



Product Approval
USER: Public User

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OFFICE OF THE
SECRETARY

FL #	FL389-R11										
Application Type	Revision										
Code Version	2023										
Application Status	Approved										
Comments											
Archived	<input type="checkbox"/>										
Product Manufacturer	American Shutter Systems Association, Inc.										
Address/Phone/Email	4268 Westroads Drive West Palm Beach, FL 33407 (561) 209-8263 bfeeley@easternmetal.com										
Authorized Signature	Bill Feeley lrodriguez@easternmetal.com										
Technical Representative											
Address/Phone/Email											
Quality Assurance Representative											
Address/Phone/Email											
Category	Shutters										
Subcategory	Accordion										
Compliance Method	Evaluation Report from a Florida Registered Architect or a Licensed Florida Professional Engineer <input type="checkbox"/> Evaluation Report - Hardcopy Received										
Florida Engineer or Architect Name who developed the Evaluation Report	Walter A.. Tillit, Jr. P.E.										
Florida License	PE-44167										
Quality Assurance Entity	National Accreditation and Management Institute										
Quality Assurance Contract Expiration Date	12/31/2024										
Validated By	John Henry Kampmann Jr. <input checked="" type="checkbox"/> Validation Checklist - Hardcopy Received										
Certificate of Independence	FL389 R11 COI Certification of Independence Drawing 23-126.pdf FL389 R11 COI CERTIFICATION OF INDEPENDENCE DRAWING 23-127.pdf FL389 R11 COI Certification of Independence Drawing 23-133.pdf										
Referenced Standard and Year (of Standard)	<table border="0"> <thead> <tr> <th>Standard</th> <th>Year</th> </tr> </thead> <tbody> <tr> <td>ASTM E-1886</td> <td>2012</td> </tr> <tr> <td>ASTM E-1996</td> <td>2012</td> </tr> <tr> <td>ASTM E-330</td> <td>2002</td> </tr> <tr> <td>TAS 201, 202, 203</td> <td>1994</td> </tr> </tbody> </table>	Standard	Year	ASTM E-1886	2012	ASTM E-1996	2012	ASTM E-330	2002	TAS 201, 202, 203	1994
Standard	Year										
ASTM E-1886	2012										
ASTM E-1996	2012										
ASTM E-330	2002										
TAS 201, 202, 203	1994										
Equivalence of Product Standards Certified By	Florida Licensed Professional Engineer or Architect FL389 R11 Equiv Letter 23-450.pdf										

Sections from the Code

Product Approval Method Method 1 Option D

Date Submitted 10/14/2023

Date Validated 10/17/2023

Date Pending FBC Approval 10/22/2023

Date Approved 12/12/2023

Summary of Products

FL #	Model, Number or Name	Description
389.1	Bertha HV Accordion Shutter - Blade 3 - (Non-HVHZ) - Drwg 23-133	Extruded aluminum interlocking blades retained by tracks (top and bottom) for storm protection
Limits of Use Approved for use in HVHZ: No Approved for use outside HVHZ: Yes Impact Resistant: Yes Design Pressure: N/A Other: Large Missile Level "D".Max span is 12'-3" for 40 psf positive ASD load and 13'-0" for 35 psf negative ASD load the HV3 blade w/o window blade,5'-2" for 110 psf ASD load for HV3 blade w/o window blade and 8'-11" for 62 psf, 9'-11" for 55 psf HV3 blade w/window blade working in unison.Max.span for HV3 blade w/o window blade for installations into Metal Stud walls is 79" for max. ASD pressure rating of +72,-72 and 84" for +64,-64 psf. See sheet 5 for other spans and ASD pressures.		Installation Instructions FL389_R11_II_Drawing_23-133.pdf Verified By: American Test Lab of South Florida, Inc. Created by Independent Third Party: Yes Evaluation Reports FL389_R11_AE_Product_Evaluation_Report_Drawing_23-133.pdf Created by Independent Third Party: Yes
389.2	Bertha HV Accordion Shutter-Blade 1 Only- (Non-HVHZ)- Drwg 23-127	Extruded aluminum interlocking blades retained by tracks (top and bottom) for storm protection
Limits of Use Approved for use in HVHZ: No Approved for use outside HVHZ: Yes Impact Resistant: Yes Design Pressure: N/A Other: Large missile level "D". Max. Span is 16'-0" for 30 p.s.f negative ASD load depending on centermates and locking rod configuration for the HV1 blade, 8'-0" for +64, -72 p.s.f. A.S.D. load for HV blade for Keystone mountings 7'-0" p.s.f. for metals stud mountings and 8'-0" for 110 p.s.f. for HV1A working in unison. See sheets 7, 11 and 20 respectively of installation drawings for other spans and pressures.		Installation Instructions FL389_R11_II_DRAWING_23-127.pdf Verified By: American Test Lab of South Florida, Inc. Created by Independent Third Party: Yes Evaluation Reports FL389_R11_AE_PRODUCT_EVALUATION_REPORT_DRAWING_23-127.pdf Created by Independent Third Party: Yes
389.3	Bertha HV Accordion Shutter-COMBO- (Non-HVHZ)- Drwg 23-126	Extruded aluminum interlocking blades retained by tracks (top and bottom) for storm protection
Limits of Use Approved for use in HVHZ: No Approved for use outside HVHZ: Yes Impact Resistant: Yes Design Pressure: N/A Other: Large missile. Max. 16'-0" span at 30 p.s.f ASD load for Blade 1 and 18'-0" for Blade 2. See schedules on sheet 12, 25 and 28 respectively		Installation Instructions FL389_R11_II_Drawing_23-126.pdf Verified By: American Test Lab of South Florida, Inc. Created by Independent Third Party: Yes Evaluation Reports FL389_R11_AE_Product_Evaluation_Report_Drawing_23-126.pdf Created by Independent Third Party: Yes

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Product Approval Accepts:



GENERAL NOTES:

1. BERTHA H.V. ACCORDION SHUTTER SYSTEM SHOWN ON THIS PRODUCT EVALUATION DOCUMENT (P.E.D.) HAS BEEN VERIFIED FOR COMPLIANCE IN ACCORDANCE WITH THE 2023 (8th EDITION) OF THE FLORIDA BUILDING CODE. THIS ACCORDION SHUTTER SYSTEM SHALL NOT BE INSTALLED AT HIGH VELOCITY HURRICANE ZONES.

DESIGN WIND LOADS SHALL BE DETERMINED AS PER SECTION 1620 OF THE ABOVE MENTIONED CODE, FOR A BASIC WIND SPEED REQUIRED BY THE JURISDICTION WHERE SHUTTER WILL BE INSTALLED WITH A DIRECTIONALITY FACTOR $K_d=0.85$, USING ASCE 7-22 AND SHALL NOT EXCEED THE MAXIMUM (A.S.D.) DESIGN PRESSURE RATINGS INDICATED ON SHEETS 11 THRU 15, 19 & 20.

IN ORDER TO VERIFY THE ABOVE CONDITION, ULTIMATE DESIGN WIND LOADS DETERMINED PER ASCE 7-22 SHALL BE FIRST REDUCED TO A.S.D. DESIGN WIND LOADS BY MULTIPLYING THEM BY 0.6 IN ORDER TO COMPARE THESE W/ MAX. (A.S.D.) DESIGN PRESSURE RATINGS INDICATED ON SHEETS 11 THRU 15, 19 & 20.

IN ORDER TO VERIFY THAT COMPONENTS AND ANCHORS ON THIS P.E.D., AS TESTED, WERE NOT OVER STRESSED, A 33 % INCREASE IN ALLOWABLE STRESS FOR WIND LOADS WAS **NOT** USED IN THEIR ANALYSIS. HOWEVER, A WIND DURATION FACTOR $CD=1.60$ WAS USED FOR VERIFICATION OF FASTENERS IN WOOD, PER NDS 2018. BERTHA H.V. ACCORDION SHUTTER SYSTEM'S ADEQUACY FOR WIND AND LARGE MISSILE IMPACT LOAD HAS BEEN VERIFIED IN ACCORDANCE WITH SECTION 1609.1.2 OF THE ABOVE MENTIONED CODE AS PER ATL REPORTS:

-HV BLADE ① #0214.01-03, #0715.01-03, #1004.01-05, #1214.01-05, #0317.02-06, #0609.01-10 AND #0210.01-11 AS PER TAS-201, TAS-202 AND TAS-203 PROTOCOLS AND ASTM E-1886 AND E-1996 STANDARDS (MISSILE LEVEL D, WIND ZONES 1, 2 & 3) & #1220.01-10 AS PER TAS 201, 203 & 203 PROTOCOLS LARGE MISSILE.

-HV WINDOW BLADE ② #0505.01-08 AS PER ASTM E-1886 AND E-1996 (MISSILE LEVEL D, WIND ZONES 1, 2, 3) BASIC PROTECTION ONLY AND # 0725.01-88 AS PER TAS 202 PROTOCOL.

2. HV BLADE ① AND HV WINDOW BLADE ② ARE ENGINEERED TO WORK IN UNISON WITH EACH OTHER UNDER THE GENERAL LIMITATIONS AND CONDITIONS OF USE INDICATED ON SHEET 19

3. BERTHA H.V. ACCORDION PINS (HV SCREWS), USED AT BLADES KNUCKLE AND FOR DIRECT MOUNT CONNECTION TO TRACKS SHALL BE #14x2.75" AND #14x1.75" RESPECTIVELY, 410-HT MINIMUM SERIES STAINLESS STEEL SCREWS WITH 135.0 ksi YIELD STRENGTH AND 180 ksi TENSILE STRENGTH. PINS SHALL BE COATED WITH BERTHA HV DACROSHIELD COATING SYSTEM AS MANUFACTURED BY APPROVED COATING APPLICATORS, REGISTERED WITH AMERICAN SHUTTER SYSTEMS ASSOCIATION. PINS MUST BEAR THE HV MARKING ON THEIR HEAD.

4. ALL ALUMINUM EXTRUSIONS SHALL BE ALUMINUM ASSOCIATION ALLOY AND TEMPER AS INDICATED ON SHEETS 2 AND 3. MINIMUM YIELD STRENGTH FOR 6063-T6 ALLOY IS 30.0 ksi AND 35.7 ksi FOR 6005-T5 ALLOY. ALL ALUMINUM EXTRUSIONS IN CONTACT WITH DISSIMILAR MATERIALS SHALL COMPLY WITH SECTION III-6 OF THE 2020 ALUMINUM DESIGN MANUAL.

5. ALL SCREWS TO BE STAINLESS STEEL 304 OR 316 AISI SERIES OR CORROSION RESISTANT COATED CARBON STEEL AS PER DIN 50018 WITH 50 ksi MIN. YIELD STRENGTH AND 90 ksi MIN. TENSILE STRENGTH. AND SHALL COMPLY W/ FLORIDA BUILDING CODE SECTION 2411.3.3.4.

6. BOLTS TO BE ASTM A-307 GALVANIZED STEEL, OR AISI 304 OR 316 SERIES STAINLESS STEEL WITH 35 ksi MINIMUM YIELD STRENGTH.

7. SEE THE FOLLOWING SHEETS FOR ANCHOR SPECIFICATIONS: HV BLADE ① : 12,13,14,15 AND 20

HV BLADE ① & ② WORKING IN UNISON: 12, 13 & 15

8. THIS BERTHA H.V. ACCORDION SHUTTER SYSTEM BEARS A U.S. PATENT #6'779,582. COMPONENTS OF THIS APPROVAL ARE COVERED, IN WHOLE OR IN PART BY U.S. PATENT #5'458,179 ISSUED TO EASTERN METAL SUPPLY, INC.

9. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE SOUNDNESS OF THE STRUCTURE WHERE SHUTTER IS TO BE ATTACHED TO INSURE PROPER ANCHORAGE. CONTRACTOR TO SEAL/CAULK ALL SHUTTER COMPONENT EDGES WHICH REMAIN, THRU FASTENING IN CONTINUOUS CONTACT WITH THE BUILDING TO PREVENT WIND/RAIN INTRUSION.

10. EACH UNIT MUST BEAR PERMANENT LABEL IN A VISIBLE PLACE WITH WARNING NOTE: DURING PERIODS OF HURRICANE WARNINGS HOME OWNER, TENANT, OR OTHERS, MUST PROPERLY CLOSE ALL HV AND HD CENTERMATES AND ENGAGE OR LOCK ALL HV AND HD LOCKS.

11. SHUTTER MANUFACTURER'S LABEL SHALL BE LOCATED ON A READILY VISIBLE LOCATION AT ACCORDION SHUTTER IN ACCORDANCE WITH SECTION 1709.9.3 OF FLORIDA BUILDING CODE. ONE LABEL SHALL BE PLACED FOR EVERY OPENING. LABELING TO COMPLY WITH SECTION 1709.9.2 OF THE FLORIDA BUILDING CODE.

12. BERTHA H.V. ACCORDION SHUTTER SYSTEM'S INSTALLATION SHALL COMPLY WITH SPECS INDICATED IN THIS DRAWING PLUS ANY BUILDING AND ZONING REGULATIONS PROVIDED BY THE JURISDICTION WHERE PERMIT IS APPLIED TO.

13. (a) THIS P.E.D. PREPARED BY THIS ENGINEER IS GENERIC AND DOES NOT PROVIDE INFORMATION FOR A SITE SPECIFIC PROJECT; i.e. WHERE THE SITE CONDITIONS DEVIATE FROM THE P.E.D.

(b) CONTRACTOR TO BE RESPONSIBLE FOR THE SELECTION, PURCHASE AND INSTALLATION INCLUDING LIFE SAFETY OF THIS PRODUCT, BASED ON THIS P.E.D., PROVIDED HE/SHE DOES NOT DEVIATE FROM THE CONDITIONS DETAILED ON THIS DOCUMENT. CONSTRUCTION SAFETY AT SITE IS THE CONTRACTOR'S RESPONSIBILITY.

(c) THIS P.E.D. WILL BE CONSIDERED INVALID IF ALTERED BY ANY MEANS.

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

(e) ORIGINAL P.E.D. SHALL BEAR THE DATE AND ORIGINAL SEAL AND SIGNATURE OF THE PROFESSIONAL ENGINEER OF RECORD THAT PREPARED IT.

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

FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)

WALTER A. TILLIT JR.
LICENSE
No. 44167
STATE OF FLORIDA
PROFESSIONAL ENGINEER
7/2023
P.E. SEAL/SIGNATURE/DATE

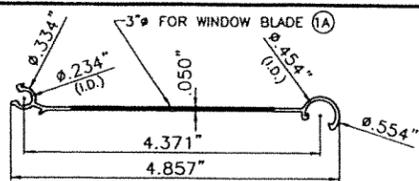
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WALTER A. TILLIT Jr. P.E.
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A.S.S.A.
American Shutter Systems
Association, Inc.
4268 Westroads Drive
West Palm Beach, FL 33407

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BERTHA HV™
Accordion Shutter System
H.V. BLADE #1 W/ OR W/O H.V. WINDOW BLADE

REV. No	DESCRIPTION	DATE	DRAWN BY: Y.M.
1	OLD 20-164	7/21/23	DATE: 7/21/2023
2			DRAWING No 23-127
3			
4			SHEET 1 OF 20
5			
6			

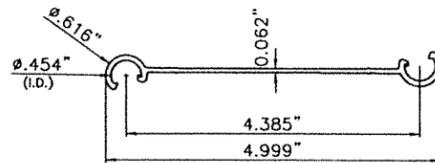


1 HV SOLID BLADE

COVERED UNDER US PATENT # 5458179

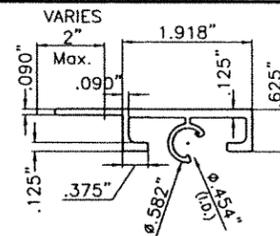
1A HV WINDOW BLADE*

*SEE LIMITATIONS OF USE OF BLADE (1A) ON SHEET 19
6063-T6 ALLOY AND TEMPER



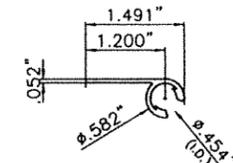
3 HV UNIVERSAL FLOATER

QUALIFIED FOR USE W/ HV BLADE (1)
6005-T5 ALLOY AND TEMPER



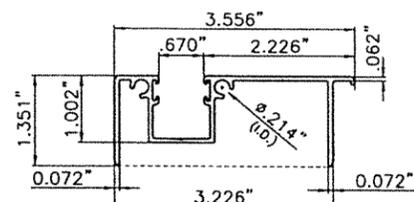
4 HV DIRECT MOUNT

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6063-T6 ALLOY AND TEMPER



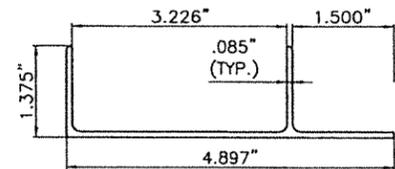
5 HV 90°/180° STARTER

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6063-T6 ALLOY AND TEMPER



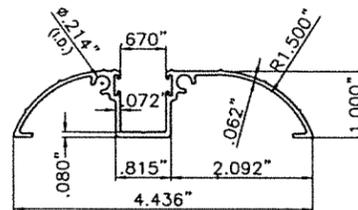
6 HV ADJ. FLOOR TRACK

QUALIFIED FOR USE W/ HV BLADE (1)
6063-T6 ALLOY AND TEMPER



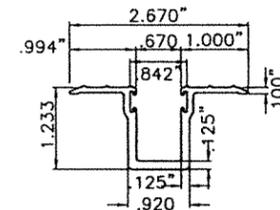
7 HV ADJ. ADAPTER W/LIP

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6063-T6 ALLOY AND TEMPER



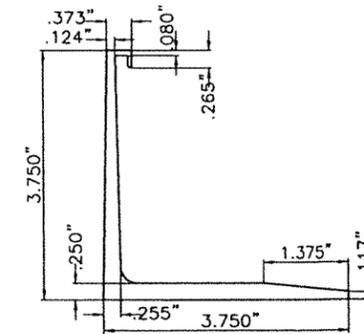
8 HV WALK-OVER TRACK

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6063-T6 ALLOY AND TEMPER



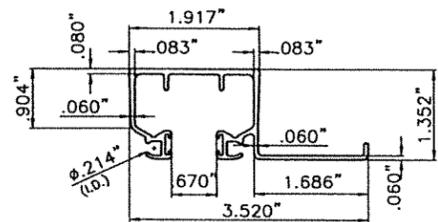
9 HV TRENCH TRACK

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6063-T6 ALLOY AND TEMPER



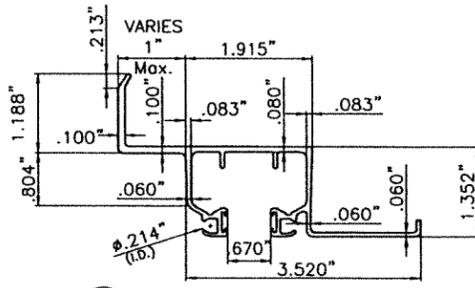
10 HV RAINGUARD

QUALIFIED FOR USE W/ HV BLADE (1)
6063-T6 ALLOY AND TEMPER



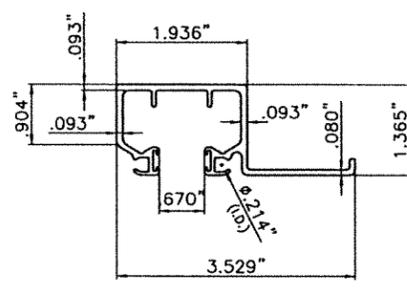
11 HV CEILING HEADER

QUALIFIED FOR USE W/ HV BLADE (1) ONLY.
SEE SECTIONS FOR VALIDITY.
6063-T6 ALLOY AND TEMPER



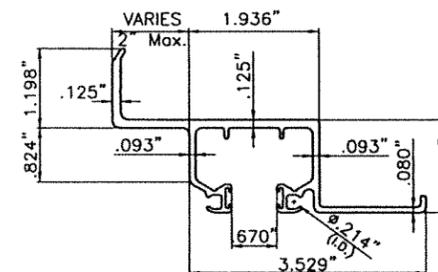
12 HV HEADER/SILL

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6063-T6 ALLOY AND TEMPER



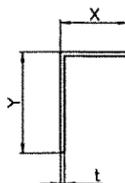
13 HD CEILING HEADER/SILL

QUALIFIED FOR USE W/ HV BLADE (1)
SEE SECTIONS FOR VALIDITY.
6063-T6 ALLOY AND TEMPER



14 HD WALL HEADER/SILL

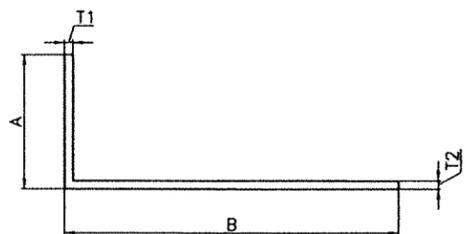
QUALIFIED FOR USE W/ HV BLADE (1) ONLY.
6063-T6 ALLOY AND TEMPER



MN. X	MN. Y	MN. t
1"	1"	0.062"

16 SIDE ANGLES

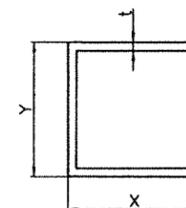
QUALIFIED FOR USE W/ HV BLADE (1)
6063-T6 ALLOY AND TEMPER



ALUMINUM ANGLES

QUALIFIED FOR USE W/ HV BLADE (1) ONLY.
6063-T6 ALLOY AND TEMPER

COMPONENT	A	B	T1	T2
(17)	2"	5" MAX.	1/8"	1/8"
(18)	2"	5" MAX.	0.192"	0.192"
(19)	2.5"	7" MAX.	0.190"	0.190"
(5A)	2"	5" MAX.	0.139"	0.131"



X	Y	t
2"	2"	0.125"
3"	3"	0.090"

20 CORNER POSTS

QUALIFIED FOR USE W/ HV BLADE (1)
6063-T6 ALLOY AND TEMPER

FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)

WALTER A. TILLIT JR.
LICENSE
No. 44167
STATE OF FLORIDA
PROFESSIONAL ENGINEER
2023
P.E. SEAL/SIGNATURE/DATE

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WALTER A. TILLIT Jr. P.E.
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A.S.S.A.

