

RE 1000, RE1500, RE600 & RE400 SHUTTER SYSTEM

EXTRUDED ALUMINUM ROLL SHUTTERS

FLORIDA STATE APPROVAL
CODE VERSION: FLORIDA BUILDING CODE 2020 - 7th EDITION
APPROVED FOR USE IN HVHZ AND OUTSIDE HVHZ
CATEGORY: SHUTTERS -- SUBCATEGORY: ROLL-UP
IMPACT RESISTANT: LARGE MISSILE



Pedro De Figueiredo
09/12/2020

ENGINEERING
ENGCO INC. - CA 8116
9715 W. BROWARD BLVD. 247
PLANTATION - FLORIDA - 33324
ENGCO@AOL.COM
ENGINEER SEAL
PEDRO DE FIGUEIREDO
PE 52609

GENERAL NOTES:

- 1- DEFINITION: THESE PRODUCTS ARE TO BE USED AS A HURRICANE PROTECTION DEVICE. THEY ARE DESIGNED, CONSTRUCTED AND ERECTED TO EASILY ENCLOSE AN AREA, PROVIDING PROTECTION FROM HURRICANE FORCE WINDS AND WIND BORNE DEBRIS WITHIN THE ALLOWABLE DESIGNED PRESSURES AND LIMITATIONS STATED IN THIS APPROVAL.
- 2- DESIGN: THIS PRODUCT HAS BEEN TESTED UNDER THE TAS 202, 201 (LARGE MISSILE), 203 AND HAS BEEN DESIGNED IN ACCORDANCE WITH THE FLORIDA BUILDING CODE 2020 7th EDITION.
- 3- POSTING: A PERMANENT LABEL SHALL BE PROVIDED AND IT SHALL BE LOCATED ON THE BOTTOM OF THE HOOD FACING THE EXTERIOR OR OUTSIDE OR THE BOTTOM SLAT FACING THE EXTERIOR OR OUTSIDE AND A MINIMUM OF ONE LABEL PER OPENING.
- 4- LOADS: DESIGNED LOAD CALCULATED BASED ON THE ASCE 7-16 AND PROVIDED BY A PROFESSIONAL ARCHITECT OR ENGINEER FOR EACH SPECIFIC PROJECT. THE CALCULATED DESIGNED PRESSURE MUST NOT EXCEED THE ALLOWABLE PRESSURES FOR EACH PRODUCT COMPONENT TO BE USED. THE DESIGN PRESSURES, AS DETERMINED FROM ASCE 7-16 ARE PERMITTED TO BE MULTIPLIED BY 0.6.
- 5- MATERIAL: ALL EXTRUDED ALUMINUM SHAPES SHALL BE MADE OF 6063-T6 OR AS NOTED.
- 6- FASTENERS: ASSEMBLY SCREWS AND ANCHORS SHALL BE AS SPECIFIED IN THE CURRENT SET OF DRAWINGS. INSTALLATION AND LOADS AS PER THIS APPROVAL.
- 7- USE: IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR, ARCHITECT OR ENGINEER OF RECORD TO VERIFY THE FOLLOWING:
7.1- THE STABILITY OF THE STRUCTURE WHERE THE DOOR IS TO BE ATTACHED INSURING PROPER ANCHORAGE.
7.2- THE SITE SPECIFIC PROJECT CRITERIA, SUCH AS BUT NOT LIMITED TO, WIND LOADS, LOCAL CODE REQUIREMENTS, DESIGNED PRESSURES ETC.
7.3- THAT THIS APPROVAL IS ADEQUATE TO THE SPECIFIC PROJECT.
- 8- DISCLAIMER: ENGCO INC. HAS NO CONTROL IN THE MANUFACTURING AND/OR PERFORMANCE OF THIS PRODUCT. THESE GENERIC PLANS WERE ENGINEERED IN ACCORDANCE WITH ACCEPTED ENGINEERING PRACTICES AND TEST DATA PROVIDED BY A CERTIFIED LABORATORY.
- 9- THE ROLL-UP MECHANISM (GEARS, MOTORS, SUPPORTING END PLATES) ARE NOT PART OF THIS APPROVAL. MANUFACTURER ARE RESPONSIBLE TO SPECIFY THESE COMPONENTS FOR PROPER DOOR OPERATION.
- 10- LIMITATIONS: PRODUCT IS QUALIFIED AS "NON POROUS", THEREFORE GLAZING SEPARATION IS NOT REQUIRED WITH THE EXCEPTION FOR THE FOLLOWING LOCATIONS:
10.1- HIGH VELOCITY HURRICANE ZONES (HVHZ MIAMI-DADE & BROWARD COUNTIES)
10.2- IN WIND ZONE 4 AS DEFINED IN ASTM E 1996.
10.3- IN ESSENTIAL FACILITIES AS DEFINED IN THE ASCE 7-16.
- IN ORDER TO COMPLY WITH CODE, THE LOCATIONS AS SPECIFIED IN 10.1, 10.2 AND 10.3 ARE REQUIRED TO HAVE GLASS SEPARATION AS SPECIFIED ON SHEETS 3 (NON HVHZ) AND SHEET 4 (HVHZ).
- 11- MULTIPLE SPAN SHUTTERS: REINFORCEMENTS SUCH AS STORM BARS, HEADER AND MULLIONS WERE DESIGNED BY RATIONAL ANALYSIS AND ARE PART OF DRAWINGS 20-151MS.

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STANDARD COMPLIANCE:

ASTM E330, E1996, E1886 (LEVEL D MISSILE)
TAS 201, 202, 203 (LARGE & SMALL MISSILE)
ASCE 7-16, ADM-15, NDS-18

ASSOCIATION:

N.A.S.A

NATIONAL APPROVED
SHUTTER ASSOCIATION
L.L.C.

15701 SW 29TH STEET STE 100
MIRAMAR, FLORIDA 33027
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WWW.NASASHUTTER.COM

PRODUCT:
ROLL UP SHUTTER SYSTEMS
RE1000, RE1500, RE600 & RE400
LARGE MISSILE IMPACT RESISTANT

ASSOCIATION OF MANUFACTURERS:
N.A.S.A
NATIONAL APPROVED SHUTTER ASSOCIATION L.L.C.
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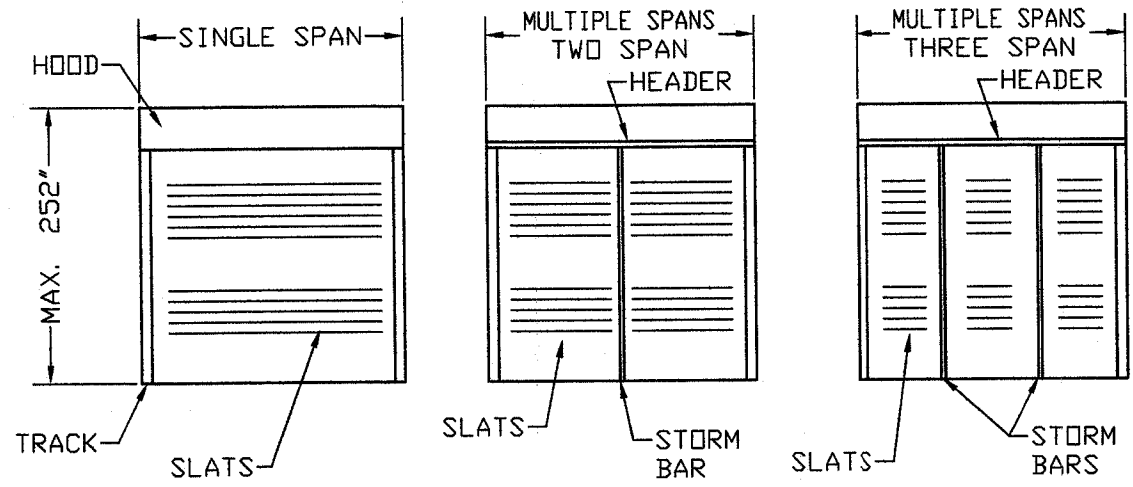
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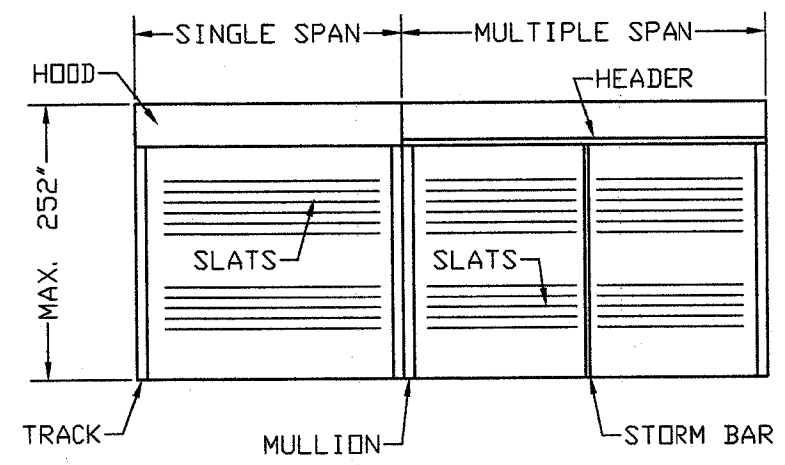
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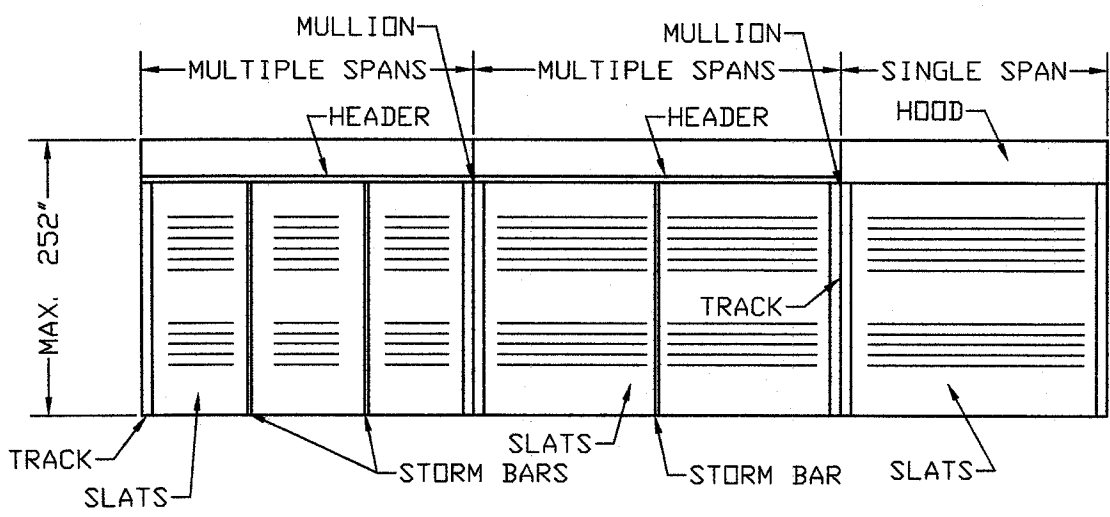
TYPICAL SHUTTER CONFIGURATIONS



SINGLE SLAT ROW
SINGLE SPAN, TWO SPANS, THREE SPANS OR MULTIPLE SPANS



TWO SLAT ROWS
COMBINATIONS OF SINGLE SPANS OR MULTIPLE SPANS
ONE INTERMEDIATE MULLION

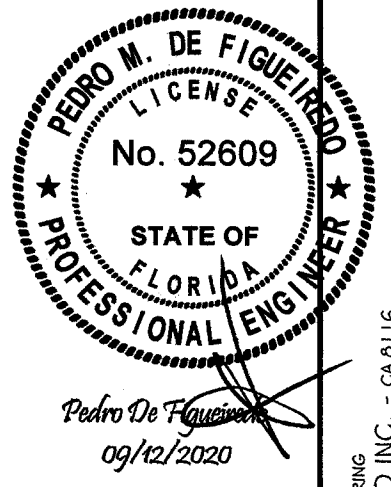


THREE OR MORE SLAT ROWS
COMBINATIONS OF SINGLE SPANS OR MULTIPLE SPANS
MULTIPLE INTERMEDIATE MULLIONS

DESIGN SCHEDULE TABLES

COMPONENT	NON HVHZ	HVHZ	REF. SHEET
SLAT ALLOWABLE PRESSURE	1	2	3, 4, 5, 6
SLAT GLASS SEPARATION	1	2	3, 4, 5, 6
TRACK ANCHORAGE	3, 4, 5, 6, 7, 7A		7, 8, 9, 10
STORM BARS AND HEADERS	SEE GEN. NOTES 11		
MULLIONS	SEE GEN. NOTES 11		

- NOTES:
- 1- ALLOWABLE DESIGNED PRESSURE ARE FUNCTION OF THE LOWEST ALLOWABLE DESIGNED LOAD FOR EACH COMPONENT (SLATS, ANCHORS, STORM BARS, HEADERS & MULLIONS)
 - 2- USE REFERENCE ABOVE TO CALCULATE THE DESIGN LOAD FOR EACH OF THE COMPONENTS
 - 3- MAXIMUM HEIGHT MUST NOT EXCEED 252'



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(OUTSIDE THE HVHZ)

