SECTION X1-X1 W/ 25 *
(END MULLION ONLY)



ALTERNATIVES SECTION X1-X1 W/ 25 *
(INTERIOR MULLION ONLY)

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

END RETENTION SYSTEM



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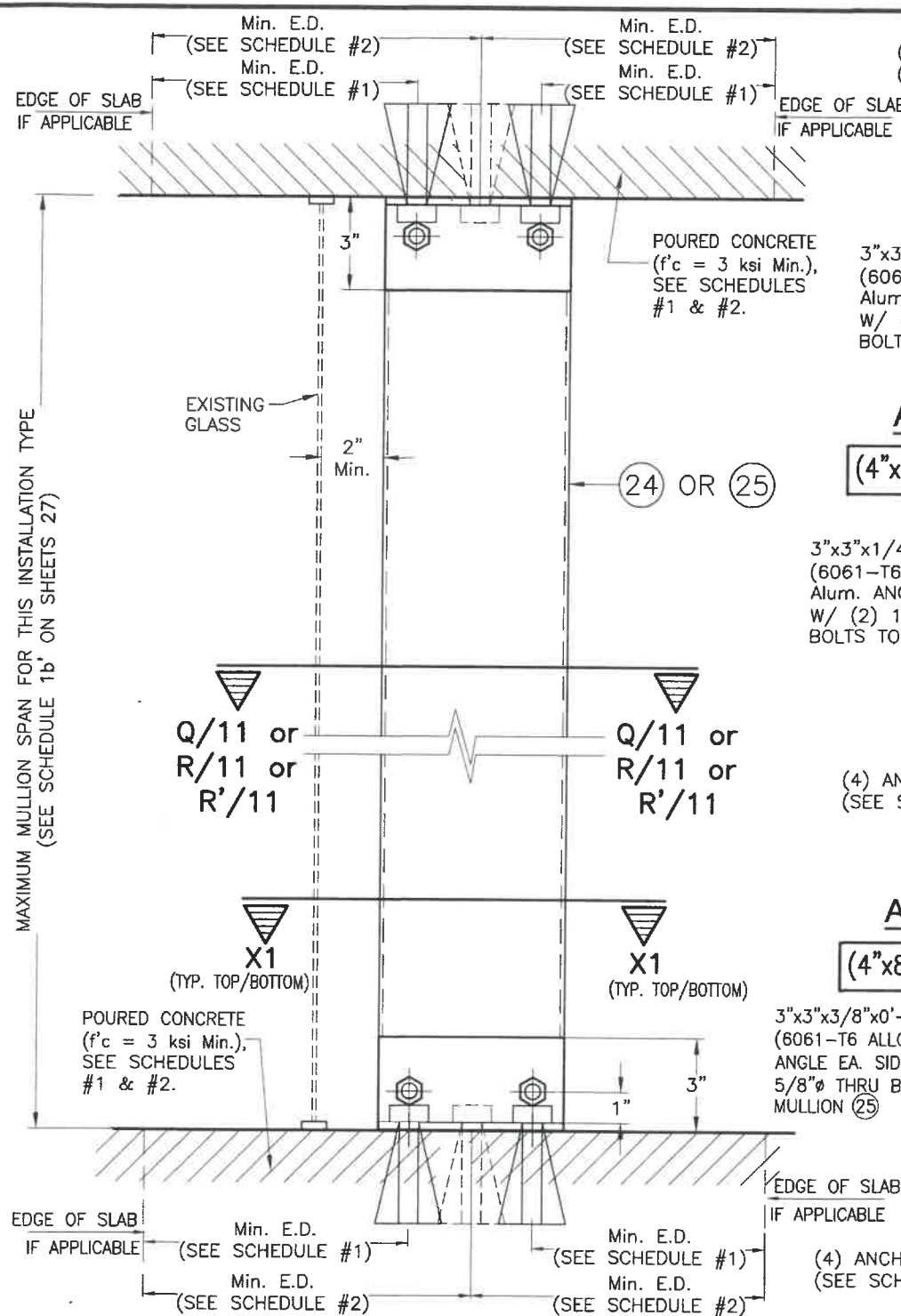
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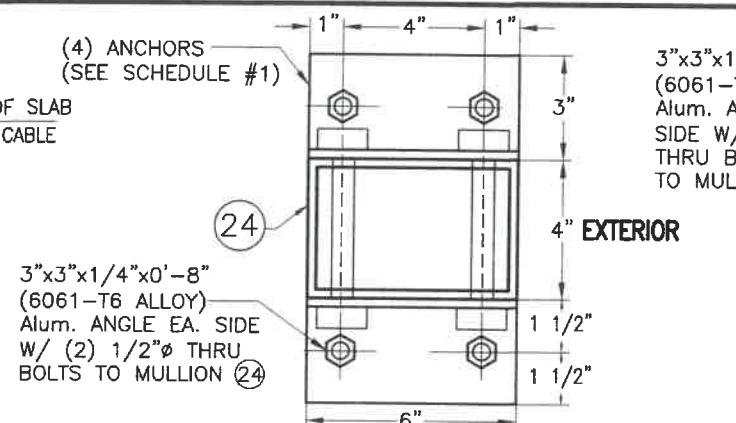


