

GENERAL NOTES:

1. 58mm ER & NER SLAT BERTHA ROLL UP 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 SHALL NOT BE INSTALLED WITHIN HIGH VELOCITY HURRICANE ZONES (MIAMI-DADE/BROWARD COUNTIES).

DESIGN WIND LOADS SHALL BE DETERMINED AS PER SECTION 1609 OF THE ABOVE MENTIONED CODE, USING ASCE 7-16 AND SHALL NOT EXCEED THE MAXIMUM (A.S.D.) DESIGN PRESSURE RATINGS INDICATED ON SHEETS 4, 6, 12 THRU 16, 18 THRU 21 & 24 THRU 27. IN 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 4, 6, 12 THRU 16, 18 THRU 21 & 24 THRU 27.

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.

58mm ER & NER SLAT BERTHA ROLL UP ADEQUACY FOR IMPACT AND FATIGUE RESISTANCE HAS BEEN VERIFIED IN ACCORDANCE WITH SECTION 1609.1.2. OF THE ABOVE MENTIONED CODE AS PER: (FOR BASIC PROTECTION ONLY MISSILE TYPE D)

- FENESTRATION TESTING LAB REPORTS #2760, #4596, #4644 & #4760
- AMERICAN TESTING LAB OF SOUTH FLORIDA REPORTS #0404.01-08, #0803.02-12, #0803.03-12, #0803.01-12, #0803.04-12

2. ALL ALUMINUM EXTRUSIONS SHALL BE ALUMINUM ASSOCIATION 6063-T6 ALLOY & TEMPER (UNLESS OTHERWISE NOTED). ALL ALUMINUM EXTRUSIONS IN CONTACT WITH DISSIMILAR MATERIALS SHALL COMPLY WITH SECTION III-6 OF THE 2015 ALUMINUM DESIGN MANUAL.

3. ALL SELF DRILL SCREWS (EXCEPT COMPONENTS B & C) TO BE AISI 410 SERIES STAINLESS STEEL 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.

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

5. ANCHORS TO WALL FOR E, F & G SIDE RAILS SHALL BE AS FOLLOWS: SEE NOTE 9 FOR SUBSTRATE LIMITATIONS BASED ON PRODUCT SYSTEM.

END RETENTION SYSTEM

SUBSTRATES											
POURED CONCRETE						GROUTED CONCRETE BLOCK (ASTM C-90)				WOOD (G=0.55)	
ANCHOR TYPE & MANUFACTURER						ANCHOR TYPE & MANUFACTURER				ANCHOR TYPE & MANUFACTURER	
3/8" Ø WEDGE BOLT/ DEWALT, INC.			5/16" Ø ULTRACON/ ELCO CONST. PRODUCTS			3/8" Ø KWIK HUS BOLT/ HILTI, INC.		5/16" Ø ULTRACON/ ELCO CONST. PRODUCTS		5/16" Ø 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. E.D.	MIN. EMBED.	MIN. E.D.	MIN. EMBED.
4 1/2"	3 1/2"	3 ksi	3 1/8"	2"	3.5 ksi	4"	3 1/4"	2 1/2"	2 1/4"	3 1/8"	2"

NON END RETENTION SYSTEM

SUBSTRATES													
POURED CONCRETE						GROUTED CONCRETE BLOCK (ASTM C-90)				WOOD (G=0.55)			
ANCHOR TYPE & MANUFACTURER						ANCHOR TYPE & MANUFACTURER				ANCHOR TYPE & MANUFACTURER			
1/4" Ø MAXI-SET TAPCONS/ITW/BUILDEX			1/4" Ø ULTRACON/ ELCO CONST. PRODUCTS			1/4" Ø MAXI-SET TAPCONS/ITW/BUILDEX		1/4" Ø ULTRACON/ ELCO CONST. PRODUCTS		1/4" Ø MAXI-SET TAPCONS/ITW/BUILDEX		1/4" Ø 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. E.D.	MIN. EMBED.	MIN. E.D.	MIN. EMBED.	MIN. E.D.	MIN. EMBED.
2 1/2"	2 1/4"	3.19 ksi	2 1/2"	2 1/4"	2.73 ksi	2 1/2"	2 1/4"	2 1/2"	2 1/4"	1"	2 1/4"	1"	

NOTES: FOR END RETENTION AND NON END RETENTION SYSTEMS

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

6. ANCHORS REQUIRED FOR STORM BARS CONNECTIONS SHALL BE AS INDICATED ON SHEETS 19 THRU 22.

7. ANCHORS REQUIRED FOR MULLION CONNECTIONS AND HEADERS SHALL BE AS SPECIFIED ON APPLICABLE SECTIONS SHOWN ON SHEETS 7 THRU 10 AND 23 RESPECTIVELY.

- 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" Ø KWIK BOLT TZ	27"	9"	4 3/4" (3000 psi)	NOT ALLOWED
1/2" Ø KWIK BOLT TZ	22 1/2"	7 1/2"	3 1/4" (3000 psi)	NOT ALLOWED
3/8" Ø KWIK BOLT TZ	6"	4 3/8"	2" (3000 psi)	NOT ALLOWED
3/8" Ø KWIK HUS-H SCREW	4"	5"	2" (3000 psi)	NOT ALLOWED
3/8" Ø WEDGE-BOLT	4 1/2"	4 1/2"	2 1/2" (3000 psi)	NOT ALLOWED
1/2" Ø KWIK HUS-H SCREW OR WEDGE BOLT	6"	6"	3" (3000 psi)	NOT ALLOWED
5/8" Ø KWIK HUS-H SCREW	7 1/2"	7 1/2"	2 1/2" (3000 psi)	NOT ALLOWED

8. 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.

9. 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 5 THRU 10 & 18 THRU 23 FOR LIMITATIONS FOR SUBSTRATE INSTALLATIONS.

10. 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.

11. PRODUCT MECHANISM NOT PART OF THIS APPROVAL.

12. (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.

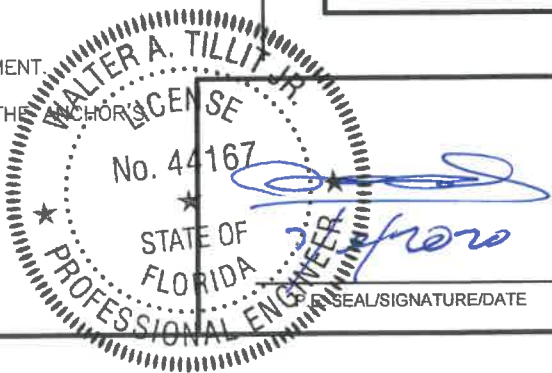
(d) SITE SPECIFIC PROJECTS SHALL BE PREPARED BY A REGISTERED ENGINEER OR ARCHITECT WHICH WILL BECOME THE ENGINEER OF RECORD (E.O.R.) FOR THE PROJECT AND WHO WILL BE RESPONSIBLE FOR THE PROPER USE OF THE P.E.D. ENGINEER OF RECORD, ACTING AS A DELEGATED ENGINEER TO THE P.E.D. ENGINEER, SHALL SUBMIT TO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

13. 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.

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

FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)



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WALTER A. TILLIT Jr., P.E.

FLORIDA Lic. # 44167

SEAL/SIGNATURE/DATE

58mm ER & NER SLAT BERTHA ROLL UP

AMERICAN SHUTTER SYSTEMS ASSOC., INC.

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

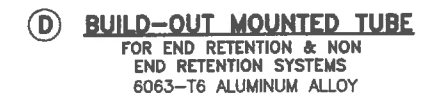
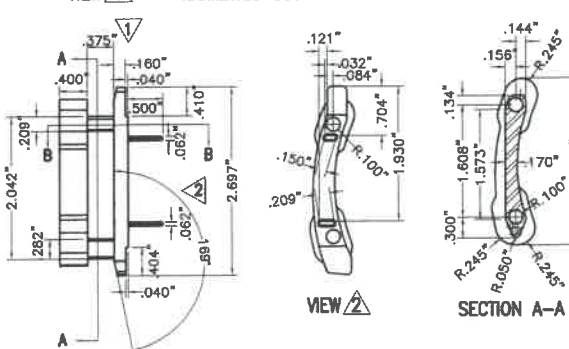
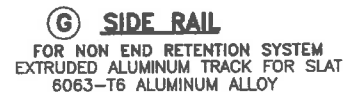
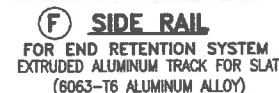
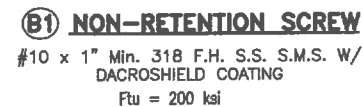
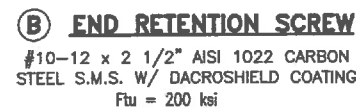
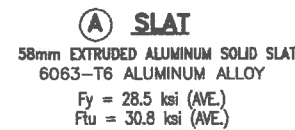
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DRAWN BY:
M.P

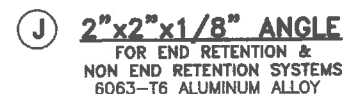
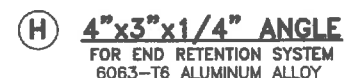
7/6/2020
DATE

20-171
DRAWING No

SHEET 1 OF 27



B.O TUBE	b	h	t
Ⓐ	4"	2"	0.25"
Ⓑ	4"	3"	0.125"
Ⓒ	4"	4"	0.125"



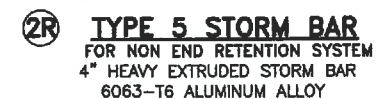
MULLIONS	b	h	t
(K) NER	3"	4"	0.125
(L) NER	4"	4"	0.25"
(M) NER ER	4"	6"	0.25"
(N) ER	4"	8"	0.25"

ER: END RETENTION SYSTEM

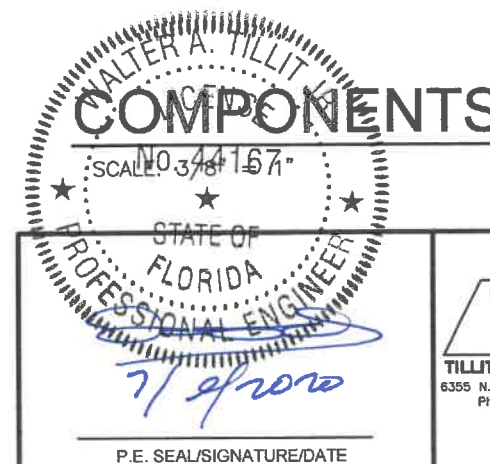
NER: NON END RETENTION SYSTEM



STORMBARS	b	h	t
⊙	2"	2"	0.25"
Ⓟ	2"	3"	0.125"
Ⓠ	2"	4"	0.125"
Ⓡ	2"	4"	0.25"



HEADERS	b	h	t
(S)	3"	2"	0.125"
(T)	4"	2"	0.125"
(U)	4"	2"	0.25"
(V)	6"	2"	0.125"



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FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)

58mm ER & NER SLAT BERTHA ROLL UP

AMERICAN SHUTTER SYSTEMS ASSOC., INC.

**4268 WESTROADS DRIVE
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PHONE: (877)999-2772
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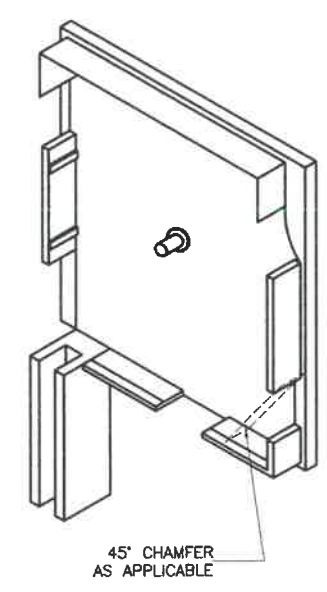
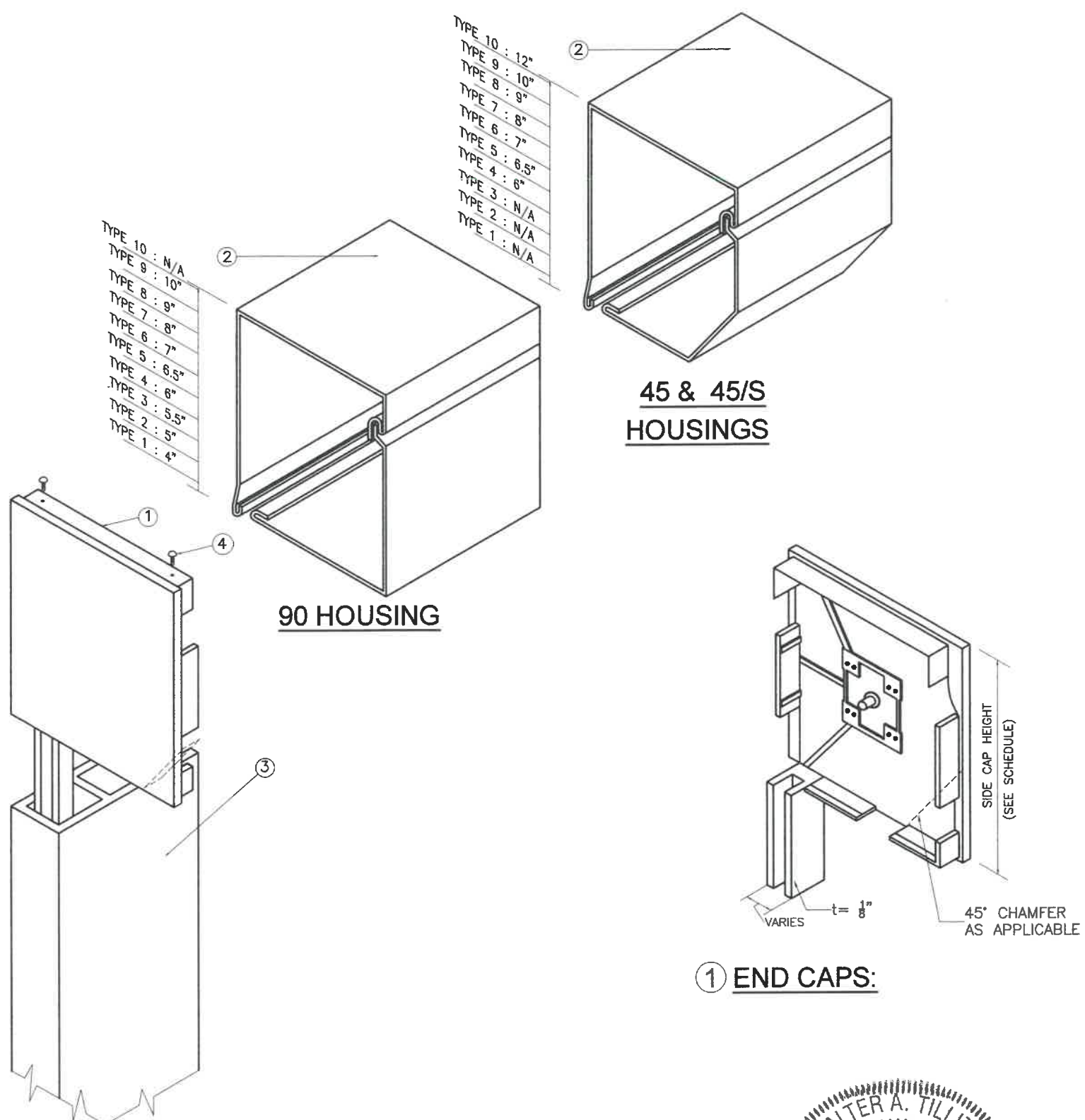
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M.P

7/6/2020
DATE

20-171
DRAWING No

SHEET 2 OF 27

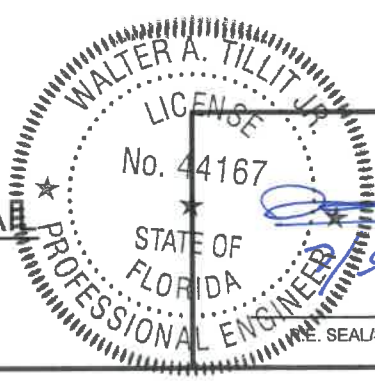


STRUCTURAL COMPONENTS FOR OPERATING SYSTEM

- 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 11/1 & 12(b)/1)

BOX STRUCTURAL COMPONENTS AND ASSEMBLY DETAIL
(SEE NOTE 11 & 12(b) ON SHEET 1)



SEAL/SIGNATURE/DATE

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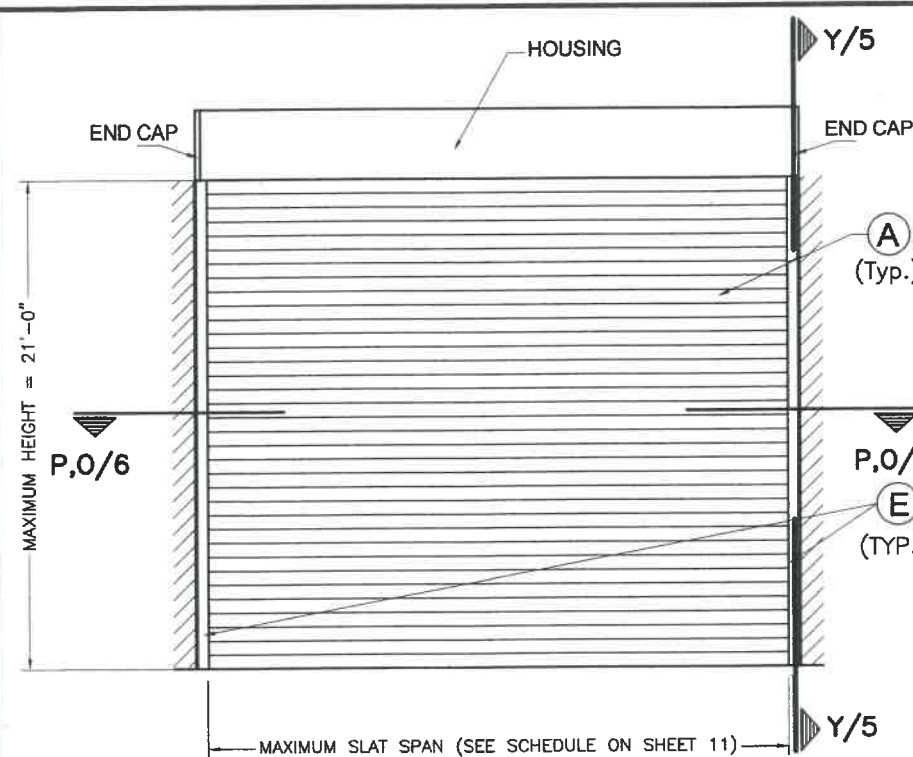
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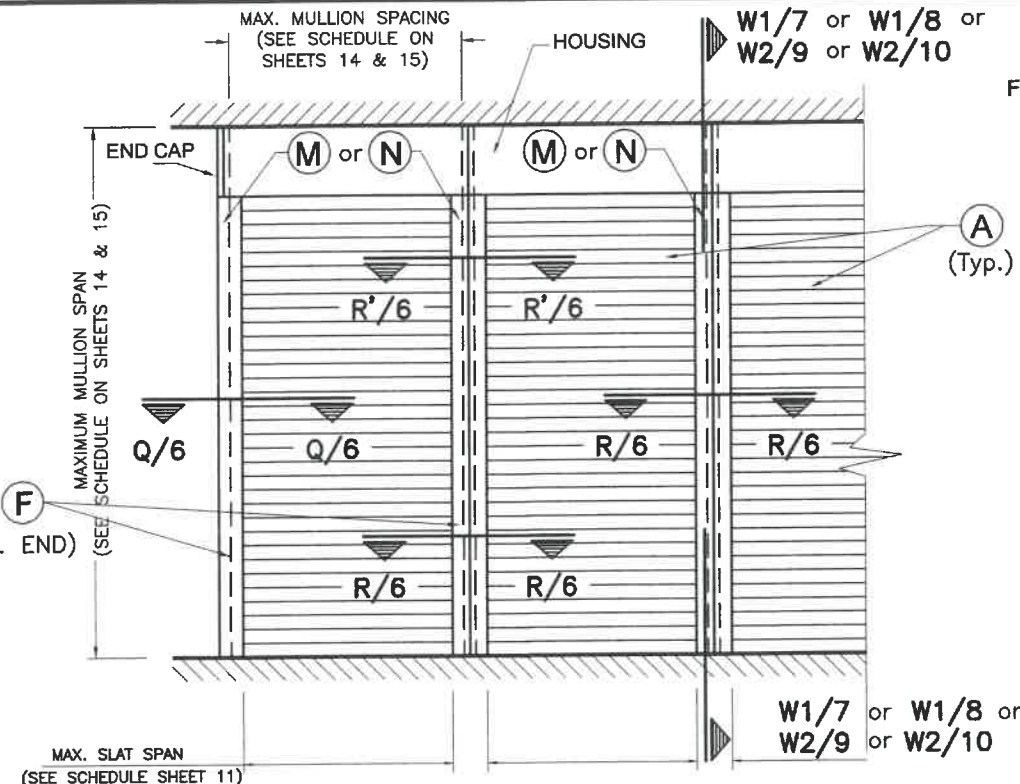
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SHEET 3 OF 27		

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2			4		



TYPICAL SINGLE UNIT ELEVATION W/O MULLIONS

NOTE: SEE SHEET 2 & 3 FOR COMPONENTS NOMENCLATURE.



TYPICAL CONSECUTIVE SINGLE UNIT ELEVATION W/ MULLIONS

NOTE: SEE SHEET 2 & 3 FOR COMPONENTS NOMENCLATURE.

SLAT PERFORMANCE CHART IN WOOD
FOR A GIVEN MAXIMUM DESIGN PRESSURE RATING (p.s.f.) AND PRODUCT MOUNT CONDITION FOR INSTALLATIONS W/O STORM BARS PER DETAIL 1 BELOW

5/16"Ø ULTRACON ANCHOR				
DESIGN LOAD (p.s.f.)	MAX. SLAT SPAN "L _{MAX.} " (ft)		REQUIRED MIN. SEPARATION TO GLASS MESURED TO BACK OF SLAT (in)	
	WALL MOUNT	BUILD-OUT MOUNT W/ (D1)	WIND ZONES 1, 2 & 3	WIND ZONES 4
+45,-60	4'-0"	4'-0"	1"	3 1/2"
+45,-60	6'-0"	6'-0"	1"	5"
+45,-60	12'-0"	12'-0"	1"	7 7/8"

NOTES:

1- WOOD FRAME WALL TO BE BUILT STRICTLY IN ACCORDANCE WITH SPECS GIVEN ON DETAIL AND PROVISIONS FROM CHAPTER 23 OF THE FLORIDA BUILDING CODE. MINIMUM LENGTH OF WALL AT EITHER SIDE OF OPENING SHALL BE 33".

2- VALID FOR SOUTHERN PINE #2 (G=0.55)

END RETENTION SYSTEM

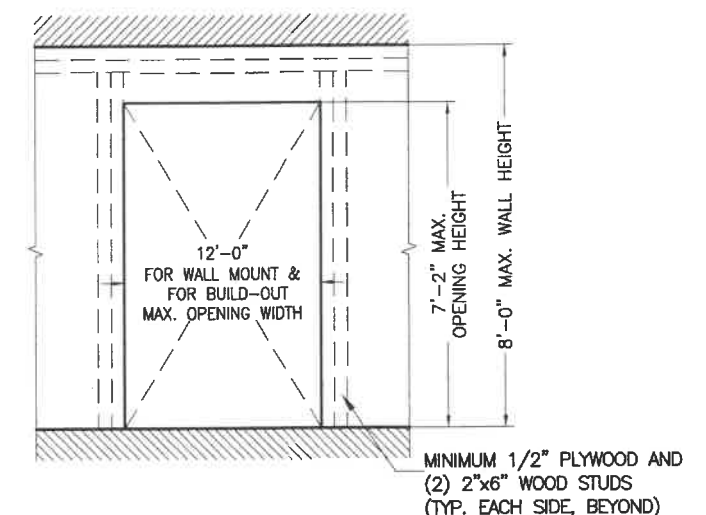
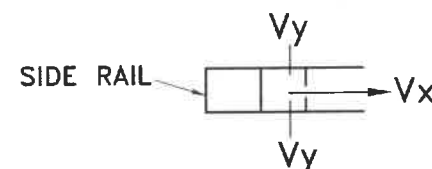
V_x FORCES (Lb/FT) & V_y FORCES (Lb/FT) ACTING AT JAMBS FOR A DESIGN LOAD RANGE.
SLAT SPAN RANGE FOR POURED CONCRETE OR GROUTED CONCRETE BLOCK WALL BUILDINGS *

(USE MAXIMUM VALUE BETWEEN POSITIVE AND NEGATIVE LOAD)

DESIGN LOAD RANGE (p.s.f.)	SLAT SPAN RANGE																	
	0'–4'		> 4'–5'		> 5'–6'		> 6'–7'		> 7'–9'		> 9'–12'		> 12'–16'		> 16'–20'		> 20'–23'	
	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	V _x	V _y	V _x	V _y
≤ 30.0	0	60	0	75	0	90	222	105	415	135	844	180	1348	240	2010	300	2183	342
>30–40	0	80	0	100	0	120	428	140	627	180	1144	240	1774	320	2515	400	2829	457
>40–60	0	120	0	150	150	180	496	210	1035	270	1722	300	2588	480	2964	533	2831	473
>60–80	0	160	0	200	398	240	788	280	1428	360	2278	480	2960	580	2976	547	–	–
>80–105	0	210	28	263	694	315	1141	368	1905	473	2083	499	2083	499	–	–	–	–
>105–120	0	240	58	300	867	360	1348	420	2184	540	2283	555	–	–	–	–	–	–
>120–140	0	280	98	350	1094	420	1619	490	2325	595	2325	595	–	–	–	–	–	–

***NOTE:**

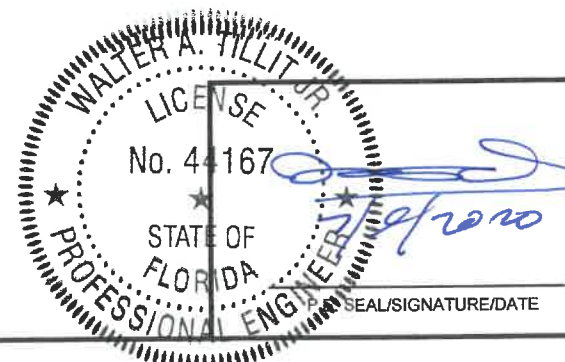
IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR OR PERMIT HOLDER TO VERIFY THAT EXISTING STRUCTURE IS DESIGNED TO SUPPORT V_x AND V_y FORCES IN POUNDS PER UNIT FOOT OF PRODUCT HEIGHT AT BOTH JAMBS. SEE THIS SHEET FOR V_x & V_y VALUES.