SLAT SPAN DESIGN FOR INSTALLATION OUTSIDE HIGH VELOCITY HURRICANE ZONES

TABLE 1: SLAT SPAN DESIGN

RE1000, RE1500-S24 & RE1500-S26, RE400 AND RE600

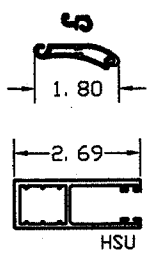
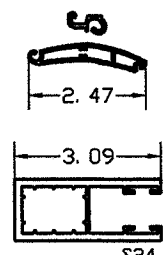
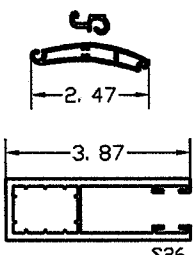
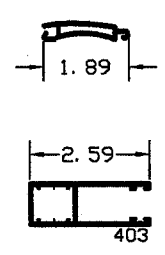
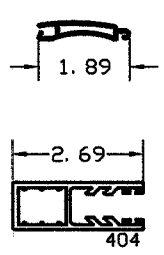
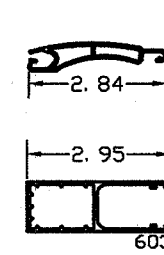
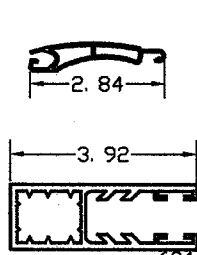
Pd (+/-)	MAX POS/NEG SPAN								
	RE1000			RE1500-S24			RE1500-S26		
	SS	GS*	GS**	SS	GS*	GS**	SS	GS*	GS**
30	73	4	5.0	92	4	5.0	132	9	9.0
45	64	4	5.0	81	4	4.5	116	8	8.0
55	59	4	5.0	76	4	4.5	106	8	8.0
65	55	4	5.0	71	4	4.5	98	8	8.0
75	51	4	5.0	67	4	4.5	91	8	8.0
85	49	3	5.0	64	4	4.5	85	8	8.0
95	47	3	4.5	61	4	4.5	80	8	8.0
105	45	3	4.5	58	4	4.5	75	7	7.0
115	43	3	4.5	55	4	4.5	70	7	7.0
125	41	3	4.5	53	3	4.5	66	6	6.0
135	40	3	4.5	51	3	4.5	63	5	5.0
145	39	3	4.5	49	3	4.5	59	5	5.0
155	38	3	4.0	47	3	4.5	56	4	4.5
165	37	3	4.0	46	3	4.5	53	4	4.5
175	36	3	4.0	44	3	4.5	50	4	4.5
185	35	3	4.0	42	3	4.5	47	3	4.5
195	34	3	4.0	41	3	4.5	45	3	4.5
205	34	3	4.0	39	3	4.5	42	3	4.5
255	30	2	4.0	--	-	--	--	-	--

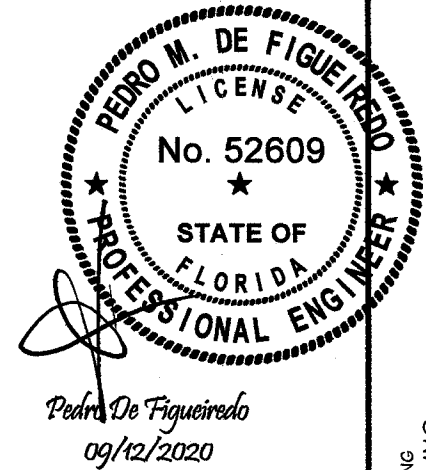
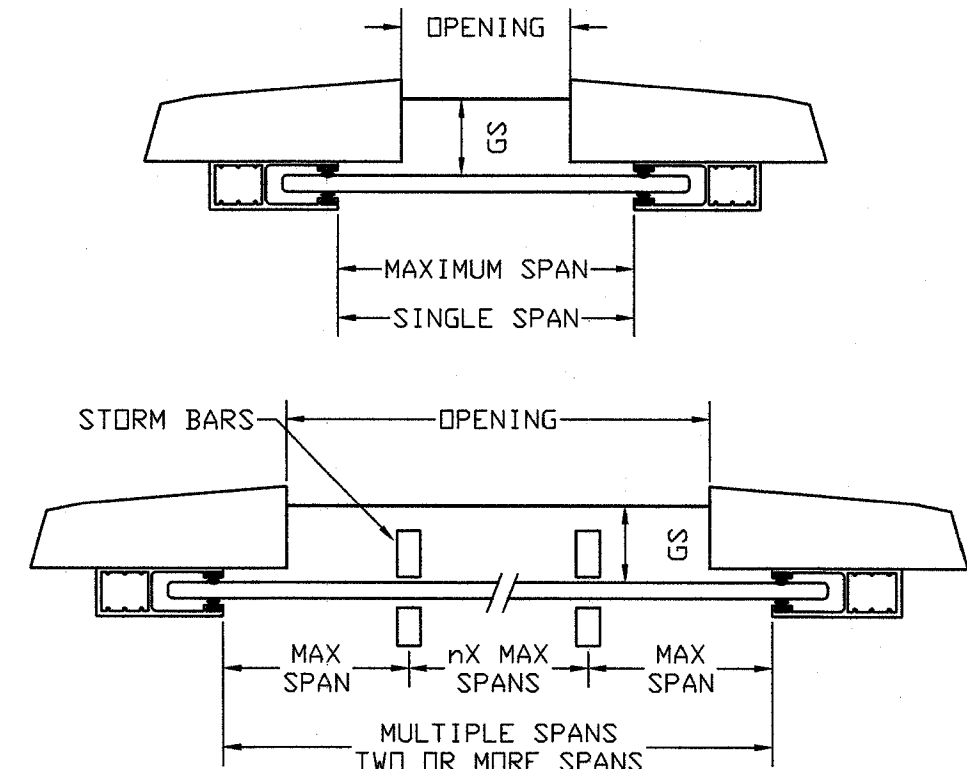
Pd (+/-)	MAX. PDS/NEG SPAN			
	RE400 STD		RE400 HD	
	SS	GS	SS	GS
25	60	3	67	3
30	57	3	63	3
35	54	3	60	3
40	52	3	58	3
45	50	3	56	3
50	49	3	55	3
55	48	3	53	3
60	46	3	52	3
65	45	3	51	3
70	44	3	50	3
75	43	3	48	3
80	43	3	47	3
90	41	3	45	3
100	40	3	44	3
110	39	3	42	3
120	38	3	41	3
140	36	3	38	3
160	35	3	36	3

Pd (+/-)	MAX. PDS/NEG SPAN			
	RE600 STD		RE600 HD	
	SS	GS	SS	GS
25	84	3	103	5
30	80	3	97	5
35	76	3	93	5
40	73	3	90	5
45	71	3	86	5
50	69	3	84	5
55	67	3	81	5
60	65	3	79	5
65	64	3	77	5
70	62	3	76	5
75	61	3	74	5
80	60	3	72	4
90	58	3	68	4
100	56	3	65	4
110	55	3	62	4
120	53	3	59	4
145	51	3	52	4
160	49	3	49	3

TABLE NOTES:

- 1- Pd: ALLOWABLE POS/NEG PRESSURE IN PSF
- 2- SS: MAXIMUM SLAT SPAN IN INCHES UNDER POSITIVE OR NEGATIVE LOADS Pd.
- 3- GS: GLASS SEPARATION ONLY FOR LOCATIONS AS DEFINED ON GENERAL NOTE 10, ALL OTHER LOCATION GLAZING SEPARATION IS NOT REQUIRED.
GS: MINIMUM GLAZING SEPARATION FOR ALL ELEVATIONS, GS*: MINIMUM GLAZING SEPARATION ONLY FOR UNITS INSTALLED ABOVE 30' GRADE,
GS**: MINIMUM GLAZING SEPARATION ONLY FOR UNITS INSTALLED BELOW 30' GRADE
- 4- MAXIMUM SLAT SPAN FOR MULTIPLES UNITS ARE TO BE LIMITED TO THE MAXIMUM ALLOWABLE SPAN SPECIFIED IN THE ABOVE TABLES.

SHUTTER MAIN COMPONENTS						
RE1000	RE1500-S24	RE1500-S26	RE400 STD	RE400 HD	RE600 STD	RE600 HD
						



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(INSIDE THE HVHZ)

SLAT SPAN DESIGN FOR INSTALLATION INSIDE THE HIGH VELOCITY HURRICANE ZONES

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09/12/2020

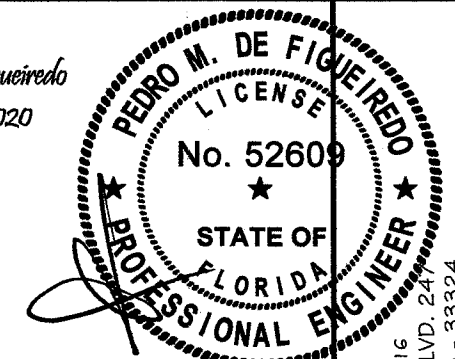


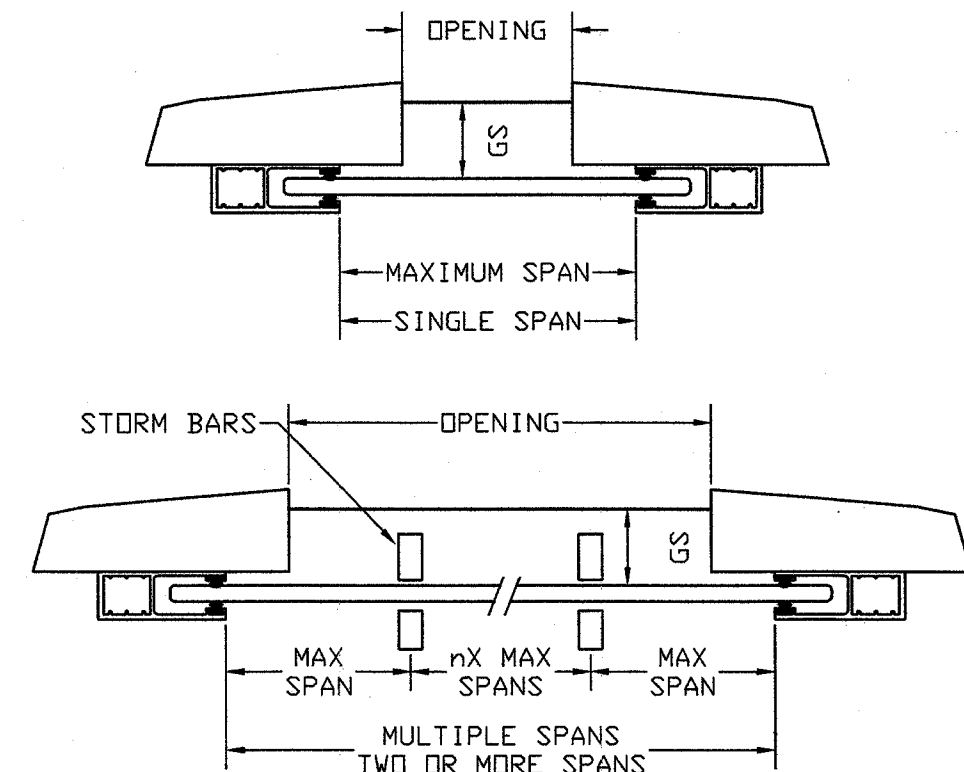
TABLE 2: SLAT SPAN DESIGN
RE1000, RE1500-S24 & RE1500-S26, RE400 AND RE600

	SLAT SPAN DESIGN - RE1000				SLAT SPAN DESIGN - RE1500 S24				SLAT SPAN DESIGN - RE1500 S26					SLAT SPAN DESIGN - RE400							SLAT SPAN DESIGN - RE600					
Pd (+/-)	MAX POS SPAN	GS* IN	GS** IN	MAX NEG SPAN	MAX POS SPAN	GS* IN	GS** IN	MAX NEG SPAN	MAX POS SPAN	GS* IN	GS** IN	MAX NEG SPAN	Pd (+/-)	MAX. POS / NEG SPAN						Pd (+/-)	MAX. POS / NEG SPAN					
														STD			HD				STD			HD		
														SS+	SS-	GS	SS+	SS-	GS		SS+	SS-	GS	SS+	SS-	GS
30	66	3	5.0	69	83	3	4.5	92	95	3	4.5	110								25	78	84	3	83	93	3
45	60	3	5.0	60	74	3	4.5	79	85	3	4.5	95	25	54	54	3	61	61	3	30	75	80	3	80	87	3
55	55	3	5.0	55	69	3	4.5	73	79	3	4.5	86	30	52	52	3	59	59	3	35	72	76	3	76	83	3
65	52	3	5.0	52	66	3	4.5	68	73	3	4.5	79	35	50	50	3	56	56	3	40	70	73	3	74	79	3
75	49	3	5.0	49	63	3	4.5	63	68	3	4.5	71	40	49	49	3	54	54	3	45	68	71	3	71	76	3
85	46	3	4.5	46	60	3	4.5	60	62	3	4.5	63	45	49	49	3	52	52	3	50	66	69	3	69	73	3
95	44	3	4.5	44	57	3	4.5	57	58	3	4.5	58	50	48	48	3	51	51	3	55	65	67	3	68	70	3
105	43	3	4.5	43	55	3	4.5	55	56	3	4.5	56	55	47	47	3	50	50	3	60	64	65	3	66	68	3
115	42	3	4.5	42	53	3	4.5	53	54	3	4.5	54	60	46	46	3	48	48	3	65	63	63	3	65	66	3
125	41	3	4.5	41	51	3	4.5	51	53	3	4.5	53	65	45	45	3	47	47	3	70	61	62	3	63	65	3
135	40	3	4.5	40	49	3	4.5	49	51	3	4.5	51	70	44	44	3	47	47	3	75	61	61	3	62	63	3
145	39	3	4.5	39	48	3	4.5	48	49	3	4.5	49	75	43	43	3	46	46	3	80	59	59	3	61	62	3
155	38	3	4.0	38	46	3	4.5	46	48	3	4.5	48	80	43	43	3	45	45	3	90	57	57	3	59	59	3
165	37	3	4.0	37	45	3	4.5	45	47	3	4.5	47	90	41	41	3	44	44	3	100	55	55	3	57	57	3
175	36	3	4.0	36	44	3	4.5	44	46	3	4.5	46	100	40	40	3	43	43	3	110	53	53	3	55	55	3
185	35	3	4.0	35	42	3	4.5	42	45	3	4.5	45	110	39	39	3	42	42	3	120	51	51	3	54	54	3
195	34	3	4.0	34	41	3	4.5	41	44	3	4.5	44	120	38	38	3	41	41	3	140	48	48	3	50	50	3
205	34	3	4.0	34	39	3	4.5	39	42	3	4.5	42	140	36	36	3	38	38	3	160	46	46	3	49	49	3
255	30	2	4.0	30									160	35	35	3	36	36	3							