SECTIONS W-1

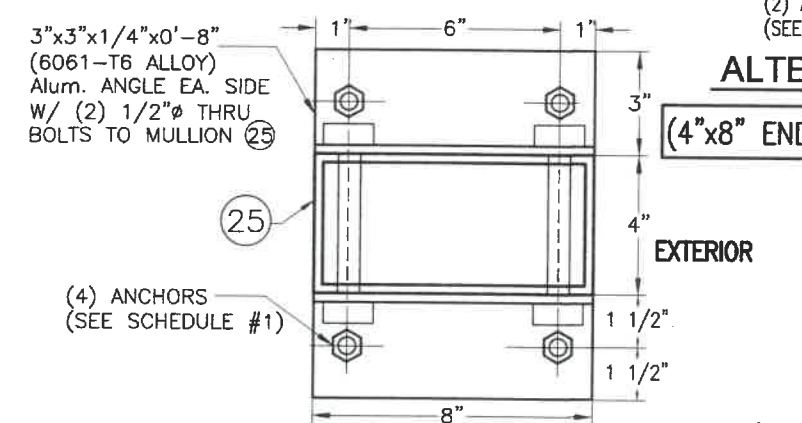
END RETENTION SYSTEM

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

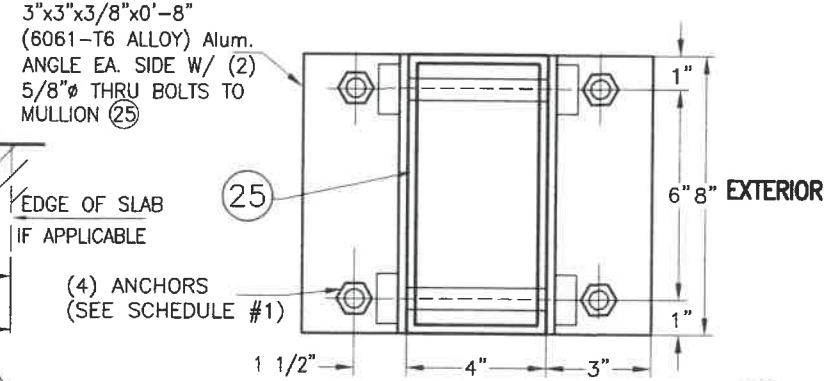
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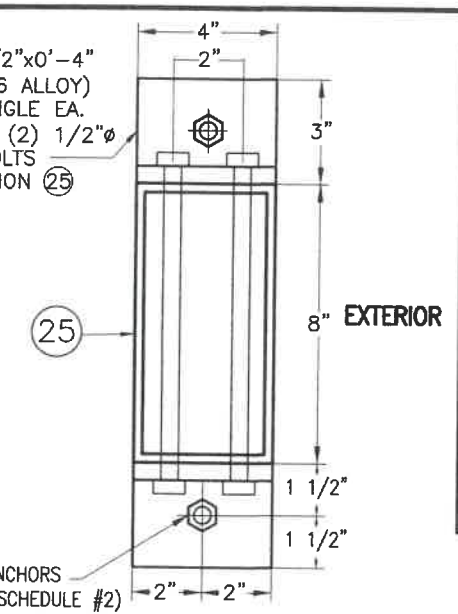
ALTERNATIVE SECTION X1-X1 W/ (24)*
(4"x6" INTERIOR MULLION ONLY W/ ORIENTATION # 2)



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):

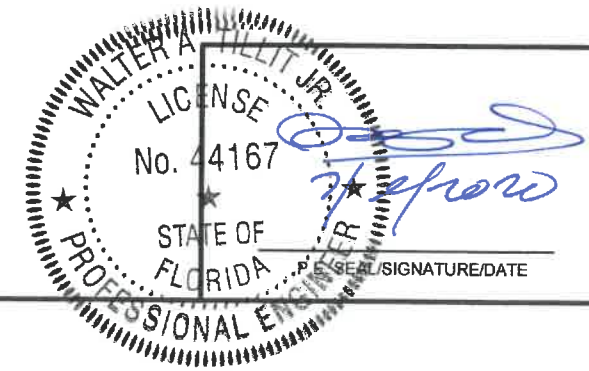
INSTALLATION CASE I - RESIDENTIAL AND COMMERCIAL APPLICATIONS W/ MAXIMUM A.S.D. DESIGN LOAD, MAXIMUM MULLION SPACING. SEE SCHEDULES #1 & #2 FOR ANCHOR SPECS.

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" HILTI INC KWIK HUS-H SCREW & 3/8" DEWALT, INC WEDGE-BOLT ANCHOR FOR (24) & (25) (INTERIOR) MULLIONS W/ ORIENTATION #2.	2 1/2"	5 1/2"
		1/2" HILTI INC KWIK HUS-H SCREW & 1/2" DEWALT, INC. WEDGE-BOLT ANCHOR FOR (25) (END & INTERIOR) MULLION W/ ORIENTATION #1.	3"	6"
Ia	4"	1/2" 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" HILTI INC KWIK HUS-H SCREW & 1/2" DEWALT, INC. WEDGE-BOLT ANCHOR FOR (24) & (25) (END OR INTERIOR MULLION) W/ ORIENTATIONS #1 OR #2.	3"	6"
II	6"	1/2" 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" HILTI INC KWIK HUS-H SCREW OR 1/2" 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" HILTI INC KWIK HUS-H SCREW & 5/8" DEWALT, INC. WEDGE-BOLT ANCHOR W/ ORIENTATION #1.	2 1/2"	7 1/2"



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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

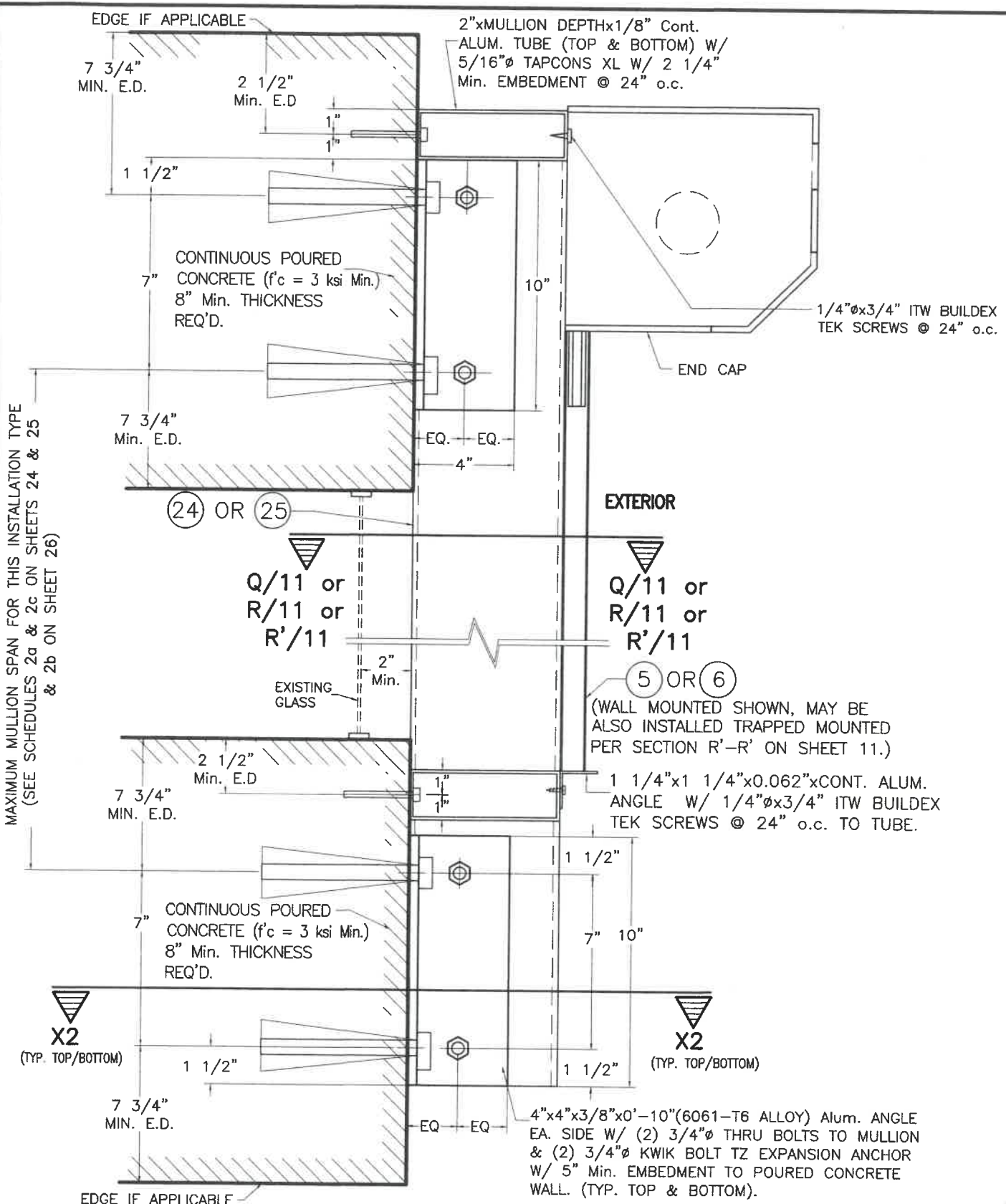
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 4268 WESTROADS DRIVE
 WEST PALM BEACH, FL. 33407
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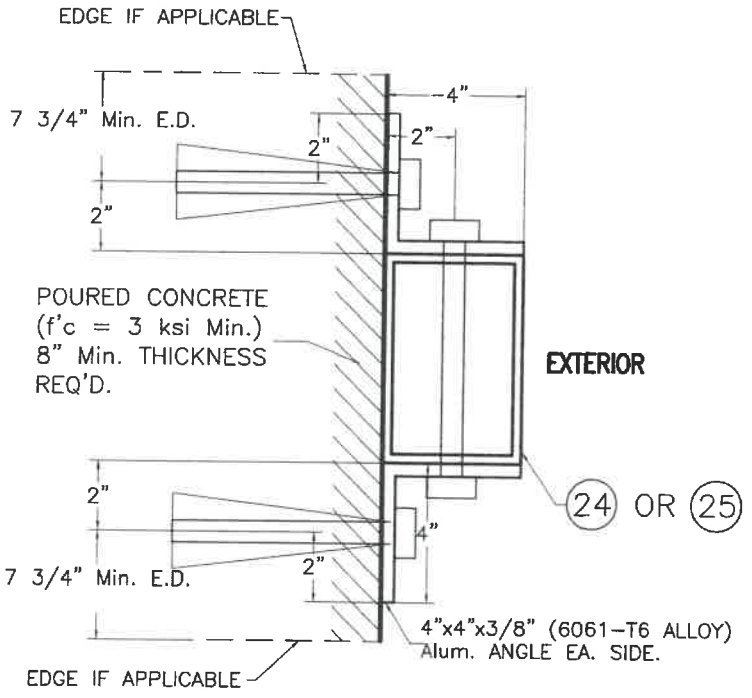
REV. No	DESCRIPTION	DATE	REV. No	DESCRIPTION	DATE
1	OLD 17-225	7/6/2020	3		
2			4		