DETAIL 1 (ELEVATION)

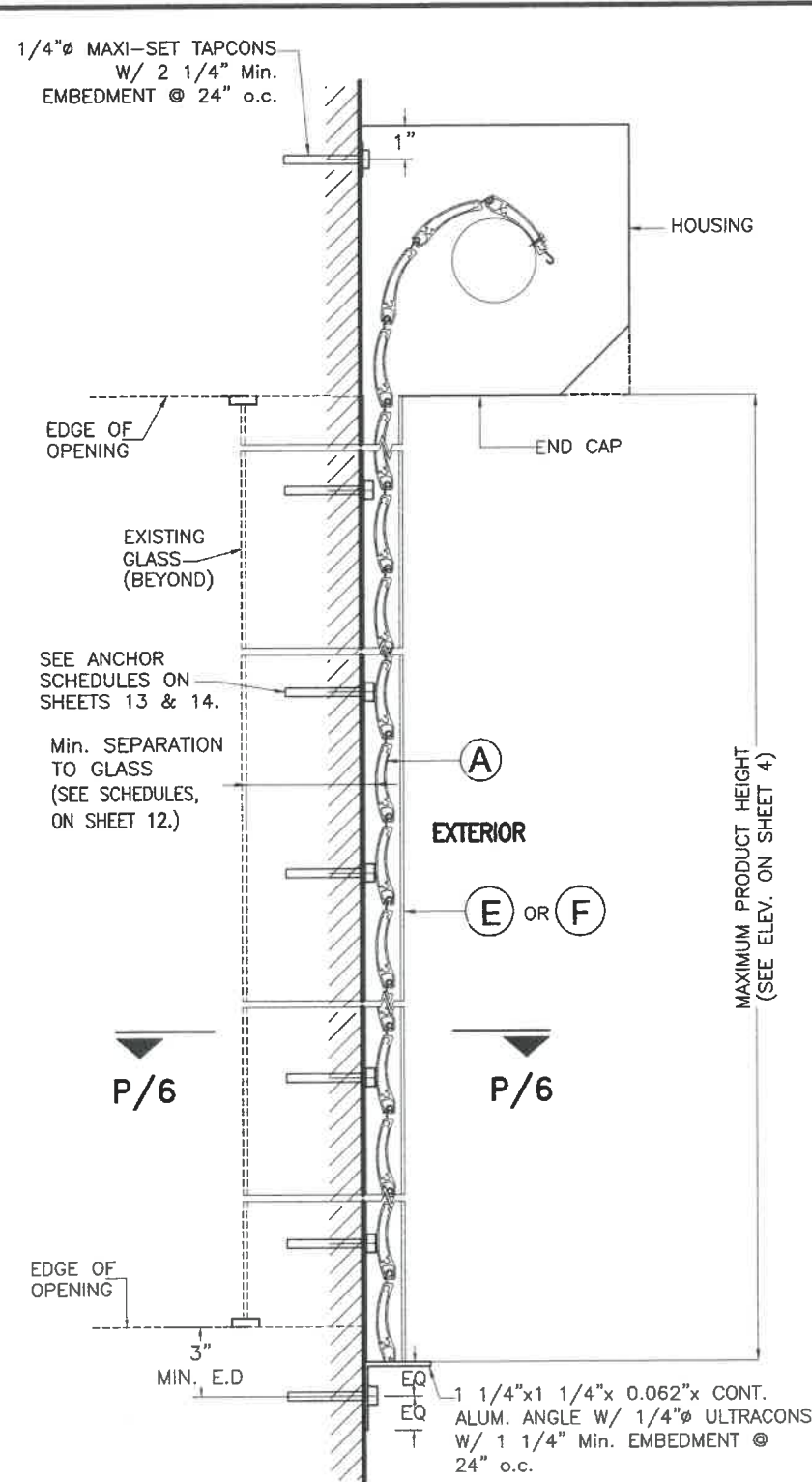
INSTALLATION INTO WOOD FRAME STRUCTURES

FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)

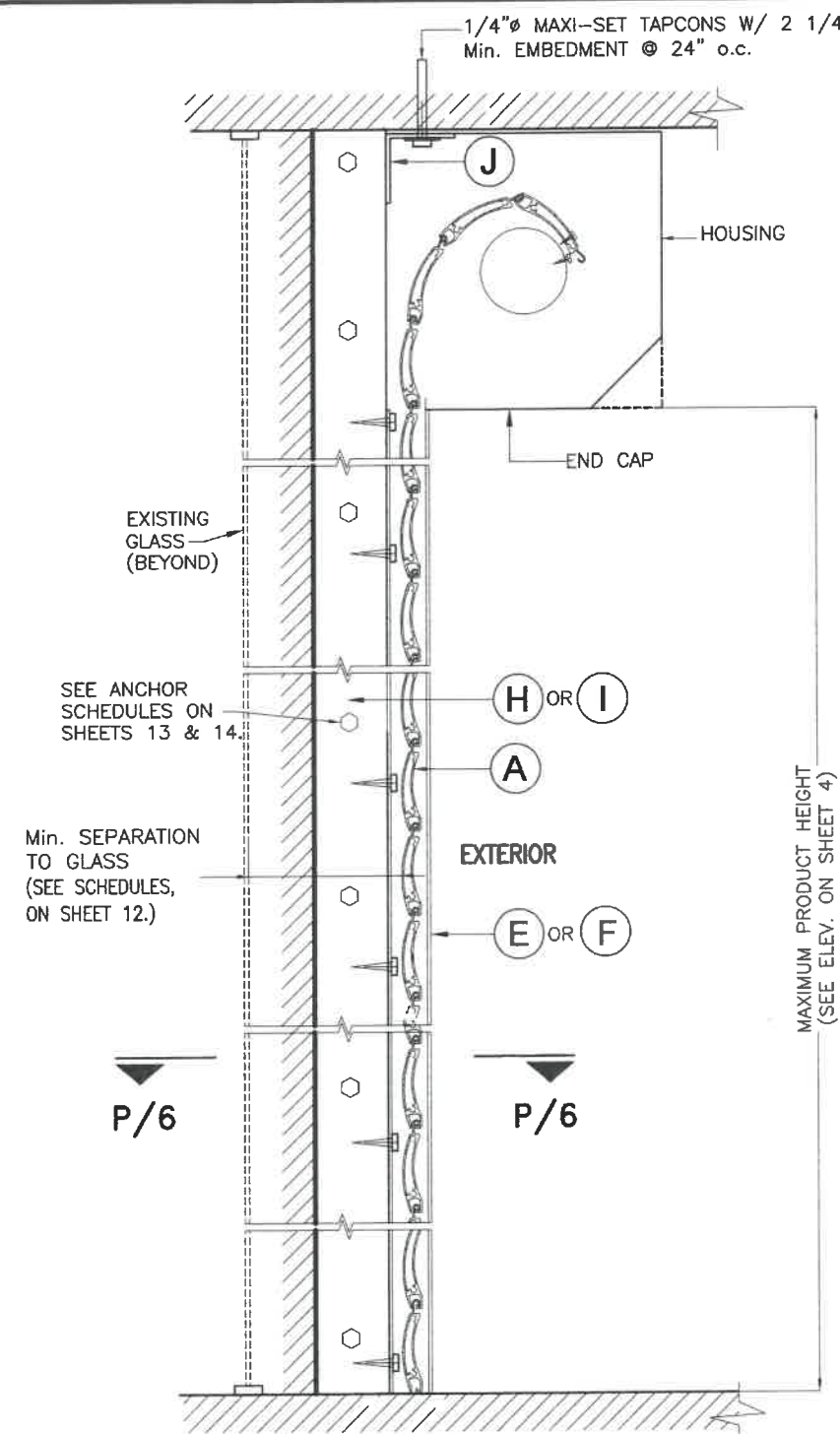


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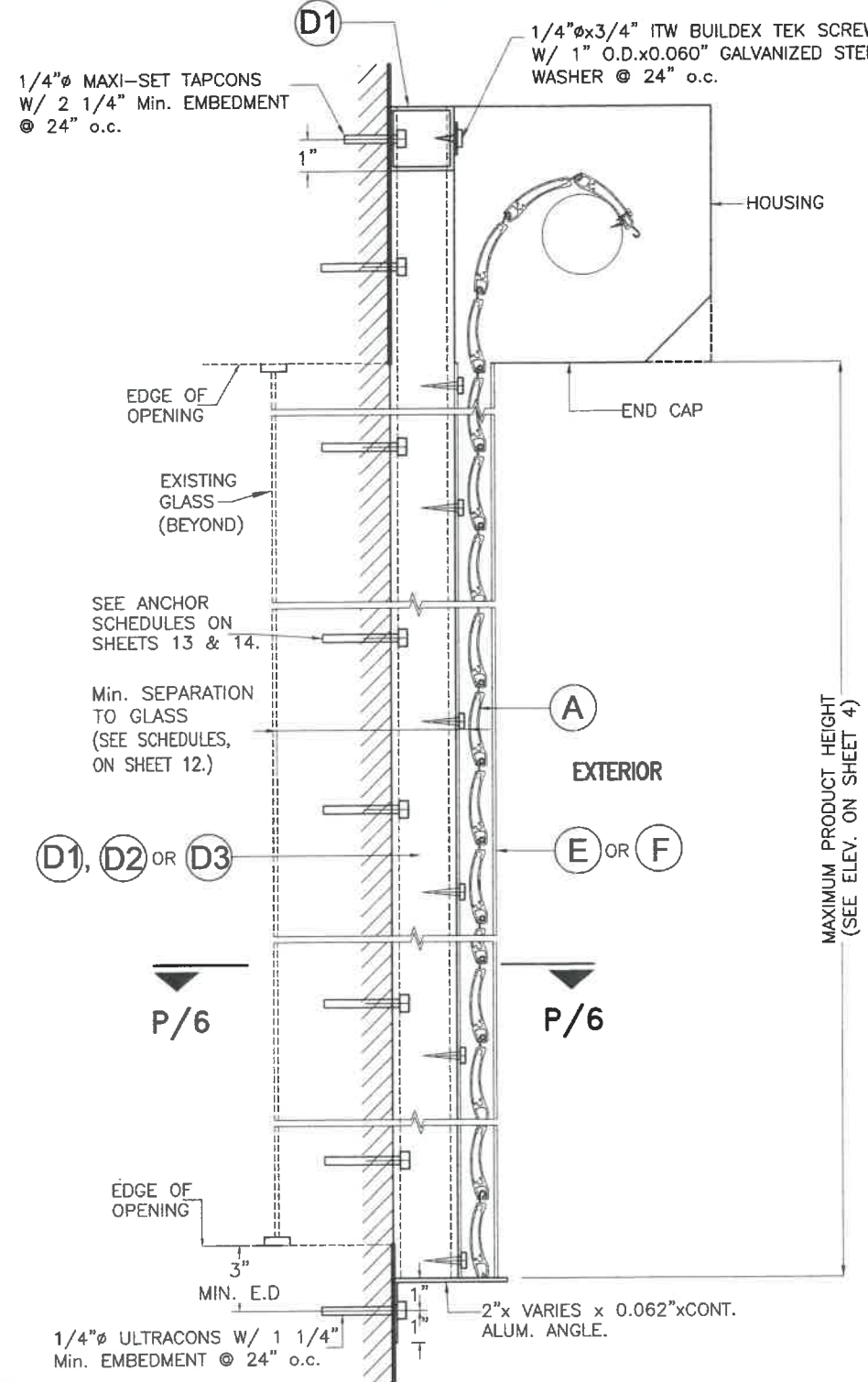
58mm ER & NER SLAT BERTHA ROLL UP				DRAWN BY: M.P.	
AMERICAN SHUTTER SYSTEMS ASSOC., INC.				7/6/2020 DATE	
4268 WESTROADS DRIVE WEST PALM BEACH, FL 33407 PHONE: (877)999-2772 FAX: (561)209-8380				20-171 DRAWING No	
REV. No	DESCRIPTION	DATE	REV. No	DESCRIPTION	DATE
1	OLD 17-223	7/6/2020	3		
2			4		



WALL MOUNTING



FLOOR/CEILING / TRAPPED MOUNTING



BUILD-OUT MOUNTING

SECTIONS Y-Y

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

SCALE: 3/16" = 1"

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

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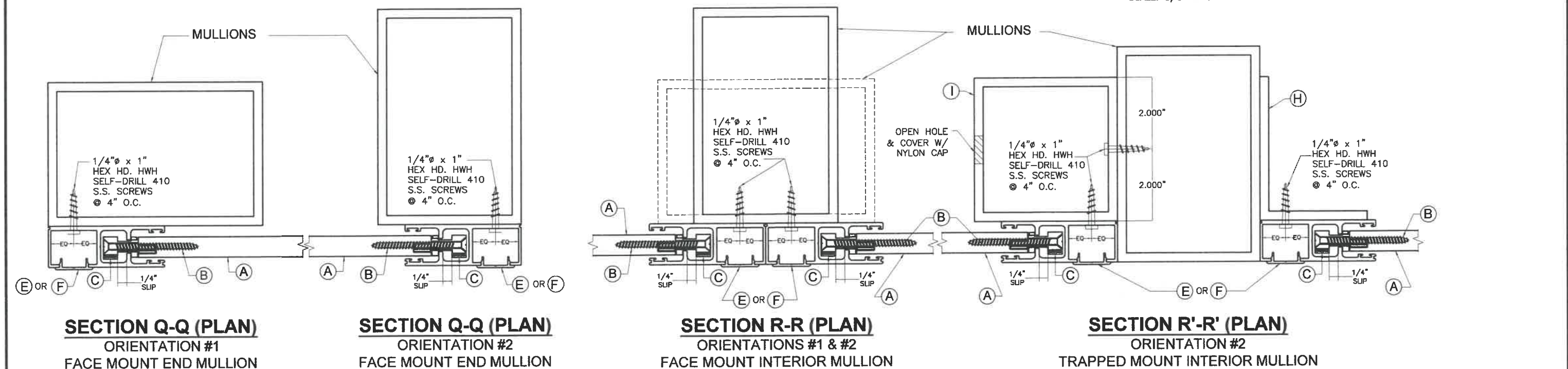
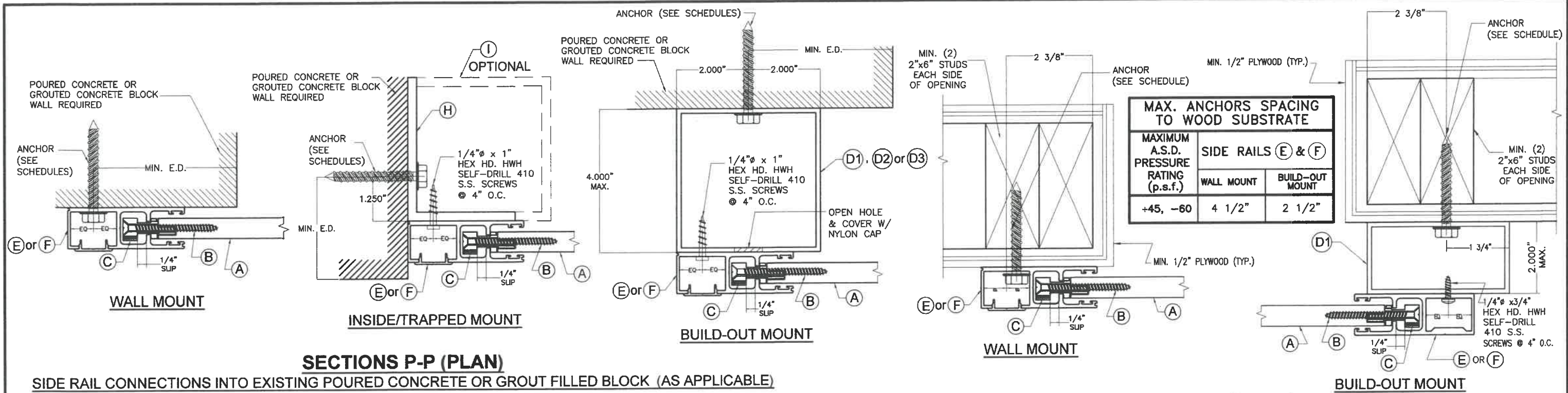
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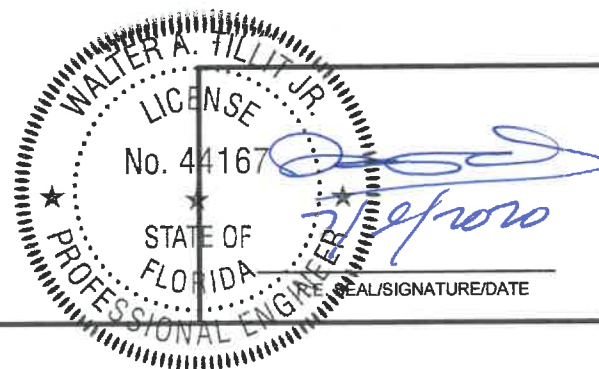
SHEET 5 OF 27

REV. No	DESCRIPTION	DATE	REV. No	DESCRIPTION	DATE
1	OLD 17-223	7/6/2020	3		
2			4		



SIDE RAIL CONNECTIONS INTO MULLIONS
SCALE: 3/8" = 1"

END RETENTION SYSTEM



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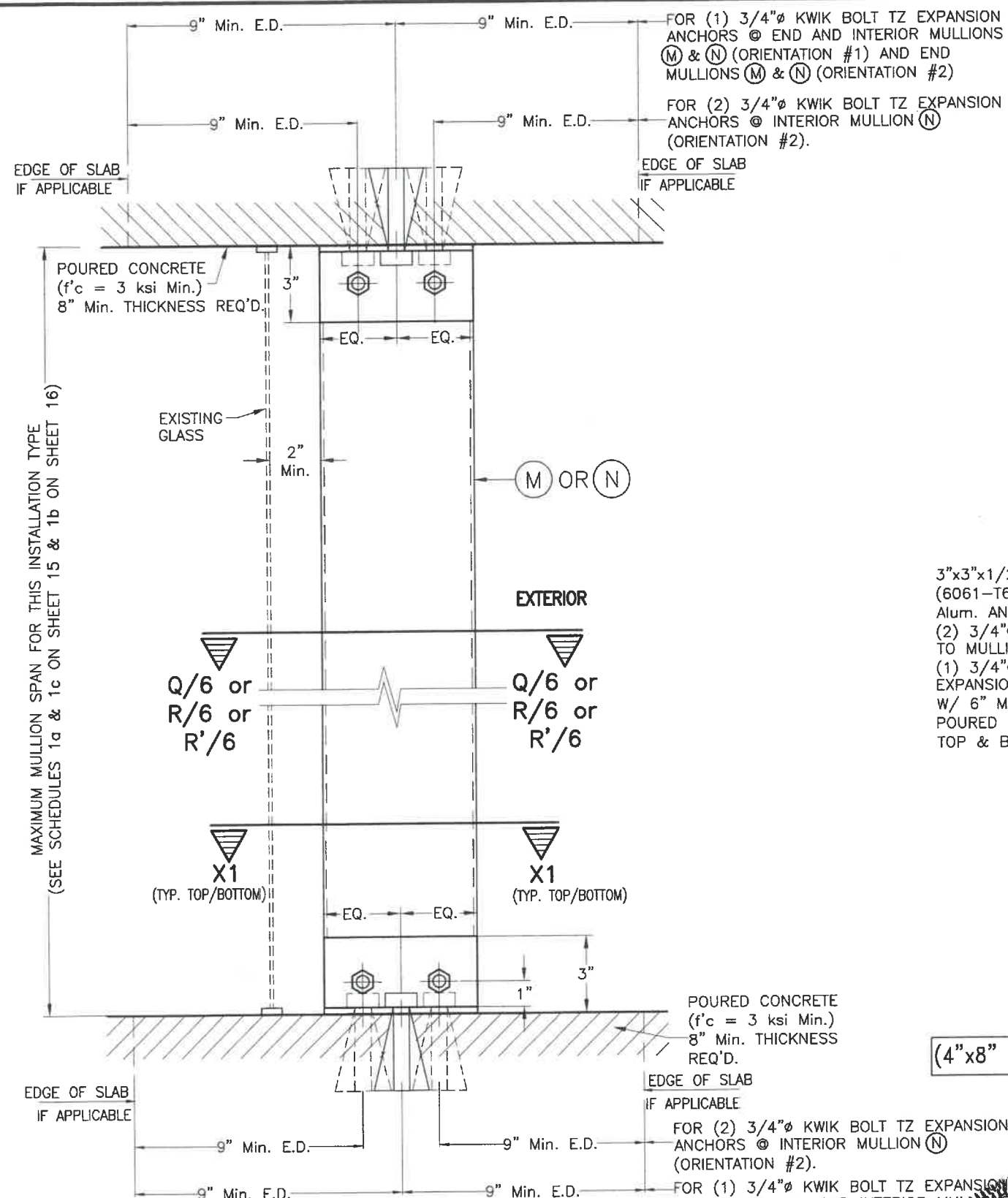
FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)

58mm ER & NER SLAT BERTHA ROLL UP
AMERICAN SHUTTER SYSTEMS ASSOC., INC.
4268 WESTROADS DRIVE
WEST PALM BEACH, FL 33407
PHONE: (877)999-2772
FAX: (561)209-8380

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1	OLD 17-223	7/6/2020	3		
2			4		

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SHEET 6 OF 27

MAXIMUM MULLION SPAN FOR THIS INSTALLATION TYPE
(SEE SCHEDULES 1a & 1c ON SHEET 15 & 1b ON SHEET 16)



FLOOR TO CEILING / TRAPPED MOUNTING : MULLIONS (M) OR (N)

SECTIONS W-1

END & INTERIOR TRAPPED MOUNTED MULLION INSTALLATION *

APPLICABLE TO ALL INSTALLATIONS EXCEPT THOSE W/ LIMITATIONS COVERED ON SHEET 18

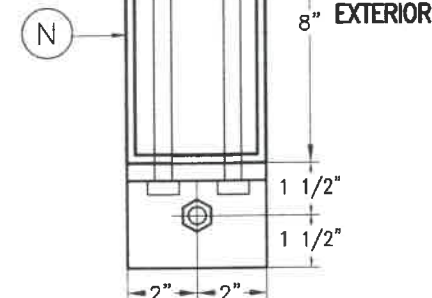
SCALE: 1/8" = 1"

3"x3"x1/2"x0'-4"
(6061-T6 ALLOY) Alum.
ANGLE EA. SIDE W/ (2)
3/4" THRU BOLTS TO
MULLION (M) & (1) 3/4" KWIK
BOLT TZ EXPANSION
ANCHOR W/ 6" Min.
EMBEDMENT TO POURED
CONCRETE (Typ. TOP &
BOTTOM)

SECTION X1-X1 W/ (M) *

(4"x6" END & INTERIOR MULLION W/ ORIENTATION #1)

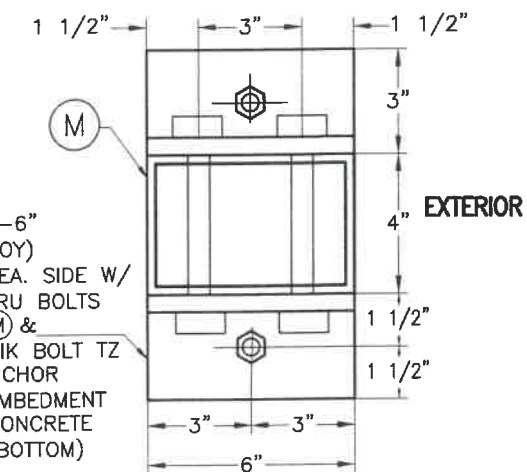
3"x3"x1/2"x0'-4"
(6061-T6 ALLOY) Alum.
ANGLE EA. SIDE W/
(2) 3/4" THRU BOLTS
TO MULLION (N) &
(1) 3/4" KWIK BOLT TZ
EXPANSION ANCHOR
W/ 6" Min. EMBEDMENT TO
POURED CONCRETE (Typ.
TOP & BOTTOM)



SECTION X1-X1 W/ (N) *

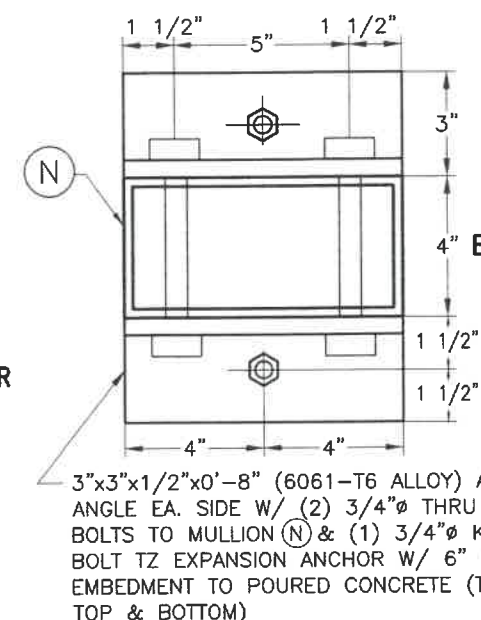
(4"x8" END & INTERIOR MULLION W/ ORIENTATION #1)

* SIDE RAILS (E) & (F) AND BOX NOT SHOWN FOR CLARITY.



