



BUILDING AND NEIGHBORHOOD COMPLIANCE DEPARTMENT (BNC)
BOARD AND CODE ADMINISTRATION DIVISION

MIAMI-DADE COUNTY
PRODUCT CONTROL SECTION
11805 SW 26 Street, Room 208
Miami, Florida 33175-2474
T (786) 315-2590 F (786) 315-2599

www.miamidade.gov/building

NOTICE OF ACCEPTANCE (NOA)

Alum-Shutters & Glass, Inc.
2205 W. 80th Street, Bay #2
Hialeah, Florida 33016

SCOPE:

This NOA is being issued under the applicable rules and regulations governing the use of construction materials. The documentation submitted has been reviewed by Miami-Dade County Product Control Section and accepted by the Board of Rules and Appeals (BORA) to be used in Miami Dade County and other areas where allowed by the Authority Having Jurisdiction (AHJ).

This NOA shall not be valid after the expiration date stated below. The Miami-Dade County Product Control Section (In Miami Dade County) and/or the AHJ (in areas other than Miami Dade County) reserve the right to have this product or material tested for quality assurance purposes. If this product or material fails to perform in the accepted manner, the manufacturer will incur the expense of such testing and the AHJ may immediately revoke, modify, or suspend the use of such product or material within their jurisdiction. BORA reserves the right to revoke this acceptance, if it is determined by Miami-Dade County Product Control Section that this product or material fails to meet the requirements of the applicable building code.

This product is approved as described herein, and has been designed to comply with the High Velocity Hurricane Zone of the Florida Building Code.

DESCRIPTION: "Bertha HV" Aluminum Accordion Shutter System

APPROVAL DOCUMENT: Drawing No. 10-086, titled "Bertha HV Accordion Shutter System", sheets 1 through 28 of 28, prepared by Tilteco, Inc., dated September 23, 2010, signed and sealed by Walter A. Tillit Jr., P.E. on September 28, 2010, bearing the Miami-Dade County Product Control Revision stamp with the Notice of Acceptance number and the expiration date by the Miami-Dade County Product Control Section.

MISSILE IMPACT RATING: Large and Small Missile Impact Resistant

LABELING: Each unit shall bear a permanent label with the manufacturer's name or logo, city, state and the following statement: "Miami-Dade County Product Control Approved", unless otherwise noted herein.

RENEWAL of this NOA shall be considered after a renewal application has been filed and there has been no change in the applicable building code negatively affecting the performance of this product.

TERMINATION of this NOA will occur after the expiration date or if there has been a revision or change in the materials, use, and/or manufacture of the product or process. Misuse of this NOA as an endorsement of any product, for sales, advertising or any other purposes shall automatically terminate this NOA. Failure to comply with any section of this NOA shall be cause for termination and removal of NOA.

ADVERTISEMENT: The NOA number preceded by the words Miami-Dade County, Florida, and followed by the expiration date may be displayed in advertising literature. If any portion of the NOA is displayed, then it shall be done in its entirety.

INSPECTION: A copy of this entire NOA shall be provided to the user by the manufacturer or its distributors and shall be available for inspection at the job site at the request of the Building Official.

This NOA revises & renews NOA # 07-0306.08 and consists of this page 1, evidence submitted pages E-1 & E-2 as well as approval document mentioned above.

The submitted documentation was reviewed by **Helmy A. Makar, P.E., M.S.**



Helmy A. Makar
01/20/2011

NOA No. 10-0930.15
Expiration Date: 03/09/2016
Approval Date: 01/20/2011
Page 1

Alum-Shutters & Glass, Inc.