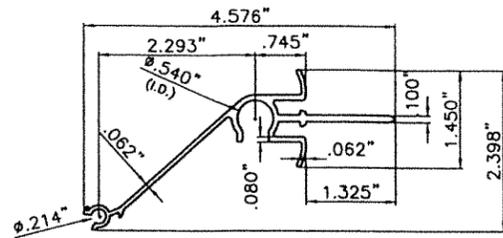
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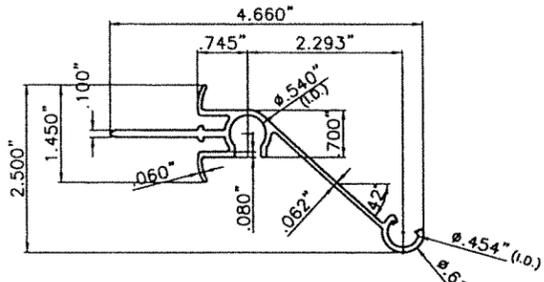
BERTHA HV™
Accordion Shutter System
H.V. BLADE #1 W/ OR W/O H.V. WINDOW BLADE

REV. No	DESCRIPTION	DATE	DRAWN BY: Y.M.
1	OLD 20-164	7/21/23	DATE: 7/21/2023
2			
3			
4			
5			
6			

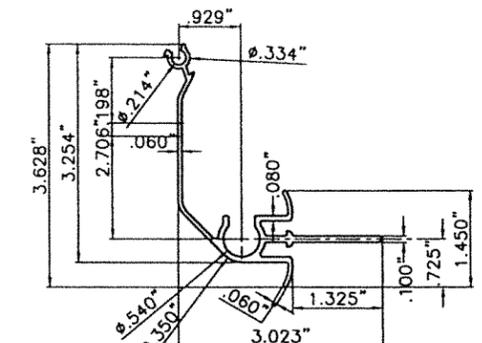
DRAWING No
23-127
SHEET
2 OF 20



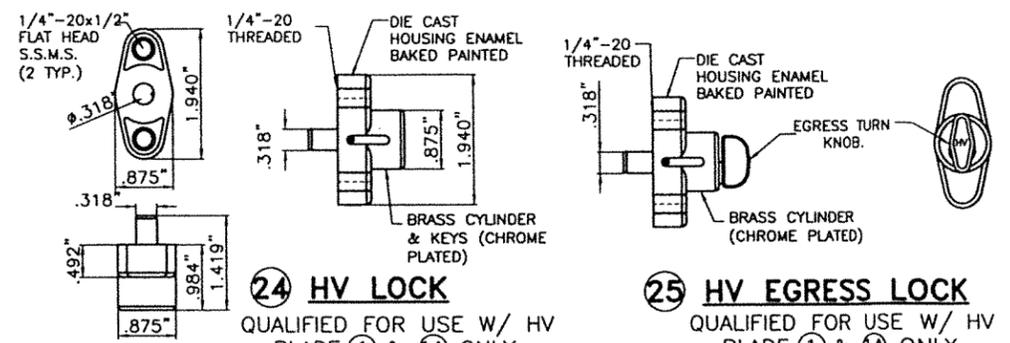
21 HV CENTERMATE
 QUALIFIED FOR USE W/ HV BLADE ① & ①A ONLY
 6063-T6 ALLOY AND TEMPER



22 HV FLOATING CENTERMATE
 QUALIFIED FOR USE W/ HV BLADE ① & ①A ONLY
 6063-T6 ALLOY AND TEMPER

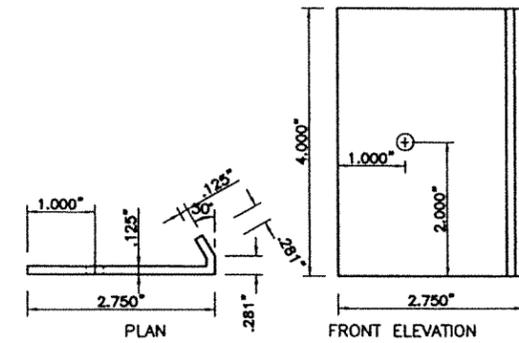


23 HV CORNER CENTERMATE
 QUALIFIED FOR USE W/ HV BLADE ① ONLY
 6063-T6 ALLOY AND TEMPER

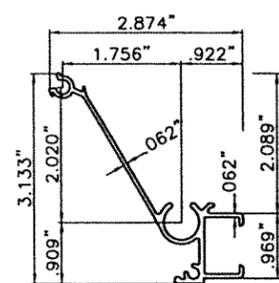


24 HV LOCK
 QUALIFIED FOR USE W/ HV BLADE ① & ①A ONLY.

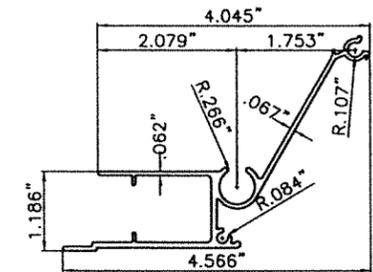
25 HV EGRESS LOCK
 QUALIFIED FOR USE W/ HV BLADE ① & ①A ONLY.



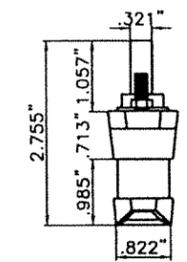
27 LOCKER FOR "T" LOCK CENTERMATE
 QUALIFIED FOR USE W/ HV BLADE ① ONLY
 6063-T6 ALLOY AND TEMPER



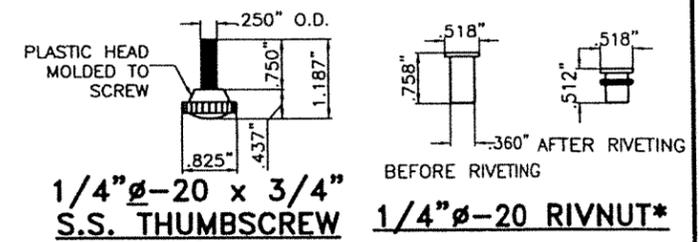
28 HV MALE "T" LOCK CENTERMATE
 QUALIFIED FOR USE W/ HV BLADE ① ONLY
 6063-T6 ALLOY AND TEMPER



29 HV FEMALE "T" LOCK CENTERMATE
 QUALIFIED FOR USE W/ HV BLADE ① ONLY
 6063-T6 ALLOY AND TEMPER

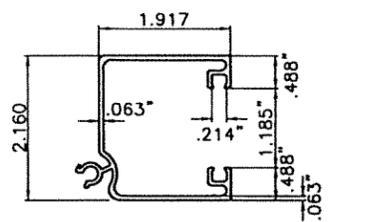


30 HV "T" LOCK
 QUALIFIED FOR USE W/HV BLADE ① ONLY.

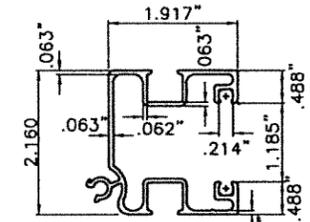


26 HV ALTERNATIVE LOCK
 QUALIFIED FOR USE W/ HV BLADE ① ONLY.

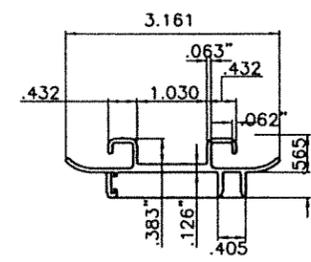
* SERIES 9444 ALUMINUM (2024-T3 ALLOY) LARGE FLANGE THIN SHEET NUTSERT, PART # 0820, AS MANUFACTURED BY AVDEL CHERRY TEXTORN, PARSIPPENY, NEW JERSEY 07054 OR EQUAL.



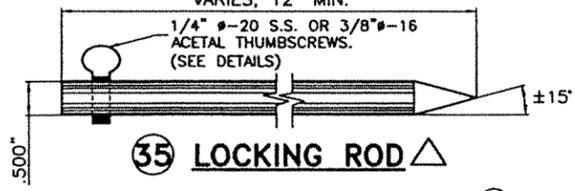
31 HD CENTERMATE W/ NO LOCKING ROD
 QUALIFIED FOR USE W/ HV BLADE ① & ①A
 6063-T6 ALLOY AND TEMPER
 VARIES, 12" MIN.



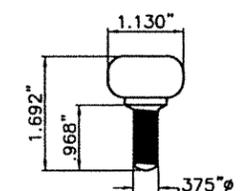
32 HD CENTERMATE W/ LOCKING ROD
 QUALIFIED FOR USE W/ HV BLADE ① & ①A
 6063-T6 ALLOY AND TEMPER



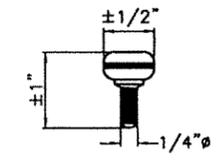
33 HD CENTERMATE'S INSERT
 QUALIFIED FOR USE W/ HV BLADE ① & ①A
 6063-T6 ALLOY AND TEMPER



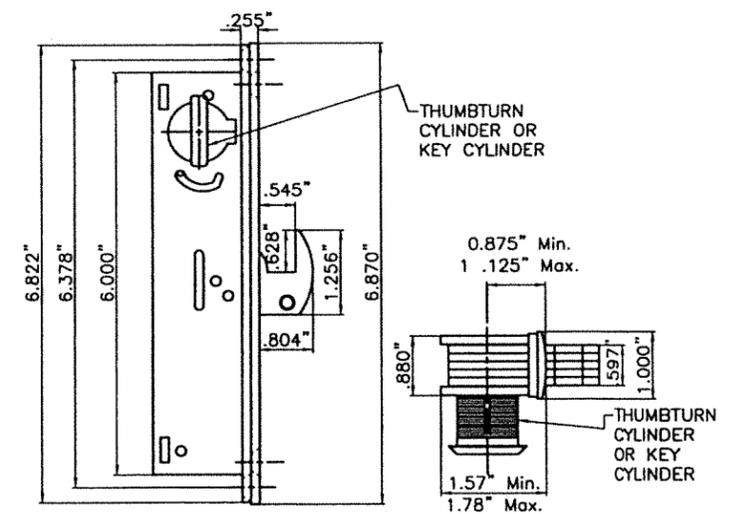
35 LOCKING ROD
 QUALIFIED FOR USE W/ HV BLADE ①
 6063-T6 ALLOY AND TEMPER
 △ INSTALLATION WILL REQUIRE A 7/16" HOLE DRILLED AT TRACKS FOR PROPER EMBEDMENT



36 HV 3/8" -16 ACETAL THUMBSCREWS
 QUALIFIED FOR USE W/ HV BLADE ①



37 HV 1/4" -20 AISI 304 SERIES S.S. THUMBSCREWS
 QUALIFIED FOR USE W/ HV BLADE ①



34 HD LOCK
 BY REGENT HARDWARE MORTISE LOCKS SERIES 2333 HOOK BOLT LOCK.
 QUALIFIED FOR USE W/ HV BLADE ① & ①A
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 2023
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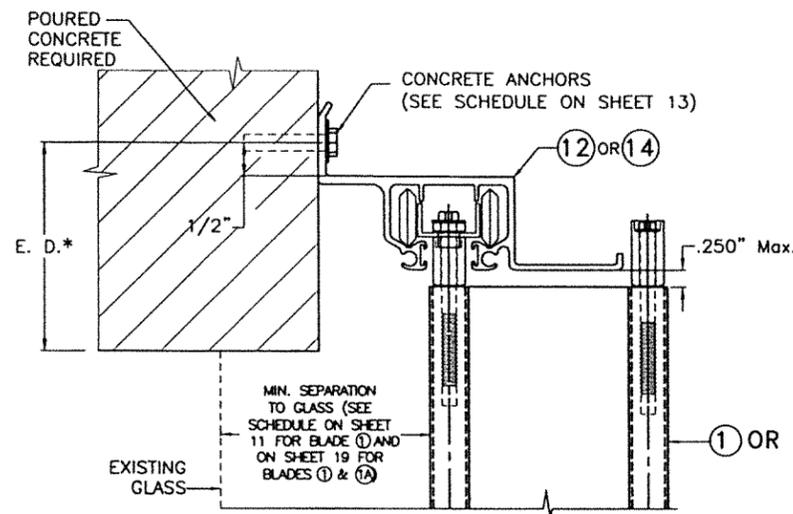
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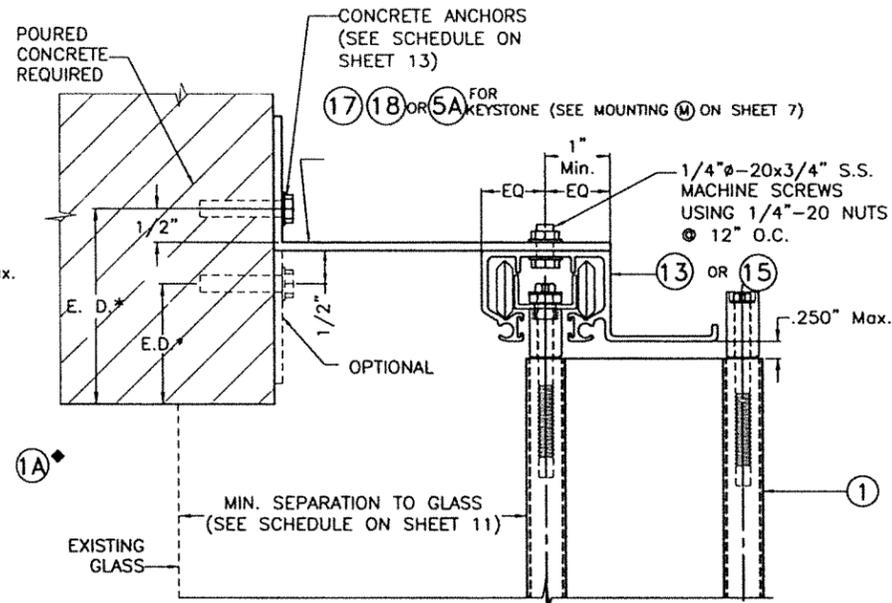
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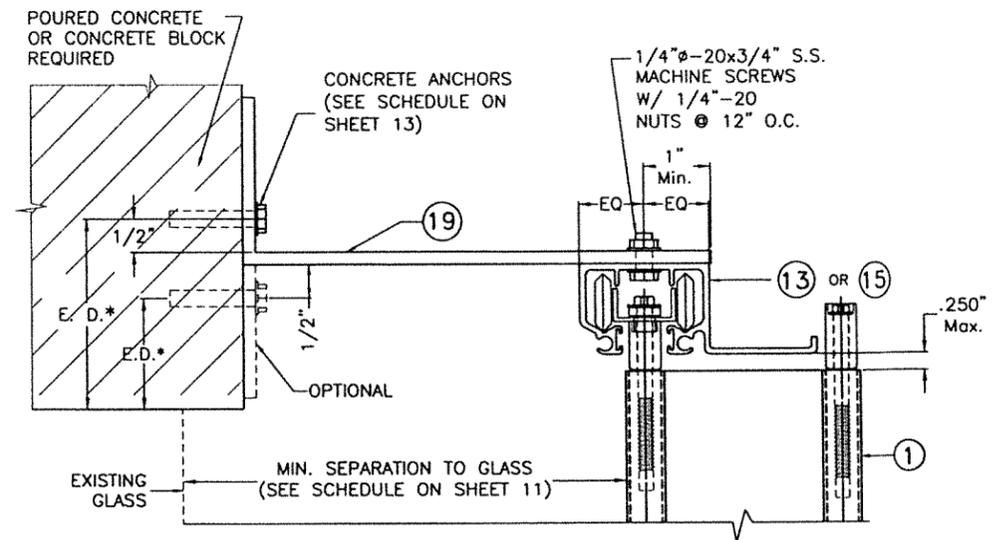
REV. No	DESCRIPTION	DATE	DRAWN BY: Y.M.
1	OLD 20-164	7/21/23	DATE: 7/21/2023
2			DRAWING No
3			23-127
4			SHEET
5			3 OF 20
6			



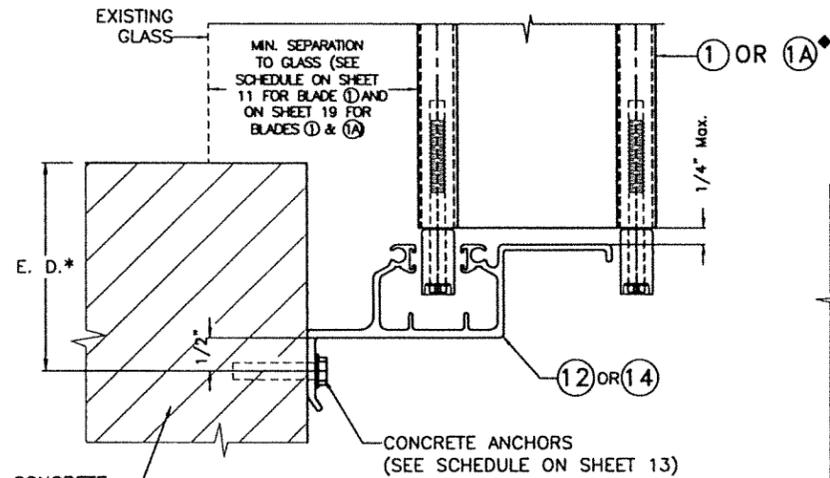
A HV WALL HEADER INSTALLATION



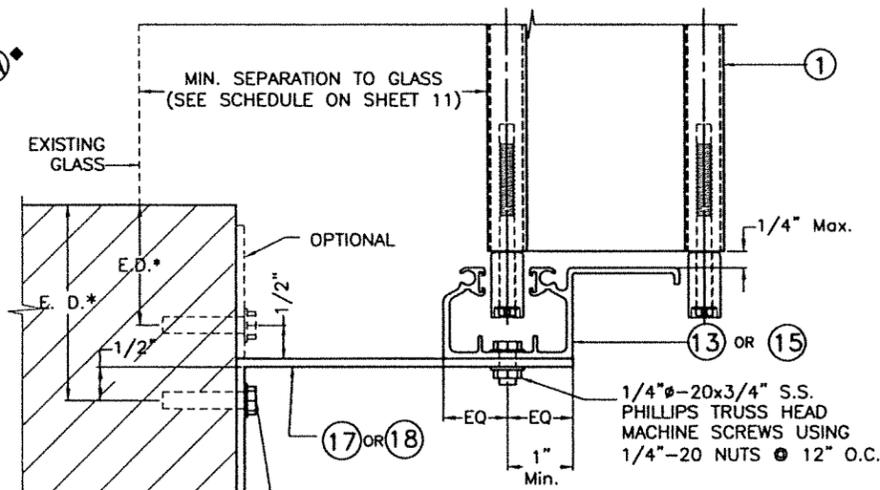
B HV WALL HEADER INSTALLATION + KEYSTONE



