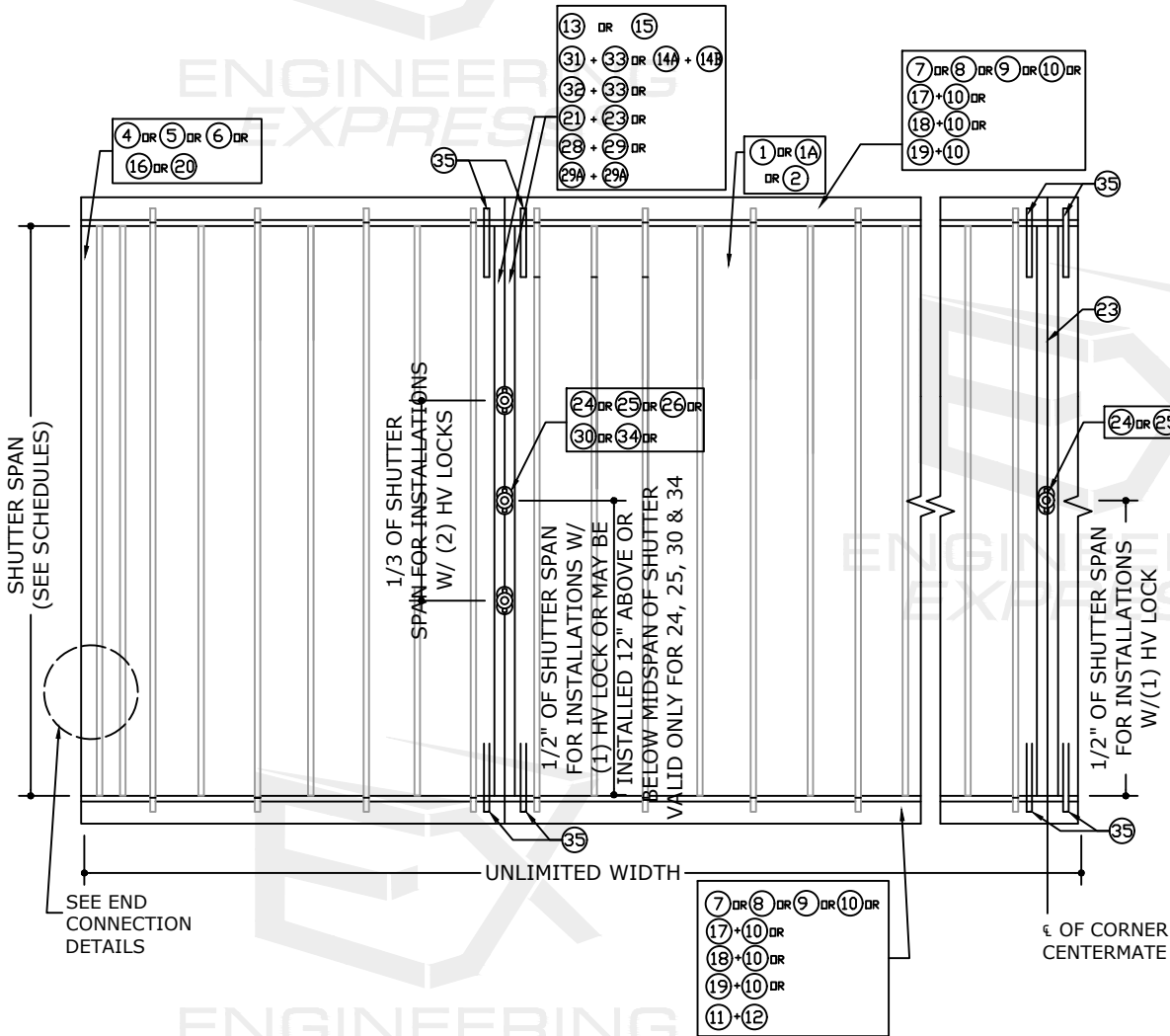


BERTHA HV ESSENTIAL ACCORDION SHUTTER

AMERICAN SHUTTER SYSTEMS ASSOCIATION, INC.
 HV BLADE 1, HV WINDOW BLADE 1A & HV BLADE 2
 LARGE MISSILE IMPACT RESISTANT (MISSILE LEVEL D)

VALID FOR USE INSIDE AND OUTSIDE THE HVHZ (SEE LIMITATIONS HEREIN)

THIS IS A NON-SITE-SPECIFIC STRUCTURAL PERFORMANCE EVALUATION. A DESIGN PROFESSIONAL SHALL BE RESPONSIBLE FOR CERTIFYING THE APPLICATION OF THIS INFORMATION TO ANY SITE-SPECIFIC LOCATION.



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

GENERAL NOTES :

1. THE SYSTEM DESCRIBED HEREIN HAS BEEN DESIGNED AND TESTED IN ACCORDANCE WITH THE FLORIDA BUILDING CODE NINTH EDITION (2026), THE INTERNATIONAL BUILDING CODE (IBC) AND THE INTERNATIONAL RESIDENTIAL CODE (IRC) FOR USE INSIDE AND OUTSIDE OUTSIDE THE HIGH VELOCITY HURRICANE ZONE, PER ASTM E330, E1886, AND E1996 AND TAS 201, 202 & 203 STANDARDS. SEE PRODUCT APPROVAL EVALUATION FOR ADDITIONAL INFORMATION.
 2. 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

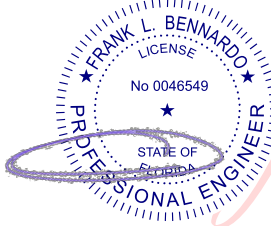
FABRICATION OF THE SPECIFIED SYSTEMS OR ASSEMBLIES SHALL BE PER MANUFACTURER PUBLISHED SPECIFICATIONS.

8. THE STRUCTURAL ADEQUACY OF THE EXISTING STRUCTURE TO WITHSTAND SUPERIMPOSED LOADS BY THIS SYSTEM SHALL BE VERIFIED BY OTHERS. THE ARCHITECT/ENGINEER OF RECORD FOR THE PROJECT SUPERSTRUCTURE WITH WHICH THIS DESIGN IS USED SHALL BE RESPONSIBLE FOR THE INTEGRITY OF ALL SUPPORTING SURFACES TO THIS DESIGN WHICH SHALL BE COORDINATED BY THE PERMITTING CONTRACTOR. WOOD BUNKS (BY OTHERS) SHALL BE ANCHORED PROPERLY TO TRANSFER LOADS TO THE EXISTING STRUCTURE.
 9. ALL EXTRUSIONS SHALL BE MINIMUM 6063-T6 ALUMINUM ALLOY, UNLESS NOTED OTHERWISE.
 10. EACH SHUTTER ASSEMBLY SHALL BEAR A PERMANENT LABEL PER SECTION 1709.9 OF THE FBC 2026 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
FLORIDA PRODUCT APPROVAL NUMBER
 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. FASTENERS SHALL BE CADMIUM-PLATED OR OTHERWISE CORROSION-RESISTANT MATERIAL AND SHALL COMPLY WITH "SPECIFICATIONS FOR ALUMINUM STRUCTURES" SECTION J.3.7.2 BY THE ALUMINUM ASSOCIATION, INC., & ANY APPLICABLE FEDERAL, STATE, AND/OR LOCAL CODES.
 12. FOR PERMANENT OUTDOOR INSTALLATIONS, ALL EXPOSED ANCHORS, FASTENERS, CONNECTORS, AND METAL PLATES SHALL BE CORROSION RESISTANT. CORROSION RESISTANCE MAY BE PROVIDED BY INHERENT MATERIAL COMPOSITION OR, WHERE PERMITTED BY CODE, BY AN APPROVED PROTECTIVE COATING OR GALVANIZATION. WHERE APPLICABLE NEAR A SALTWATER COASTLINE, SUCH COMPONENTS SHALL COMPLY WITH FBC SECTION 1711, INCLUDING APPLICABLE REQUIREMENTS FOR EXPOSED, PROTECTED, OR ENCLOSED CONDITIONS.

MATERIALS, COATINGS, AND FINISHES SHALL BE COMPATIBLE WITH CONNECTED MATERIALS, AND PROTECTIVE COATINGS SHALL BE CONTINUOUS OVER EXPOSED SURFACES. FASTENERS USED WITH ALUMINUM MEMBERS SHALL ALSO COMPLY WITH SECTION J.3.7.2 OF THE ALUMINUM DESIGN MANUAL, "SPECIFICATION FOR ALUMINUM STRUCTURES." SUBSTITUTION OF COMPONENTS FROM ALTERNATE MANUFACTURERS, OR WITH DIFFERENT MATERIALS, COATINGS, OR FINISHES, SHALL NOT BE ASSUMED EQUIVALENT AND MAY REQUIRE ADDITIONAL ENGINEERING REVIEW OR SITE-SPECIFIC ANALYSIS.

13. ALL STEEL IN CONTACT WITH ALUMINUM SHALL BE PAINTED OR PLATED AS PRESCRIBED IN THE ABOVE-NOTED BUILDING CODE.
 14. CONCRETE ANCHORS NOTED HEREIN SHALL BE EMBEDDED TO NON-CRACKED CONCRETE ONLY. INSTALL ALL CONCRETE ANCHORS PER MANUFACTURER'S RECOMMENDATIONS.
 15. CONTRACTOR IS RESPONSIBLE TO INSULATE OR PROTECT ALL MEMBERS FROM DISSIMILAR MATERIALS TO PREVENT ELECTROLYSIS.
 16. REFER TO FASTENER MANUFACTURER'S PUBLISHED DATA SHEETS AND RECOMMENDATIONS FOR FASTENER INSTALLATION INSTRUCTIONS.
 17. ENGINEER SEAL AFFIXED HERETO VALIDATE STRUCTURAL DESIGN AS SHOWN ONLY. USE OF THIS SPECIFICATION BY CONTRACTOR, et. al. INDEMNIFIES & SAVES HARMLESS THIS ENGINEER FOR ALL COST & DAMAGES INCLUDING LEGAL FEES & APPELLATE FEES RESULTING FROM MATERIAL FABRICATION, SYSTEM ERECTION, & CONSTRUCTION PRACTICES BEYOND THAT WHICH IS CALLED FOR BY LOCAL, STATE & FEDERAL CODES & FROM DEVIATIONS OF THIS PLAN.
 18. PRESSURE VALUES ON THIS APPROVAL ARE (ASD) ALLOWABLE DESIGN PRESSURES.
 19. ALTERATIONS ADDITIONS OR OTHER MARKINGS TO THIS DOCUMENT ARE NOT PERMITTED AND INVALIDATE THIS CERTIFICATION.
 20. EXCEPT AS EXPRESSLY PROVIDED HEREIN, NO ADDITIONAL CERTIFICATIONS OR AFFIRMATIONS ARE INTENDED.

FRANK BENNARDO, P.E.
 PE# 0046549 CA# 9885



Digitally signed by
 Frank Bennardo
 Date: 2026.08.17
 17:00:01 -04'00'

PAGE INDEX:

SHEET INDEX	
# SHEET	DESCRIPTION
1	COVER SHEET
2-3	BLADE 1, 1A & 2 COMPONENTS
4	TYPICAL SHUTTER ASSEMBLY (ALL BLADE TYPES)
5-6	SECTION DETAILS - ALL BLADE OPTIONS
7-8	HV BLADE 1 - SECTIONS DETAILS
9	HV BLADE 1 OR 2 - SECTION DETAILS
10	END CONNECTION DETAILS (ALL BLADE OPTIONS)
11	CONNECTION TO METAL WALL STUDS (BLADE 1 ONLY)
12	SPAN SCHEDULES (ALL BLADE OPTIONS)
13-15	ANCHOR SCHEDULES - ALL BLADE OPTIONS
16	WINDOW BLADE 1A OPTION

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. GLASS SEPARATION ONLY REQUIRED WITHIN WIND ZONE 4 AND THE HIGH VELOCITY HURRICANE ZONE (HVHZ).
 2. GLASS SEPARATION VALUES SHOWN APPLY TO INSTALLATIONS LESS THAN 30 FEET FROM GRADE.
 3. INSTALLATIONS ABOVE 30 FEET FROM GRADE SHALL HAVE A MINIMUM GLASS SEPARATION OF 3.25".

NOTE REGARDING USE OF THIS DOCUMENT & USE OUTSIDE FLORIDA:

THIS IS A NON-SITE-SPECIFIC STRUCTURAL PERFORMANCE EVALUATION. THIS PRODUCT EVALUATION IS VALID FOR USE IN **FLORIDA ONLY**. USE OF THIS EVALUATION REQUIRES A REVIEW & CERTIFICATION BY A LOCAL DESIGN PROFESSIONAL WHO SHALL BE RESPONSIBLE FOR THE PROPER ADAPTATION OF THIS GENERAL PERFORMANCE EVALUATION TO ANY SITE-SPECIFIC PROJECT. CONTACT THIS OFFICE AT **ENGINEERINGEXPRESS.COM/QUOTE** FOR ASSISTANCE WITH YOUR PROJECT-SPECIFIC NEEDS & FOR ADAPTATION & CERTIFICATION OF THIS DOCUMENT OUTSIDE OF FLORIDA.

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VISIT [ECALC.IO/EASTERNMETALS](https://ecalcalc.io/easternmetals)

FOR SITE-SPECIFIC DEVIATIONS
 & MORE INFORMATION ABOUT THIS DOCUMENT
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VISIT **ENGINEERINGEXPRESS.COM/STORE**
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TERMINOLOGY:

THE FOLLOWING ABBREVIATIONS APPEAR IN THIS APPROVAL: "ER" FOR "END RETENTION", "NER" FOR "NON-END RETENTION", "INC." FOR "INCORPORATION", "CORP." FOR "CORPORATION", "ALUM" FOR "ALUMINUM", "ASD" FOR "ALLOWABLE STRESS DESIGN", "ASTM" FOR "AMERICAN SOCIETY FOR TESTING AND MATERIALS", "CS" FOR "CARBON STEEL", "CONN" FOR "CONNECTION", "EMBED" FOR "EMBEDMENT", "DIST." FOR "DISTANCE", "GA" FOR "GAUGE", "HVHZ" FOR "HIGH-VELOCITY HURRICANE ZONE", "LB" FOR "POUND", "MAX" FOR "MAXIMUM", "N.T.S." FOR "NOT TO SCALE", "PSF" FOR "POUNDS PER SQUARE FOOT (lb/ft²)", "SPECS" FOR "SPECIFICATIONS", "&" FOR "AND", "MAX" FOR "MAXIMUM", "W/" FOR "WITH", "EXIST" FOR "EXISTING", "STRUCT" FOR "STRUCTURE", "CONC." FOR "CONCRETE". CONTACT ENGINEERING EXPRESS FOR ADDITIONAL ABBREVIATION/TERMINOLOGY CLARIFICATIONS.

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AMERICAN SHUTTER SYSTEMS ASSOCIATION, INC.

4268 WESTROADS DR.

WEST PALM BEACH, FL 33407

(800) 432-2204

BERTHA HV ESSENTIAL ACCORDION SHUTTER

FLORIDA BUILDING CODE NINTH EDITION (2026)

FLORIDA STATEWIDE APPROVAL (FSA FL#32030.2)

REMARKS	DATE	DRWN	CHKD	DATE
2020 FBC (20-31270)	09/02/20	CCB	FLB	
2023 FBC (23-65177)	10/09/23	MRT	RWN	
2026 FBC UPDATE	07/13/26	MEF	CCB	

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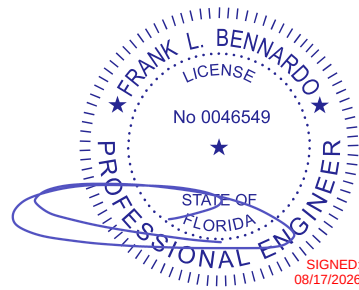
26-102890

SCALE: NTS UNLESS NOTED

1 OF 15

BLADE 1, 1A & 2 COMPONENTS

FRANK BENNARDO, P.E.
PE# 0046549 CA# 9885



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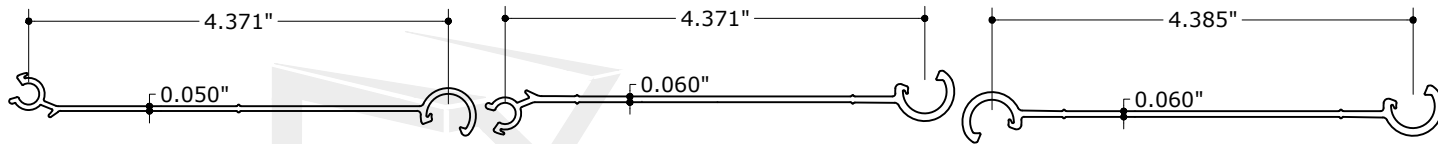
AMERICAN SHUTTER SYSTEMS ASSOCIATION, INC.
4268 WESTROADS DR.
WEST PALM BEACH, FL 33407
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BERTHA HV ESSENTIAL ACCORDION SHUTTER
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DATE	DRWN	CHKD	REMARKS
09/02/20	CCB	FLB	2020 FBC (20-31270)
10/09/23	MRT	RWN	2023 FBC (23-65177)
07/13/26	MEF	CCB	2026 FBC UPDATE

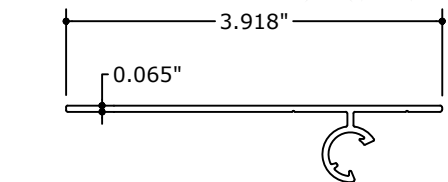
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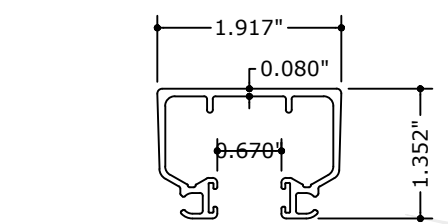
2 OF 15



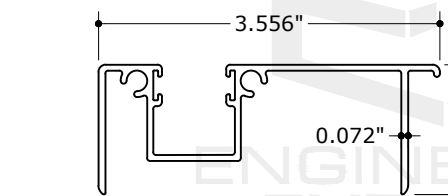
1 1A HV BLADE 1
N.T.S. 6063-T6 ALUM
*W/ OR W/ OUT WINDOW



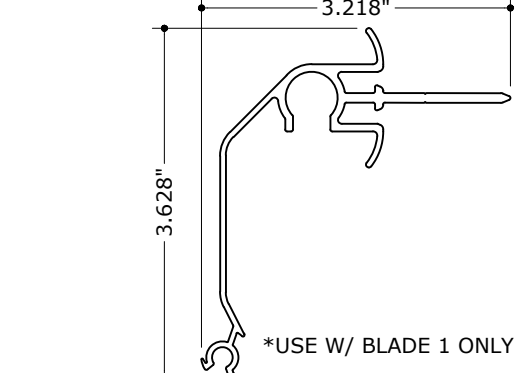
6 HV ESSENTIAL 2" DIRECT MOUNT
N.T.S. 6063-T6 ALUM