SHEET 13 OF 29

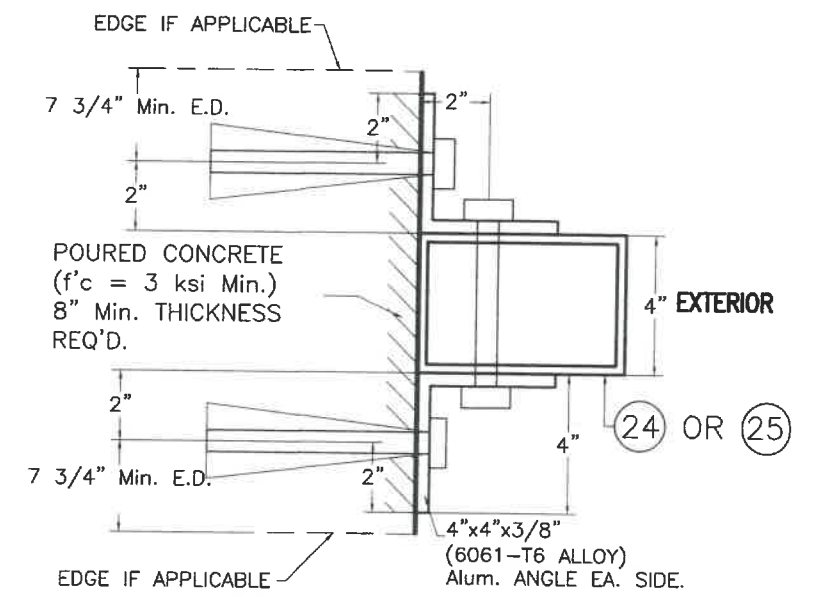
MAXIMUM MULLION SPAN FOR THIS INSTALLATION TYPE
(SEE SCHEDULES 2a & 2c ON SHEETS 24 & 25
& 2b ON SHEET 26)



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")

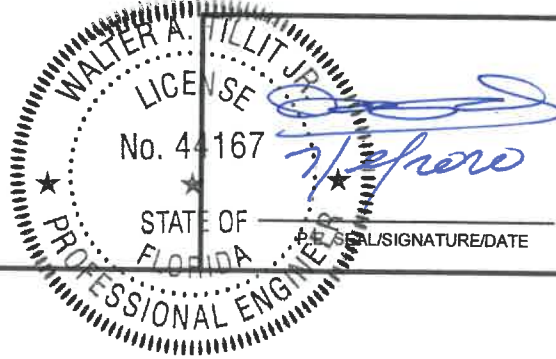


ALTERNATIVE SECTION X2-X2 W/ 24 OR 25*
(END & INTERIOR MULLION)
(W/ ORIENTATION # 2)
(4"x6" or 4"x8")

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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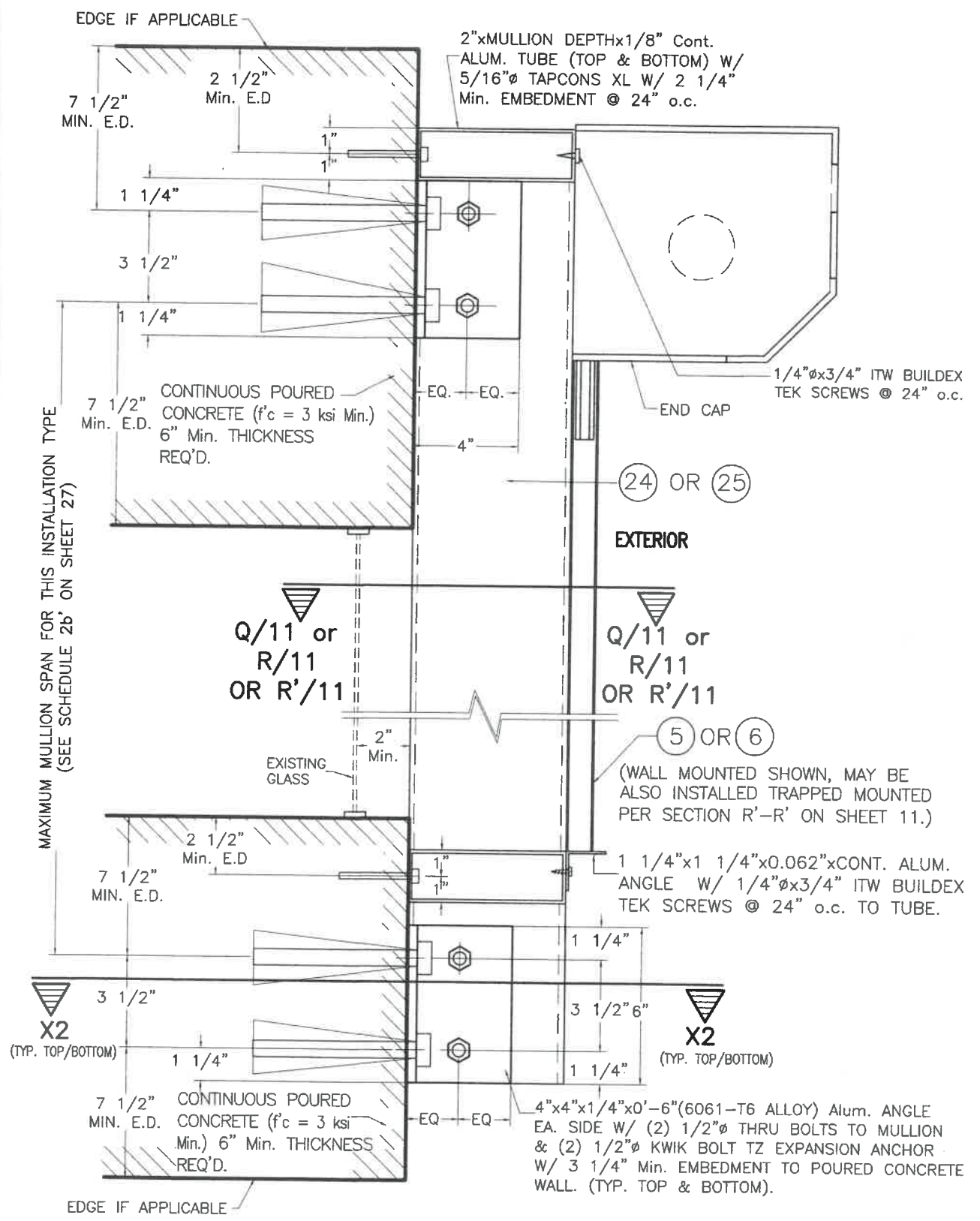
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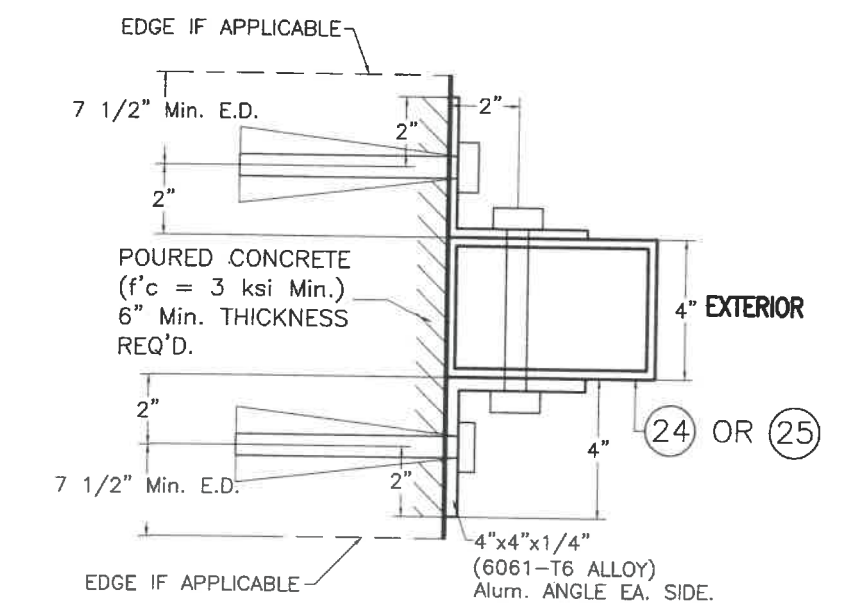
SHEET 14 OF 29