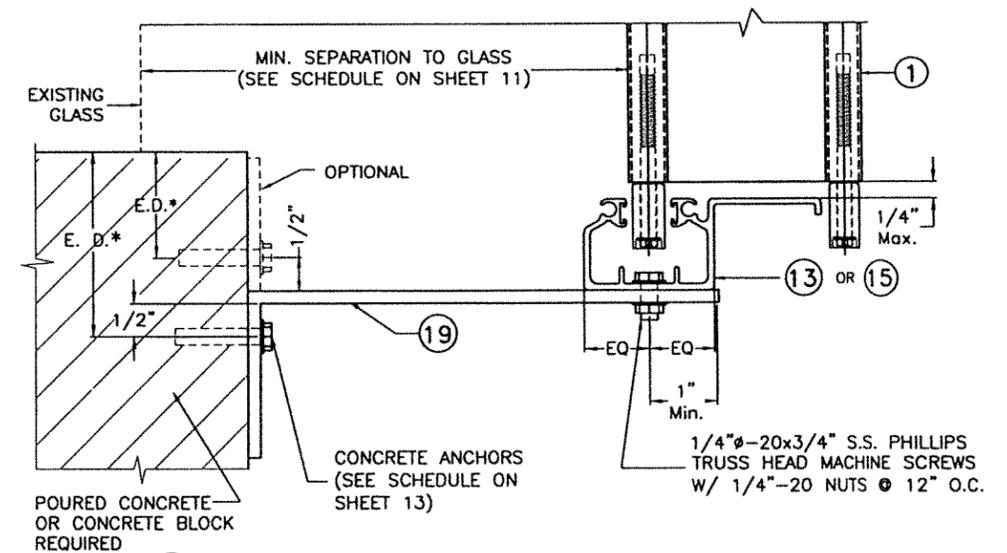
C HV WALL HEADER INSTALLATION



D HV WALL SILL INSTALLATION



E HV WALL SILL INSTALLATION



F HV WALL SILL INSTALLATION

NOTE FOR COMBINATION OF SECTIONS:

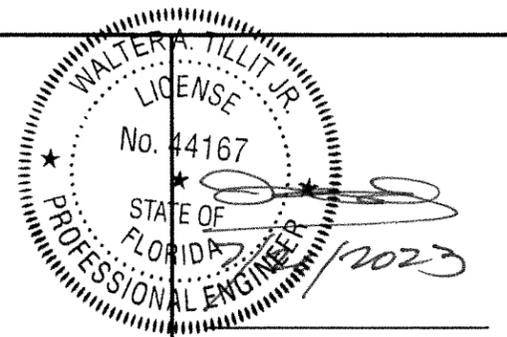
1- SEE SHEET 4 FOR TYPICAL SHUTTER ASSEMBLY
2- MOUNTING SECTIONS CAN BE COMBINED IN ANY WAY TO SUIT ANY INSTALLATION.

* E. D. = EDGE DISTANCE
(SEE SPECIFICATIONS ON SHEET 13)

◆ SEE LIMITATIONS OF USE FOR BLADE (1A) ON SHEET 19

**INSTALLATION DETAILS W/
① HV BLADE**

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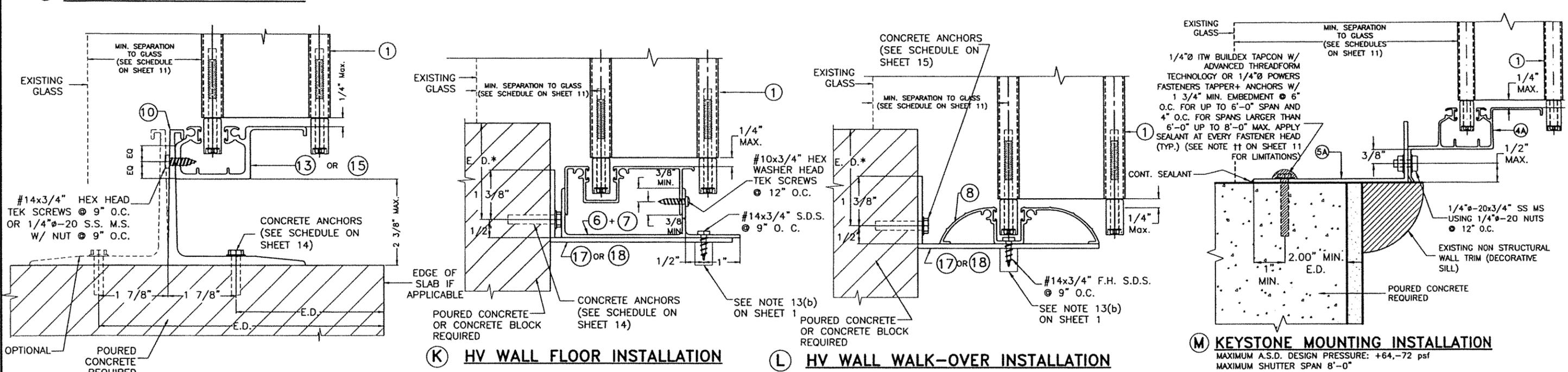
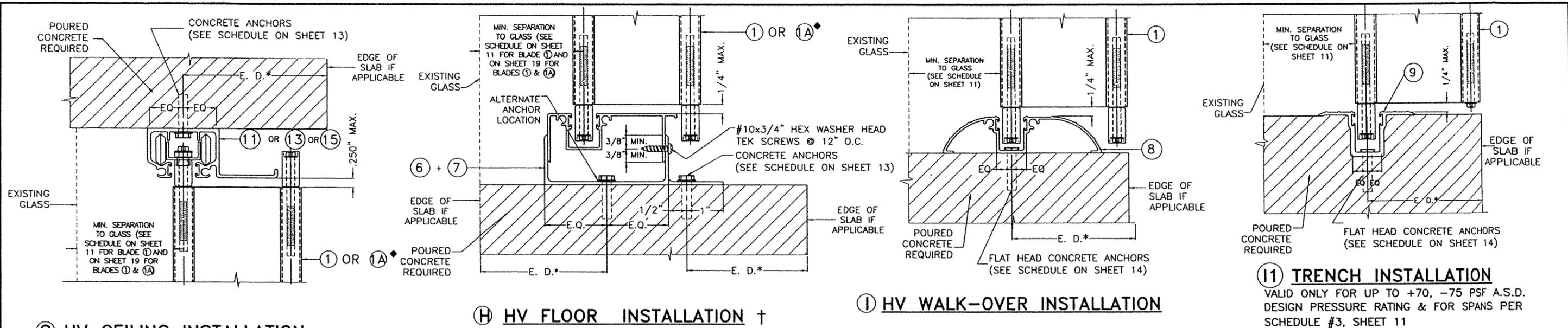
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1	OLD 20-164	7/21/23	DATE: 7/21/2023
2			DRAWING No
3			23-127
4			SHEET
5			6 OF 20
6			



NOTE FOR COMBINATION OF SECTIONS:
 1- SEE SHEET 4 FOR TYPICAL SHUTTER ASSEMBLY
 2- MOUNTING SECTIONS CAN BE COMBINED IN ANY WAY TO SUIT ANY INSTALLATION.

* E. D. = EDGE DISTANCE (SEE SPECIFICATIONS ON SHEET 13)

NOTE:
 † THIS INSTALLATION SHALL BE REMOVABLE WHEN PERFORMED ADJACENT TO AN OPERABLE EXIT OR ENTRANCE

♦ SEE LIMITATIONS OF USE FOR BLADE ①A ON SHEET 19

INSTALLATION DETAILS W/ ① HV BLADE

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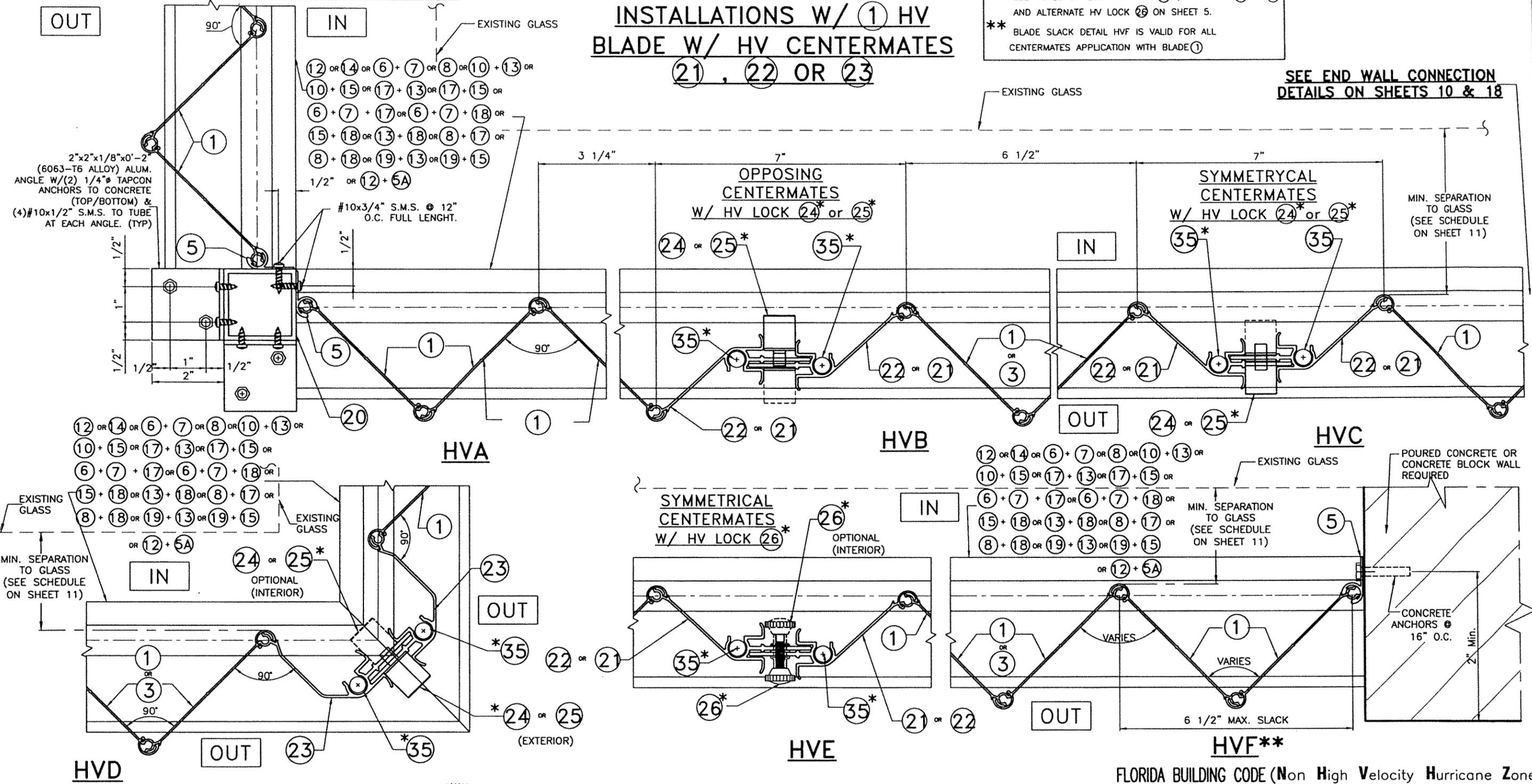
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1	OLD 20-164	7/21/23	DATE: 7/21/2023
2			DRAWING No
3			23-127
4			SHEET
5			7 OF 20
6			

SEE END WALL CONNECTION DETAILS ON SHEETS 10 & 18

INSTALLATIONS W/ ① HV BLADE W/ HV CENTERMATES ②①, ②② OR ②③

* SEE NOTES ON LOCKING RODS ③③, HV LOCKS ②④ OR ②⑤
AND ALTERNATE HV LOCK ②⑥ ON SHEET 5.
** BLADE SLACK DETAIL HVF IS VALID FOR ALL
CENTERMATES APPLICATION WITH BLADE ①

SEE END WALL CONNECTION
DETAILS ON SHEETS 10 & 18



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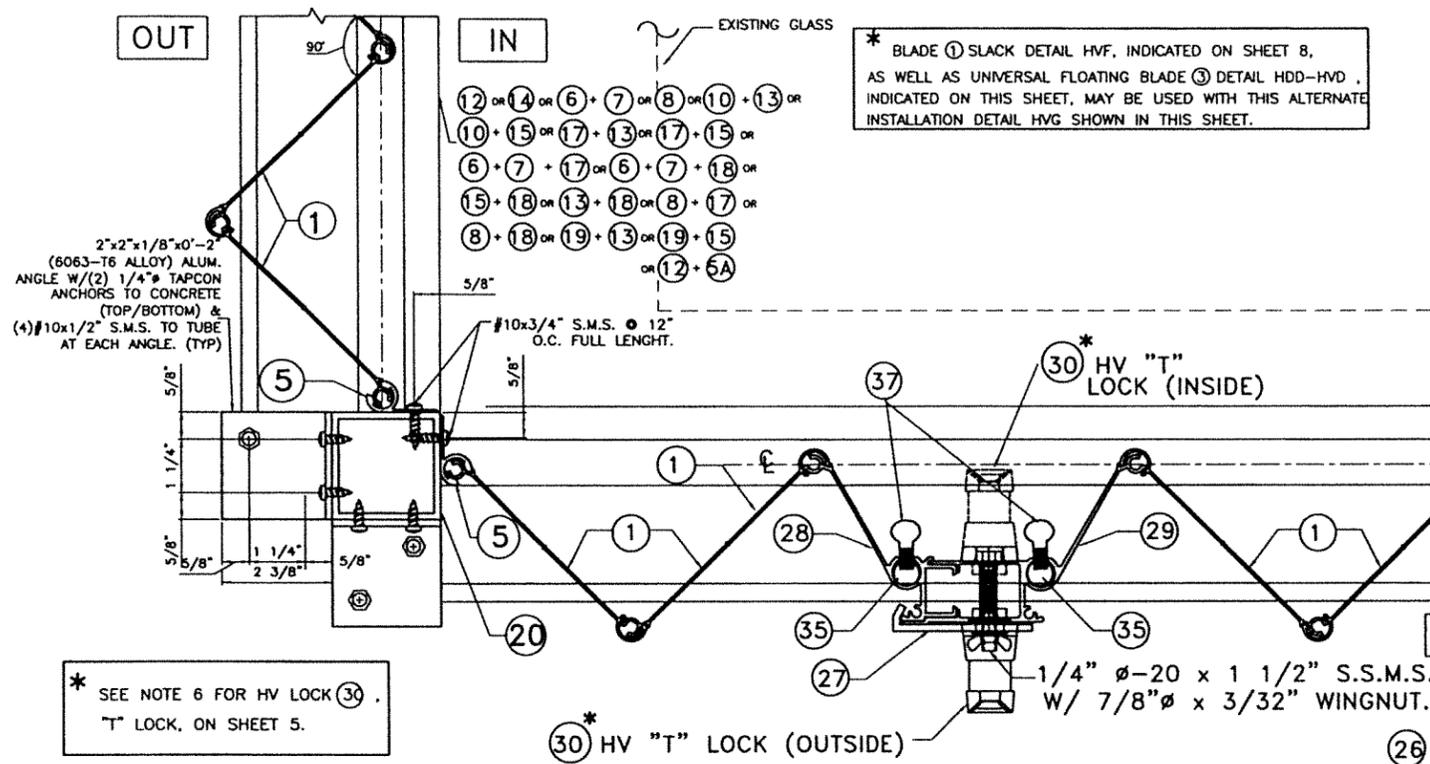
Accordion Shutter System

H.V. BLADE #1 W/ OR W/O H.V. WINDOW BLADE

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1	OLD 20-164	7/21/23	DATE: 7/21/2023
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3			23-127
4			SHEET
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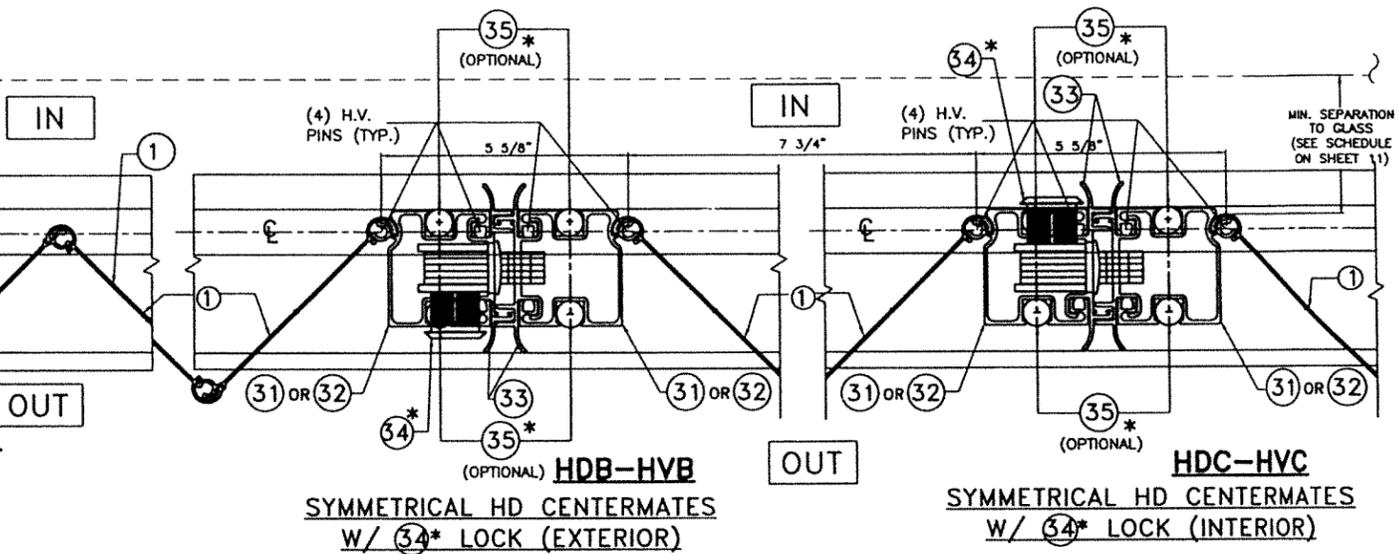
ALTERNATE INSTALLATION W/HV "T" LOCK (30), HV MALE/FEMALE "T" LOCKS CENTERMATES (28), (29) & LOCKERS (27) W/ (1) HV BLADE *

SEE END CONNECTION DETAILS ON SHEETS 10 & 18



INSTALLATION (1) HV BLADE W/ HD CENTERMATES (31), (32), (33)

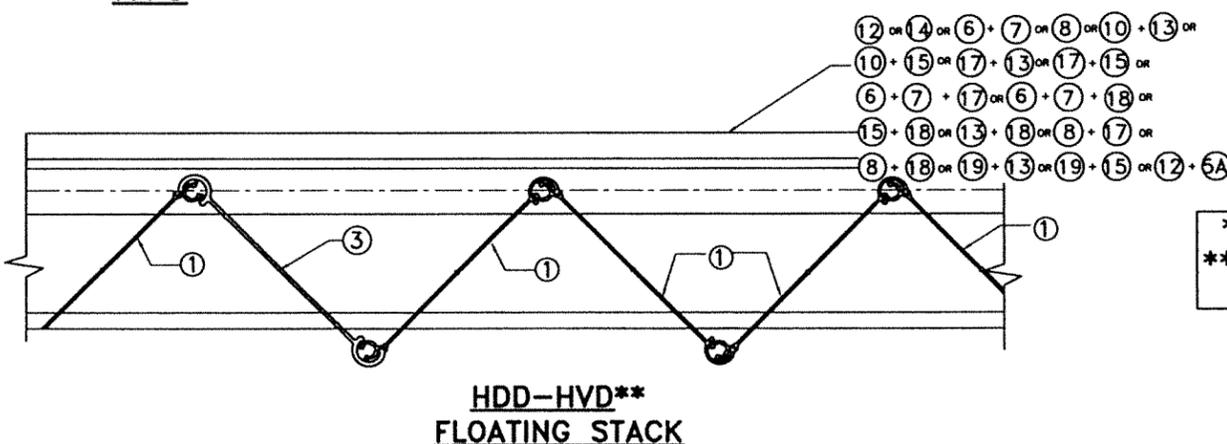
SEE END WALL CONNECTION DETAILS ON SHEETS 10 & 18



* SEE NOTE 6 FOR HV LOCK (30) "T" LOCK, ON SHEET 5.