10 HV ESSENTIAL HEADER
N.T.S. 6063-T6 ALUM



11A HV ADJ. FLOOR TRACK
N.T.S. 6063-T6 ALUM



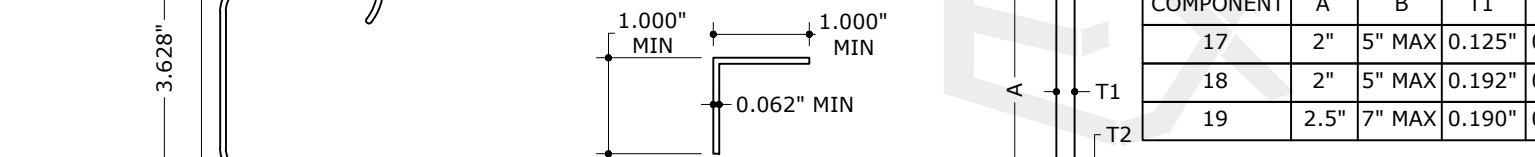
15 HV CORNER CENTERMATE
N.T.S. 6063-T6 ALUM



16 SIDE ANGLE
N.T.S. 6063-T6 ALUM

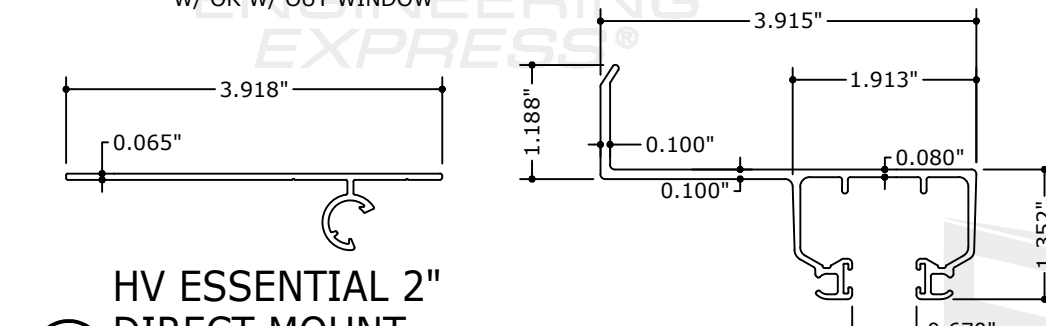


17 18 19 ALUM ANGLES
N.T.S. 6063-T6 ALUM

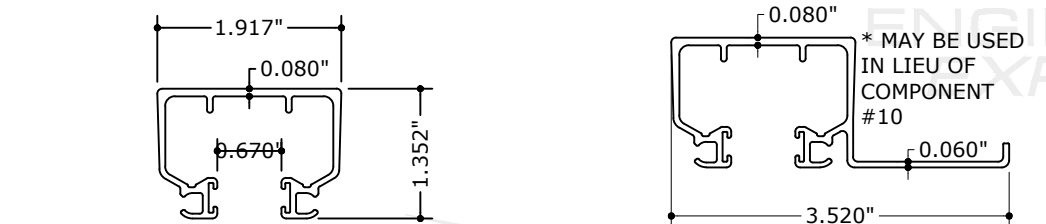


COMPONENT	A	B	T1	T2	BLADE QUALIFIED
17	2"	5" MAX	0.125"	0.125"	ALL
18	2"	5" MAX	0.192"	0.192"	ALL
19	2.5"	7" MAX	0.190"	0.190"	ALL

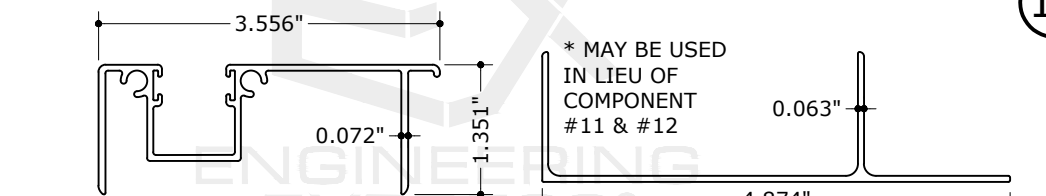
2 HV BLADE 2
N.T.S. 6063-T6 ALUM



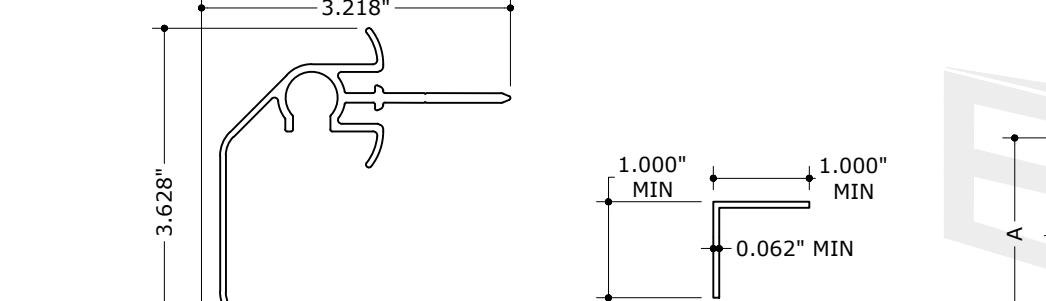
7 HV ESSENTIAL 2" BUILD-OUT
N.T.S. 6063-T6 ALUM



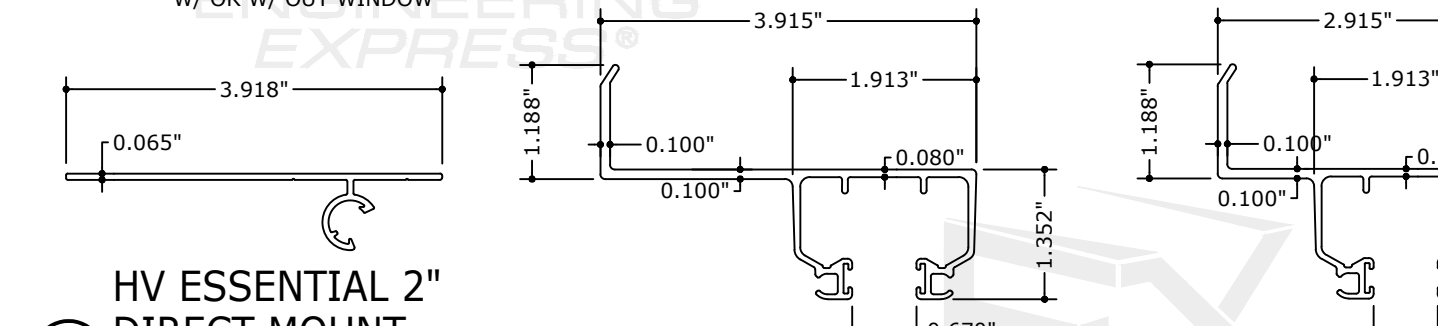
10A HV CEILING HEADER
N.T.S. 6063-T6 ALUM



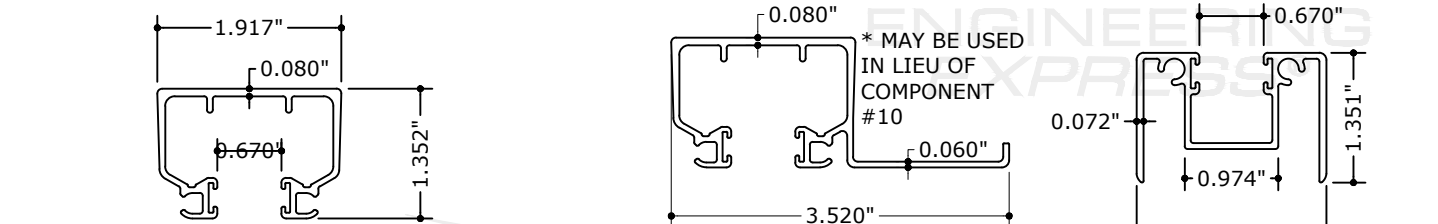
12A HV ADJ. ADAPTOR W/ LIP
N.T.S. 6063-T6 ALUM



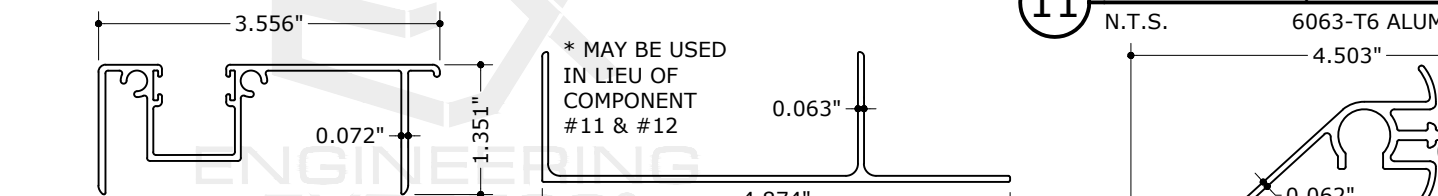
3 HV UNIVERSAL FLOATER
N.T.S. 6063-T6 ALUM



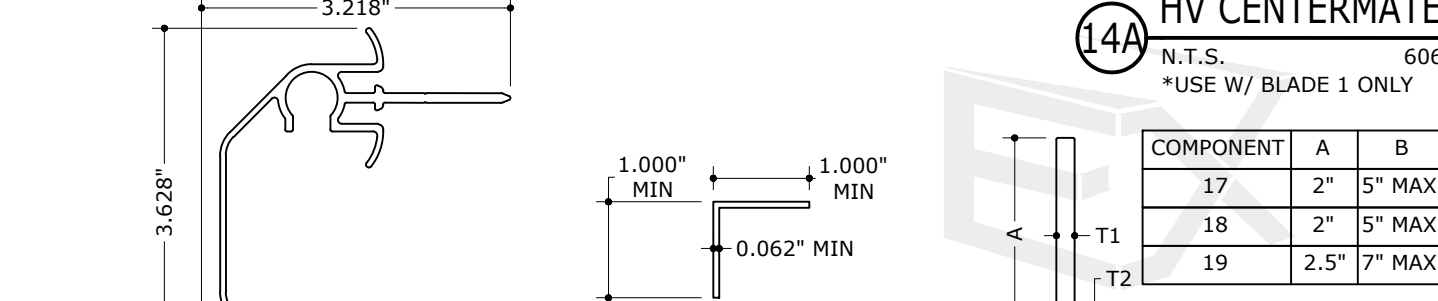
8 HV ESSENTIAL 1" BUILD-OUT
N.T.S. 6063-T6 ALUM



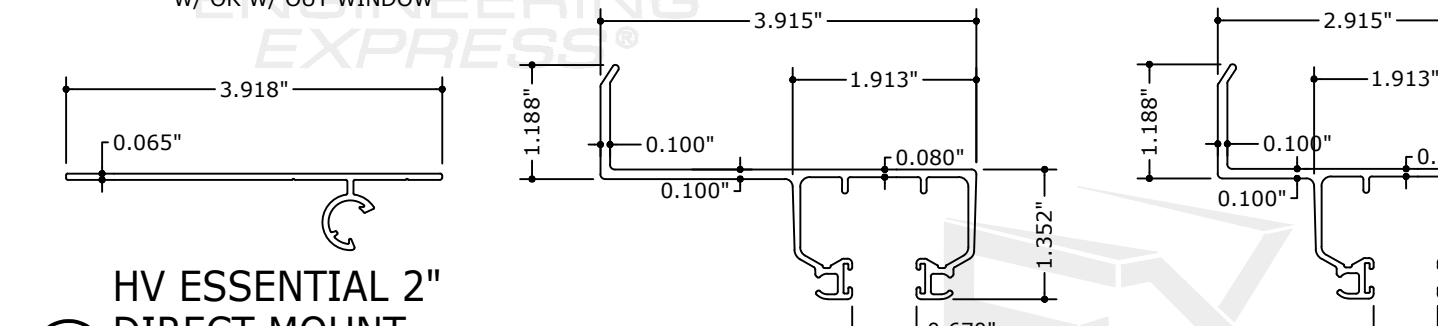
11 HV ESSENTIAL ADJ. ADAPTOR W/ FELT
N.T.S. 6063-T6 ALUM



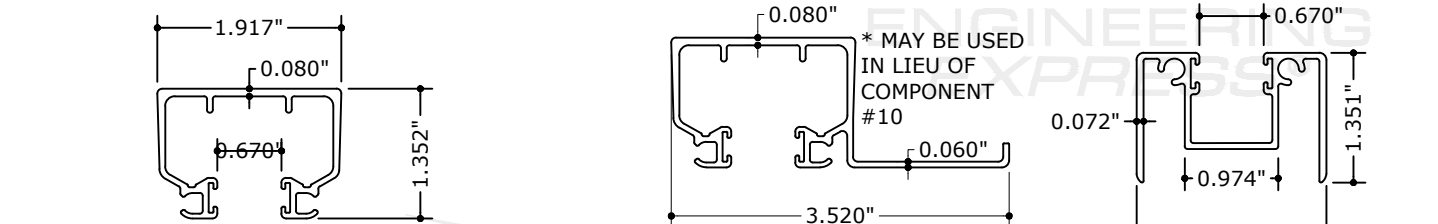
14A HV CENTERMATE
N.T.S. 6063-T6 ALUM
*USE W/ BLADE 1 ONLY



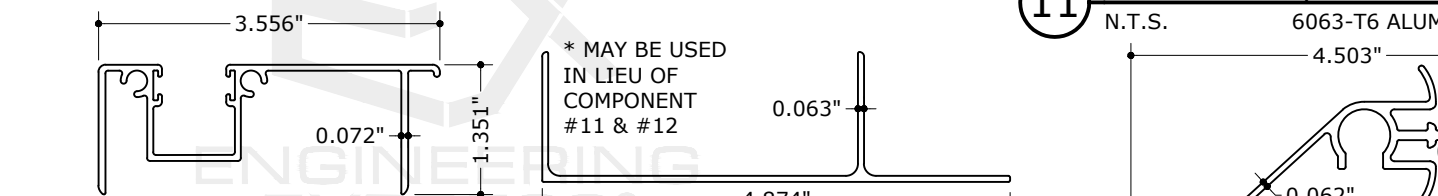
4 HV ESSENTIAL 3/8" DIRECT MOUNT
N.T.S. 6063-T6 ALUM



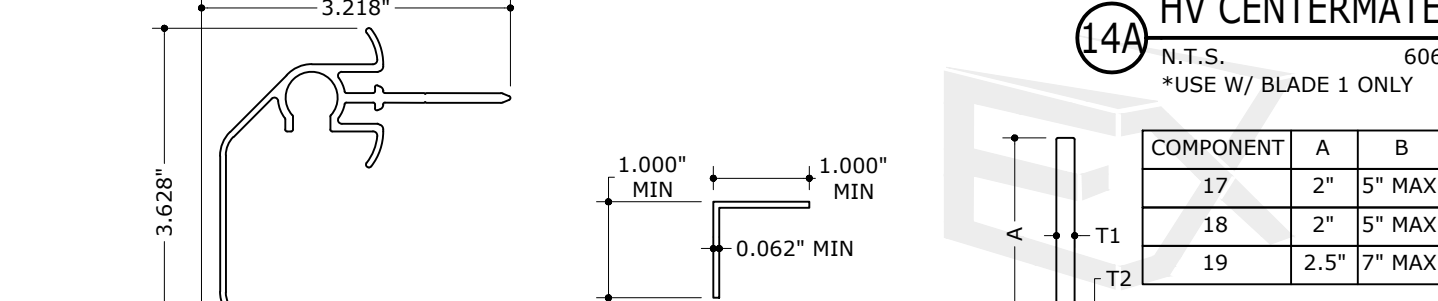
9 HV ESSENTIAL 3/8" BUILD-OUT
N.T.S. 6063-T6 ALUM



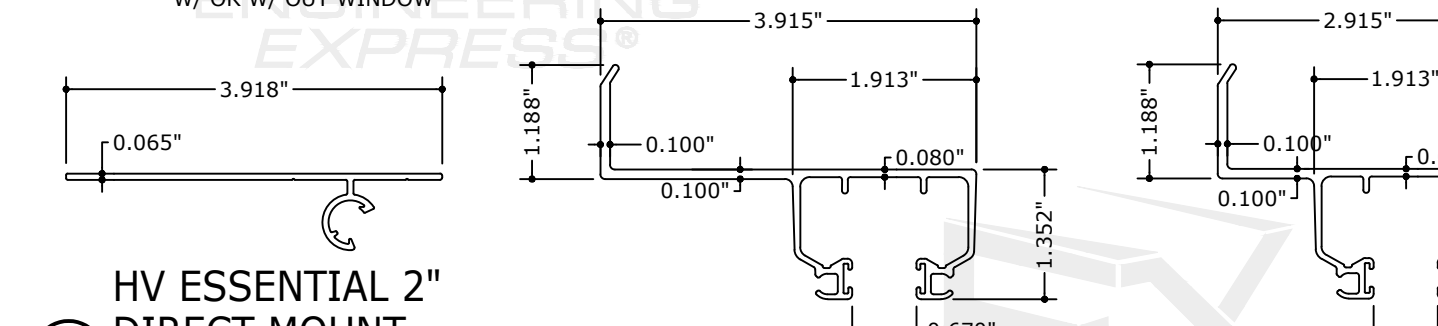
12 HV ESSENTIAL ADJ. ADAPTOR W/ LIP
N.T.S. 6063-T6 ALUM



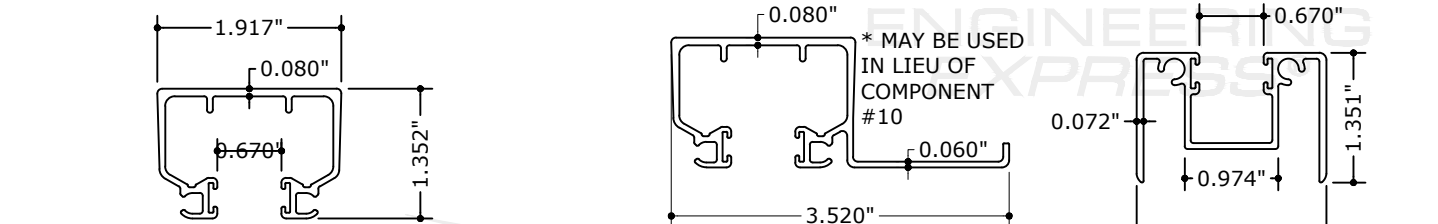
14B HV FLOATING CENTERMATE
N.T.S. 6063-T6 ALUM
*USE W/ BLADE 1 ONLY