REV. No	DESCRIPTION	DATE	REV. No	DESCRIPTION	DATE
1	OLD 17-225	7/6/2020	3		
2			4		

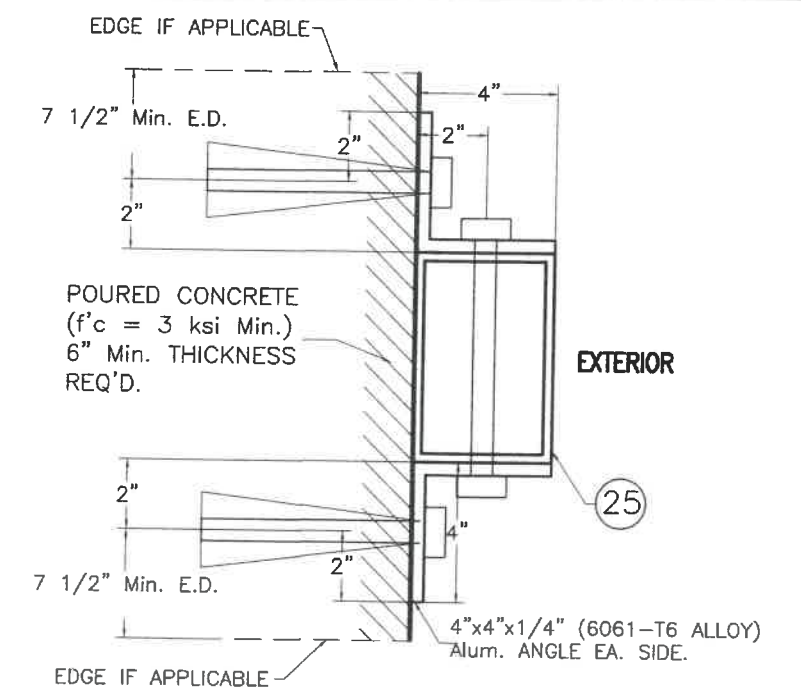


WALL MOUNTING : MULLIONS (24) OR (25)
POURED CONCRETE WALL

SECTION W-2



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.

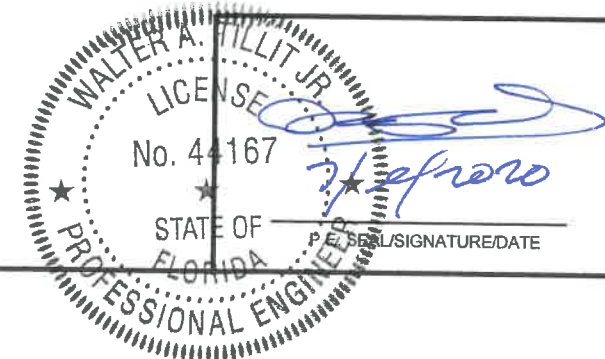
INSTALLATION CASE II' - COMMERCIAL APPLICATION FOR MAXIMUM A.S.D. DESIGN LOAD, MAXIMUM MULLION SPACING. VALID FOR CONNECTION TO CONCRETE W/ HILTI INC KWIK BOLT TZ ANCHORS.

END RETENTION SYSTEM

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

SCALE: 1/8" = 1"

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40mm ER SLAT BERTHA IMPACT PROTECTIVE ROLLING SYSTEM

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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).

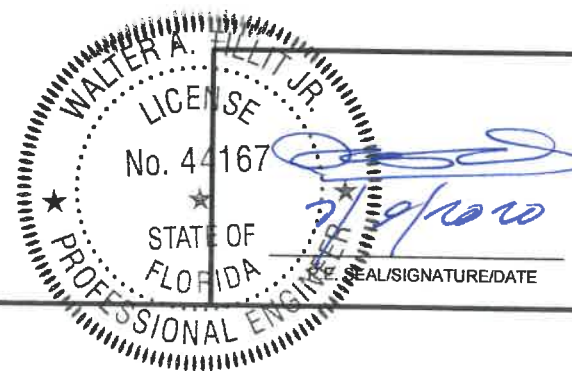
STEP 2: ENTER TO CHARTS Ia, Ib & Ic ON SHEETS 17 & 18 FOR SLAT ①, AND TO CHARTS Ia, Ib & Ic ON SHEET 19 FOR SLAT ③ TO DETERMINE, BASED ON SUBSTRATE, ANCHOR TYPE AT SIDE RAILS & A.S.D. DESIGN LOAD (p.s.f.); THE MAXIMUM SLAT SPAN "LMAX" (ft) AND THE REQUIRED SEPARATION TO GLASS.