ALTERNATIVE SECTION X1-X1 W/ (M) *

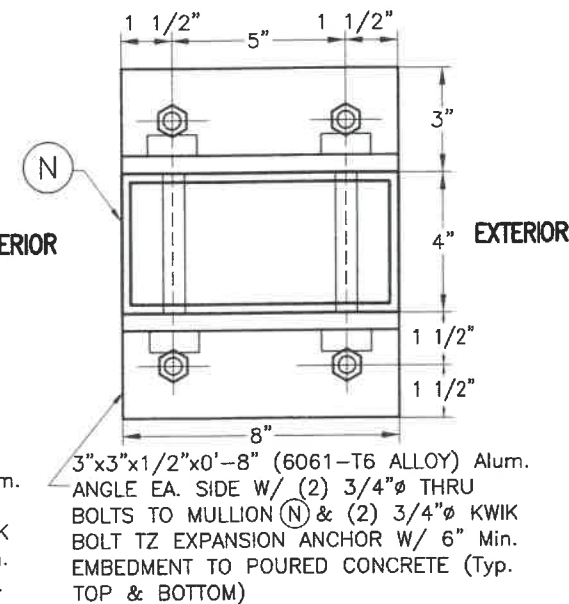
(4"x6" END & INTERIOR MULLION W/ ORIENTATION #2)



(END MULLION ONLY)

ALTERNATIVES SECTION X1-X1 W/ (N) *

(4"x8" END & INTERIOR MULLION W/ ORIENTATION #2)



(INTERIOR MULLION ONLY)

END RETENTION SYSTEM

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58mm ER & NER SLAT BERTHA ROLL UP

AMERICAN SHUTTER SYSTEMS ASSOC., INC.
4268 WESTROADS DRIVE
WEST PALM BEACH, FL 33407
PHONE: (877)999-2772
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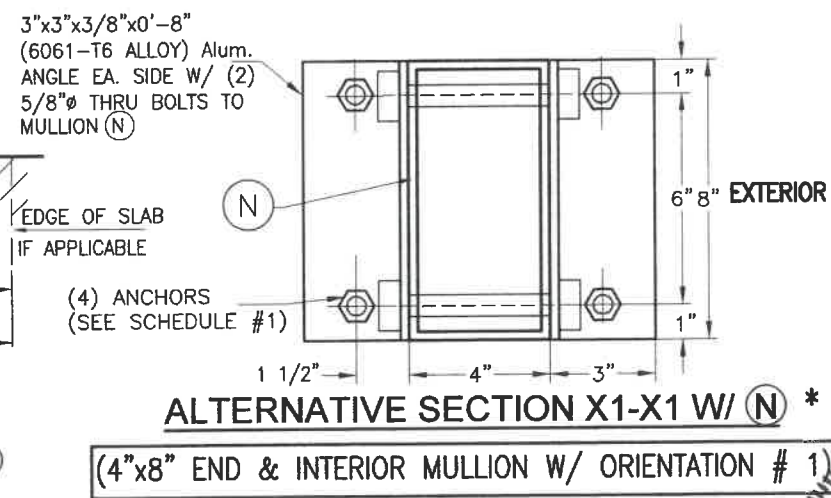
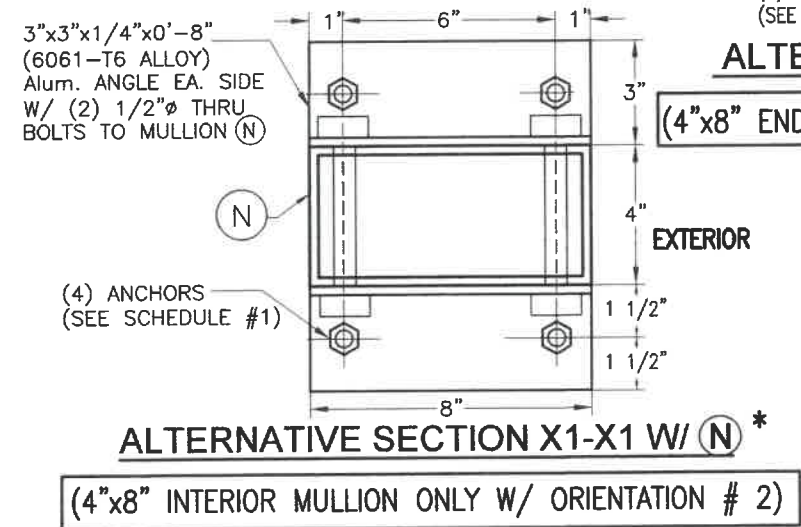
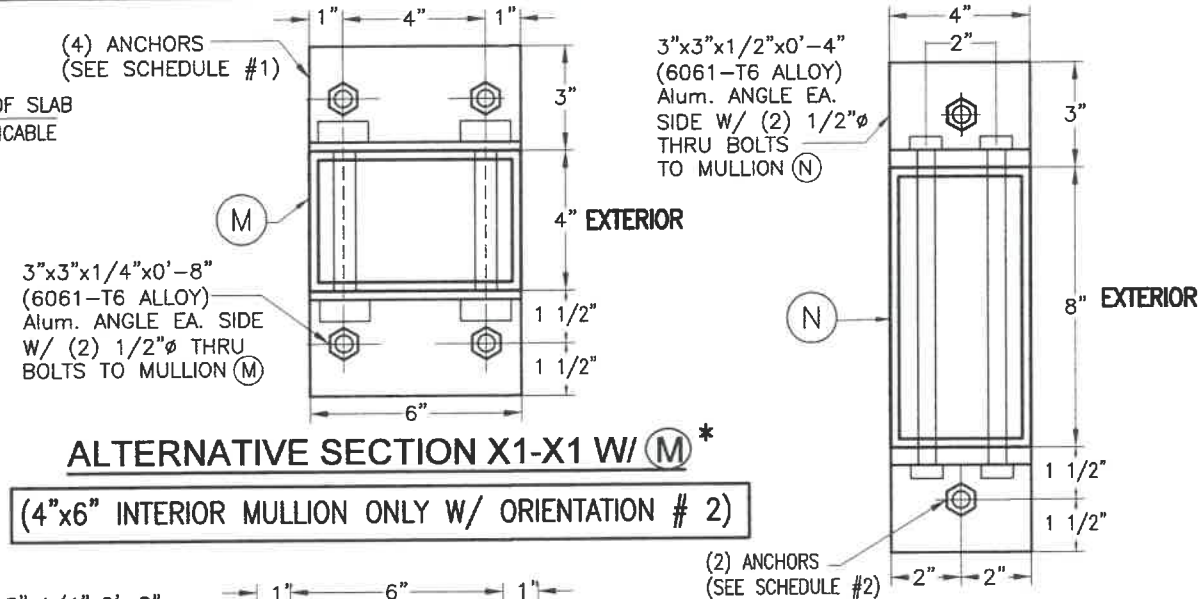
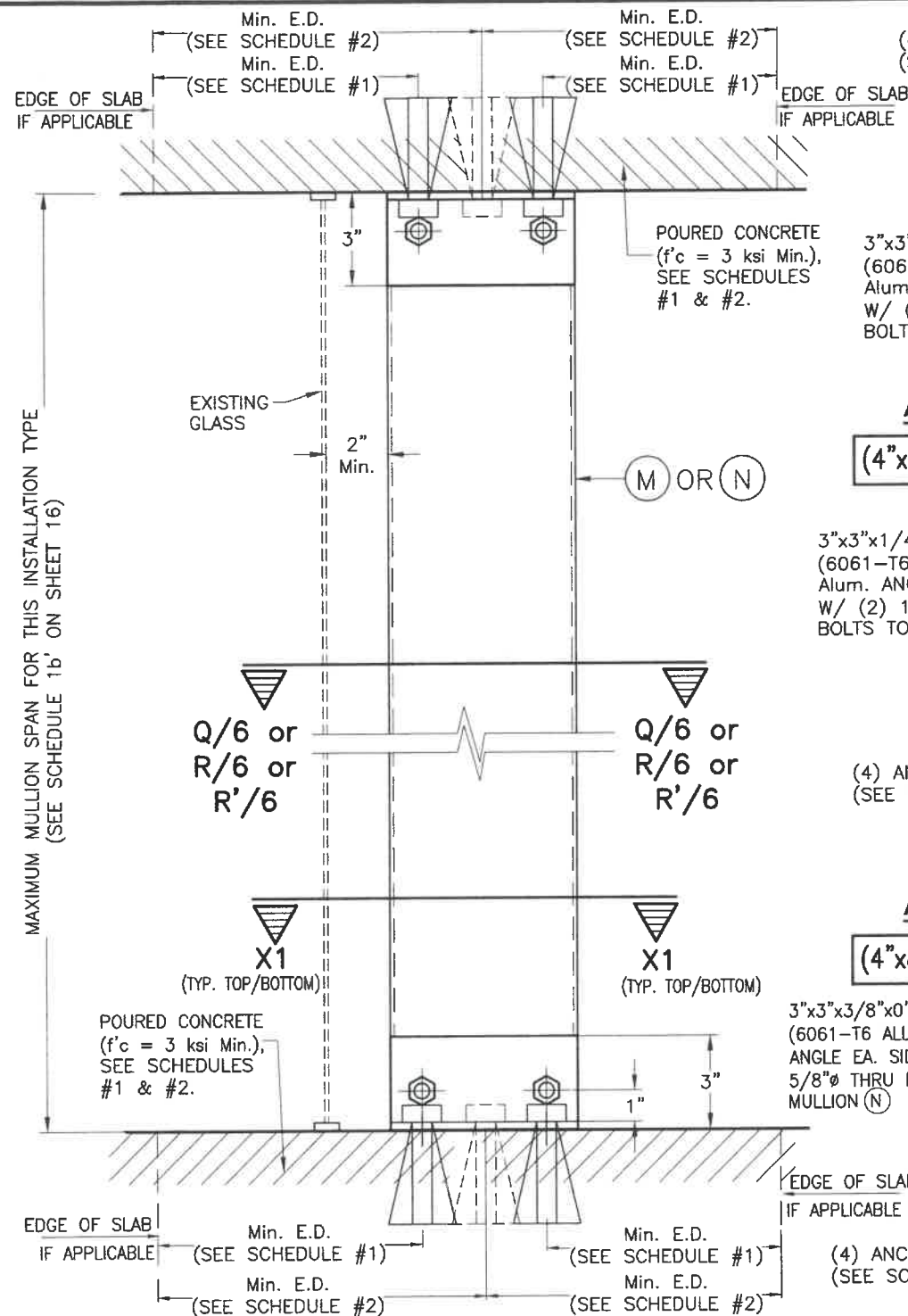
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2			4		

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SHEET 7 OF 27



SEE MAXIMUM (M) (INTERIOR) & (N) (END & INTERIOR) TRAPPED MOUNTED MULLIONS SPAN COVERED BY SCHEDULE 1b' FOR INSTALLATION CASES I, Ia & II ON SHEET 16. (LIMITED LOAD, MULLION SPACING AND SPAN INSTALLATION):

INSTALLATION CASE I - RESIDENTIAL AND COMMERCIAL APPLICATIONS WITH ± 60.8 p.s.f. MAXIMUM A.S.D. DESIGN LOAD, 12'-0" MAXIMUM MULLION SPACING. SEE SCHEDULES #1 & #2 FOR ANCHOR SPECS.

INSTALLATION CASE Ia - RESIDENTIAL AND COMMERCIAL APPLICATION W/ ± 60.8 p.s.f. MAXIMUM A.S.D. DESIGN LOAD, 8'-0" MAXIMUM MULLION SPACING. SEE SCHEDULES #1 & #2 FOR ANCHOR SPECS.

INSTALLATION CASE II - COMMERCIAL APPLICATION FOR ± 100.0 p.s.f. MAXIMUM A.S.D. DESIGN LOAD, 8'-0" MAXIMUM MULLION SPACING. SEE SCHEDULES #1 & #2 FOR ANCHOR SPECS.

* SIDE RAILS (E) & (F) AND BOX NOT SHOWN FOR CLARITY.

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

SECTIONS W-1

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

SCALE: 1/8" = 1"

END RETENTION SYSTEM

FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)

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

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TILTING & ENGINEERING COMPANY
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58mm ER & NER SLAT BERTHA ROLL UP

AMERICAN SHUTTER SYSTEMS ASSOC., INC.
4268 WESTROADS DRIVE
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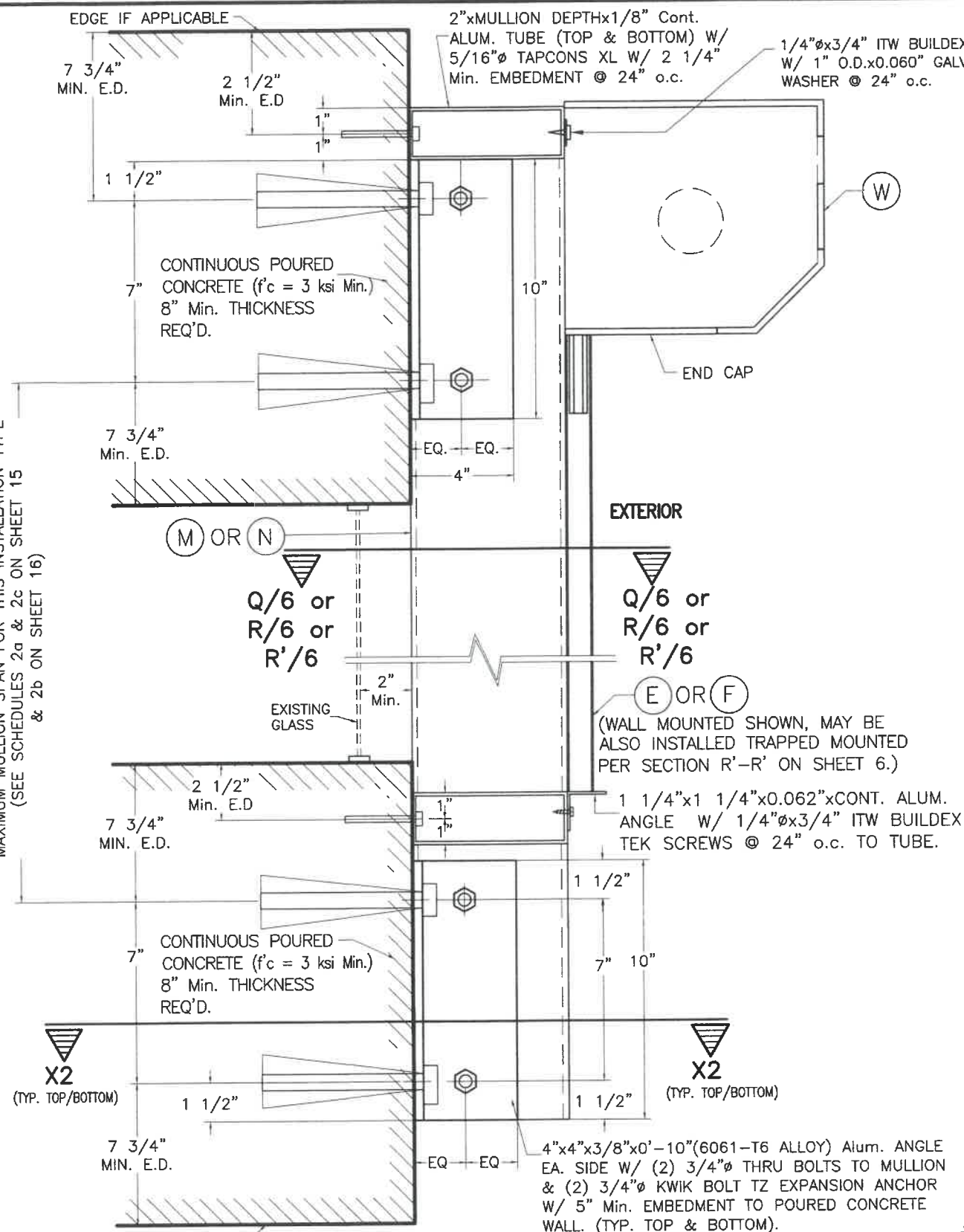
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1	OLD 17-223	7/6/2020	3		
2			4		

SHEET 8 OF 27

MAXIMUM MULLION SPAN FOR THIS INSTALLATION TYPE
(SEE SCHEDULES 2a & 2c ON SHEET 15
& 2b ON SHEET 16)



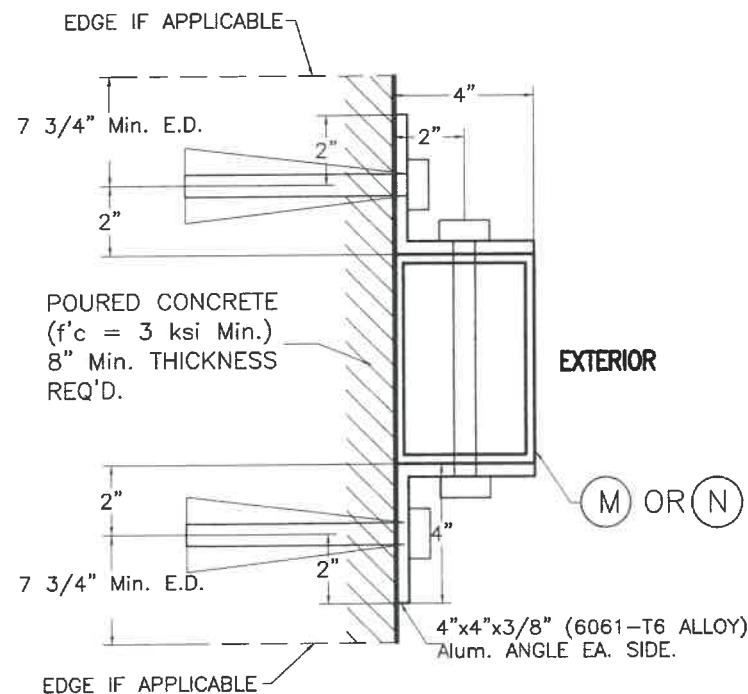
WALL MOUNTING: MULLIONS (M) OR (N)
POURED CONCRETE WALL

SECTION W-2

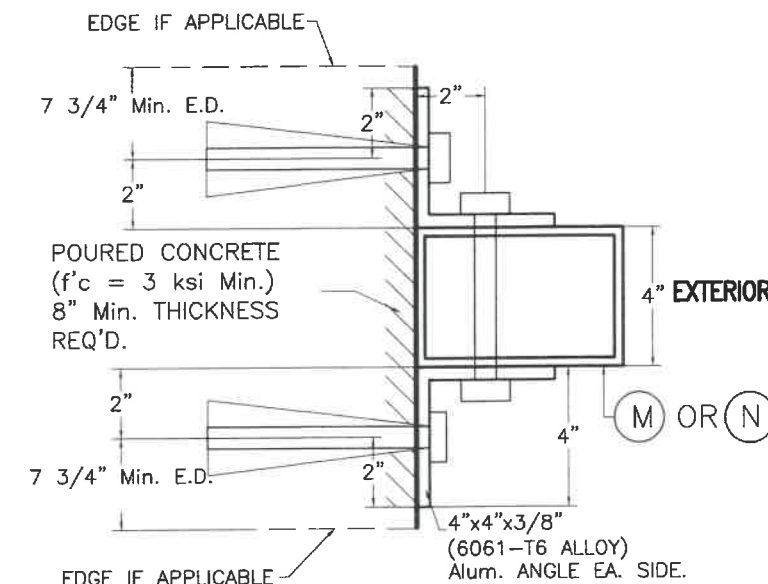
END & INTERIOR WALL MOUNTED MULLION INSTALLATION

APPLICABLE TO ALL INSTALLATIONS EXCEPT THOSE W/ LIMITATIONS COVERED ON SHEET 14

SCALE: 1/8" = 1"



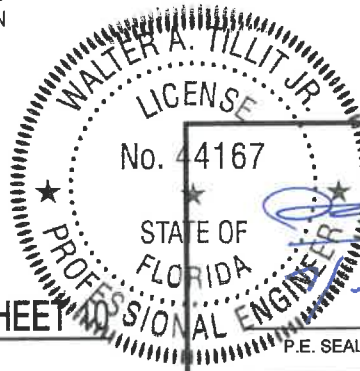
SECTION X2-X2 W/ (M) OR (N)*
(END & INTERIOR MULLION)
(W/ ORIENTATION # 1)
(6"x4" or 8"x4")



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

* SIDE RAILS (E) & (F) AND BOX NOT SHOWN FOR CLARITY.

END RETENTION SYSTEM



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WALTER A. TILLIT Jr., P.E.
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FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)

58mm ER & NER SLAT BERTHA ROLL UP

AMERICAN SHUTTER SYSTEMS ASSOC., INC.
4268 WESTROADS DRIVE
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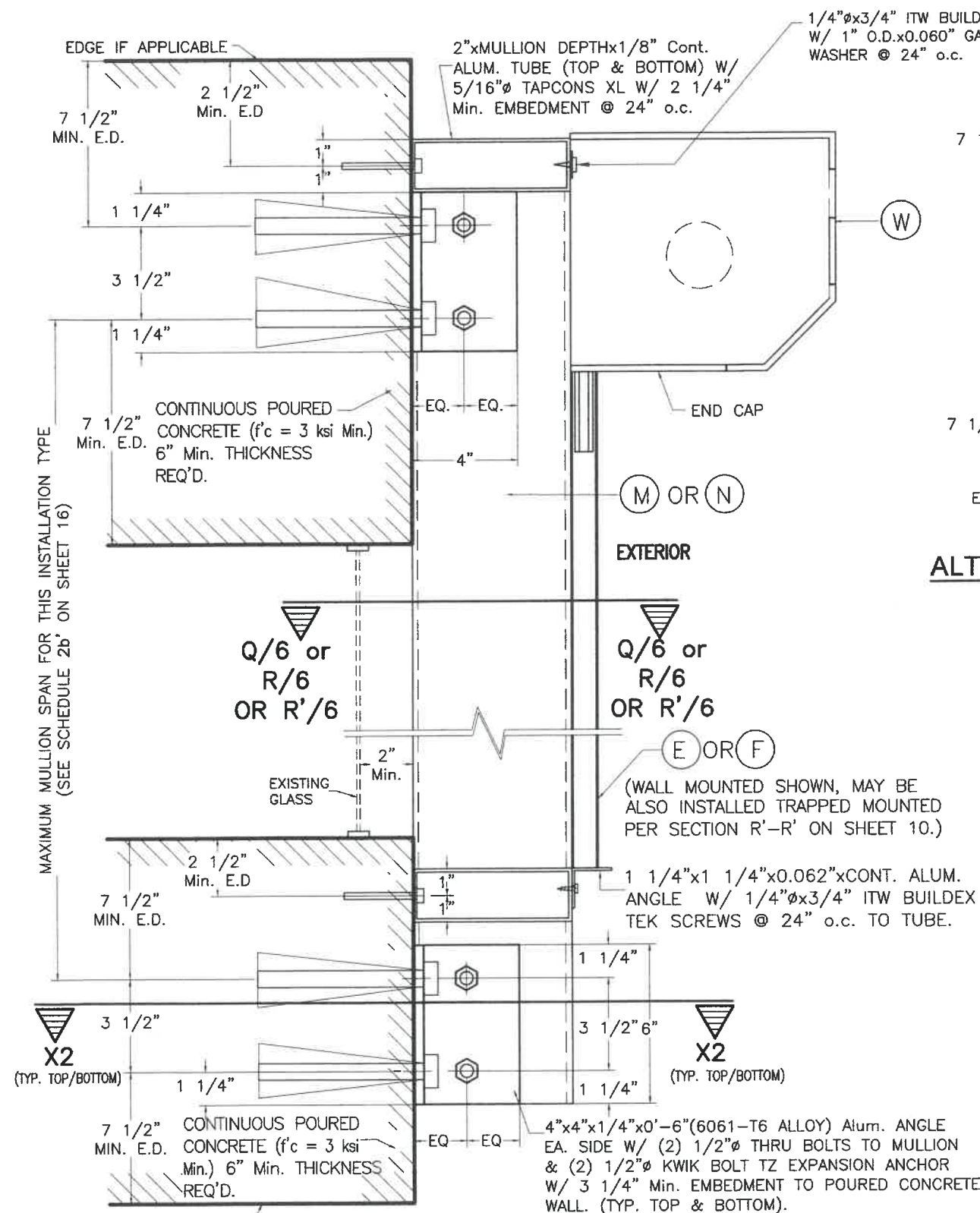
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SHEET 9 OF 27

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2			4		



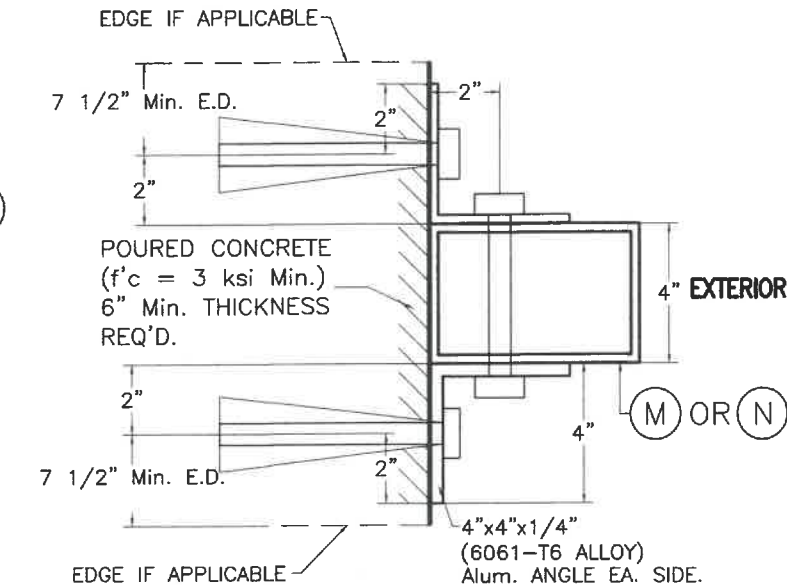
WALL MOUNTING : MULLIONS (M) OR (N)
POURED CONCRETE WALL

SECTION W-2

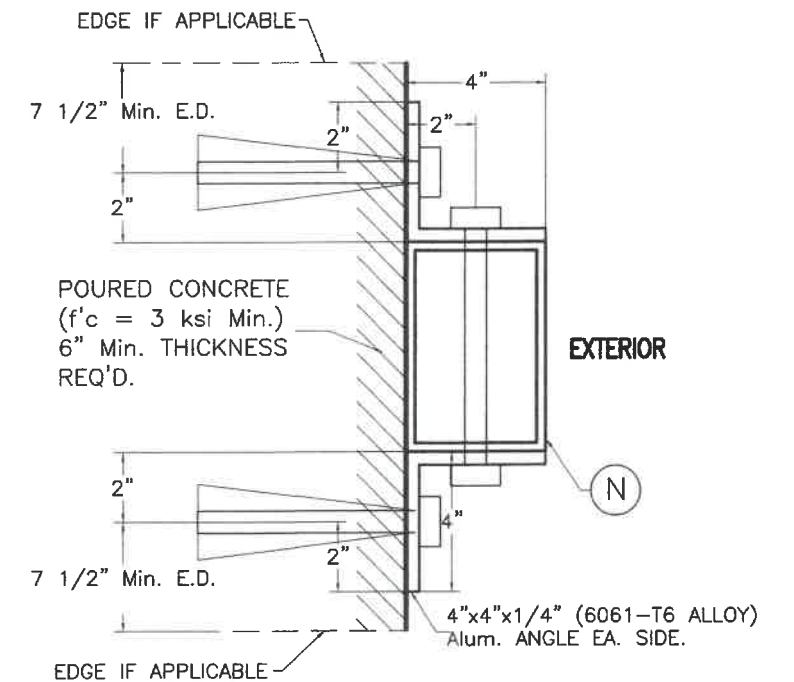
◇ END & INTERIOR WALL MOUNTED MULLION INSTALLATION

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

SCALE: 1/8" = 1"



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



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

* SIDE RAILS (E) & (F) AND BOX NOT SHOWN FOR CLARITY.

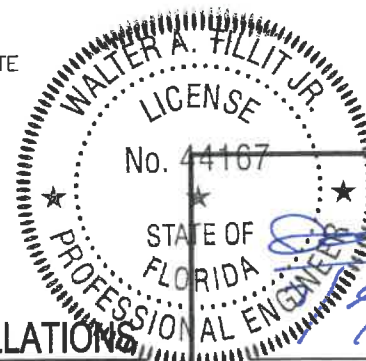
◇ SEE MAXIMUM (M) (INTERIOR) & (N) (END & INTERIOR) WALL MOUNTED MULLIONS SPAN COVERED BY SCHEDULE 2b' FOR INSTALLATION CASES I' & II' ON SHEET 16 (LIMITED LOAD, MULLION SPACING AND SPAN INSTALLATION):

INSTALLATION CASE I' - RESIDENTIAL AND COMMERCIAL APPLICATIONS WITH ± 60.8 p.s.f. MAXIMUM A.S.D. DESIGN LOAD, 12'-0" MAXIMUM MULLION SPACING. VALID FOR CONNECTION TO CONCRETE W/ HILTI INC KWIK HUS-H OR DEWALT INC WEDGE-BOLT ANCHORS.

INSTALLATION CASE II' - COMMERCIAL APPLICATION FOR ± 100.0 p.s.f. MAXIMUM A.S.D. DESIGN LOAD, 8'-0" MAXIMUM MULLION SPACING. VALID FOR CONNECTION TO CONCRETE W/ HILTI INC KWIK BOLT TZ ANCHORS.