† SERIES 9444 ALUMINUM (2024-T3 ALLOY) LARGE FLANGE THIN SHEET NUTSERT, PART # 0820, AS MANUFACTURED BY AVDEL CHERRY TEXTORN, PARSIPPENY, NEW JERSEY 07054 OR EQUAL.

* SEE NOTES ON LOCKING RODS (3) & HD (3) LOCKS ON SHEET 5
 ** UNIVERSAL FLOATING BLADE (3) DETAIL HDD-HVD IS VALID FOR ALL CENTERMATES APPLICATIONS WITH BLADE (1)



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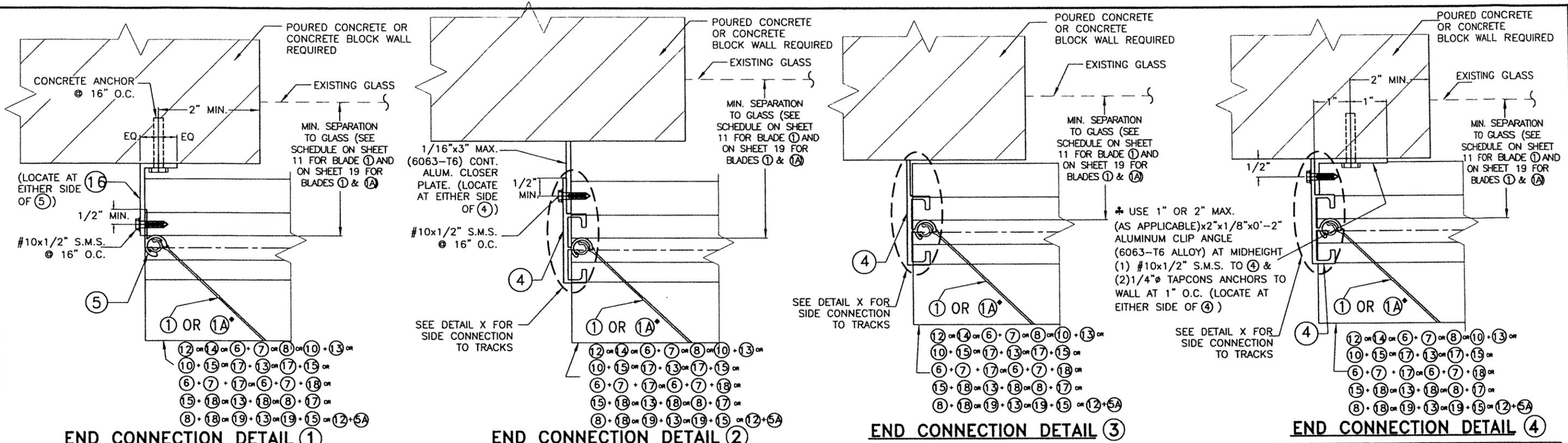
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2			DRAWING No
3			23-127
4			SHEET
5			9 OF 20
6			



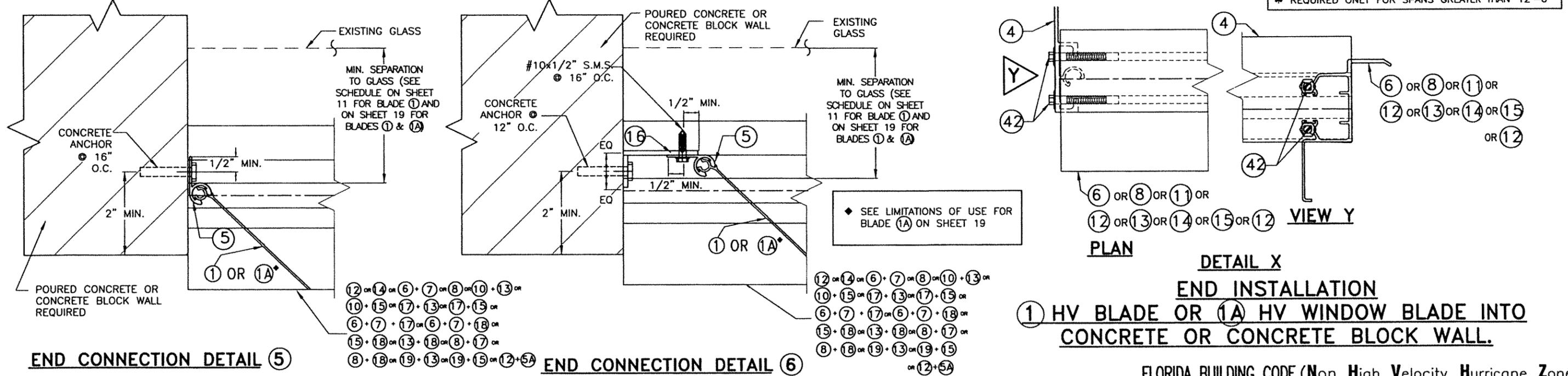
END CONNECTION DETAIL ①

END CONNECTION DETAIL ②

END CONNECTION DETAIL ③

END CONNECTION DETAIL ④

✦ REQUIRED ONLY FOR SPANS GREATER THAN 12'-0"



END CONNECTION DETAIL ⑤

END CONNECTION DETAIL ⑥

① HV BLADE OR ①A HV WINDOW BLADE INTO CONCRETE OR CONCRETE BLOCK WALL.

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1	OLD 20-164	7/21/23	DATE: 7/21/2023
2			DRAWING No
3			23-127
4			SHEET
5			10 OF 20
6			

SCHEDULE #1

MAXIMUM SHUTTER SPAN* "L+" OR "L-" (ft.). FOR INSTALLATIONS W/ SYMMETRICAL CENTERMATES, ① & ② or ③ or ④ W/ ONE H.V. LOCK ④ or ⑤ or ⑥ or HD LOCK ④ W/ NO LOCKING RODS ⑤ or CENTERMATES ② & ③ W/ ONE HV "T" LOCK ⑤ W/TWO LOCKING RODS ⑤ TOP & BOTTOM (SEE NOTES †, ††)

MAXIMUM A.S.D. DESIGN PRESSURE RATING (p.s.f.) (+ OR -)	CONCRETE & WOOD INSTALLATIONS ①			
	WALL MOUNTING		FLOOR/CEILING MOUNTING	
	L + (ft)	L - (ft)	L + (ft)	L - (ft)
30 OR LESS	16'-0"	16'-0"	16'-0"	16'-0"
35	14'-10"	14'-10"	15'-2"	16'-0"
40	13'-10"	13'-10"	14'-2"	15'-2"
45	13'-1"	13'-1"	13'-4"	14'-3"
50	12'-5"	12'-5"	12'-8"	13'-7"
55	11'-10"	11'-10"	12'-1"	12'-11"
60	11'-4"	11'-4"	11'-7"	12'-4"
65	10'-10"	10'-10"	11'-1"	11'-11"
70	10'-6"	10'-6"	10'-9"	11'-5"
75	10'-1"	10'-1"	10'-4"	11'-1"
80	9'-10"	9'-10"	10'-0"	10'-9"
85	9'-6"	9'-6"	9'-9"	10'-5"
90	9'-3"	9'-3"	9'-5"	10'-1"
95	9'-0"	8'-9"	9'-2"	9'-10"
100	8'-9"	8'-4"	9'-0"	9'-7"
105	8'-7"	7'-11"	8'-9"	9'-4"
110	8'-4"	7'-7"	8'-7"	9'-2"
115	8'-2"	7'-3"	8'-4"	8'-11"
120	8'-0"	6'-11"	8'-2"	8'-9"
125	7'-10"	6'-8"	8'-0"	8'-5"
130	7'-8"	6'-5"	7'-10"	8'-1"
135	7'-7"	6'-2"	7'-9"	7'-9"
140	7'-5"	5'-11"	7'-7"	7'-6"
145	7'-3"	5'-9"	7'-5"	7'-3"
150	7'-2"	5'-7"	7'-4"	7'-0"
155	7'-0"	5'-5"	7'-2"	6'-9"
160	6'-11"	5'-2"	7'-1"	6'-7"
165	6'-10"	5'-1"	7'-0"	6'-4"
170	6'-9"	4'-11"	6'-11"	6'-2"
175	6'-7"	4'-9"	6'-9"	6'-0"
180	6'-6"	4'-8"	6'-8"	5'-10"
185	6'-5"	4'-6"	6'-7"	5'-8"
190	6'-4"	4'-5"	6'-6"	5'-6"
195	6'-3"	4'-3"	6'-5"	5'-5"
200	6'-2"	4'-2"	6'-4"	5'-3"
205	6'-1"	4'-1"	6'-3"	5'-1"

SCHEDULE #2

MAXIMUM SHUTTER SPAN* "L+" OR "L-" (ft.) FOR INSTALLATIONS W/ OPPOSING CENTERMATES, ① & ② ONE HV LOCK ④ or ⑤ or ⑥ W/ NO LOCKING RODS ⑤ (SEE NOTES †, ††)

MAXIMUM A.S.D. DESIGN PRESSURE RATING (p.s.f.) (+ OR -)	CONCRETE & WOOD INSTALLATIONS ①			
	WALL MOUNTING & FLOOR/CEILING MOUNTING		FLOOR/CEILING MOUNTING	
	L + (ft)	L - (ft)	L + (ft)	L - (ft)
30	16'-0"	16'-0"	16'-0"	16'-0"
35	14'-10"	14'-10"	14'-10"	14'-10"
40	13'-10"	13'-10"	13'-10"	13'-10"
45	13'-1"	13'-1"	13'-1"	13'-1"
50	12'-5"	12'-5"	12'-5"	12'-5"
55	11'-10"	11'-10"	11'-10"	11'-10"
60	11'-4"	11'-4"	11'-4"	11'-4"
65	10'-10"	10'-10"	10'-10"	10'-10"
70	10'-6"	10'-6"	10'-6"	10'-6"
75	10'-1"	10'-1"	10'-1"	10'-1"
80	9'-10"	9'-10"	9'-10"	9'-10"
85	9'-6"	9'-6"	9'-6"	9'-6"
90	9'-3"	9'-3"	9'-3"	9'-3"
95	9'-0"	8'-9"	8'-9"	8'-9"
100	8'-9"	8'-4"	8'-4"	8'-4"
105	8'-7"	7'-11"	7'-11"	7'-11"
110	8'-4"	7'-7"	7'-7"	7'-7"
115	8'-2"	7'-3"	7'-3"	7'-3"
120	8'-0"	6'-11"	6'-11"	6'-11"
125	7'-10"	6'-8"	6'-8"	6'-8"
130	7'-8"	6'-5"	6'-5"	6'-5"
135	7'-7"	6'-2"	6'-2"	6'-2"
140	7'-5"	5'-11"	5'-11"	5'-11"
145	7'-3"	5'-9"	5'-9"	5'-9"
150	7'-2"	5'-7"	5'-7"	5'-7"
155	7'-0"	5'-5"	5'-5"	5'-5"
160	6'-11"	5'-2"	5'-2"	5'-2"
165	6'-10"	5'-1"	5'-1"	5'-1"
170	6'-9"	4'-11"	4'-11"	4'-11"
175	6'-7"	4'-9"	4'-9"	4'-9"
180	6'-6"	4'-8"	4'-8"	4'-8"
185	6'-5"	4'-6"	4'-6"	4'-6"
190	6'-4"	4'-5"	4'-5"	4'-5"
195	6'-3"	4'-3"	4'-3"	4'-3"
200	6'-2"	4'-2"	4'-2"	4'-2"
205	6'-1"	4'-1"	4'-1"	4'-1"

SCHEDULE #3

MAXIMUM SHUTTER SPAN* "L+" OR "L-" (ft.) INSTALLATIONS W/ SYMMETRICAL CENTERMATES ① & ② W/ ONE HV LOCKS ④ OR ⑤ W/ NO LOCKING RODS ⑤ (VALID FOR MOUNTING ① SHEET 7)

MAXIMUM A.S.D. DESIGN PRESSURE RATING (p.s.f.) (+ OR -)	CONCRETE INSTALLATIONS	
	FLOOR/CEILING MOUNTING OR FLOOR/WALL MOUNTING	
	L + (ft)	L - (ft)
30	16'-0"	16'-0"
35	15'-2"	16'-10"
40	14'-2"	15'-2"
45	13'-4"	14'-3"
50	12'-3"	13'-1"
55	11'-1"	11'-11"
60	10'-2"	10'-11"
65	9'-5"	10'-1"
70	8'-9"	9'-4"
75	-	8'-9"

INSTALLATION LEGEND		
	CONCRETE & MANSORY	WOOD
WALL MOUNTING	A, B, C, D, E, F, K & L	M, N, O, P, Q, R, S, & V.
FLOOR/CEILING MOUNTING	G, H, I, J & M	T, U, W & X

① MAXIMUM SHUTTER SPAN "L+" OR "L-" FOR INSTALLATIONS INTO WOOD SHALL BE LIMITED TO 105 psf. A.S.D. DESIGN PRESSURE RATING.

† HV CORNER CENTERMATE #3 MAY BE USED AT ALL MOUNTING INSTALLATIONS. LOCKING SPECIFICATIONS SHALL BE AS INDICATED ON MANDATORY CONDITION #2 NOTE #5, SHEET 5.

†† EXCEPT THAT MAXIMUM SHUTTER SPAN "L+" OR "L-" AND MAXIMUM A.S.D. DESIGN PRESSURE RATING FOR INSTALLATIONS INTO CONCRETE OR CONCRETE BLOCK SHALL BE LIMITED AS FOLLOWS:
1- CONNECTIONS TO KEYSTONE MOUNTING LIMITED TO +64,-72 p.s.f. AND 8'-0" SPAN, SEE MOUNTING ① ON SHEET 7.

SEPARATION TO GLASS SCHEDULE

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

① HV BLADE

*** NOTES:**

(1) L+: MAXIMUM ALLOWABLE SPAN FOR A GIVEN POSITIVE A.S.D. DESIGN PRESSURE RATING.
L-: MAX. ALLOWABLE SPAN FOR A GIVEN NEGATIVE A.S.D. DESIGN PRESSURE RATING.

(2) PROCEDURE TO DETERMINE MAXIMUM SPAN FOR WALL MOUNTINGS (TOP/BOTTOM) OR FLOOR/CEILING:
GIVEN A POSITIVE A.S.D. DESIGN PRESSURE RATING, DETERMINE MAXIMUM SPAN "L+" FROM SCHEDULE.
GIVEN A NEGATIVE A.S.D. DESIGN PRESSURE RATING, DETERMINE MAXIMUM SPAN "L-" FROM SCHEDULE.
FINAL MAXIMUM ALLOWABLE SPAN IS EQUAL TO THE MINIMUM DETERMINED SPAN BETWEEN "L+" AND "L-".

(3) PROCEDURE TO DETERMINE MAXIMUM SPAN FOR COMBINATIONS IN BETWEEN WALL MOUNTINGS W/ FLOOR/CEILING MOUNTINGS:
FOR A GIVEN POSITIVE A.S.D. DESIGN PRESSURE RATING:
DETERMINE:
L1+= MAX. SPAN FOR WALL MOUNTING INSTALLATIONS.
L2+= MAX. SPAN FOR FLOOR/CEILING MOUNTING INSTALLATIONS.
FOR A GIVEN NEGATIVE A.S.D. DESIGN PRESSURE RATING:
DETERMINE:
L1-= MAX. SPAN FOR WALL MOUNTING INSTALLATIONS.
L2-= MAX. SPAN FOR FLOOR/CEILING MOUNTING INSTALLATIONS.
FINAL MAXIMUM ALLOWABLE SPAN IS EQUAL TO THE MINIMUM BETWEEN "L1+", "L2+", "L1-" AND "L2-".

(4) GO TO ANCHOR SCHEDULE WITH FINAL MAXIMUM ALLOWABLE SPAN AND NEGATIVE A.S.D. DESIGN PRESSURE RATING TO DETERMINE MAXIMUM ANCHOR SPACING.

FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)

WALTER A. TILLIT JR.
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4268 Westroads Drive
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BERTHA HV™
Accordion Shutter System
H.V. BLADE #1 W/ OR W/O H.V. WINDOW BLADE

REV. No	DESCRIPTION	DATE	DRAWN BY: MYQW./L.G.
1	OLD 20-164	7/21/23	DATE: 7/21/2023
2			DRAWING No
3			23-127
4			SHEET
5			11 OF 20
6			

MAXIMUM ANCHOR* SPACING (in.) SCHEDULE FOR A GIVEN MAX. SHUTTER SPAN.
A.S.D. DESIGN NEGATIVE PRESSURE RATING AND A CORRESPONDING MOUNTING TYPE FOR CONCRETE OR CONCRETE BLOCK INSTALLATIONS
 (SEE MOUNTINGS E, G, & H ON SHEETS 6 & 7)