NOTICE OF ACCEPTANCE: EVIDENCE SUBMITTED

1. EVIDENCE SUBMITTED UNDER PREVIOUS APPROVAL # 05-1220.14

A. DRAWINGS

1. *Drawing No. 05-366, titled " Bertha HV Accordion Shutter System ", sheets 1 through 14 of 14, prepared by Tilteco, Inc., dated December 01, 2005, signed and sealed by Walter A. Tillit Jr., P.E.*

B. TESTS

1. *See Association's generic approval under 05-0227.*

C. CALCULATIONS

1. *See Association's generic approval under 05-0227.*

D. QUALITY ASSURANCE

1. *By Miami-Dade Building Code Compliance Office.*

E. MATERIAL CERTIFICATIONS

1. *See Association's generic approval under 05-0227.*

F. STATEMENTS

1. *Release letter issued by the American Shutter Systems Association, Inc., dated November 28, 2005, certifying this product to meet the criteria of product tested and approved, and allowing Alum-Shutters & Glass, Inc. to use the test results approved under Miami- Dade County Approval No. 05-0227, signed by Mr. Legny Santana.*
2. *Acknowledgment letter by Alum-Shutters & Glass, Inc., dated December 05, 2005, signed by Marlon Montes.*
3. *Letter by Tilteco Inc., dated December 09, 2005, certifying that the drawing (No. 05-366) prepared for Alum-Shutters & Glass, Inc., signed and sealed by Mr. Walter A. Tillit, Jr., P.E., is engineering wise identical to ASSA's generic drawing (No. 05-072).*

2. EVIDENCE SUBMITTED UNDER PREVIOUS APPROVAL #07-0306.08

A. DRAWINGS

1. *Drawing No. 05-366, titled " Bertha HV Accordion Shutter System ", sheets 1 through 14 of 14, prepared by Tilteco, Inc., dated December 01, 2005, signed and sealed by Walter A. Tillit Jr., P.E. on February 22, 2007.*

B. TESTS

1. *None. See Association's generic approval under 05-0227.*



Helmy A. Makar, P.E., M.S.
BNC Product Control Unit Supervisor

NOA No. 10-0930.15

Expiration Date: 03/09/2016

Approval Date: 01/20/2011

Alum-Shutters & Glass, Inc.

NOTICE OF ACCEPTANCE: EVIDENCE SUBMITTED

C. CALCULATIONS

1. *None. See Association's generic approval under 05-0227.*

D. QUALITY ASSURANCE

1. *By Miami-Dade Building Code Compliance Office.*

E. MATERIAL CERTIFICATIONS

1. *None. See Association's generic approval under 05-0227.*

F. STATEMENTS

1. *None.*

3. EVIDENCE SUBMITTED UNDER PREVIOUS APPROVAL # 05-1220.14

A. DRAWINGS

1. *Drawing No. 10-086, titled " Bertha HV Accordion Shutter System ", sheets 1 through 28 of 28, prepared by Tilteco, Inc., dated September 23, 2010, signed and sealed by Walter A. Tillit Jr., P.E. on September 28, 2010.*

B. TESTS

1. *See Association's generic approval under 09-0436.*

C. CALCULATIONS

1. *See Association's generic approval under 09-0436.*

D. QUALITY ASSURANCE

1. *By Miami-Dade Building Code Compliance Office.*

E. MATERIAL CERTIFICATIONS

1. *See Association's generic approval under 09-0436.*

F. STATEMENTS

1. *Release letter issued by the American Shutter Systems Association, Inc., dated September 22, 2010, certifying this product to meet the criteria of product tested and approved, and allowing Alum-Shutters & Glass, Inc. to use the test results approved under Miami- Dade County Approval No. 09-0436, signed by Ms. Legny Rodriguez.*
2. *Acknowledgment letter by Alum-Shutters & Glass, Inc., dated September 08, 2010, signed by Marlon Montes.*
3. *Letter by Tilteco Inc., dated September 27, 2010, certifying that the drawing (No. 10-086) prepared for Alum-Shutters & Glass, Inc., signed and sealed by Mr. Walter A. Tillit, Jr., P.E., is engineering wise identical to ASSA's generic drawing (No. 09-033).*



Helmy A. Makar, P.E., M.S.
BNC Product Control Unit Supervisor
NOA No. 10-0930.15
Expiration Date: 03/09/2016
Approval Date: 01/20/2011

GENERAL NOTES:

1. BERTHA H.V. ACCORDION SHUTTER SYSTEM SHOWN ON THIS PRODUCT APPROVAL DOCUMENT (P.A.D.) HAS BEEN VERIFIED FOR COMPLIANCE IN ACCORDANCE WITH THE 2007 EDITION OF THE FLORIDA BUILDING CODE.
THIS ACCORDION SHUTTER SYSTEM MAY BE INSTALLED AT HIGH VELOCITY HURRICANE ZONES. DESIGN WIND LOADS SHALL BE DETERMINED AS PER SECTION 1620 OF THE ABOVE MENTIONED CODE. IN ORDER TO VERIFY THAT ANCHORS ON THIS P.A.D., AS TESTED, WERE NOT OVERSTRESSED, A 33 % INCREASE IN ALLOWABLE LOADS FOR WIND LOADS WAS NOT USED IN THEIR ANALYSIS. BERTHA H.V. ACCORDION SHUTTER SYSTEM'S ADEQUACY FOR WIND AND LARGE MISSILE IMPACT LOAD HAS BEEN VERIFIED IN ACCORDANCE WITH SECTION 1626 OF THE ABOVE MENTIONED CODE AS PER ATL REPORTS:

-HV BLADE ① #0214.01-03, #0715.01-03, #1004.01-05, #1214.01-05 AND 0317.02-06 AS PER TAS 201, TAS 202 AND TAS 203 PROTOCOLS.

-HV WINDOW BLADE ①A #0505.01-08 AS PER TAS 201, 202 & 203 PROTOCOLS AND 0725.01-08 AS PER TAS 202 PROTOCOL.

-HV BLADE ② #0422.01-05 AS PER TAS 201, TAS 202 AND TAS 203 PROTOCOLS.

2. HV BLADE ① AND HV BLADE ② ARE ENGINEERED TO WORK IN UNISON WITH EACH OTHER IN AREAS WHERE THE DESIGN PRESSURES TRANSITION FROM END ZONE 5 TO INTERIOR ZONE 4. EACH WIND ZONE MUST BE CLEARLY IDENTIFIED IN ACCORDANCE WITH SECTION 6, OF ASCE 7-05 STANDARD. ALL MOUNTING CONDITIONS AND FASTENER TYPES SCHEDULES MUST BE APPLIED TO THE CORRESPONDING WIND ZONE. THIS SHALL INCLUDE REQUIREMENTS FOR MIN. SEPARATION TO GLASS. DELIMITATION OF WIND ZONES 4 AND 5 AS WELL AS VALIDITY OF COMPONENTS FOR HV BLADE 1 & 2 ACCORDION SHUTTERS SYSTEMS FOR EITHER WIND ZONE SHALL BE PREPARED AND CERTIFIED BY A FLORIDA REGISTERED ENGINEER OR ARCHITECT BASED ON BUILDING CONFIGURATION AND ASCE 7-05 STANDARD, AND SHALL BE SUBMITTED TO THE BUILDING OFFICIAL AT THE TIME PERMIT IS APPLIED FOR.

HV BLADE ① AND HV WINDOW BLADE ①A ARE ALSO ENGINEERED TO WORK IN UNISON WITH EACH OTHER UNDER THE GENERAL LIMITATIONS AND CONDITIONS OF USE INDICATED ON SHEET 28.

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 31.7 ksi AND 35.7 ksi FOR 6005-T5 ALLOY.

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.

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 : 13,14,15,16 AND 17

HV BLADE ② : 26.

HV BLADE ① & ①A WORKING IN UNISON: 13, 14 & 16

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. A PERMANENT SHUTTER MANUFACTURER'S LABEL SHALL BE PLACED ON THE EXPOSED SURFACE OF THE SIDE RAIL APPROXIMATELY 4" BELOW THE TOP OF SUCH RAIL LABEL SHALL READ AS FOLLOWS:

ALUM-SHUTTERS & GLASS, INC.
HIALEAH, FL.
MIAMI - DADE COUNTY PRODUCT CONTROL APPROVED.

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.A.O. 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.A.D.

(b) CONTRACTOR TO BE RESPONSIBLE FOR THE SELECTION, PURCHASE AND INSTALLATION INCLUDING LIFE SAFETY OF THIS PRODUCT, BASED ON THIS P.A.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.A.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.A.D. ENGINEER OF RECORD, ACTING AS A DELEGATED ENGINEER TO THE P.A.D. ENGINEER SHALL SUBMIT TO THIS LATTER THE SITE SPECIFIC DRAWINGS FOR REVIEW.