END RETENTION SYSTEM

FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)



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SHEET 10 OF 27

END RETENTION SYSTEM

TYPICAL MANDATORY PROCEDURE FOR VERIFYING PRODUCT CODE COMPLIANCE RELATED TO ITS INSTALLATION INTO EXISTING POURED CONCRETE OR GROUTED CONCRETE BLOCK STRUCTURES

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** OR **Ib** ON SHEET 12 TO DETERMINE, BASED ON 1/4" SLAT SLIP (in), ANCHOR TYPE AT SIDE RAILS; A.S.D. DESIGN LOAD (p.s.f.); AND THE MAXIMUM SLAT SPAN "LMAX" (ft).

THE FOLLOWING INFORMATION IS PROVIDED AT CHARTS **Ia**, **Ib** & **Ic** TO PROCEED WITH PRODUCT INSTALLATION VERIFICATION:

- ENTER A.S.D. DESIGN LOAD: SEE STEP (1) ABOVE.

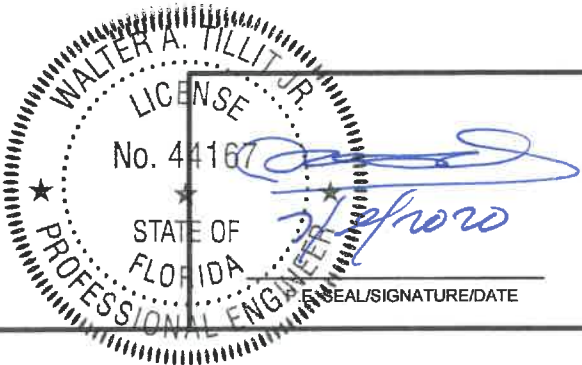
Lmax: THIS IS THE MAXIMUM ALLOWABLE SLAT SPAN FOR WHICH A 1/4" SLAT SLIP MAY BE USED, FOR A GIVEN A.S.D. DESIGN LOAD.
- MINIMUM REQUIRED SEPARATION TO GLASS IS PROVIDED ON CHART **Ic** (SEE STEP 4).

STEP 3: OBTAIN INFORMATION ON PRODUCT'S SIDE RAIL ANCHOR SPACING REQUIREMENTS FOR CONNECTION TO EXISTING STRUCTURE FROM ANCHOR SCHEDULES **IIa**, **IIb**, **IIIa** & **IIIb** ON SHEETS 13 & 14. 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 PROCEDURES ARE APPLICABLE.

PROCEDURE 4a:

- MINIMUM SEPARATION TO GLASS FOR SLATS IF MULLIONS ARE USED SHALL BE BASED ON INSTALLATIONS INDICATED ON CHART **Ic** ON SHEET 12. IT SHALL BE MEASURED FROM BACK OF SLAT TO GLASS.
- ENTER SCHEDULES **1a** THRU **2c** ON SHEETS 15 & 16 W/ A.S.D. DESIGN LOAD ; MAXIMUM MULLION SPACING (MAX., 12', 8' OR 7'), AND DETERMINE MAXIMUM MULLION SPAN (HEIGHT) W/ ALLOWABLE INTERPOLATION IN BETWEEN SPACINGS FOR A GIVEN (M)(N), MULLION TYPE & MULLION ORIENTATION.
- SEE SHEETS 7 THRU 10 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 (M)(N)



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58mm ER & NER SLAT BERTHA ROLL UP

AMERICAN SHUTTER SYSTEMS ASSOC., INC.

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SHEET 11 OF 27

SLAT PERFORMANCE CHARTS (POURED CONCRETE)										
SLAT PERFORMANCE CHARTS Ia, Ib & Ic: (ONLY VALID FOR 1/4" 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 ULTRACON ANCHOR					
A.S.D. DESIGN LOAD (psf)	MAX. SLAT SPAN "L _{max} " (FT)				MAX. SLAT SPAN "L _{max} " (FT)				REQUIRED MIN. SEPARATION TO GLASS MEASURED TO BACK OF SLAT (in)	
	WALL MOUNT	TRAPPED MOUNT	BUILD-OUT MOUNT W/ ①	BUILD-OUT MOUNT W/ ②, ③	WALL MOUNT	TRAPPED MOUNT	BUILD-OUT MOUNT W/ ①	BUILD-OUT MOUNT W/ ②, ③		
									WIND ZONES 1, 2 & 3	WIND ZONES 4
30.0	22'-10"	22'-6"	20'-0"	17'-0"	18'-9"	14'-6"	12'-0"	10'-3"	1"	8 1/4"
35.0	22'-10"	22'-6"	18'-0"	15'-3"	16'-10"	13'-0"	11'-0"	9'-3"	1"	8 1/4"
40.0	22'-10"	22'-0"	16'-6"	14'-0"	15'-6"	12'-0"	10'-0"	8'-5"	1"	8 1/4"
45.0	21'-0"	21'-10"	15'-0"	13'-0"	14'-3"	11'-0"	9'-6"	7'-10"	1"	8"
50.0	20'-0"	19'-10"	14'-0"	12'-3"	13'-0"	10'-4"	8'-9"	7'-4"	1"	7 3/4"
55.0	19'-0"	19'-0"	13'-3"	11'-4"	12'-0"	10'-0"	8'-3"	6'-10"	1"	7 1/2"
60.0	17'-9"	18'-0"	12'-3"	10'-9"	11'-3"	9'-6"	7'-9"	6'-6"	1"	7 1/2"
65.0	16'-10	17'-0"	11'-6"	10'-3"	10'-9"	9'-0"	7'-6"	6'-3"	1"	7 1/4"
70.0	16'-0"	16'-0"	10'-9"	9'-9"	10'-4"	8'-9"	7'-3"	6'-0"	1"	7"
75.0	15'-0"	15'-0"	10'-3"	9'-3"	10'-0"	8'-5"	7'-0"	5'-10"	1"	7"
80.0	14'-6"	14'-3"	9'-0"	8'-9"	9'-6"	7'-6"	6'-9"	5'-9"	1"	6 3/4"
85.0	13'-6"	13'-9"	9'-4"	8'-4"	9'-0"	7'-2"	6'-8"	5'-8"	1"	6 1/2"
90.0	12'-6"	13'-3"	9'-0"	8'-0"	8'-9"	6'-9"	6'-6"	5'-7"	1"	6 1/2"
95.0	11'-6"	12'-9"	8'-9"	7'-8"	8'-6"	6'-4"	6'-4"	5'-6"	1"	6 1/8"
100.0	10'-6"	12'-3"	8'-6"	7'-5"	8'-3"	6'-0"	6'-2"	5'-5"	1"	6"
105.0	9'-6"	11'-9"	8'-3"	7'-2"	8'-0"	5'-11"	6'-1"	5'-4"	1"	5 5/8"
110.0	9'-5"	11'-3"	8'-0"	7'-0"	7'-9"	5'-9"	6'-0"	5'-3"	1"	5 5/8"
115.0	9'-4"	11'-0"	7'-10"	6'-10"	7'-7"	5'-6"	5'-11"	5'-2"	1"	5 5/8"
120.0	9'-3"	10'-9"	7'-9"	6'-8"	7'-6"	5'-5"	5'-10"	5'-0"	1"	5 5/8"
125.0	9'-0"	10'-7"	7'-6"	6'-6"	7'-4"	5'-4"	5'-9"	4'-11"	1"	5 1/2"
130.0	8'-10"	10'-6"	7'-3"	6'-4"	7'-3"	5'-3"	5'-8"	4'-10"	1"	5 1/2"
135.0	8'-9"	10'-3"	7'-0"	6'-2"	7'-0"	5'-2"	5'-7"	4'-9"	1"	5 1/2"
140.0	8'-6"	10'-0"	6'-10"	6'-0"	6'-10"	5'-0"	5'-6"	4'-8"	1"	5 1/2"

* **NOTES:**

- ABOVE INDICATED MAX. SLAT SPANS MAY BE USED AS LONG AS ANCHOR SPACING SCHEDULES ON SHEET 13 INDICATE THAT AN ANCHOR SPACING IS AVAILABLE FOR THE CORRESPONDING SLAT SPAN AND DESIGN LOAD.
- REQUIRES SIDE RAILS FASTENED TO EXISTING STRUCTURE WITH **3/8"Ø WEDGE-BOLT ANCHOR OR 5/16"Ø ULTRACON 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.



SLAT SPAN DEFINITION

END RETENTION SYSTEM

SLAT PERFORMANCE CHARTS (GROUTED CONCRETE BLOCK)										
SLAT PERFORMANCE CHARTS Ia, Ib & Ic: (ONLY VALID FOR 1/4" SLIP) FOR A GIVEN A.S.D. DESIGN LOAD (p.s.f.), PRODUCT MOUNT CONDITION INCLUDING ANCHOR TYPE										
CHART Ia					CHART Ib				CHART Ic	
USE MAXIMUM VALUE BETWEEN POSITIVE AND NEGATIVE A.S.D. LOAD									USE MAXIMUM POSITIVE A.S.D. LOAD VALUE	
<u>3/8"Ø KWIK HUS BOLT ANCHOR</u>					<u>5/16"Ø ULTRACON ANCHOR</u>					
A.S.D. DESIGN LOAD (psf)	MAX. SLAT SPAN "L _{max} " (FT)				MAX. SLAT SPAN "L _{max} " (FT)				REQUIRED MIN. SEPARATION TO GLASS MEASURED TO BACK OF SLAT (in) WIND ZONES 1, 2 & 3 WIND ZONES 4	
	WALL MOUNT	TRAPPED MOUNT	BUILD-OUT MOUNT W/ ①	BUILD-OUT MOUNT W/ ②, ③	WALL MOUNT	TRAPPED MOUNT	BUILD-OUT MOUNT W/ ①	BUILD-OUT MOUNT W/ ②, ③		
	SEE NOTES *	SEE NOTES *	SEE NOTES *	SEE NOTES *	SEE NOTES *	SEE NOTES *	SEE NOTES *	SEE NOTES *		
30.0	14'-6"	14'-7"	11'-0"	9'-7"	10'-6"	8'-6"	8'-0"	7'-6"	1"	7 1/2"
35.0	13'-2"	13'-3"	10'-0"	8'-11"	9'-6"	7'-10"	7'-4"	7'-2"	1"	7"
40.0	12'-0"	12'-0"	9'-4"	8'-4"	9'-0"	7'-4"	6'-9"	7'-0"	1"	7"
45.0	11'-3"	11'-0"	8'-10"	7'-11"	8'-6"	6'-10"	6'-7"	6'-8"	1"	6 1/2"
50.0	10'-6"	10'-3"	8'-4"	7'-6"	8'-2"	6'-6"	6'-4"	6'-5"	1"	6 1/2"
55.0	9'-11"	9'-7"	7'-11"	7'-3"	7'-9"	6'-3"	6'-2"	6'-3"	1"	6 1/8"
60.0	9'-4"	9'-0"	7'-7"	6'-11"	7'-3"	6'-0"	6'-0"	6'-0"	1"	6"
65.0	8'-11"	8'-7"	7'-4"	6'-9"	7'-0"	5'-10"	5'-11"	5'-11"	1"	6"
70.0	8'-8"	8'-2"	7'-1"	6'-6"	6'-7"	5'-7"	5'-10"	5'-10"	1"	6"
75.0	8'-3"	7'-10"	6'-10"	6'-4"	6'-6"	5'-6"	5'-9"	5'-6"	1"	5 3/4"
80.0	7'-11"	7'-6"	6'-8"	6'-2"	6'-3"	5'-5"	5'-7"	5'-4"	1"	5 5/8"
85.0	7'-8"	7'-2"	6'-5"	6'-0"	6'-2"	5'-4"	5'-6"	5'-2"	1"	5 1/2"
90.0	7'-5"	6'-11"	6'-3"	5'-11"	6'-0"	5'-2"	5'-5"	5'-0"	1"	5 1/2"
95.0	7'-2"	6'-8"	6'-1"	5'-9"	5'-10"	5'-0"	5'-4"	4'-8"	1"	5 1/2"
100.0	7'-0"	6'-6"	6'-0"	5'-8"	5'-8"	4'-10"	5'-3"	4'-6"	1"	5 1/4"
105.0	6'-10"	6'-4"	5'-11"	5'-6"	5'-6"	4'-8"	5'-2"	4'-3"	1"	5 1/4"
110.0	6'-8"	6'-1"	5'-9"	5'-5"	5'-5"	4'-6"	5'-1"	4'-6"	1"	5 1/4"
115.0	6'-6"	5'-11"	5'-8"	5'-4"	5'-4"	4'-4"	5'-0"	3'-9"	1"	5 1/8"
120.0	6'-4"	5'-10"	5'-7"	5'-3"	5'-3"	4'-2"	4'-11"	3'-8"	1"	5"
125.0	6'-3"	5'-8"	5'-5"	5'-2"	5'-2"	4'-0"	4'-10"	3'-8"	1"	5"
130.0	6'-1"	5'-7"	5'-4"	5'-1"	5'-0"	3'-10"	4'-9"	3'-8"	1"	5"
135.0	6'-0"	5'-5"	5'-3"	5'-0"	4'-11"	3'-8"	4'-8"	3'-7"	1"	5"
140.0	5'-11"	5'-4"	5'-2"	4'-11"	4'-10"	3'-6"	4'-7"	3'-7"	1"	5"

* **NOTES:**

- ABOVE INDICATED MAX. SLAT SPANS MAY BE USED AS LONG AS ANCHOR SPACING SCHEDULES ON SHEET 14 INDICATE THAT AN ANCHOR SPACING IS AVAILABLE FOR THE CORRESPONDING SLAT SPAN AND DESIGN LOAD.
- REQUIRES SIDE RAILS FASTENED TO EXISTING STRUCTURE WITH **3/8"Ø HILTI KWIK HUS BOLT ANCHOR W/ 4" MIN. E.D. & 3 1/4" MIN. EMBEDMENT OR 5/16"Ø ULTRACON ANCHOR W/ 2 1/2" MIN. E.D. & 2 1/4" MIN. EMBEDMENT** 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.

FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)



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58mm ER & NER SLAT BERTHA ROLL UP

AMERICAN SHUTTER SYSTEMS ASSOC., INC.

4268 WESTROADS DRIVE
WEST PALM BEACH, FL. 33407
PHONE: (877)989-2772
FAX: (561)209-8380

REV. No	DESCRIPTION	DATE	REV. No	DESCRIPTION	DATE
1	OLD 17-223	7/6/2020	3		
2			4		

DRAWN BY:
M.P

7/6/2020
DATE

20-171
DRAWING No

SHEET 12 OF 27

END RETENTION SYSTEM

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' †	> 16'-23' †
≤ 30.0	12"	12"	12"	12"	12"	12"	10"	6"
>30-40	12"	12"	12"	12"	12"	11 1/2"	7 1/2"	4 1/2"
>40-60	12"	12"	12"	12"	12"	7 1/2"	5"	4 1/2"
>60-80	12"	12"	12"	12"	9"	5 1/2"	4 1/2"	4 1/2"
>80-105	12"	12"	12"	11"	6 1/2"	5 1/2"	6"	—
>105-120	12"	12"	12"	9"	6"	5 1/2"	6"	—
>120-140	12"	12"	11"	7 1/2"	5 1/2"	5 1/2"	—	—

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' †	> 16'-23' †
≤ 30.0	6"	6"	6"	6"	6"	6"	6"	6"
>30-40	6"	6"	6"	6"	6"	6"	6"	6"
>40-60	6"	6"	6"	6"	6"	6"	6"	5 1/2"
>60-80	6"	6"	6"	6"	6"	6"	5 1/2"	5 1/2"
>80-105	6"	6"	6"	6"	6"	5"	5"	—
>105-120	6"	6"	6"	6"	6"	5"	5"	—
>120-140	6"	6"	6"	6"	6"	5"	—	—

BUILD-OUT 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' †		> 16'-20' †	
	D1	D2, D3	D1	D2, D3	D1	D2, D3	D1	D2, D3	D1	D2, D3	D1	D2, D3	D1	D2, D3	D1	D2, D3
≤ 30.0	5"	5"	5"	5"	5"	5"	5"	5"	5"	5"	5"	5"	5"	5"	4 1/2"	—
>30-40	5"	5"	5"	5"	5"	5"	5"	5"	5"	5"	5"	5"	5"	5"	4 1/2"	—
>40-60	5"	5"	5"	5"	5"	5"	5"	5"	5"	5"	5"	5"	4 1/2"	—	—	—
>60-80	5"	5"	5"	5"	5"	5"	5"	5"	5"	5"	5"	—	—	—	—	—
>80-105	5"	5"	5"	5"	5"	5"	5"	5"	5"	5"	5"	—	—	—	—	—
>105-120	5"	5"	5"	5"	5"	5"	5"	5"	5"	5"	5"	—	—	—	—	—
>120-140	5"	5"	5"	5"	5"	5"	5"	5"	5"	5"	5"	—	—	—	—	—



SLAT SPAN DEFINITION

† NOTE:
MAX. SLAT SPAN FOR A GIVEN DESIGN LOAD SHALL NEVER EXCEED MAX. SLAT SPAN INDICATED ON SLAT PERFORMANCE CHART ON SHEET 12.

MAX. ANCHOR'S SPACING SCHEDULE IIb

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

WALL MOUNT

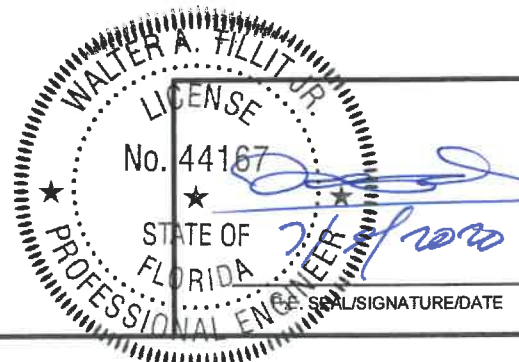
A.S.D. DESIGN LOAD RANGE (p.s.f.)	SLAT SPAN RANGE							
	0'-4' †	> 4'-5' †	> 5'-6' †	> 6'-7' †	> 7'-9' †	> 9'-12' †	> 12'-16' †	> 16'-23' †
≤ 30.0	5"	5"	5"	5"	5"	5"	5"	5"
>30-40	5"	5"	5"	5"	5"	5"	5"	5"
>40-60	5"	5"	5"	5"	5"	5"	5"	5"
>60-80	5"	5"	5"	5"	5"	5"	5"	5"
>80-105	5"	5"	5"	5"	5"	5"	5"	5"
>105-120	5"	5"	5"	5"	5"	5"	5"	5"
>120-140	5"	5"	5"	5"	5"	5"	5"	5"

TRAPPED MOUNT

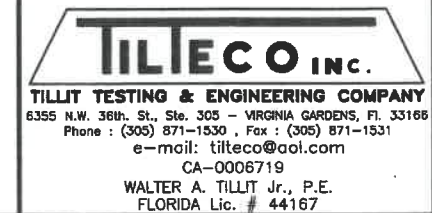
A.S.D. DESIGN LOAD RANGE (p.s.f.)	SLAT SPAN RANGE							
	0'-4' †	> 4'-5' †	> 5'-6' †	> 6'-7' †	> 7'-9' †	> 9'-12' †	> 12'-16' †	> 16'-23' †
≤ 30.0	5"	5"	5"	5"	5"	5"	5"	—
>30-40	5"	5"	5"	5"	5"	5"	5"	—
>40-60	5"	5"	5"	5"	5"	5"	—	—
>60-80	5"	5"	5"	5"	5"	5"	—	—
>80-105	5"	5"	5"	5"	5"	5"	—	—
>105-120	5"	5"	5"	5"	5"	5"	—	—
>120-140	5"	5"	5"	5"	5"	5"	—	—

BUILD-OUT 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' †		> 16'-20' †	
	D1	D2, D3	D1	D2, D3	D1	D2, D3	D1	D2, D3	D1	D2, D3	D1	D2, D3	D1	D2, D3	D1	D2, D3
≤ 30.0	3 1/2"	3 1/2"	3 1/2"	3 1/2"	3 1/2"	3 1/2"	3 1/2"	3 1/2"	3 1/2"	3 1/2"	3 1/2"	3 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"	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"	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"	3 1/2"	—	—	—	—	—	—	—	—
>80-105	3 1/2"	3 1/2"	3 1/2"	3 1/2"	3 1/2"	3 1/2"	3 1/2"	—	—	—	—	—	—	—	—	—
>105-120	3 1/2"	3 1/2"	3 1/2"	3 1/2"	3 1/2"	3 1/2"	3 1/2"	—	—	—	—	—	—	—	—	—
>120-140	3 1/2"	3 1/2"	3 1/2"	3 1/2"	3 1/2"	3 1/2"	3 1/2"	—	—	—	—	—	—	—	—	—



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58mm ER & NER SLAT BERTHA ROLL UP

AMERICAN SHUTTER SYSTEMS ASSOC., INC.

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DRAWN BY:
M.P

7/6/2020
DATE

20-171
DRAWING No

SHEET 13 OF 27

END RETENTION SYSTEM

MAX. ANCHOR'S SPACING SCHEDULE IIIa

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' †	> 16'-23' †
≤ 30.0	12"	12"	12"	12"	12"	8"	6"	—
>30-40	12"	12"	12"	12"	10 1/2"	6"	6"	—
>40-60	12"	12"	12"	12"	6 1/2"	6"	6"	—
>60-80	12"	12"	12"	8"	6"	6"	—	—
>80-105	12"	12"	8 1/2"	6"	6"	—	—	—
>105-120	12"	12"	7"	6"	—	—	—	—
>120-140	12"	11"	6"	6"	—	—	—	—

BUILD-OUT 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' †		> 16'-20' †	
	D1	D2, D3	D1	D2, D3	D1	D2, D3	D1	D2, D3	D1	D2, D3	D1	D2, D3	D1	D2, D3	D1	D2, D3
≤ 30.0	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	—	—	—	—
>30-40	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	—	—	—	—
>40-60	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	—	—	—	—
>60-80	6"	6"	6"	6"	6"	6"	6"	6"	6"	—	—	—	—	—	—	—
>80-105	6"	6"	6"	6"	6"	6"	6"	6"	—	—	—	—	—	—	—	—
>105-120	6"	6"	6"	6"	6"	6"	—	—	—	—	—	—	—	—	—	—
>120-140	6"	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'-9' †	> 9'-12' †	> 12'-16' †	> 16'-23' †
≤ 30.0	6"	6"	6"	6"	6"	6"	6"	—
>30-40	6"	6"	6"	6"	6"	6"	6"	—
>40-60	6"	6"	6"	6"	6"	6"	6"	—
>60-80	6"	6"	6"	6"	6"	6"	—	—
>80-105	6"	6"	6"	6"	6"	—	—	—
>105-120	6"	6"	6"	6"	—	—	—	—
>120-140	6"	6"	6"	—	—	—	—	—



SLAT SPAN DEFINITION

† NOTE:
MAX. SLAT SPAN FOR A GIVEN DESIGN LOAD SHALL NEVER EXCEED MAX. SLAT SPAN INDICATED ON SLAT PERFORMANCE CHART ON SHEET 12.