*** SPECIFICATIONS ON ANCHOR REQUIREMENTS: POURED CONCRETE OR CONCRETE BLOCK SUBSTRATES**

MAXIMUM SPAN (ft)	POURED CONCRETE/CONCRETE BLOCK																POURED CONCRETE															
	E WALL SILL MOUNTING								G CEILING MOUNTING								H FLOOR MOUNTING															
	A.S.D. DESIGN NEGATIVE PRESSURE RATING (psf)																															
	30	40	60	75	90	120	160	205	30	40	60	75	90	120	160	205	30	40	60	75	90	120	160	205								
3'-0" OR LESS	14	12	10	9	8	8	6	5.5	14	12	10	9	8	8	6	6	14	12	10	9	8	8	6	6								
	14	12	10	9	8	8	6	6	14	12	10	9	8	8	6	6	14	12	10	9	8	8	6	6								
	14	12	10	9	8	8	6	6	14	12	10	9	8	8	6	6	14	12	10	9	8	8	6	5								
	14	12	10	9	8	8	6	7	14	12	10	9	8	8	6	6	14	12	10	9	8	8	6	6								
4'-0"	14	12	10	9	8	7	5.5	3.5	14	12	10	9	8	8	6	6	14	12	10	9	8	8	6	5								
	14	12	10	9	8	8	6	6	14	12	10	9	8	8	6	6	14	12	10	9	8	8	6	5.5								
	14	12	10	9	8	8	6	4	14	12	10	9	8	8	6	4.5	14	12	10	9	8	8	6	4.5								
	14	12	10	9	8	8	6	4.5	14	12	10	9	8	8	6	5.5	14	12	10	9	8	8	6	4.5								
5'-0"	14	12	10	9	7.5	5.5	3.5	14	12	10	9	8	8	6	5	14	12	10	9	8	7	5.5	4									
	14	12	10	9	8	8	6	6	14	12	10	9	8	8	6	5.5	14	12	10	9	8	8	6	4.5								
	14	12	10	9	8	7	4	14	12	10	9	8	6.5	5	3.5	14	12	10	8	6.5	5	3.5	3									
	14	12	10	9	8	7.5	4.5	14	12	10	9	8	8	6	4.5	14	12	10	9	8	6	4.5	3.75									
6'-0"	14	12	9.5	7.5	6.5	4.5	14	12	10	9	8	7.5	5.5	4	14	12	10	9	8	6	4.5	3.5										
	14	12	10	9	8	8	6	14	12	10	9	8	8	6	5	14	12	10	9	8	6.5	5	3.5									
	14	12	10	9	7.5	5.5	3	14	12	10	8.5	7	5.5	4	3	14	12	8	6.5	5.5	4	3										
	14	12	10	9	8	6	14	12	10	9	8	8	6.5	5	3.75	14	12	10	8.5	8	5	4										
7'-0"	14	12	8	6.5	5.5	3	14	12	10	9	8	8.5	4.5	3.5	14	12	10	8	7	5	3.5	3										
	14	12	10	9	8	8	14	12	10	9	8	7	5	4	14	12	10	9	7.5	5.5	4	3										
	14	12	10	8	6.5	4	14	12	9	7.5	6	4.5	3.5	14	10.5	7	5.5	4.5	3.5	14	12	10	8	7.5	4.5							
	14	12	10	8.5	7	4	14	12	9	7.5	5.5	4	14	12	9	7	5.5	4.5	14	12	10	8	7.5	4.5								
8'-0"	14	11	7	5.5	4.5	14	12	10	9	7.5	5.5	4	14	12	9	7	6	4.5	3													
	14	12	10	9	8	6.5	14	12	10	9	8	6	4	14	12	10	8	6.5	5	3.5												
	14	12	8.5	7	5.5	3	14	12	8	6.5	5.5	4	3	12.5	9.5	8	5	4	3													
	14	12	9.5	7.5	6	14	12	9.5	8	6.5	5	14	12	8	6	6.5	4															
9'-0"	13	9.5	6.5	5	3.5	14	12	10	8	6.5	5	14	12	8	6.5	5	4															
	14	12	10	9	8	14	12	10	9	7.5	4.5	14	12	8.5	7	5.5	4															
	14	11.5	7.5	6	4	14	11	7	5.5	5	3.5	14	11	8	5.5	4.5	3.5															
	14	12	8	6.5	4.5	14	12	8.5	7	5.5	4	14	10.5	7	5.5	6	4.5															
10'-0"	11.5	8.5	5.5	4	14	12	9	7	6	4.5	14	11	7	5.5	4.5	3.5																
	14	12	10	9	7.5	14	12	10	8	6.5	5	14	12	8	6	5	4															
	14	10.5	7	5	3.5	13	9.5	6.5	5	4	3	10	7.5	5	4	3																
	14	11	7.5	5.5	14	11.5	9	6	5	4	12.5	9.5	8	5	4	4																
11'-0"	10.5	8	5	14	12	8	6.5	5.5	4	13	10	6.5	5	4	3																	
	14	12	10	14	12	9	7	6	4.5	14	10.5	7	5.5	4.5	3.5																	
	12.5	9.5	5	12	9	6	4.5	4	3	9	7	4.5	3.5	3																		
	14	10	7	14	10.5	7	5.5	4.5	11.5	8.5	5.5	4.5	3.75																			
12'-0"	9.5	7	4.5	14	11.5	7.5	6	5	12	9	6	4.5	4																			
	14	12	10	14	12	8	6.5	5.5	13	10	6.5	5	4																			
	11.5	8.5	4.5	11	8	5.5	4	3.5	8	6	4	3																				
	13.5	9.5	6	13	9.5	6.5	5	4	10.5	8	5	4																				
13'-0"	9	6.5	14	10.5	7	5.5	4.5	11	8.5	5.5	4.5	3.5																				
	14	12	14	11.5	7.5	6	5	12	9	6	4.5	4																				
	10.5	8	10	7.5	5	4	3	7.5	5.5	4	3																					
	12.5	8.5	12	9	6	4.5	4	9.5	7	5	4																					
14'-0"	8	6	13	9.5	6.5	5	10.5	7.5	5	4																						
	14	12	14	10.5	7	5.5	11	8.5	5.5	4.5																						
	10	7.5	9	7	4.5	3.5	7	5	3.5	3																						
	11.5	8	11	8	5.5	4.5	9	6.5	4.5																							
15'-0"	7.5	12	9	6	9.5	7	4.5																									
	14	13.5	10	6.5	10.5	8	5																									
	9	8.5	6.5	4	6.5	5	3																									
	10	10.5	8	5	8.5	6	4																									
16'-0"	7	11.5	8.5	5.5	9	6.5	4.5																									
	14	12.5	9.5	6	10	7.5	5																									
	8	8	6	4	6	4.5	3																									
	9.5	9.5	7	5	8	6	4																									

ANCHORS SPACING LEGEND

TAPCON OR TAPCON WITH ADVANCED THREADFORM TECHNOLOGY
ALL POINTS SOLID-SET
BLUE TAP W/ CAP
TAPPER+

SEE LIMITATIONS OF USE FOR BLADE (A) ON SHEET 19

① HV BLADE OR
 ① HV BLADE W/
 (A) HV WINDOW
 BLADE WORKING
 IN UNISON ♦

1. ANCHORS TO SUBSTRATE SHALL BE AS FOLLOWS:
- (A) TO EXISTING POURED CONCRETE: (Min. f'c = 3 ksi)
 - 1/4" TAPCON OR TAPCON WITH ADVANCED THREADFORM TECHNOLOGY ANCHORS, AS MANUFACTURED BY I.T.W. BUILDDEX. (Min. f'c = 3 ksi)
 - 1/4" x 3/4" ALL POINTS SOLID-SET ANCHORS, AS DISTRIBUTED BY ALL POINTS SCREW, BOLT & SPECIALTY COMPANY. (Min. f'c = 3 ksi)
 - 1/4" BLUE TAP CONCRETE ANCHORS W/ CAP AS MANUFACTURED BY FLORIDA FASTENERS DIRECT, INC. (Min. f'c = 2 ksi)
 - 1/4" TAPPER+ ANCHORS AS MANUFACTURED BY DEWALT, INC., AND DISTRIBUTED BY ALL POINTS SCREW, BOLT & SPECIALTY COMPANY OR ANY OTHER APPROVED LICENSED OR AUTHORIZED VENDOR REGISTERED WITH THE AMERICAN SHUTTER SYSTEMS ASSOCIATION, INC. (Min. f'c = 3 ksi)
- NOTES:
 A.1) MINIMUM EMBEDMENT INTO POURED CONCRETE OF TAPCON OR TAPCON WITH ADVANCED THREADFORM TECHNOLOGY ANCHORS AND TAPPER+ ANCHORS IS 1 3/4", AND FOR BLUE TAP W/ CAP ANCHORS IS 1 1/2".
 A.2) MINIMUM EMBEDMENT OF 1/4" x 3/4" ALL POINTS SOLID-SET ANCHORS SHALL BE 7/8" INTO THE POURED CONCRETE. NO EMBEDMENT INTO STUCCO SHALL BE PERMITTED. 1/4" -20 S.S. MACHINE SCREW USED SHALL BE 1 1/2" LONG MINIMUM SHOULD STUCCO EXIST, AND 1" MINIMUM FOR WALLS WITH NO STUCCO.
 A.3) IN CASE THAT PRECAST STONE, PRECAST CONCRETE PANELS, PAVERS OR ANY VENEER BE FOUND ON THE EXISTING WALL OR FLOOR, ANCHORS SHALL BE LONG ENOUGH TO REACH THE MAIN STRUCTURE BEHIND SAID WALL FINISHES. ANCHORAGE SHALL BE AS INDICATED ON NOTES A.1) & A.2) ABOVE. FOR INSTALLATIONS ON VINYL SIDING OR EIFS WITH OR WITHOUT METAL STUDS CONSULT THIS ENGINEER. FOR INSTALLATION INTO EIFS WITH METAL STUDS SEE SHEET 20.
- (B) TO EXISTING CONCRETE BLOCK: (ASTM C-90)
 - 1/4" TAPCON OR TAPCON WITH ADVANCED THREADFORM TECHNOLOGY ANCHORS, AS MANUFACTURED BY I.T.W. BUILDDEX.
 - 1/4" x 3/4" ALL POINTS SOLID-SET ANCHORS, AS DISTRIBUTED BY ALL POINTS SCREW, BOLT & SPECIALTY COMPANY.
 - 1/4" BLUE TAP CONCRETE ANCHORS W/ CAP AS MANUFACTURED BY FLORIDA FASTENERS DIRECT, INC.
 - 1/4" TAPPER+ ANCHORS AS MANUFACTURED BY DEWALT, INC., AND DISTRIBUTED BY ALL POINTS SCREW, BOLT & SPECIALTY COMPANY OR ANY OTHER APPROVED LICENSED OR AUTHORIZED VENDOR REGISTERED WITH THE AMERICAN SHUTTER SYSTEMS ASSOCIATION, INC.
- NOTES:
 B.1) MINIMUM EMBEDMENT INTO CONCRETE BLOCK OF TAPCON, BLUE TAP W/ CAP ANCHORS AND TAPPER+ ANCHORS IS 1 1/4" AND TAPCON WITH ADVANCED THREADFORM TECHNOLOGY ANCHORS IS 1".
 B.2) MINIMUM EMBEDMENT OF 1/4" x 3/4" ALL POINTS SOLID-SET ANCHORS SHALL BE ENTIRELY EMBEDDED INTO THE CONCRETE BLOCK. NO EMBEDMENT INTO STUCCO SHALL BE PERMITTED. 1/4" -20 S.S. MACHINE SCREW USED SHALL BE 1 1/2" LONG MINIMUM SHOULD STUCCO EXIST, AND 1" MINIMUM FOR WALLS WITH NO STUCCO.
 B.3) IN CASE THAT PRECAST STONE, PRECAST CONCRETE PANELS, PAVERS OR ANY VENEER BE FOUND ON THE EXISTING WALL OR FLOOR, ANCHORS SHALL BE LONG ENOUGH TO REACH THE MAIN STRUCTURE BEHIND SAID WALL FINISHES. ANCHORAGE SHALL BE AS INDICATED ON NOTES B.1) & B.2) ABOVE. FOR INSTALLATIONS ON VINYL SIDING OR EIFS WITH OR WITHOUT METAL STUDS CONSULT THIS ENGINEER. FOR INSTALLATION INTO EIFS WITH METAL STUDS SEE SHEET 20.
- (C) ANCHORS SHALL BE INSTALLED FOLLOWING ALL OF THE RECOMMENDATIONS AND SPECIFICATIONS OF THE ANCHOR'S MANUFACTURER.
- (D) SEE SCHEDULE BELOW FOR EDGE DISTANCE (E.D.) VERSUS SPACING RELATIONSHIP FOR ANCHORS.

EDGE DISTANCE VERSUS SPACING SCHEDULE FOR ANCHORS:
 MAXIMUM ANCHOR SPACINGS ARE VALID FOR EDGE DISTANCES INDICATED BELOW. FOR E. D. LESS THAN THE INDICATED, REDUCE ANCHOR SPACING BY MULTIPLYING SPACING SHOWN ON SCHEDULE BY THE FOLLOWING FACTORS.
 REDUCED SPACING OBTAINED USING FACTOR SHALL NOT BE LESS THAN MINIMUM SPACING INDICATED FOR EACH ANCHOR TYPE.

ACTUAL EDGE DISTANCE	FACTOR					
	TAPCON	TAPCON WITH ADVANCED THREADFORM TECHNOLOGY	ALL POINT SOLID SET	BLUE TAP W/ CAP	TAPPER + MIN. SPACING	
	MIN. SPACING = 3"	MIN. SPACING = 3"	MIN. SPACING = 3 1/2"	MIN. SPACING = 3"	3 3/4"	4"
	POURED CONCRETE & CONCRETE BLOCK MIN. ED.=3"	POURED CONCRETE MIN. ED.=3 1/2"	CONCRETE BLOCK MIN. ED.=2 1/2"	POURED CONCRETE & CONCRETE BLOCK MIN. ED.=3 1/2"	POURED CONCRETE & CONCRETE BLOCK MIN. ED.=3"	POURED CONCRETE & CONCRETE BLOCK MIN. ED.=2 1/2"
3"	1.0	0.90	1.0	0.78	1.0	0.84
2 1/2"	-	0.81	1.0	-	-	0.67
2"	-	0.71	-	-	-	0.51
1 3/4"	-	0.91	-	-	-	0.43
1 1/2"	0.35	-	-	-	-	0.35

FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)

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 STATE OF FLORIDA
 PROFESSIONAL ENGINEER
 2023
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BERTHA HV™
 Accordion Shutter System
 H.V. BLADE #1 W/ OR W/O H.V. WINDOW BLADE
 REV. No DESCRIPTION DATE DRAWN BY: Y.M.
 1 OLD 20-164 7/21/23 DATE: 7/21/2023
 2
 3 DRAWING No
 4 **23-127**
 5 SHEET
 6 **13 OF 20**

FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)

MAXIMUM ANCHOR* SPACING (in.) SCHEDULE FOR A GIVEN MAX. SHUTTER SPAN.
A.S.D DESIGN NEGATIVE PRESSURE RATING AND A CORRESPONDING MOUNTING TYPE FOR CONCRETE OR CONCRETE BLOCK INSTALLATIONS
 (SEE MOUNTINGS I, J, K & L ON SHEET 7)

MAXIMUM SPAN (ft)	POURED CONCRETE																POURED CONCRETE/CONCRETE BLOCK															
	(I) WALK OVER & (II) TRENCH MOUNTINGS								(J) RAINGUARD MOUNTING								(K) WALL/FLOOR MOUNTING								(L) WALL/WALK OVER MOUNTING							
	A.S.D. DESIGN NEGATIVE PRESSURE RATING (psf)								A.S.D. DESIGN NEGATIVE PRESSURE RATING (psf)								A.S.D. DESIGN NEGATIVE PRESSURE RATING (psf)								A.S.D. DESIGN NEGATIVE PRESSURE RATING (psf)							
	30	40	60	75	90	120	160	205	30	40	60	75	90	120	160	205	30	40	60	75	90	120	160	205	30	40	60	75	90	120	160	205
3'-0" OR LESS	14	12	10	9	8	8	6	6	12	12	12	12	12	11.5	8.5	6.5	7	7	7	7	7	7	7	7	5.5	5	5	5	5	5	5	5
	14	12	10	9	8	8	6	6	12	12	12	12	12	12	12	10.5	8	8	7	7	7	7	7	7	6.5	5	5	5	5	5	5	5
4'-0"	14	12	10	9	8	8	6	6	12	12	12	12	12	10	7.5	6	7	7	7	7	7	7	7	7	5	5	5	5	5	5	5	5
	14	12	10	9	8	8	6	6	12	12	12	12	11.5	8.5	6.5	5	7	7	7	7	7	7	7	7	5.5	4	5	5	5	5	5	4
5'-0"	14	12	10	9	8	8	6	6	12	12	12	12	11	9	7	5	4	7	7	7	7	7	7	5.5	4	3	5	5	5	5	5	4
	14	12	10	9	8	8	6	6	12	12	12	12	10	7.5	5.5	4	7	7	7	7	7	7	7	7	5	5	5	5	5	5	5	5
6'-0"	14	12	10	9	8	8	6	6	12	12	12	12	10.5	8	6	4.5	3.5	7	7	7	7	7	7	7	5	5	5	5	5	5	5	4
	14	12	10	9	8	8	6	6	12	12	12	12	10	7.5	5.5	4	3	7	7	7	7	7	7	5.5	4	5	5	5	5	5	5	4
7'-0"	14	12	10	9	8	8	6	6	12	12	10	8	6.5	5	3.75	—	7	7	7	7	7	6	4.5	—	5	5	5	5	5	5	4.5	—
	14	12	10	9	8	8	6	6	12	12	10	8	6.5	5	3.5	—	7	7	7	6.5	5.5	4	—	—	5	5	5	5	5	5	4	3
8'-0"	14	12	10	9	8	8	6	6	12	12	12	8.5	7	5	4	3	7	7	7	7	7	7	6	5	5	5	5	5	5	5	5	5
	14	12	10	9	8	8	6	6	12	10	6.5	5	4.5	3	—	—	7	7	7	7	6.5	5	3	—	5	5	5	5	5	5	3.5	3
9'-0"	14	12	10	9	8	8	6	6	12	12	8.5	7	5.5	4	—	—	7	7	7	7	7	5	—	—	5	5	5	5	5	5	4	—
	14	12	10	9	8	8	6	6	12	12	8.5	7	5.5	4	3	—	7	7	7	7	7	5	—	—	5	5	5	5	5	5	4	—
10'-0"	14	12	10	9	8	8	6	6	12	12	11.5	8	6.5	5	3.5	—	7	7	7	7	7	7	6	4.5	—	5	5	5	5	5	5	4.5
	14	12	10	9	8	8	6	6	12	12	9.5	6.5	5.5	4	3	—	7	7	7	7	7	7	6	3	5	5	5	5	5	5	5	5
11'-0"	14	12	10	9	8	8	6	6	12	10	7	5.5	4.5	3.5	—	—	7	7	7	7	7	7	3.5	—	5	5	5	5	5	5	5	4
	14	12	10	9	8	8	6	6	12	9.5	6	5	4	3	—	—	7	7	5	4	3	—	—	—	5	5	5	4	3.5	—	—	—
12'-0"	14	12	10	9	8	8	6	6	12	10	7	5.5	4.5	3.5	—	—	7	7	7	7	7	7	3.5	—	5	5	5	5	5	5	5	4
	14	12	10	9	8	8	6	6	12	8.5	6	5	4	3	—	—	7	7	8	5	4	—	—	—	5	5	5	5	4	3	—	—
13'-0"	14	12	10	9	8	8	6	6	12	11	7.5	6	5	3.75	—	—	7	7	7	7.5	6	4.5	—	—	5	5	5	5	5	4.5	—	—
	14	12	10	9	8	8	6	6	12	12	9.5	6.5	5.5	4	3	—	7	7	7	7	7	7	6	3	5	5	5	5	5	5	4.5	3.5
14'-0"	14	12	10	9	8	8	6	6	12	10.5	7	5.5	4.5	3.5	—	—	7	7	5.5	4.5	3.5	—	—	—	5	5	5	4.5	3.5	—	—	
	14	12	10	9	8	8	6	6	12	11	8.5	6	5	3.5	—	—	7	7	7	7	7	7	4.5	—	5	5	5	5	5	5	5	4.5
15'-0"	14	12	10	9	8	8	6	6	12	9.5	7	4.5	3.5	3	—	—	7	7	7	5.5	4.5	—	—	—	5	5	5	5	4.5	3.5	—	
	14	12	10	9	8	8	6	6	12	9	6	5	4	—	—	7	7	7	6	5	—	—	—	5	5	5	4.5	5	—	—		
16'-0"	14	12	10	9	8	8	6	6	12	10	7	5.5	4.5	3.5	—	—	7	7	7	7	7	7	3.5	—	5	5	5	5	5	5	4	3
	14	12	10	9	8	8	6	6	12	10.5	7	5.5	4.5	3.5	—	—	7	7	5.5	4.5	3.5	—	—	—	5	5	5	4.5	3.5	—	—	

ANCHORS SPACING LEGEND

TAPCON OR TAPCON WITH ADVANCED THREADFORM TECHNOLOGY
ALL POINTS SOLID-SET
BLUE TAP
TAPPER+

* SEE ANCHOR SPECIFICATIONS ON SHEET 13

◇ VALID ONLY FOR UP TO +70, -75 PSF A.S.D DESIGN PRESSURE RATING & FOR SPANS PER SCHEDULE #3, SHEET 11

① HV BLADE ONLY

FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)

WALTER A. TILLIT JR.
 LICENSE
 No. 44167
 STATE OF FLORIDA
 PROFESSIONAL ENGINEER
 7/2023
 P.E. SEAL/SIGNATURE/DATE

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 FLORIDA Lic. # 44167

A.S.S.A.
 American Shutter Systems
 Association, Inc.
 4268 Westroads Drive
 West Palm Beach, FL 33407

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BERTHA HV™
 Accordion Shutter System
 H.V. BLADE #1 W/ OR W/O H.V. WINDOW BLADE

REV. No	DESCRIPTION	DATE	DRAWN BY: Y.M.
1	OLD 20-164	7/21/23	DATE: 7/21/2023
2			DRAWING No
3			23-127
4			SHEET
5			14 OF 20
6			

MAXIMUM A.S.D. DESIGN PRESSURE RATING (p.s.f.) AND CORRESPONDING MAXIMUM ANCHOR SPACING (in.) SCHEDULE FOR A GIVEN MAX. SHUTTER SPAN, NEGATIVE A.S.D. DESIGN PRESSURE RATING AND A CORRESPONDING MOUNTING TYPE.

