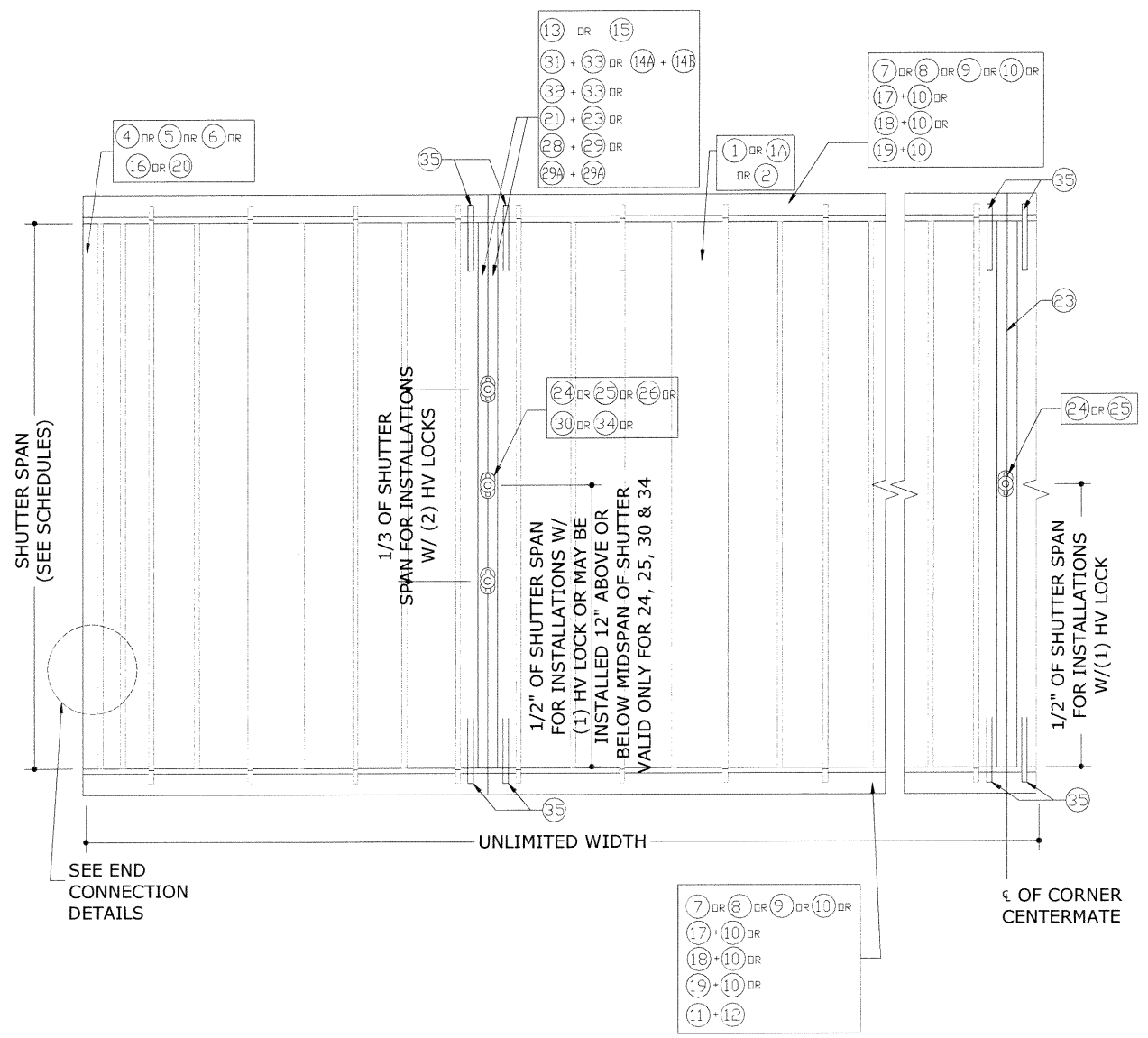
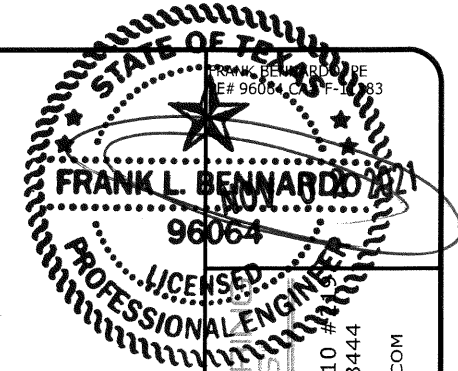


# BERTHA HV ESSENTIAL ACCORDION SHUTTER

## HV BLADE 1, HV WINDOW BLADE 1A & HV BLADE 2



SCHEDULE #1 (ALL BLADE OPTIONS)		
MAXIMUM SHUTTER SPAN FOR ALL INSTALLATION OPTIONS SHOWN HEREIN EXCEPT TO STEEL WALL STUDS. SEE STEEL WALL STUD DETAIL FOR LIMITATIONS		
MAXIMUM DESIGN PRESSURE RATING (+/-)	CONCRETE & WOOD INSALLATIONS ALL MOUNTING OPTIONS	
	MAX SPAN (+)	MAX SPAN (-)
30 psf	144.0 in	144.0 in
35 psf	144.0 in	144.0 in
40 psf	144.0 in	144.0 in
45 psf	140.5 in	140.5 in
50 psf	137.0 in	137.0 in
55 psf	133.5 in	133.5 in
60 psf	130.0 in	130.0 in
65 psf	126.5 in	126.5 in
70 psf	123.0 in	123.0 in
75 psf	119.5 in	119.5 in
80 psf	116.0 in	116.0 in

SCHEDULE #2 (GLASS SEPARATION)	
SHUTTER SPAN	MINIMUM GLASS SEPARATION FOR ALL CONFIGURATIONS HEREIN
UP TO 116"	3.5 in
>116" UP TO 144"	5.0 in

SCHEDULE 2 NOTES:  
 1. FOR BASIC PROTECTION, GLASS SEPARATION IS NOT REQUIRED.  
 2. SHUTTERS MAY BE USED IN ESSENTIAL FACILITIES AT HEIGHTS ABOVE 30 FEET ABOVE GRADE IN WIND ZONE 3 AND SHALL ADHERE TO THE GLASS SEPARATION REQUIREMENTS IN THIS SCHEDULE.  
 3. SHUTTERS MAY BE USED IN ESSENTIAL FACILITIES AT ANY HEIGHT IN WIND ZONE 2 AND SHALL ADHERE TO THE GLASS SEPARATION REQUIREMENTS IN THIS SCHEDULE

1 TYPICAL HV ESSENTIAL SHUTTER  
 1 N.T.S. EXTERIOR ELEV

### GENERAL NOTES

1. THE SYSTEM DESCRIBED HEREIN HAS BEEN DESIGNED AND TESTED IN ACCORDANCE WITH THE INTERNATIONAL BUILDING CODE (2018) AND THE INTERNATIONAL RESIDENTIAL CODE (IRC) FOR USE IN ACCORDANCE WITH THE TEXAS DEPARTMENT OF INSURANCE (TDI) REQUIREMENTS, PER ASTM E330, E1886, AND E1996 AND TAS 201, 202 & 203 STANDARDS. SEE PRODUCT APPROVAL EVALUATION FOR ADDITIONAL INFORMATION.  
 2. NO 33-1/3% INCREASE IN ALLOWABLE STRESS HAS BEEN USED IN THE DESIGN OF THIS SYSTEM. WIND LOAD DURATION FACTOR Cd=1.6 HAS BEEN USED FOR WOOD ANCHOR DESIGN.  
 3. POSITIVE AND NEGATIVE DESIGN PRESSURES CALCULATED FOR USE WITH THIS SYSTEM SHALL BE DETERMINED PER SEPARATE ENGINEERING IN ACCORDANCE WITH THE GOVERNING CODE. PRESSURE REQUIREMENTS AS DETERMINED IN ACCORDANCE WITH ASCE 7 AND CHAPTER 1609 OF THE FLORIDA BUILDING CODE SHALL BE LESS THAN OR EQUAL TO THE POSITIVE OR NEGATIVE ASD DESIGN PRESSURE CAPACITY VALUES LISTED HEREIN FOR ANY ASSEMBLY AS SHOWN.  
 4. DESIGN PRESSURES NOTED HEREIN ARE BASED ON MAXIMUM TESTED PRESSURES DIVIDED BY A 1.5 SAFETY FACTOR.

5. THE SYSTEM DETAILED HEREIN IS GENERIC AND DOES NOT PROVIDE INFORMATION FOR A SPECIFIC SITE. FOR SITE CONDITIONS DIFFERENT FROM THE CONDITIONS DETAILED HEREIN, A LICENSED ENGINEER OR REGISTERED ARCHITECT SHALL PREPARE SITE SPECIFIC DOCUMENTS FOR USE IN CONJUNCTION WITH THIS DOCUMENT.  
 6. EACH UNIT MUST BEAR A PERMANENT LABEL IN A VISIBLE PLACE WITH WARNING NOTE: DURING PERIODS OF HURRICANE WARNINGS HOME OWNER, TENANT OR OTHERS MUST PROPERLY CLOSE A HV AND HD CENTERMATES AND ENGAGE OR LOCK ALL HV/HD LOCKS.  
 7. THIS DOCUMENT CONTAINS INFORMATION RELEVANT TO THE NECESSARY STRUCTURAL REQUIREMENTS OF THE SYSTEM INSTALLATION. COMPONENTS AND FASTENERS NOT REFERENCED WHICH ARE PART OF THE INTERNAL FABRICATION OF THE SPECIFIED SYSTEMS OR ASSEMBLIES SHALL BE PER MANUFACTURER PUBLISHED SPECIFICATIONS.  
 8. THE STRUCTURAL ADEQUACY OF THE EXISTING STRUCTURE TO WITHSTAND SUPERIMPOSED LOADS BY THIS SYSTEM SHALL BE VERIFIED BY OTHERS.

9. ALL EXTRUSIONS SHALL BE MINIMUM 6063-T6 ALUMINUM ALLOY, UNLESS NOTED OTHERWISE.  
 10. EACH SHUTTER ASSEMBLY SHALL BEAR A PERMANENT LABEL PER SECTION 1709 THE IBC WITH THE FOLLOWING MINIMUM INFORMATION:  
 AMERICAN SHUTTER SYSTEMS ASSOC., INC.  
 WEST PALM BEACH, FL  
 MISSILE LEVEL D - ASTM E1886, E1996 & E330 - TAS 201, 202 & 203 TDI EVALUATED  
 11. ALL BOLTS & WASHERS SHALL BE ZINC COATED STEEL, GALVANIZED STEEL, OR STAINLESS STEEL WITH A MINIMUM TENSILE YIELD STRENGTH OF 60 KSI. ALL ALUMINUM 3/16"Ø OR 1/4"Ø POP RIVETS SHALL BE 7075-T6 OR STRONGER.  
 12. ALL STEEL IN CONTACT WITH ALUMINUM SHALL BE PAINTED OR PLATED AS PRESCRIBED IN THE ABOVE-NOTED BUILDING CODE.

AMERICAN SHUTTER SYSTEMS ASSOCIATION, INC.  
 4268 West Roads Dr.  
 West Palm Beach, FL 33407  
 (561) 841-5480  
 BERTHA HV ESSENTIAL ACCORDION SHUTTER  
 HV BLADE 1, HV WINDOW BLADE 1A \* HV BLADE 2  
 TEXAS DEPARTMENT OF INSURANCE

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

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RVN	FLB	10/8/2021

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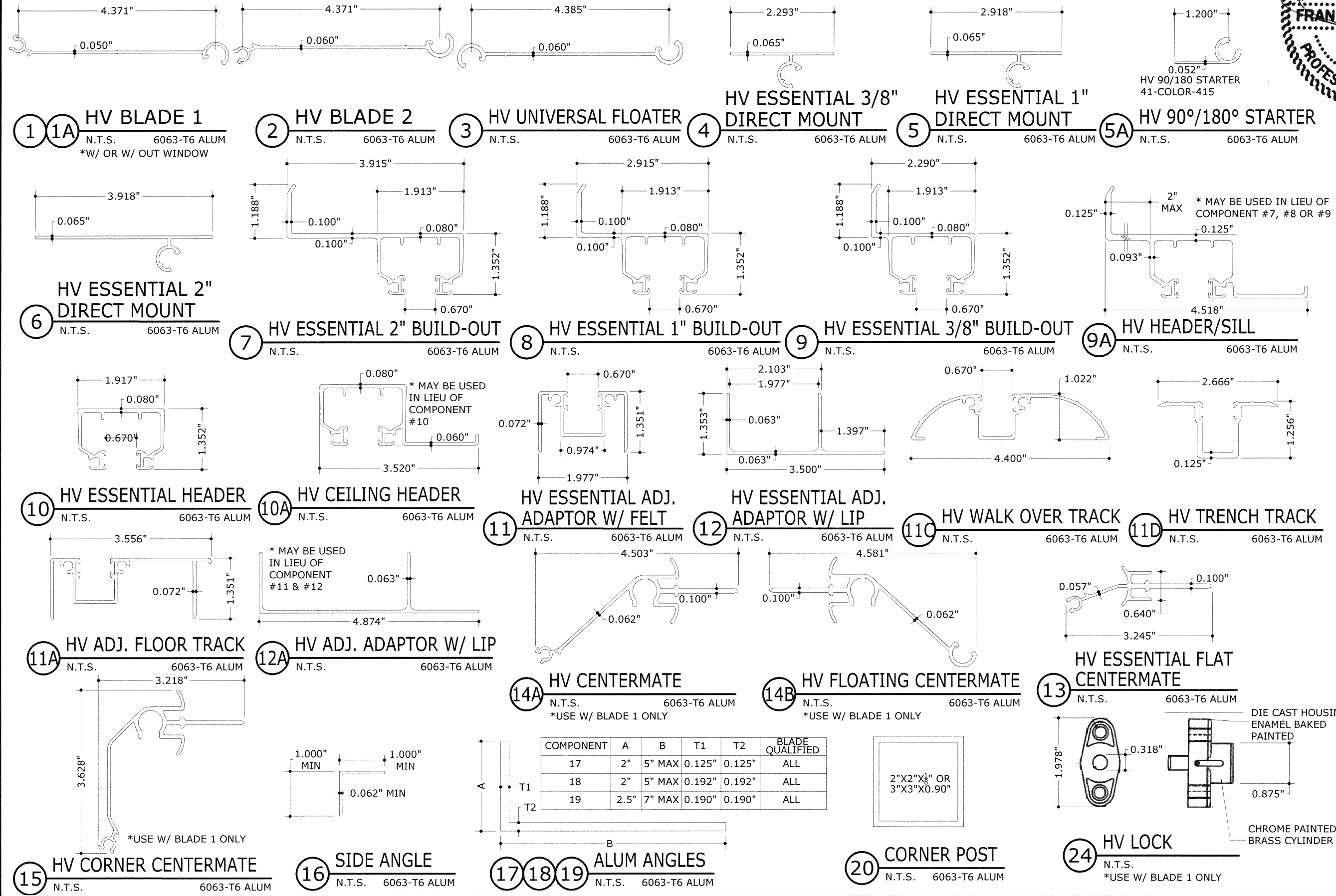
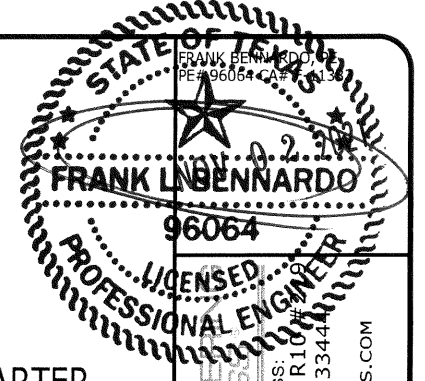
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# BLADE 1, 1A & 2 COMPONENTS