STEP 3: OBTAIN INFORMATION ON PRODUCT'S SIDE RAIL ANCHOR SPACING REQUIREMENTS FOR CONNECTION TO EXISTING STRUCTURE FROM ANCHOR SCHEDULES Iia & Iib ON SHEETS 20 & 21 FOR SLAT ① & FROM ANCHOR SCHEDULES Iia & 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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SHEET 16 OF 29

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	
3/8"Ø WEDGE BOLT ANCHOR						5/16"Ø TAPCON XL, ULTRACON OR TAPPER +XTREME ANCHORS							
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 SEE NOTES*	TRAPPED MOUNT SEE NOTES*	2" BUILD-OUT MOUNT W/ (12A) SEE NOTES*	4" BUILD-OUT MOUNT W/ (12A) SEE NOTES*	2" BUILD-OUT MOUNT W/ (15) SEE NOTES*	4" BUILD-OUT MOUNT W/ (15) SEE NOTES*	WALL MOUNT SEE NOTES*	TRAPPED MOUNT SEE NOTES*	2" BUILD-OUT MOUNT W/ (12A) SEE NOTES*	4" BUILD-OUT MOUNT W/ (12A) SEE NOTES*	2" BUILD-OUT MOUNT W/ (15) SEE NOTES*	4" BUILD-OUT MOUNT W/ (15) 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:**

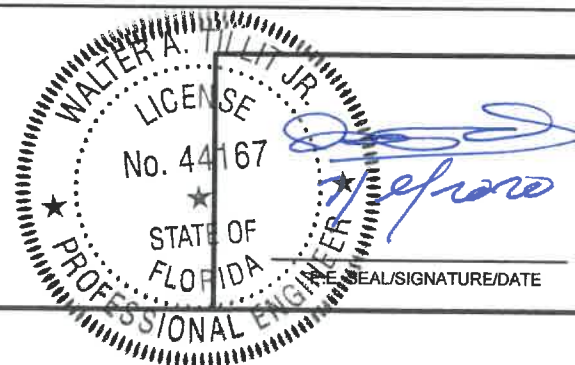
- ABOVE INDICATED MAX. SLAT SPANS MAY BE USED AS LONG AS ANCHOR SPACING SCHEDULES ON SHEET 20 INDICATE THAT AN ANCHOR SPACING IS AVAILABLE FOR THE CORRESPONDING SLAT SPAN AND A.S.D. DESIGN LOAD.
- REQUIRES SIDE RAILS FASTENED TO EXISTING STRUCTURE WITH 3/8"Ø WEDGE BOLT, 5/16"Ø TAPCON XL, 5/16"Ø ULTRACON OR 5/16"Ø TAPPER+XTREME ANCHORS, 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.
- MAXIMUM SLAT SPANS FOR INTERMEDIATE LOADS MAY BE DETERMINED BY LINEAR INTERPOLATION BETWEEN END VALUES.



SLAT SPAN DEFINITION

END RETENTION SYSTEM INTO POURED CONCRETE

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1	OLD 17-225	7/6/2020	3		
2			4		

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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													
3/8"Ø HILTI KWIK HUS BOLT ANCHOR							5/16"Ø TAPCON XL, ULTRACON OR TAPPER+XTREME ANCHORS						USE MAXIMUM POSITIVE A.S.D. LOAD VALUE
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 SEE NOTES *	TRAPPED MOUNT SEE NOTES *	2" BUILD-OUT MOUNT W/ (12A) SEE NOTES *	4" BUILD-OUT MOUNT W/ (12A) SEE NOTES *	2" BUILD-OUT MOUNT W/ (15) SEE NOTES *	4" BUILD-OUT MOUNT W/ (15) SEE NOTES *	WALL MOUNT SEE NOTES *	TRAPPED MOUNT SEE NOTES *	2" BUILD-OUT MOUNT W/ (12A) SEE NOTES *	4" BUILD-OUT MOUNT W/ (12A) SEE NOTES *	2" BUILD-OUT MOUNT W/ (15) SEE NOTES *	4" BUILD-OUT MOUNT W/ (15) 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:**

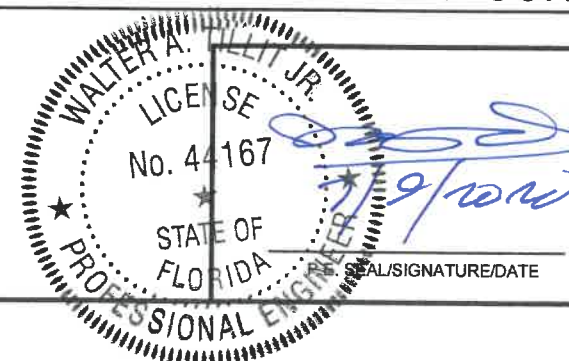
- ABOVE INDICATED MAX. SLAT SPANS MAY BE USED AS LONG AS ANCHOR SPACING SCHEDULES ON SHEET 21 INDICATE THAT AN ANCHOR SPACING IS AVAILABLE FOR THE CORRESPONDING SLAT SPAN AND A.S.D. DESIGN LOAD.
- REQUIRES SIDE RAILS FASTENED TO EXISTING STRUCTURE WITH 3/8"Ø HILTI KWIK HUS BOLT, 5/16"Ø TAPCON XL, 5/16" Ø ULTRACON OR 5/16" Ø TAPPER+XTREME ANCHORS 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.
- 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)



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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
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DRAWN BY: M.P.
DATE: 7/6/2020
20-173
DRAWING No
SHEET 18 OF 29

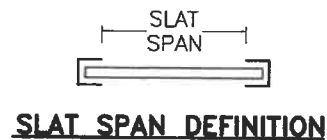
REV. No	DESCRIPTION	DATE	REV. No	DESCRIPTION	DATE
1	OLD 17-225	7/8/2020	3		
2			4		

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	
3/8"Ø WEDGE BOLTS ANCHOR				5/16"Ø TAPCON XL ANCHORS					
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 SEE NOTES *	TRAPPED MOUNT SEE NOTES *	2" BUILD-OUT MOUNT W/ (12A) SEE NOTES *	4" BUILD-OUT MOUNT W/ (12A) SEE NOTES *	WALL MOUNT SEE NOTES *	TRAPPED MOUNT SEE NOTES *	2" BUILD-OUT MOUNT W/ (12A) SEE NOTES *	4" BUILD-OUT MOUNT W/ (12A) 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:**

- 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.
- REQUIRES SIDE RAILS FASTENED TO EXISTING STRUCTURE WITH 3/8"Ø WEDGE BOLTS ANCHOR OR 5/16"Ø TAPCON XL ANCHOR, 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.
- MAXIMUM SLAT SPANS FOR INTERMEDIATE LOADS MAY BE DETERMINED BY LINEAR INTERPOLATION BETWEEN END VALUES.