TABLE NOTES:

- 1- Pd: ALLOWABLE POS/NEG PRESSURE IN PSF
- 2- MAX. POS SPAN: MAXIMUM SLAT SPAN IN INCHES UNDER POSITIVE LOAD Pd.
- 3- MAX. NEG SPAN: MAXIMUM SLAT SPAN IN INCHES UNDER NEGATIVE LOAD Pd.
- 4- GS: MINIMUM GLAZING SEPARATION FOR ALL ELEVATIONS, GS*: MINIMUM GLAZING SEPARATION ONLY FOR UNITS INSTALLED ABOVE 30' GRADE, GS**: MINIMUM GLAZING SEPARATION ONLY FOR UNITS INSTALLED BELOW 30' GRADE
- 6- HVHZ: BROWARD AND MIAMI-DADE COUNTIES AS DEFINED IN THE FLORIDA BUILDING CODE
- 7- MAXIMUM SLAT SPAN FOR MULTIPLES UNITS ARE TO BE LIMITED TO THE MAXIMUM ALLOWABLE SPAN SPECIFIED IN THE ABOVE TABLES.

SHUTTER MAIN COMPONENTS						
RE1000	RE1500-S24	RE1500-S26	RE400 STD	RE400 HD	RE600 STD	RE600 HD



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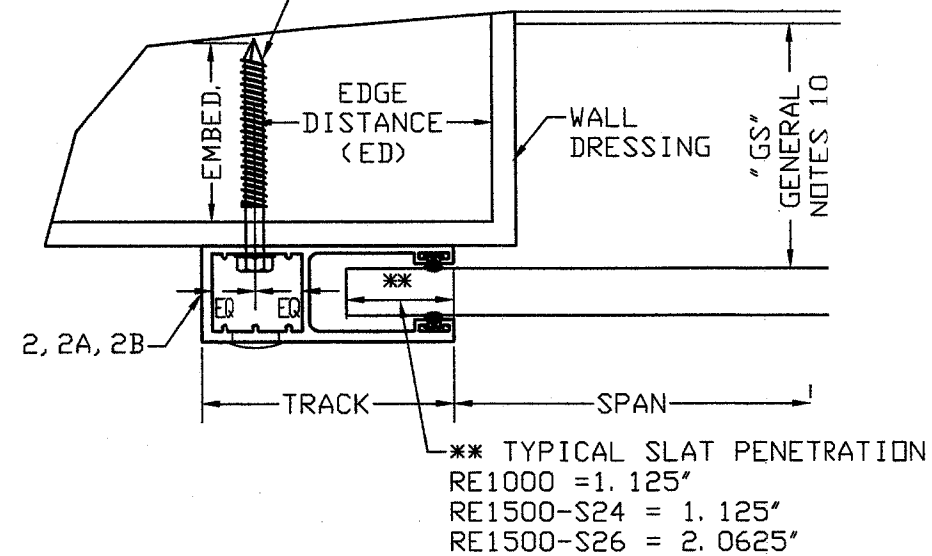
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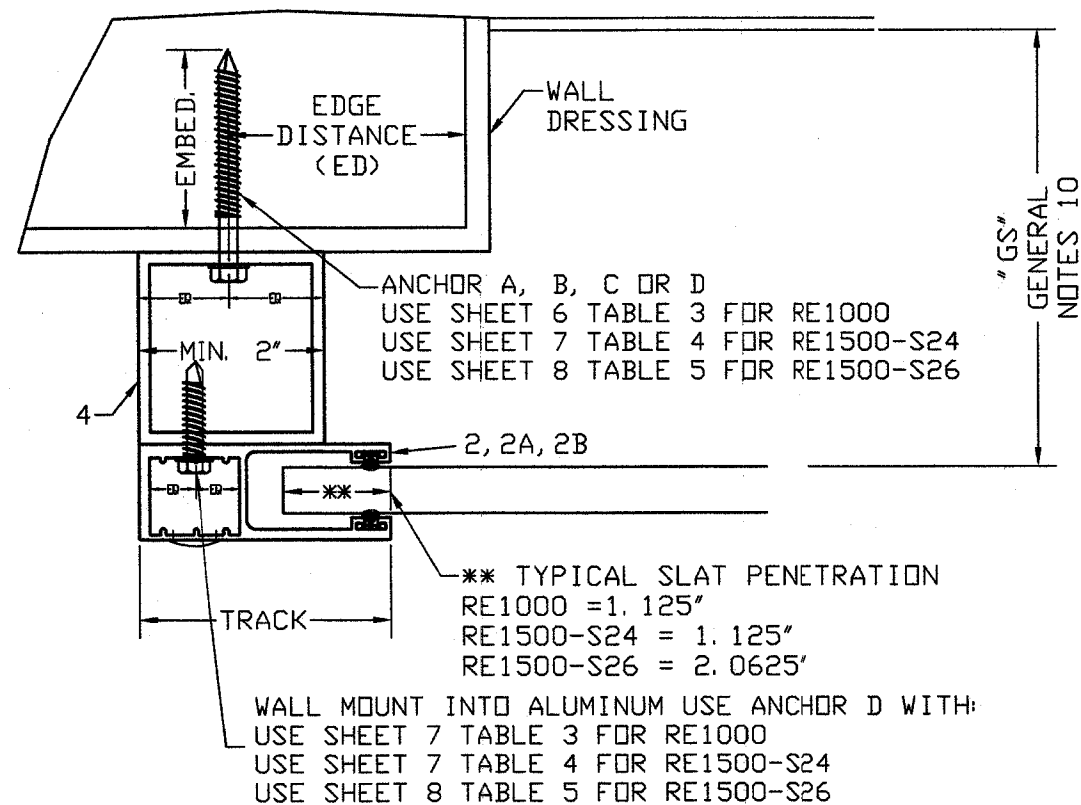
RE1000 AND RE1500 - GUIDE RAILS MOUNTING OPTIONS

A- WALL MOUNT

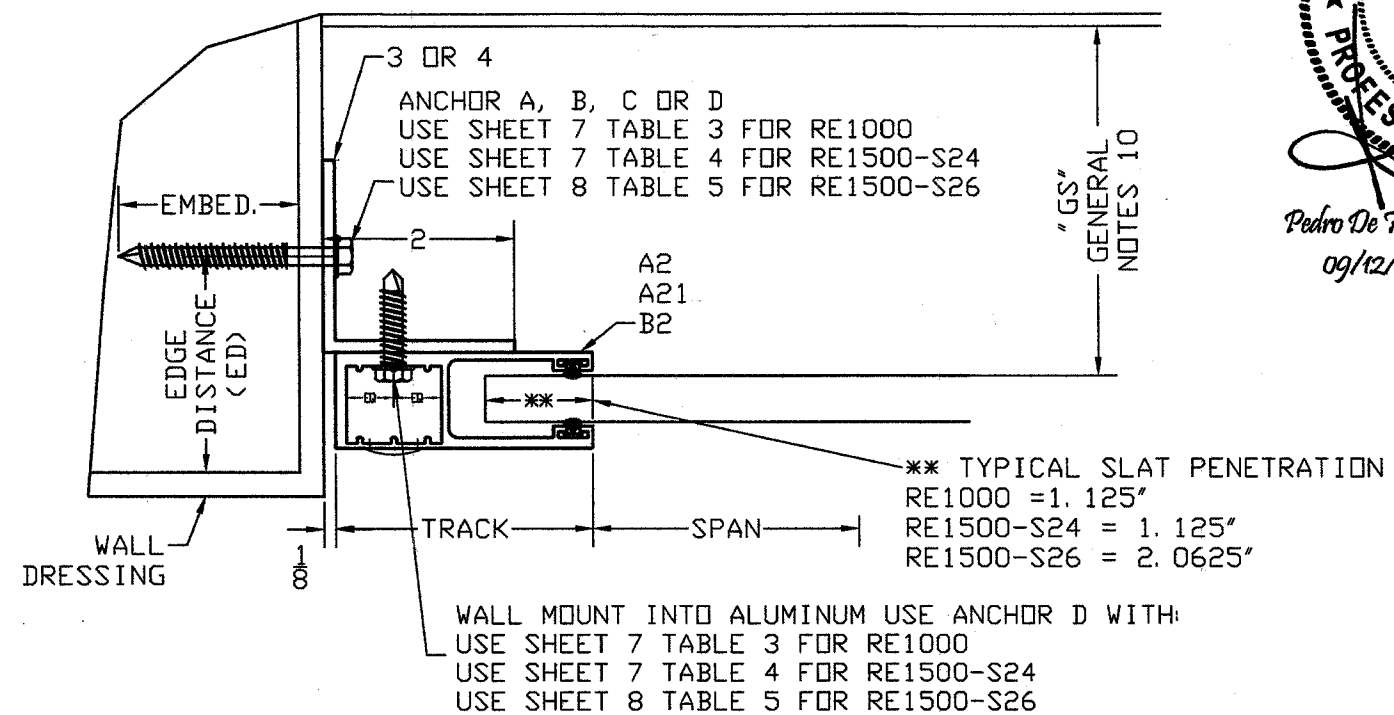
ANCHOR A, B, C OR D
USE SHEET 7 TABLE 3 FOR RE1000
USE SHEET 7 TABLE 4 FOR RE1500-S24
USE SHEET 8 TABLE 5 FOR RE1500-S26



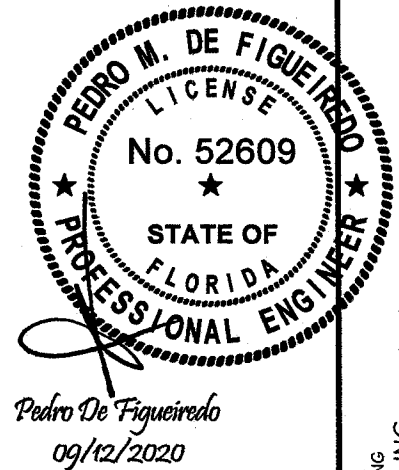
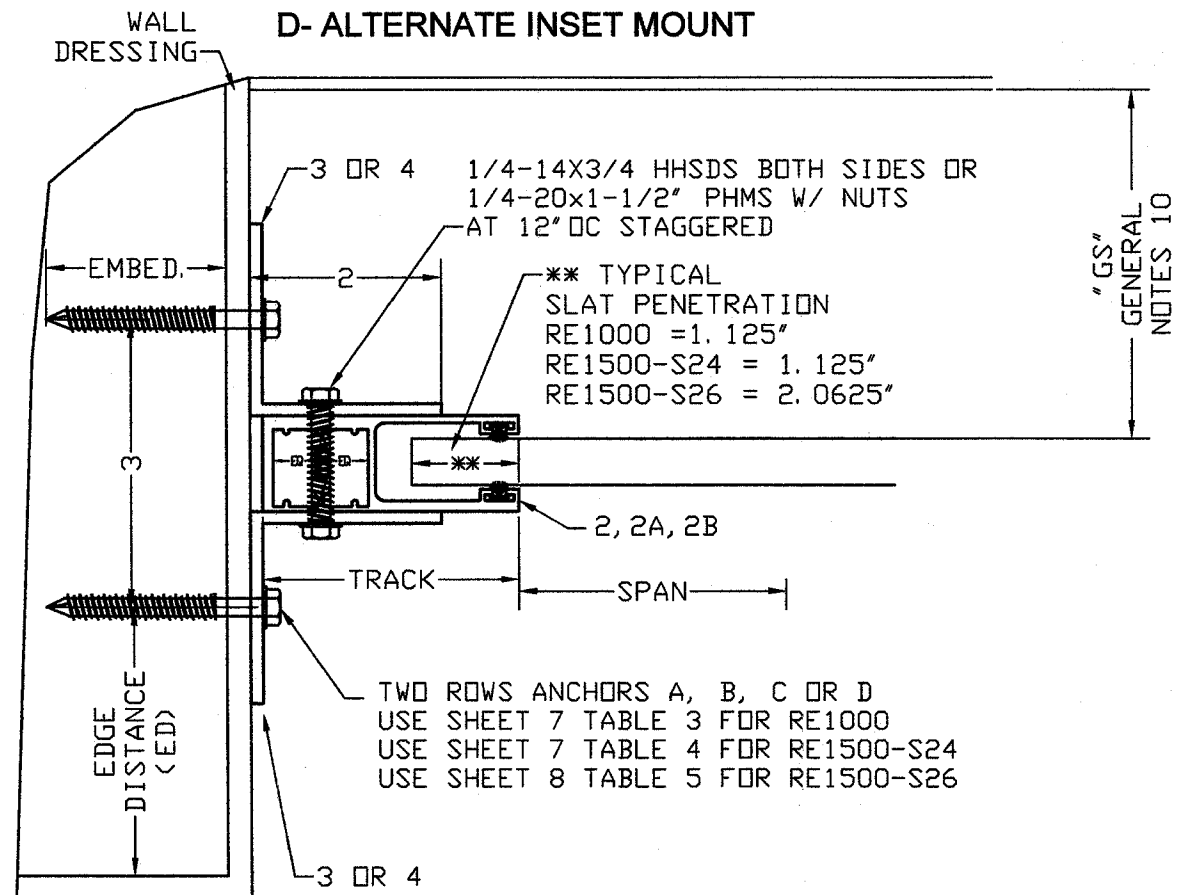
B- BUILT-OUT MOUNT