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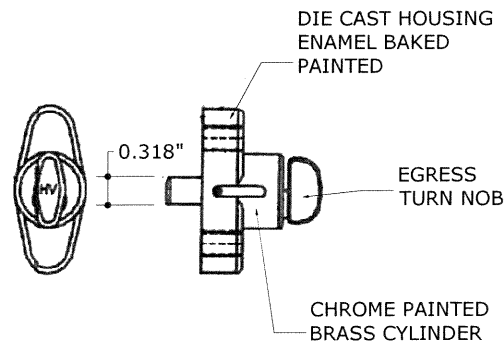
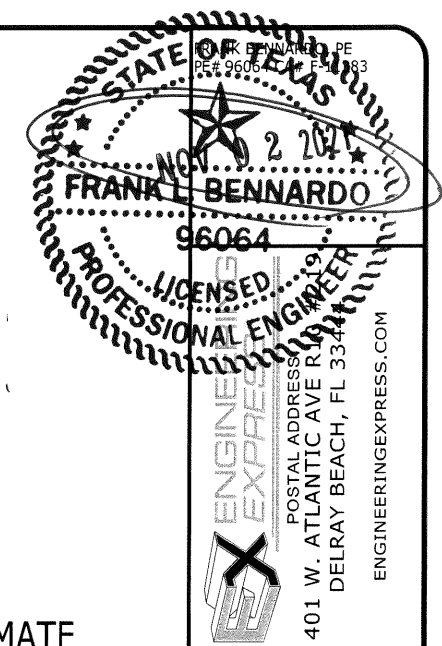
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HV BLADE 1, HV WINDOW BLADE 1A \* HV BLADE 2  
TEXAS DEPARTMENT OF INSURANCE

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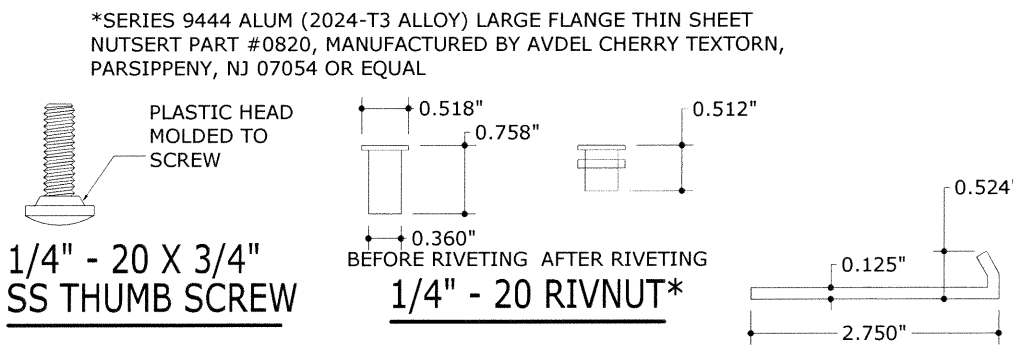
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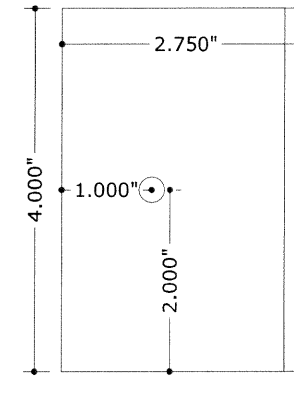
# BLADE 1, 1A & 2 COMPONENTS (CONT'D)



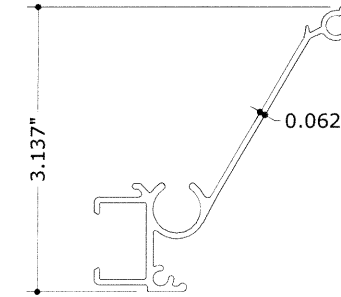
**25 HV EGRESS LOCK**  
N.T.S.  
\*USE W/ BLADE 1 ONLY



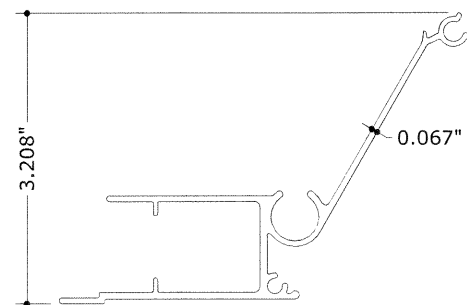
**26 HV ALTERNATIVE LOCK**  
N.T.S.  
\*USE W/ BLADE 1 ONLY



**27 LOCKER FOR "T" LOCK CENTERMATE**  
N.T.S.  
\*USE W/ BLADE 1 ONLY  
6063-T6 ALUM



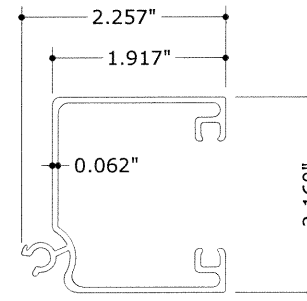
**28 HV MALE "T" LOCK CENTERMATE**  
N.T.S.  
\*USE W/ BLADE 1 ONLY  
6063-T6 ALUM



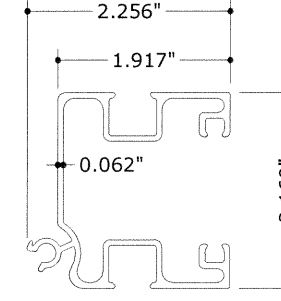
**29 HV FEMALE "T" LOCK CENTERMATE**  
N.T.S.  
\*USE W/ BLADE 1 ONLY  
6063-T6 ALUM



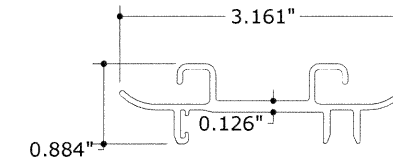
**30 HV "T" LOCK**  
N.T.S.  
\*USE W/ BLADE 1 ONLY



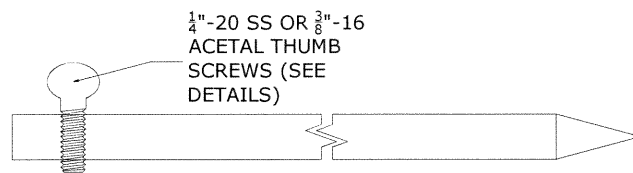
**31 HD CENTERMATE W/ NO LOCKING ROD**  
N.T.S.  
6063-T6 ALUM



**32 HD CENTERMATE W/ LOCKING ROD**  
N.T.S.  
6063-T6 ALUM



**33 HD CENTERMATE INSERT**  
N.T.S.  
6063-T6 ALUM



**35 LOCKING ROD**  
N.T.S.  
6063-T6 ALUM

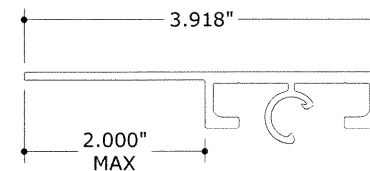
\*TOP/BOTTOM TRACK SHALL HAVE RAINGUARD LIP TO HOLD LOCK ROD  
\*\*LOCKING ROD MAY BE USED TO HOLD SYSTEM IN OPEN POSITION WITHOUT EXTENDING THROUGH RAINGUARD (VIA FRICTION). WHEN LOCKING ROD IS USED TO LOCK IN SYSTEM IN CLOSED POSITION, ROD SHALL EXTEND THROUGH RAINGUARD LIP, TYP.



**36 HV 1/4"-20 THUMBSCREW**  
N.T.S.  
304 SS

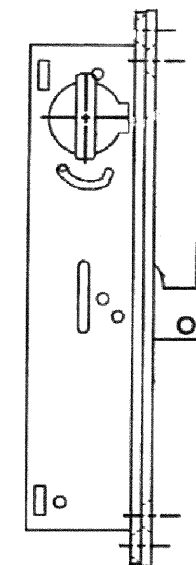


**37 HV 3/8"-16 ACETAL THUMBSCREW**  
N.T.S.  
6063-T6 ALUM



**38 HV DIRECT MOUNT**  
N.T.S.  
6063-T6 ALUM

\*CAN BE USED IN LIEU OF COMPONENT #4, #5, OR #6



**34 HD LOCK**  
N.T.S.

BY REGENT HARDWARE  
MORTISE LOCKS SERIES  
2333 HOOK BOLT LOCK

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BERTHA HV ESSENTIAL ACCORDION SHUTTER  
HV BLADE 1, HV WINDOW BLADE 1A \* HV BLADE 2  
TEXAS DEPARTMENT OF INSURANCE

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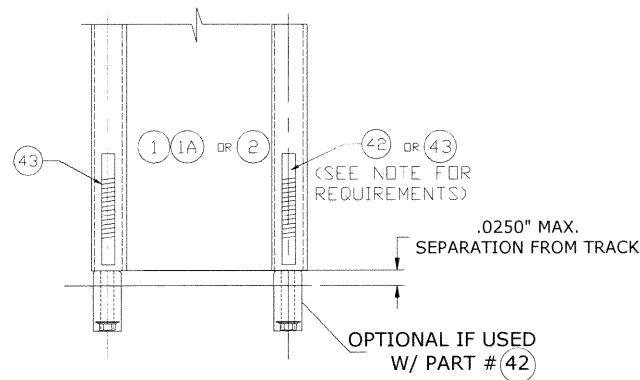
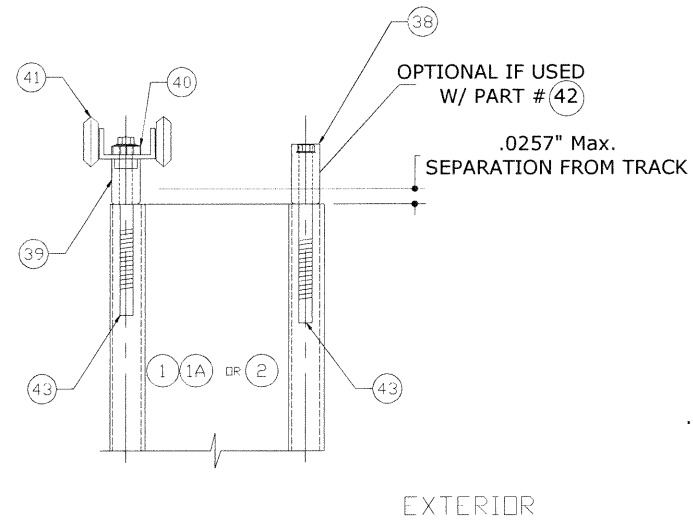
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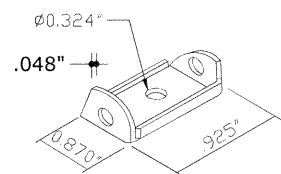
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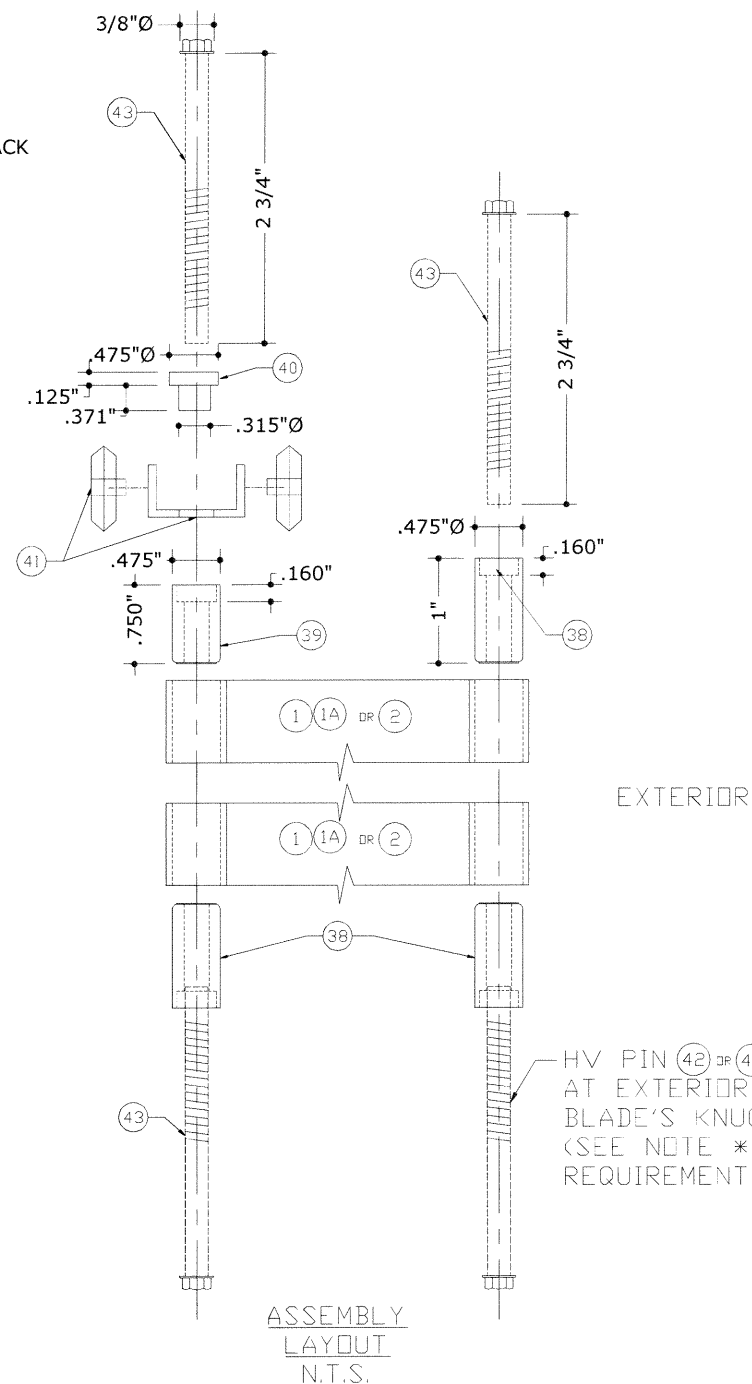
# TYPICAL SHUTTER ASSEMBLY (ALL BLADE TYPES)