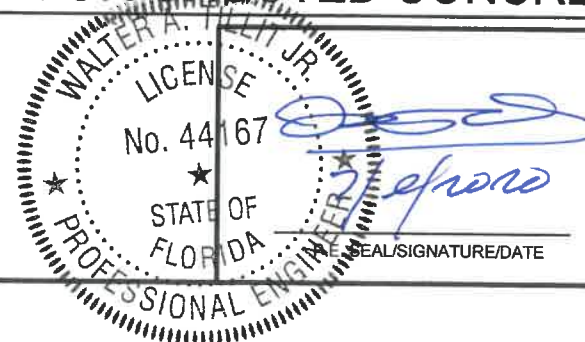
GROUTED CONCRETE BLOCK									
SLAT PERFORMANCE CHARTS Ia, Ib & Ic : (ONLY VALID FOR 3/8" SLIP) FOR A GIVEN A.S.D. DESIGN LOAD (p.s.f.), PRODUCT MOUNT CONDITION INCLUDING ANCHOR TYPE									
CHART Ia				CHART Ib				CHART Ic	
USE MAXIMUM VALUE BETWEEN POSITIVE AND NEGATIVE A.S.D. LOAD								USE MAXIMUM POSITIVE A.S.D. LOAD VALUE	
3/8"Ø HILTI KWIK HUS BOLT ANCHOR				5/16"Ø TAPCON XL ANCHORS					
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 SEE NOTES *	TRAPPED MOUNT SEE NOTES *	2" BUILD-OUT MOUNT W/ (12A) SEE NOTES *	4" BUILD-OUT MOUNT W/ (12A) SEE NOTES *	WALL MOUNT SEE NOTES *	TRAPPED MOUNT SEE NOTES *	2" BUILD-OUT MOUNT W/ (12A) SEE NOTES *	4" BUILD-OUT MOUNT W/ (12A) 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:**

- 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.
- REQUIRES SIDE RAILS FASTENED TO EXISTING STRUCTURE WITH 3/8"Ø HILTI KWIK HUS BOLT ANCHOR OR 5/16"Ø TAPCON XL ANCHOR 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.
- MAXIMUM SLAT SPANS FOR INTERMEDIATE LOADS MAY BE DETERMINED BY LINEAR INTERPOLATION BETWEEN END VALUES.

END RETENTION SYSTEM INTO CONCRETE OR GROUTED CONCRETE BLOCK

FLORIDA BUILDING CODE (High Velocity Hurricane Zone)



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40mm ER SLAT BERTHA IMPACT PROTECTIVE ROLLING SYSTEM

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

REV. No	DESCRIPTION	DATE	REV. No	DESCRIPTION	DATE
1	OLD 17-225	7/6/2020	3		
2			4		

DRAWN BY: M.P.
DATE: 7/6/2020
DRAWING No: **20-173**
SHEET 19 OF 29

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 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"	-	-	-

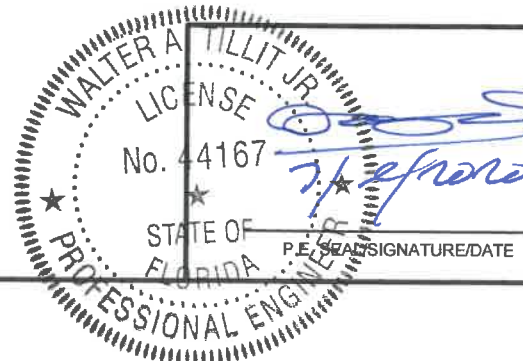
BUILD-OUT MOUNT W/(12A)

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"	-	-	-	-
>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.
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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: M.P.
7/6/2020 DATE
20-173
DRAWING No
SHEET 20 OF 29

REV. No	DESCRIPTION	DATE	REV. No	DESCRIPTION	DATE
1	OLD 17-225	7/6/2020	3		
2			4		

END RETENTION SYSTEM W/ SLAT ①

MAX. ANCHOR'S SPACING SCHEDULE IIb

FOR A GIVEN PRODUCT MOUNTING TYPE, W/ 3/8"Ø HILTI KWIK HUS BOLT 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	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"	6"
>30-40	6"	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"	-	-	-
>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 IIb

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"	-	-	-	-	-	-

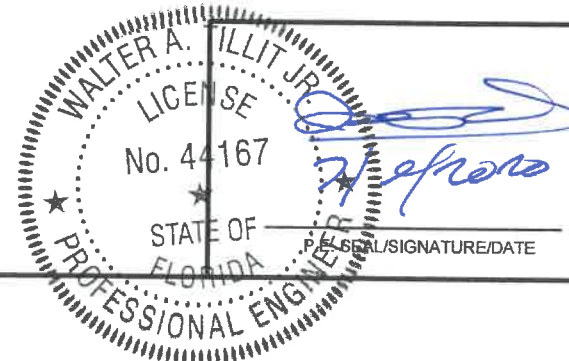
BUILD-OUT MOUNT W/ (12A)

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"	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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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:
M.P

7/6/2020
DATE

20-173
DRAWING No

REV. No	DESCRIPTION	DATE	REV. No	DESCRIPTION	DATE
1	OLD 17-225	7/6/2020	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 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"	-

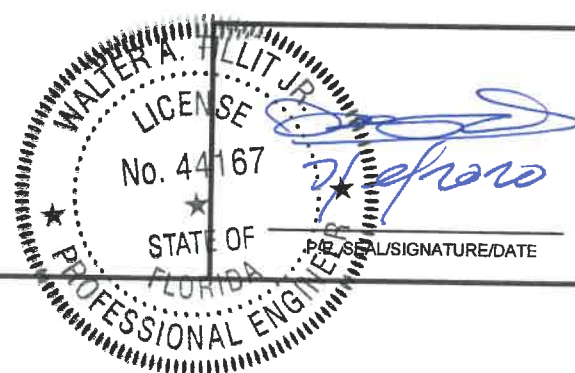
BUILD-OUT MOUNT W/ ⑫A

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"	-

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40mm ER SLAT BERTHA IMPACT PROTECTIVE ROLLING SYSTEM

AMERICAN SHUTTER SYSTEMS ASSOC., INC.
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DRAWN BY:
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7/6/2020
DATE

20-173
DRAWING No

SHEET 22 OF 29

REV. No	DESCRIPTION	DATE	REV. No	DESCRIPTION	DATE
1	OLD 17-225	7/6/2020	3		
2			4		

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 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"	-

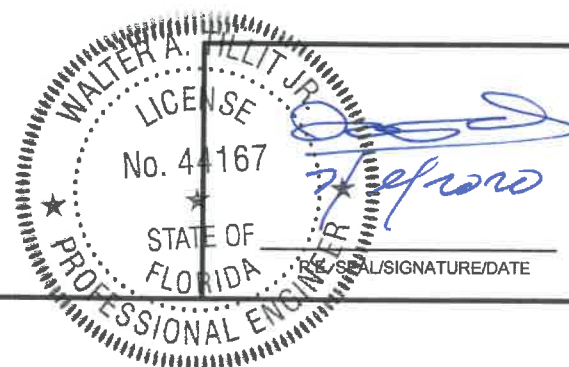
BUILD-OUT MOUNT W/ (12A)

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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40mm ER SLAT BERTHA IMPACT PROTECTIVE ROLLING SYSTEM
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DRAWN BY: M.P.
DATE: 7/6/2020
20-173
DRAWING No
SHEET 23 OF 29

REV. No	DESCRIPTION	DATE	REV. No	DESCRIPTION	DATE
1	OLD 17-225	7/6/2020	3		
2			4		

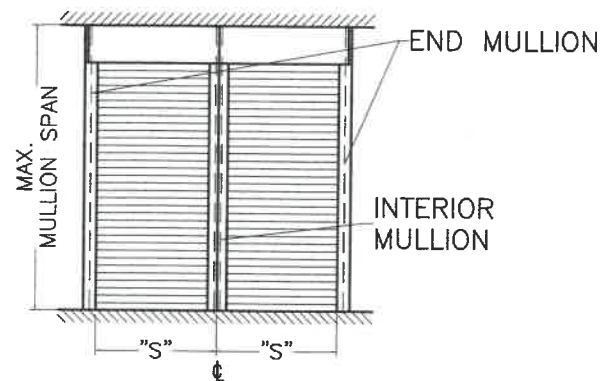
MULLION SCHEDULE FOR END RETENTION SYSTEM W/ SLAT ①

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' - 1"	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' - 5"	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"	5' - 1"	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.