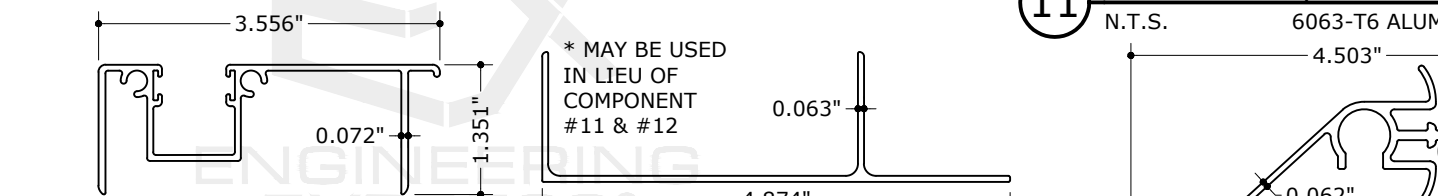
5 HV ESSENTIAL 1" DIRECT MOUNT
N.T.S. 6063-T6 ALUM



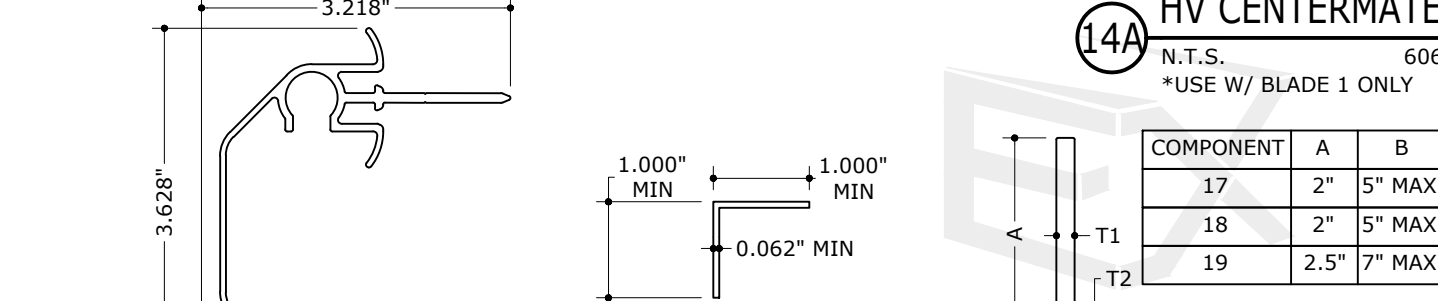
9A HV HEADER/SILL
N.T.S. 6063-T6 ALUM



11C HV WALK OVER TRACK
N.T.S. 6063-T6 ALUM



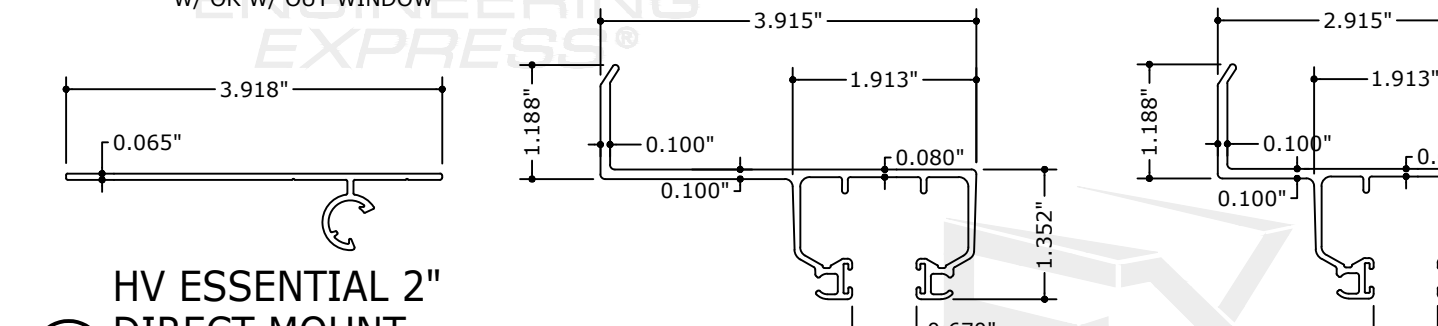
13 HV ESSENTIAL FLAT CENTERMATE
N.T.S. 6063-T6 ALUM



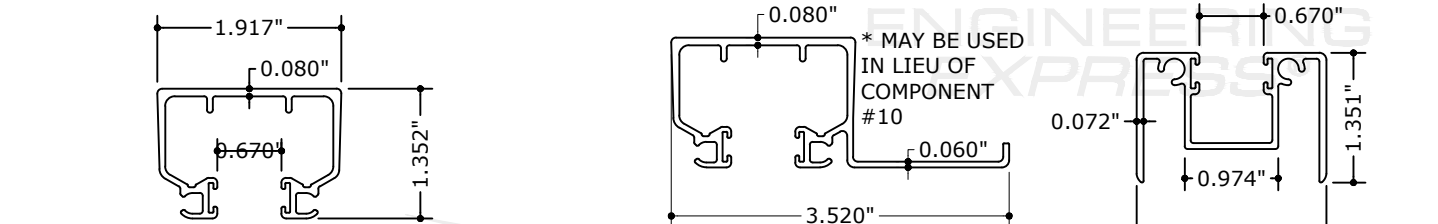
20 CORNER POST
N.T.S. 6063-T6 ALUM



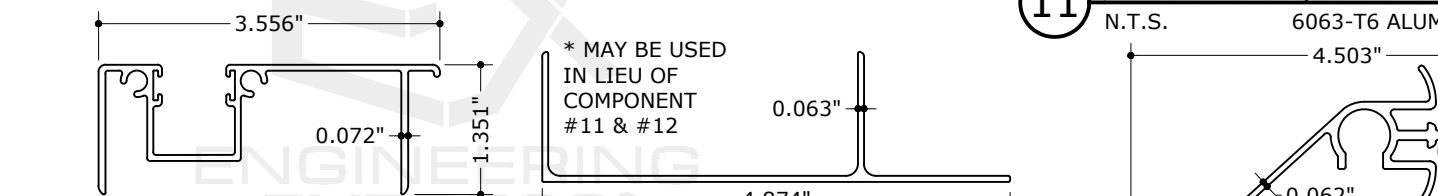
5A HV 90°/180° STARTER
N.T.S. 6063-T6 ALUM



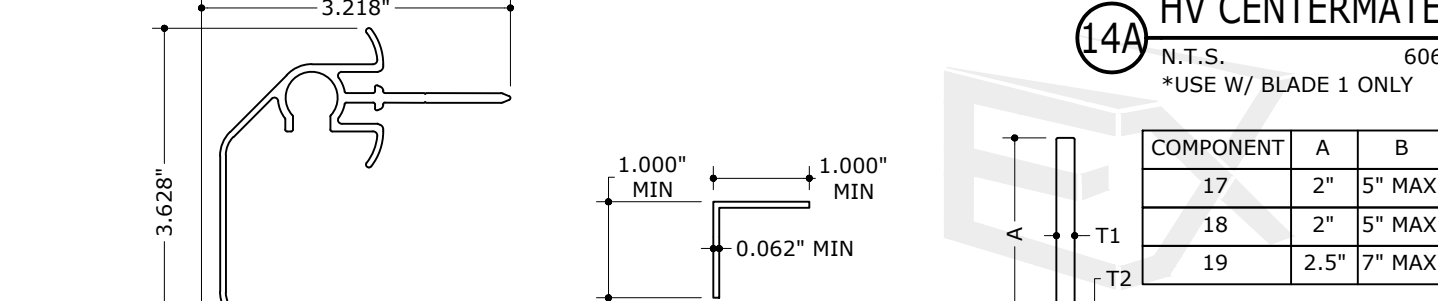
9A HV HEADER/SILL
N.T.S. 6063-T6 ALUM



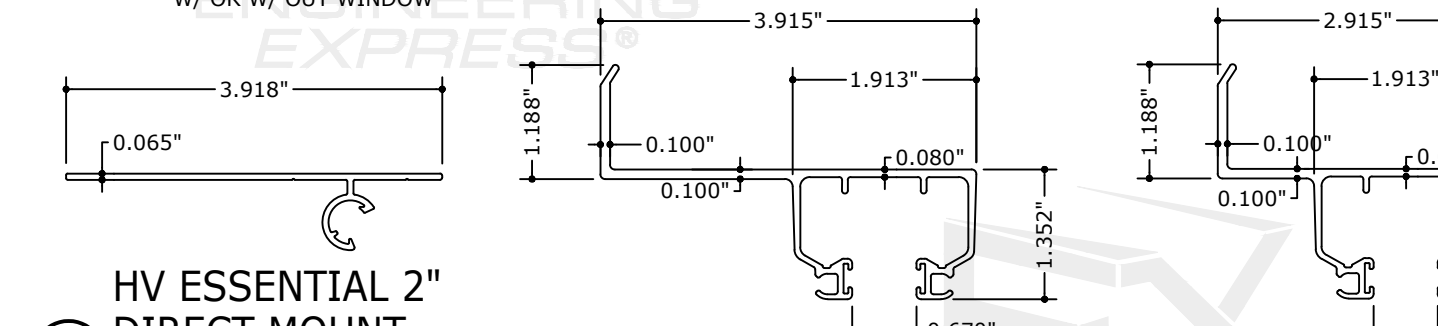
11D HV TRENCH TRACK
N.T.S. 6063-T6 ALUM



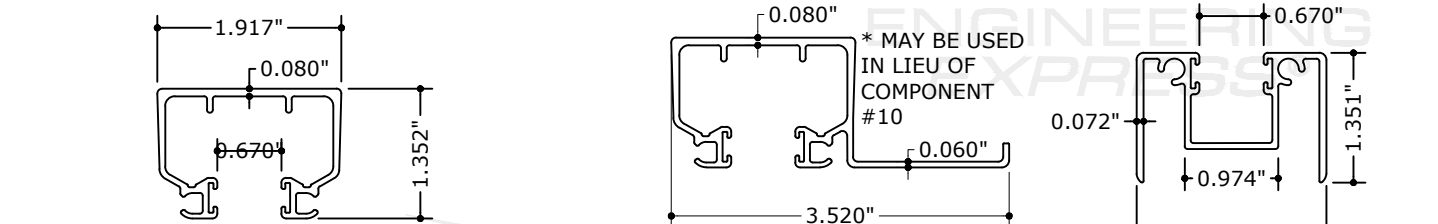
24 HV LOCK
N.T.S. 6063-T6 ALUM
*USE W/ BLADE 1 ONLY



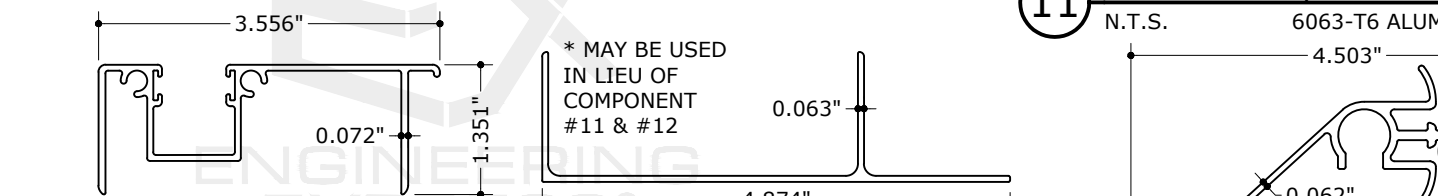
6 HV ESSENTIAL 2" DIRECT MOUNT
N.T.S. 6063-T6 ALUM



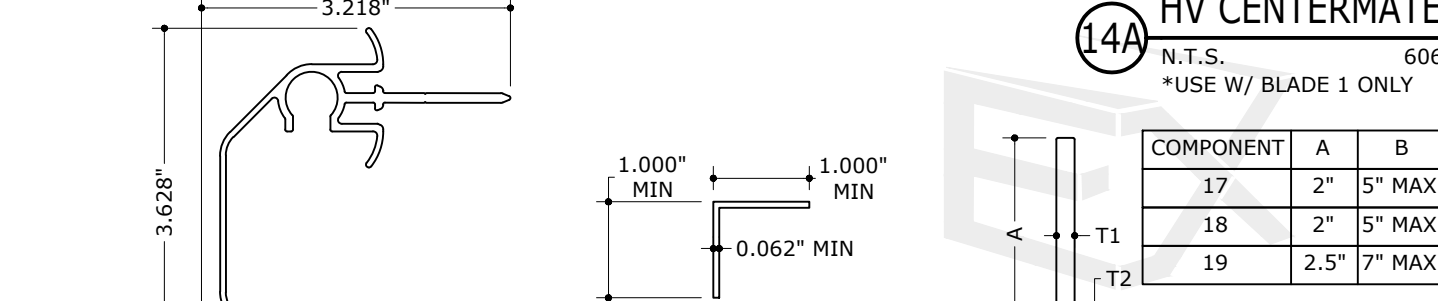
7 HV ESSENTIAL 2" BUILD-OUT
N.T.S. 6063-T6 ALUM



8 HV ESSENTIAL 1" BUILD-OUT
N.T.S. 6063-T6 ALUM



9 HV ESSENTIAL 3/8" BUILD-OUT
N.T.S. 6063-T6 ALUM



10 HV ESSENTIAL HEADER
N.T.S. 6063-T6 ALUM



10A HV CEILING HEADER
N.T.S. 6063-T6 ALUM



11 HV ESSENTIAL ADJ. ADAPTOR W/ FELT
N.T.S. 6063-T6 ALUM



11A HV ADJ. FLOOR TRACK
N.T.S. 6063-T6 ALUM



11C HV WALK OVER TRACK
N.T.S. 6063-T6 ALUM



11D HV TRENCH TRACK
N.T.S. 6063-T6 ALUM



12 HV ESSENTIAL ADJ. ADAPTOR W/ LIP
N.T.S. 6063-T6 ALUM



12A HV ADJ. ADAPTOR W/ LIP
N.T.S. 6063-T6 ALUM



13 HV ESSENTIAL FLAT CENTERMATE
N.T.S. 6063-T6 ALUM



14A HV CENTERMATE
N.T.S. 6063-T6 ALUM
*USE W/ BLADE 1 ONLY



14B HV FLOATING CENTERMATE
N.T.S. 6063-T6 ALUM
*USE W/ BLADE 1 ONLY



15 HV CORNER CENTERMATE
N.T.S. 6063-T6 ALUM



16 SIDE ANGLE
N.T.S. 6063-T6 ALUM



17 18 19 ALUM ANGLES
N.T.S. 6063-T6 ALUM



20 CORNER POST
N.T.S. 6063-T6 ALUM

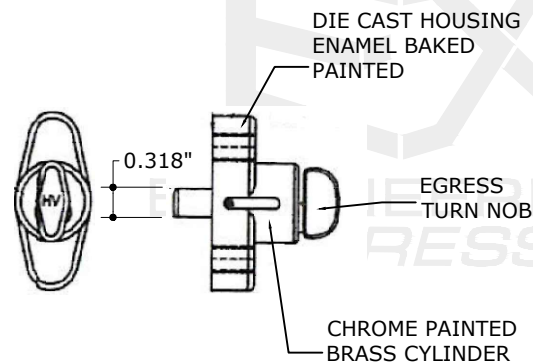
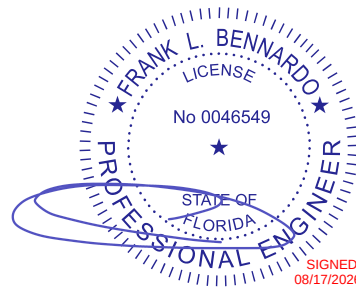


24 HV LOCK
N.T.S. 6063-T6 ALUM
*USE W/ BLADE 1 ONLY

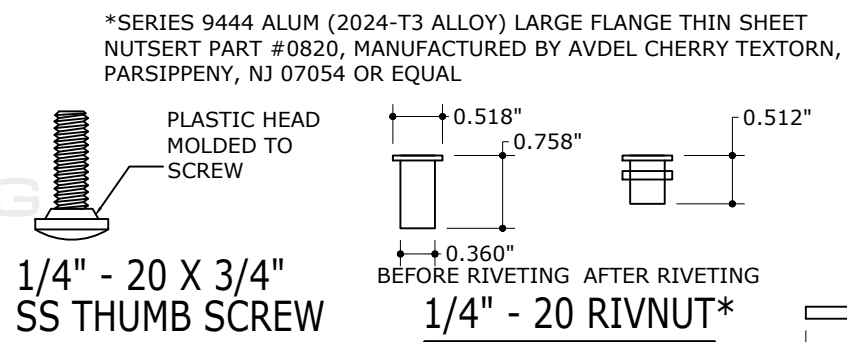


BLADE 1, 1A & 2 COMPONENTS (CONT'D)

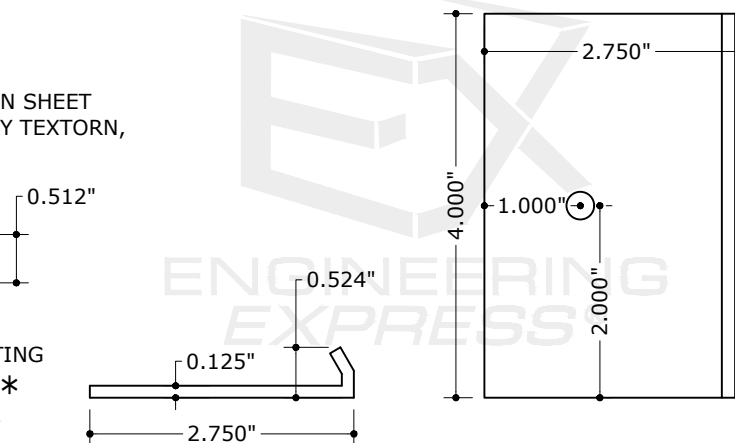
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PE# 0046549 CA# 9885



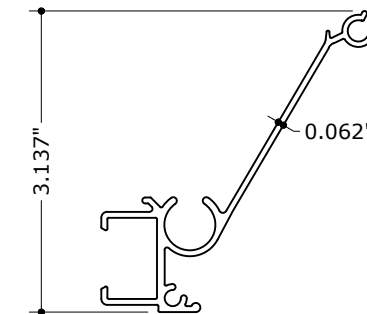
25 HV EGRESS LOCK
N.T.S.
*USE W/ BLADE 1 ONLY



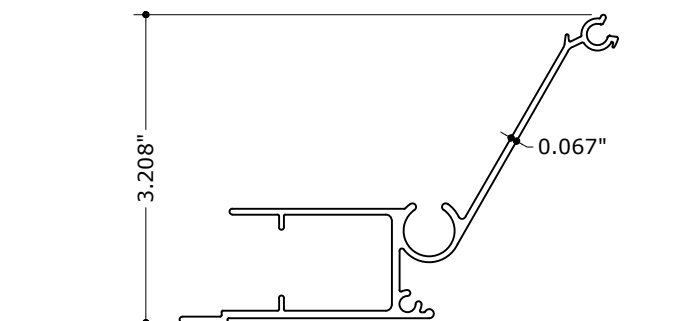
26 HV ALTERNATIVE LOCK
N.T.S.
*USE W/ BLADE 1 ONLY