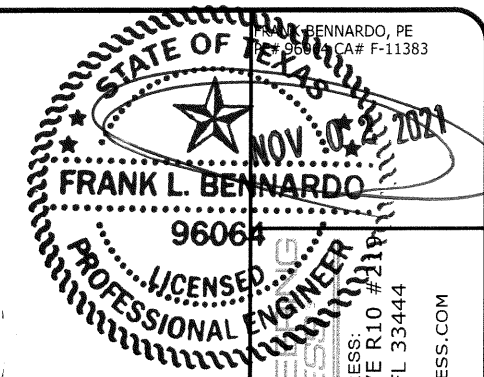
TYPICAL SHUTTER ASSEMBLY  
SCALE: 3/8" = 1"



HV WALL SILL INSTALLATION  
N.T.S.



- (38) - HV LONG RECESSED NYLON BUSHING
- (39) - HV SHORT RECESSED NYLON BUSHING
- (41) - HV NYLON HAT WASHER
- (42) - HV 1-3/4" ACCORDION PIN W/ #8 HEAD
- (43) - HV 2-3/4" ACCORDION PIN W/ #8 HEAD
- (44) - POLYCARBONATE IMPACT RESISTANT HV WINDOW



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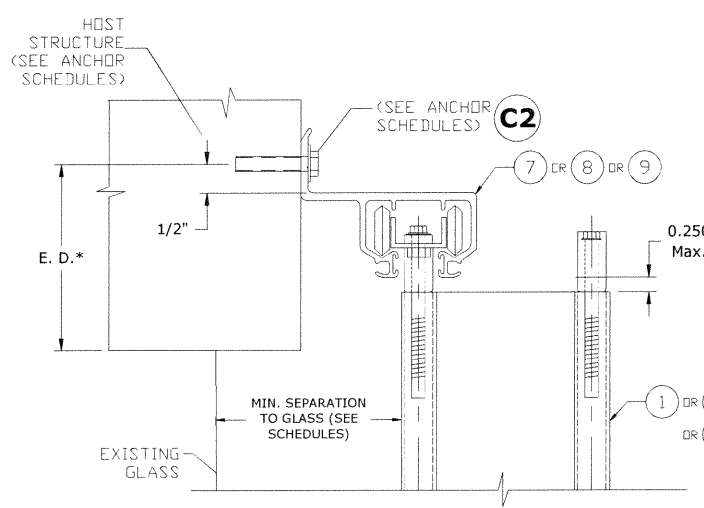
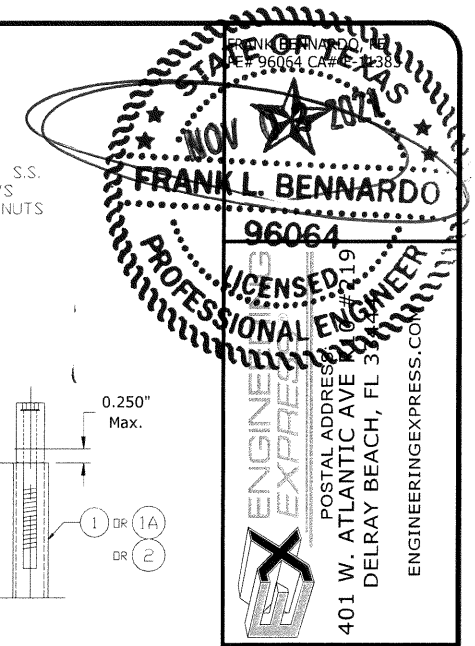
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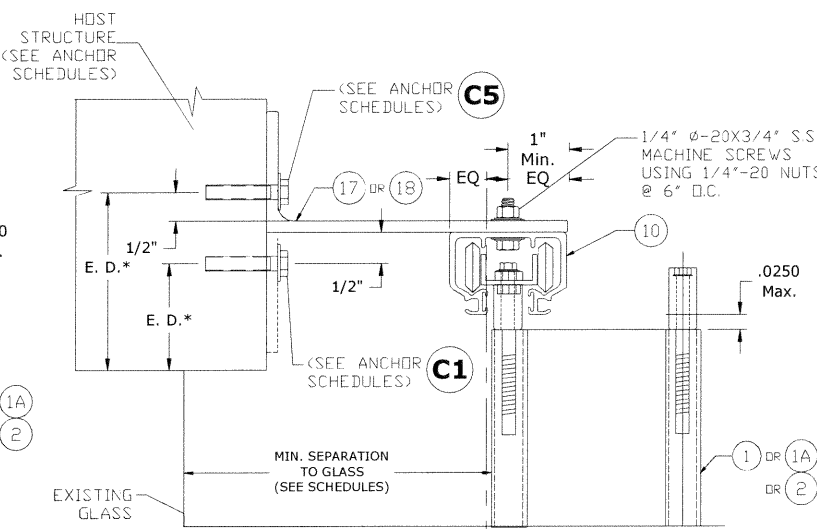
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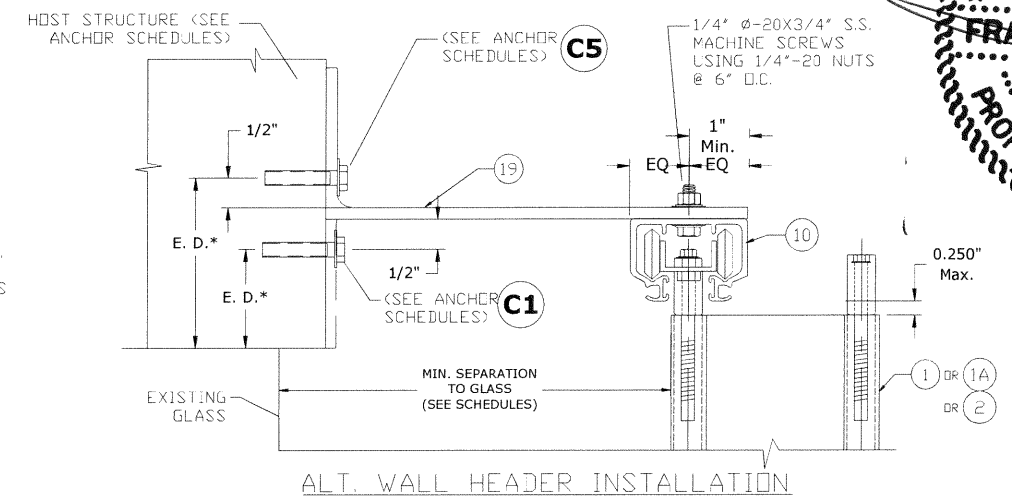
# SECTION DETAILS - ALL BLADE OPTIONS



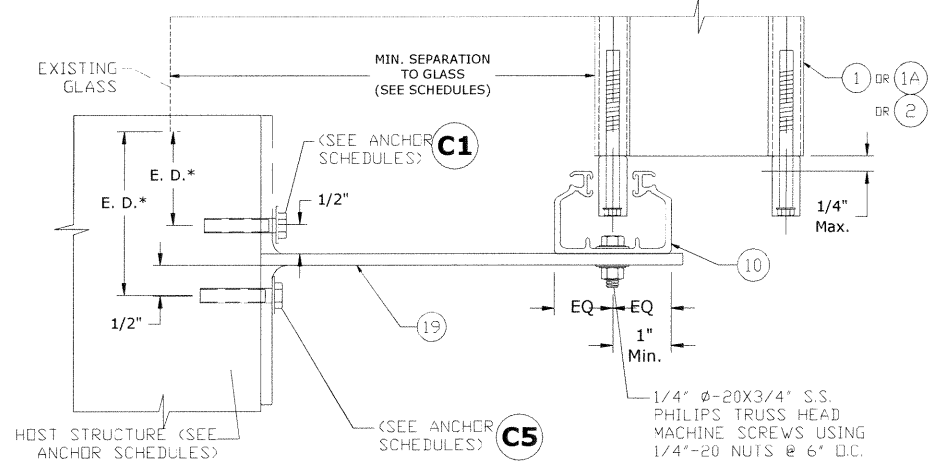
WALL HEADER INSTALLATION  
\*ONLY APPROVED FOR BLADE 1 OR 1A