C- INSET MOUNT



D- ALTERNATE INSET MOUNT



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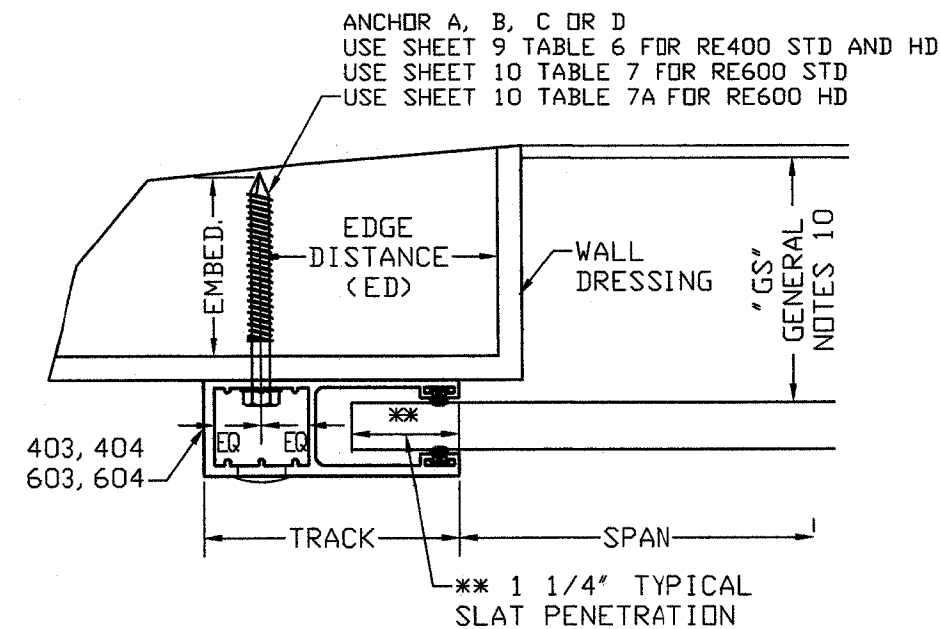
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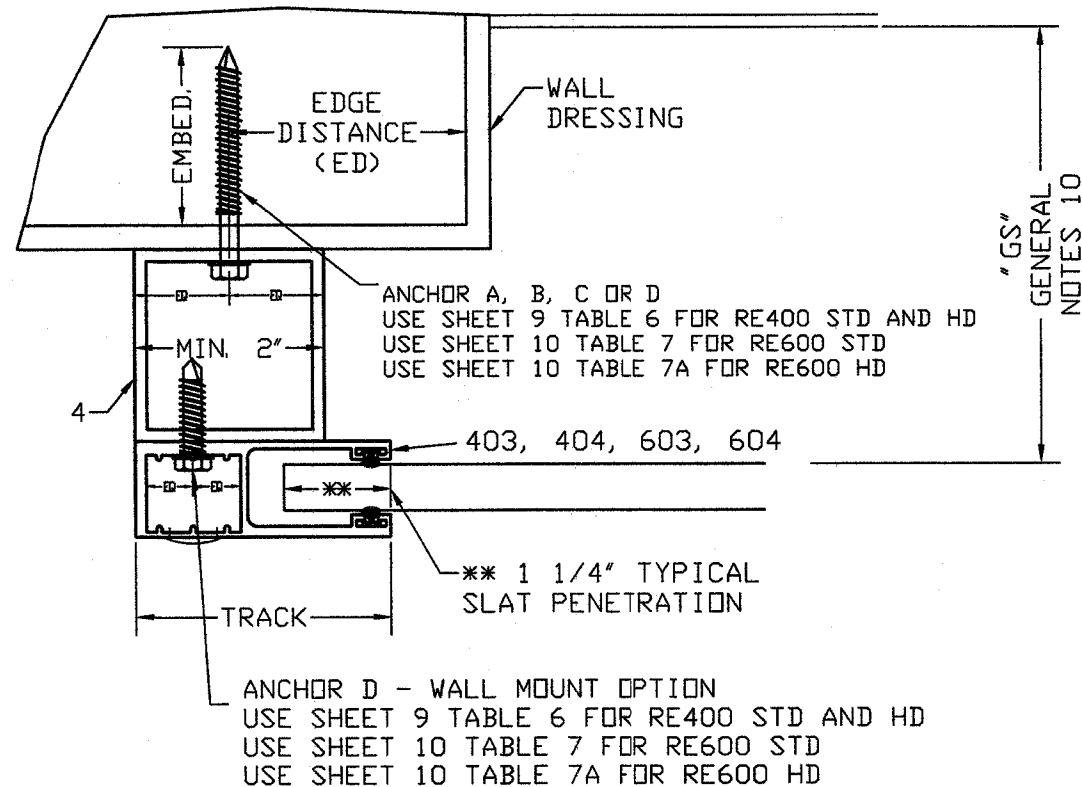
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RE400 AND RE600 - GUIDE RAILS MOUNTING OPTIONS

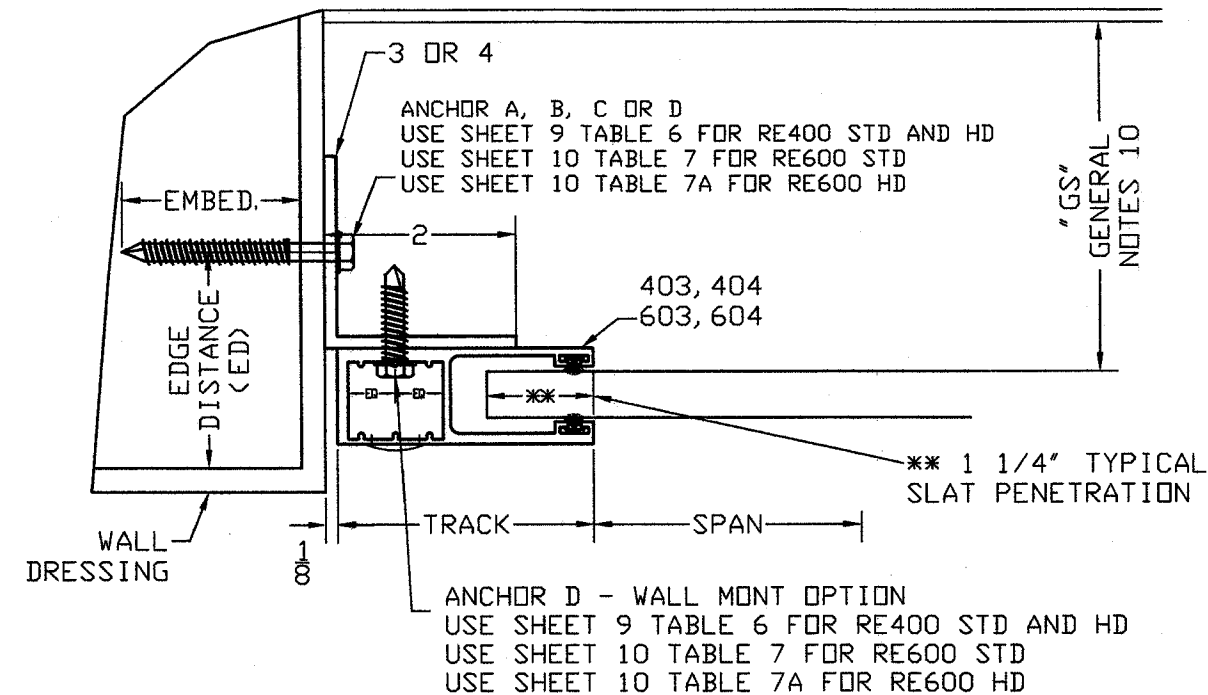
A- WALL MOUNT



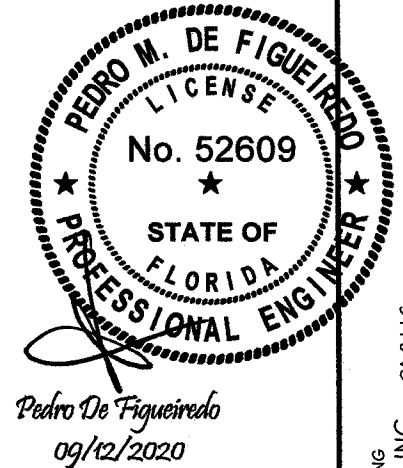
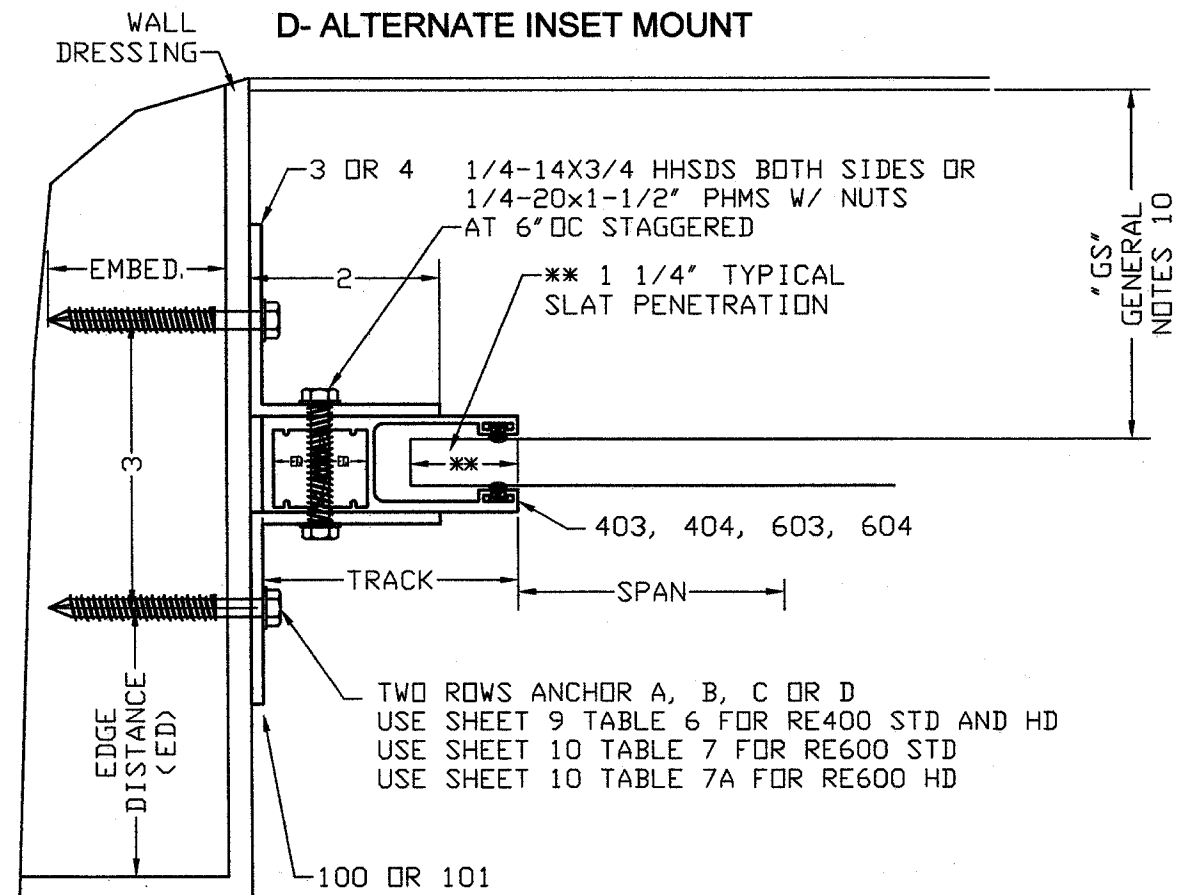
B- BUILT-OUT MOUNT



C- INSET MOUNT



D- ALTERNATE INSET MOUNT



ENGINEERING
ENGCO INC. - CA 8116
9715 W. BROWARD BLVD. 247
PLANTATION - FLORIDA - 33324
ENGCO@AOL.COM
ENGINEER SEAL
PEDRO DE FIGUEIREDO
PE 52609