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



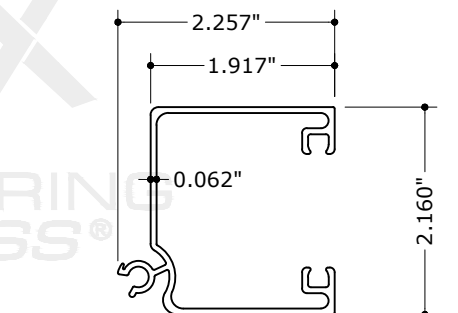
28 HV MALE "T" LOCK CENTERMATE
N.T.S.
*USE W/ BLADE 1 ONLY
6063-T6 ALUM



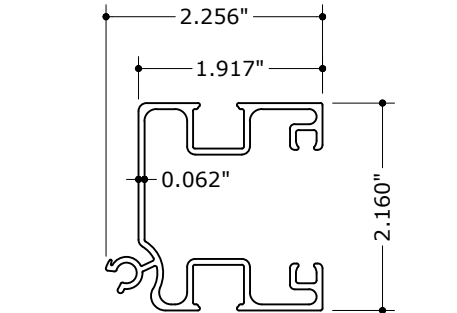
29 HV FEMALE "T" LOCK CENTERMATE
N.T.S.
*USE W/ BLADE 1 ONLY
6063-T6 ALUM



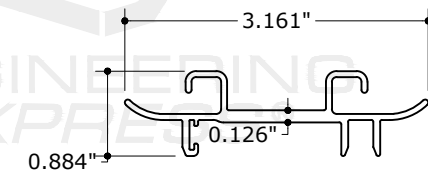
30 HV "T" LOCK
N.T.S.
*USE W/ BLADE 1 ONLY



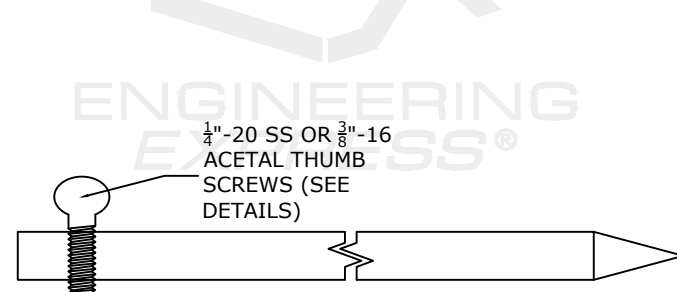
31 HD CENTERMATE W/
NO LOCKING ROD
N.T.S.
6063-T6 ALUM



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



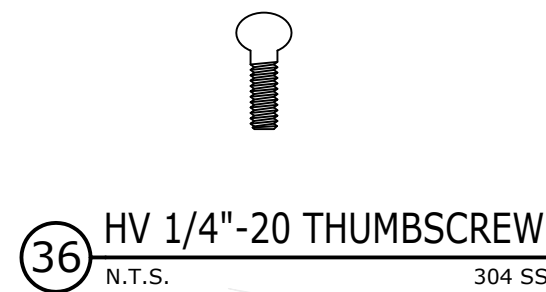
33 HD CENTERMATE
INSERT
N.T.S.
6063-T6 ALUM



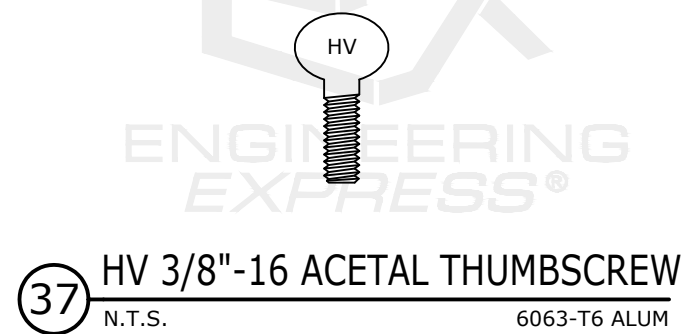
35 LOCKING ROD
N.T.S.
6063-T6 ALUM

*TOP/BOTTOM TRACK SHALL
HAVE RAINGUARD LIP TO HOLD
LOCK ROD

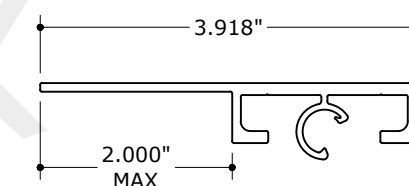
**LOCKING ROD MAY BE USED TO HOLD
SYSTEM IN OPEN POSITION WITHOUT
EXTENDING THROUGH RAINGUARD (VIA
FRICTION). WHEN LOCKING ROD IS
USED TO LOCK IN SYSTEM IN CLOSED
POSITION, ROD SHALL EXTEND
THROUGH RAINGUARD LIP, TYP.



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

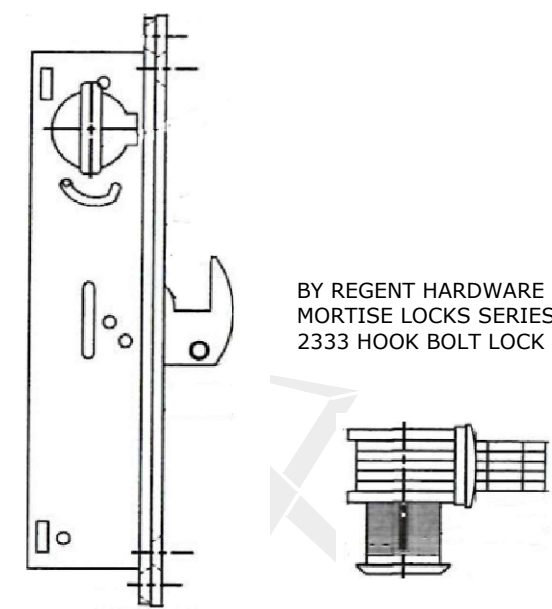


37 HV 3/8"-16 ACETAL THUMBSCREW
N.T.S.
6063-T6 ALUM



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

FL 32030.2

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BERTHA HV ESSENTIAL ACCORDION SHUTTER
FLORIDA BUILDING CODE NINTH EDITION (2026)
FLORIDA STATEWIDE APPROVAL (FSA FL #32030.2)

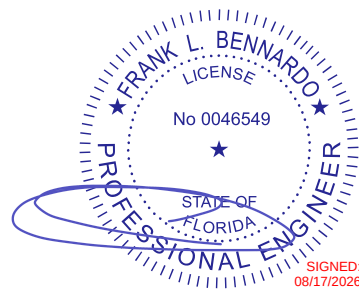
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2020 FBC (20-31270)	CCB	FLB	09/02/20
2023 FBC (23-65177)	MRT	RWN	10/09/23
2026 FBC UPDATE	MEF	CCB	07/13/26

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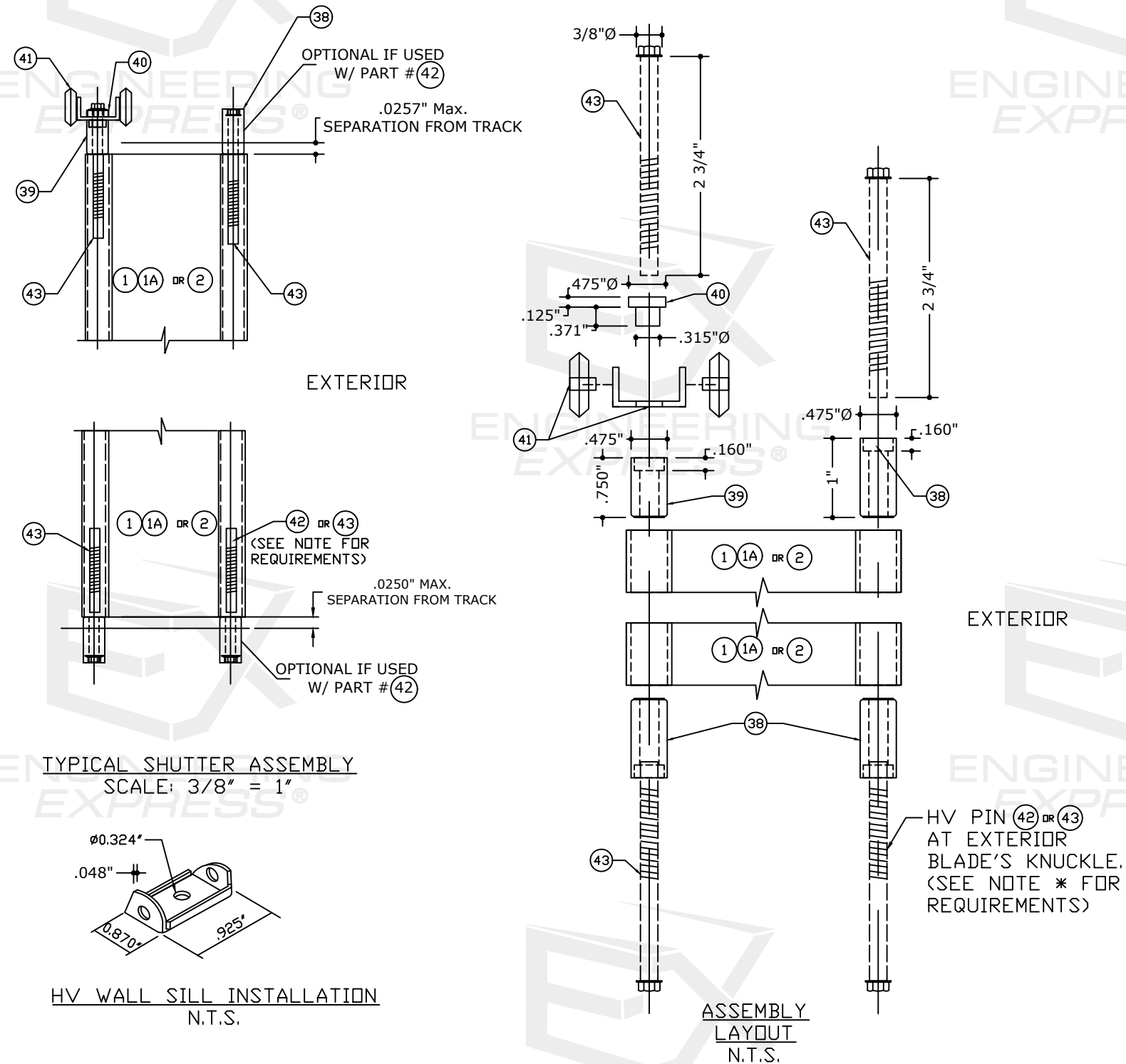
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 FLORIDA BUILDING CODE NINTH EDITION (2026)
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-	-	-	-

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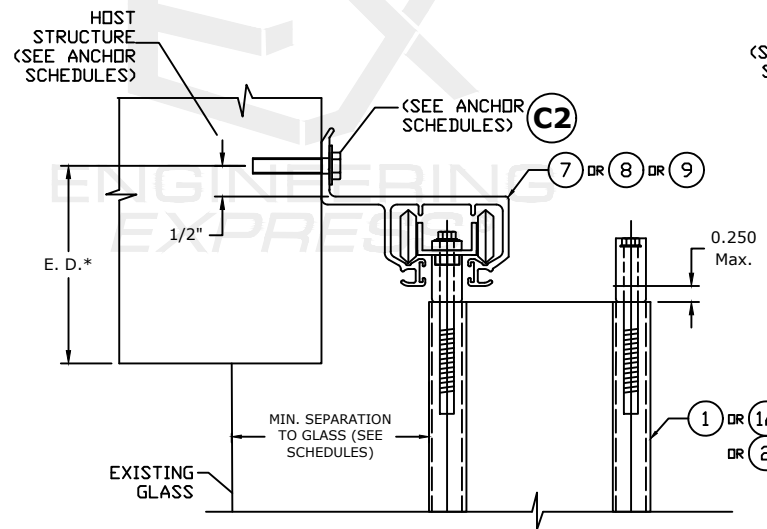
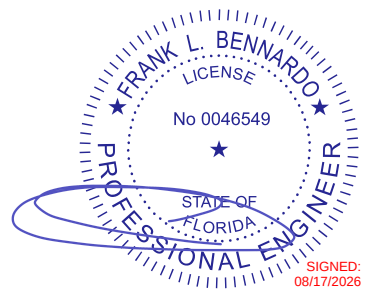
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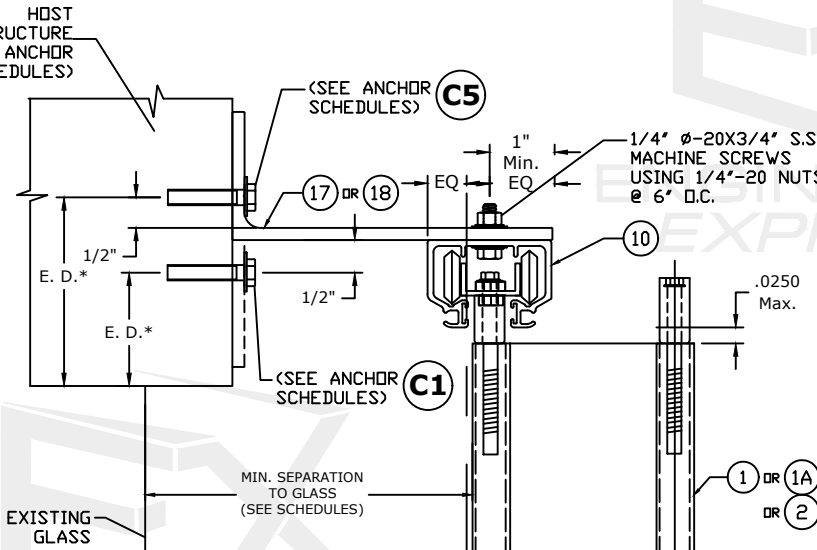


SECTION DETAILS - ALL BLADE OPTIONS

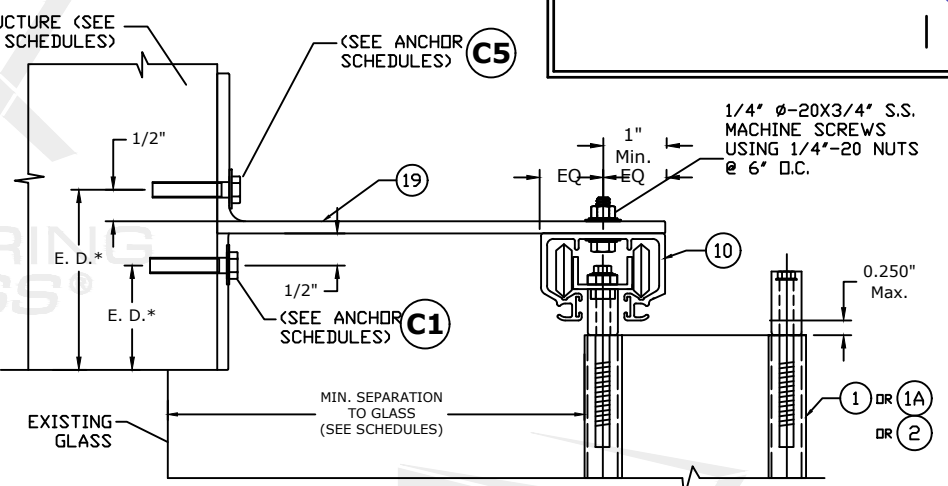
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PE# 0046549 CA# 9885



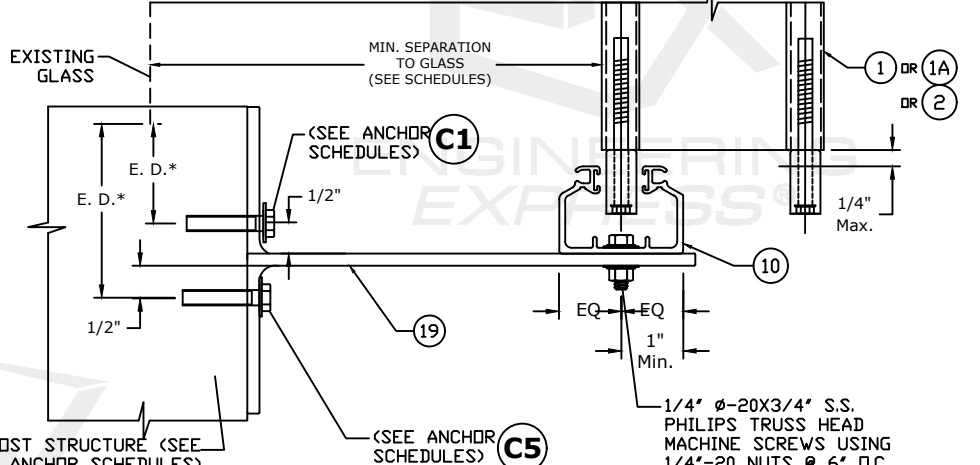
WALL HEADER INSTALLATION
*ONLY APPROVED FOR BLADE 1 OR 1A