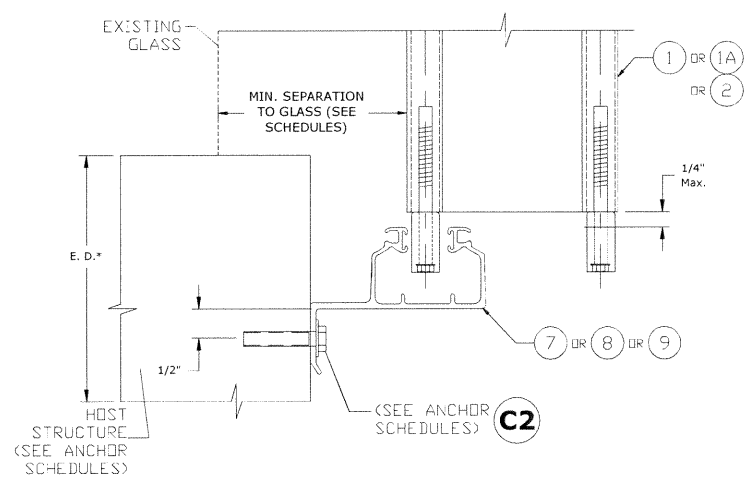
ALT. WALL HEADER INSTALLATION



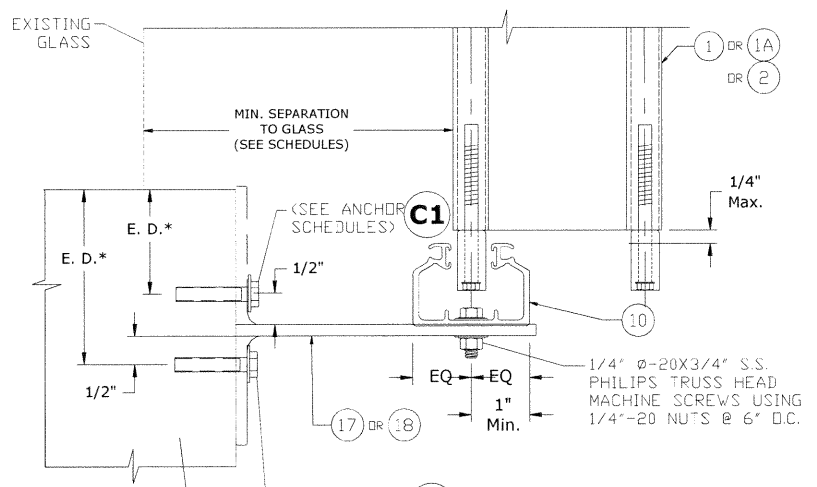
ALT. WALL HEADER INSTALLATION



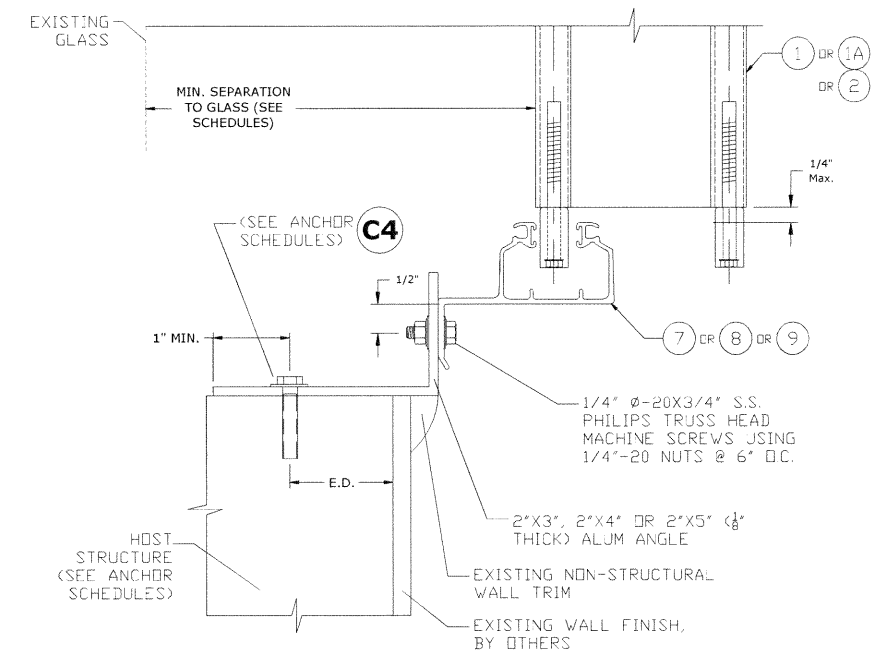
ALT. WALL SILL INSTALLATION



WALL SILL INSTALLATION  
\*ONLY APPROVED FOR BLADE 1 OR 1A



ALT. WALL SILL INSTALLATION



KEYSTONE MOUNT INSTALLATION

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HV BLADE 1, HV WINDOW BLADE 1A \* HV BLADE 2  
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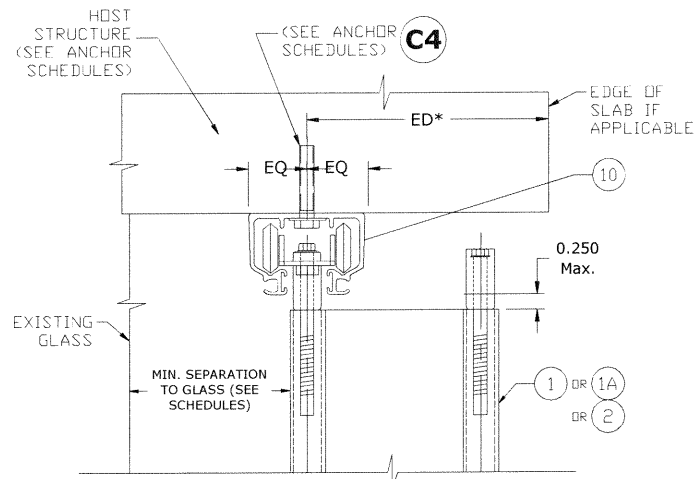
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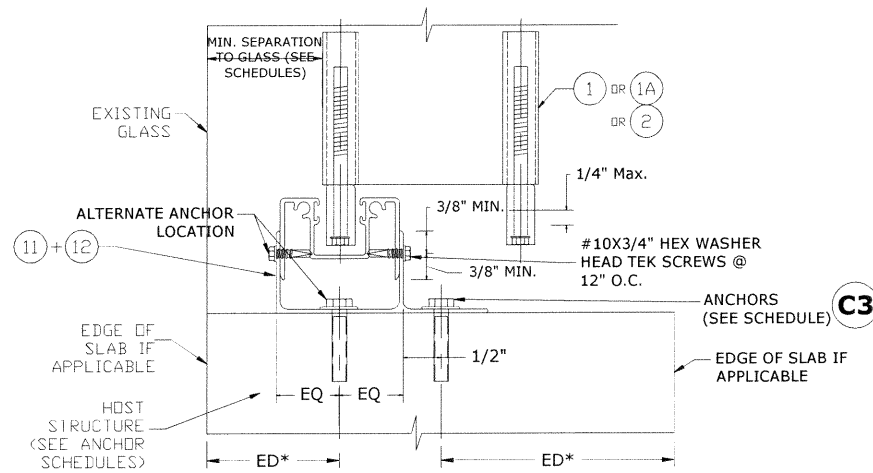
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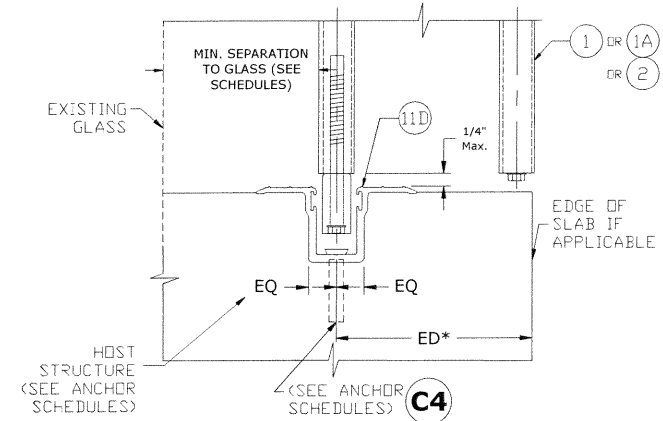
# SECTION DETAILS - ALL BLADE OPTIONS (CONT'D)



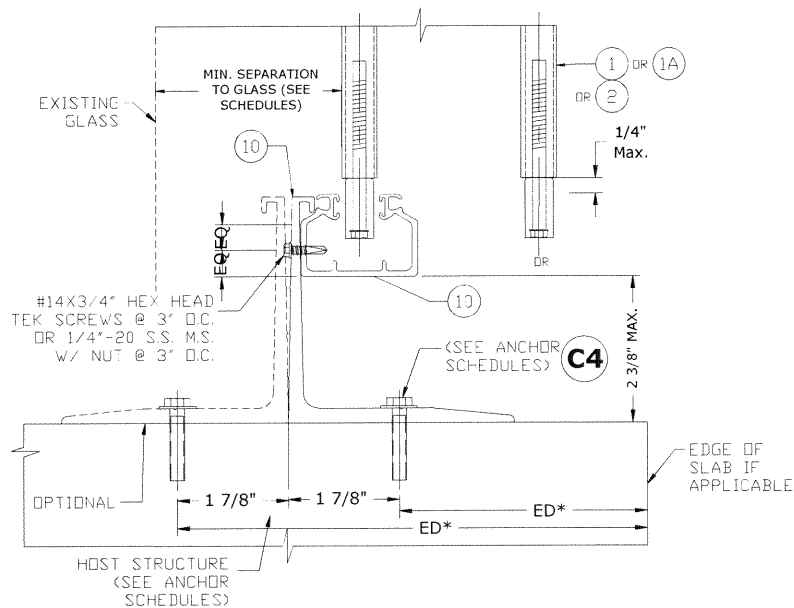
CEILING INSTALLATION



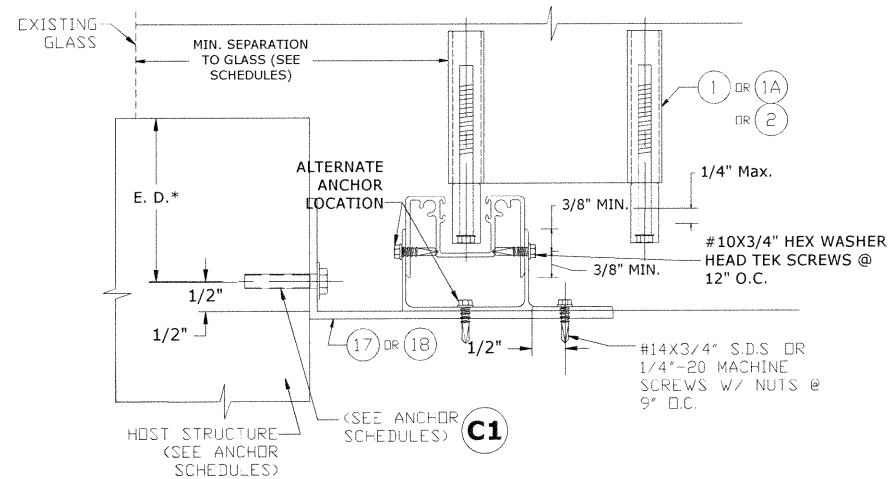
FLOOR INSTALLATION



TRENCH INSTALLATION

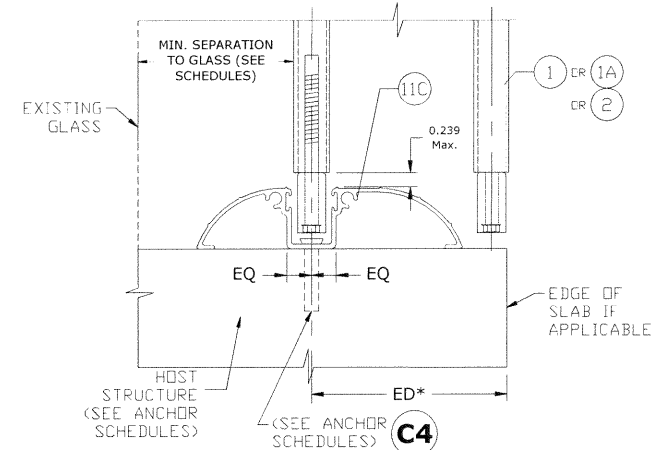


RAINGUARD INSTALLATION †

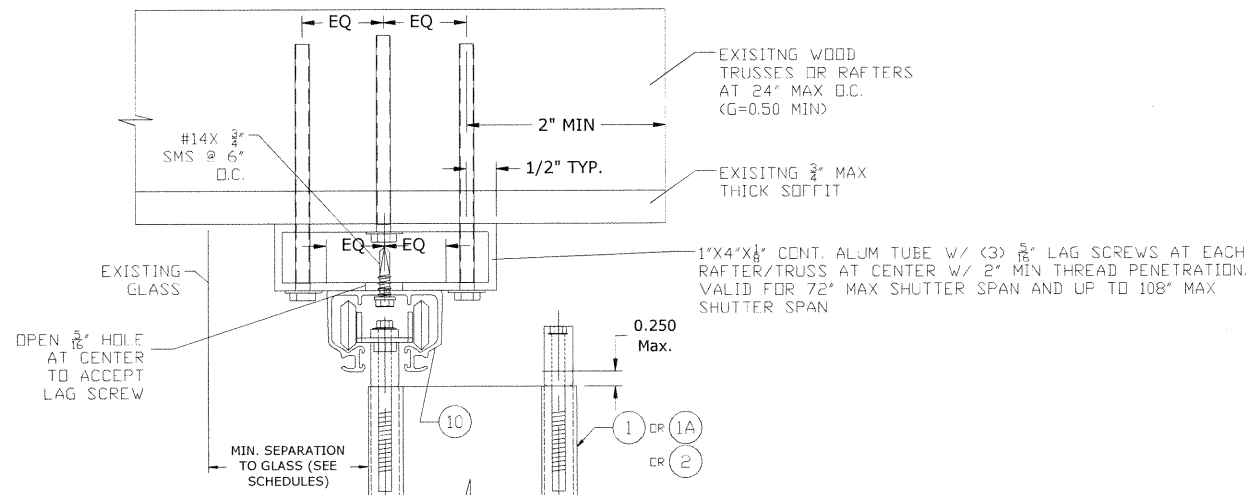


ALT. RAINGUARD INSTALLATION

\*ONLY APPROVED FOR BLADE 1 OR 1A



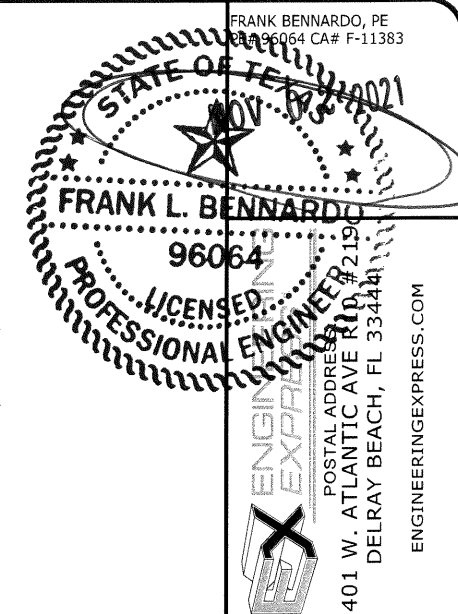
WALK-OVER INSTALLATION



CEILING INSTALLATION TO WOOD TRUSSES/RAFTERS

**NOTE:**

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 HV BLADE 1, HV WINDOW BLADE 1A \* HV BLADE 2  
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INIT ISSUE	1/8/2020	RWN	RWN
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TDI	10/9/2021	RWN	FLB

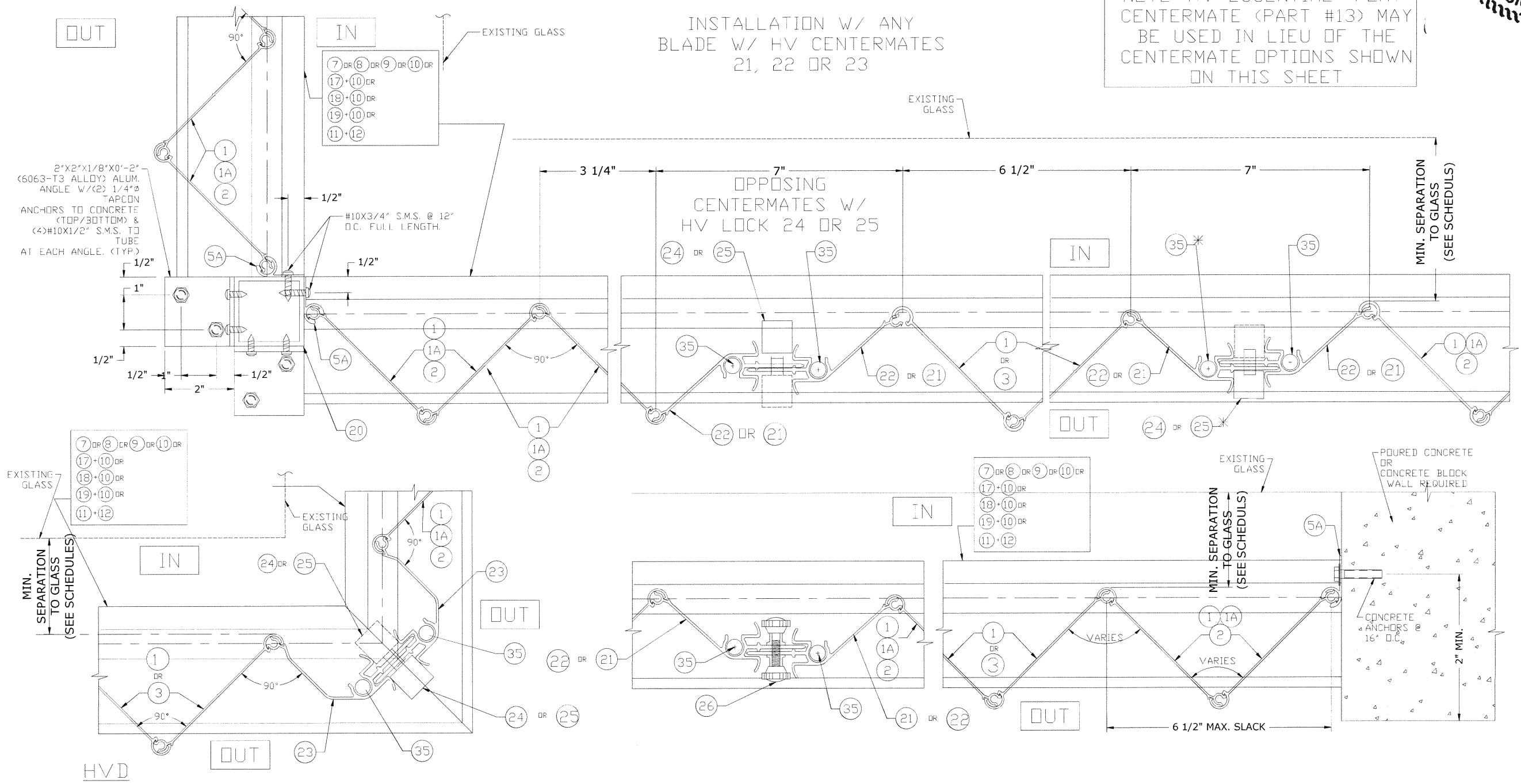
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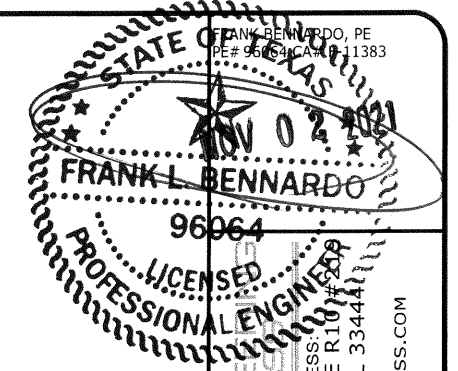
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# HV BLADE 1 - SECTION DETAILS