(SEE MOUNTINGS ON SHEETS 16 & 17).

MAXIMUM SPAN (ft)	SUBSTRATE																																																																																			
	SOUTHERN PINE No. 2 W/ MIN. G=0.55, DOUGLAS FIR W/ MIN. G=0.50						SPRUCE PINE FIR NORTH W/ MIN. G=0.43						SPRUCE PINE FIR SOUTH W/ MIN. G=0.36						1/2" MIN. CDX PLYWOOD			SOUTHERN PINE No. 2 W/ MIN. G=0.55, DOUGLAS FIR W/ MIN. G=0.50			SPRUCE PINE FIR NORTH W/ MIN. G=0.43			SPRUCE PINE FIR SOUTH W/ MIN. G=0.36																																																								
	WALL MOUNTINGS M, N, O & R			CEILING MOUNT T FLOOR MOUNTINGS W & X			WALL MOUNTINGS M, N, O & R			CEILING MOUNT T FLOOR MOUNTINGS W & X			WALL MOUNTINGS M, N, O & R			CEILING MOUNT T FLOOR MOUNTINGS W & X			WALL MOUNTINGS P & Q			B.O. WALL MOUNTINGS S & V			B.O. WALL MOUNTINGS S & V			B.O. WALL MOUNTINGS S & V																																																								
	A.S.D. DESIGN NEGATIVE PRESSURE RATING (psf)			A.S.D. DESIGN NEGATIVE PRESSURE RATING (psf)			A.S.D. DESIGN NEGATIVE PRESSURE RATING (psf)			A.S.D. DESIGN NEGATIVE PRESSURE RATING (psf)			A.S.D. DESIGN NEGATIVE PRESSURE RATING (psf)			A.S.D. DESIGN NEGATIVE PRESSURE RATING (psf)			A.S.D. DESIGN NEGATIVE PRESSURE RATING (psf)			A.S.D. DESIGN NEGATIVE PRESSURE RATING (psf)			A.S.D. DESIGN NEGATIVE PRESSURE RATING (psf)			A.S.D. DESIGN NEGATIVE PRESSURE RATING (psf)																																																								
	30	40	60	75	90	105	30	40	60	75	90	105	30	40	60	75	90	105	30	40	60	75	90	105	30	40	60	75	90	105	30	40	60	75	90	105	30	40	60	75	90	105	30	40	60	75	90	105	30	40	60	75	90	105																														
3'-0" OR LESS	12	10	10	9	8	8	6	6	6	6	6	6	12	10	10	9	8	8	6	6	6	6	6	6	12	10	10	9	8	8	6	6	6	6	6	6	6	5	4	4	4	3	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12												
4'-0"	12	10	10	9	8	8	6	6	6	6	6	6	12	10	10	9	8	8	6	6	6	6	6	6	12	10	10	9	8	7	6	6	6	6	6	5	6	5	4	4	4	3	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12												
5'-0"	12	10	10	9	8	8	6	6	6	6	6	5.5	12	10	10	9	8	8	6	6	6	6	6	5	12	10	10	9	8	7	6	6	6	6	6	5	6	5	4	4	4	3	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12												
6'-0"	12	10	10	9	8	6.5	6	6	6	6	5.5	4.5	12	10	10	9	8	5	6	6	6	5.5	5	4.5	12	10	10	9	6	3.5	6	6	6	6	5	4.5	6	5	4	4	3.5	-	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12												
7'-0"	12	10	10	9	6.5	4	6	6	6	6	5.5	4.5	12	10	10	9	5	3	6	6	6	5	4	3.5	12	10	10	7	3.5	-	6	6	6	5	4	3.5	6	5	4	4	-	-	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	10.5	12	12	12	12	10.5	8.5	7.5	7.5	7.5	7.5	7.5	7.5												
8'-0"	12	10	10	7.5	4.5	3	6	6	6	6	5	4	3.5	12	10	10	6	3.5	-	6	6	5	4.5	3.5	3	12	10	10	4	-	-	6	6	5	4.5	3.5	3	6	5	4	-	-	-	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12											
9'-0"	12	10	10	5	3.5	-	6	6	5.5	4.5	3.5	3	12	10	9	4	-	-	6	6	4.5	4	3	3	12	10	4	3	-	-	6	6	4.5	4	3	3	6	5	3.5	-	-	-	12	12	12	12	12	10.5	12	12	12	11.5	9.5	8.5	12	12	12	10.5	8.5	7.5	12	12	12	10.5	8.5	7.5	12	12	12	10.5	8.5	7.5	12	12	12	10.5	8.5	7.5	12	12	12	10.5	8.5	7.5
10'-0"	12	10	7.5	4	-	-	6	6	5	4	3	-	12	10	6	3	-	-	6	6	4	3.5	3	-	12	10	3	-	-	-	6	6	4	3.5	3	-	6	5	-	-	-	-	12	12	12	12	11.5	9.5	12	12	12	11.5	9.5	8.5	12	12	12	11.5	9.5	8.5	12	12	12	11.5	9.5	8.5	12	12	12	11.5	9.5	8.5	12	12	12	11.5	9.5	8.5	12	12	12	11.5	9.5	8.5
11'-0"	12	10	5.5	-	-	-	6	6	4.5	-	-	-	12	10	4.5	-	-	-	6	5.5	3.5	-	-	-	12	10	-	-	-	-	6	5.5	4	-	-	-	6	5	-	-	-	-	12	12	12	12	10	8.5	12	12	12	9.5	8	7	12	12	12	9.5	8	7	12	12	12	9.5	8	7	12	12	12	9.5	8	7												
12'-0"	12	10	4.5	-	-	-	6	6	4	-	-	-	12	10	3.5	-	-	-	6	5	3.5	-	-	-	12	10	-	-	-	-	6	5	3.5	-	-	-	6	5	-	-	-	-	12	12	12	11.5	9.5	8	12	12	12	11.5	9.5	8	12	12	12	11.5	9.5	8	12	12	12	11.5	9.5	8	12	12	12	11.5	9.5	8												
13'-0"	12	10	-	-	-	-	6	6	-	-	-	-	12	10	-	-	-	-	6	4.5	-	-	-	-	12	7.5	-	-	-	-	6	4.5	-	-	-	-	6	4.5	-	-	-	-	12	12	12	10.5	8.5	7.5	12	12	12	10.5	8.5	7.5	12	12	12	10.5	8.5	7.5	12	12	12	10.5	8.5	7.5	12	12	12	10.5	8.5	7.5												
14'-0"	12	10	-	-	-	-	6	5.5	-	-	-	-	12	7	-	-	-	-	5.5	4.5	-	-	-	-	12	7	-	-	-	-	5.5	4.5	-	-	-	-	6	3	-	-	-	-	12	12	12	9.5	8	6	12	12	12	9.5	8	6	12	12	12	9.5	8	6	12	12	12	9.5	8	6																		
15'-0"	12	-	-	-	-	-	6	-	-	-	-	-	12	-	-	-	-	-	5	-	-	-	-	-	12	-	-	-	-	-	5	-	-	-	-	-	6	-	-	-	-	-	12	12	11	9	7.5	5	12	12	11	9	7.5	5	12	12	11	9	7.5	5	12	12	11	9	7.5	5																		
16'-0"	12	-	-	-	-	-	6	-	-	-	-	-	12	-	-	-	-	-	5	-	-	-	-	-	11.5	-	-	-	-	-	5	-	-	-	-	-	6	-	-	-	-	-	12	12	10.5	8.5	6.5	4	12	12	10.5	8.5	6.5	4	12	12	10.5	8.5	6.5	4	12	12	10.5	8.5	6.5	4																		

**① HV BLADE OR ① HV BLADE W/
①A HV WINDOW BLADE WORKING IN UNISON**

♦ SEE LIMITATIONS OF USE FOR BLADE ①A ON SHEET 19

+ NOTES ON ANCHORS REQUIREMENTS: WOOD SUBSTRATES.

- | | |
|---|---|
| <p>1. ANCHORS TO WALL, FLOOR OR SOLID WOOD SOFFIT SHALL BE AS FOLLOWS:</p> <p>- 1/4" TAPCON ANCHORS, AS MANUFACTURED BY I.T.W. BUILDDEX W/ MINIMUM EMBEDMENT AS INDICATED AT EACH SECTION ON SHEETS 16 & 17. EXCEPTION: SEE NOTE 2 BELOW.</p> <p>2. ANCHORS TO HOLLOW CEILING SHALL BE AS PER MOUNTING TYPE U, SHEET 17 AND SHALL CONSIST OF LAG SCREWS AS PER NDS 2018 SPECIFICATIONS.</p> | <p>3. SUBSTRATE SHALL CONSIST OF THE FOLLOWING:</p> <p>-SOUTHERN PINE No. 2 W/ G=0.55 (N.D.S.)
 -DOUGLAS FIR W/ G=0.50 (N.D.S.)
 -SPRUCE PINE FIR NORTH W/ G=0.43 (N.D.S.)
 -SPRUCE PINE FIR SOUTH W/ G=0.36 (N.D.S.)
 -MIN. 1/2" CDX PLYWOOD (1986 APA)</p> <p>4. ANCHORS SHALL BE INSTALLED FOLLOWING ALL OF THE RECOMMENDATIONS AND SPECIFICATIONS OF THE ANCHOR'S MANUFACTURER.</p> |
|---|---|

FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)

WALTER A. TILLIT JR.
 LICENSE
 No. 44167
 STATE OF FLORIDA
 PROFESSIONAL ENGINEER
 1/2023
 P.E. SEAL/SIGNATURE/DATE

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 CA-0006719
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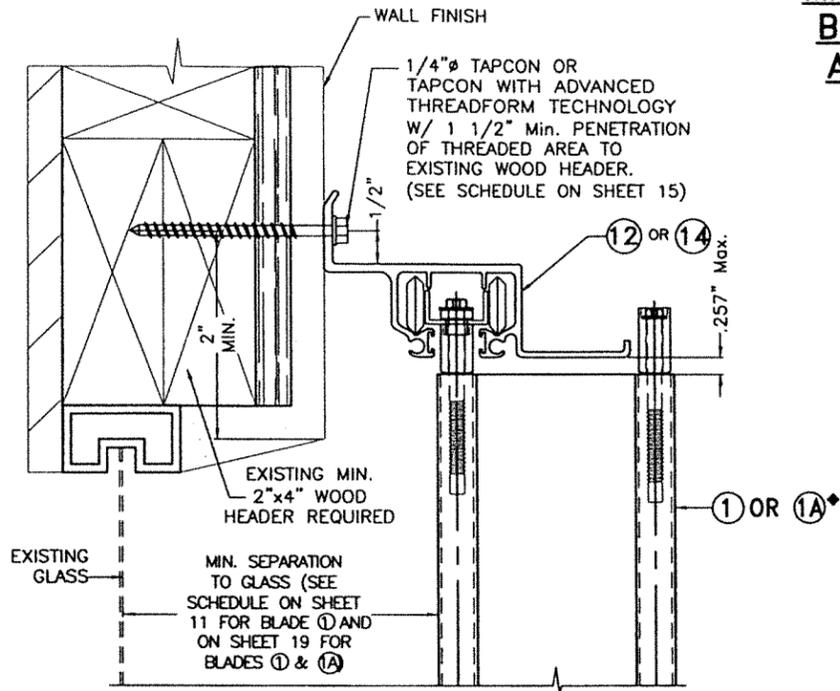
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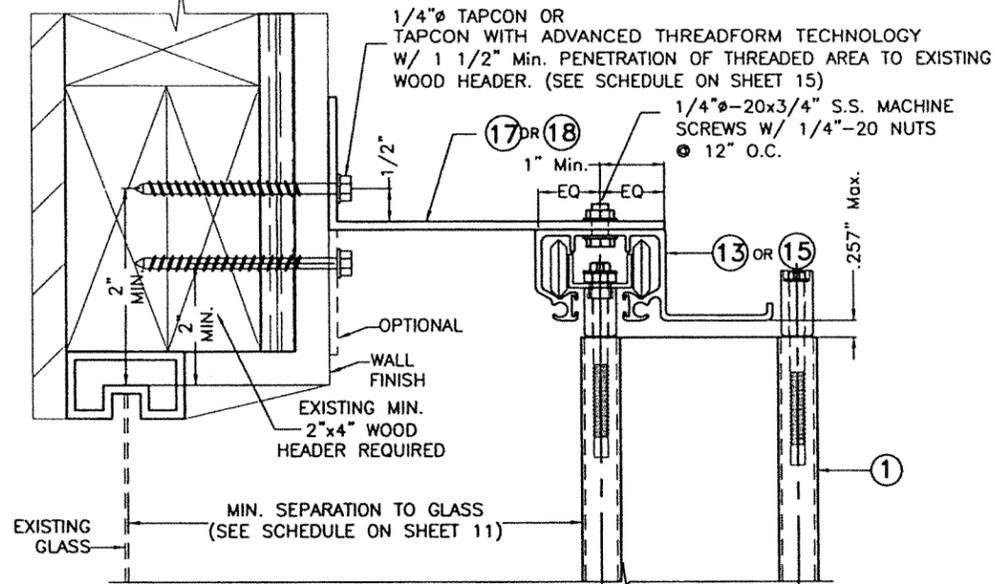
REV. No	DESCRIPTION	DATE	DRAWN BY: Y.M.
1	OLD 20-164	7/21/23	DATE: 7/21/2023
2			DRAWING No
3			23-127
4			SHEET
5			15 OF 20
6			

INSTALLATION DETAILS ON EXISTING WOOD BUILDINGS FOR (1) HV & (1A) HV ♦ BLADES (AS APPLICABLE)

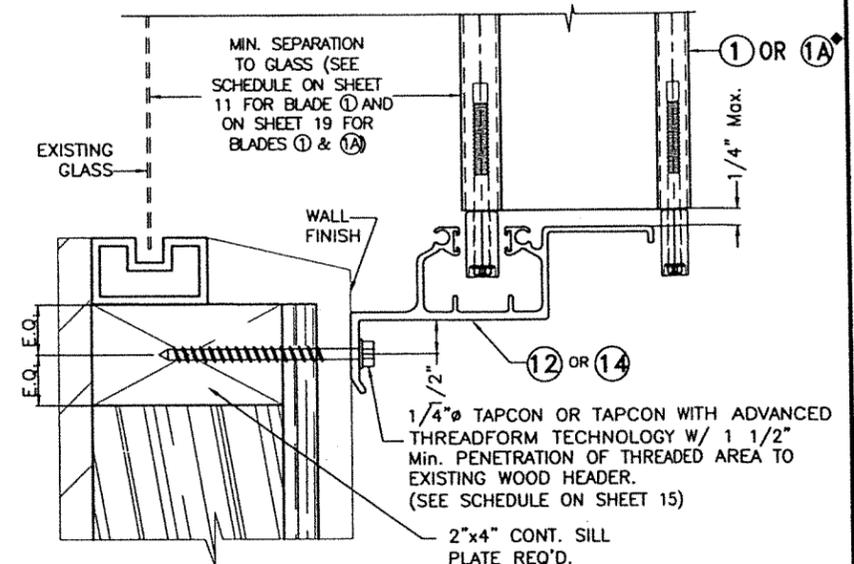
MAX. SHUTTER SPAN L+ OR L- FOR INSTALLATIONS INTO WOOD WITH HV BLADE (1) ONLY SHALL BE LIMITED TO 105.0 psf. A.S.D. DESIGN PRESSURE RATING, SEE SHEET 19 FOR MAX SPAN & A.S.D. DESIGN PRESSURE RATING FOR INSTALLATION WITH BLADE (1) & (1A) WORKING IN UNISON



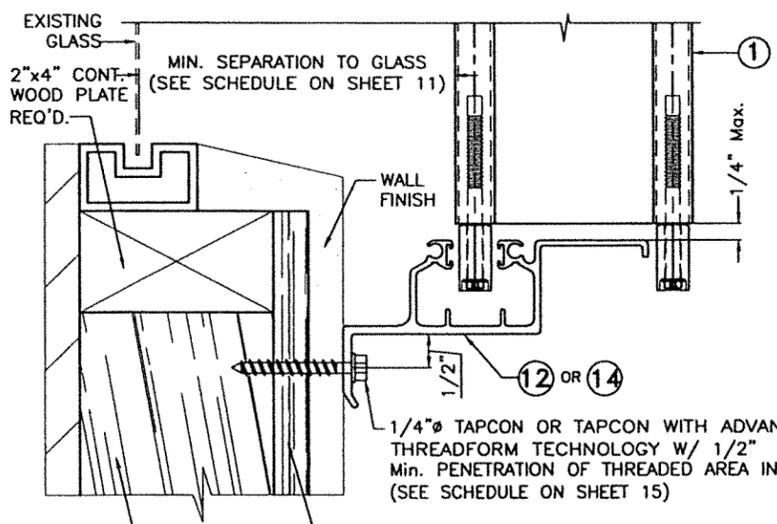
(M) HV WALL HEADER INSTALLATION



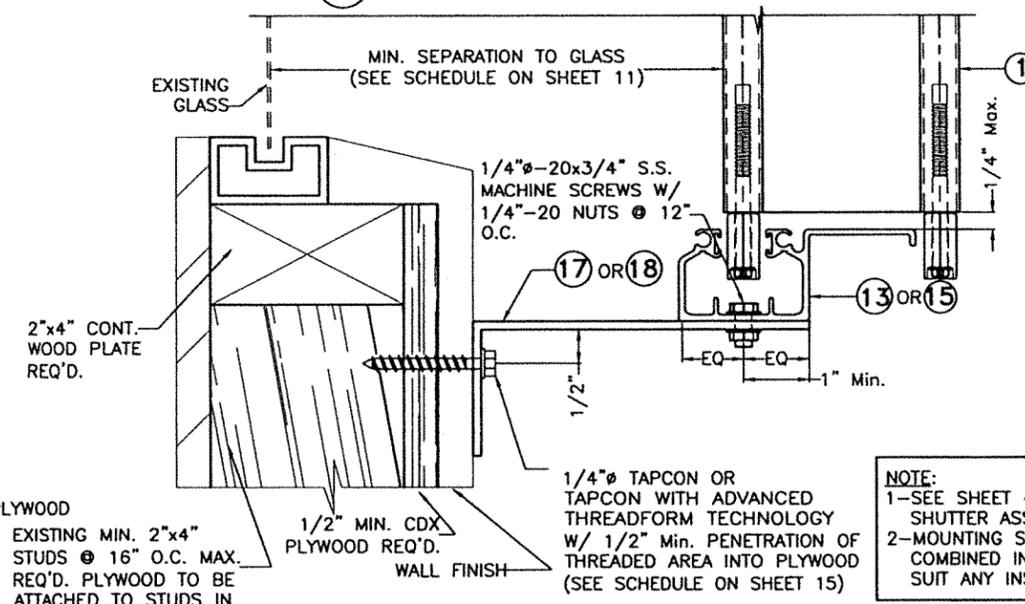
(N) HV WALL HEADER INSTALLATION



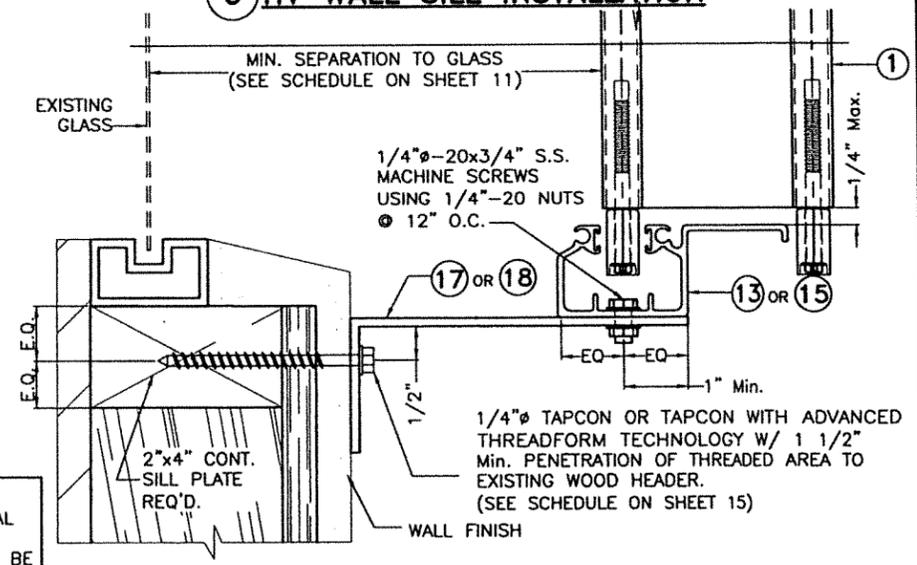
(O) HV WALL SILL INSTALLATION



(P) HV WALL SILL INSTALLATION



(Q) HV WALL SILL INSTALLATION



(R) HV WALL SILL INSTALLATION

NOTE:
1-SEE SHEET 4 FOR TYPICAL SHUTTER ASSEMBLY.
2-MOUNTING SECTIONS CAN BE COMBINED IN ANY WAY TO SUIT ANY INSTALLATION.