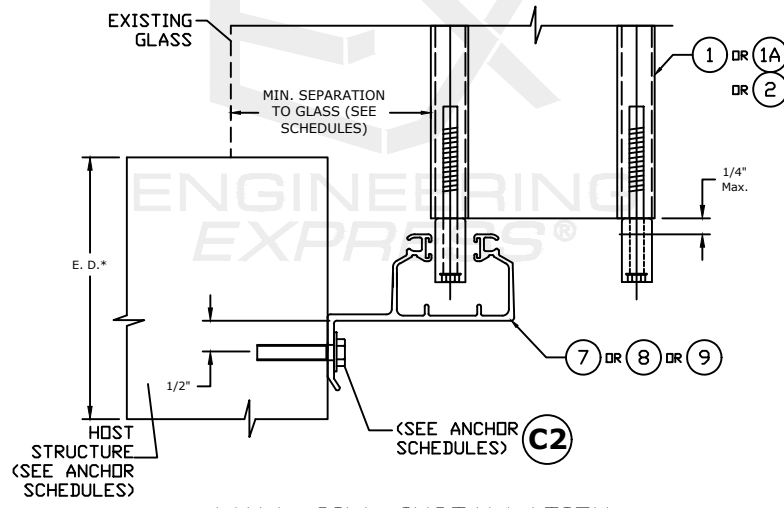
ALT. WALL HEADER INSTALLATION



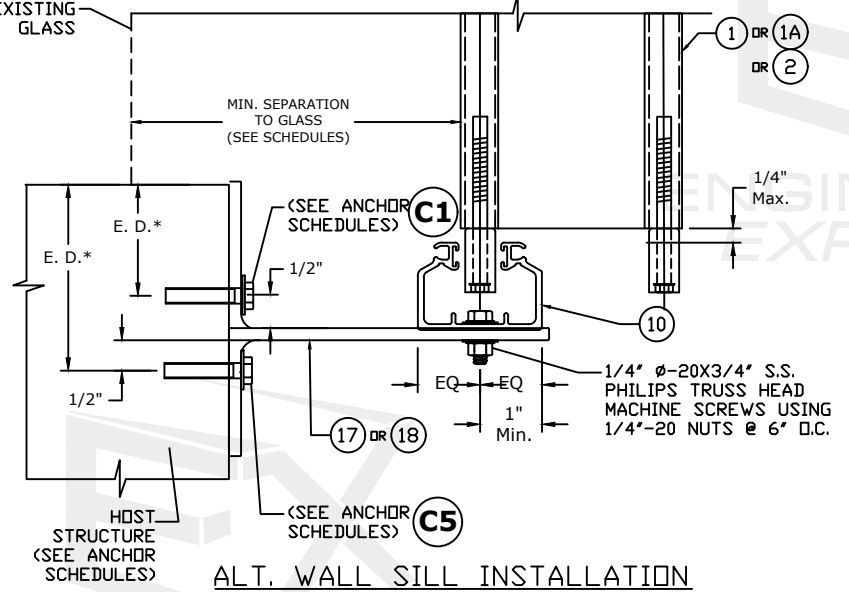
ALT. WALL HEADER INSTALLATION



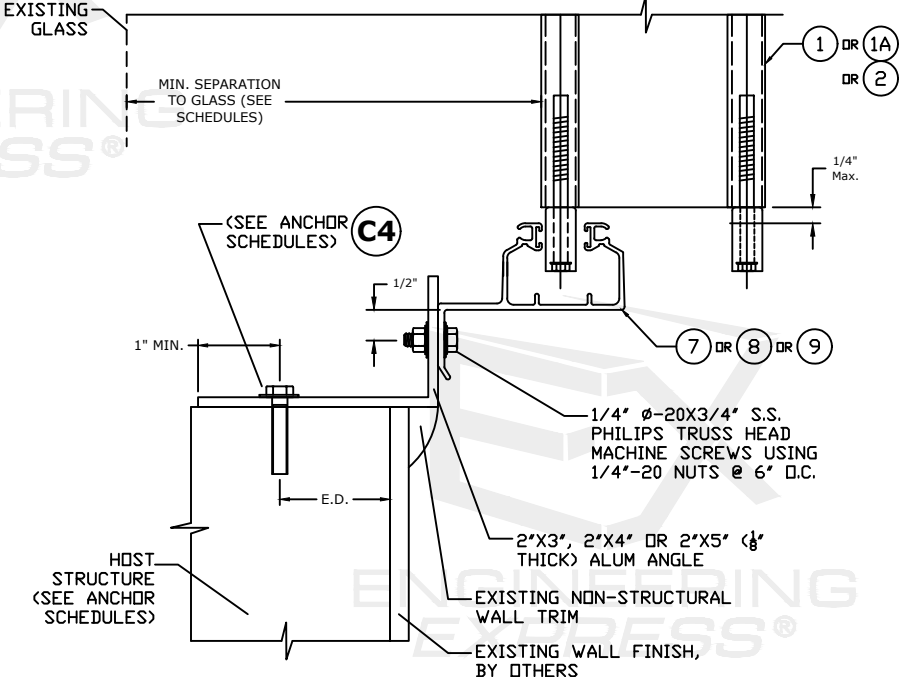
ALT. WALL SILL INSTALLATION



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



ALT. WALL SILL INSTALLATION



KEYSTONE MOUNT INSTALLATION

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DATE	09/02/20
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CHKD	FLB
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2023 FBC (23-65177)	MRT
2026 FBC UPDATE	MEF
09/09/23	RWN
10/09/23	CCB
07/13/26	CCB

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SECTION DETAILS - ALL BLADE OPTIONS (CONT'D)

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PE# 0046549 CA# 9885

FRANK L. BENNARDO

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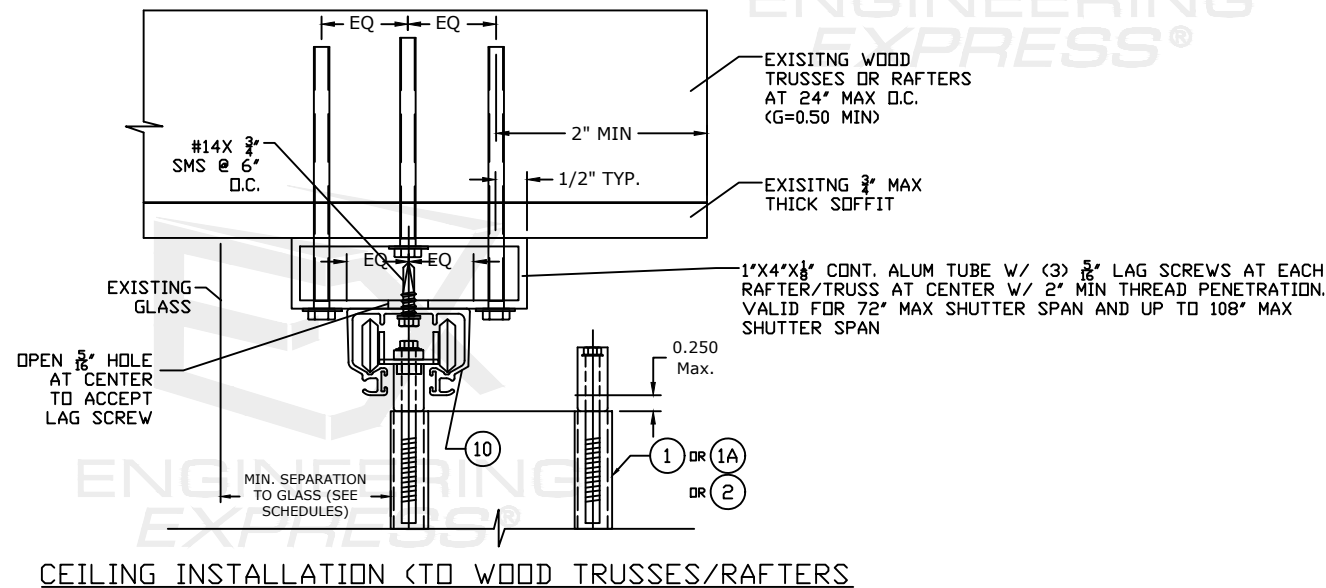
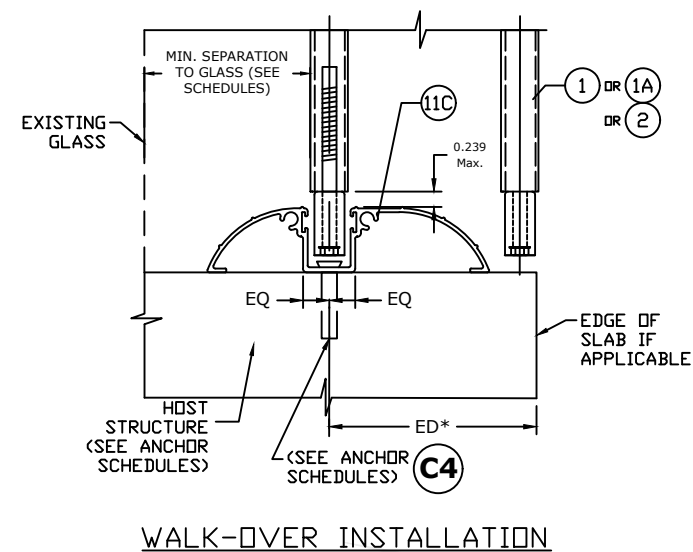
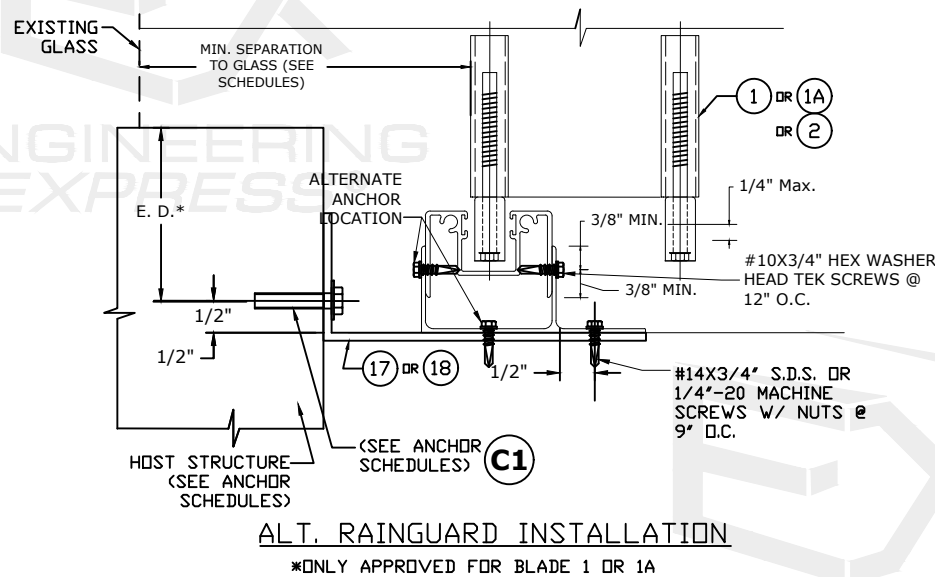
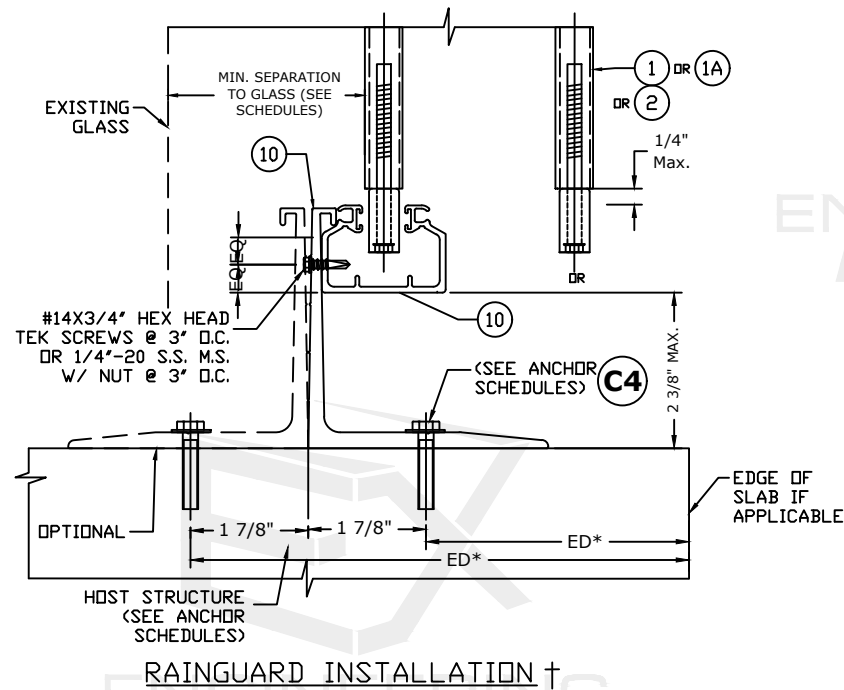
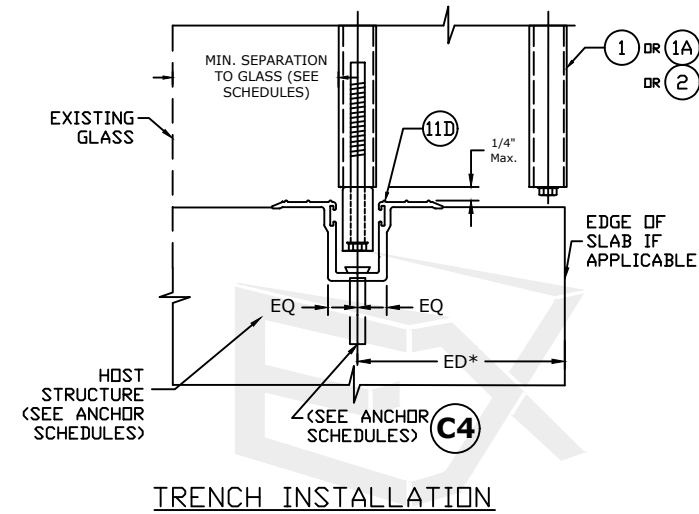
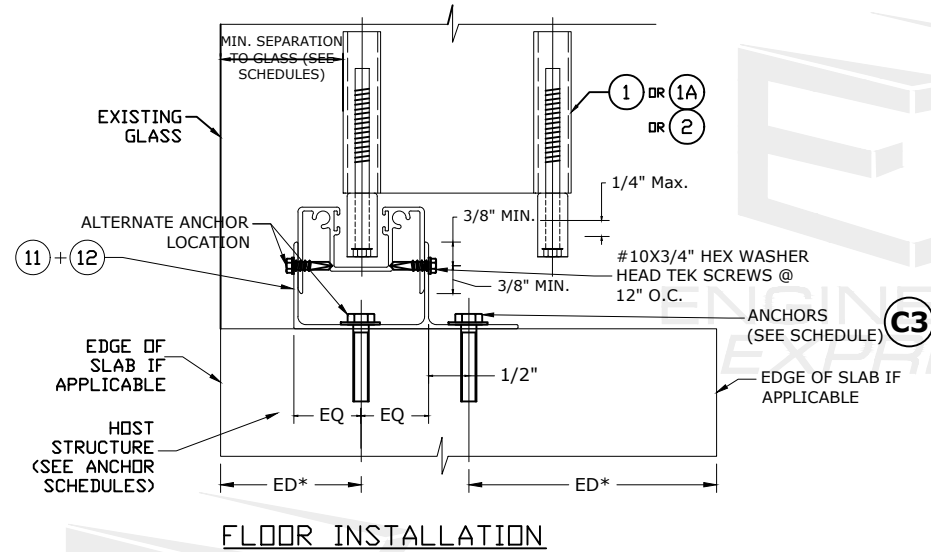
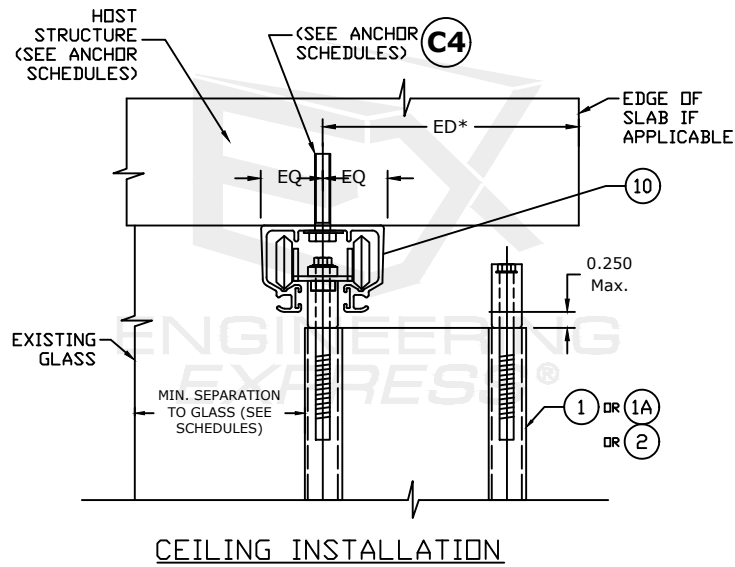
No 0046549

STATE OF FLORIDA

PROFESSIONAL ENGINEER

SIGNED: 08/17/2026

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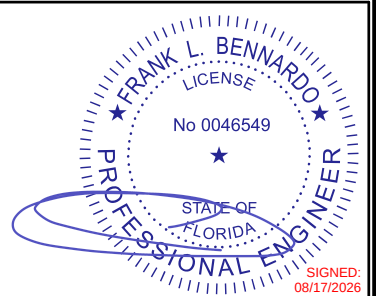
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2026 FBC UPDATE	07/13/26	MEF	CCB
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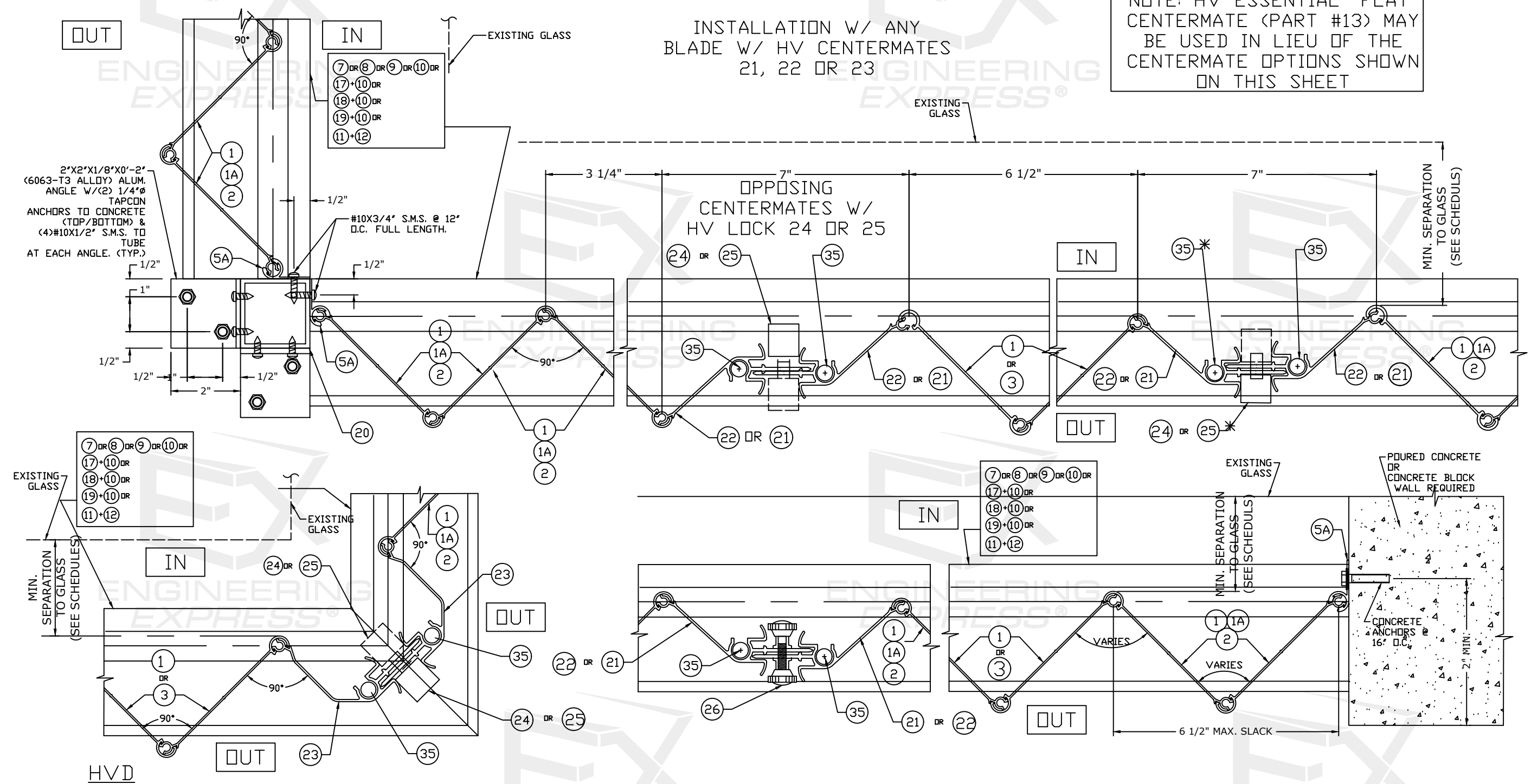
HV BLADE 1 - SECTION DETAILS

FRANK BENNARDO, P.E.
PE# 0046549 CA# 9885



INSTALLATION W/ ANY
BLADE W/ HV CENTERMATES
21, 22 OR 23

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



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Technical drawing of a window blind assembly, showing internal and external views with detailed callouts for components and dimensions.