NOTE: HV ESSENTIAL "FLAT" CENTERMATE (PART #13) MAY BE USED IN LIEU OF THE CENTERMATE OPTIONS SHOWN ON THIS SHEET



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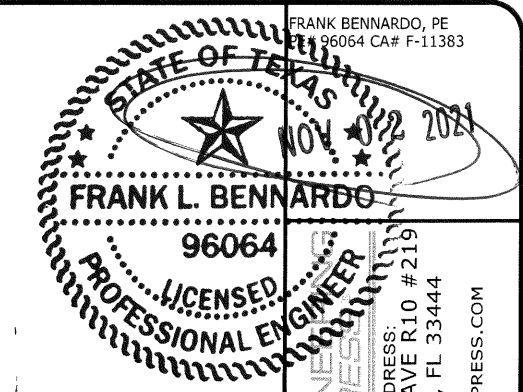
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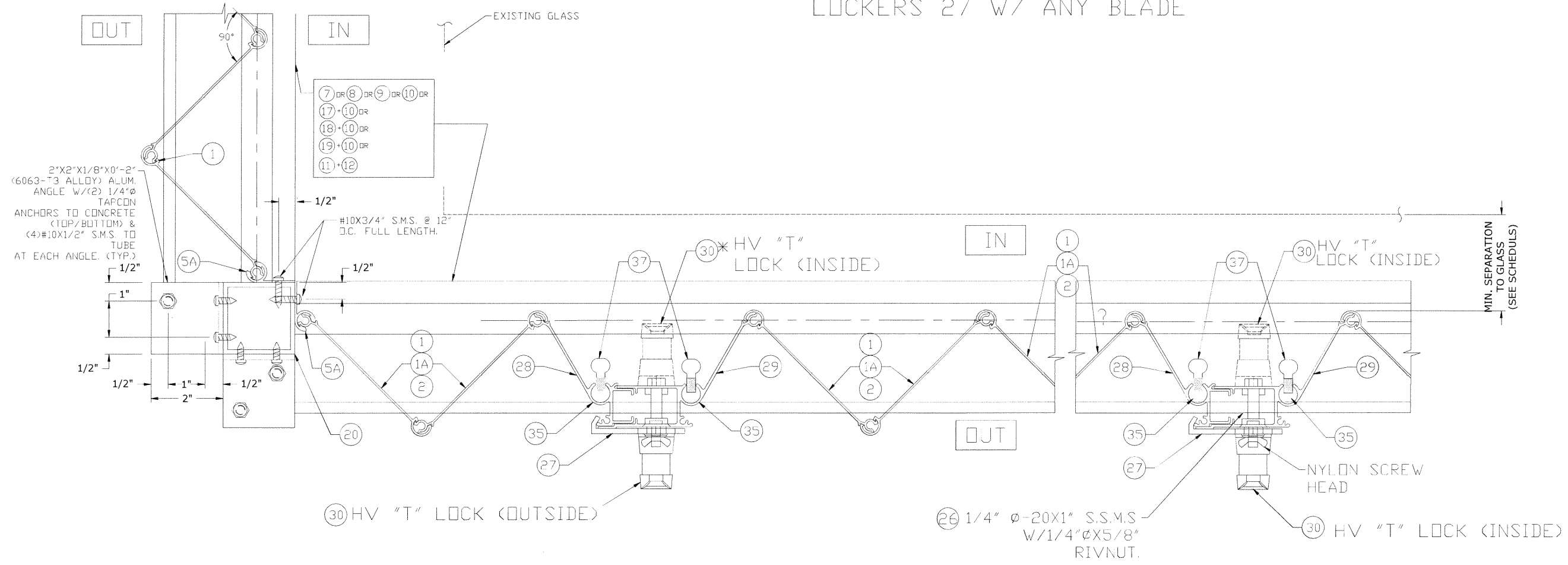
# HV BLADE 1 - SECTION DETAILS (CONT'D)



FRANK BENNARDO, PE  
96064 CA# F-11383

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ALTERNATE INSTALLATION W/ HV "T" LOCK 30, HV MALE/FEMALE "T" LOCKS CENTERMATES 28, 29 & LOCKERS 27 W/ ANY BLADE



AMERICAN SHUTTER SYSTEMS ASSOCIATION, INC.  
4268 West Roads Dr.  
West Palm Beach, FL 33407  
(561) 841-5480

BERTHA HV ESSENTIAL ACCORDION SHUTTER  
HV BLADE 1, HV WINDOW BLADE 1A \* HV BLADE 2  
TEXAS DEPARTMENT OF INSURANCE

REMARKS	DRWN	CHKD	DATE
INTL ISSUE	RWN	RWN	1/8/2020
2020 FBC	CCB	RWN	9/2/2020
TDI	RWN	FLB	10/8/2021

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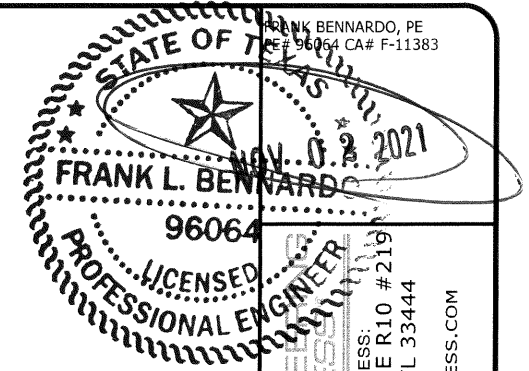
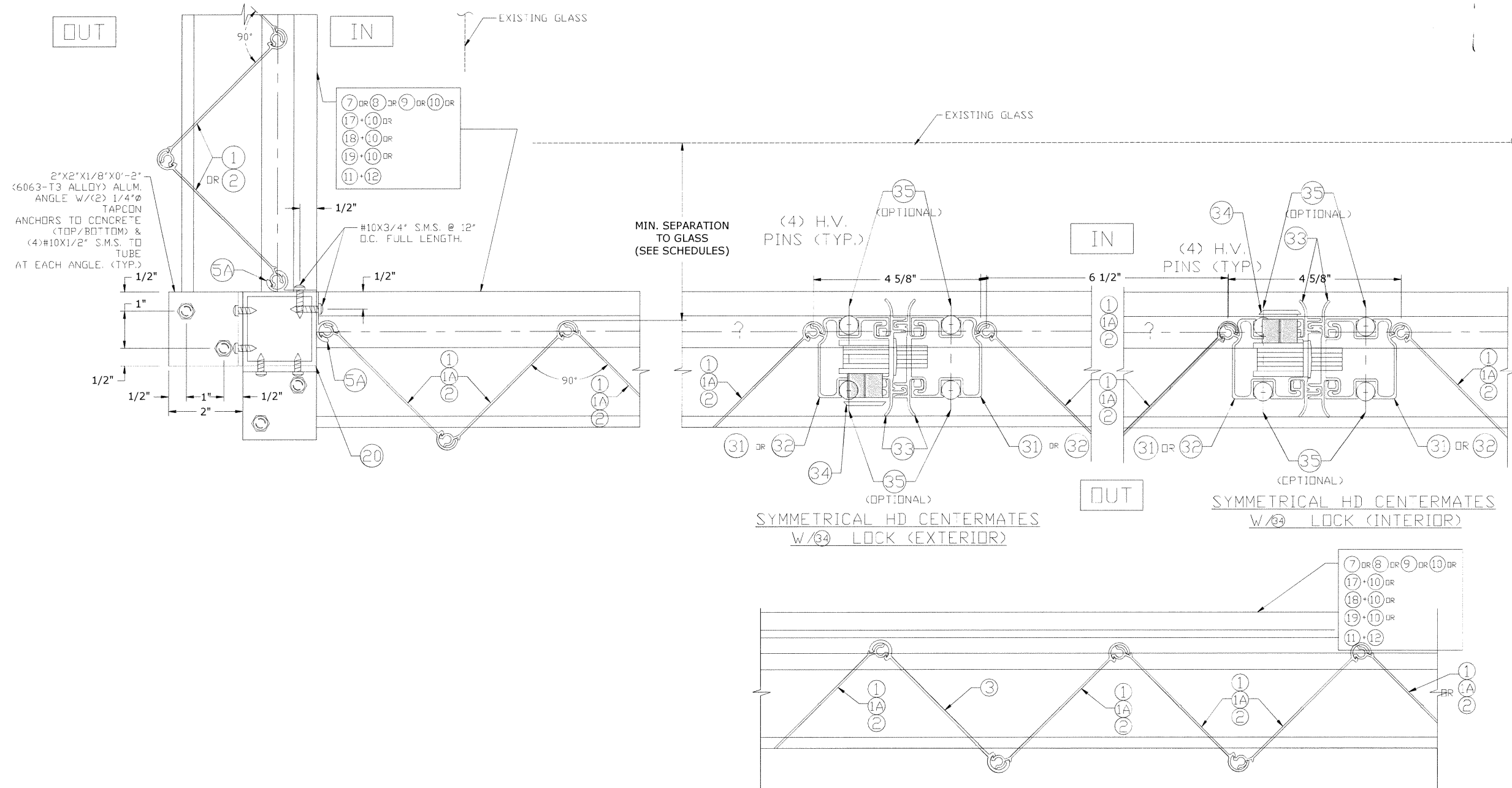
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# HV BLADE 1 OR 2 - SECTION DETAILS

INSTALLATION W/ ANY BLADE W/ HD  
CENTERMATES 31, 32 OR 33



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 BERTHA HV ESSENTIAL ACCORDION SHUTTER  
 HV BLADE 1, HV WINDOW BLADE 1A \* HV BLADE 2  
 TEXAS DEPARTMENT OF INSURANCE