MAX. ANCHOR'S SPACING SCHEDULE IIIb

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

WALL MOUNT

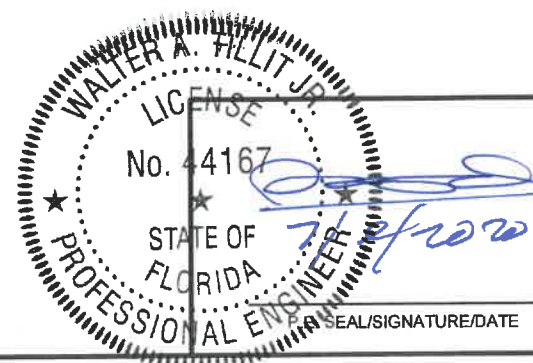
A.S.D. DESIGN LOAD RANGE (p.s.f.)	SLAT SPAN RANGE							
	0'-4' †	> 4'-5' †	> 5'-6' †	> 6'-7' †	> 7'-9' †	> 9'-12' †	> 12'-16' †	> 16'-23' †
≤ 30.0	5"	5"	5"	5"	5"	5"	—	—
>30-40	5"	5"	5"	5"	5"	5"	—	—
>40-60	5"	5"	5"	5"	5"	—	—	—
>60-80	5"	5"	5"	5"	—	—	—	—
>80-105	5"	5"	5"	—	—	—	—	—
>105-120	5"	5"	5"	—	—	—	—	—
>120-140	5"	5"	5"	—	—	—	—	—

BUILD-OUT 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' †		> 16'-20' †	
	D1	D2, D3	D1	D2, D3	D1	D2, D3	D1	D2, D3	D1	D2, D3	D1	D2, D3	D1	D2, D3	D1	D2, D3
≤ 30.0	3 1/2"	3 1/2"	3 1/2"	3 1/2"	3 1/2"	3 1/2"	3 1/2"	3 1/2"	3 1/2"	3 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"	3 1/2"	—	—	—	—	—	—	—	—
>40-60	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	3 1/2"	3 1/2"	3 1/2"	3 1/2"	3 1/2"	—	—	—	—	—	—	—	—	—	—	—
>105-120	3 1/2"	3 1/2"	3 1/2"	3 1/2"	3 1/2"	—	—	—	—	—	—	—	—	—	—	—
>120-140	3 1/2"	3 1/2"	3 1/2"	3 1/2"	3 1/2"	—	—	—	—	—	—	—	—	—	—	—

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' †	> 16'-23' †
≤ 30.0	5"	5"	5"	5"	5"	—	—	—
>30-40	5"	5"	5"	5"	5"	—	—	—
>40-60	5"	5"	5"	—	—	—	—	—
>60-80	5"	5"	5"	—	—	—	—	—
>80-105	5"	5"	5"	—	—	—	—	—
>105-120	5"	5"	5"	—	—	—	—	—
>120-140	5"	5"	5"	—	—	—	—	—



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TILTECO INC.
TILLIT TESTING & ENGINEERING COMPANY
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e-mail: tilteco@aol.com
CA-0006719
WALTER A. TILLIT JR., P.E.
FLORIDA Lic. # 44167

FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)

58mm ER & NER SLAT BERTHA ROLL UP

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

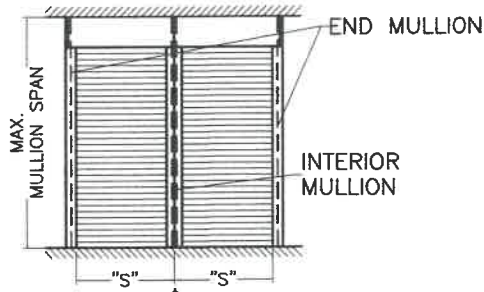
7/6/2020
DATE

20-171
DRAWING No

REV. No	DESCRIPTION	DATE	REV. No	DESCRIPTION	DATE
1	OLD 17-223	7/6/2020	3		
2			4		

SHEET 14 OF 27

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)							
		M 4"x6"x1/4" MULLION				N 4"x8"x1/4" MULLION			
		ORIENTATION #1 ()		ORIENTATION #2 ()		ORIENTATION #1 ()		ORIENTATION #2 ()	
		END	INTERIOR	END	INTERIOR	END	INTERIOR	END	INTERIOR
30	22'-10"	6' - 6"	9' - 4"	5' - 11"	11' - 6"	7' - 8"	9' - 7"	6' - 9"	12' - 0"
35	22'-10"	6' - 0"	8' - 10"	5' - 6"	10' - 11"	7' - 2"	8' - 11"	6' - 4"	12' - 0"
40	22'-10"	5' - 8"	8' - 5"	5' - 2"	10' - 5"	6' - 5"	8' - 0"	5' - 11"	12' - 0"
45	21'-0"	5' - 8"	8' - 4"	5' - 2"	10' - 4"	6' - 4"	8' - 1"	5' - 11"	12' - 0"
50	20'-0"	5' - 6"	8' - 2"	5' - 1"	9' - 10"	6' - 1"	7' - 10"	5' - 10"	12' - 0"
55	19'-0"	5' - 6"	8' - 1"	5' - 0"	9' - 5"	5' - 11"	7' - 9"	5' - 9"	12' - 0"
60	17'-9"	5' - 6"	8' - 0"	5' - 1"	9' - 3"	5' - 11"	7' - 10"	5' - 9"	12' - 0"
65	16'-10"	5' - 6"	7' - 11"	5' - 0"	9' - 0"	5' - 11"	7' - 7"	5' - 8"	12' - 0"
70	16'-0"	5' - 5"	7' - 11"	5' - 0"	8' - 7"	5' - 10"	7' - 5"	5' - 7"	12' - 0"
75	15'-0"	5' - 6"	7' - 10"	5' - 1"	8' - 7"	5' - 11"	7' - 5"	5' - 8"	12' - 0"
80	14'-6"	5' - 5"	7' - 10"	5' - 0"	8' - 6"	5' - 9"	7' - 2"	5' - 7"	12' - 0"
85	13'-6"	5' - 6"	7' - 10"	5' - 1"	8' - 7"	6' - 0"	7' - 4"	5' - 9"	12' - 0"
90	12'-6"	5' - 8"	7' - 10"	5' - 3"	8' - 9"	6' - 2"	7' - 7"	6' - 0"	12' - 0"
95	11'-6"	5' - 10"	7' - 11"	5' - 5"	9' - 0"	6' - 7"	8' - 0"	6' - 2"	12' - 0"
100	10'-6"	6' - 0"	8' - 1"	5' - 7"	9' - 4"	7' - 0"	8' - 6"	6' - 5"	12' - 0"
105	9'-6"	6' - 4"	8' - 2"	5' - 11"	9' - 10"	7' - 6"	8' - 9"	6' - 9"	12' - 0"
110	9'-5"	6' - 2"	8' - 1"	5' - 10"	9' - 6"	7' - 5"	8' - 6"	6' - 8"	12' - 0"
115	9'-4"	6' - 0"	8' - 0"	5' - 9"	9' - 2"	7' - 2"	8' - 3"	6' - 7"	12' - 0"
120	9'-3"	6' - 0"	7' - 11"	5' - 8"	9' - 10"	6' - 11"	7' - 10"	6' - 6"	12' - 0"
125	9'-0"	6' - 0"	7' - 10"	5' - 8"	8' - 9"	6' - 11"	7' - 8"	6' - 6"	12' - 0"
130	8'-10"	6' - 0"	7' - 10"	5' - 7"	8' - 7"	6' - 10"	7' - 6"	6' - 5"	12' - 0"
135	8'-9"	6' - 0"	7' - 9"	5' - 6"	8' - 4"	6' - 8"	7' - 2"	6' - 4"	11' - 10"
140	8'-6"	6' - 0"	7' - 9"	5' - 7"	8' - 3"	6' - 8"	7' - 1"	6' - 4"	11' - 10"



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)							
		M 4"x6"x1/4" MULLION				N 4"x8"x1/4" MULLION			
		ORIENTATION #1 ()		ORIENTATION #2 ()		ORIENTATION #1 ()		ORIENTATION #2 ()	
		END	INTERIOR	END	INTERIOR	END	INTERIOR	END	INTERIOR
30	22'-10"	6' - 5"	9' - 3"	5' - 11"	11' - 6"	7' - 8"	9' - 7"	5' - 7"	12' - 0"
35	22'-10"	6' - 0"	8' - 10"	5' - 6"	10' - 11"	7' - 2"	8' - 11"	4' - 10"	12' - 0"
40	22'-10"	5' - 8"	8' - 5"	5' - 2"	10' - 5"	6' - 9"	8' - 5"	4' - 4"	12' - 0"
45	21'-0"	5' - 8"	8' - 4"	5' - 2"	10' - 4"	6' - 9"	8' - 8"	4' - 3"	12' - 0"
50	20'-0"	5' - 6"	8' - 2"	5' - 1"	10' - 2"	6' - 7"	8' - 8"	4' - 2"	12' - 0"
55	19'-0"	5' - 6"	8' - 1"	5' - 0"	10' - 0"	6' - 6"	8' - 8"	4' - 1"	12' - 0"
60	17'-9"	5' - 6"	8' - 0"	5' - 1"	9' - 11"	6' - 6"	8' - 7"	4' - 1"	12' - 0"
65	16'-10"	5' - 6"	7' - 11"	5' - 0"	9' - 10"	6' - 5"	8' - 6"	4' - 1"	12' - 0"
70	16'-0"	5' - 6"	7' - 10"	5' - 0"	9' - 9"	6' - 6"	8' - 5"	4' - 0"	12' - 0"
75	15'-0"	5' - 6"	7' - 10"	5' - 1"	9' - 9"	6' - 6"	8' - 5"	4' - 1"	12' - 0"
80	14'-6"	5' - 6"	7' - 9"	5' - 0"	9' - 8"	6' - 6"	8' - 4"	4' - 1"	12' - 0"
85	13'-6"	5' - 6"	7' - 10"	5' - 1"	9' - 8"	6' - 7"	8' - 4"	4' - 2"	12' - 0"
90	12'-6"	5' - 7"	7' - 10"	5' - 3"	9' - 9"	6' - 9"	8' - 5"	4' - 5"	12' - 0"
95	11'-6"	5' - 10"	7' - 11"	5' - 5"	9' - 10"	6' - 11"	8' - 5"	4' - 8"	12' - 0"
100	10'-6"	6' - 0"	8' - 0"	5' - 7"	10' - 0"	7' - 2"	8' - 6"	5' - 1"	12' - 0"
105	9'-6"	6' - 4"	8' - 2"	5' - 11"	10' - 2"	7' - 6"	8' - 6"	6' - 9"	12' - 0"
110	9'-5"	6' - 3"	8' - 1"	5' - 10"	10' - 0"	7' - 5"	8' - 6"	5' - 6"	12' - 0"
115	9'-4"	6' - 2"	8' - 0"	5' - 9"	9' - 11"	7' - 3"	8' - 5"	5' - 4"	12' - 0"
120	9'-3"	6' - 0"	7' - 11"	5' - 8"	9' - 10"	7' - 2"	8' - 5"	5' - 2"	12' - 0"
125	9'-0"	6' - 0"	7' - 10"	5' - 8"	9' - 9"	7' - 2"	8' - 5"	5' - 2"	12' - 0"
130	8'-10"	6' - 0"	7' - 10"	5' - 7"	9' - 8"	7' - 1"	8' - 4"	5' - 1"	12' - 0"
135	8'-9"	6' - 0"	7' - 9"	5' - 6"	9' - 7"	7' - 0"	8' - 4"	5' - 0"	11' - 10"
140	8'-6"	6' - 0"	7' - 9"	5' - 7"	9' - 7"	7' - 1"	8' - 4"	5' - 0"	11' - 10"

SCHEDULE 1c									
FLOOR TO CEILING (TRAPPED) MOUNTING									
MAX. SPAN (ft) FOR END AND INTERIOR MULLIONS FOR A GIVEN 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)							
		M 4"x6"x1/4" MULLION				N 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"	11' - 7"	10' - 9"	12' - 0"	12' - 0"
70.0	7'-0"	10' - 9"	10' - 5"	9' - 6"	12' - 0"	12' - 0"	11' - 3"	10' - 4"	12' - 0"
75.0	7'-0"	10' - 3"	10' - 2"	9' - 2"	12' - 0"	12' - 0"	11' - 0"	9' - 11"	12' - 0"
80.0	7'-0"	9' - 10"	9' - 11"	8' - 10"	12' - 0"	11' - 6"	10' - 10"	9' - 8"	12' - 0"
85.0	7'-0"	9' - 5"	9' - 9"	8' - 7"	12' - 0"	11' - 1"	10' - 7"	9' - 4"	12' - 0"
90.0	7'-0"	9' - 1"	9' - 7"	8' - 5"	11' - 10"	10' - 8"	10' - 5"	9' - 1"	12' - 0"
95.0	7'-0"	8' - 9"	9' - 5"	8' - 2"	11' - 7"	10' - 4"	10' - 2"	8' - 11"	12' - 0"
100.0	7'-0"	8' - 6"	9' - 3"	8' - 0"	11' - 5"	10' - 0"	10' - 0"	8' - 8"	12' - 0"
105.0	7'-0"	8' - 3"	9' - 1"	7' - 9"	11' - 3"	9' - 9"	8' - 6"	12' - 0"	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	7'-0"	7' - 8"	8' - 8"	7' - 2"	10' - 9"	9' - 0"	8' - 5"	12' - 0"	12' - 0"
125.0	7'-0"	7' - 5"	8' - 7"	7' - 0"	10' - 7"	8' - 10"	9' - 4"	7' - 11"	12' - 0"
130.0	7'-0"	7' - 3"	8' - 5"	6' - 10"	10' - 6"	8' - 7"	9' - 2"	7' - 10"	12' - 0"
135.0	7'-0"	7' - 2"	8' - 4"	6' - 8"	10' - 4"	8' - 5"	9' - 1"	7' - 8"	12' - 0"
140.0	7'-0"	7' - 0"	8' - 3"	6' - 7"	10' - 1"	8' - 3"	9' - 0"	7' - 7"	12' - 0"

SCHEDULE 2c									
WALL MOUNTING									
MAX. SPAN (ft) FOR END AND INTERIOR MULLIONS FOR A GIVEN DESIGN LOAD (psf) AND A 7'-0" MAX MULLION SPACING (ft) *									
A.S.D.		MAXIMUM MULLION SPAN (ft)							
DESIGN LOAD (p.s.f.)	MAXIMUM MULLION SPACING (ft)*	M 4"x6"x1/4" MULLION				N 4"x8"x1/4" MULLION			
		ORIENTATION #1 ()		ORIENTATION #2 ()		ORIENTATION #1 ()		ORIENTATION #2 ()	
		END	INTERIOR	END	INTERIOR	END	INTERIOR	END	INTERIOR
30.0	7'-0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"
35.0	7'-0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"
40.0	7'-0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"
45.0	7'-0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"
50.0	7'-0"	12' - 0"	11' - 7"	11' - 8"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"
55.0	7'-0"	12' - 0"	11' - 3"	10' - 11"	12' - 0"	12' - 0"	12' - 0"	11' - 11"	12' - 0"
60.0	7'-0"	12' - 0"	10' - 11"	10' - 4"	12' - 0"	12' - 0"	11' - 11"	11' - 3"	12' - 0"
65.0	7'-0"	11' - 4"	10' - 8"	9' - 11"	12' - 0"	12' - 0"	11' - 7"	10' - 9"	12' - 0"
70.0	7'-0"	10' - 9"	10' - 5"	9' - 6"	12' - 0"	12' - 0"	11' - 3"	10' - 4"	12' - 0"
75.0	7'-0"	10' - 3"	10' - 2"	9' - 2"	12' - 0"	12' - 0"	11' - 0"	9' - 11"	12' - 0"
80.0	7'-0"	9' - 10"	9' - 11"	8' - 10"	12' - 0"	11' - 6"	10' - 10"	9' - 8"	12' - 0"
85.0	7'-0"	9' - 5"	9' - 9"	8' - 7"	12' - 0"	11' - 1"	10' - 7"	9' - 4"	12' - 0"
90.0	7'-0"	9' - 1"	9' - 7"	8' - 5"	11' - 10"	10' - 8"	10' - 5"	9' - 1"	12' - 0"
95.0	7'-0"	8' - 9"	9' - 5"	8' - 2"	11' - 7"	10' - 4"	10' - 2"	8' - 11"	12' - 0"
100.0	7'-0"	8' - 6"	9' - 3"	8' - 0"	11' - 5"	10' - 0"	10' - 0"	8' - 8"	12' - 0"
105.0	7'-0"	8' - 3"	9' - 1"	7' - 9"	11' - 3"	9' - 9"	9' - 10"	8' - 6"	12' - 0"
110.0	7'-0"	8' - 0"	8' - 11"	7' - 7"	11' - 1"	9' - 6"	9' - 9"	8' - 4"	12' - 0"
115.0	7'-0"	7' - 10"	8' - 10"	7' - 4"	10' - 11"	9' - 3"	9' - 7"	8' - 2"	12' - 0"
120.0	7'-0"	7' - 8"	8' - 8"	7' - 2"	10' - 9"	9' - 0"	9' - 5"	8' - 1"	12' - 0"
125.0	7'-0"	7' - 5"	8' - 7"	7' - 0"	10' - 7"	8' - 10"	9' - 4"	7' - 11"	12' - 0"
130.0	7'-0"	7' - 3"	8' - 5"	6' - 10"	10' - 6"	8' - 7"	9' - 2"	7' - 10"	12' - 0"
135.0	7'-0"	7' - 2"	8' - 4"	6' - 8"	10' - 4"	8' - 5"	9' - 1"	7' - 8"	12' - 0"
140.0	7'-0"	7' - 0"	8' - 3"	6' - 7"	10' - 3"	8' - 3"	9' - 0"	7' - 7"	12' - 0"

MULLION SCHEDULE FOR END RETENTION SYSTEM

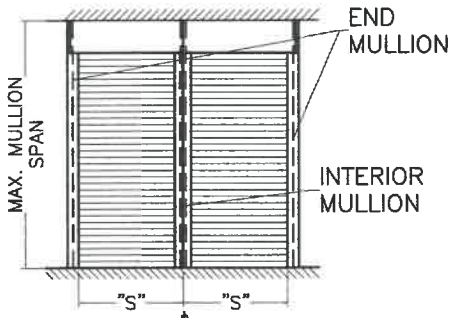
SCHEDULE 1b										
FLOOR TO CEILING (TRAPPED) MOUNTING										
MAX. SPAN (ft) FOR END AND INTERIOR MULLIONS FOR A GIVEN DESIGN LOAD (psf), AND A 12'-0" MAX. MULLION SPACING (ft) *										
A.S.D.	MAXIMUM MULLION SPAN (ft)									
DESIGN LOAD (p.s.f.)	MAXIMUM MULLION SPACING (ft)	M 4"x6"x1/4" MULLION				N 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' - 0"	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"	
85.0	12'-0"	6' - 0"	8' - 2"	5' - 6"	9' - 9"	6' - 11"	8' - 10"	6' - 4"	12' - 0"	
90.0	12'-0"	5' - 10"	8' - 0"	5' - 5"	9' - 2"	6' - 6"	8' - 8"	6' - 2"	12' - 0"	
95.0	12'-0"	5' - 8"	7' - 10"	5' - 3"	8' - 8"	6' - 2"	8' - 6"	6' - 0"	12' - 0"	
100.0	12'-0"	5' - 6"	7' - 8"	5' - 2"	8' - 3"	5' - 11"	8' - 3"	5' - 11"	11' - 9"	
105.0	12'-0"	5' - 5"	7' - 7"	5' - 0"	7' - 10"	5' - 8"	7' - 10"	5' - 8"	11' - 6"	
110.0	12'-0"	5' - 3"	7' - 6"	4' - 11"	7' - 6"	5' - 3"	7' - 6"	5' - 5"	11' - 3"	

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) *										
A.S.D.	MAXIMUM MULLION SPAN (ft)									
DESIGN LOAD (p.s.f.)	MAXIMUM MULLION SPACING (ft)	M 4"x6"x1/4" MULLION				N 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' - 0"	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"	6' - 9"	12' - 0"	
80.0	12'-0"	5' - 8"	8' - 4"	5' - 8"	10' - 3"	7' - 4"	9' - 0"	6' - 6"	12' - 0"	
85.0	12'-0"	5' - 6"	8' - 2"	5' - 6"	9' - 9"	6' - 11"	8' - 10"	6' - 4"	12' - 0"	
90.0	12'-0"	5' - 5"	8' - 0"	5' - 5"	9' - 2"	6' - 6"	8' - 8"	6' - 2"	12' - 0"	
95.0	12'-0"	5' - 3"	7' - 10"	5' - 3"	8' - 8"	6' - 2"	8' - 6"	6' - 0"	12' - 0"	
100.0	12'-0"	5' - 2"	7' - 8"	5' - 2"	8' - 3"	5' - 11"	8' - 3"	5' - 11"	11' - 9"	
105.0	12'-0"	5' - 0"	7' - 7"	5' - 0"	7' - 10"	5' - 8"	7' - 10"	5' - 8"	11' - 6"	
110.0	12'-0"	4' - 11"	7' - 6"	4' - 11"	7' - 6"	5' - 5"	7' - 6"	5' - 5"	11' - 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 12'-0" (CASE I) & 8'-0" (CASE Ia & II) MAX. MULLION SPACING (ft) *										
INSTALLATION CASES	A.S.D. DESIGN LOAD (p.s.f.)	MAXIMUM MULLION SPACING (ft)	MAXIMUM MULLION SPAN (ft)							
			M 4"x6"x1/4" MULLION		N 4"x8"x1/4" MULLION		ORIENTATION #2 ()	ORIENTATION #1 ()		ORIENTATION #2 ()
			ORIENTATION #1 ()	ORIENTATION #2 ()	ORIENTATION #1 ()	ORIENTATION #2 ()		ORIENTATION #1 ()	ORIENTATION #2 ()	
			END	INTERIOR	END	INTERIOR	END	INTERIOR	INTERIOR	INTERIOR
CASE I	30.0	12'-0"	-	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	
	35.0	12'-0"	-	12' - 0"	11' - 1"	11' - 11"	12' - 0"	12' - 0"	12' - 0"	
	40.0	12'-0"	-	12' - 0"	10' - 4"	11' - 4"	12' - 0"	12' - 0"	12' - 0"	
	45.0	12'-0"	-	12' - 0"	9' - 9"	10' - 11"	12' - 0"	12' - 0"	12' - 0"	
	50.0	12'-0"	-	12' - 0"	8' - 11"	10' - 7"	12' - 0"	12' - 0"	12' - 0"	
	55.0	12'-0"	-	11' - 8"	8' - 2"	10' - 3"	12' - 0"	12' - 0"	12' - 0"	
	60.0	12'-0"	-	11' - 4"	7' - 6"	9' - 11"	12' - 0"	12' - 0"	12' - 0"	
CASE Ia	30.0	8'-0"	-	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	
	35.0	8'-0"	-	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	
	40.0	8'-0"	-	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	
	45.0	8'-0"	-	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	
	50.0	8'-0"	-	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	
	55.0	8'-0"	-	12' - 0"	12' - 0"	11' - 8"	12' - 0"	12' - 0"	12' - 0"	
	60.0	8'-0"	-	12' - 0"	11' - 10"	11' - 4"	12' - 0"	12' - 0"	12' - 0"	
CASE II	30.0	8'-0"	-	9' - 0"	9' - 0"	9' - 0"	9' - 0"	9' - 0"	9' - 0"	
	35.0	8'-0"	-	9' - 0"	9' - 0"	9' - 0"	9' - 0"	9' - 0"	9' - 0"	
	40.0	8'-0"	-	9' - 0"	9' - 0"	9' - 0"	9' - 0"	9' - 0"	9' - 0"	
	45.0	8'-0"	-	9' - 0"	9' - 0"	9' - 0"	9' - 0"	9' - 0"	9' - 0"	
	50.0	8'-0"	-	9' - 0"	9' - 0"	9' - 0"	9' - 0"	9' - 0"	9' - 0"	
	55.0	8'-0"	-	9' - 0"	9' - 0"	9' - 0"	9' - 0"	9' - 0"	9' - 0"	
	60.0	8'-0"	-	9' - 0"	9' - 0"	9' - 0"	9' - 0"	9' - 0"	9' - 0"	

Δ NOTE: USE 9'-0" SPAN IF ANCHOR CONSISTS OF HILTI, INC KWIK HUS-H SCREW, POWER FASTENERS OR WEDGE-BOLT ANCHOR IN LIEU OF HILTI KWIK BOLT TZ, SEE SCHEDULES 1 & 2 ON SHEET 8.

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)							
			M 4"x6"x1/4" MULLION		N 4"x8"x1/4" MULLION		ORIENTATION #2 ()	ORIENTATION #1 ()		ORIENTATION #2 ()
			ORIENTATION #1 ()	ORIENTATION #2 ()	ORIENTATION #1 ()	ORIENTATION #2 ()		ORIENTATION #1 ()	ORIENTATION #2 ()	
			END	INTERIOR	END	INTERIOR	END	INTERIOR	INTERIOR	INTERIOR
CASE I	30.0	12'-0"	-	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	12' - 0"	
	35.0	12'-0"	-	12' - 0"	11' - 1"	11' - 11"	12' - 0"	12' - 0"	12' - 0"	
	40.0	12'-0"	-	12' - 0"	10' - 4"	11' - 4"	12' - 0"	12' - 0"	12' - 0"	
	45.0	12'-0"	-	12' - 0"	9' - 9"	10' - 11"	12' - 0"	12' - 0"	12' - 0"	
	50.0	12'-0"	-	12' - 0"	8' - 11"	10' - 7"	12' - 0"	12' - 0"	12' - 0"	
	55.0	12'-0"	-	11' - 8"	8' - 2"	10' - 3"	12' - 0"	12' - 0"	12' - 0"	
	60.0	12'-0"	-	11' - 4"	7' - 6"	9' - 11"	12' - 0"	12' - 0"	12' - 0"	
CASE II	30.0	8'-0"	-	9' - 0"	9' - 0"	9' - 0"	9' - 0"	9' - 0"	9' - 0"	
	35.0	8'-0"	-	9' - 0"	9' - 0"	9' - 0"	9' - 0"	9' - 0"	9' - 0"	
	40.0	8'-0"	-	9' - 0"	9' - 0"	9' - 0"	9' - 0"	9' - 0"	9' - 0"	
	45.0	8'-0"	-	9' - 0"	9' - 0"	9' - 0"	9' - 0"	9' - 0"	9' - 0"	
	50.0	8'-0"	-	9' - 0"	9' - 0"	9' - 0"	9' - 0"	9' - 0"	9' - 0"	
	55.0	8'-0"	-	9' - 0"	9' - 0"	9' - 0"	9' - 0"	9' - 0"	9' - 0"	
	60.0	8'-0"	-	9' - 0"	9' - 0"	9' - 0"	9' - 0"	9' - 0"	9' - 0"	

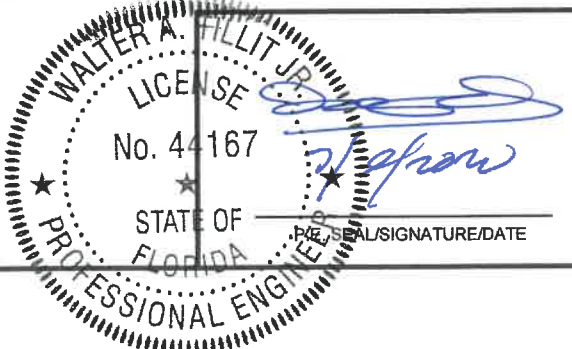


MULLION SPACING: "S"

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

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

FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)



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CA-0006719

WALTER A. TILLIT JR., P.E.

FLORIDA Lic. # 44167

58mm ER & NER SLAT BERTHA ROLL UP

AMERICAN SHUTTER SYSTEMS ASSOC., INC.

4268 WESTROADS DRIVE

WEST PALM BEACH, FL 33407

PHONE: (877)999-2772

FAX: (561)209-8380

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

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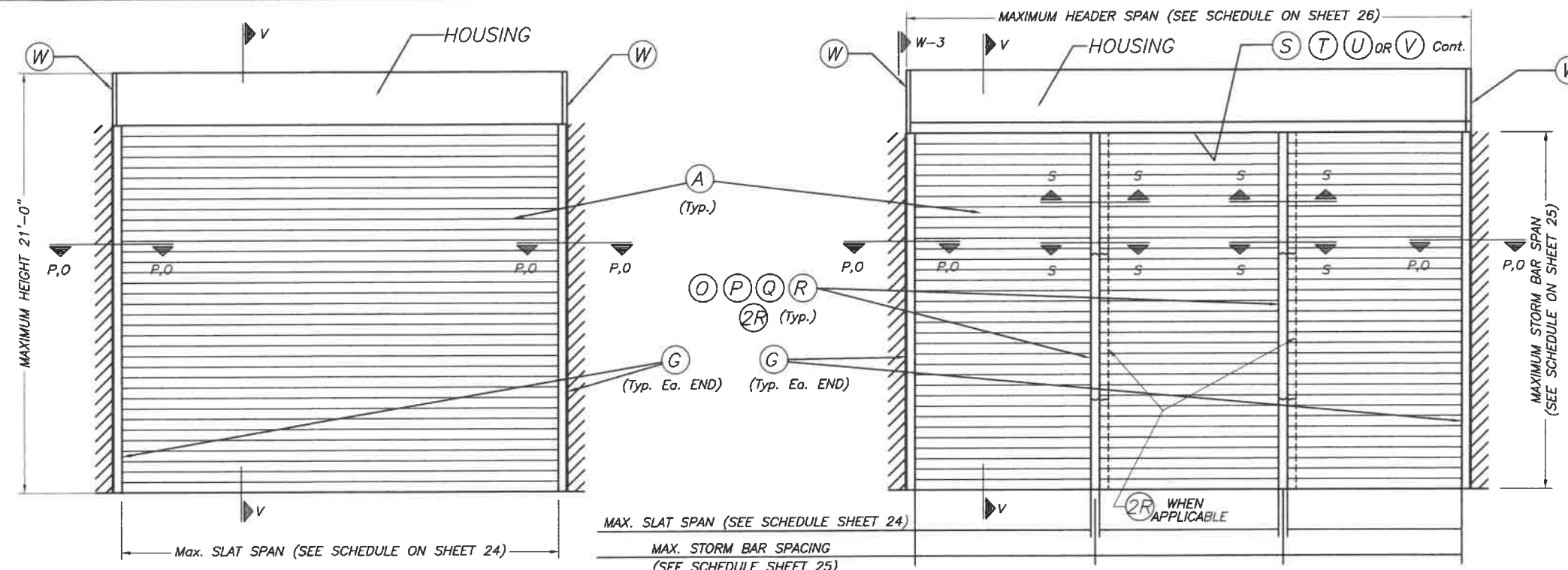
7/6/2020

DATE

20-171

DRAWING No

SHEET 16 OF 27

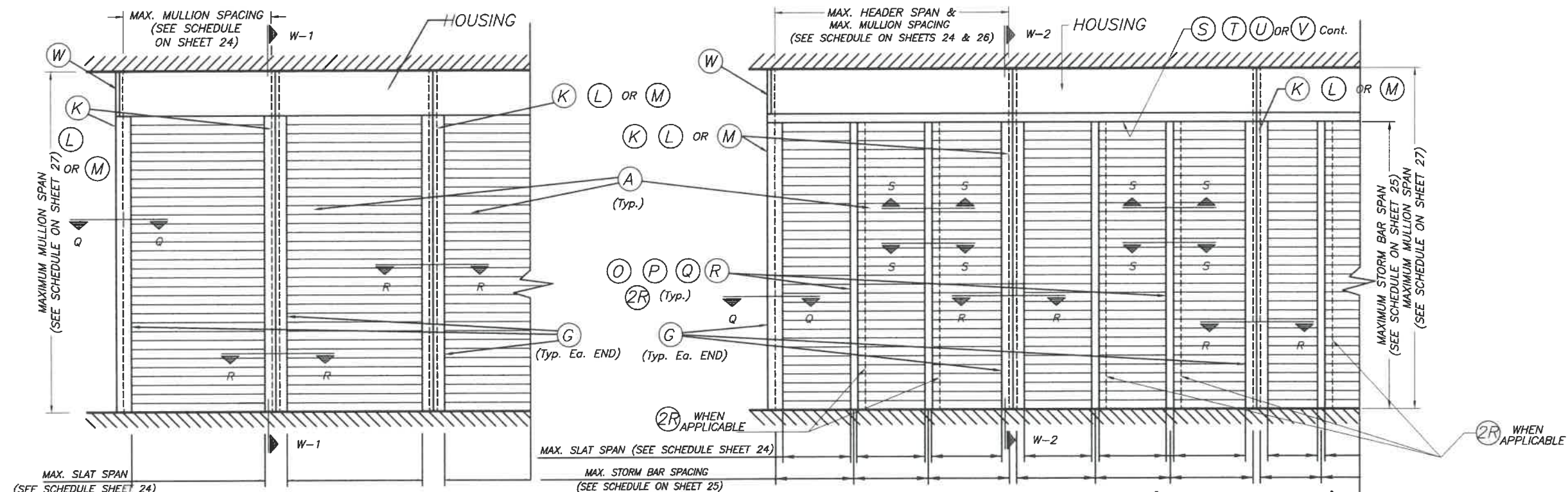


TYPICAL SINGLE UNIT ELEVATION (NO STORM BARS REQUIRED)

NOTE: SEE SHEET 2 & 3 FOR COMPONENTS NOMENCLATURE.