Internal View (Left):

- OUT** (Left side)
- IN** (Right side)
- EXISTING GLASS** (Top right)
- 2"x2"x1/8"x0'-2"** (6063-T3 ALLOY) ALUM. ANGLE W/(2) 1/4"Ø TAPCON ANCHORS TO CONCRETE (TOP/BOTTOM) & (4)#10X1/2" S.M.S. TO TUBE AT EACH ANGLE. (TYP.)
- 1** (Hinge)
- 5A** (Bracket)
- 1/2"** (Dimension)
- 1"** (Dimension)
- 1/2"** (Dimension)
- 2"** (Dimension)
- 1A** (Hinge)
- 2** (Hinge)
- 20** (Bracket)
- 28** (Bracket)
- 29** (Bracket)
- 30** HV "T" LOCK (OUTSIDE)
- 35** (Bracket)
- 37** (Bracket)

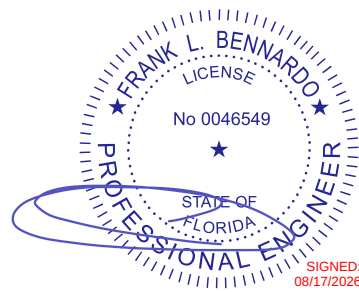
Internal View (Right):

- IN** (Left side)
- OUT** (Right side)
- 1** (Hinge)
- 1A** (Hinge)
- 2** (Hinge)
- 28** (Bracket)
- 29** (Bracket)
- 30** HV "T" LOCK (INSIDE)
- 35** (Bracket)
- 37** (Bracket)
- NYLON SCREW HEAD**
- 30** HV "T" LOCK (INSIDE)
- 26** 1/4" Ø-20X1" S.S.M.S. W/1/4"ØX5/8" RIVNUT.

Dimensions and Notes:

- 1/2"** (Dimension)
- 1"** (Dimension)
- 1/2"** (Dimension)
- 2"** (Dimension)
- #10X3/4" S.M.S. @ 12" O.C. FULL LENGTH.**
- MIN. SEPARATION TO GLASS (SEE SCHEDULES)**

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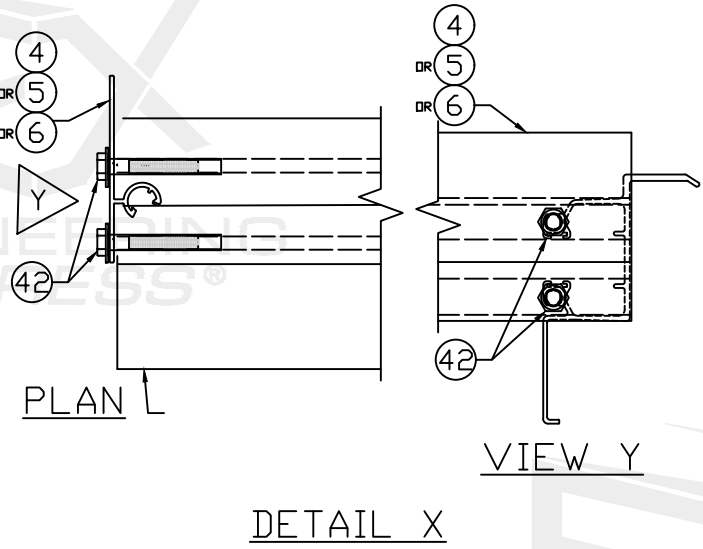
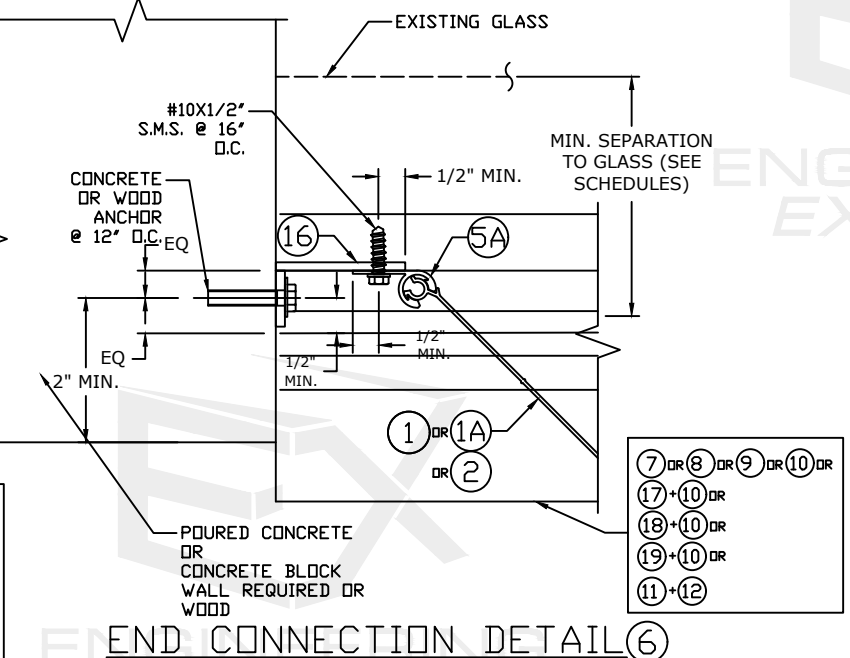
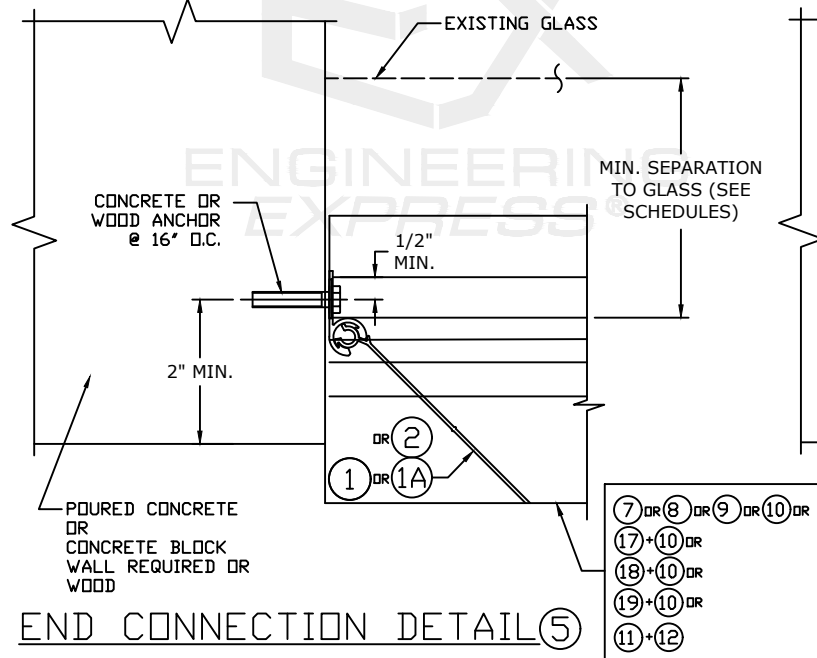
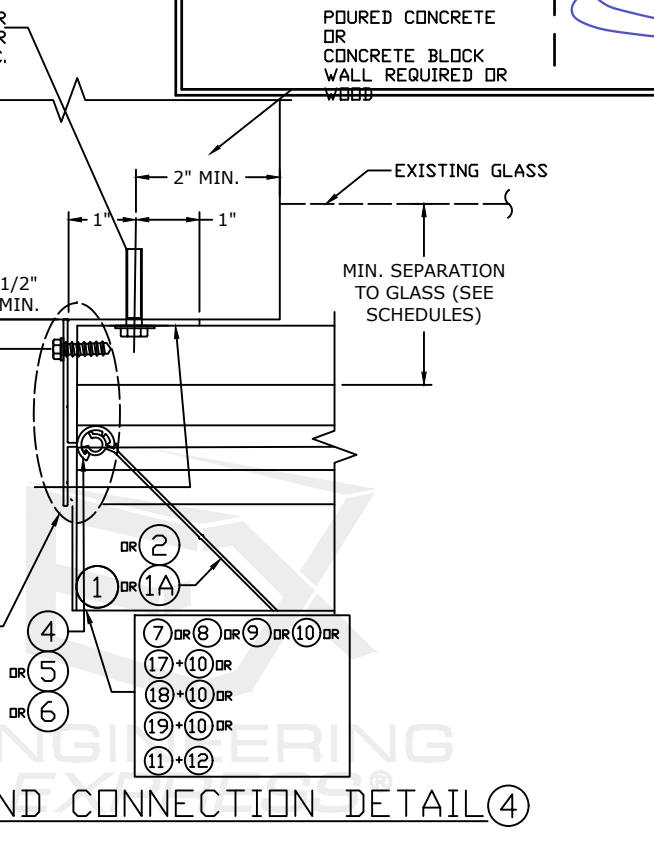
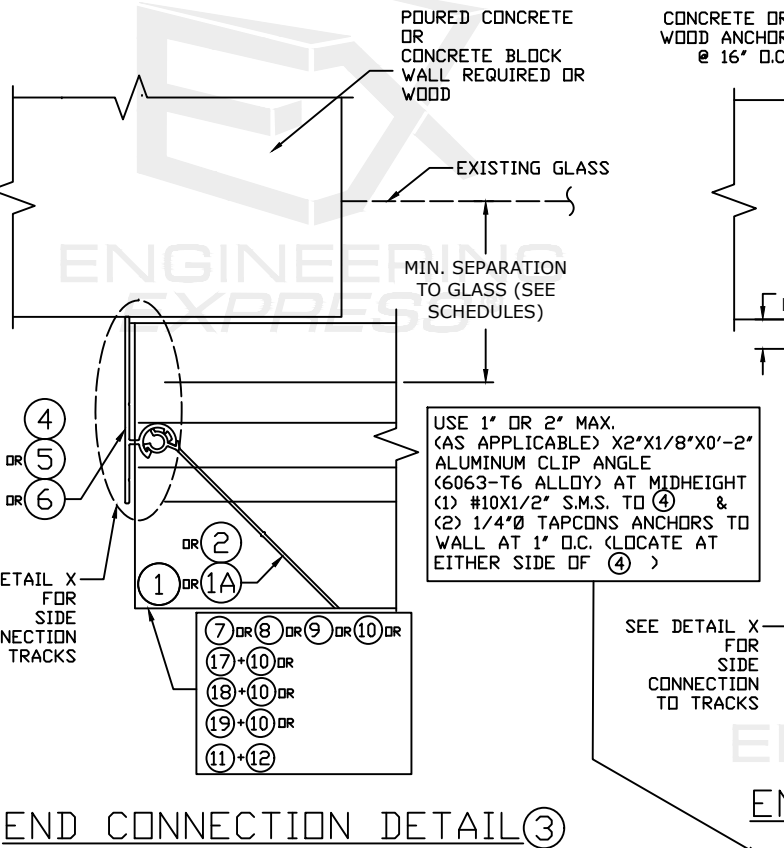
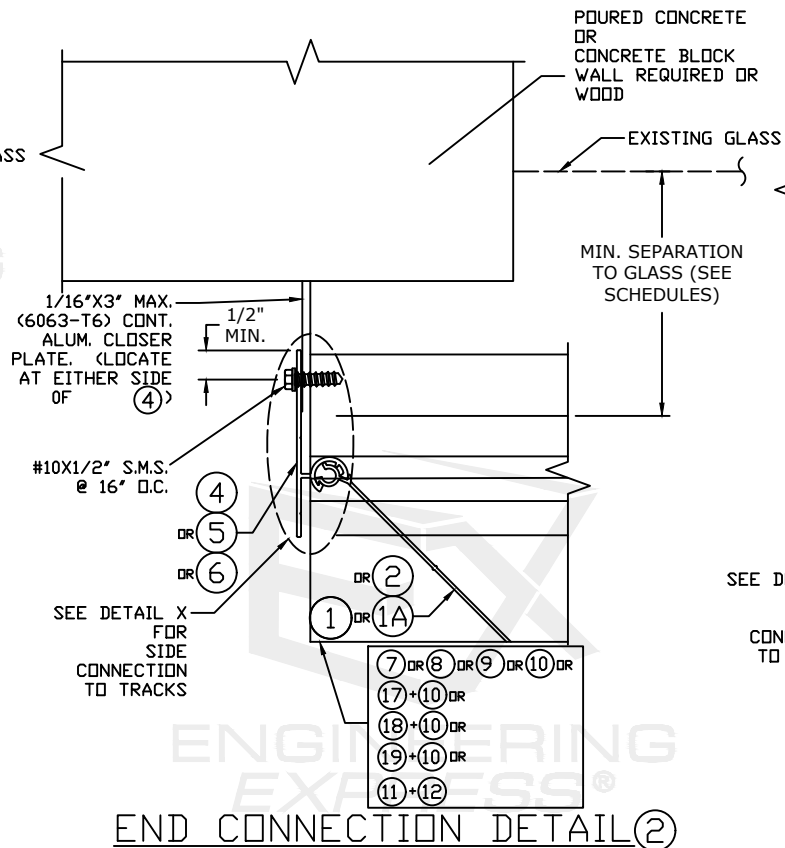
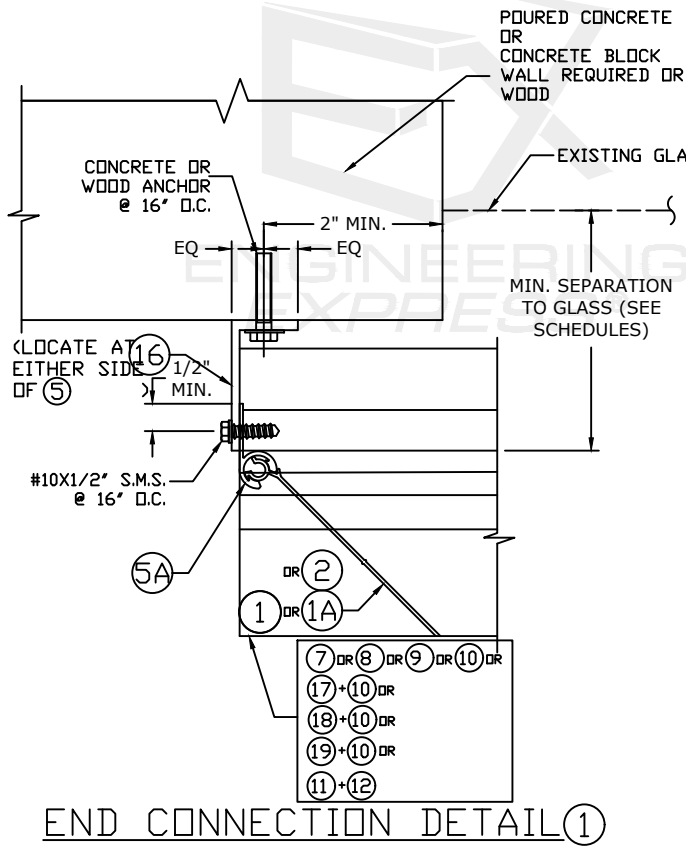
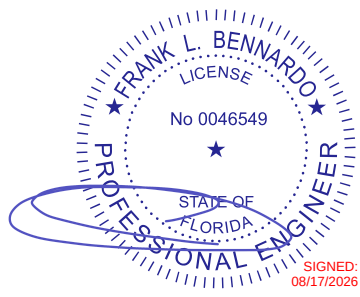
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END CONNECTION DETAILS (ALL BLADE OPTIONS)

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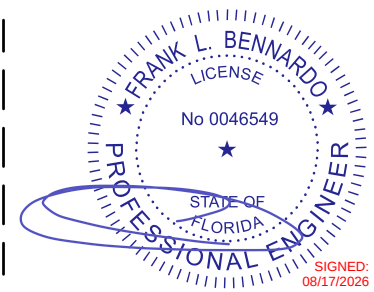
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CONNECTION TO METAL WALL STUDS (BLADE 1 ONLY)