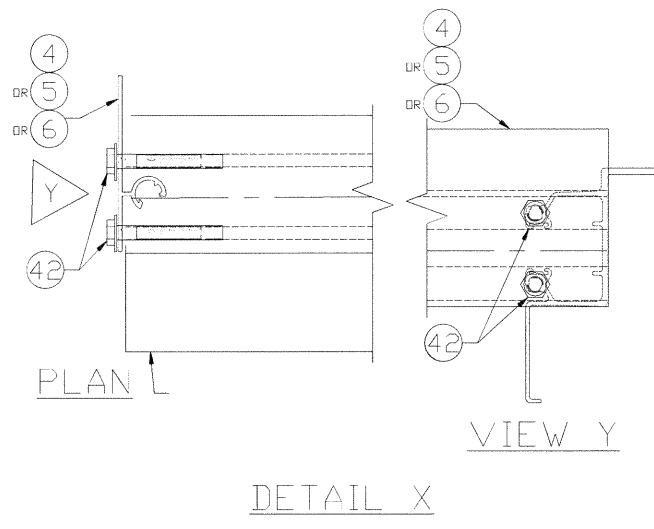
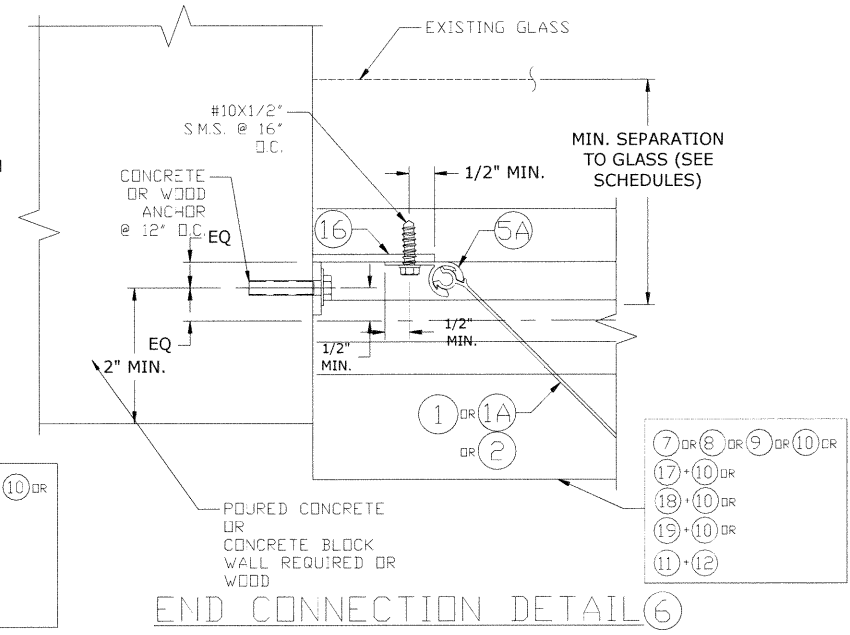
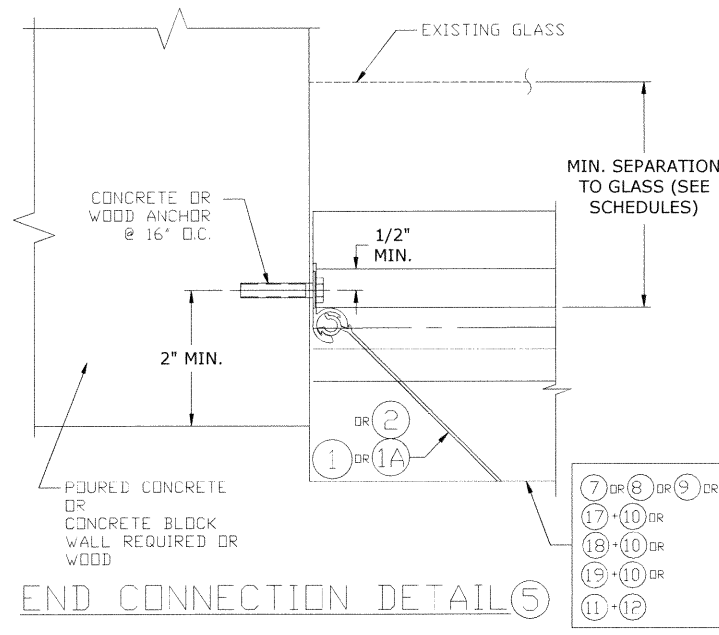
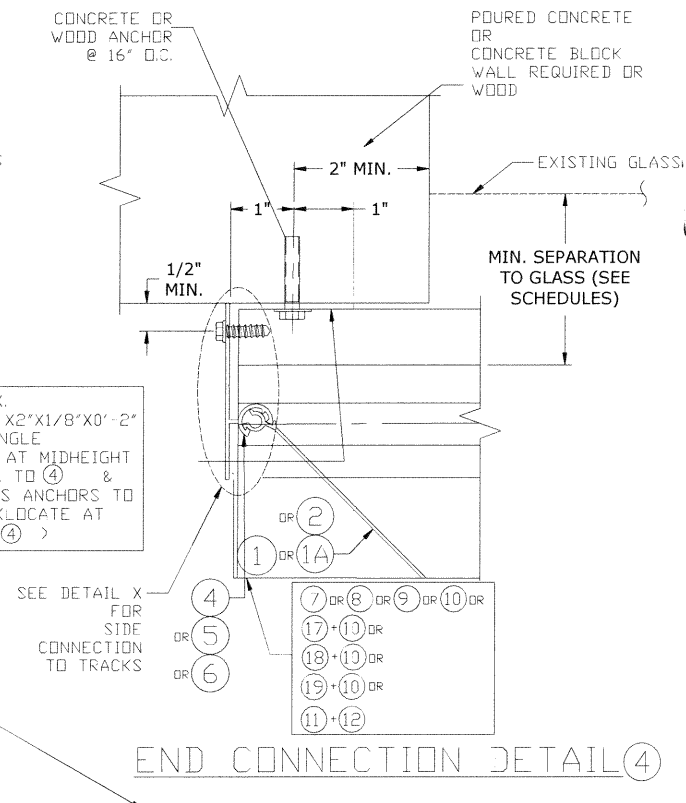
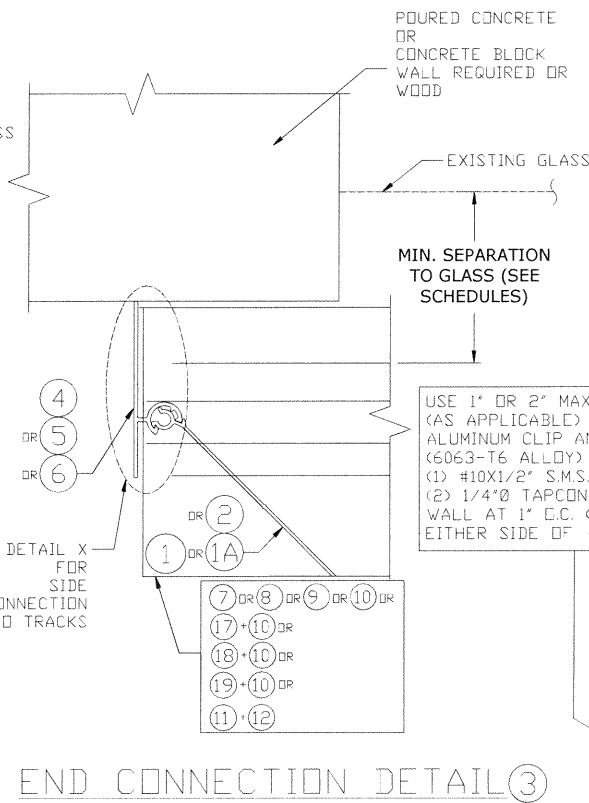
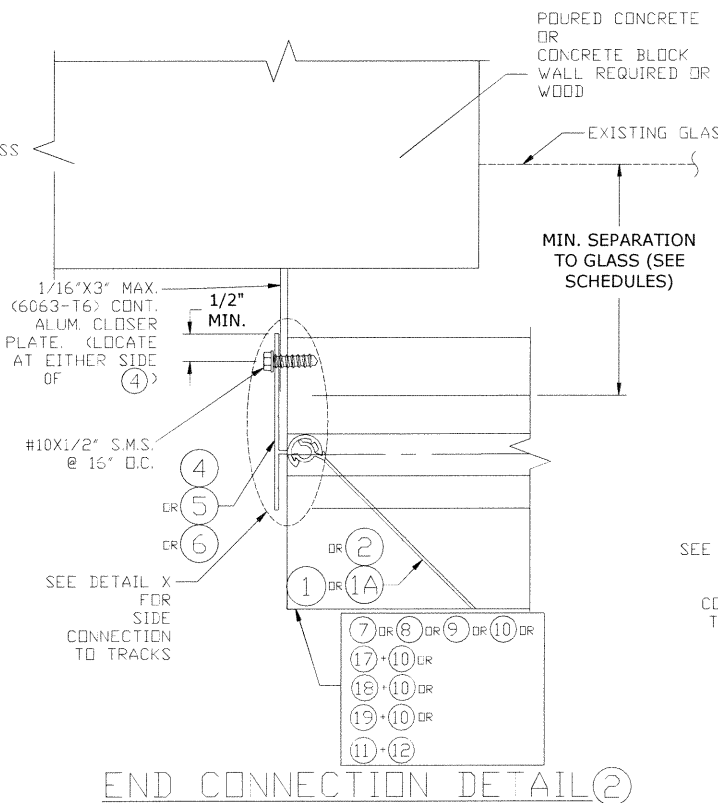
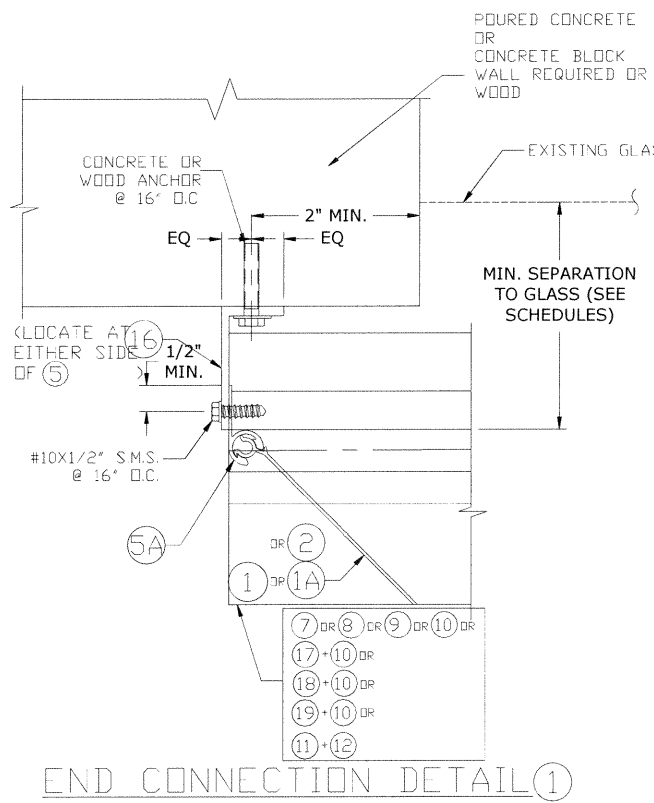
DRWN	CHKD	DATE
RWN	RWN	1/8/2020
CCB	RWN	9/2/2020
RWN	FLB	10/8/2021

REMARKS  
 2020 FBC  
 TDI

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# END CONNECTION DETAILS (ALL BLADE OPTIONS)



FRANK BENNARDO  
PE# 96034  
STATE OF TEXAS  
FRANK L. BENNARDO  
96064  
LICENSED PROFESSIONAL ENGINEER  
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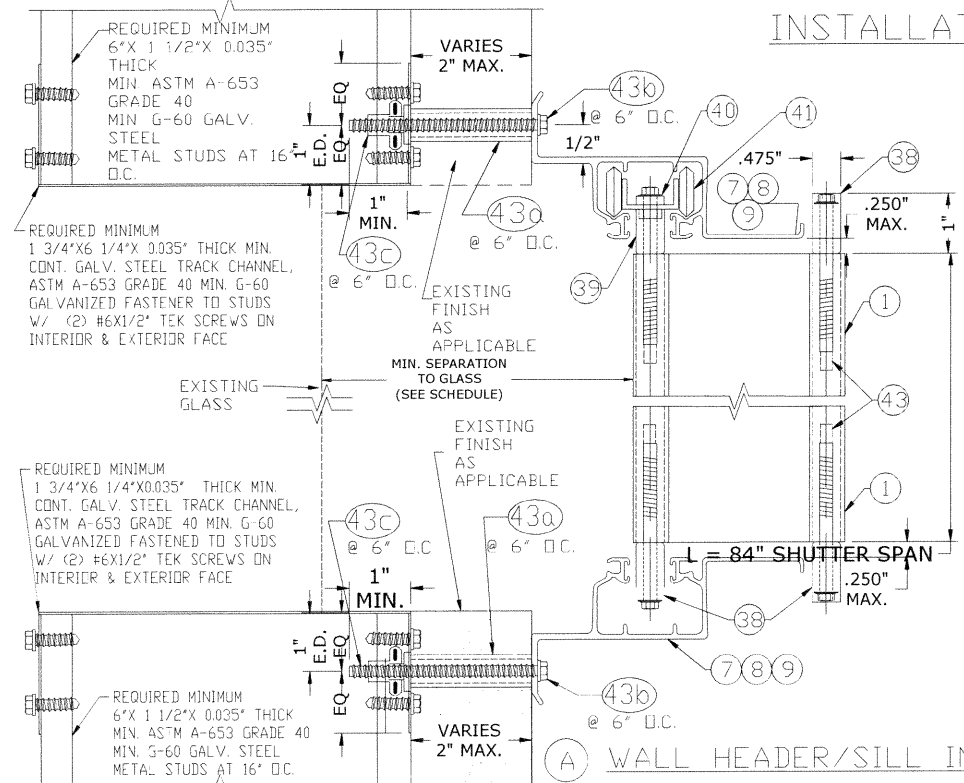
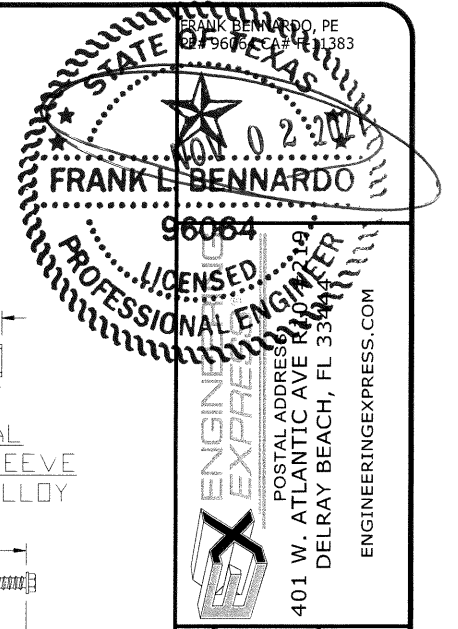
AMERICAN SHUTTER SYSTEMS ASSOCIATION, INC.  
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(561) 841-5480  
BERTHA HV ESSENTIAL ACCORDION SHUTTER  
HV BLADE 1, HV WINDOW BLADE 1A \* HV BLADE 2  
TEXAS DEPARTMENT OF INSURANCE

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# CONNECTION TO METAL WALL STUDS (BLADE 1 ONLY)



INSTALLATIONS W/ ① HV BLADE & HV CENTERMATES ② INTO METAL STUD WALLS \*

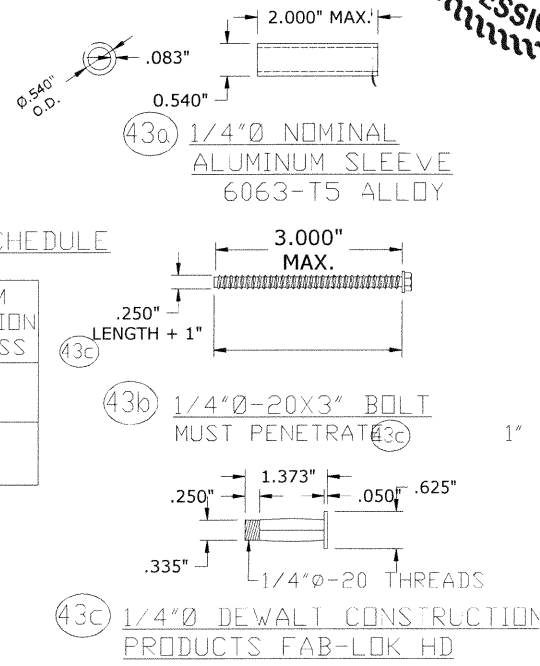
\*LIMITATIONS AND CONDITIONS OF USE FOR BERTHA 1 HV BLADE INSTALLATION TO METAL STUD WALLS

1. MAX. A.S.D. DESIGN PRESSURE RATING: +75 p.s.f
2. MAX. SHUTTER SPAN: 84"
3. ALLOWED MOUNTING: (A) ON THIS SHEET
4. ONLY CENTERMATE ② W/ ② HV LOCK ARE ALLOWED WITH ② ARRANGED IN A SYMMETRICAL LAYOUT. USE OF ③ (2) (6" LONG, MINIMUM) MUST ALWAYS BE INCLUDED AT EXTERIOR OR INTERIOR ACCESS SIDE OF CENTERMATES.