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

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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)989-2772
 FAX: (561)209-8380

DRAWN BY:
 M.P.
 7/6/2020
 DATE
20-173
 DRAWING No
 SHEET 24 OF 29

REV. No	DESCRIPTION	DATE	REV. No	DESCRIPTION	DATE
1	OLD 17-225	7/6/2020	3		
2			4		

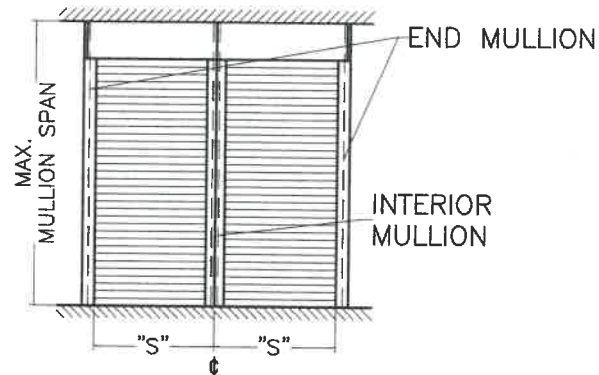
MULLION SCHEDULE FOR END RETENTION SYSTEM W/ SLAT ①

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' - 5"	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"

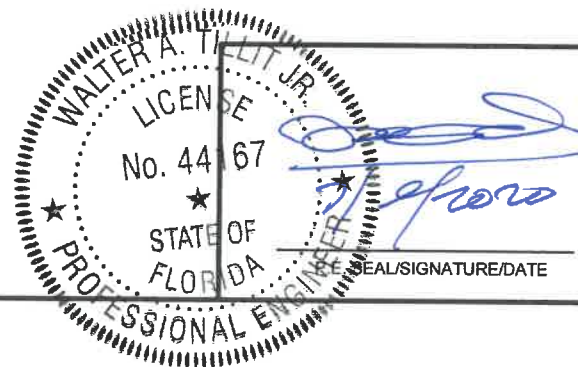
SCHEDULE 2c WALL MOUNTING									
MAX. SPAN (ft) FOR END AND INTERIOR MULLIONS FOR A GIVEN A.S.D. DESIGN LOAD (psf), AND A 7'-0" MAX MULLION SPACING (ft) *									
A.S.D. DESIGN LOAD (p.s.f.)	MAXIMUM MULLION SPACING (ft)*	MAXIMUM MULLION SPAN (ft)							
		②4 4"x6"x1/4" MULLION				②5 4"x8"x1/4" MULLION			
		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"	11' - 11"	11' - 11"	12' - 0"
60.0	7'-0"	12' - 0"	10' - 11"	10' - 4"	12' - 0"	12' - 0"	11' - 7"	10' - 9"	12' - 0"
65.0	7'-0"	11' - 4"	10' - 8"	9' - 11"	12' - 0"	12' - 0"	11' - 3"	10' - 4"	12' - 0"
70.0	7'-0"	10' - 9"	10' - 5"	9' - 6"	12' - 0"	12' - 0"	11' - 0"	9' - 11"	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' - 5"	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"



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

DRAWN BY:
M.P.

7/6/2020
DATE

20-173
DRAWING No

REV. No	DESCRIPTION	DATE	REV. No	DESCRIPTION	DATE
1	OLD 17-225	7/6/2020	3		
2			4		

SHEET 25 OF 29

MULLION SCHEDULE FOR END RETENTION SYSTEM W/ SLAT ①

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 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	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

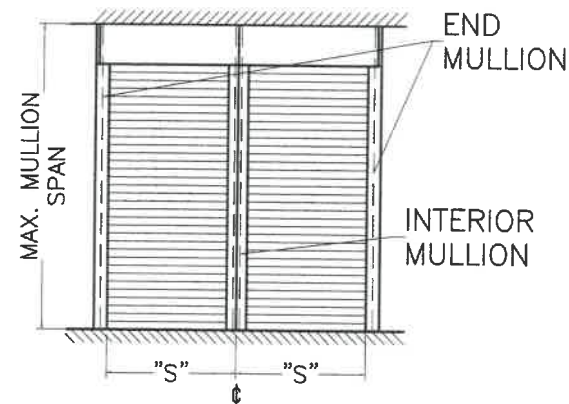
WALL MOUNTING

MAX. SPAN (ft) FOR END AND INTERIOR MULLIONS FOR A GIVEN DESIGN LOAD (psf), AND A 12'-0" MAX. MULLION SPACING (ft) *

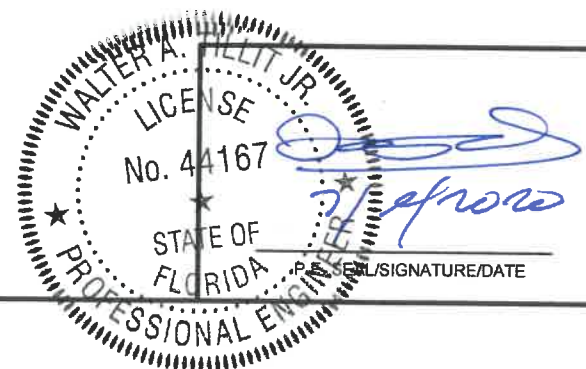
DESIGN LOAD (p.s.f.)	MAXIMUM MULLION SPACING (ft)*	MAXIMUM MULLION SPAN (ft)							
		②4 4"x6"x1/4" MULLION				②5 4"x8"x1/4" MULLION			
		ORIENTATION #1 (☐) ☒		ORIENTATION #2 (Ⓛ) ☒		ORIENTATION #1 (☐) ☒		ORIENTATION #2 (Ⓛ) ☒	
		END	INTERIOR	END	INTERIOR	END	INTERIOR	END	INTERIOR
30.0	12'-0"	8' - 8"	11' - 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.



MULLION SPACING: "S"



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FLORIDA BUILDING CODE (High Velocity Hurricane Zone)

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

DRAWN BY:
M.P

7/6/2020
DATE

20-173
DRAWING No

REV. No	DESCRIPTION	DATE	REV. No	DESCRIPTION	DATE
1	OLD 17-225	7/6/2020	3		
2			4		

SHEET 26 OF 29

MULLION SCHEDULE FOR END RETENTION SYSTEM W/ SLAT ①

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
			(□) □	(□) □	(□) □	(□) □	(□) □
			END	INTERIOR	END	INTERIOR	INTERIOR
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"△	8' - 6"△	9' - 0"
90.0	8'-0"	-	9' - 0"	8' - 0"△	8' - 0"△	9' - 0"	
95.0	8'-0"	-	9' - 0"	7' - 7"△	7' - 7"△	9' - 0"	
100.0	8'-0"	-	9' - 0"	7' - 2"△	7' - 3"△	9' - 0"	

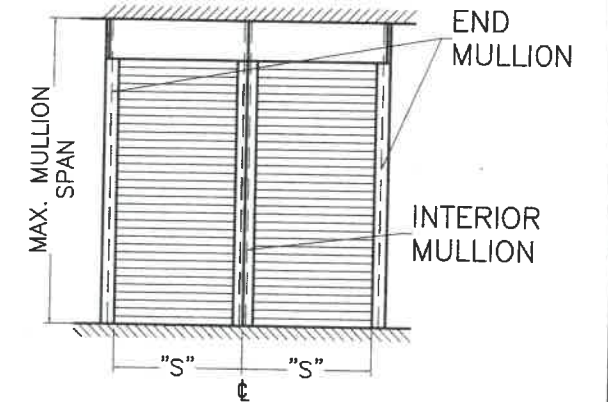
△ NOTE: USE 9'-0" SPAN IF ANCHOR CONSISTS OF HILTI, INC KWIK HUS-H SCREW, DEWALT, INC OR WEDGE-BOLT ANCHOR IN LIEU OF HILTI KWIK BOLT TZ, SEE SCHEDULES 1 & 2 ON SHEET 11.