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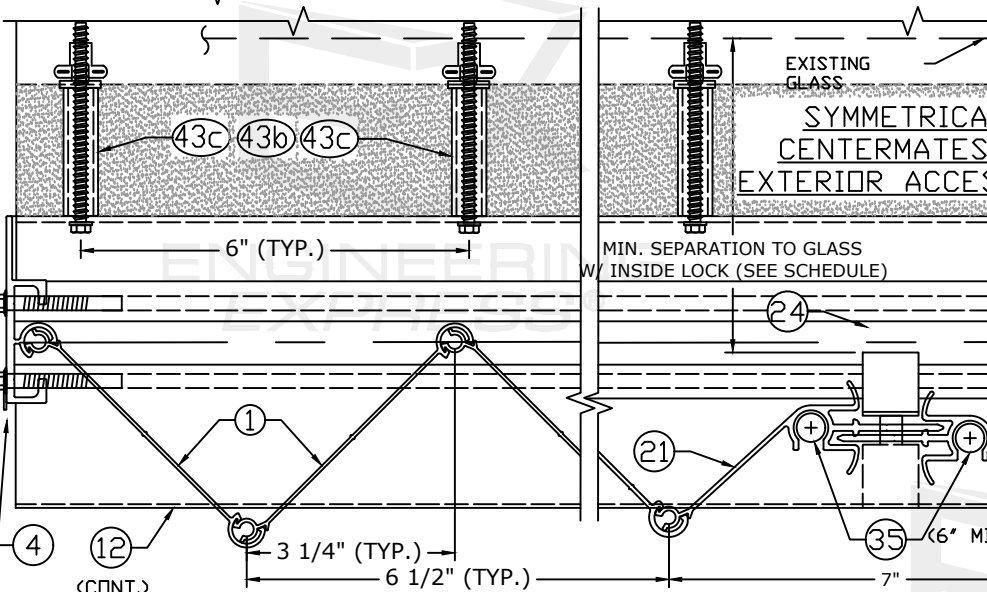
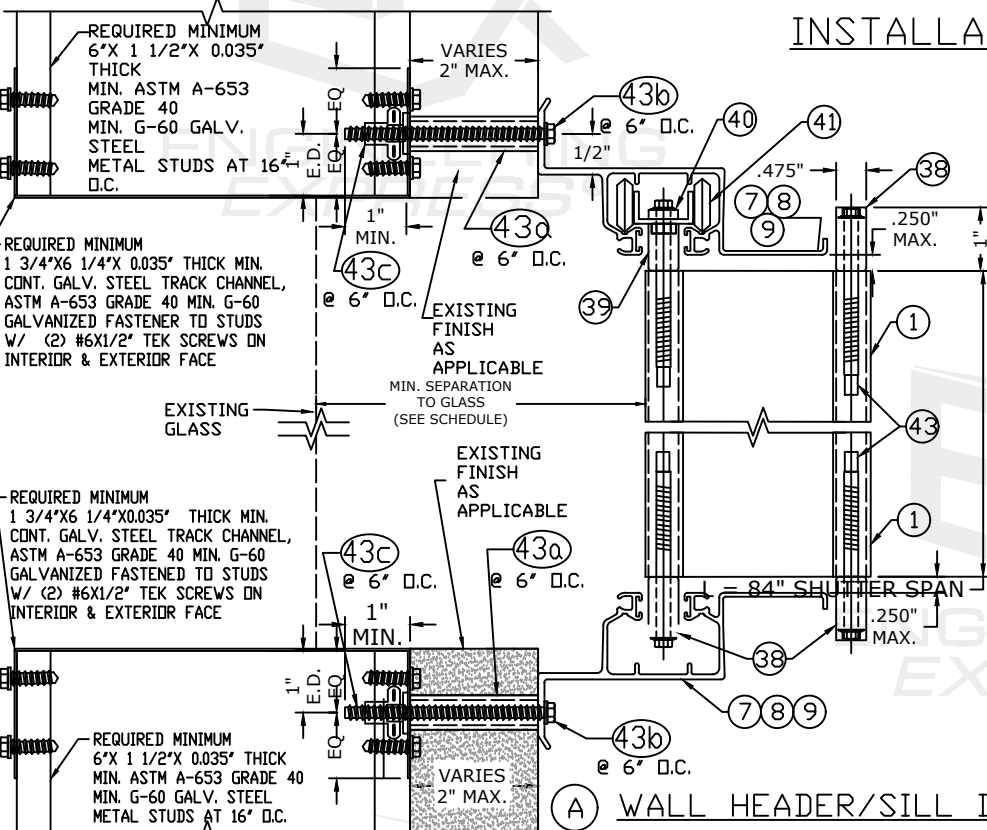
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INSTALLATIONS W/ ① HV BLADE & HV CENTERMATES ②① INTO METAL STUD WALLS *

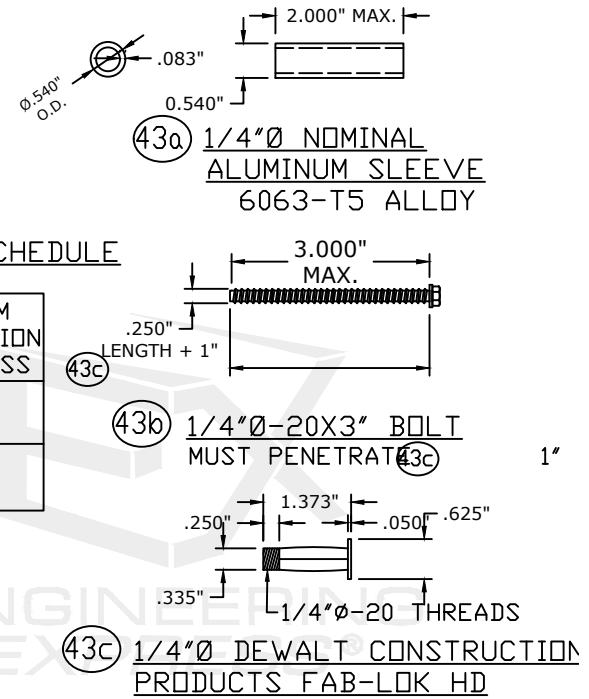
*LIMITATIONS AND CONDITIONS OF USE FOR BERTHA 1 HV BLADE INSTALLATION TO METAL STUD WALLS

1. MAX. A.S.D. DESIGN PRESSURE RATING: +75 p.s.f
2. MAX. SHUTTER SPAN: 84"
3. ALLOWED MOUNTING: ① ON THIS SHEET.
4. ONLY CENTERMATE ②① W/ ②④ HV LOCK ARE ALLOWED WITH ②① ARRANGED IN A SYMMETRICAL LAYOUT. USE OF ③⑤ (2) (6" LONG, MINIMUM) MUST ALWAYS BE INCLUDED AT EXTERIOR OR INTERIOR ACCESS SIDE OF CENTERMATES.

** BLADE SLACK DETAIL E IS VALID FOR CENTERMATE ②① APPLICATION WITH BLADE ①

SEPARATION GLASS SCHEDULE

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



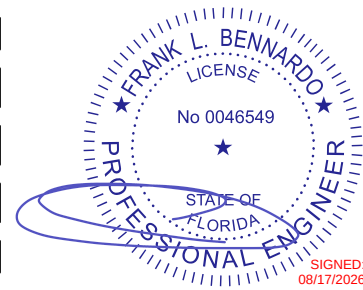
COMPONENTS

SCALE: 3/8" = 1"

VIEW Y
SIDE CONNECTION TO RACK

ANCHOR SCHEDULES - ALL BLADE OPTIONS

FRANK BENNARDO, P.E.
PE# 0046549 CA# 9885



FL 32030.2

EX ENGINEERING EXPRESS®

POSTAL ADDRESS:
2234 NORTH FEDERAL HWY #7664
BOCA RATON, FL 33431
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AMERICAN SHUTTER SYSTEMS ASSOCIATION, INC.

4268 WESTROADS DR.

WEST PALM BEACH, FL 33407

(800) 432-2204

BERTHA HV ESSENTIAL ACCORDION SHUTTLE

FLORIDA BUILDING CODE NINTH EDITION (2026)
FLORIDA STATEWIDE APPROVAL (FSA FL#32030.2)

REMARKS	DRWN	CHKD	DATE
2020:FBC (20-31270)	CCB	FLB	09/02/20
2023 FBC (23-65177)	MRT	RWN	10/09/23
2026:FBC UPDATE	MEF	CCB	07/13/26
-	-	-	-
-	-	-	-

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26-102890

SCALE: NTS UNLESS NOTED

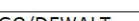
12

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 ULTRA CON WITH 1-3/4" EMBED (3000psi MIN CONC) 	40	16.0"	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"	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"	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"		4.5"	
	1/4" ELCO CRETEFLEX 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"	16.0"	13.5"	12.5"	16.0"
		50	16.0"	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"	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" CONN TYPE					Spans Up To 9'-8" CONN TYPE					Spans Up To 12'-0" 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"	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															
			<u>Spans Up To 6'-0"</u>					<u>Spans Up To 9'-8"</u>					<u>Spans Up To 12'-0"</u>					
			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"	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"	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"	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"	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"	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"	15.5"	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"	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"	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"	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"	16.0"	14.5"	13.5"	7.0"	6.0"	8.0"	11.0"	9.5"	5.5"	4.5"	5.5"	
	5/16" ELCO/DEWALT ULTRA CON 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"	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"	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"	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"	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"	16.0"	15.0"	8.5"	7.5"	9.0"	12.5"	10.5"	6.5"	5.5"	6.5"	

ANCHOR NOTES:

1. SPANS AND LOADS SHOWN HERE ARE FOR DETERMINING ANCHOR SACING ONLY. ALLOWABLE STORM SHUTTER SPANS FOR SPECIFIC LOADS MUST BE LIMITED TO THOSE SHOWN IN SPAN SCHEDULES.
 2. 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
 3. SEE MOUNTING SECTION DETAILS FOR IDENTIFICATION OF CONNECTION TYPE.
 4. 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.
 5. ALL CONCRETE ANCHORS SHALL BE INSTALLED TO NON-CRACKED CONCRETE ONLY.
 6. 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.
 7. WHERE EXISTING STRUCTURE IS WOOD FRAMING, WOOD FRAMING CONDITIONS VARY. FIELD VERIFY THAT FASTENERS ARE INTO ADEQUATE WOOD FRAMING MEMBERS. ATTACHMENT TO $\frac{1}{2}$ " MIN THICK CDX PLYWOOD SHALL BE $1/ \frac{1}{4}$ " ITW TAPCONS OR #14 WOOD SCREWS W/ $\frac{1}{4}$ " 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.
 8. 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.
 9. 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.
10. MINIMUM CONCRETE STRENGTHS ARE AS INDICATED IN ANCHOR SCHEDULE.
 11. 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

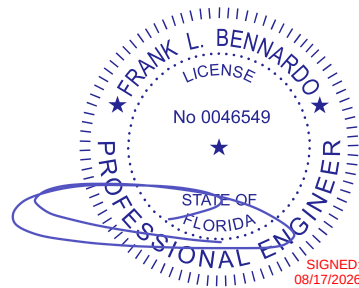
ALTERNATE ANCHOR NOTE:

FOR ALL 1/4" AND 5/16" DIAMETER ANCHOR OPTIONS LISTED IN THE ANCHOR SCHEDULES, AN EQUIVALENT DIAMETER HILLMAN/ALL-POINTS SOLID-SET ANCHOR (CARBON OR STAINLESS STEEL) MAY BE USED IN LIEU OF THE OPTION(S) LISTED SO LONG AS THE LISTED MINIMUM EMBEDMENT, EDGE DISTANCE AND SPACING ARE ACHIEVED

8/17/2026 11:49 AM COLBYBENNARDOPE w:\shared\projects\26-126-102889\work\2026 fbc\2 - drawings & cad\26-102890b - fl32030.2 - dwg.dwg

ANCHOR SCHEDULES - ALL BLADE OPTIONS (CONT'D)

FRANK BENNARDO, P.E.
PE# 0046549 CA# 9885



FL 32030.2

HOST STRUCT.	ANCHOR	LOAD (psf)	1" MIN EDGE DISTANCE														
			Spans Up To 6'-0"					Spans Up To 9'-8"					Spans Up To 12'-0"				
			CONN TYPE					CONN TYPE					CONN TYPE				
HOLLOW CONCRETE BLOCK	1/4" ITW TAPCON WITH 1-1/4" EMBED	40	9.0"	9.0"	4.0"	4.0"	9.0"	5.5"	5.5"			5.5"	4.5"	4.5"			3.0"
		50	7.0"	7.0"	3.0"	3.0"	7.0"	4.5"	4.5"			3.0"	3.0"	3.0"			
		60	6.0"	6.0"			6.0"	3.0"	3.5"								
		70	5.0"	5.0"			5.0"										
	1/4" ELCO/DEWALT ULTRAICON WITH 1-1/4" EMBED	80	4.5"	4.5"			3.0"										
		40	14.0"	14.0"	7.5"	7.5"	14.0"	8.5"	8.5"	4.0"	4.0"	8.5"	6.5"	7.0"	3.0"		5.0"
		50	11.0"	11.0"	6.0"	6.0"	11.0"	6.5"	6.5"	3.0"		5.0"	4.5"	5.0"			3.0"
		60	9.0"	9.0"	4.5"	4.5"	9.0"	5.0"	5.5"			3.0"	3.5"	3.5"			
		70	8.0"	8.0"	3.5"	3.5"	7.5"	4.0"	4.0"			3.0"					
		80	6.5"	7.0"	3.0"		5.0"	3.5"	3.0"								

HOST STRUCT.	ANCHOR	LOAD (psf)	2-1/2" MIN EDGE DISTANCE														
			Spans Up To 6'-0"					Spans Up To 9'-8"					Spans Up To 12'-0"				
			CONN TYPE					CONN TYPE					CONN TYPE				
HOLLOW CONCRETE BLOCK	1/4" ITW TAPCON WITH 1-1/4" EMBED	40	12.5"	12.5"	7.5"	7.5"	12.5"	7.5"	7.5"	4.0"	4.0"	7.5"	6.0"	6.0"	3.0"		4.5"
		50	10.0"	10.0"	6.0"	6.0"	10.0"	6.0"	6.0"	3.0"		4.5"	4.5"	4.5"			
		60	8.5"	8.5"	4.5"	4.5"	8.5"	4.5"	5.0"			3.0"	3.5"	3.0"			
		70	7.0"	7.0"	3.5"	3.5"	6.5"	3.5"	3.5"								
	1/4" ELCO/DEWALT ULTRAICON WITH 1-1/4" EMBED	80	6.0"	6.0"	3.0"		4.5"	3.0"									
		40	14.0"	14.0"	7.0"	7.0"	14.0"	8.5"	8.5"	4.0"	3.5"	8.5"	6.5"	7.0"	3.0"		5.0"
		50	11.0"	11.0"	5.5"	5.5"	11.0"	6.5"	6.5"	3.0"		5.0"	4.5"	5.0"			3.0"
		60	9.0"	9.0"	4.0"	4.0"	9.0"	5.0"	5.5"			3.0"	3.5"	3.5"			
		70	8.0"	8.0"	3.5"	3.0"	7.5"	4.0"	4.0"			3.0"					
		80	6.5"	7.0"	3.0"		5.0"	3.5"	3.0"								

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				
HOLLOW CONC. BLOCK	1/4" ALL-POINTS SOLID-SET ANCHOR W/ 7/8" EMBED & 1/4-20 SS MACHINE SCREW	40	16.0"	16.0"	7.0"	7.0"	16.0"	10.0"	10.0"	4.0"	3.5"	10.0"	8.0"	8.0"	3.0"		6.0"
		50	13.0"	13.0"	5.5"	5.5"	13.0"	8.0"	8.0"	3.0"		6.0"	5.5"	6.0"			3.5"
		60	11.0"	11.0"	4.0"	4.0"	11.0"	6.0"	6.5"			3.5"	4.5"	4.0"			
		70	9.5"	9.5"	3.5"	3.0"	9.0"	4.5"	4.5"				3.5"	3.0"			
		80	8.0"	8.0"	3.0"		6.0"	4.0"	3.5"				3.0"				

HOST STRUCT.	ANCHOR	LOAD (psf)	2" MIN EDGE DISTANCE														
			Spans Up To 6'-0"					Spans Up To 9'-8"					Spans Up To 12'-0"				
			CONN TYPE					CONN TYPE					CONN TYPE				
HOLLOW CONC BLOCK	1/4" ALL-POINTS SOLID-SET ANCHOR W/ 7/8" EMBED & 1/4-20 SS MACHINE SCREW	40	16.0"	16.0"	11.5"	11.5"	16.0"	16.0"	6.5"	6.0"	16.0"	14.0"	14.0"	5.0"	4.5"	10.5"	
		50	16.0"	16.0"	9.0"	9.0"	16.0"	13.5"	14.0"	5.0"	4.5"	10.0"	10.0"	10.5"	3.5"	6.0"	
		60	16.0"	16.0"	7.0"	7.0"	16.0"	10.5"	11.0"	4.0"	3.5"	6.5"	7.5"	7.5"	3.0"	4.5"	
		70	16.0"	16.0"	6.0"	5.5"	15.5"	8.5"	8.0"	3.0"	3.0"	5.0"	6.0"	5.5"		3.5"	
		80	14.0"	14.0"	5.0"	4.5"	10.5"	7.0"	6.5"			4.0"	5.0"	4.5"			

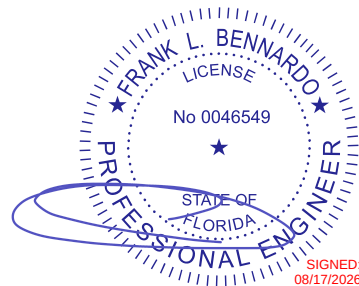
HOST STRUCT.	ANCHOR	LOAD (psf)	3-1/8" MIN EDGE DISTANCE														
			Spans Up To 6'-0"					Spans Up To 9'-8"					Spans Up To 12'-0"				
			CONN TYPE					CONN TYPE					CONN TYPE				
HOLLOW CONC BLOCK	5/16" ELCO/DEWALT ULTRAICON WITH 1-1/4" EMBED	40	16.0"	16.0"	12.5"	12.5"	16.0"	13.5"	13.5"	7.0"	6.5"	13.5"	11.0"	11.0"	5.0"	4.5"	8.0"
		50	16.0"	16.0"	10.0"	9.5"	16.0"	10.5"	11.0"	5.0"	4.5"	8.0"	7.5"	8.0"	4.0"		5.0"
		60	15.0"	15.0"	7.5"	7.0"	15.0"	8.0"	8.5"	4.0"		5.0"	6.0"	5.5"			
		70	12.5"	12.5"	6.0"	5.5"	12.0"	6.5"	6.5"			4.0"	5.0"	4.5"			
		80	11.0"	11.0"	5.0"	4.5"	8.0"	5.5"	5.0"				4.0"				

HOST STRUCT.	ANCHOR	LOAD (psf)	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				
GROUT-FILLED CONCRETE BLOCK	5/16" ITW TAPCON XL W/ 2-1/4" MIN. EMBED	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"	14.5"	13.5"	16.0"
		50	16.0"	16.0"	16.0"	16.0"	16.0"	16.0"	16.0"	14.5"	13.0"	16.0"	16.0"	16.0"	11.0"	10.0"	16.0"
		60	16.0"	16.0"	16.0"	16.0"	16.0"	16.0"	16.0"	11.5"	10.5"	16.0"	16.0"	16.0"	9.0"	8.0"	12.0"
		70	16.0"	16.0"	16.0"	16.0"	16.0"	16.0"	16.0"	9.5"	8.5"	13.0"	16.0"	15.0"	7.5"	6.5"	9.0"
	5/16" ELCO/DEWALT ULTRAICON W/ 2-1/4" MIN. EMBED	80	16.0"	16.0"	14.5"	13.5"	16.0"	16.0"	16.0"	8.0"	7.0"	10.5"	14.0"	12.0"	6.5"	5.5"	7.5"
		40	16.0"	16.0"	16.0"	16.0"	16.0"	16.0"	16.0"	9.0"	8.0"	16.0"	14.0"	14.5"	6.5"	6.0"	10.5"
		50	16.0"	16.0"	12.5"	12.5"	16.0"	14.0"	14.0"	6.5"	6.0"	10.0"	10.0"	10.5"	5.0"	4.5"	6.0"
		60	16.0"	16.0"	9.5"	9.0"	16.0"	10.5"	11.5"	5.0"	4.5"	6.5"	7.5"	7.5"	4.0"		4.5"
		70	16.0"	16.0"	8.0"	7.0"	15.5"	8.5"	8.0"	4.0"		5.0"	6.5"	5.5"			
		80	14.0"	14.5"	6.5"	6.0"	10.5"	7.0"	6.5"			4.0"					