\*\* BLADE SLACK DETAIL E IS VALID FOR CENTERMATE ② APPLICATION WITH BLADE ①

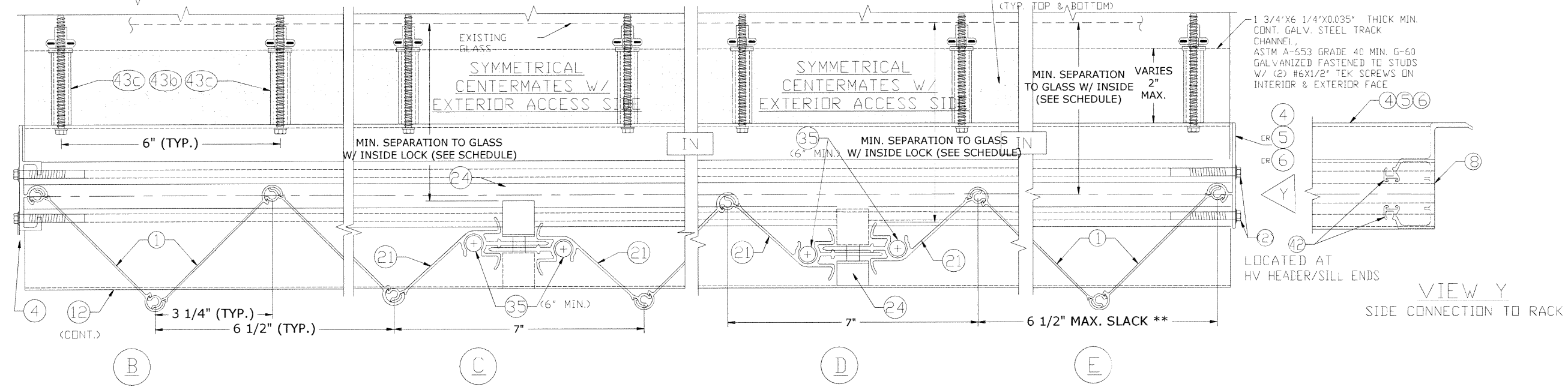
### SEPARATION GLASS SCHEDULE

WIND ZONE ASTM E-1996	MINIMUM SEPARATION TO GLASS
1 THRU 3	1"
4	4"



### COMPONENTS SCALE: 3/8" = 1"

### (A) WALL HEADER/SILL INSTALLATION



AMERICAN SHUTTER SYSTEMS ASSOCIATION, INC.  
4268 West Roads Dr.  
West Palm Beach, FL 33407  
(561) 841-5480

BERTHA HV ESSENTIAL ACCORDION SHUTTER  
HV BLADE 1, HV WINDOW BLADE 1A \* HV BLADE 2  
TEXAS DEPARTMENT OF INSURANCE

DATE	DRWN	CHKD
1/8/2020	RWN	RWN
9/2/2020	CCB	RWN
10/8/2021	FLB	TDI

INITIALS: RWN, CCB, FLB, TDI

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## ANCHOR SCHEDULES - ALL BLADE OPTIONS

HOST STRUCT.	ANCHOR	LOAD (psf)	2.5" MIN EDGE DISTANCE														
			Spans Up To 6'-0"					Spans Up To 9'-8"					Spans Up To 12'-0"				
			CONN TYPE					CONN TYPE					CONN TYPE				
			C1	C2	C3	C4	C5	C1	C2	C3	C4	C5	C1	C2	C3	C4	C5
CONCRETE	1/4" ITW TAPCON OR ELCO/DEWALT ULTRACON WITH 1-3/4" EMBED (3000psi MIN CONC) 	40	16.0"	16.0"	16.0"	16.0"	16.0"	16.0"	16.0"	12.0"	11.0"	16.0"	16.0"	16.0"	9.0"	8.0"	16.0"
		50	16.0"	16.0"	16.0"	16.0"	16.0"	16.0"	16.0"	9.0"	8.0"	16.0"	16.0"	16.0"	7.0"	6.0"	10.5"
		60	16.0"	16.0"	13.0"	12.5"	16.0"	16.0"	16.0"	7.0"	6.5"	11.0"	13.0"	12.0"	5.5"	5.0"	7.5"
		70	16.0"	16.0"	10.5"	10.0"	16.0"	14.0"	13.5"	6.0"	5.0"	8.0"	10.5"	9.5"	4.5"	4.0"	5.5"
		80	16.0"	16.0"	9.0"	8.0"	16.0"	11.5"	11.0"	5.0"	4.5"	6.5"	9.0"	7.5"	4.0"	4.0"	4.5"
CONCRETE	1/4" ELCO CRETEFLX SS4 W/ 2" EMBED (3350psi MIN CONC) 	40	16.0"	16.0"	16.0"	16.0"	16.0"	16.0"	16.0"	16.0"	16.0"	16.0"	16.0"	16.0"	13.5"	12.5"	16.0"
		50	16.0"	16.0"	16.0"	16.0"	16.0"	16.0"	16.0"	13.5"	12.0"	16.0"	16.0"	16.0"	10.5"	9.0"	13.5"
		60	16.0"	16.0"	16.0"	16.0"	16.0"	16.0"	16.0"	10.5"	9.5"	14.5"	16.0"	16.0"	8.5"	7.0"	10.0"
		70	16.0"	16.0"	16.0"	15.0"	16.0"	16.0"	16.0"	9.0"	8.0"	11.0"	14.0"	12.5"	7.0"	6.0"	7.5"
		80	16.0"	16.0"	13.5"	12.5"	16.0"	15.5"	14.5"	7.5"	6.5"	8.5"	11.5"	10.0"	6.0"	5.0"	6.0"

HOST STRUCT.	ANCHOR	LOAD (psf)	1.25" MIN EDGE DISTANCE														
			Spans Up To 6'-0"					Spans Up To 9'-8"					Spans Up To 12'-0"				
			CONN TYPE					CONN TYPE					CONN TYPE				
			C1	C2	C3	C4	C5	C1	C2	C3	C4	C5	C1	C2	C3	C4	C5
CONCRETE	1/4" ITW TAPCON OR ELCO/DEWALT ULTRACON WITH 1-3/4" EMBED (3000psi MIN CONC) 	40	16.0"	16.0"	9.0"	9.0"	16.0"	16.0"	16.0"	5.0"	5.0"	16.0"	16.0"	16.0"	4.0"	4.0"	16.0"
		50	16.0"	16.0"	7.0"	7.0"	16.0"	16.0"	16.0"	4.0"	4.0"	16.0"	16.0"	16.0"			10.0"
		60	16.0"	16.0"	5.5"	5.5"	16.0"	16.0"	16.0"			10.5"	12.5"	12.0"			7.0"
		70	16.0"	16.0"	4.5"	4.5"	16.0"	13.5"	13.0"			8.0"	10.0"	9.0"			5.5"
		80	16.0"	16.0"	4.0"	4.0"	16.0"	11.5"	10.5"			6.5"	8.5"	7.5"			4.5"

HOST STRUCT.	ANCHOR	LOAD (psf)	1-1/4" MIN EDGE DISTANCE														
			Spans Up To 6'-0"					Spans Up To 9'-8"					Spans Up To 12'-0"				
			CONN TYPE					CONN TYPE					CONN TYPE				
			C1	C2	C3	C4	C5	C1	C2	C3	C4	C5	C1	C2	C3	C4	C5
CONCRETE	1/4" ALL-POINTS SOLID-SET ANCHOR W/ 7/8" EMBED & 1/4-20 SS MACHINE SCREW (3000psi MIN CONC) 	40	16.0"	16.0"	11.5"	11.5"	16.0"	16.0"	16.0"	6.5"	6.5"	16.0"	16.0"	16.0"	5.0"	4.5"	12.0"
		50	16.0"	16.0"	9.0"	9.0"	16.0"	15.5"	16.0"	5.0"	4.5"	11.5"	12.0"	4.0"	3.5"	7.0"	
		60	16.0"	16.0"	7.0"	7.0"	16.0"	12.0"	13.0"	4.0"	3.5"	7.5"	9.0"	8.5"	3.0"	3.0"	5.0"
		70	16.0"	16.0"	6.0"	5.5"	16.0"	9.5"	9.5"	3.5"	3.0"	5.5"	7.0"	6.5"			4.0"
		80	16.0"	16.0"	5.0"	4.5"	12.0"	8.0"	7.5"	3.0"		4.5"	6.0"	5.0"			3.0"

HOST STRUCT.	ANCHOR	LOAD (psf)	3" MIN EDGE DISTANCE														
			Spans Up To 6'-0"					Spans Up To 9'-8"					Spans Up To 12'-0"				
			CONN TYPE					CONN TYPE					CONN TYPE				
			C1	C2	C3	C4	C5	C1	C2	C3	C4	C5	C1	C2	C3	C4	C5
CONCRETE	1/4" ALL-POINTS SOLID-SET ANCHOR W/ 7/8" EMBED & 1/4-20 SS MACHINE SCREW (3000psi MIN CONC) 	40	16.0"	16.0"	16.0"	16.0"	16.0"	16.0"	16.0"	15.0"	14.5"	16.0"	16.0"	16.0"	11.5"	10.5"	16.0"
		50	16.0"	16.0"	16.0"	16.0"	16.0"	16.0"	16.0"	11.5"	10.5"	16.0"	16.0"	16.0"	8.5"	7.5"	12.0"
		60	16.0"	16.0"	16.0"	16.0"	16.0"	16.0"	16.0"	9.0"	8.0"	13.0"	14.5"	14.0"	7.0"	6.0"	8.5"
		70	16.0"	16.0"	13.5"	12.5"	16.0"	16.0"	15.5"	7.5"	6.5"	9.5"	12.0"	11.0"	6.0"	5.0"	6.5"
		80	16.0"	16.0"	11.5"	10.5"	16.0"	13.5"	12.5"	6.5"	5.5"	7.5"	10.0"	9.0"	5.0"	4.5"	5.5"

HOST STRUCT.	ANCHOR	LOAD (psf)	3-1/8" MIN EDGE DISTANCE														
			Spans Up To 6'-0"					Spans Up To 9'-8"					Spans Up To 12'-0"				
			CONN TYPE					CONN TYPE					CONN TYPE				
			C1	C2	C3	C4	C5	C1	C2	C3	C4	C5	C1	C2	C3	C4	C5
CONCRETE	5/16" ITW TAPCON XL WITH 1-3/4" EMBED (2899psi MIN CONC) 	40	16.0"	16.0"	16.0"	16.0"	16.0"	16.0"	16.0"	16.0"	16.0"	16.0"	16.0"	16.0"	12.5"	11.5"	16.0"
		50	16.0"	16.0"	16.0"	16.0"	16.0"	16.0"	16.0"	12.5"	11.5"	16.0"	16.0"	16.0"	9.5"	8.5"	13.0"
		60	16.0"	16.0"	16.0"	16.0"	16.0"	16.0"	16.0"	10.0"	9.0"	13.5"	16.0"	15.0"	7.5"	6.5"	9.0"
		70	16.0"	16.0"	15.0"	14.0"	16.0"	16.0"	16.0"	8.0"	7.0"	10.0"	13.0"	11.5"	6.5"	5.5"	7.0"
		80	16.0"	16.0"	12.5"	11.5"	16.0"	14.5"	13.5"	7.0"	6.0"	8.0"	11.0"	9.5"	5.5"	4.5"	5.5"
CONCRETE	5/16" ELCO/DEWALT ULTRACON WITH 1-3/4" EMBED (3500psi MIN CONC) 	40	16.0"	16.0"	16.0"	16.0"	16.0"	16.0"	16.0"	16.0"	16.0"	16.0"	16.0"	16.0"	15.5"	14.0"	16.0"
		50	16.0"	16.0"	16.0"	16.0"	16.0"	16.0"	16.0"	15.0"	13.5"	16.0"	16.0"	16.0"	11.5"	10.0"	14.5"
		60	16.0"	16.0"	16.0"	16.0"	16.0"	16.0"	16.0"	12.0"	10.5"	15.5"	16.0"	16.0"	9.5"	8.0"	10.5"
		70	16.0"	16.0"	16.0"	16.0"	16.0"	16.0"	16.0"	10.0"	8.5"	11.5"	14.5"	13.0"	7.5"	6.5"	8.0"
		80	16.0"	16.0"	15.5"	14.0"	16.0"	16.0"	15.0"	8.5"	7.5"	9.0"	12.5"	10.5"	6.5"	5.5"	6.5"