♦ SEE LIMITATIONS OF USE OF BLADE (1A) ON SHEET (19)

FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)

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STATE OF FLORIDA
PROFESSIONAL ENGINEER
7/21/2023

P.E. SEAL/SIGNATURE/DATE

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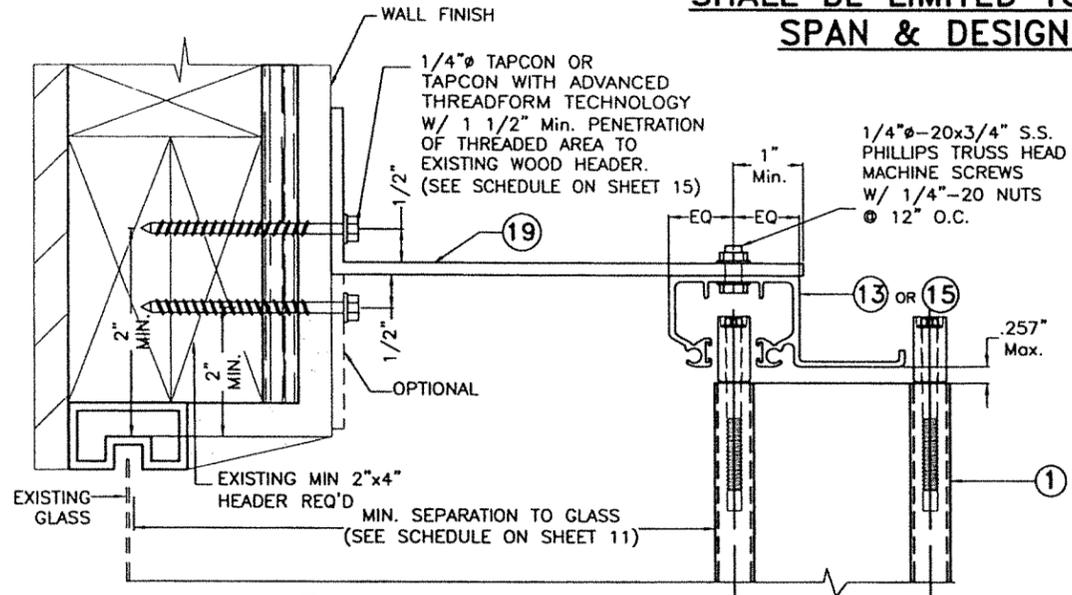
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H.V. BLADE #1 W/ OR W/O H.V. WINDOW BLADE

REV. No	DESCRIPTION	DATE	DRAWN BY: Y.M.
1	OLD 20-164	7/21/23	DATE: 7/21/2023
2			DRAWING No 23-127
3			
4			SHEET 16 OF 20
5			
6			

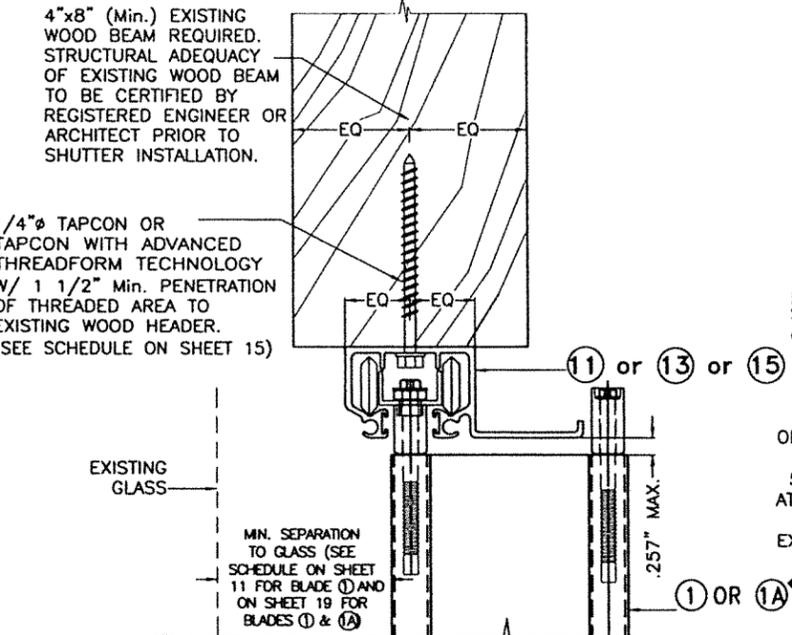
INSTALLATION DETAILS ON EXISTING WOOD BUILDINGS FOR (1) HV & (1A) HV ♦ BLADES (AS APPLICABLE)

MAX. SHUTTER SPAN L+ OR L- FOR INSTALLATIONS INTO WOOD WITH HV BLADE (1) ONLY SHALL BE LIMITED TO 105.0 psf. A.S.D. DESIGN PRESSURE RATING, SEE SHEET 19 FOR MAX SPAN & DESIGN LOAD FOR INSTALLATION WITH BLADE (1) & (1A) WORKING IN UNISON

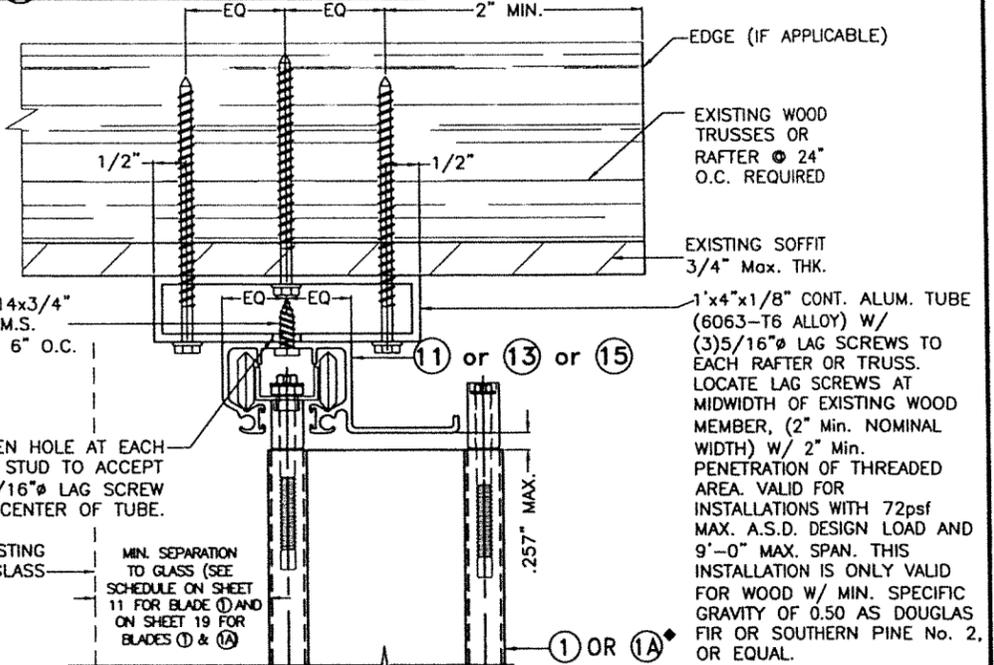


(S) HV WALL HEADER INSTALLATION

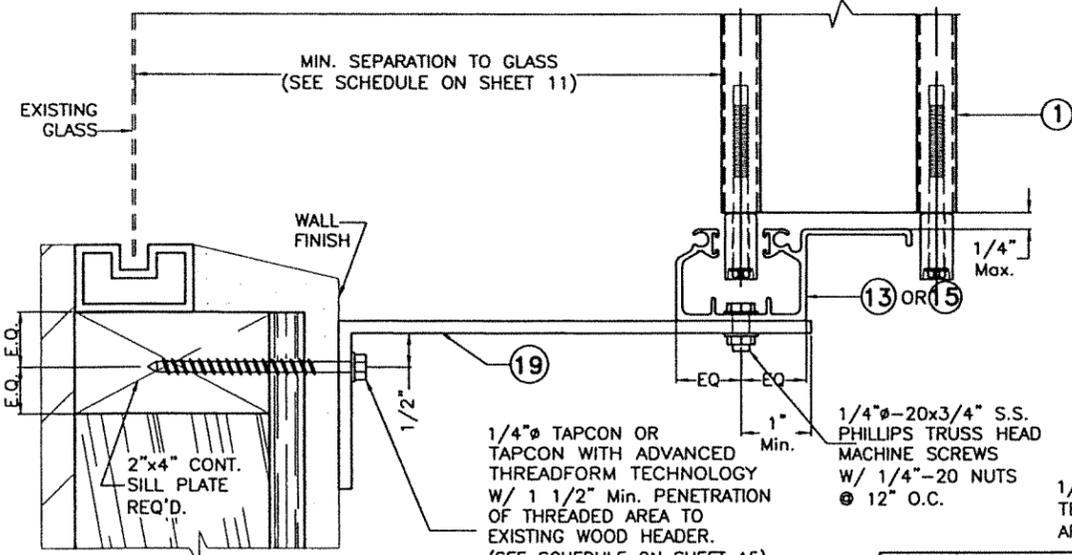
NOTES:
 1-SEE SHEET 4 FOR TYPICAL SHUTTER ASSEMBLY
 2-MOUNTING SECTIONS CAN BE COMBINED IN ANY WAY TO SUIT ANY INSTALLATION.



(T) HV CEILING INSTALLATION

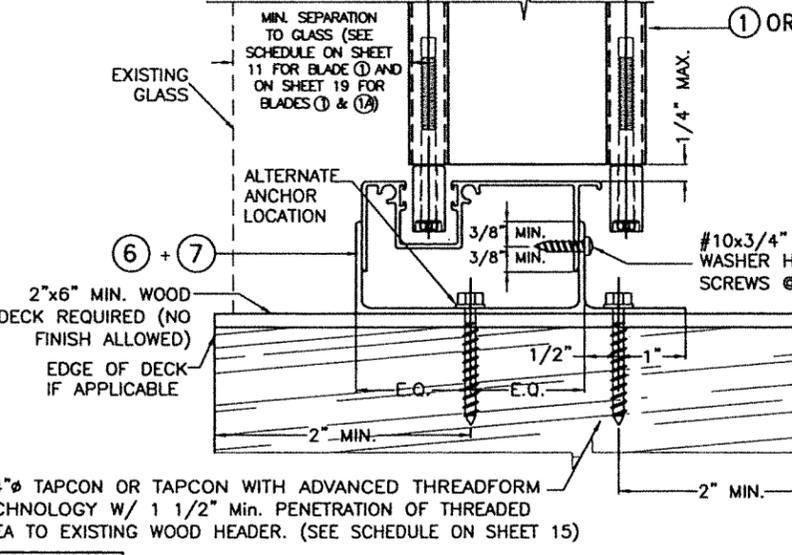


(U) HV CEILING INSTALLATION

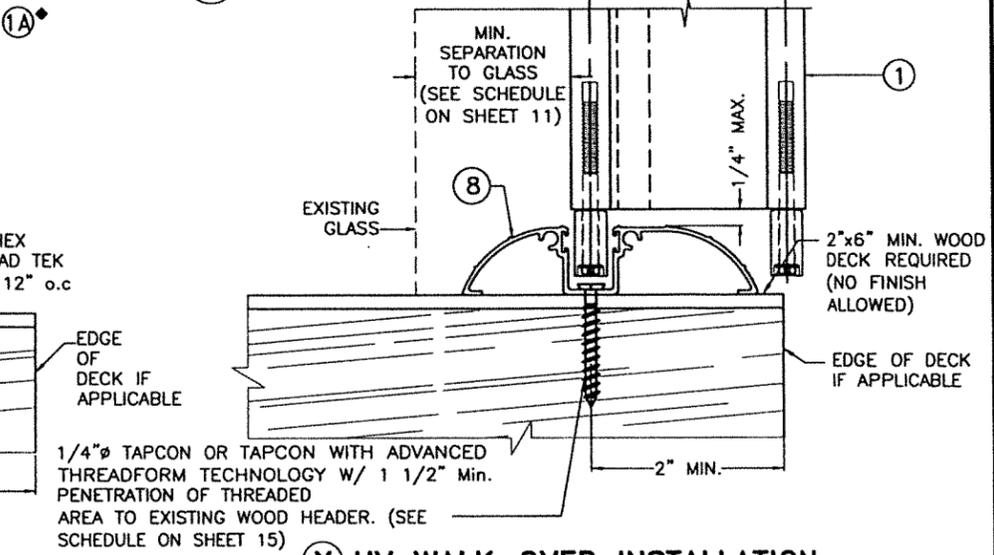


(V) HV WALL SILL INSTALLATION

♦ SEE LIMITATIONS OF USE FOR BLADE (1A) ON SHEET 19



(W) HV FLOOR INSTALLATION



(X) HV WALK-OVER INSTALLATION

FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)

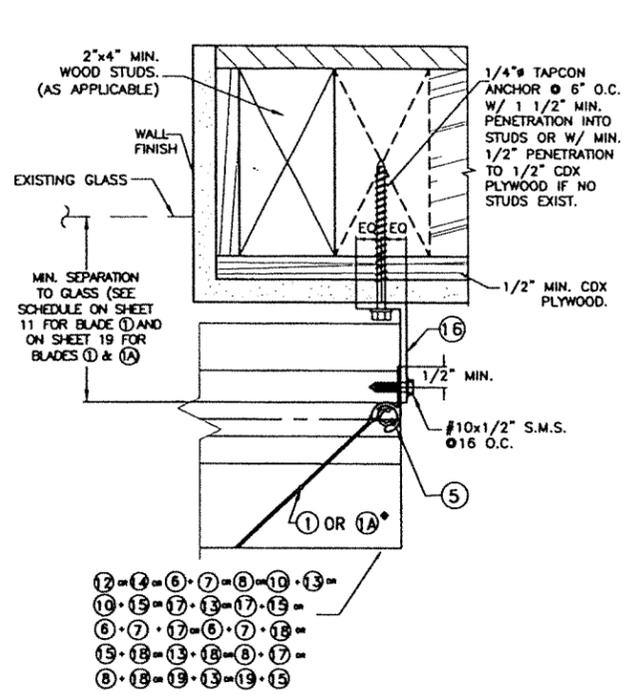
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 CA-0006719
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 FLORIDA Lic. # 44167

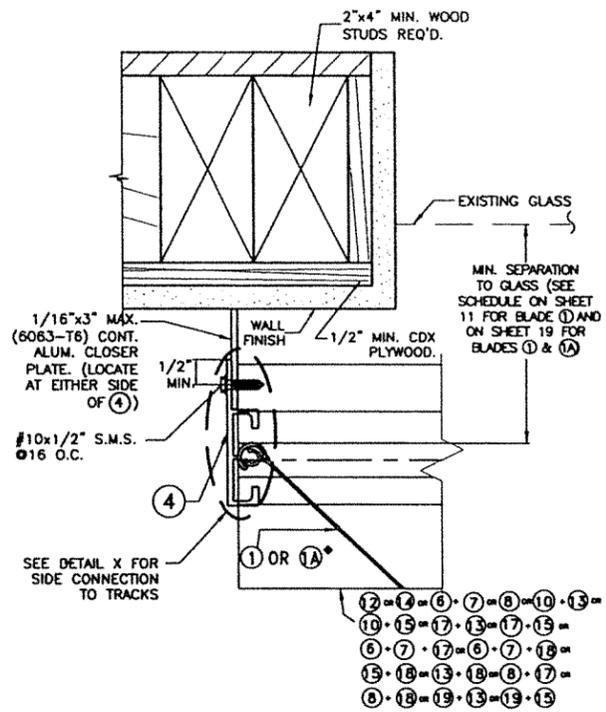
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BERTHA HV™
 Accordion Shutter System
 H.V. BLADE #1 W/ OR W/O H.V. WINDOW BLADE
A.S.S.A.
 American Shutter Systems
 Association, Inc.
 4268 Westroads Drive
 West Palm Beach, FL 33407

REV. No	DESCRIPTION	DATE	DRAWN BY: Y.M.
1	OLD 20-164	7/21/23	DATE: 7/21/2023
2			DRAWING No
3			23-127
4			SHEET
5			17 OF 20
6			