PRODUCT:
ROLL UP SHUTTER SYSTEMS
RE1000, RE1500, REGOO & RE400
LARGE MISSILE IMPACT RESISTANT

ASSOCIATION OF MANUFACTURERS:
N.A.S.A.
NATIONAL APPROVED SHUTTER ASSOCIATION LLC.
MIRAMAR, FL 33027

SCALE:
NA
DATE:
09/12/2020
DRAWING #
20-151
SHEET
6 OF 12

TABLES 3 AND 4 - RE1000 AND RE1500-S24 - GUIDE RAIL ANCHORAGE DESIGN

TABLE 3 - RE1000 MAXIMUM TRACK ANCHORAGE SPACING

		WALL MOUNT ANCHOR TYPE				BUILT-OUT MOUNT ANCHOR TYPE				INSET MOUNT ANCHOR TYPE				ALTERNATE INSET MOUNT ANCHOR TYPE				
Pd	SPAN A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D		
30	73	12	4	11	12	12	6	12	12	12	5	11	12	12	12	12	12	12
	60	12	4	12	12	12	8	12	12	12	6	12	12	12	12	12	12	12
	50	12	5	12	12	12	9	12	12	12	7	12	12	12	12	12	12	12
	40	12	7	12	12	12	12	12	12	12	9	12	12	12	12	12	12	12
	30	12	9	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
45	73	11	-	7	8	12	4	12	12	12	-	7	10	12	8	12	12	12
	60	12	-	9	10	12	5	12	12	12	4	9	12	12	10	12	12	12
	50	12	-	10	12	12	6	12	12	12	5	11	12	12	12	12	12	12
	40	12	4	12	12	12	8	12	12	12	6	12	12	12	12	12	12	12
	30	12	6	12	12	12	10	12	12	12	8	12	12	12	12	12	12	12
55	73	9	-	6	7	12	-	10	12	10	-	6	8	12	7	12	12	12
	60	11	-	7	8	12	4	12	12	12	-	7	10	12	8	12	12	12
	50	12	-	8	10	12	5	12	12	12	4	9	12	12	10	12	12	12
	40	12	4	11	12	12	6	12	12	12	5	11	12	12	12	12	12	12
	30	12	5	12	12	12	8	12	12	12	7	12	12	12	12	12	12	12
65	73	8	-	5	6	11	-	8	10	8	-	5	7	11	6	11	11	11
	60	9	-	6	7	12	-	10	12	10	-	6	9	12	7	12	12	12
	50	11	-	7	9	12	4	12	12	12	-	7	10	12	9	12	12	12
	40	12	-	9	11	12	5	12	12	12	4	9	12	12	11	12	12	12
	30	12	4	12	12	12	7	12	12	12	5	12	12	12	12	12	12	12
75	73	7	-	4	5	9	-	7	8	7	-	4	6	9	5	9	9	9
	60	8	-	5	6	12	-	8	10	8	-	5	7	12	6	12	12	12
	50	10	-	6	7	12	-	10	12	10	-	6	9	12	7	12	12	12
	40	12	-	8	9	12	4	12	12	12	-	8	11	12	9	12	12	12
	30	12	-	10	12	12	6	12	12	12	5	11	12	12	12	12	12	12
85	60	7	-	4	5	10	-	7	9	7	-	5	6	10	5	10	10	10
	50	9	-	5	6	12	-	9	11	9	-	6	8	12	6	12	12	12
	40	11	-	7	8	12	4	11	12	11	-	7	10	12	8	12	12	12
	30	12	-	9	11	12	5	12	12	12	4	10	12	12	11	12	12	12
	24	12	-	10	12	12	6	12	12	12	5	11	12	12	12	12	12	12
95	50	8	-	5	6	11	-	8	10	8	-	5	7	11	6	11	11	11
	40	10	-	6	7	12	-	10	12	10	-	6	9	12	7	12	12	12
	30	12	-	8	10	12	5	12	12	12	4	8	12	12	10	12	12	12
	24	12	-	10	12	12	6	12	12	12	5	11	12	12	12	12	12	12
	135	40	7	-	4	5	10	-	7	8	7	-	4	6	10	5	10	10
135	30	9	-	6	7	12	-	9	11	9	-	6	8	12	7	12	12	12
	24	11	-	7	9	12	4	12	12	12	-	7	10	12	9	12	12	12
	155	40	6	-	3	4	8	-	6	7	6	-	4	5	8	4	8	8
155	30	8	-	5	6	11	-	8	10	8	-	5	7	11	6	11	11	11
	24	10	-	6	7	12	-	10	12	10	-	6	9	12	7	12	12	12
	175	40	5	-	3	4	7	-	5	6	5	-	3	4	7	3	7	7
175	30	7	-	4	5	10	-	7	9	7	-	4	6	10	5	10	10	10
	24	9	-	5	7	12	-	9	11	9	-	6	8	12	7	12	12	12
	195	40	4	-	3	3	7	-	5	6	5	-	3	4	7	3	7	7
195	30	6	-	4	5	9	-	6	8	6	-	4	6	9	5	9	9	9
	24	8	-	5	6	11	-	8	10	8	-	5	7	11	6	11	11	11
	205	40	4	-	3	3	6	-	4	5	4	-	3	4	6	3	6	6
205	30	6	-	4	4	8	-	6	7	6	-	4	5	8	4	8	8	8
	24	7	-	5	5	11	-	8	9	8	-	5	7	11	5	11	11	11

ANCHOR SCHEDULE

TYPE	DESCRIPTION	MANUFACTURER	EMBEDMENT	ED	BASE MATERIAL
A	1/4" ss TAPCON	ITW	1 3/4"	3"	3000 psi CONCRETE
B	1/4" ss TAPCON	ITW	1 1/4"	4"	HOLLOW BLOCK
C	1/4"-14 ss HHSMS	GENERIC	1 1/2"	1"	WOOD (SG>= .46)
D	1/4"-14 ss HHSMS	GENERIC	1/8"	3/4"	1/8" METAL STRUCTURE

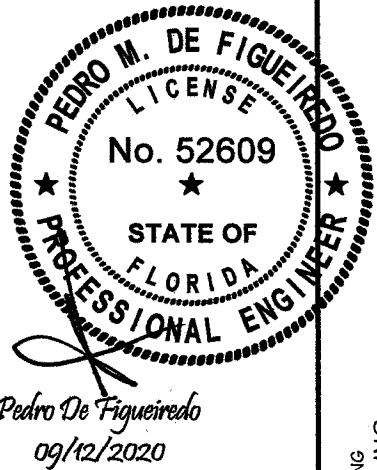
ANCHOR NOTES:

- 1- 1/4" TAPCONS CAN BE USED AS TYPE C INTO WOOD
- 2- 1/4" CARBON STEEL TAPCONS CAN BE USED AS AN ALTERNATE TO THE STAINLESS STEEL
- 3- METAL STRUCTURES ARE MADE OF MINIMUM 6063-T6 ALUMINUM OR ASTM A36 STEEL

TABLE 4 - RE1500 S24 MAXIMUM TRACK ANCHORAGE SPACING

		WALL MOUNT ANCHOR TYPE				BUILT-OUT MOUNT ANCHOR TYPE				INSET MOUNT ANCHOR TYPE				ALTERNATE INSET MOUNT ANCHOR TYPE			
Pd	SPAN A	B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	
30	92	12	-	11	12	12	4	12	12	12	-	8	11	12	10	12	12
	72	12	5	12	12	12	6	12	12	12	5	11	12	12	12	12	12
	60	12	6	12	12	12	7	12	12	12	6	12	12	12	12	12	12
	48	12	7	12	12	12	9	12	12	12	7	12	12	12	12	12	12
	36	12	10	12	12	12	12	12	12	12	10	12	12	12	12	12	12
45	92	11	-	7	8	12	-	9	10	9	-	5	7	12	6	12	12
	72	12	-	9	11	12	4	11	12	11	-	7	10	12	8	12	12
	60	12	4	11	12	12	4	12	12	12	4	8	12	12	10	12	12
	48	12	5	12	12	12	6	12	12	12	5	11	12	12	12	12	12
	36	12	6	12	12	12	8	12	12	12	6	12	12	12	12	12	12
55	84	10	-	6	7	11	-	8	9	8	-	5	7	11	6	11	11
	72	12	-	7	9	12	-	9	11	9	-	6	8	12	7	12	12
	60	12	-	9	11	12	4	11	12	11	-	7	10	12	8	12	12
	48	12	4	11	12	12	5	12	12	12	4	9	12	12	10	12	12
	36	12	5	12	12	12	6	12	12	12	5	12	12	12	12	12	12
65	84	8	-	5	6	9	-	6	8	7	-	4	6	9	5	9	9
	72	10	-	6	7	11	-	8	9	8	-	5	7	11	5	11	11
	60	12	-	7	9	12	-	9	11	9	-	6	8	12	7	12	12
	48	12	-	9	11	12	4	12	12	12	-	7	10	12	8	12	12
	36	12	4	12	12	12	5	12	12	12	4	10	12	12	11	12	12
75	84	7	-	4	5	8	-	5	7	6	-	3	5	8	4	8	8
	72	8	-	5	6	9	-	6	8	7	-	4	6	9	5	9	9
	60	10	-	6	8	11	-	8	9	8	-	5	7	11	6	11	11
	48	12	-	8	10	12	-	10	12	10	-	6	9	12	7	12	12
	36	12	4	11	12	12	4	12	12	12	4	8	12	12	10	12	12
85	72	7	-	5	5	8	-	6	7	6	-	3	5	8	4	8	8
	60	9	-	6	7	10	-	7	8	7	-	4	6	10	5	10	10
	48	11	-	7	8	12	-	9	10	9	-	5	8	12	6	12	12
	36	12	-	10	11	12	4	12	12	12	-	7	10	12	9	12	12
	24	12	-	11	12	12	5	12	12	12	4	10	12	12	10	12	12
95	72	7	-	4	5	7	-	5	6	5	-	3	4	7	4	7	7
	60	8	-	5	6	9	-	6	7	6	-	4	5	9	4	9	9
	48	10	-	6	8	11	-	8	9	8	-	5	7	11	6	11	11
	36	12	-	8	10	12	-	10	12	11	-	7	9	12	8	12	12
	24	12	-	10	12	12	5	12	12	12	4	10	12	12	10	12	12
135	60	5	-	3	4	6	-	4	5	4	-	-	4	6	3	6	6
	48	7	-	4	5	8	-	5	6	5	-	3	5	8	4	8	8
	36	9	-	6	7	10	-	7	9	7	-	4	6	10	5	10	10
155	60	5	-	3	3	5	-	4	4	4	-	-	3	5	-	5	5
	48	6	-	4	4	7	-	5	6	5	-	3	4	7	3	7	7
	36	8	-	5	6	9	-	6	8	6	-	4	5	9	4	9	9
175	48	5	-	3	4	6	-	4	5	4	-	-	3	6	3	6	6
	36	7	-	4	5	8	-	5	7	6	-	3	5	8	4	8	8
	30	9	-	5	6	10	-	7	8	7	-	4	6	10	5	10	10
195	48	5	-	3	3	5	-	4	4	4	-	-	3	5	-	5	5
	36	6	-	4	5	7	-	5	6	5	-	3	4	7	3	7	7
	30	8	-	5	6	9	-	6	7	6	-	4	5	9	4	9	9
205	48	4	-	3	3	5	-	3	4	-	-	-	3	5	-	5	5
	36	6	-	4	4	7	-	5	6	5	-	3	4	7	3	7	7
	30	7	-	4	5	8	-	6	7	6	-	3	5	8	4	8	8

TABLE 5 - REI 500-S26 - GUIDE RAIL ANCHORAGE DESIGN



ENGINEERING
ENGCO INC. - CA 8116
9715 W. BROWARD BLVD. 247
PLANTATION - FLORIDA - 33324
ENGCO@AOL.COM
ENGINEER SEAL
PEDRO DE FIGUEIREDO
PE 52609