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

TABLE OF CONTENTS

AREA 1: HV BLADES ① ①A & ②

GENERAL NOTES.		SHEET 1
SYSTEM COMPONENTS.	1-20	SHEET 2
SYSTEM COMPONENTS.	21-37	SHEET 3
TYPICAL SHUTTER ASSEMBLY.	38-43	SHEET 4

AREA 2: HV BLADE ① AND HV WINDOW BLADE ①A (WHERE APPLICABLE)

TYPICAL SHUTTER ELEVATION & NOTES ON LOCKS.		SHEET 5
INSTALLATION DETAILS A-E -CONCRETE & BLOCK		SHEET 6
INSTALLATION DETAILS F-L-CONCRETE & BLOCK.		SHEET 7
CENTERMATE DETAILS HV.		SHEET 8
CENTERMATE ALTERNATING DETAILS HV.		SHEET 9
CENTERMATE DETAILS HD.		SHEET 10
END CONNECTION DETAILS 1-6-CONCRETE & BLOCK		SHEET 11
MAXIMUM SPAN TABLES.		SHEET 12
ANCHOR SCHEDULE- CONCRETE & BLOCK.		SHEET 13
ANCHOR SCHEDULE- CONCRETE & BLOCK.		SHEET 14
ANCHOR SCHEDULE- CONCRETE & BLOCK.		SHEET 15
ANCHOR SCHEDULE- WOOD.		SHEET 16
ANCHOR SCHEDULE- WOOD.		SHEET 17
INSTALLATION DETAILS M-R-WOOD.		SHEET 18
INSTALLATION DETAILS S-X-WOOD.		SHEET 19
END CONNECTION DETAILS 7-12, X.		SHEET 20

AREA 3: HV BLADE ② ONLY

TYPICAL SHUTTER ELEVATION & NOTES ON LOCKS.		SHEET 21
INSTALLATION DETAILS AA-GG.		SHEET 22
CENTERMATE DETAILS HD.		SHEET 23
END CONNECTION DETAILS 1-6, X.		SHEET 24
MAXIMUM SPAN TABLES.		SHEET 25
ANCHOR SCHEDULE CONCRETE.		SHEET 26

AREA 4: HV WINDOW BLADE ①A ONLY

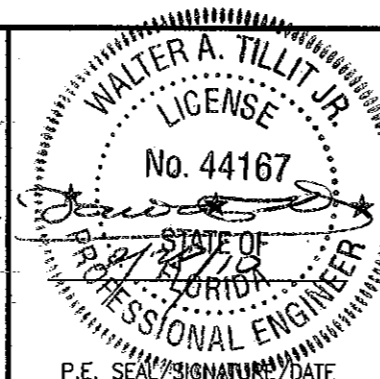
TYPICAL WINDOW BLADE & WINDOW DETAIL		SHEET 27
TYPICAL SHUTTER ELEVATION		SHEET 28

FLORIDA BUILDING CODE (High Velocity Hurricane Zone)

© 2009 EASTERN METAL SUPPLY, INC.

PRODUCT REVISED
as complying with the Florida
Building Code
Acceptance No 10-0930-15
Expiration Date 03/09/2016
By *Walter A. Tillit Jr.*
Miami Dade Product Control
Division

MIAMI-DADE COUNTY



TILLIT TESTING & ENGINEERING COMPANY
6355 N.W. 36th. St., Ste. 305, VIRGINIA GARDENS, FLORIDA 33166
Phone : (305)871-1530 . Fax : (305)871-1531
e-mail: tiltco@aol.com
EB-0006719
WALTER A. TILLIT Jr. P.E.
FLORIDA Lic. # 44167

**ALUM-SHUTTERS &
GLASS, INC.**

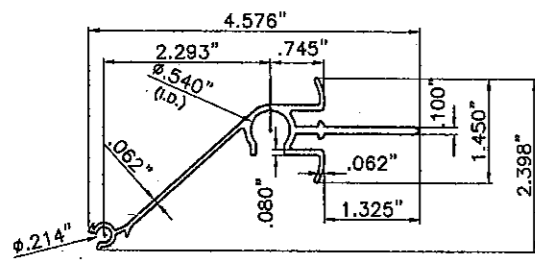
(ASSA # 384)