TYPICAL MULTIPLE UNIT ELEVATION (STORM BARS REQUIRED)

NOTE: SEE SHEET 2 & 3 FOR COMPONENTS NOMENCLATURE.



TYPICAL CONSECUTIVE SINGLE UNIT ELEVATION (NO STORM BARS REQUIRED)

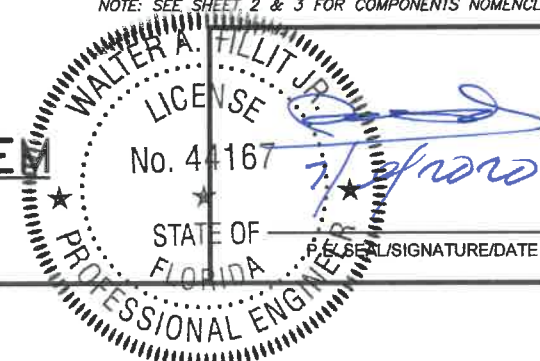
NOTE: SEE SHEET 2 & 3 FOR COMPONENTS NOMENCLATURE.

TYPICAL CONSECUTIVE MULTIPLE UNIT ELEVATION (STORM BARS REQUIRED)

NOTE: SEE SHEET 2 & 3 FOR COMPONENTS NOMENCLATURE.

NOTE:
SEE SECTIONS ON
SHEETS 18 THRU 23

NON END RETENTION SYSTEM



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58mm ER & NER SLAT BERTHA ROLL UP

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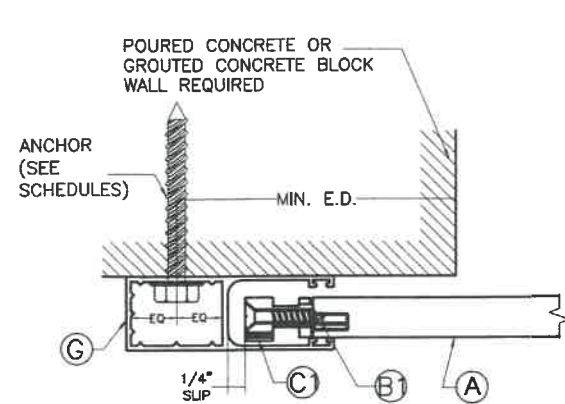
DRAWN BY:
M.P.

7/6/2020
DATE

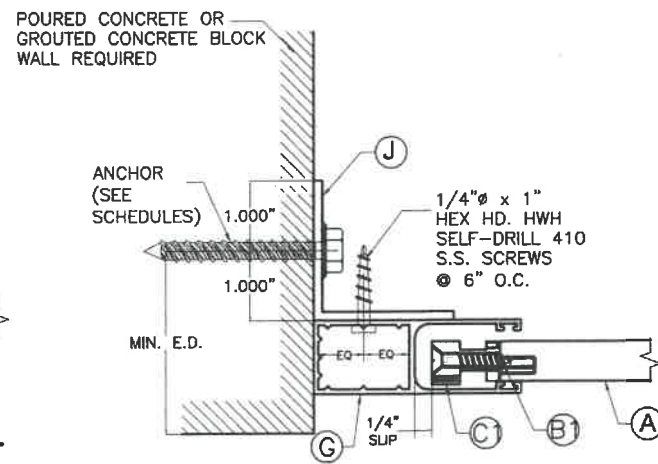
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DRAWING No

SHEET 17 OF 27

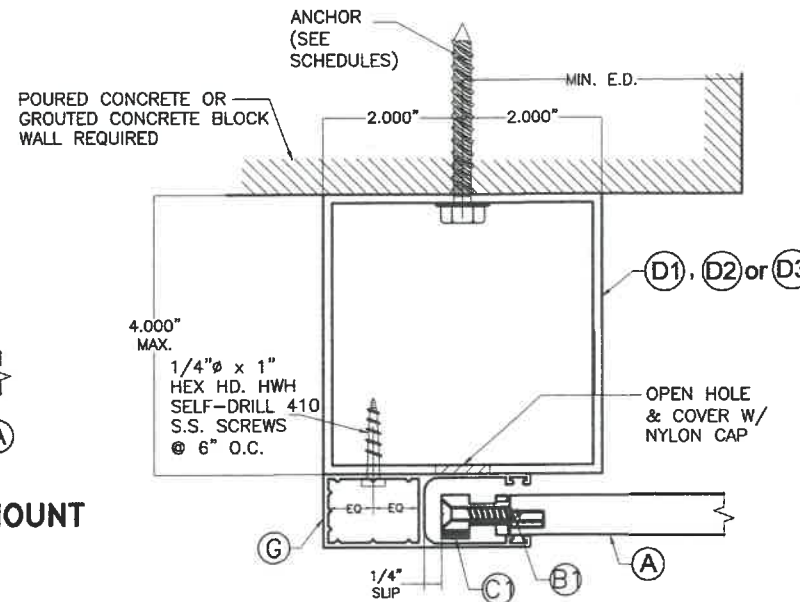
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2			4		



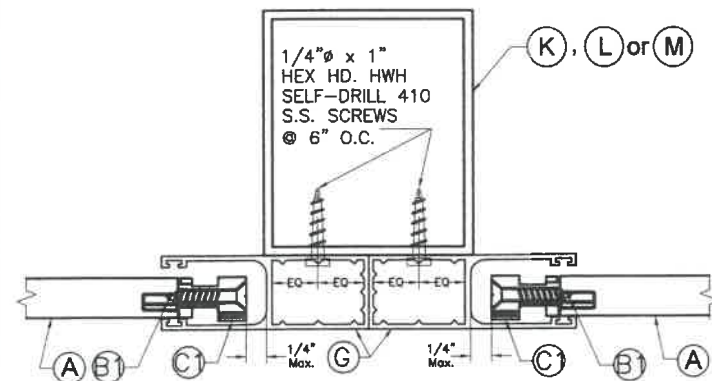
SECTION P-P (1): WALL MOUNT
SCALE: 3/8" = 1"



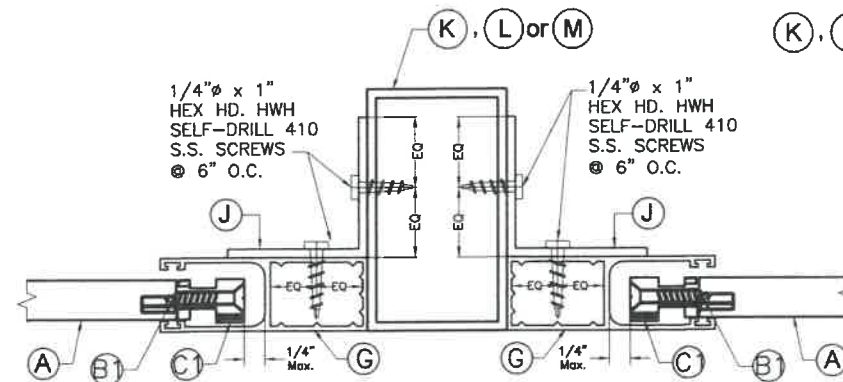
SECTION P-P (2): TRAPPED WALL MOUNT
SCALE: 3/8" = 1"



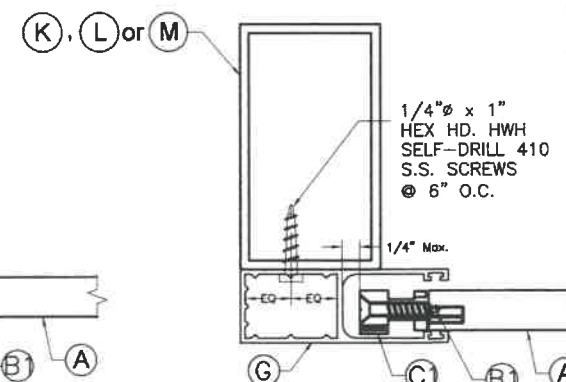
SECTION P-P (3): BUILD-OUT MOUNT
SCALE: 3/8" = 1"



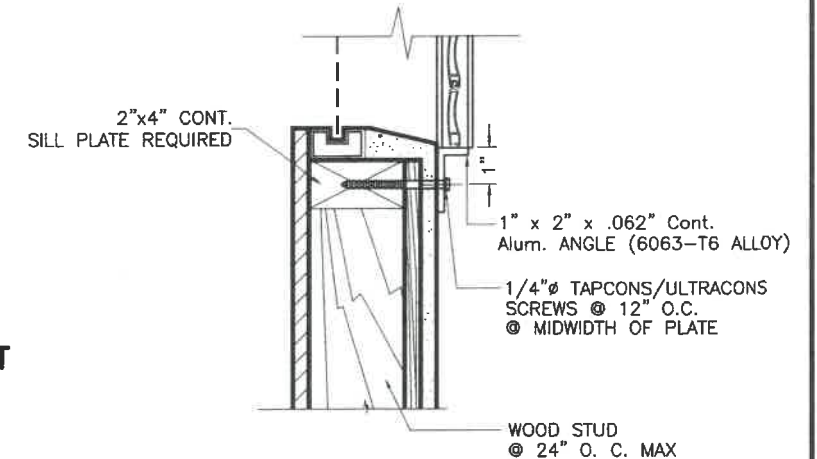
SECTION R-R :MULLION MOUNT (FACE MOUNT)
SCALE: 3/8" = 1"



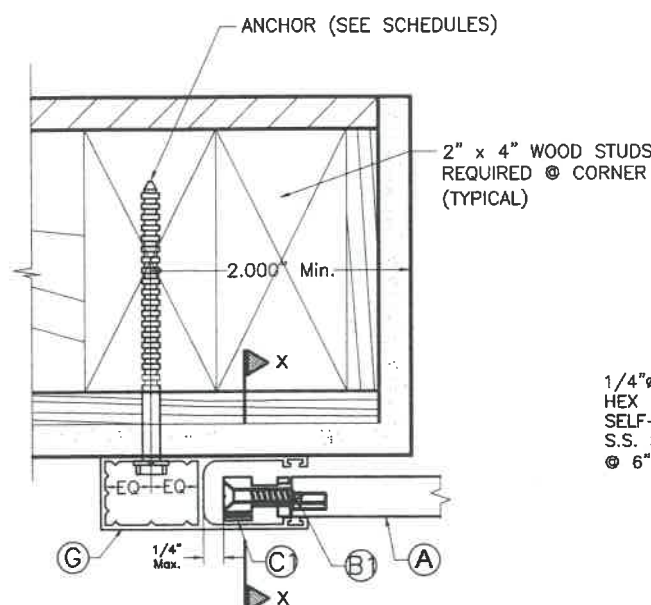
SECTION R-R:MULLION MOUNT (INSIDE MOUNT)
SCALE: 3/8" = 1"



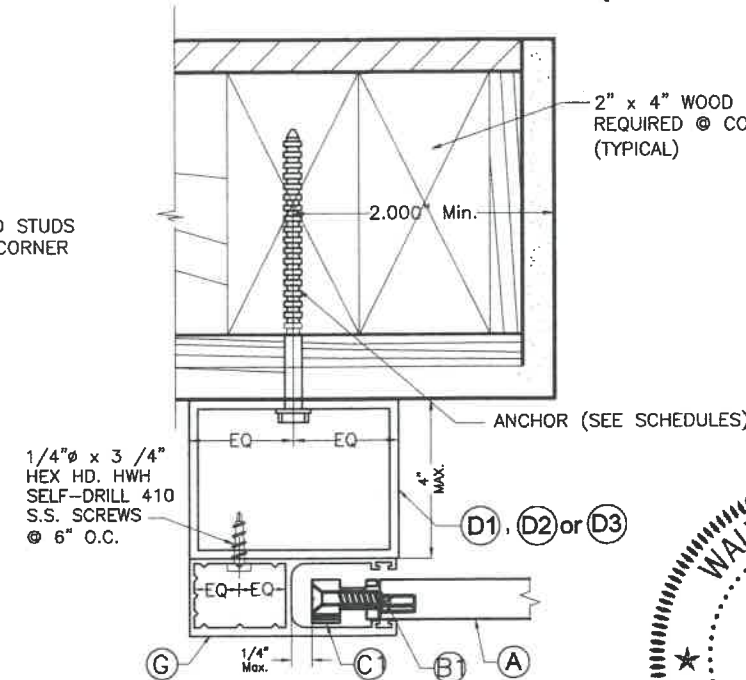
SECTION Q-Q :MULLION MOUNT (FACE MOUNT)
SCALE: 3/8" = 1"



SECTION X-X
SCALE: 3/8" = 1"



SECTION O-O: WALL MOUNT
SCALE: 3/8" = 1"



SECTION O-O: BUILD-OUT MOUNT
SCALE: 3/8" = 1"

SECTION O-O: TRAPPED MOUNT
SCALE: 3/8" = 1"

SIDE RAIL ANCHOR SCHEDULE MAXIMUM A.S.D. DESIGN PRESSURE RATING (p.s.f.) AND CORRESPONDING MAXIMUM ANCHOR SPACING (in) FOR SIDE RAIL (G) CONNECTION TO POURED CONCRETE, GROUTED CONCRETE BLOCK OR WOOD
(USE MAXIMUM VALUES BETWEEN POSITIVE AND NEGATIVE A.S.D. LOAD)

MAXIMUM A.S.D. PRESSURE RATING (p.s.f.)	SIDE RAIL (G)		
	WALL MOUNT	TRAPPED MOUNT	BUILD-OUT MOUNT
≤ 25 TO 40	6"	5"	5"
	6"	3"	5"
	6"	6"	6"
>40 TO 70	6"	5"	5"
	3 1/2"	3***	4"
	6"	5"	6"
>70 TO 90	6"	5"	5"
	3"	3 1/2"	3 1/2"
	6"	4 1/2"	6"
>90 TO 140	6"	5"	5"
	3**	3***	3"
	6"	3 1/2"	6"

POURED CONCRETE
GROUTED CONCRETE BLOCK
WOOD

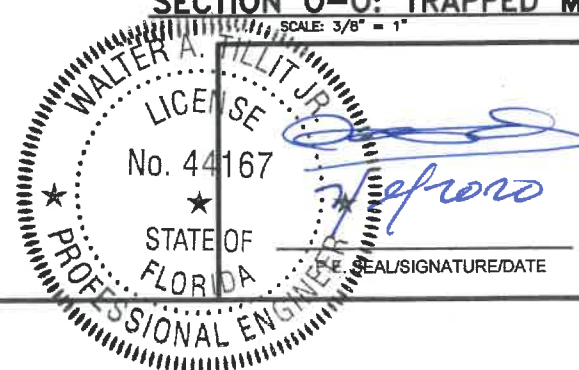
SUBSTRATE LEGEND

* VALID FOR 3'-3" MAX. SPAN
** VALID FOR 4'-5" MAX. SPAN
*** VALID FOR 3'-4" MAX. SPAN

SIDE RAIL TO WOOD NOTES:
1. FOR NEW FRAME CONSTRUCTION: WOOD MEMBER TO BE SOUTHERN PINE No. 2 W/ SPECIFIC DENSITY OF 0.55 OR EQUAL.
2. THIS APPROVAL INCLUDES INSTALLATION IN WOOD FOR SINGLE UNITS WITHOUT STORM BARS, MULLIONS & HEADERS AS SHOWN IN THIS SHEET.

NON END RETENTION SYSTEM

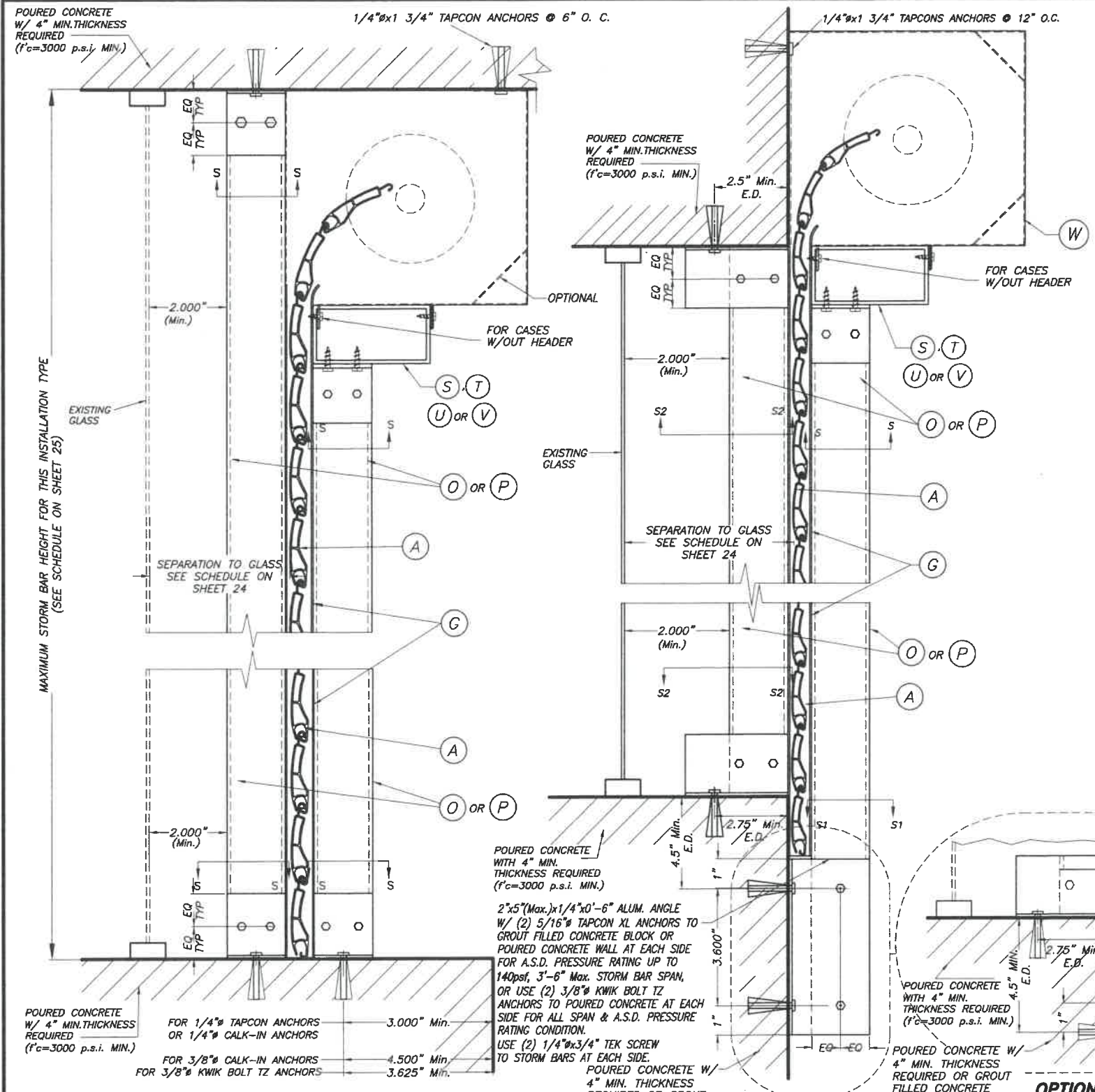
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58mm ER & NER SLAT BERTHA ROLL UP					DRAWN BY: M.P	
AMERICAN SHUTTER SYSTEMS ASSOC., INC.					7/6/2020 DATE	
4268 WESTROADS DRIVE WEST PALM BEACH, FL. 33407 PHONE: (877)999-2772 FAX: (561)209-8380					20-171 DRAWING No	
REV. No	DESCRIPTION	DATE	REV. No	DESCRIPTION	DATE	
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2			4			

SHEET 18 OF 27

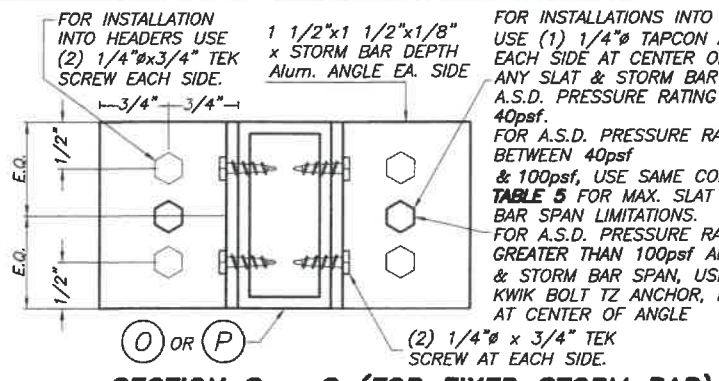


CEILING & FLOOR MOUNTING SECTION V-V(2) INSTALLATION
W/ FIXED OR REMOVABLE STORM BARS W/ CONCRETE ANCHORS
 (SEE SECTION "S" FOR ANCHOR TYPE REQUIREMENT)
 SCALE : N. T. S.

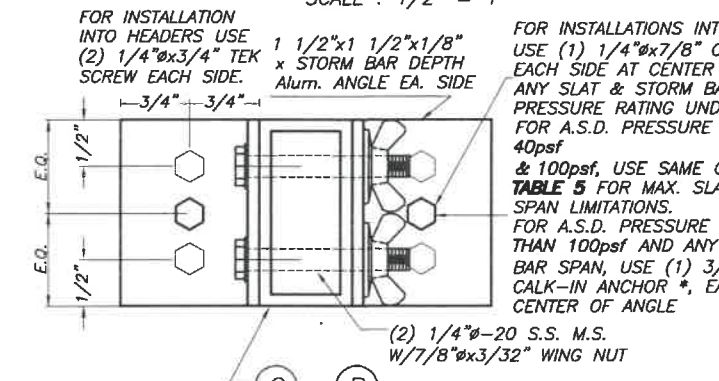
WALL MOUNTING SECTION V-V(1) INSTALLATION
W/ FIXED STORM BARS W/ CONCRETE ANCHORS
 SCALE : N. T. S.

SECTION V - V
 SINGLE SPAN SECTIONS AND DETAILS
 ARE SIMILAR TO ABOVE SHOWN WITHOUT
 STORM BAR & HEADERS.

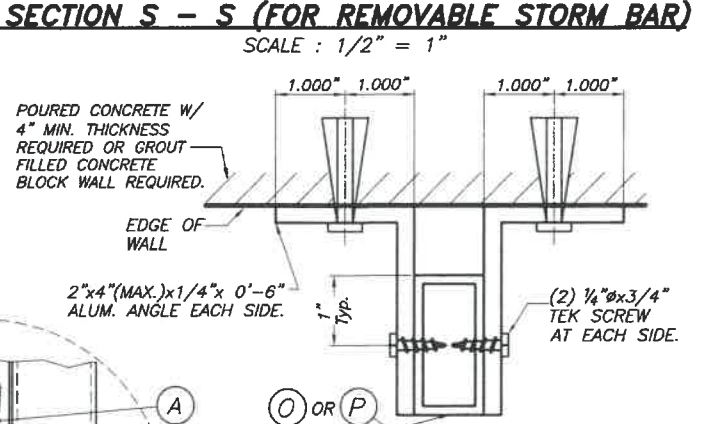
NON END RETENTION SYSTEM



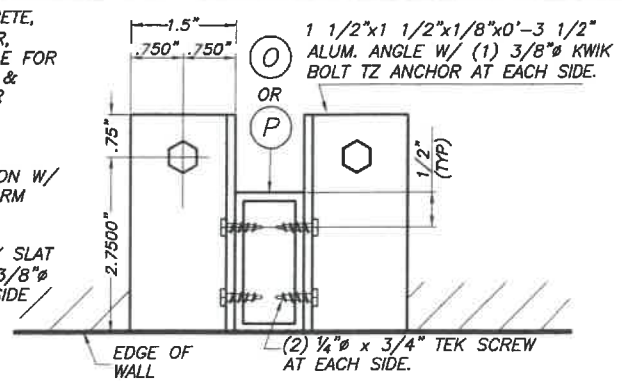
SECTION S - S (FOR FIXED STORM BAR)
 SCALE : 1/2" = 1"



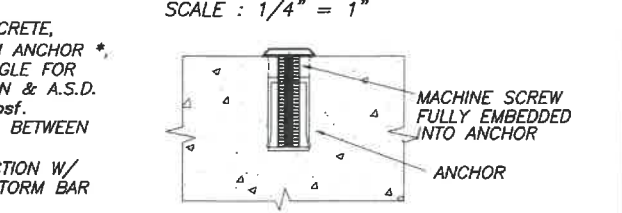
SECTION S - S (FOR REMOVABLE STORM BAR)
 SCALE : 1/2" = 1"



SECTION S1 - S1
 SCALE : N. T. S.