### ANCHOR NOTES:

- SPANS AND LOADS SHOWN HERE ARE FOR DETERMINING ANCHOR SPACING ONLY. ALLOWABLE STORM SHUTTER SPANS FOR SPECIFIC LOADS MUST BE LIMITED TO THOSE SHOWN IN SPAN SCHEDULES.
- ENTER ANCHOR SCHEDULE BASED ON THE EXISTING STRUCTURE MATERIAL, ANCHOR TYPE AND EDGE DISTANCE. SELECT DESIGN LOAD GREATER THAN OR EQUAL TO NEGATIVE DESIGN LOAD ON SHUTTER AND SELECT SPAN GREATER THAN OR EQUAL TO SHUTTER SPAN. INTERPOLATION BETWEEN PRESSURES OR SPANS IS PERMITTED.
- SEE MOUNTING SECTION DETAILS FOR IDENTIFICATION OF CONNECTION TYPE.
- EXISTING STRUCTURE MAY BE CONCRETE, ASTM C-90 HOLLOW CONCRETE BLOCK OR WOOD FRAMING. REFERENCE ANCHOR SCHEDULE FOR PROPER ANCHOR TYPE BASED ON TYPE OF EXISTING STRUCTURE AND APPROPRIATE CONNECTION TYPE. SEE CONNECTION DETAILS FOR IDENTIFICATION OF CONNECTION TYPE.
- ALL CONCRETE ANCHORS SHALL BE INSTALLED TO NON-CRACKED CONCRETE ONLY.
- THE CONTRACTOR IS RESPONSIBLE TO ENSURE THE ANCHORS ARE INSTALLED IN ACCORDANCE WITH MANUFACTURERS' RECOMMENDATIONS. EMBEDMENT LENGTHS SHALL BE AS NOTED AND DO NOT INCLUDE STUCCO OR OTHER FINISHES.
- WHERE EXISTING STRUCTURE IS WOOD FRAMING, WOOD FRAMING CONDITIONS VARY. FIELD VERIFY THAT FASTENERS ARE INTO ADEQUATE WOOD FRAMING MEMBERS. ATTACHMENT TO 1/2" MIN THICK CDX PLYWOOD SHALL BE 1/4" ITW TAPCONS OR #14 WOOD SCREWS W/ 3/4" THREAD PENETRATION SPACED AT 3" O.C.. EXISTING WOOD STUDS SHALL BE MIN 2X4 SPACED AT 16" O.C. MAX W/ PLYWOOD ATTACHED TO STUDS IN ACCORDANCE W/ SECTION 2322 OF THE FBC.
- WHERE LAG SCREWS FASTEN TO NARROW FACE OF STUD FRAMING, FASTENER SHALL BE LOCATED IN CENTER OF NOMINAL 2" x 4" (MIN.) WOOD STUD. 3/4" EDGE DISTANCE IS ACCEPTABLE FOR WOOD FRAMING. LAG SCREWS SHALL HAVE PHILLIPS PAN HEAD OR HEX HEAD.
- MACHINE SCREWS SHALL HAVE MINIMUM OF 1/2" ENGAGEMENT OF THREADS IN BASE ANCHOR AND MAY HAVE EITHER A PAN HEAD, TRUSS HEAD, OR WAFER HEAD (SIDEWALK BOLT), U.O.N.
- DESIGNATES ANCHOR CONDITIONS WHICH ARE NOT ACCEPTABLE USES.
- DESIGNATES ANCHORS WHICH ARE REMOVABLE BY REMOVING MACHINE SCREW, NUT OR WASHER WINGNUT.
- MINIMUM CONCRETE STRENGTHS ARE AS INDICATED IN ANCHOR SCHEDULE.
- WHEN ANCHORING TO HOLLOW BLOCK, SDS DRILLS SHOULD NOT BE USED TO DRILL INTO HOLLOW BLOCK, NOR SHOULD IMPACT DRILLS BE USED TO INSTALL CONCRETE SCREWS TO HOLLOW BLOCK.



FRANK L. BENNARDO  
96064  
PROFESSIONAL ENGINEER  
EXPRESSIONS

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TEXAS DEPARTMENT OF INSURANCE

DRWN	CHKD	DATE
IRVN	IRVN	1/8/2020
CCB	IRVN	9/2/2020
TDI	IRVN	10/9/2021

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ANCHOR SCHEDULES - ALL BLADE OPTIONS (CONT'D)

Table with columns for HOST STRUCTURE, ANCHOR, LOAD (psf), and various span lengths (6'-0", 9'-8", 12'-0") for 1" MIN EDGE DISTANCE in hollow concrete blocks.

Table with columns for HOST STRUCTURE, ANCHOR, LOAD (psf), and various span lengths (6'-0", 9'-8", 12'-0") for 2-1/2" MIN EDGE DISTANCE in hollow concrete blocks.

Table with columns for HOST STRUCTURE, ANCHOR, LOAD (psf), and various span lengths (6'-0", 9'-8", 12'-0") for 1-1/4" MIN EDGE DISTANCE in hollow concrete blocks.

Table with columns for HOST STRUCTURE, ANCHOR, LOAD (psf), and various span lengths (6'-0", 9'-8", 12'-0") for 2" MIN EDGE DISTANCE in hollow concrete blocks.

Table with columns for HOST STRUCTURE, ANCHOR, LOAD (psf), and various span lengths (6'-0", 9'-8", 12'-0") for 3-1/8" MIN EDGE DISTANCE in hollow concrete blocks.

Table with columns for HOST STRUCTURE, ANCHOR, LOAD (psf), and various span lengths (6'-0", 9'-8", 12'-0") for 4" MIN EDGE DISTANCE in grout-filled concrete blocks.

Table with columns for HOST STRUCTURE, ANCHOR, LOAD (psf), and various span lengths (6'-0", 9'-8", 12'-0") for 3/4" MIN EDGE DISTANCE in wood (G=0.55).

Table with columns for HOST STRUCTURE, ANCHOR, LOAD (psf), and various span lengths (6'-0", 9'-8", 12'-0") for 3/4" MIN EDGE DISTANCE in wood (G=0.42).

ANCHOR NOTES: SEE SHEET 13 FOR ANCHOR NOTES.

FRANK BENNARDO, PE #96064



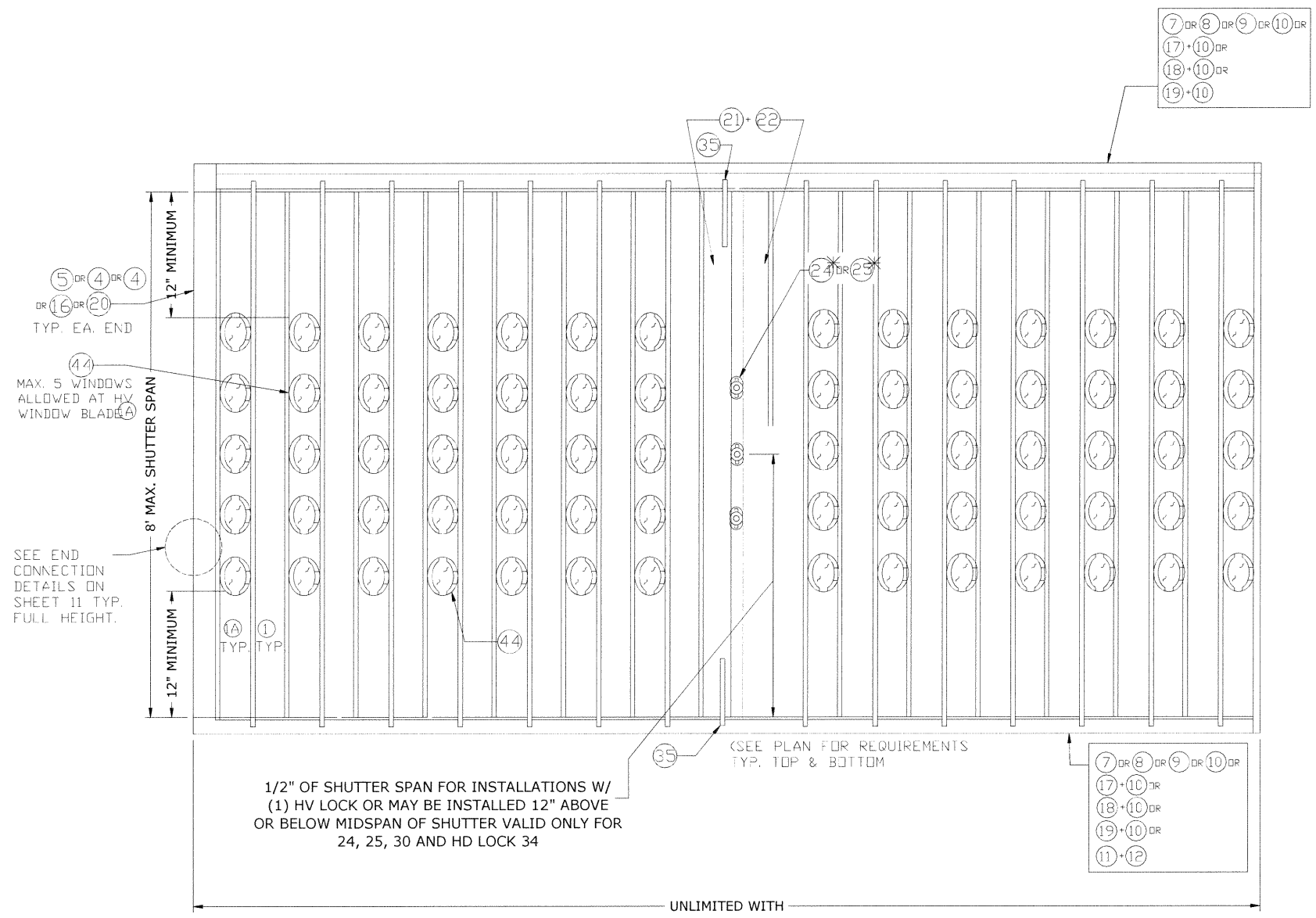
AMERICAN SHUTTER SYSTEMS ASSOCIATION, INC. 4268 West Roads Dr. West Palm Beach, FL 33407 (561) 841-5480

Table with columns: REMARKS, DATE, DRWN, CHKD, RWN, RWN, RWN, RWN, CCB, RWN, RWN, RWN, FLB, TDI. Includes a disclaimer: THIS DOCUMENT IS THE PROPERTY OF ENGINEERING EXPRESS...

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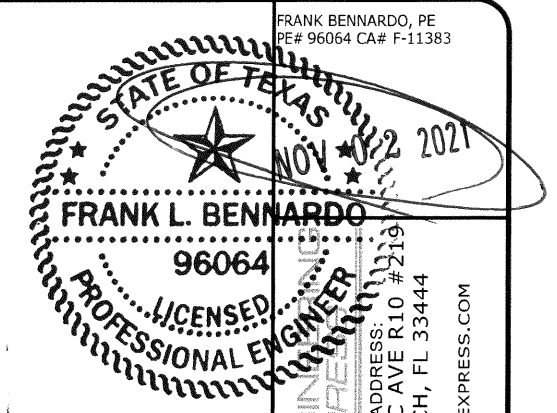
SCALE: NTS UNLESS NOTED

# WINDOW BLADE 1A OPTION



- WINDOW BLADE 1A NOTES:**
1. MAXIMUM DESIGN PRESSURE = +/-80psf
  2. MAXIMUM SHUTTER SPAN = 96"
  3. MINIMUM GLASS SEPARATION (SEE GLASS SEPARATION TABLE)
  4. SEE SECTION DETAILS FOR MOUNTING OPTIONS
  5. ONLY CENTERMATES 21, 22 (WITH 24 OR 25) ARE ALLOWED WITH SYMMETRICAL OR OPPOSING LAYOUT. 35 MUST BE INCLUDED FOR OPPOSING LAYOUT.
  6. BLADE 1A SHALL ONLY ALLOW 5 OPENINGS MAXIMUM. SEE NEXT SHEET FOR SPACING.
  7. MINIMUM CLEARANCE FROM TOP OR BOTTOM EDGE OF WINDOW BLADE SHALL BE 12"
  8. FIRST OR LAST BLADE CONNECTED TO STARTERS MAY BE WINDOW BLADE 1A
  9. BLADE 1A SHALL ALTERNATE WITH HV BLADE 1 THROUGHOUT SHUTTER WIDTH
  10. CENTERMATES SHALL ALWAYS BE INSTALLED ADJACENT TO SOLID HV BLADE 1 ON BOTH SIDES.
  11. POLYCARBONATE HV WINDOW SHALL BE INSTALLED SUCH THAT TABS FACE THE INTERIOR OF OPENING BEING PROTECTED.
  12. HV WINDOW SHALL ONLY BE INSTALLED AND LOCKED USING AN HV SETTING TOOL PROVIDED BY ASSA, INC.
  13. REFERENCE ANCHOR SCHEDULES FOR ANCHOR SPACING OPTIONS.

TYPICAL 1A HV BLADE WORKING IN UNISON WITH 1 HV WINDOW BLADE SHUTTER



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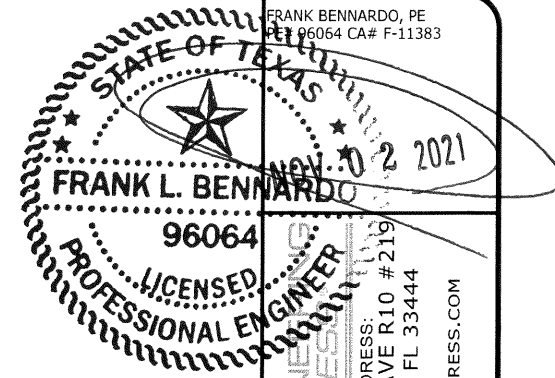
**BERTHA HV ESSENTIAL ACCORDION SHUTTER**  
 HV BLADE 1, HV WINDOW BLADE 1A \* HV BLADE 2  
 TEXAS DEPARTMENT OF INSURANCE

REMARKS	DRWN	CHKD	DATE
INIT ISSUE	RWN	IRWN	1/8/2020
2020 FBC	CCB	RWN	9/2/2020
TDI	RWN	FLB	10/6/2021

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# WINDOW BLADE 1A OPTION



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BERTHA HV ESSENTIAL ACCORDION SHUTTER  
 HV BLADE 1, HV WINDOW BLADE 1A \* HV BLADE 2  
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