HOST STRUCT.	ANCHOR	LOAD (psf)	3/4" MIN EDGE DISTANCE														
			Spans Up To 6'-0"					Spans Up To 9'-8"					Spans Up To 12'-0"				
			CONN TYPE					CONN TYPE					CONN TYPE				
WOOD (G=0.55)	1/4" LAG SCREW WITH 1-3/4" MIN THREAD PENETRATION 	40	16.0"	16.0"	14.0"	14.0"	16.0"	16.0"	16.0"	8.0"	8.0"	16.0"	16.0"	16.0"	6.5"	6.0"	16.0"
		50	16.0"	16.0"	11.0"	11.0"	16.0"	16.0"	16.0"	6.5"	6.0"	16.0"	16.0"	16.0"	5.0"	4.5"	16.0"
		60	16.0"	16.0"	9.0"	8.5"	16.0"	16.0"	16.0"	5.0"	5.0"	16.0"	16.0"	16.0"	4.0"	4.0"	11.5"
		70	16.0"	16.0"	7.5"	7.0"	16.0"	16.0"	16.0"	4.5"	4.0"	12.5"	16.0"	14.5"	3.5"	3.0"	9.0"
		80	16.0"	16.0"	6.5"	6.0"	16.0"	16.0"	16.0"	3.5"	3.5"	10.0"	13.5"	12.0"	3.0"	2.5"	7.0"
	7/16" WOOD BUSHING WITH 1.13" MIN EMBED & 1/4-20 SS MACHINE SCREW 	40	16.0"	16.0"	11.5"	11.5"	16.0"	14.0"	14.0"	6.0"	6.0"	14.0"	11.0"	11.5"	4.5"	4.0"	8.5"
		50	16.0"	16.0"	9.0"	9.0"	16.0"	11.0"	11.0"	4.5"	4.0"	8.0"	8.0"	8.5"	3.5"	3.0"	5.0"
		60	15.0"	15.0"	7.0"	6.5"	15.0"	8.5"	9.0"	3.5"	3.5"	5.5"	6.0"	6.0"	3.0"	2.5"	3.5"
		70	13.0"	13.0"	5.5"	5.0"	12.5"	6.5"	6.5"	3.0"	2.5"	4.0"	5.0"	4.5"	2.5"	2.0"	2.5"
	#14 WOOD SCREW OR 1/4" ITW TAPCON WITH 1-3/4" MIN THREAD PENETRATION 	80	11.0"	11.5"	4.5"	4.0"	8.5"	5.5"	5.0"	2.5"	2.0"	3.0"	4.0"	3.5"	2.0"	1.5"	2.0"
		40	16.0"	16.0"	16.0"	16.0"	16.0"	16.0"	16.0"	9.0"	9.0"	16.0"	16.0"	16.0"	7.0"	6.5"	16.0"
		50	16.0"	16.0"	12.5"	12.5"	16.0"	16.0"	16.0"	7.0"	6.5"	16.0"	16.0"	16.0"	5.5"	5.0"	13.0"
		60	16.0"	16.0"	10.0"	10.0"	16.0"	16.0"	16.0"	5.5"	5.5"	13.5"	16.0"	15.0"	4.5"	4.0"	9.0"
		70	16.0"	16.0"	8.5"	8.0"	16.0"	16.0"	16.0"	5.0"	4.5"	10.0"	13.0"	11.5"	3.5"	3.5"	7.0"
	80	16.0"	16.0"	7.0"	6.5"	16.0"	14.5"	13.5"	4.0"	3.5"	8.0"	11.0"	9.5"	3.0"	3.0"	5.5"	

WINDOW BLADE 1A OPTION

FRANK BENNARDO, P.E.
PE# 0046549 CA# 9885



FL 32030.2

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BERTHA HV ESSENTIAL ACCORDION SHUTTER
FLORIDA BUILDING CODE NINTH EDITION (2026)
FLORIDA STATEWIDE APPROVAL (FSA FL#32030.2)

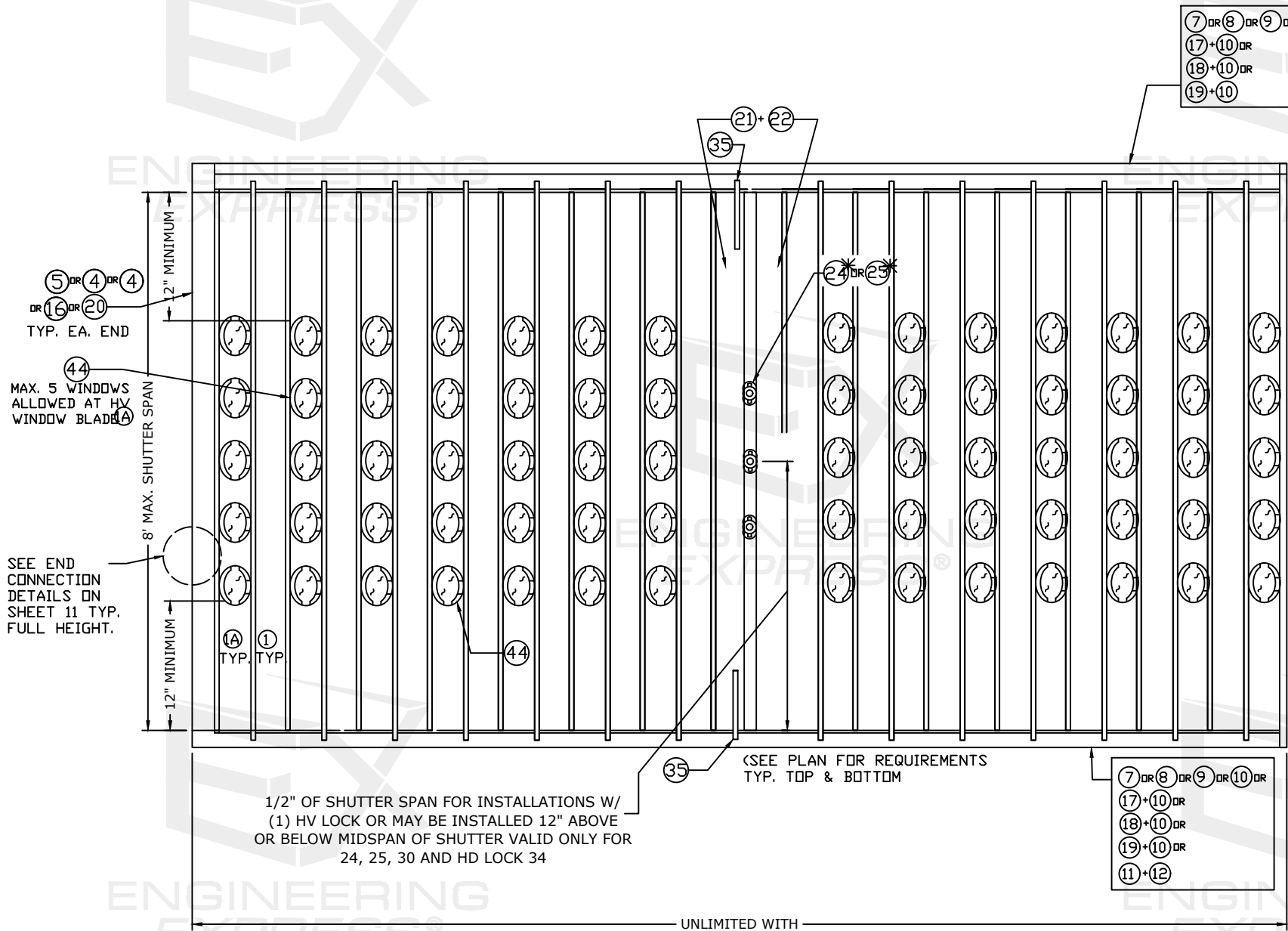
REMARKS	DRWN	CHKD	DATE
2020 FBC (20-31270)	CCB	FLB	09/02/20
2023 FBC (23-65177)	MRT	RWN	10/09/23
2026 FBC UPDATE	MEF	CCB	07/13/26

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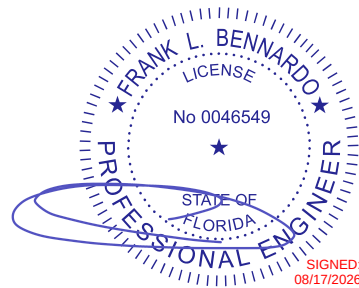
WINDOW BLADE 1A NOTES:

1. MAXIMUM DESIGN PRESSURE = +/-80psf
2. MAXIMUM SHUTTER SPAN = 96"
3. MINIMUM GLASS SEPARATION = 5"
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

WINDOW BLADE 1A OPTION

FRANK BENNARDO, P.E.
PE# 0046549 CA# 9885



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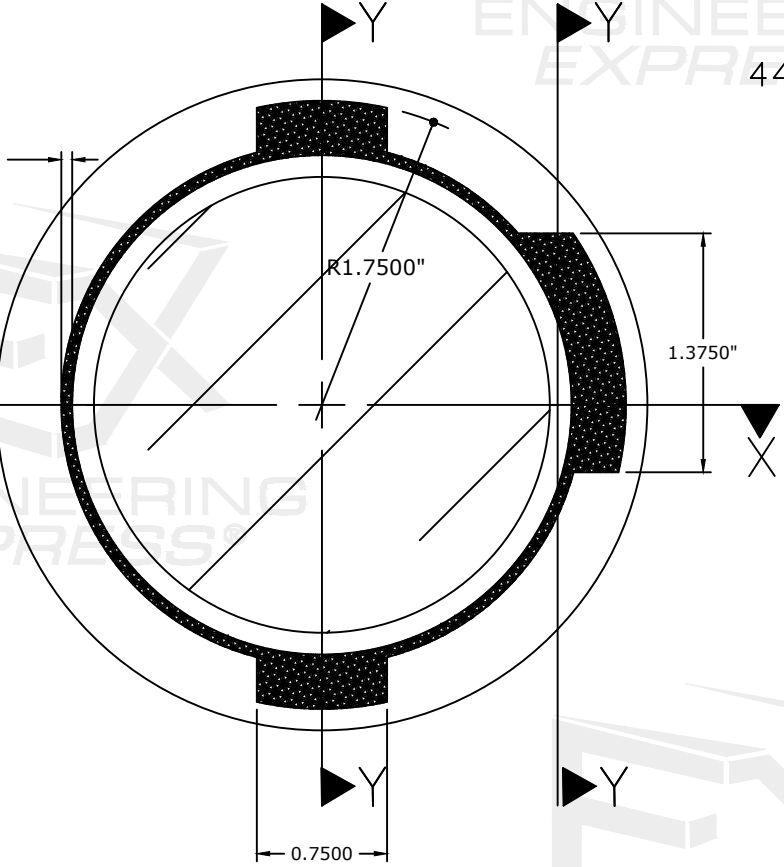
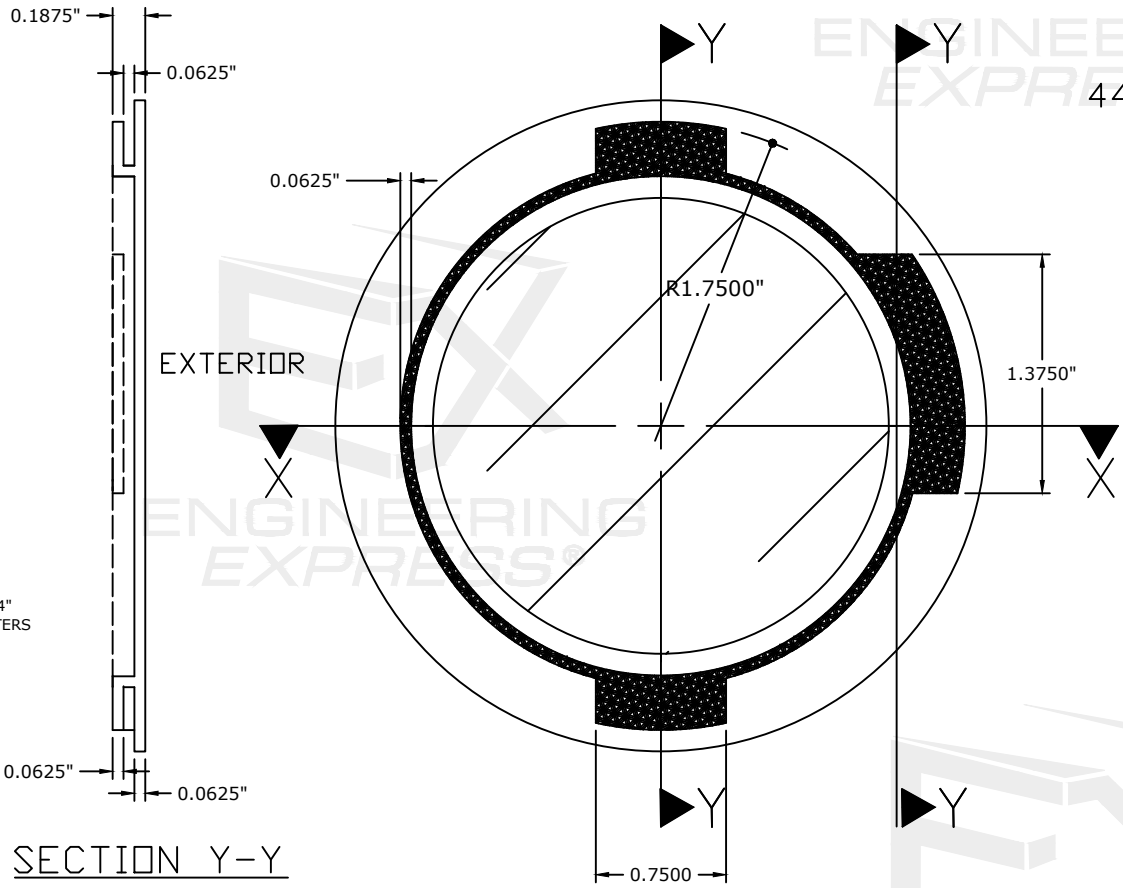
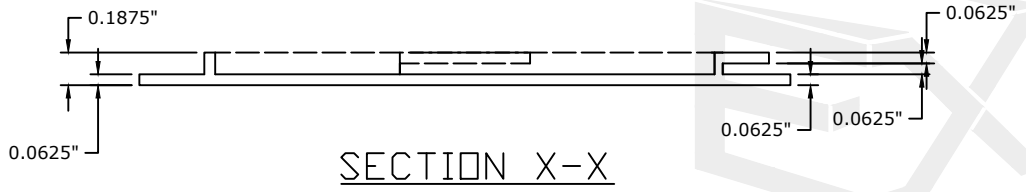
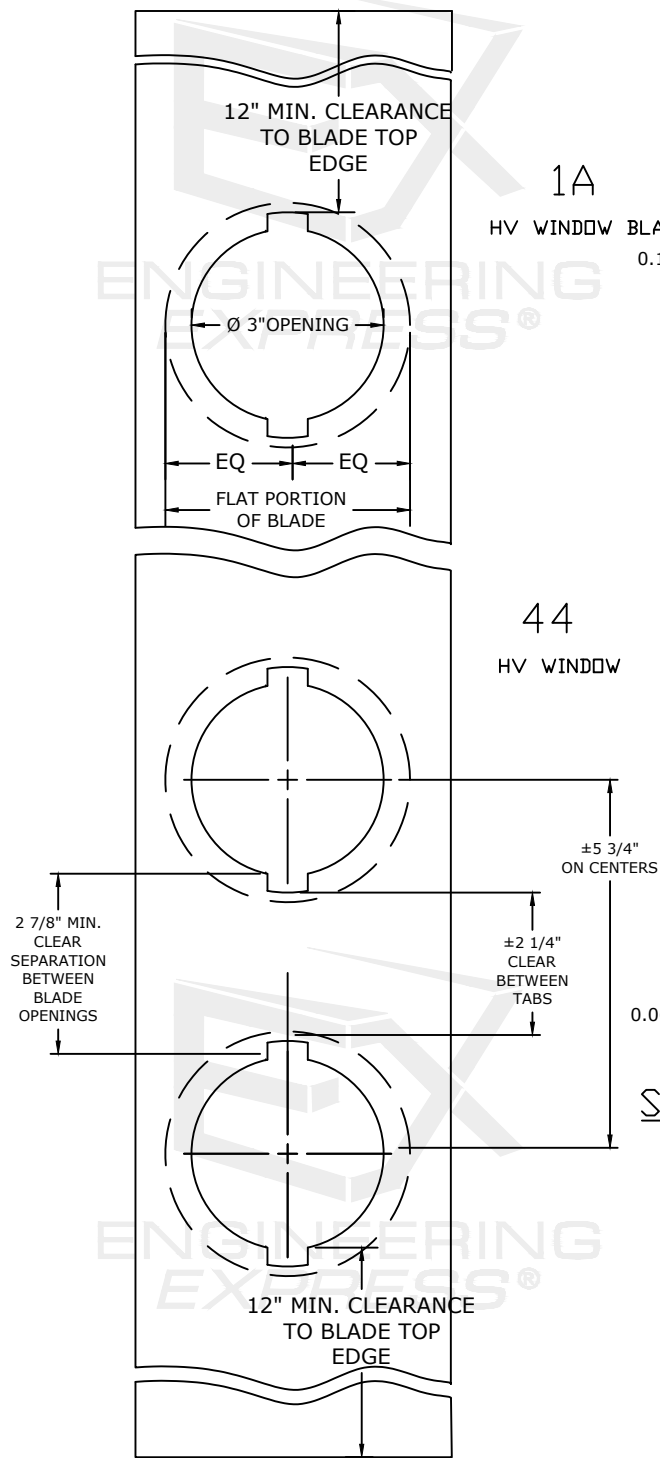
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2026 FBC UPDATE	MEF	CCB	07/13/26

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44 POLYCARBONATE IMPACT RESISTANT HV WINDOW
BAYER MAKROLON 3103 POLYCARBONATE RESINS, UV-STABILIZED GRADE OR SABIC INNOVATIVE PLASTIC LEXAN 103 RESIN

TYPICAL HV WINDOW BLADE 1A AND POLYCARBONATE HV WINDOW DETAIL