SECTION S2 - S2
 SCALE : 1/4" = 1"



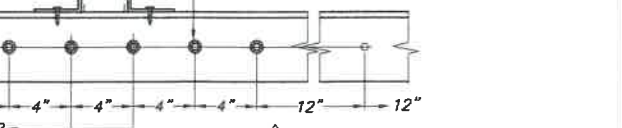
DETAIL A
 N.T.S.

* 1/4" Ø-20 OR 3/8" Ø-16 MACHINE SCREWS USED JOINTLY W/ 1/4" Ø x 7/8" OR 3/8" Ø x 1 1/4" CALK-IN ANCHORS RESPECTIVELY SHALL BE LEFT TOGETHER W/ ANCHORS AT THE TIME STORM BARS ARE REMOVED. (SEE DET. A).

TABLE 5

A.S.D. PRESSURE RATING (p.s.f.)	MAX. SLAT SPAN	"L" MAX. STORM BAR SPAN
40.0	3'-0"	8'-0"
	4'-0"	7'-9"
	5'-0"	6'-11"
	6'-0"	5'-9"
50.0	3'-0"	8'-0"
	4'-0"	6'-11"
	5'-0"	5'-6"
	6'-0"	4'-7"
60.0	3'-0"	7'-4"
	4'-0"	5'-9"
	5'-0"	4'-7"
	6'-0"	4'-4"
80.0	3'-0"	5'-9"
	4'-0"	4'-7"
100.0	3'-0"	4'-7"
	4'-0"	3'-5"

2"x4"(MAX.)x1/4" CONT. ALUM. ANGLE, W/ CONCENTRATION OF (6) 5/16" TAPCON XL ANCHORS TO GROUT FILLED CONCRETE BLOCK OR POURED CONCRETE WALL @ 4" O.C. AT STORM BAR LOCATION AND REST 1/4"x1 3/4" TAPCON @ 12" O.C.



ELEVATION X
 SCALE : N. T. S.

OPTIONAL STORM BAR CONNECTION

WALTER A. TILLIT JR.
 LICENSE
 No. 44167

STATE OF FLORIDA
 PROFESSIONAL ENGINEER

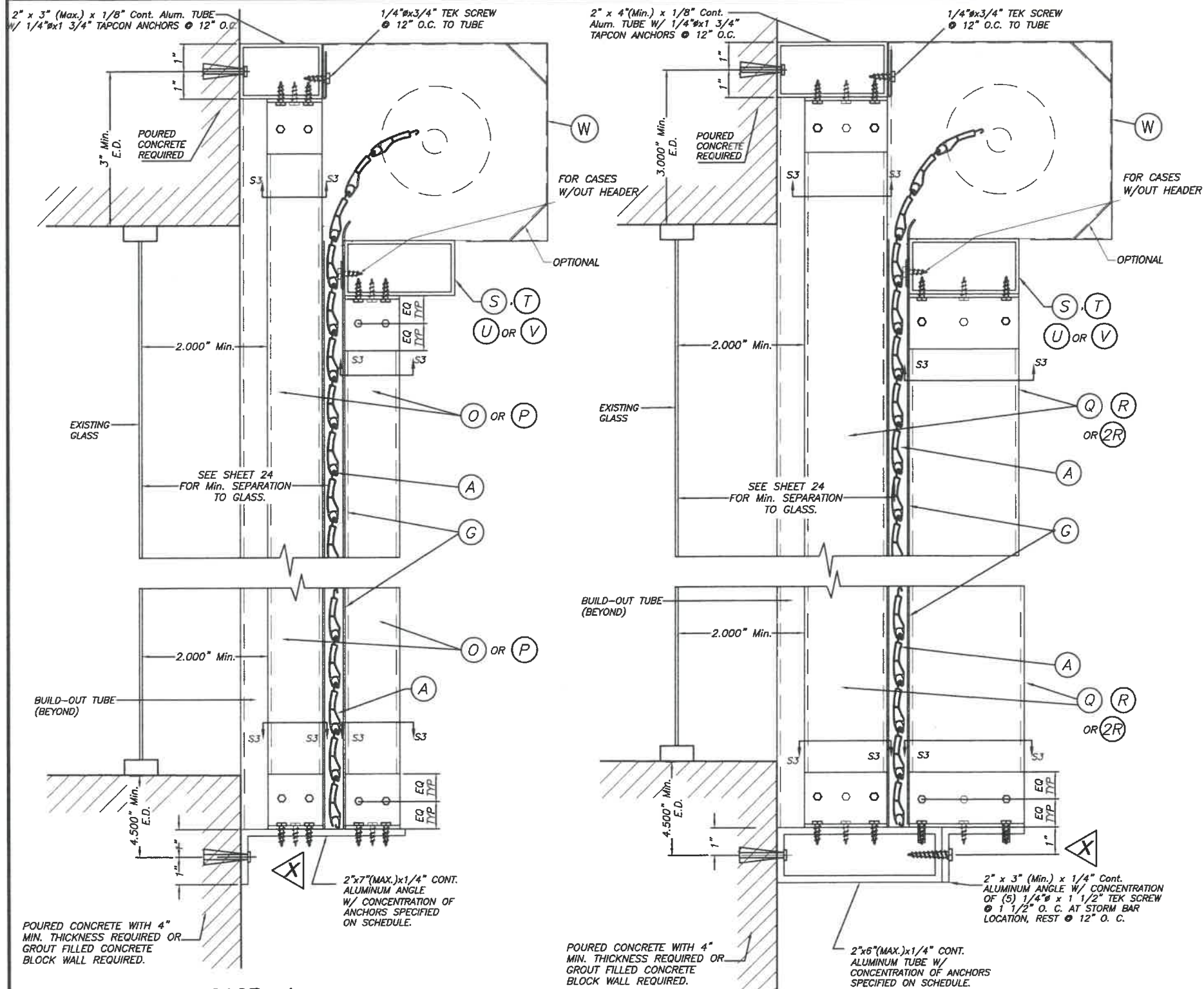
TILTECO inc.
 TESTING & ENGINEERING COMPANY
 N.W. 36th St., Ste. 305 - VIRGINIA GARDENS, FL 33165
 Phone : (305) 871-1530, Fax : (305) 871-1531
 e-mail: tiltco@aol.com
 CA-0006719
 WALTER A. TILLIT JR., P.E.
 FLORIDA Lic. # 44167

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ALTERNATIVELY TO 5/16" TAPCON ANCHOR, USE CONCENTRATION OF (2) 3/8" KWIK BOLT TZ ANCHORS TO POURED CONCRETE WALL @ 4" O.C. AT STORM BAR LOCATION AND REST 1/4"x1 3/4" TAPCON @ 12" O.C.

FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)

ER & NER SLAT BERTHA ROLL UP						DRAWN BY: M.P	
CAN SHUTTER SYSTEMS ASSOC., INC.						7/6/2020 DATE	
4268 WESTROADS DRIVE WEST PALM BEACH, FL. 33407 PHONE: (877)999-2772 FAX: (561)209-8380						20-171 DRAWING No	
DESCRIPTION		DATE	REV. No	DESCRIPTION		DATE	
OLD 17-223		7/6/2020	3				
		4					
						SHEET 19 OF 27	



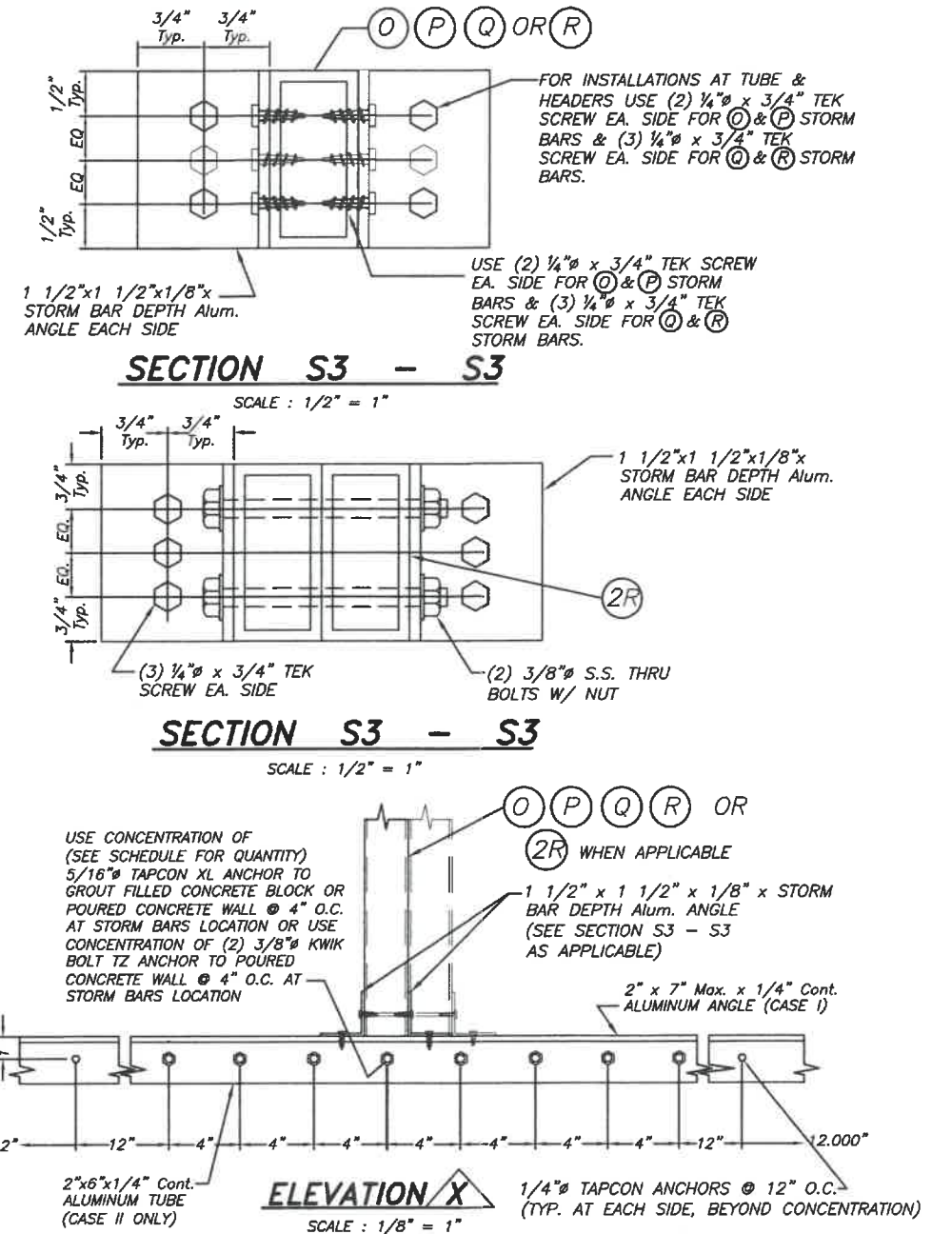
FIXED STORM BAR CONNECTION AT BUILD-OUT INSTALLATIONS W/SHEET METAL SCREWS OR MACHINE SCREWS

SCALE : 1/4" = 1"

SECTION V - V(3)

SINGLE SPAN SECTIONS AND DETAILS ARE SIMILAR TO ABOVE SHOWN WITHOUT STORM BAR & HEADERS.

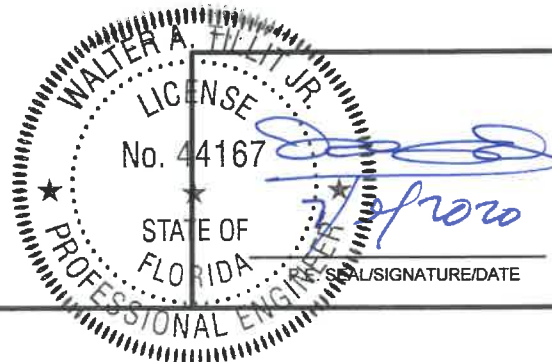
NON END RETENTION SYSTEM



ANCHORS & STORM BARS SCHEDULE FOR ELEVATION X	
ANCHOR TYPE & QUANTITY	STORM BAR TYPE
(6) 5/16" ϕ TAPCON XL	(O) (P)
(8) 5/16" ϕ TAPCON XL	(Q) (R)
(8) 5/16" ϕ TAPCON XL	(2R)*

LIMITED TO 195psf, 3'-1" SPACING & 7'-0" MAX. SPAN STORM BAR (2R)

FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)



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CA-0006719

WALTER A. TILLIT JR., P.E.

FLORIDA Lic. # 44167

58mm ER & NER SLAT BERTHA ROLL UP

AMERICAN SHUTTER SYSTEMS ASSOC., INC.

4268 WESTROADS DRIVE

WEST PALM BEACH, FL 33407

PHONE: (877)999-2772

FAX: (561)209-8380

REV. No	DESCRIPTION	DATE	REV. No	DESCRIPTION	DATE
1	OLD 17-223	7/6/2020	3		
2			4		

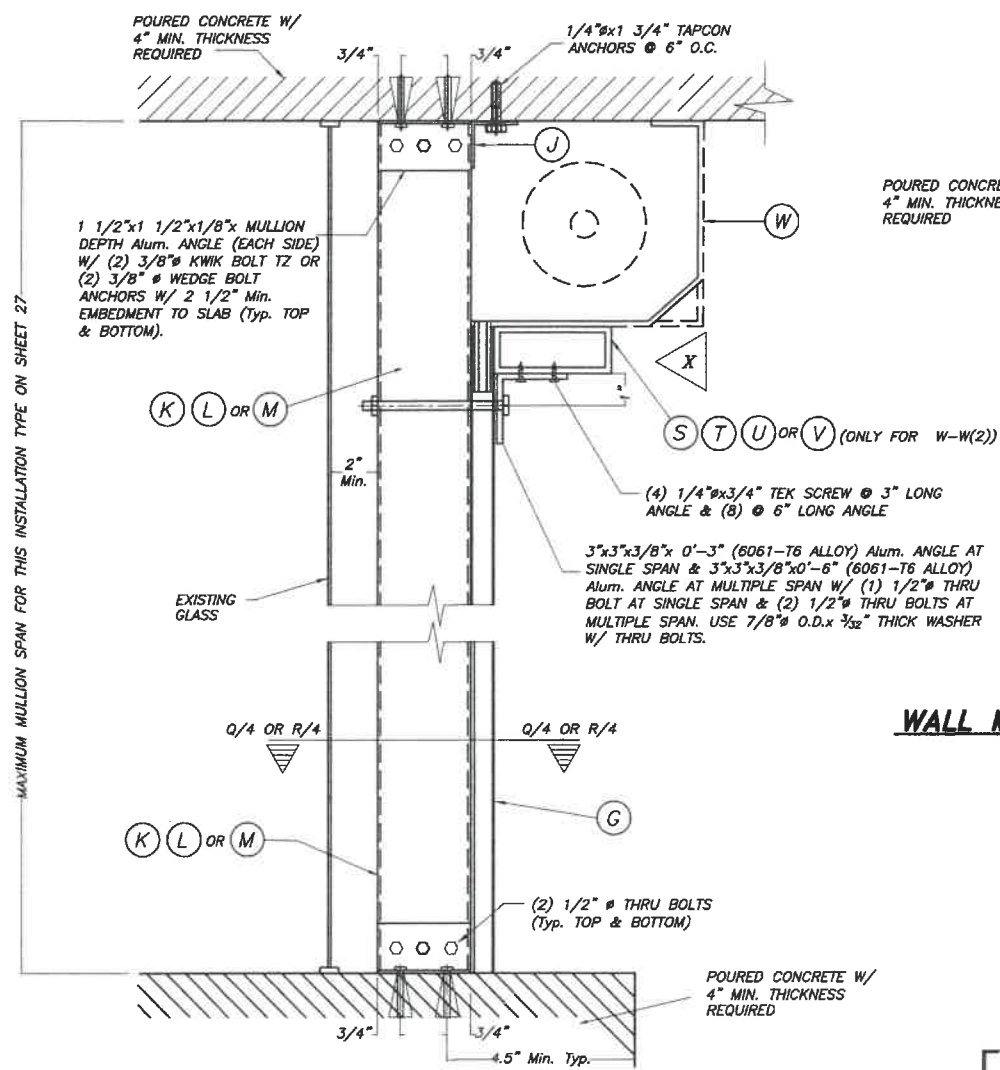
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M.P.

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DRAWING No

SHEET 22 OF 27

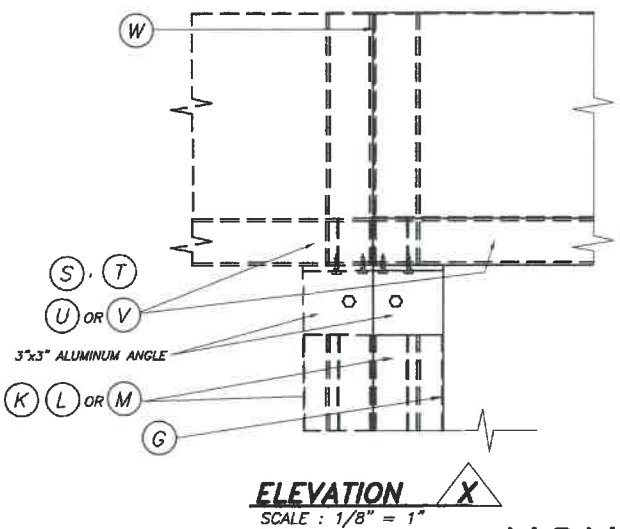
MAXIMUM MULLION SPAN FOR THIS INSTALLATION TYPE ON SHEET 27



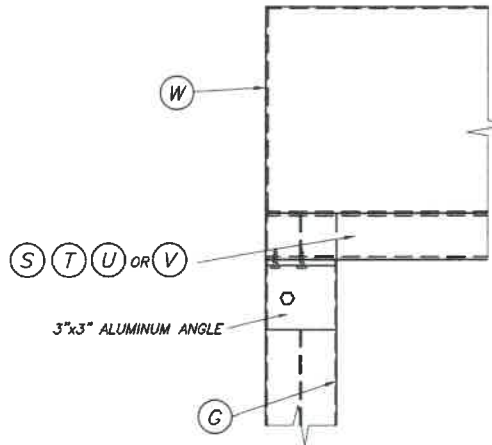
ALTERNATIVE: 1
WALL MOUNTING : SECTION W-W (3)
SCALE : 1/8" = 1"

NOTE:
THIS INSTALLATION IS ONLY VALID FOR STORM BARS WITH MAX. SPAN = 7'-0", HEADERS CON 12'-0" MAX. SINGLE SPAN & 80 p.s.f. MAXIMUM A.S.D. PRESSURE RATING, OR STORM BARS WITH MAX. SPAN = 6'-0", HEADERS WITH 15'-0" SINGLE 80 p.s.f. MAXIMUM A.S.D. PRESSURE RATING.

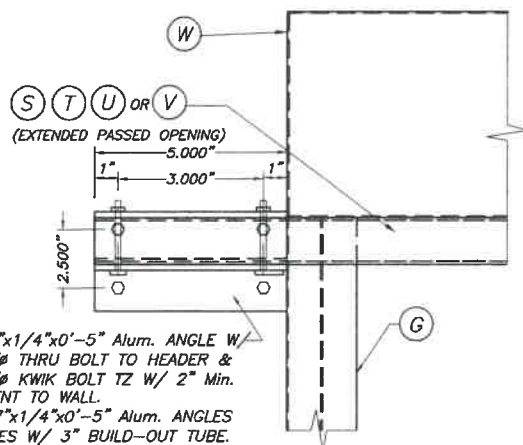
FLOOR/CEILING MOUNTING :
SECTION W-W (1), W/O HEADER
SECTION W-W (2), W/HEADER
SCALE : 1/8" = 1"



ELEVATION X
SCALE : 1/8" = 1"

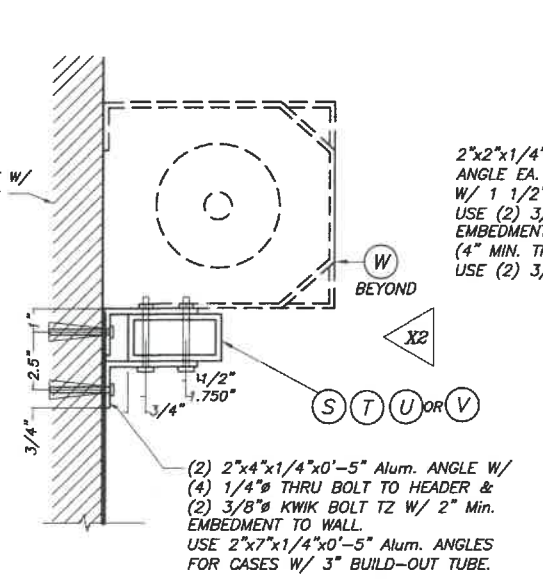


TYPICAL HEADER CONNECTION
AT ENDS:
SECTION W-W



ELEVATION X2
SCALE : 1/8" = 1"

ALTERNATIVE: 2
WALL MOUNTING : SECTION W-W(3)
SCALE : 1/8" = 1"



2"xMULLION'S DEPTHx1/8" Cont.
ALUMINUM TUBE W/ 2"x2"x1/8"x0'-2"
ALUMINUM ANGLE AT MULLION W/
(3) 1/4"x3/4" TEK SCREW EA. LEG.
(TOP/BOTTOM)

2"x2"x1/4"x0'-6" (6061-T6 ALLOY) Alum.
ANGLE EA. SIDE W/ (2) 5/16" TAPCON XL
W/ 1 1/2" Min. EMBEDMENT WALL, OR
USE (2) 3/8" KWIK BOLT TZ W/ 2" Min.
EMBEDMENT TO POURED CONCRETE WALL
(4" MIN. THICK).
USE (2) 3/8" THRU BOLTS TO MULLION.

POURED CONCRETE W/
4" MIN. THICKNESS
REQUIRED

EXISTING
GLASS

NO HEADER & STORM BAR ALLOWED.
JUST SPLIT ROLL UP MULLIONS &
TRACKS W/ FACE MOUNT.

1"x1"x1/8"CONT. ALUM ANGLE
W/ 1/4"x1/2" TEK SCREW
@ 12" O.C.

2"x2"x1/4"x0'-6" (6061-T6 ALLOY) Alum.
ANGLE EA. SIDE W/ (2) 5/16" TAPCON XL
W/ 1 1/2" Min. EMBEDMENT TO CONCRETE
BLOCK OR POURED CONCRETE WALL, OR
USE (2) 3/8" KWIK BOLT TZ W/ 2" Min.
EMBEDMENT TO POURED CONCRETE WALL
(4" MIN. THICK)
USE (2) 3/8" THRU BOLTS TO MULLION

POURED CONCRETE
W/ 4" MIN. THICKNESS
REQUIRED OR CONCRETE
BLOCK WALL REQUIRED.
SEE NOTE 1.

WALL MOUNTING : MULLION CONNECTION
AT TOP & BOTTOM : SECTION W-W (1)
SCALE : 1/8" = 1"

NOTE 1:
EXISTING WALL MAY CONCRETE BLOCK FOR A.S.D. PRESSURE RATING UP TO 130.0 psf W/ 4'-0" Max. MULLION SPAN AND 4'-0" Max. MULLION SPACING AND SHALL BE 4" MIN. THICK POURED CONCRETE FOR ALL GREATER MULLION SPAN AND A.S.D. PRESSURE RATING COMBINATIONS.

FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)

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

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58mm ER & NER SLAT BERTHA ROLL UP
AMERICAN SHUTTER SYSTEMS ASSOC., INC.
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WEST PALM BEACH, FL. 33407
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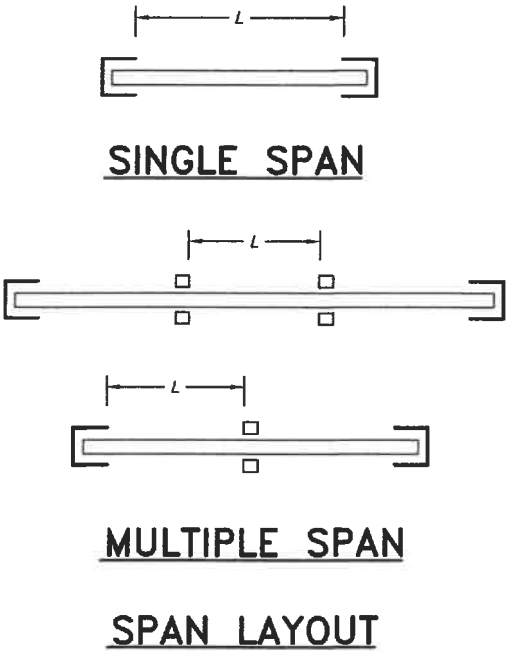
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1	OLD 17-223	7/6/2020	3		
2			4		

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7/6/2020
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20-171
DRAWING No
SHEET 23 OF 27

SLAT PERFORMANCE CHART #1, MAXIMUM A.S.D. DESIGN PRESSURE RATING (psf) AND CORRESPONDING MAXIMUM SLAT SPAN "L" (ft)

(USE MAXIMUM VALUES BETWEEN POSITIVE AND NEGATIVE A.S.D. LOAD)

MAXIMUM A.S.D. DESIGN PRESSURE RATING (p.s.f.)	MAXIMUM SLAT SPAN "L" (ft)	MINIMUM SEPARATION TO GLASS (in)			
		SINGLE & MULTIPLE UNIT **		SINGLE & MULTIPLE UNIT ***	
		WIND ZONES 1, 2 & 3	WIND ZONES 4	WIND ZONES 1, 2 & 3	WIND ZONES 4
25.0	8'-0"	1"	6 7/16"	1"	6 7/16"
30.0	7'-9"	1"	6 1/2"	1"	6 1/2"
35.0	7'-2"	1"	6 3/8"	1"	6 3/8"
40.0	6'-8"	1"	6 1/4"	1"	6 1/4"
45.0	6'-4"	1"	5 13/16"	1"	5 13/16"
50.0	6'-0"	1"	5 1/2"	1"	5 1/2"
55.0	5'-11"	1"	5 1/2"	1"	5 1/2"
60.0	5'-9"	1"	5 3/8"	1"	5 3/8"
65.0	5'-8"	1"	5 7/16"	1"	5 7/16"
70.0	5'-7'	1"	5 9/16"	1"	5 9/16"
75.0	5'-5"	1"	5 5/16"	1"	5 5/16"
80.0	5'-4"	1"	5 5/16"	1"	5 5/16"
85.0	5'-1"	1"	4 3/4"	1"	4 3/4"
90.0	5'-0"	1"	4 3/4"	1"	4 3/4"
95.0	4'-10"	1"	4 7/16"	1"	4 7/16"
100.0	4'-9"	1"	4 3/8"	1"	4 3/8"
105.0	4'-7"	1"	4 1/4"	1"	4 1/4"
110.0	4'-6"	1"	4 1/4"	1"	4 1/4"
115.0	4'-5"	1"	4 1/4"	1"	4 1/4"
120.0	4'-4"	1"	4 1/4"	1"	4 1/4"
125.0	4'-3"	1"	4 1/4"	1"	4 1/4"
130.0	4'-2"	1"	4 1/4"	1"	4 1/4"
135.0	4'-1"	1"	4 1/4"	1"	4 1/4"
140.0	4'-0"	1"	3 1/8"	1"	3 1/8"



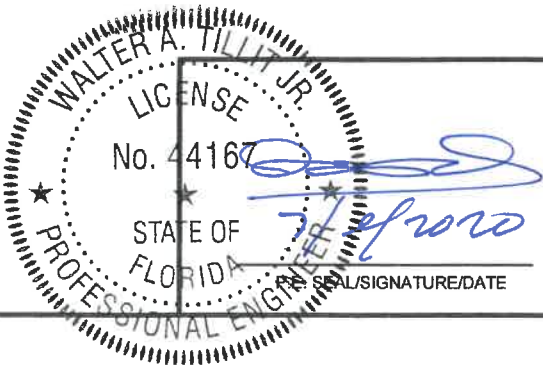
SLAT PERFORMANCE CHART #2, MAXIMUM A.S.D. DESIGN PRESSURE RATING (psf) AND REQUIRED MINIMUM SEPARATION TO GLASS FOR A GIVEN SLAT SPAN "L" (ft)

(USE MAXIMUM VALUES BETWEEN POSITIVE AND NEGATIVE A.S.D. LOAD)

MAXIMUM A.S.D. DESIGN PRESSURE RATING (p.s.f.)	MAXIMUM SLAT SPAN "L" (ft)	MINIMUM SEPARATION TO GLASS (in)			
		SINGLE & MULTIPLE UNIT **		SINGLE & MULTIPLE UNIT ***	
		WIND ZONES 1, 2 & 3	WIND ZONES 4	WIND ZONES 1, 2 & 3	WIND ZONES 4
40 OR LESS	6'-0"	1"	4 5/8"	1"	4 5/8"
	5'-0"	1"	4 1/4"	1"	2 3/4"
	4'-0" OR LESS	1"	3 1/8"	1"	1 3/4"
>40 TO 50	6'-0"	1"	5 1/2"	1"	5 1/2"
	5'-0"	1"	4 1/4"	1"	3 3/16"
	4'-0" OR LESS	1"	3 1/8"	1"	2"
>50 TO 65	5'-6"	1"	5 3/16"	1"	5 3/16"
	5'-0"	1"	4 1/4"	1"	3 7/8"
	4'-0" OR LESS	1"	3 1/8"	1"	2 3/16"
>65 TO 80	5'-0"	1"	4 1/2"	1"	4 1/2"
	4'-0" OR LESS	1"	3 1/8"	1"	2 7/16"
>80 TO 100	5'-0"	1"	5 3/8"	1"	5 3/8"
	4'-0" OR LESS	1"	3 1/8"	1"	2 5/8"
>100 TO 120	4'-6"	1"	4 1/4"	1"	4 3/16"
	4'-0" OR LESS	1"	3 1/8"	1"	3"
>120 TO 130	4'-0"	1"	3 1/8"	1"	3 1/8"
	3'-0" OR LESS	1"	3 1/8"	1"	1 3/4"
>130 TO 140	3'-6"	1"	3 1/8"	1"	2 1/2"
	3'-0" OR LESS	1"	3 1/8"	1"	1 3/4"

- * SPANS VALID FOR EVERY INSTALLATION LOCATED AT ANY ELEVATION OF BUILDING MEASURED AT BOTTOM OF SHUTTER. MINIMUM SEPARATION TO GLASS FOR SINGLE AND MULTIPLE UNITS SHALL BE MEASURED FROM BACK OF SLAT TO GLASS.
- ** MINIMUM SEPARATION TO GLASS FOR SHUTTERS INSTALLED WITHIN THE FIRST 30'-0" ELEVATION OF BUILDING AND MAXIMUM SPAN. SEE CHART #2 FOR MIN. SEPARATION TO GLASS FOR SPANS LESS THAN THE MAX. ALLOWED.
- *** MINIMUM SEPARATION TO GLASS FOR SHUTTERS INSTALLED ABOVE 30'-0" ELEVATION OF BUILDING, MEASURED AT BOTTOM OF SHUTTER.

NON END RETENTION SYSTEM



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58mm ER & NER SLAT BERTHA ROLL UP

AMERICAN SHUTTER SYSTEMS ASSOC., INC.

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PHONE: (877)998-2772
FAX: (561)209-8380

DRAWN BY:
M.P

7/6/2020
DATE

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SHEET 24 OF 27

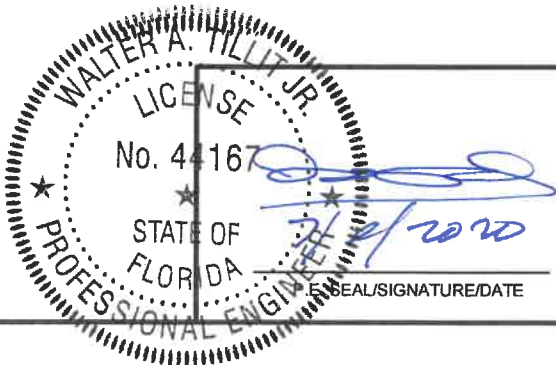
STORM BAR LOADING CHART
MAXIMUM A.S.D. DESIGN PRESSURE RATING (p. s. f.) AND CORRESPONDING MAXIMUM SPAN "L"
FOR A GIVEN TYPE OF STORM BAR AND STORM BAR SPACING.

(USE MAXIMUM VALUES BETWEEN POSITIVE AND NEGATIVE A.S.D. LOAD)

MAXIMUM A.S.D. DESIGN PRESSURE RATING (p.s.f.)	TYPE 1 STORM BAR 2" x 2" x 1/4" (O)					TYPE 2 STORM BAR 2" x 3" x 1/8" (P)					TYPE 3 STORM BAR 2" x 4" x 1/8" (Q)					TYPE 4 STORM BAR 2" x 4" x .250" (R)					TYPE 5 STORM BAR (2) 2" x 4" x .250" (2R)				
	* STORM BAR SPACING					* STORM BAR SPACING					* STORM BAR SPACING					* STORM BAR SPACING					* STORM BAR SPACING				
	< 3'-0"	3' TO 4'	4' TO 5'	5' TO 6'	6' TO 6.5'	< 3'-0"	3' TO 4'	4' TO 5'	5' TO 6'	6' TO 6.5'	< 3'-0"	3' TO 4'	4' TO 5'	5' TO 6'	6' TO 6.5'	< 3'-0"	3' TO 4'	4' TO 5'	5' TO 6'	6' TO 6.5'	< 3'-0"	3' TO 4'	4' TO 5'	5' TO 6'	6' TO 6.5'
40 OR LESS	7'-7"	7'-1"	6'-9"	6'-2"	5'-11"	8'-0"	7'-9"	6'-11"	6'-4"	6'-1"	10'-0"	9'-6"	8'-6"	7'-9"	7'-5"	11'-10"	11'-0"	10'-5"	9'-11"	9'-9"	14'-1"	13'-1"	12'-5"	11'-10"	11'-7"
45	7'-5"	6'-11"	6'-4"	5'-10"	5'-7"	8'-0"	7'-4"	6'-7"	6'-0"	5'-9"	9'-11"	8'-11"	8'-0"	7'-4"	7'-0"	11'-6"	10'-8"	10'-1"	9'-8"	9'-4"	13'-8"	12'-9"	12'-0"	11'-6"	11'-3"
50	7'-3"	6'-9"	6'-0"	5'-6"	5'-4"	8'-0"	7'-0"	6'-3"	5'-8"	5'-6"	9'-8"	8'-6"	7'-7"	6'-11"	6'-8"	11'-2"	10'-5"	9'-10"	9'-2"	8'-10"	13'-4"	12'-5"	11'-9"	11'-2"	11'-0"
55	7'-0"	6'-5"	5'-9"	5'-3"	—	7'-8"	6'-8"	5'-6"	5'-6"	—	9'-4"	8'-1"	7'-3"	6'-7"	—	10'-11"	10'-2"	9'-7"	8'-9"	—	13'-0"	12'-1"	11'-5"	10'-11"	—
60	6'-11"	6'-2"	5'-6"	5'-0"	—	7'-4"	6'-4"	5'-8"	5'-2"	—	8'-11"	7'-9"	6'-11"	6'-4"	—	10'-8"	9'-11"	9'-2"	8'-5"	—	12'-9"	11'-10"	11'-2"	10'-8"	—
65	6'-9"	5'-11"	5'-4"	4'-10"	—	7'-1"	6'-1"	5'-5"	5'-0"	—	8'-7"	7'-5"	6'-8"	6'-1"	—	10'-6"	9'-9"	8'-10"	8'-1"	—	12'-6"	11'-7"	11'-0"	10'-6"	—
70	6'-7"	5'-8"	5'-1"	4'-8"	—	6'-10"	5'-11"	5'-3"	4'-10"	—	8'-3"	7'-2"	6'-5"	5'-10"	—	10'-4"	9'-6"	8'-6"	7'-9"	—	12'-3"	11'-5"	10'-9"	10'-4"	—
75	6'-4"	5'-6"	4'-11"	4'-6"	—	6'-7"	5'-8"	5'-1"	4'-8"	—	8'-0"	6'-11"	6'-2"	5'-8"	—	10'-1"	9'-2"	8'-3"	7'-6"	—	12'-0"	11'-2"	10'-7"	10'-1"	—
80	6'-2"	5'-4"	4'-9"	4'-4"	—	6'-4"	5'-6"	4'-11"	4'-6"	—	7'-9"	6'-9"	6'-0"	5'-6"	—	9'-11"	8'-11"	7'-11"	7'-3"	—	11'-10"	11'-0"	10'-5"	9'-11"	—
85	6'-0"	5'-2"	4'-8"	4'-3"	—	6'-2"	5'-4"	4'-9"	4'-4"	—	7'-6"	6'-6"	5'-10"	5'-4"	—	9'-10"	8'-7"	7'-9"	7'-0"	—	11'-8"	10'-10"	10'-3"	9'-10"	—
90	5'-10"	5'-0"	4'-6"	4'-1"	—	6'-0"	5'-2"	4'-8"	4'-3"	—	7'-4"	6'-4"	5'-8"	5'-2"	—	9'-8"	8'-5"	7'-6"	6'-10"	—	11'-6"	10'-8"	10'-1"	9'-8"	—
95	5'-8"	4'-11"	4'-5"	4'-0"	—	5'-10"	5'-1"	4'-6"	4'-1"	—	7'-1"	6'-2"	5'-6"	5'-0"	—	9'-5"	8'-2"	7'-4"	6'-8"	—	11'-4"	10'-7"	10'-0"	9'-5"	—
100	5'-6"	4'-9"	4'-3"	3'-11"	—	5'-8"	4'-11"	4'-5"	4'-0"	—	6'-11"	6'-0"	5'-4"	4'-11"	—	9'-2"	7'-11"	7'-1"	6'-6"	—	11'-2"	10'-5"	9'-10"	9'-2"	—
105	5'-5"	4'-8"	4'-2"	3'-10"	—	5'-7"	4'-10"	4'-4"	3'-11"	—	6'-9"	5'-10"	5'-3"	4'-9"	—	8'-11"	7'-9"	6'-11"	6'-4"	—	11'-1"	10'-4"	9'-9"	8'-11"	—
110	5'-3"	4'-7"	4'-1"	—	—	5'-5"	4'-8"	4'-2"	—	—	6'-7"	5'-9"	5'-1"	—	—	8'-9"	7'-7"	6'-9"	—	—	10'-11"	10'-2"	9'-7"	—	—
115	5'-2"	4'-5"	4'-0"	—	—	5'-4"	4'-7"	4'-1"	—	—	6'-6"	5'-7"	5'-0"	—	—	8'-7"	7'-5"	6'-8"	—	—	10'-10"	10'-1"	9'-4"	—	—
120	5'-0"	4'-4"	3'-11"	—	—	5'-2"	4'-6"	4'-0"	—	—	6'-4"	5'-6"	4'-11"	—	—	8'-5"	7'-3"	6'-6"	—	—	10'-8"	9'-11"	9'-2"	—	—
125	4'-11"	4'-3"	3'-10"	—	—	5'-1"	4'-5"	3'-11"	—	—	6'-2"	5'-4"	4'-10"	—	—	8'-3"	7'-1"	6'-4"	—	—	10'-7"	9'-10"	9'-0"	—	—
130	4'-10"	4'-2"	3'-9"	—	—	5'-0"	4'-4"	3'-10"	—	—	6'-1"	5'-3"	4'-9"	—	—	8'-1"	7'-0"	6'-3"	—	—	10'-6"	9'-9"	8'-10"	—	—
135	4'-9"	4'-1"	3'-8"	—	—	4'-11"	4'-3"	3'-9"	—	—	6'-0"	5'-2"	4'-7"	—	—	7'-11"	6'-10"	6'-1"	—	—	10'-5"	9'-8"	8'-8"	—	—
140	4'-8"	4'-0"	3'-7"	—	—	4'-10"	4'-2"	3'-9"	—	—	5'-10"	5'-1"	4'-6"	—	—	7'-9"	6'-9"	6'-0"	—	—	10'-4"	9'-6"	8'-6"	—	—

* STORM BAR SPACING SHALL BE SUCH THAT MAXIMUM SLAT SPAN SHALL NOT BE EXCEEDED.

NON END RETENTION SYSTEM



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FLORIDA Lic. # 44167

FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)

58mm ER & NER SLAT BERTHA ROLL UP

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REV. No	DESCRIPTION	DATE	REV. No	DESCRIPTION	DATE
1	OLD 17-223	7/6/2020	3		
2			4		

DRAWN BY:
M.P

7/6/2020
DATE

20-171

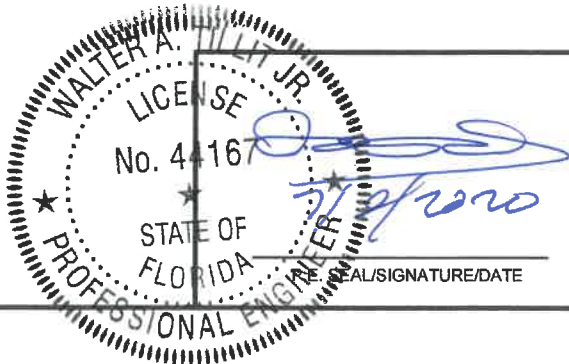
DRAWING No

SHEET 25 OF 27

HEADER LOADING CHART MAXIMUM A.S.D. DESIGN PRESSURE RATING (psf) AND
CORRESPONDING MAXIMUM SPAN "L" FOR A GIVEN TYPE OF HEADER.
(USE MAXIMUM VALUES BETWEEN POSITIVE AND NEGATIVE A.S.D. LOAD)

MAXIMUM A.S.D. DESIGN PRESSURE RATING (p.s.f.)	TYPE 1 HEADER (S) 2" x 3" x 1/8"		TYPE 2 HEADER (T) 2" x 4" x 1/8"			TYPE 3 HEADER (U) 2" x 4" x 1/4"					TYPE 4 HEADER (V) 2" x 6" x 1/8"				
	STORM BAR HEIGHT		STORM BAR HEIGHT			STORM BAR HEIGHT					STORM BAR HEIGHT				
	≤ 5'-0"	5' TO 7'	≤ 5'-0"	5' TO 8'	8' TO 10'	≤ 6'-0"	6' TO 8'	8' TO 10'	10' TO 12'	12' TO 14'	≤ 6'-0"	6' TO 8'	8' TO 10'	10' TO 12'	12' TO 14'
40.0 OR LESS	9'-11"	8'-4"	12'-2"	9'-8"	8'-8"	14'-10"	12'-10"	11'-6"	10'-6"	9'-9"	15'-1"	13'-1"	11'-8"	10'-8"	9'-11"
45.0	9'-4"	7'-11"	11'-6"	9'-1"	8'-2"	14'-0"	12'-2"	10'-10"	9'-11"	9'-2"	14'-3"	12'-4"	11'-0"	10'-1"	9'-4"
50.0	8'-10"	7'-6"	10'-11"	8'-8"	7'-9"	13'-4"	11'-6"	10'-4"	9'-5"	8'-8"	13'-6"	11'-8"	10'-6"	9'-7"	8'-10"
55.0	8'-5"	7'-2"	10'-5"	8'-3"	7'-4"	12'-8"	11'-0"	9'-10"	9'-0"	8'-4"	12'-11"	11'-2"	10'-0"	9'-1"	8'-5"
60.0	8'-1"	6'-10"	10'-0"	7'-11"	7'-1"	12'-2"	10'-6"	9'-5"	9'-7"	7'-11"	12'-4"	10'-8"	9'-7"	8'-9"	8'-1"
65.0	7'-9"	6'-7"	9'-7"	7'-7"	6'-9"	11'-8"	10'-1"	9'-0"	8'-3"	7'-8"	11'-10"	10'-3"	9'-2"	8'-5"	7'-9"
70.0	7'-6"	6'-4"	9'-3"	7'-4"	6'-6"	11'-3"	9'-9"	8'-8"	7'-11"	7'-4"	11'-5"	9'-11"	8'-10"	8'-1"	7'-6"
75.0	7'-3"	6'-1"	8'-11"	7'-1"	6'-4"	10'-10"	9'-5"	8'-5"	7'-8"	7'-1"	11'-0"	9'-7"	8'-7"	7'-10"	7'-3"
80.0	7'-0"	5'-11"	8'-8"	6'-10"	6'-1"	10'-6"	9'-1"	8'-2"	7'-5"	6'-11"	10'-8"	9'-3"	8'-3"	7'-7"	7'-0"
85.0	6'-9"	5'-9"	8'-5"	6'-7"	5'-11"	10'-2"	8'-10"	7'-11"	7'-3"	6'-8"	10'-4"	9'-0"	8'-0"	7'-4"	6'-9"
90.0	6'-7"	5'-7"	8'-2"	6'-5"	5'-9"	9'-11"	8'-7"	7'-8"	7'-0"	6'-6"	10'-1"	8'-9"	7'-10"	7'-1"	6'-7"
95.0	6'-5"	5'-5"	7'-11"	6'-3"	5'-7"	9'-8"	8'-4"	7'-6"	6'-10"	6'-4"	9'-10"	8'-6"	7'-7"	6'-11"	6'-5"
100.0	6'-3"	5'-3"	7'-9"	6'-1"	5'-6"	9'-5"	8'-2"	7'-3"	6'-8"	6'-2"	9'-7"	8'-3"	7'-5"	6'-9"	6'-3"
105.0	6'-1"	5'-2"	7'-6"	6'-0"	5'-4"	9'-2"	7'-11"	7'-1"	6'-6"	6'-0"	9'-4"	8'-1"	7'-3"	6'-7"	6'-1"
110.0	6'-0"	5'-1"	7'-4"	5'-10"	5'-2"	9'-0"	7'-9"	6'-11"	6'-4"	5'-10"	9'-1"	7'-11"	7'-1"	6'-5"	6'-0"
115.0	5'-10"	4'-11"	7'-2"	5'-8"	5'-1"	8'-9"	7'-7"	6'-9"	6'-2"	5'-9"	8'-11"	7'-9"	6'-11"	6'-4"	5'-10"
120.0	5'-9"	4'-10"	7'-1"	5'-7"	5'-0"	8'-7"	7'-5"	6'-8"	6'-1"	5'-7"	8'-9"	7'-7"	6'-9"	6'-2"	5'-9"
125.0	5'-7"	4'-9"	6'-11"	5'-6"	4'-11"	8'-5"	7'-3"	6'-6"	5'-11"	5'-6"	8'-7"	7'-5"	6'-7"	6'-1"	5'-7"
130.0	5'-6"	4'-8"	6'-9"	5'-4"	4'-9"	8'-3"	7'-2"	6'-5"	5'-10"	5'-5"	8'-5"	7'-3"	6'-6"	5'-11"	5'-6"
135.0	5'-5"	4'-7"	6'-8"	5'-3"	4'-8"	8'-1"	7'-0"	6'-3"	5'-9"	5'-4"	8'-3"	7'-1"	6'-4"	5'-10"	5'-5"
140.0	5'-3"	4'-6"	6'-6"	5'-2"	4'-7"	7'-11"	6'-11"	6'-2"	5'-7"	5'-2"	8'-1"	7'-0"	6'-3"	5'-9"	5'-3"

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REV. No	DESCRIPTION	DATE	REV. No	DESCRIPTION	DATE
1	OLD 17-223	7/6/2020	3		
2			4		

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DRAWING No

SHEET 26 OF 27

MULLION LOADING CHART MAXIMUM A.S.D. DESIGN PRESSURE RATING (psf) AND CORRESPONDING
MAXIMUM SPAN "L"(Ft) FOR A GIVEN TYPE OF MULLION AND MULLION SPACING (Ft.).
(USE MAXIMUM VALUES BETWEEN POSITIVE AND NEGATIVE A.S.D. LOAD)

MAXIMUM A.S.D. DESIGN PRESSURE RATING (p.s.f.)	TYPE 1 MULLION (K) 3" x 4" x 1/8"				TYPE 2 MULLION (L) 4" x 4" x 1/4"				TYPE 3 MULLION (M) 4" x 6" x 1/4"					
	MULLION SPACING				MULLION SPACING				MULLION SPACING					
	≤ 4'-0"	4' TO 5'	5' TO 6'	6' TO 8'	≤ 4'-0"	4' TO 5'	5' TO 6'	6' TO 8'	≤ 4'-0"	4' TO 5'	5' TO 6'	6' TO 8'	8' TO 10'	10' TO 12'
40.0 OR LESS	9'-0"	8'-4"	7'-10"	8'-2"	11'-9"	10'-11"	10'-3"	10'-9"	16'-4"	15'-2"	14'-3"	14'-10"	13'-10"	13'-0"
45.0	8'-8"	8'-0"	7'-7"	7'-10"	11'-4"	10'-6"	9'-11"	10'-4"	15'-8"	14'-7"	13'-8"	14'-4"	13'-3"	12'-6"
50.0	8'-4"	7'-9"	7'-3"	7'-7"	10'-11"	10'-2"	9'-7"	10'-0"	15'-2"	14'-1"	13'-3"	13'-10"	12'-10"	12'-1"
55.0	8'-1"	7'-6"	7'-1"	7'-4"	10'-7"	9'-10"	9'-3"	9'-8"	14'-8"	13'-7"	12'-10"	13'-4"	12'-5"	11'-8"
60.0	7'-10"	7'-3"	6'-10"	7'-2"	10'-3"	9'-7"	9'-0"	9'-5"	14'-3"	13'-3"	12'-5"	13'-0"	12'-1"	11'-4"
65.0	7'-8"	7'-1"	6'-8"	7'-0"	10'-0"	9'-4"	8'-9"	9'-2"	13'-11"	12'-11"	12'-2"	12'-8"	11'-9"	11'-1"
70.0	7'-5"	6'-11"	6'-6"	6'-10"	9'-9"	9'-1"	8'-6"	8'-11"	13'-7"	12'-7"	11'-10"	12'-4"	11'-5"	10'-9"
75.0	7'-3"	6'-9"	6'-4"	6'-8"	9'-7"	8'-10"	8'-4"	8'-8"	13'-3"	12'-3"	11'-7"	12'-1"	11'-2"	10'-6"
80.0	7'-2"	6'-7"	6'-3"	6'-6"	9'-4"	8'-8"	8'-2"	8'-6"	12'-11"	12'-0"	11'-4"	11'-10"	10'-11"	10'-4"
85.0	7'-0"	6'-6"	6'-1"	6'-4"	9'-2"	8'-6"	8'-0"	8'-4"	12'-8"	11'-9"	11'-1"	11'-7"	10'-9"	10'-1"
90.0	6'-10"	6'-4"	6'-0"	6'-3"	9'-0"	8'-4"	7'-10"	8'-2"	12'-5"	11'-7"	10'-11"	11'-4"	10'-6"	9'-11"
95.0	6'-9"	6'-3"	5'-10"	6'-2"	8'-10"	8'-2"	7'-9"	8'-1"	12'-3"	11'-4"	10'-8"	11'-2"	10'-4"	9'-9"
100.0	6'-7"	6'-2"	5'-9"	6'-0"	8'-8"	8'-1"	7'-7"	7'-11"	12'-0"	11'-2"	10'-6"	10'-11"	10'-2"	9'-7"
105.0	6'-6"	6'-1"	5'-7"	5'-11"	8'-6"	7'-11"	7'-6"	7'-9"	11'-10"	11'-0"	10'-4"	10'-9"	—	—
110.0	6'-5"	5'-11"	5'-5"	5'-10"	8'-5"	7'-10"	7'-4"	7'-8"	11'-8"	10'-10"	10'-2"	10'-7"	—	—
115.0	6'-4"	5'-10"	5'-4"	5'-8"	8'-3"	7'-8"	7'-3"	7'-7"	11'-6"	10'-8"	10'-0"	10'-5"	—	—
120.0	6'-3"	5'-9"	5'-3"	5'-7"	8'-2"	7'-7"	7'-2"	7'-5"	11'-4"	10'-6"	9'-11"	10'-4"	—	—
125.0	6'-2"	5'-7"	5'-1"	5'-5"	8'-1"	7'-6"	7'-0"	7'-4"	11'-2"	10'-4"	9'-9"	10'-2"	—	—
130.0	6'-1"	5'-6"	5'-0"	5'-4"	7'-11"	7'-5"	6'-11"	7'-3"	11'-0"	10'-3"	9'-8"	10'-0"	—	—
135.0	6'-0"	5'-5"	4'-11"	5'-3"	7'-10"	7'-3"	6'-10"	7'-2"	10'-11"	10'-1"	9'-6"	9'-11"	—	—
140.0	5'-11"	5'-3"	4'-10"	5'-2"	7'-9"	7'-2"	6'-9"	7'-1"	10'-9"	10'-0"	9'-5"	9'-10"	—	—

NOTES : REFER TO ELEVATIONS ON SHEET 17 OF 27

1-. FOR MULLIONS INSTALLED W/O STORM BARS

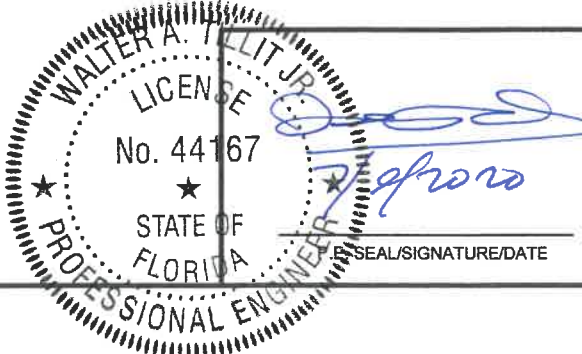
A) MULLION SPACING SHALL BE SUCH THAT MAXIMUM SLAT SPAN SHALL NOT BE EXCEEDED

2-. FOR MULLIONS INSTALLED W/ STORM BARS & HEADERS

A) MULLION SPACING SHALL BE SUCH THAT MAXIMUM HEADER SPAN SHALL NOT BE EXCEEDED

B) STORM BAR SPACING SHALL BE SUCH THAT MAXIMUM SLAT SPAN SHALL NOT BE EXCEEDED

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