TABLE 5 - REI 500 S26 MAXIMUM TRACK ANCHORAGE SPACING

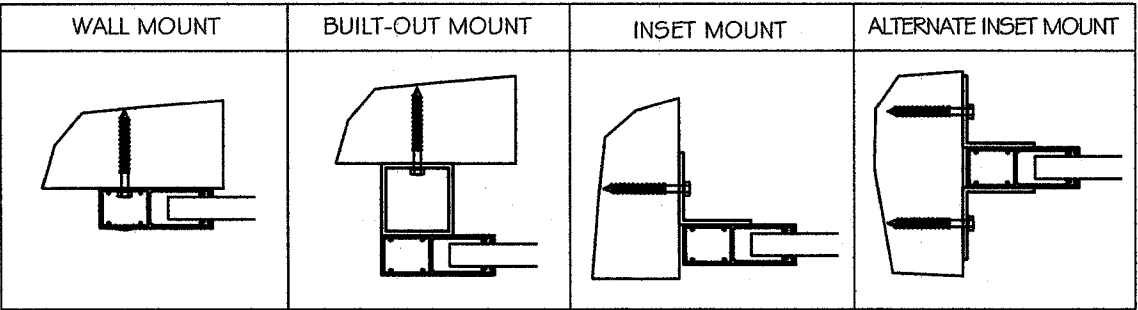
Pd	SPAN	WALL MOUNT ANCHOR TYPE				BUILT-OUT MOUNT ANCHOR TYPE				INSET MOUNT ANCHOR TYPE				ALTERNATE INSET MOUNT ANCHOR TYPE			
		B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	
30	132	6	-	6	6	6	-	6	6	6	-	5	6	6	5	6	6
	108	6	-	6	6	6	-	6	6	6	-	6	6	6	6	6	6
	84	6	-	6	6	6	4	6	6	6	-	6	6	6	6	6	6
	60	6	4	6	6	6	5	6	6	6	4	6	6	6	6	6	6
	48	6	5	6	6	6	6	6	6	6	6	6	6	6	6	6	6
45	132	6	-	4	4	6	-	4	5	5	-	3	4	6	3	6	6
	108	6	-	4	5	6	-	5	6	6	-	4	5	6	4	6	6
	84	6	-	6	6	6	-	6	6	6	-	5	6	6	6	6	6
	60	6	-	6	6	6	-	6	6	6	-	6	6	6	6	6	6
	48	6	-	6	6	6	4	6	6	6	4	6	6	6	6	6	6
55	108	6	-	4	4	6	-	4	5	5	-	3	4	6	3	6	6
	84	6	-	5	6	6	-	6	6	6	-	4	5	6	4	6	6
	60	6	-	6	6	6	-	6	6	6	-	6	6	6	6	6	6
	48	6	-	6	6	6	-	6	6	6	-	6	6	6	6	6	6
	36	6	4	6	6	6	5	6	6	6	4	6	6	6	6	6	6
65	108	5	-	3	4	6	-	4	4	4	-	-	3	6	3	6	6
	84	6	-	4	5	6	-	5	6	5	-	3	4	6	4	6	6
	60	6	-	6	6	6	-	6	6	6	-	5	6	6	5	6	6
	48	6	-	6	6	6	-	6	6	6	-	6	6	6	6	6	6
	36	6	-	6	6	6	4	6	6	6	-	6	6	6	6	6	6
75	96	5	-	3	3	6	-	4	4	4	-	-	3	6	3	6	6
	84	5	-	3	4	6	-	4	5	5	-	3	4	6	3	6	6
	60	6	-	5	6	6	-	6	6	6	-	4	6	6	5	6	6
	48	6	-	6	6	6	-	6	6	6	-	5	6	6	6	6	6
	36	6	-	6	6	6	-	6	6	6	-	6	6	6	6	6	6
85	96	4	-	-	3	5	-	3	4	-	-	-	3	6	-	6	6
	84	5	-	3	3	6	-	4	4	4	-	-	3	6	3	6	6
	60	6	-	4	5	6	-	5	6	6	-	4	5	6	4	6	6
	48	6	-	5	6	6	-	6	6	6	-	5	6	6	5	6	6
	36	6	-	6	6	6	-	6	6	6	-	6	6	6	6	6	6
95	84	4	-	-	3	5	-	3	4	4	-	-	3	6	-	6	6
	60	6	-	4	4	6	-	5	6	5	-	3	4	6	3	6	6
	48	6	-	5	6	6	-	6	6	6	-	4	5	6	4	6	6
	36	6	-	6	6	6	-	6	6	6	-	5	6	6	6	6	6
135	84	-	-	-	-	4	-	-	3	-	-	-	-	4	-	4	4
	60	4	-	-	3	5	-	3	4	-	-	-	3	6	-	6	6
	48	5	-	3	4	6	-	4	5	4	-	3	4	6	3	6	6
	36	6	-	4	5	6	-	5	6	6	-	4	5	6	4	6	6
155	60	4	-	-	3	4	-	3	3	-	-	-	-	5	-	5	5
	48	5	-	3	3	6	-	3	4	4	-	-	3	6	3	6	6
	36	6	-	4	5	6	-	5	6	5	-	3	4	6	4	6	6
175	60	-	-	-	-	4	-	-	3	-	-	-	-	4	-	4	4
	48	4	-	-	3	5	-	3	4	-	-	-	3	6	-	6	6
	36	5	-	3	4	6	-	4	5	5	-	3	4	6	3	6	6
195	60	-	-	-	-	-	-	-	-	-	-	-	-	4	-	4	4
	48	-	-	-	3	4	-	3	3	-	-	-	-	5	-	5	5
	36	5	-	3	4	6	-	4	4	4	-	-	3	6	3	6	6
205	60	-	-	-	-	-	-	-	-	-	-	-	-	4	-	4	4
	48	-	-	-	-	4	-	-	3	-	-	-	-	5	-	5	5
	36	5	-	3	3	6	-	3	4	4	-	-	3	6	3	6	6

ANCHOR SCHEDULE

TYPE	DESCRIPTION	MANUFACTURER	EMBEDMENT	ED	BASE MATERIAL
A	1/4" ss TAPCON	ITW	1 3/4"	3"	3000 psi CONCRETE
B	1/4" ss TAPCON	ITW	1 1/4"	4"	HOLLOW BLOCK
C	1/4"-14 ss HHSMS	GENERIC	1 1/2"	1"	WOOD (SG) = .46
D	1/4"-14 ss HHSMS	GENERIC	1/8"	3/4"	1/8" METAL STRUCTURE

ANCHOR NOTES:

- 1- 1/4" TAPCONS CAN BE USED AS TYPE C INTO WOOD
2- 1/4" CARBON STEEL TAPCONS CAN BE USED AS AN ALTERNATE TO THE STAINLESS STEEL
3- METAL STRUCTURES ARE MADE OF MINIMUM 6063-T6 ALUMINUM OR ASTM A36 STEEL



PRODUCT:
ROLL UP SHUTTER SYSTEMS
REI 000, REI 500, REGOO & RE400
LARGE MISSILE IMPACT RESISTANT

ASSOCIATION OF MANUFACTURERS:
N.A.S.A
NATIONAL APPROVED SHUTTER ASSOCIATION LLC.
MIRAMAR, FL 33027

SCALE:
NA
DATE:
09/12/2020
DRAWING #
20-151
SHEET
8 OF 12

TABLE 6 - RE400 STD AND HD - GUIDE RAIL ANCHORAGE DESIGN

TABLE 6 - RE400 STD AND HD MAXIMUM TRACK ANCHORAGE SPACING

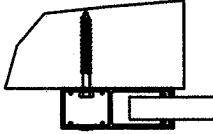
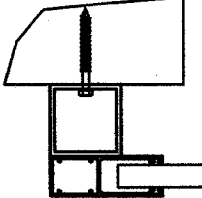
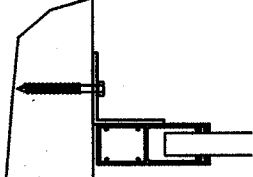
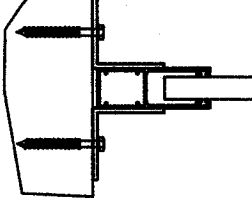
Pd	SPAN	WALL MOUNT ANCHOR TYPE				BUILT-OUT MOUNT ANCHOR TYPE				INSET MOUNT ANCHOR TYPE				ALTERNATE INSET MOUNT ANCHOR TYPE			
		B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A
30	73	9	-	9	9	6	-	6	6	6	5	6	6	9	9	9	9
	60	9	4	9	9	6	4	6	6	6	6	6	6	9	9	9	9
	50	9	5	9	9	6	5	6	6	6	7	6	6	9	9	9	9
	40	9	6	9	9	6	6	6	6	6	9	6	6	9	9	9	9
	30	9	8	9	9	6	6	6	6	6	9	6	6	9	9	9	9
45	73	9	-	6	8	6	-	6	6	6	-	6	6	9	8	9	9
	60	9	-	8	9	6	-	6	6	6	4	6	6	9	9	9	9
	50	9	-	9	9	6	-	6	6	6	5	6	6	9	9	9	9
	40	9	4	9	9	6	4	6	6	6	6	6	6	9	9	9	9
	30	9	5	9	9	6	5	6	6	6	8	6	6	9	9	9	9
55	73	8	-	5	6	6	-	5	6	6	-	6	6	9	6	9	9
	60	9	-	6	8	6	-	6	6	6	-	6	6	9	8	9	9
	50	9	-	8	9	6	-	6	6	6	4	6	6	9	9	9	9
	40	9	-	9	9	6	-	6	6	6	5	6	6	9	9	9	9
	30	9	4	9	9	6	4	6	6	6	7	6	6	9	9	9	9
65	73	7	-	4	5	6	-	4	5	6	-	5	6	9	5	9	9
	60	9	-	5	6	6	-	5	6	6	-	6	6	9	7	9	9
	50	9	-	6	8	6	-	6	6	6	-	6	6	9	8	9	9
	40	9	-	8	9	6	-	6	6	6	4	6	6	9	9	9	9
	30	9	4	9	9	6	4	6	6	6	5	6	6	9	9	9	9
75	73	6	-	4	4	6	-	4	4	6	-	4	6	9	4	9	9
	60	7	-	4	5	6	-	4	5	6	-	5	6	9	6	9	9
	50	9	-	5	7	6	-	5	6	6	-	6	6	9	7	9	9
	40	9	-	7	8	6	-	6	6	6	-	6	6	9	9	9	9
	30	9	-	9	9	6	-	6	6	6	5	6	6	9	9	9	9
85	60	6	-	4	5	6	-	4	5	6	-	5	6	9	5	9	9
	50	8	-	5	6	6	-	5	6	6	-	6	6	9	6	9	9
	40	9	-	6	7	6	-	6	6	6	-	6	6	9	8	9	9
	30	9	-	8	9	6	-	6	6	6	4	6	6	9	9	9	9
	24	9	-	9	9	6	-	6	6	6	5	6	6	9	9	9	9
95	50	7	-	4	5	6	-	4	5	6	-	5	6	9	5	9	9
	40	9	-	5	7	6	-	5	6	6	-	6	6	9	7	9	9
	30	9	-	7	9	6	-	6	6	6	4	6	6	9	9	9	9
	24	9	-	9	9	6	-	6	6	6	5	6	6	9	9	9	9
	20	9	-	9	9	6	-	6	6	6	5	6	6	9	9	9	9
135	40	6	-	4	4	6	-	4	4	6	-	4	6	9	5	9	9
	30	8	-	5	6	6	-	5	6	6	-	6	6	9	6	9	9
	24	9	-	6	8	6	-	6	6	6	-	6	6	9	8	9	9
	20	9	-	6	8	6	-	6	6	6	-	6	6	9	8	9	9
	16	9	-	6	8	6	-	6	6	6	-	6	6	9	8	9	9
155	40	5	-	3	4	5	-	3	4	6	-	4	5	9	4	9	9
	30	7	-	4	5	6	-	4	5	6	-	5	6	9	5	9	9
	24	9	-	6	7	6	-	6	6	6	-	6	6	9	7	9	9
	20	9	-	6	7	6	-	6	6	6	-	6	6	9	7	9	9
	16	9	-	6	7	6	-	6	6	6	-	6	6	9	7	9	9
160	40	5	-	3	4	5	-	3	4	6	-	3	5	9	4	9	9
	30	7	-	4	5	6	-	4	5	6	-	5	6	9	5	9	9
	24	9	-	5	6	6	-	5	6	6	-	6	6	9	7	9	9
	20	9	-	5	6	6	-	5	6	6	-	6	6	9	7	9	9
	16	9	-	5	6	6	-	5	6	6	-	6	6	9	7	9	9

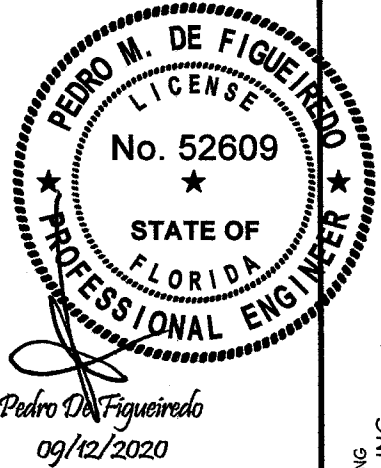
ANCHOR SCHEDULE

TYPE	DESCRIPTION	MANUFACTURER	EMBEDMENT	ED	BASE MATERIAL
A	1/4" ss TAPCON	ITW	1 3/4"	3"	3000 psi CONCRETE
B	1/4" ss TAPCON	ITW	1 1/4"	4"	HOLLOW BLOCK
C	1/4"-14 ss HHSMS	GENERIC	1 1/2"	1"	WOOD (SG) = .46
D	1/4"-14 ss HHSMS	GENERIC	1/8"	3/4"	1/8" METAL STRUCTURE

ANCHOR NOTES:

- 1- 1/4" TAPCONS CAN BE USED AS TYPE C INTO WOOD
2- 1/4" CARBON STEEL TAPCONS CAN BE USED AS AN ALTERNATE TO THE STAINLESS STEEL
3- METAL STRUCTURES ARE MADE OF MINIMUM 6063-T6 ALUMINUM OR ASTM A36 STEEL

WALL MOUNT	BUILT-OUT MOUNT	INSET MOUNT	ALTERNATE INSET MOUNT
			



ENGINEERING
ENGCO INC. - CA 8116
9715 W. BROWARD BLVD. 247
PLANTATION - FLORIDA - 33324
ENGCO@AOL.COM
ENGINEER SEAL
PEDRO DE FIGUEIREDO
PE 52609

PRODUCT:
ROLL UP SHUTTER SYSTEMS
RE1000, RE1500, RE600 & RE400
LARGE MISSILE IMPACT RESISTANT

ASSOCIATION OF MANUFACTURERS:
N.A.S.A.
NATIONAL APPROVED SHUTTER ASSOCIATION LLC.
MIRAMAR, FL 33027

SCALE:

NA

DATE:

09/12/2020

DRAWING #

20-151

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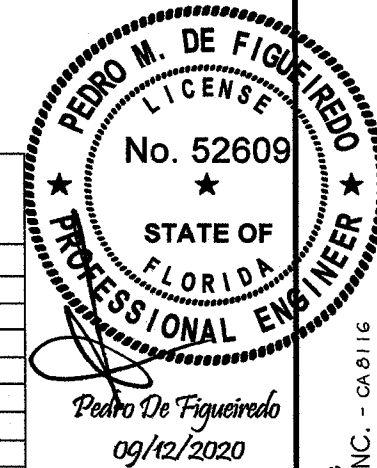
TABLE 7 AND 7A - RE600 STD AND HD - GUIDE RAIL ANCHORAGE DESIGN

TABLE 7 - RE600 STD MAXIMUM TRACK ANCHORAGE SPACING

Pd	SPAN A	WALL MOUNT ANCHOR TYPE				BUILT-OUT MOUNT ANCHOR TYPE				INSET MOUNT ANCHOR TYPE				ALTERNATE INSET MOUNT ANCHOR TYPE			
		B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A
30	92	9	-	9	9	6	4	6	6	6	-	6	6	9	9	9	9
	72	9	4	9	9	6	6	6	6	6	4	6	6	9	9	9	9
	60	9	5	9	9	6	6	6	6	6	5	6	6	9	9	9	9
	48	9	6	9	9	6	6	6	6	6	6	6	6	9	9	9	9
	36	9	8	9	9	6	6	6	6	6	6	6	6	9	9	9	9
45	92	9	-	6	7	6	-	6	6	6	-	5	6	9	7	9	9
	72	9	-	8	9	6	4	6	6	6	-	6	6	9	9	9	9
	60	9	-	9	9	6	4	6	6	6	-	6	6	9	9	9	9
	48	9	4	9	9	6	6	6	6	6	4	6	6	9	9	9	9
	36	9	5	9	9	6	6	6	6	6	6	6	6	9	9	9	9
55	84	8	-	5	6	6	-	6	6	6	-	5	6	9	6	9	9
	72	9	-	6	7	6	-	6	6	6	-	6	6	9	7	9	9
	60	9	-	7	9	6	-	6	6	6	-	6	6	9	9	9	9
	48	9	-	9	9	6	4	6	6	6	4	6	6	9	9	9	9
	36	9	4	9	9	6	6	6	6	6	5	6	6	9	9	9	9
65	84	7	-	4	5	6	-	6	6	6	-	4	5	9	5	9	9
	72	8	-	5	6	6	-	6	6	6	-	5	6	9	6	9	9
	60	9	-	6	7	6	-	6	6	6	-	6	6	9	7	9	9
	48	9	-	8	9	6	4	6	6	6	-	6	6	9	9	9	9
	36	9	-	9	9	6	5	6	6	6	4	6	6	9	9	9	9
75	84	6	-	4	4	6	-	5	6	5	-	3	5	9	4	9	9
	72	7	-	4	5	6	-	6	6	6	-	4	6	9	5	9	9
	60	9	-	5	6	6	-	6	6	6	-	5	6	9	6	9	9
	48	9	-	7	8	6	-	6	6	6	-	6	6	9	8	9	9
	36	9	-	9	9	6	4	6	6	6	-	6	6	9	9	9	9
85	72	6	-	4	5	6	-	5	6	6	-	3	5	9	4	9	9
	60	8	-	5	6	6	-	6	6	6	-	4	6	9	5	9	9
	48	9	-	6	7	6	-	6	6	6	-	5	6	9	7	9	9
	36	9	-	8	9	6	4	6	6	6	-	6	6	9	9	9	9
	72	5	-	3	4	6	-	5	6	5	-	3	4	9	4	9	9
95	60	7	-	4	5	6	-	6	6	6	-	4	5	9	5	9	9
	48	8	-	5	6	6	-	6	6	6	-	5	6	9	6	9	9
	36	9	-	7	9	6	-	6	6	6	-	6	6	9	8	9	9
	60	5	-	3	3	6	-	4	5	4	-	-	4	9	3	7	9
	48	6	-	4	4	6	-	5	6	5	-	3	5	9	4	9	9
135	36	8	-	5	6	6	-	6	6	6	-	4	6	9	6	9	9
	60	4	-	-	3	6	-	3	4	4	-	-	3	9	3	6	9
	48	5	-	3	4	6	-	4	5	5	-	3	4	9	3	8	9
	36	7	-	4	5	6	-	6	6	6	-	4	5	9	5	9	9
	60	5	-	3	3	6	-	4	5	4	-	-	4	9	3	7	9
160	36	7	-	4	5	6	-	6	6	6	-	4	5	9	5	9	9
	30	8	-	5	6	6	-	6	6	6	-	4	6	9	6	9	9

TABLE 7A - RE600 HD MAXIMUM TRACK ANCHORAGE SPACING

Pd	SPAN A	WALL MOUNT ANCHOR TYPE				BUILT-OUT MOUNT ANCHOR TYPE				INSET MOUNT ANCHOR TYPE				ALTERNATE INSET MOUNT ANCHOR TYPE			
		B	C	D	A	B	C	D	A	B	C	D	A	B	C	D	A
30	106	9	-	7	8	6	-	6	6	6	-	6	6	9	7	9	9
	102	9	-	7	9	6	-	6	6	6	-	6	6	9	8	9	9
	84	9	-	9	9	6	4	6	6	6	-	6	6	9	9	9	9
	60	9	4	9	9	6	5	6	6	6	4	6	6	9	9	9	9
	48	9	5	9	9	6	6	6	6	6	6	6	6	9	9	9	9
45	132	6	-	3	4	6	-	4	5	5	-	3	4	9	4	9	9
	108	7	-	4	5	6	-	5	6	6	-	4	5	9	5	9	9
	84	9	-	6	7	6	-	6	6	6	-	5	6	9	6	9	9
	60	9	-	8	9	6	-	6	6	6	-	6	6	9	9	9	9
	48	9	-	9	9	6	4	6	6	6	4	6	6	9	9	9	9
55	108	6	-	3	4	6	-	4	5	5	-	3	4	9	4	9	9
	84	8	-	5	6	6	-	6	6	6	-	4	5	9	5	9	9
	60	9	-	7	8	6	-	6	6	6	-	6	6	9	7	9	9
	48	9	-	8	9	6	-	6	6	6	-	6	6	9	9	9	9
	36	9	4	9	9	6	5	6	6	6	4	6	6	9	9	9	9
65	108	5	-	3	3	6	-	4	4	4	-	-	3	9	3	7	9
	84	6	-	4	5	6	-	5	6	5	-	3	4	9	4	9	9
	60	9	-	6	7	6	-	6	6	6	-	5	6	9	6	9	9
	48	9	-	7	8	6	-	6	6	6	-	6	6	9	7	9	9
	36	9	-	9	9	6	4	6	6	6	-	6	6	9	9	9	9
75	96	5	-	3	3	6	-	4	4	4	-	-	3	9	3	7	9
	84	5	-	3	4	6	-	4	5	5	-	3	4	9	3	8	9
	60	8	-	5	6	6	-	6	6	6	-	4	6	9	5	9	9
	48	9	-	6	7	6	-	6	6	6	-	5	6	9	6	9	9
	36	9	-	8	9	6	-	6	6	6	-	6	6	9	9	9	9
85	96	4	-	-	3	5	-	3	4	4	-	-	3	9	3	6	9
	84	5	-	3	3	6	-	4	4	4	-	-	3	9	3	7	9
	60	7	-	4	5	6	-	5	6	6	-	4	5	9	4	9	9
	48	9	-	5	6	6	-	6	6	6	-	5	6	9	6	9	9
	36	9	-	7	9	6	-	6	6	6	-	6	6	9	8	9	9
95	84	4	-	-	3	5	-	3	4	4	-	-	3	9	3	6	9
	60	6	-	4	4	6	-	5	6	5	-	3	4	9	4	9	9
	48	8	-	5	6	6	-	6	6	6	-	4	5	9	5	9	9
	36	9	-	6	8	6	-	6	6	6	-	5	6	9	7	9	9
	84	-	-	-	-	4	-	-	3	-	-	-	-	7	-	4	6
135	60	4	-	-	3	5	-	3	4	-	-	-	3	9	3	6	9
	48	5	-	3	4	6	-	4	5	4	-	3	4	9	3	8	9
	36	7	-	4	5	6	-	5	6	6	-	4	5	9	5	9	9
	60	-	-	-	3	4	-	3	3	-	-	-	-	9	-	5	8
	48	4	-	3	3	6	-	3	4	4	-	-	3	9	3	7	9
155	36	6	-	4	5	6	-	5	6	5	-	3	4	9	4	9	9
	60	-	-	-	-	4	-	3	3	-	-	-	-	8	-	5	7
	48	4	-	3	3	5	-	3	4	4	-	-	3	9	3	7	9
	36	6	-	4	4	6	-	5	6	5	-	3	4	9	4	9	9
	60	-	-	-	-	4	-	3	3	-	-	-	-	8	-	5	7
160	48	4	-	3	3	5	-	3	4	4	-	-	3	9	3	7	9
	36	6	-	4	4	6	-	5	6	5	-	3	4	9	4	9	9
	60	-	-	-	-	4	-	3	3	-	-	-	-	8	-	5	7



ENGINEER SEAL
PEDRO DE FIGUEIREDO
PE 52609

ENGINEERING
ENGCO INC. - CA 8116
9715 W. BROWARD BLVD. 247
PLANTATION - FLORIDA - 33324
ENGCO@AOL.COM

PRODUCT:
ROLL UP SHUTTER SYSTEMS
RE1000, RE1500, RE600 & RE400
LARGE MISSILE IMPACT RESISTANT

ASSOCIATION OF MANUFACTURERS:
N.A.S.A.
NATIONAL APPROVED SHUTTER ASSOCIATION LLC.
MIRAMAR, FL 33027

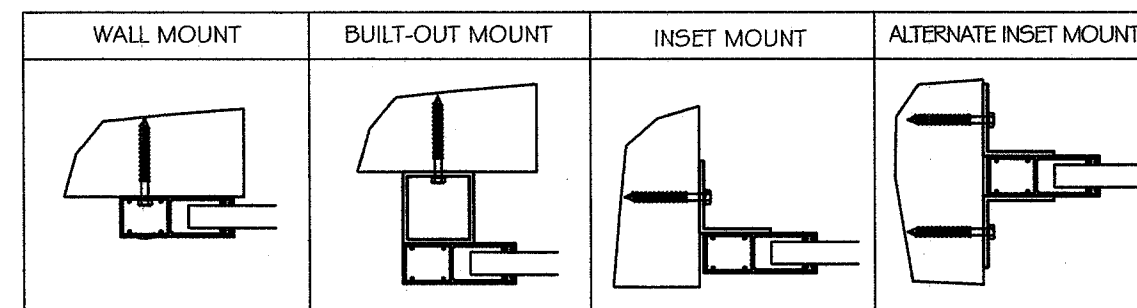
SCALE:
NA
DATE:
09/12/2020
DRAWING #
20-151
SHEET
10 OF 12

ANCHOR SCHEDULE

TYPE	DESCRIPTION	MANUFACTURER	EMBEDMENT	ED	BASE MATERIAL
A	1/4" ss TAPCON	ITW	1 3/4"	3"	3000 psi CONCRETE
B	1/4" ss TAPCON	ITW	1 1/4"	4"	HOLLOW BLOCK
C	1/4"-14 ss HHSMS	GENERIC	1 1/2"	1"	WOOD (SG>= .46)
D	1/4"-14 ss HHSMS	GENERIC	1/8"	3/4"	1/8" METAL STRUCTURE

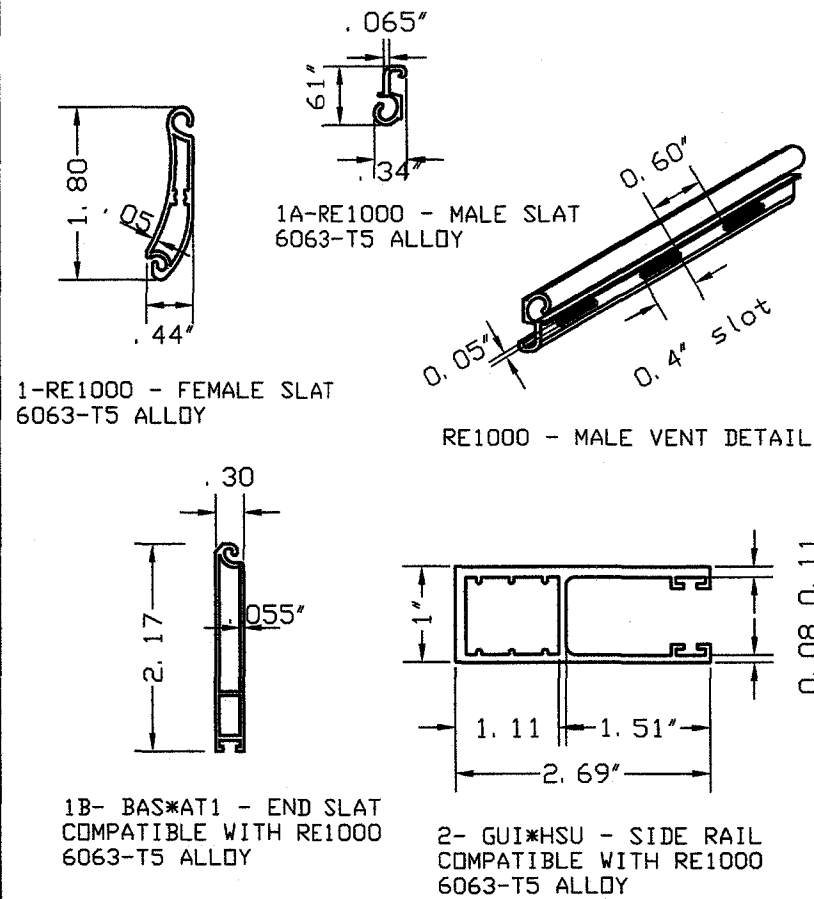
ANCHOR NOTES:

- 1- 1/4" TAPCONS CAN BE USED AS TYPE C INTO WOOD
- 2- 1/4" CARBON STEEL TAPCONS CAN BE USED AS AN ALTERNATE TO THE STAINLESS STEEL
- 3- METAL STRUCTURES ARE MADE OF MINIMUM 6063-T6 ALUMINUM OR ASTM A36 STEEL

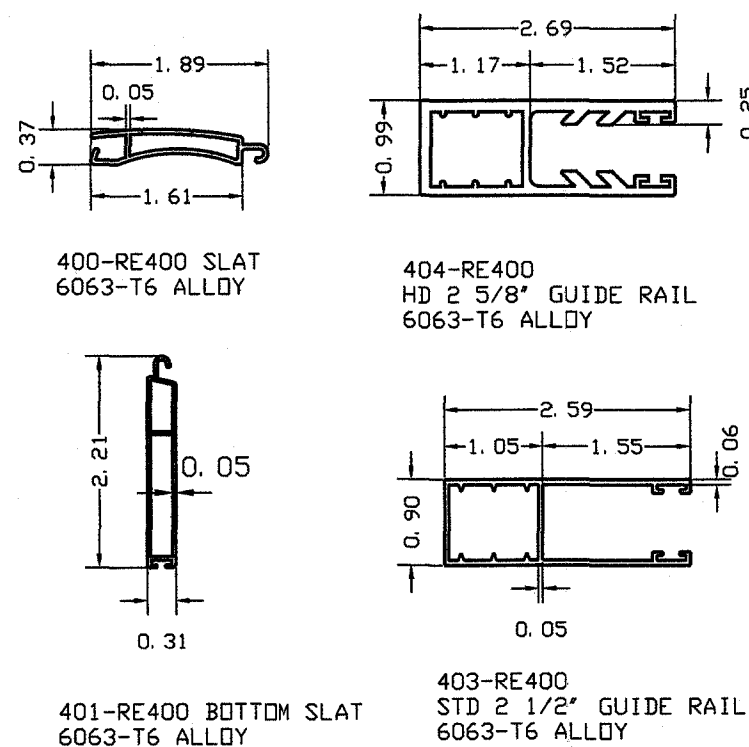


PRODUCT COMPONENTS

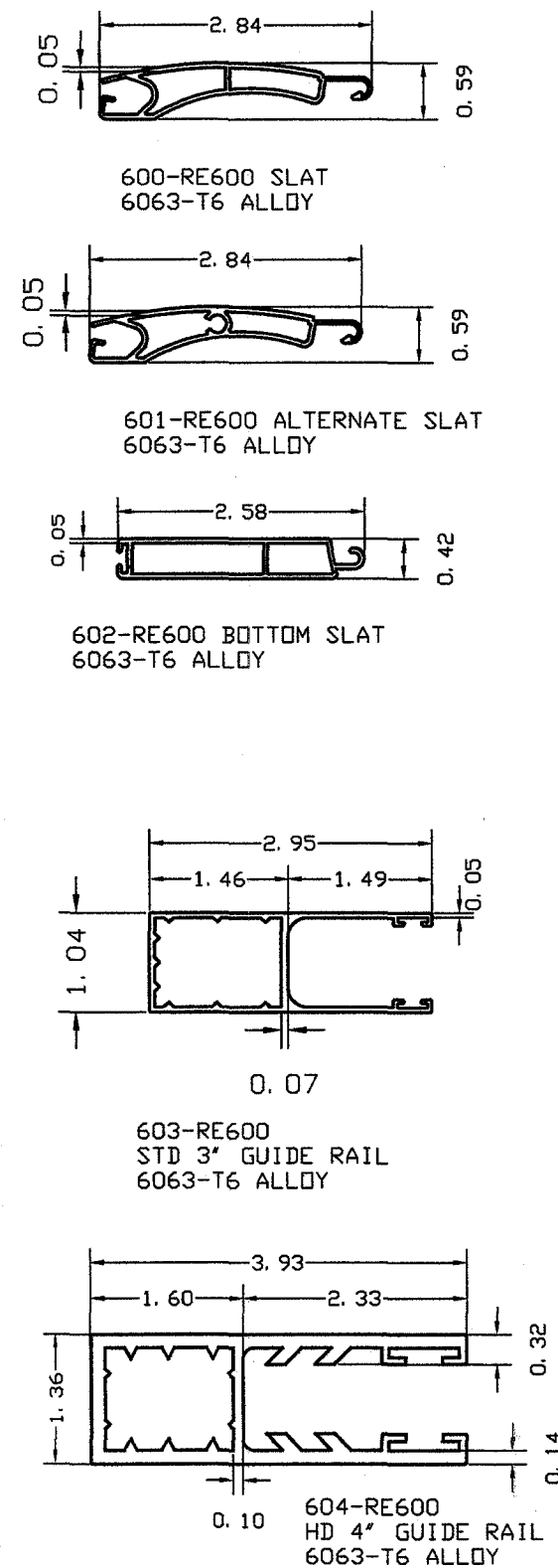
RE1000 PRODUCT COMPONENTS



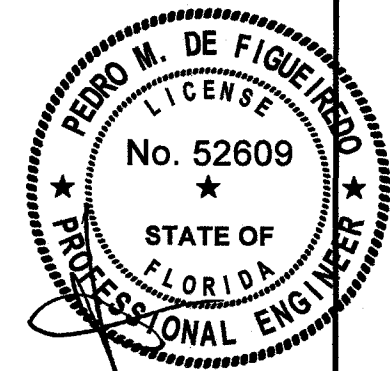
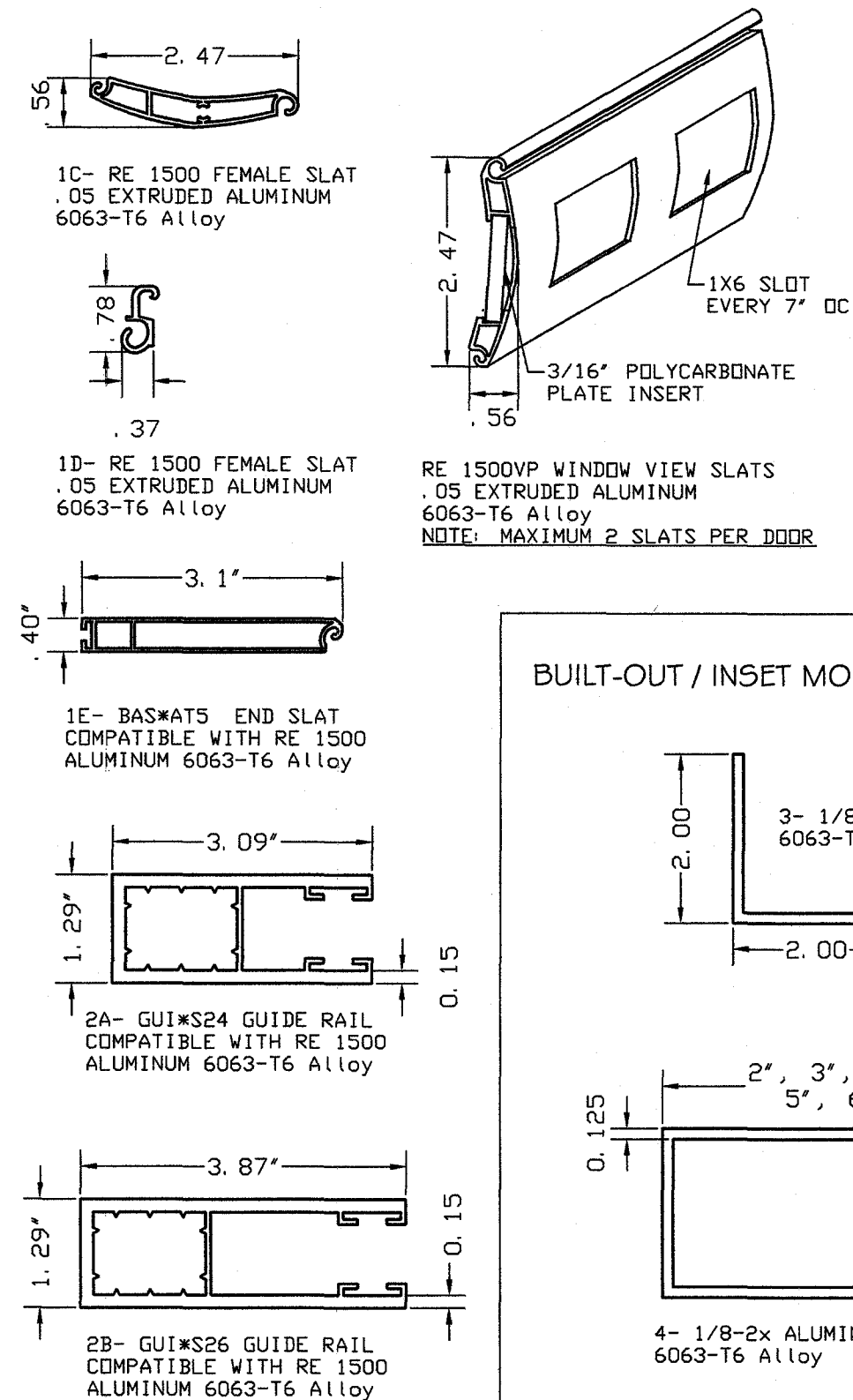
RE400 COMPONENTS



RE600 COMPONENTS



RE1500 PRODUCT COMPONENTS



Pedro De Figueiredo
09/12/2020

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9715 W. BROWARD BLVD. 247
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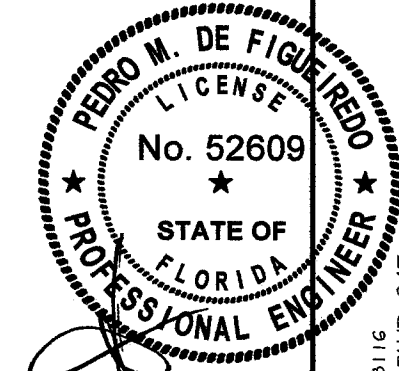
PRODUCT:
ROLL UP SHUTTER SYSTEMS
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LARGE MISSILE IMPACT RESISTANT

ASSOCIATION OF MANUFACTURERS:
N.A.S.A.
NATIONAL APPROVED SHUTTER ASSOCIATION LLC.
MIRAMAR, FL 33027

SCALE:
NA
DATE:
09/12/2020
DRAWING #
20-151
SHEET
11 OF 12

HOUSING ASSEMBLY

STD. HOOD / END CAP
WALL MOUNT



Pedro De Figueiredo
09/12/2020

ENGINEERING
ENGCO INC. - CA 8116
9715 W. BROWARD BLVD. 247
PLANTATION - FLORIDA - 33324
ENGCO@AOL.COM
ENGINEER SEAL
PEDRO DE FIGUEIREDO
PE 52609

PRODUCT:
ROLL UP SHUTTER SYSTEMS
RE1000, RE1500, REGOO & RE400
LARGE MISSILE IMPACT RESISTANT

ASSOCIATION OF MANUFACTURERS:
N.A.S.A
NATIONAL APPROVED SHUTTER ASSOCIATION LLC.
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09/12/2020
DRAWING #
20-151
SHEET
12 OF 12

MINIMUM HOUSING THICKNESS
 $t \geq 0.04"$ FOR 8" OR GREATER HOUSING
 $t = 0.032$ FOR 8" OR LESSER HOUSING

#8 TEKS SCREWS

GALVANIZED STEEL
OR ALUMINUM TUBE

Pivot

Slats

Gear Assembly

Motor Assembly

BEARING
PLATE

FRONT HOOD OPTIONS
SLOPED, ROUND & SQUARE

CUSTOM HOOD / BRACKET
WALL MOUNT

2 ANCHORS BRACKET

3 ANCHORS BRACKET

4 ANCHORS BRACKET

PIVOT

PRODUCT COVER

NON STRUCTURAL
HEADER (1X2 OR 1X3)
USE WHEN NECESSARY TO AVOID
HOOD SAGGING ON LARGER SPANS

1/4" TAPCON AT 12" OC

#10 TEKS AT 12" OC

HOUSING W/ BRACKETS

1/4" TAPCONS AT 12" OC

HOUSING W/
END CAPS

BUILT-OUT
OPTION

#14X3/4" SDS

STEEL OR
ALUMINUM REEL

PRODUCT FRONT
HOOD COVER

NOTE: THE ROLL-UP MECHANISM (GEARS,
MOTORS, SUPPORTING END PLATES) ARE NOT
PART OF THIS APPROVAL. MANUFACTURER IS
RESPONSIBLE TO SPECIFY THESE COMPONENTS
FOR PROPER PRODUCT OPERATION.