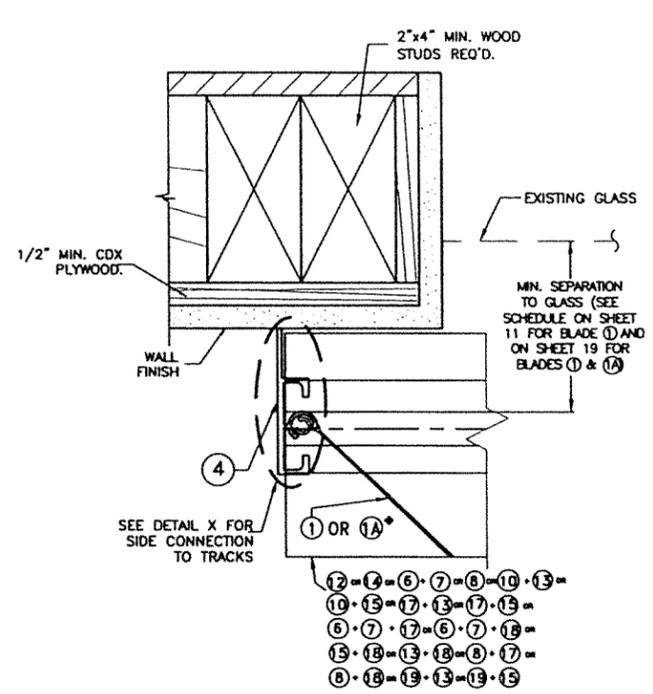
END INSTALLATIONS (1) HV BLADE OR (1A) WINDOW BLADE INTO 2"x4" MIN. WOOD STUDS



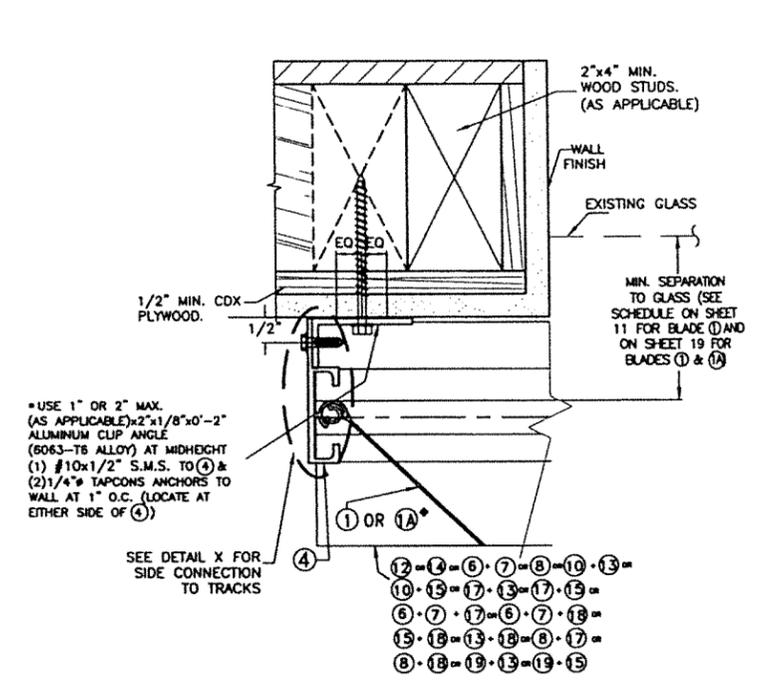
END CONNECTION DETAIL 7



END CONNECTION DETAIL 8



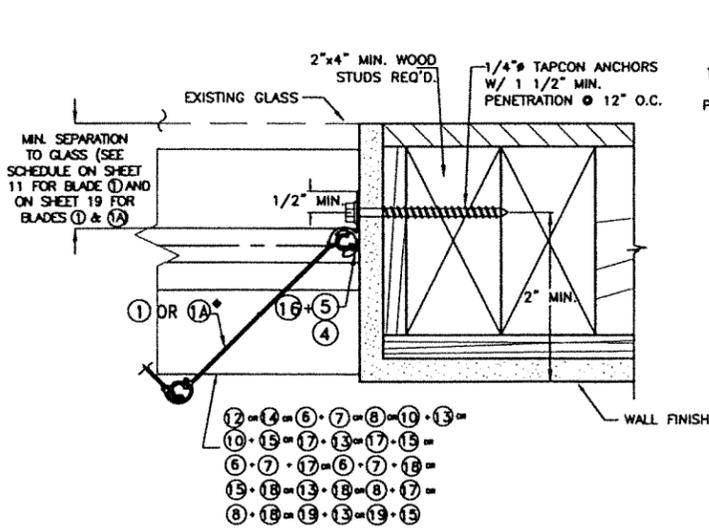
END CONNECTION DETAIL 9



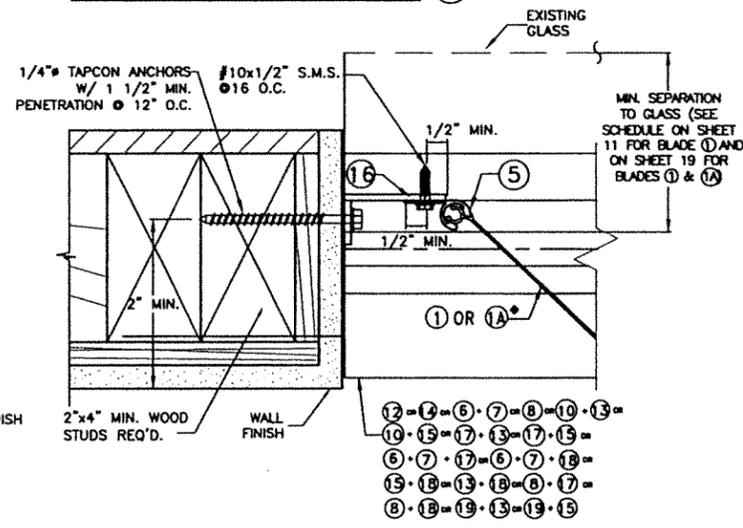
END CONNECTION DETAIL 10

■ REQUIRED ONLY FOR SPANS GREATER THAN 12'-0"

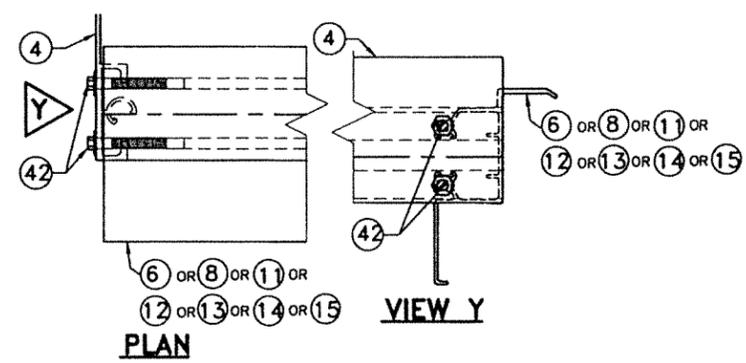
◆ SEE LIMITATIONS OF USE FOR BLADE (1A) ON SHEET 19



END CONNECTION DETAIL 11



END CONNECTION DETAIL 12



DETAIL X

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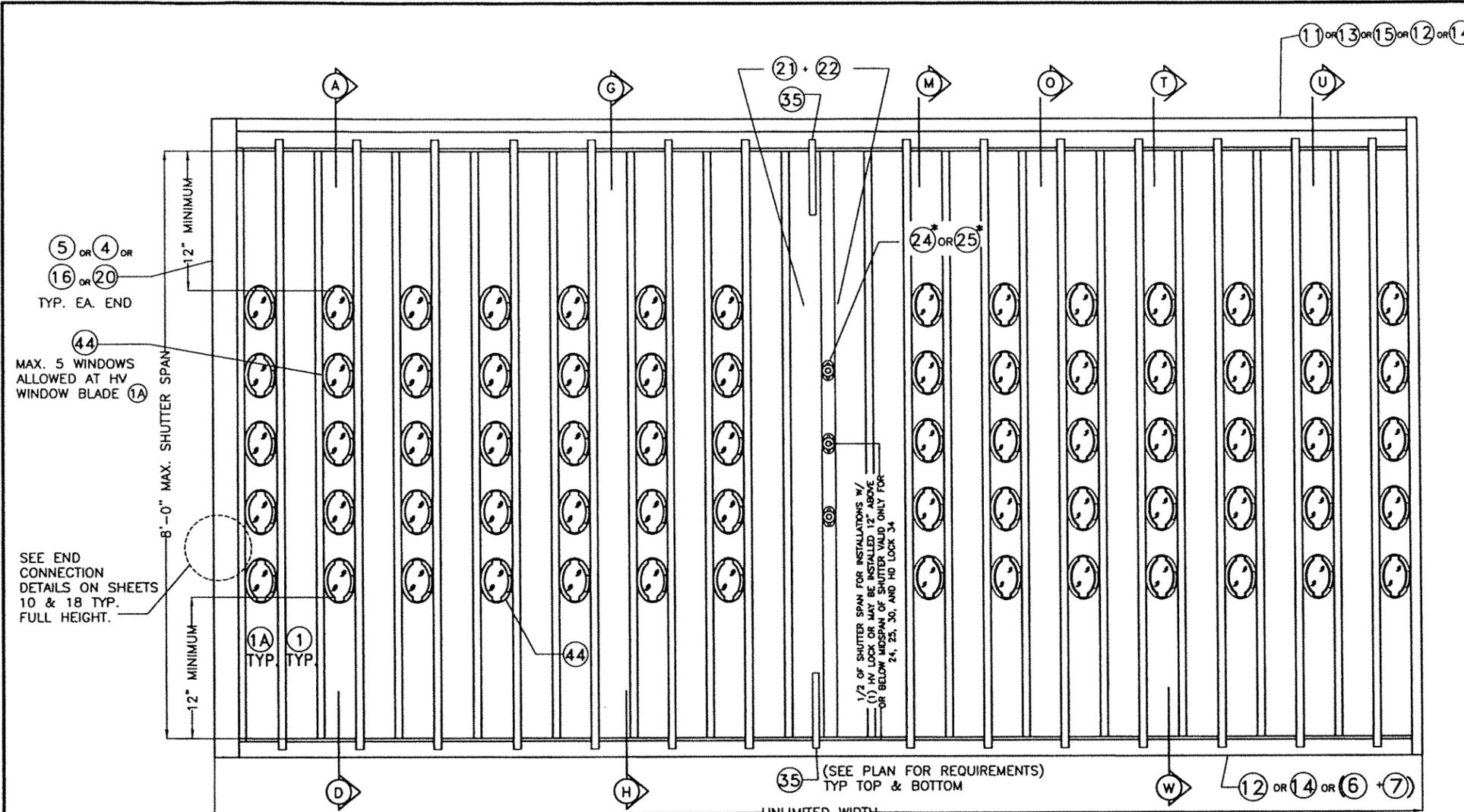
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TILTECO INC.
TILLIT TESTING & ENGINEERING COMPANY
6355 N.W. 36th St., Ste. 305, VIRGINIA GARDENS, FLORIDA 33166
Phone : (305)871-1530 . Fax : (305)871-1531
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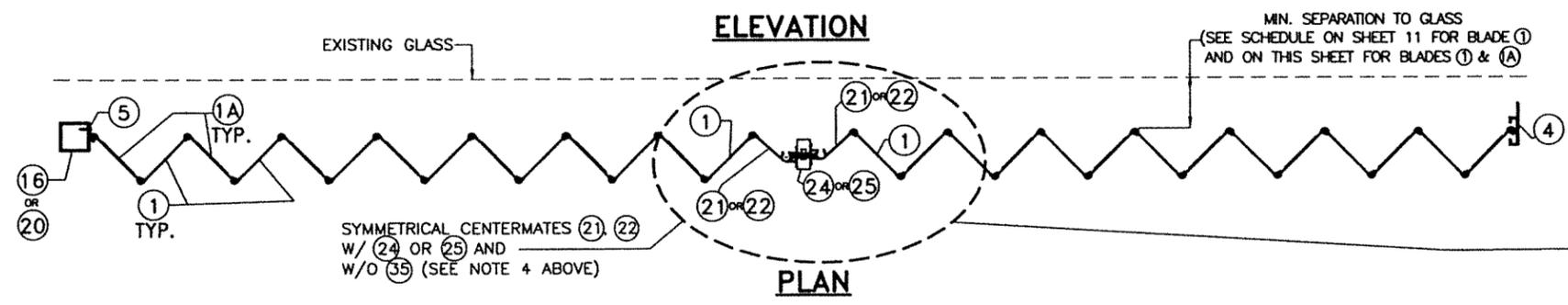
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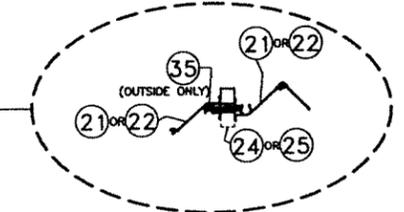
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- * GENERAL LIMITATIONS AND CONDITIONS OF USE FOR BERTHA**
- 1 HV BLADE ACCORDION SHUTTER SYSTEM WORKING IN UNISON WITH HV WINDOW BLADE 1A**
- MAX. A.S.D. DESIGN PRESSURE RATING: +110, - 110 p.s.f.
 - MAX. SHUTTER SPAN: 96"
 - ALLOWED MOUNTINGS: A, D, G & H ON SHEETS 6, 7; AS WELL AS MOUNTINGS M, O, T, U & W ON SHEETS 16 & 17.
 - ONLY CENTERMATES (21), (22) (BOTH W/ (24) OR (25)) ARE ALLOWED WITH (21), (22) ARRANGED IN A SYMMETRICAL OR OPPOSING LAYOUT. IN CASE OF OPPOSING LAYOUT, (35) MUST BE INCLUDED ONLY AT EXTERIOR ACCESS SIDE OF CENTERMATE.
 - (A) HV WINDOW BLADE 1A SHALL ONLY ALLOW A MAXIMUM OF 5 OPENINGS (3" HOLES) FOR (44) PER BLADE AT SPACINGS SHOWN ON SHEET 4.
(B) MIN. CLEARANCE FROM TOP OR BOTTOM EDGE OF HV WINDOW BLADE 1A OF ANY 3" HOLE FOR (44) SHALL BE 12".
(C) FIRST OR LAST BLADE COMING OUT FROM STARTERS AT ENDS MAY BE HV WINDOW BLADE 1A
(D) HV WINDOW BLADE 1A MUST BE USED ALTERNATE TO A SOLID HV BLADE 1 THROUGHOUT SHUTTER'S WIDTH.
(E) CENTERMATES SHALL ALWAYS BE INSTALLED ADJACENT TO A SOLID HV BLADE 1 AT EITHER SIDE OF THEM.
(F) POLYCARBONATE HV WINDOW (44) SHALL BE INSTALLED SO THAT TABS FACE THE INTERIOR OF THE OPENING BEING PROTECTED. HV WINDOW (44) MUST BE ONLY INSTALLED AND LOCKED USING A HV SETTING TOOL PROVIDED BY ASSA, INC.
 - SEE ANCHOR SPACING SCHEDULE FOR INSTALLATIONS INTO WOOD FRAME BUILDINGS ON SHEET 15, AS LIMITED BY SPAN AND DESIGN LOAD (SEE NOTES 1 & 2 ABOVE).
 - SEE ANCHOR SPACING SCHEDULE FOR INSTALLATIONS INTO POURED CONCRETE OR CONCRETE BLOCK WALL ON SHEETS 12 & 13 AS LIMITED BY SPAN AND DESIGN LOAD (SEE NOTES 1 & 2 ABOVE).
 - MINIMUM SEPARATION TO GLASS SCHEDULE, PER ASTM E-1996:
- | WIND ZONE | MINIMUM SEPARATION TO GLASS |
|-----------|-----------------------------|
| 1 THRU 3 | 1" |
| 4 | 6.25" |



ALTERNATE OPPOSING CENTERMATES (21, 22) W/ (35) (EXTERIOR ONLY) AND W/ (24) OR (25) (SEE NOTE 4 ABOVE)



TYPICAL 1 HV BLADE WORKING IN UNISON WITH HV WINDOW BLADE 1A SHUTTER*
N.T.S.

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

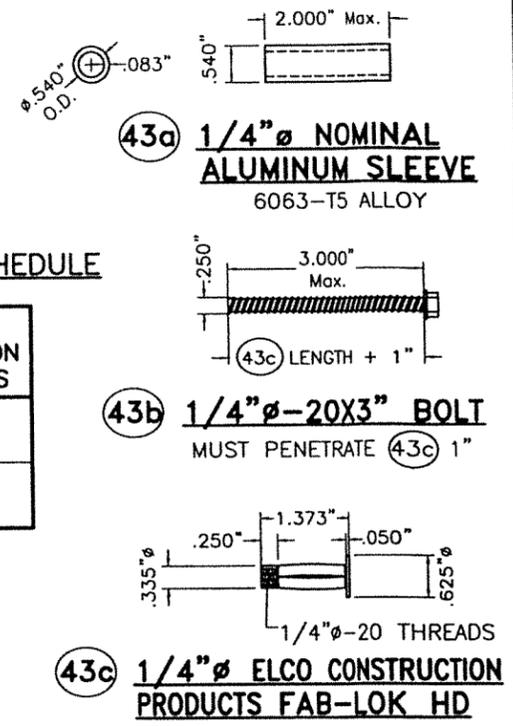
*** GENERAL LIMITATIONS AND CONDITIONS OF USE FOR BERTHA (1) HV BLADE ACCORDION SHUTTER SYSTEM INSTALLATION TO METAL STUD WALLS**

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

**** BLADE SLACK DETAIL HVF IS ALSO VALID FOR CENTERMATE (21) APPLICATION WITH BLADE (1)**

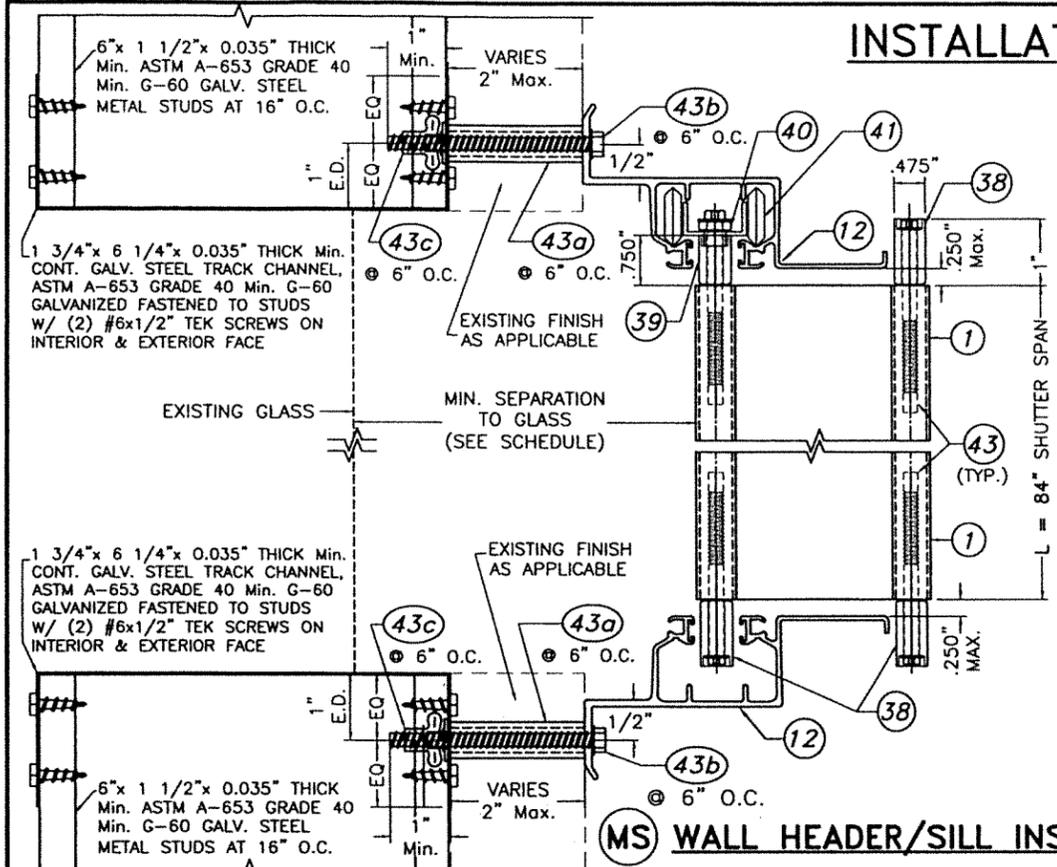
SEPARATION TO GLASS SCHEDULE

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

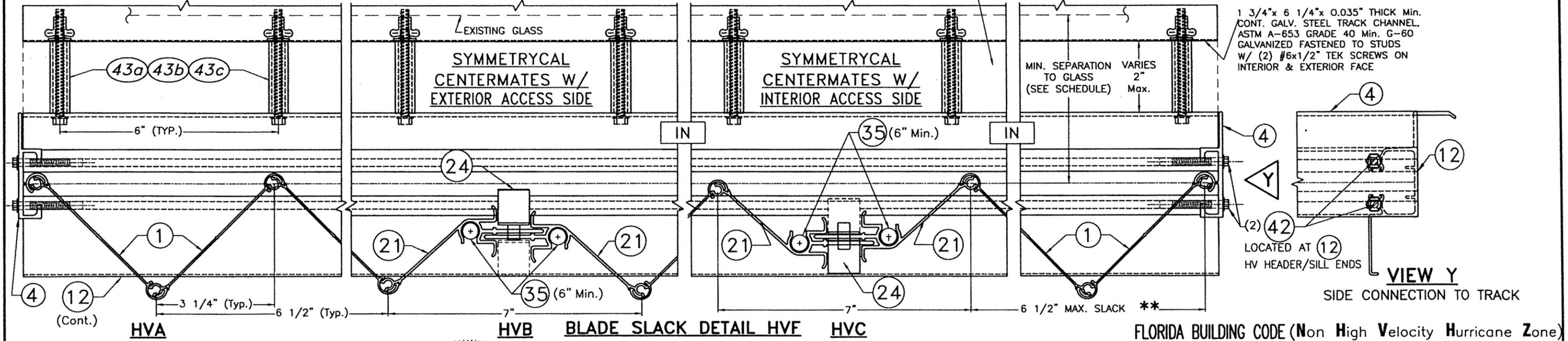


COMPONENTS

SCALE: 3/8" = 1"



(MS) WALL HEADER/SILL INSTALLATION



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