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)*

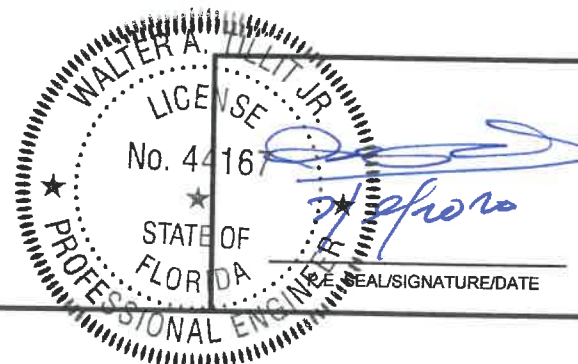
INSTALLATION CASES	A.S.D. DESIGN LOAD (p.s.f.)	MAXIMUM MULLION SPACING (ft)*	MAXIMUM MULLION SPAN (ft)				
			②4 4"x6"x1/4" MULLION		②5 4"x8"x1/4" MULLION		
			ORIENTATION #1	ORIENTATION #2	ORIENTATION #1	ORIENTATION #1	ORIENTATION #2
			(□) □	(□) □	(□) □	(□) □	(□) □
			END	INTERIOR	END	INTERIOR	INTERIOR
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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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:
M.P

7/6/2020
DATE

20-173

DRAWING No

REV. No	DESCRIPTION	DATE	REV. No	DESCRIPTION	DATE
1	OLD 17-225	7/6/2020	3		
2			4		

SHEET 27 OF 29

MULLION SCHEDULE FOR END RETENTION SYSTEM W/ SLAT ③

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) *

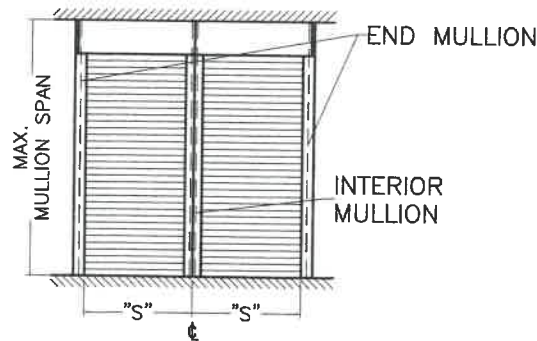
A.S.D. DESIGN LOAD (p.s.f.)	MAXIMUM MULLION SPACING (ft)*	MAXIMUM MULLION SPAN (ft)							
		②4 4"x6"x1/4" MULLION				②5 4"x8"x1/4" MULLION			
		ORIENTATION #1 (☐) ☑		ORIENTATION #2 (☐) ☑		ORIENTATION #1 (☐) ☑		ORIENTATION #2 (☐) ☑	
		END	INTERIOR	END	INTERIOR	END	INTERIOR	END	INTERIOR
30	8'-4"	12' - 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

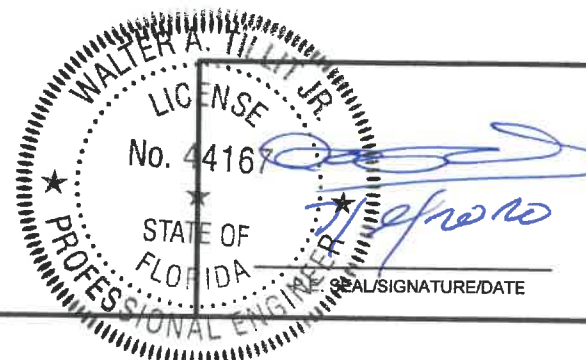
WALL MOUNTING

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.



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FLORIDA BUILDING CODE (High Velocity Hurricane Zone)

40mm ER SLAT BERTHA IMPACT PROTECTIVE ROLLING SYSTEM

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DRAWN BY:
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7/6/2020
DATE

20-173
DRAWING No

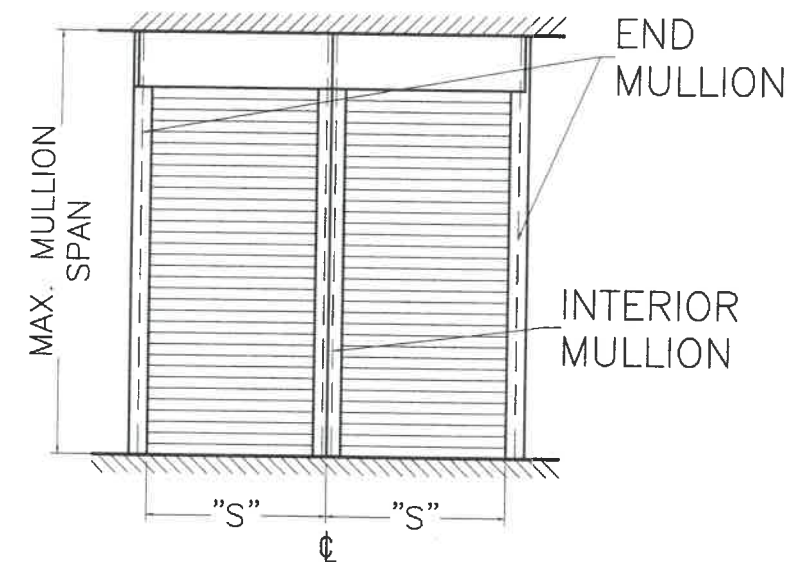
REV. No	DESCRIPTION	DATE	REV. No	DESCRIPTION	DATE
1	OLD 17-225	7/6/2020	3		
2			4		

SHEET 28 OF 29

MULLION SCHEDULE FOR END RETENTION SYSTEM W/ SLAT^③

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 (□) ▣ END	ORIENTATION #2 (□) ▣ INTERIOR	ORIENTATION #1 (□) ▣ END	ORIENTATION #1 (□) ▣ INTERIOR	ORIENTATION #2 (□) ▣ 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 (□) ▣ END	ORIENTATION #2 (□) ▣ INTERIOR	ORIENTATION #1 (□) ▣ END	ORIENTATION #1 (□) ▣ INTERIOR	ORIENTATION #2 (□) ▣ 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.



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M.P

7/6/2020
DATE

20-173

DRAWING No

REV. No	DESCRIPTION	DATE	REV. No	DESCRIPTION	DATE
1	OLD 17-225	7/6/2020	3		
2			4		

SHEET 29 OF 29