2205 W. 80TH STREET, BAY#2
HIALEAH, FLORIDA 33016

PHONE: (305) 819-5555. FAX: (305) 819-5556

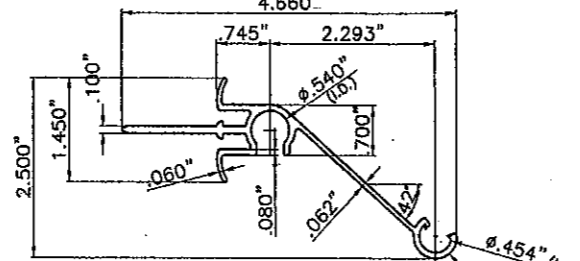
BERTHA HV™
Accordion Shutter System

REV.No	DESCRIPTION	DATE	DRAWN BY:	L.G.
1				DATE: 09/23/10
2				
3				
4				DRAWING No 10-086
5				SHEET
6				1 OF 28



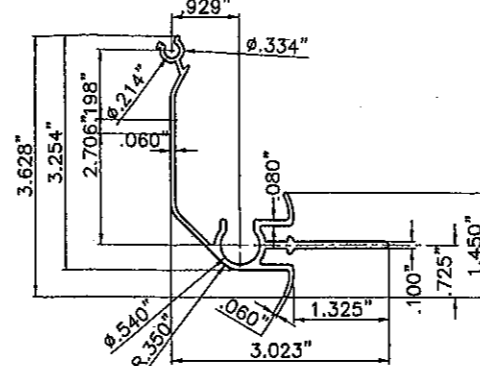
21 HV CENTERMATE

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



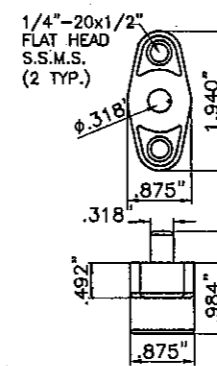
22 HV FLOATING CENTERMATE

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6063-T6 ALLOY AND TEMPER



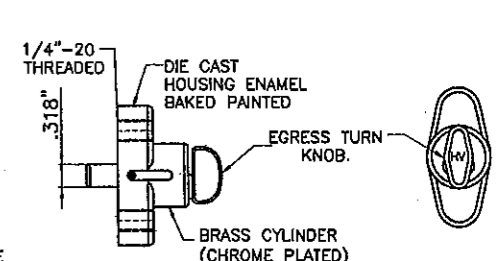
23 HV CORNER CENTERMATE

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



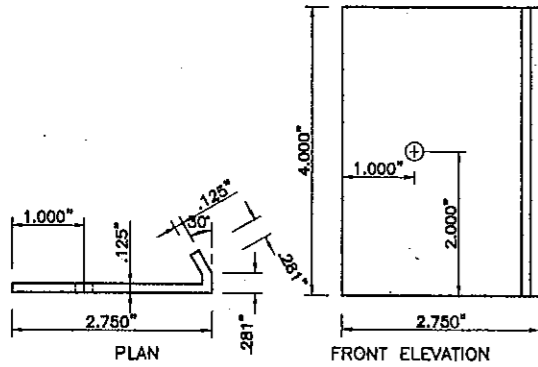
24 HV LOCK

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



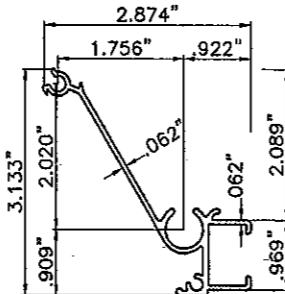
25 HV EGRESS LOCK

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



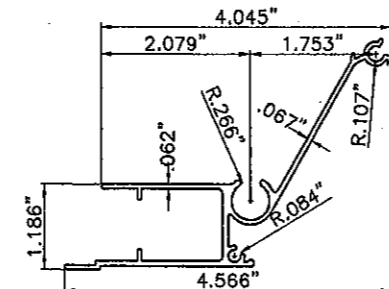
27 LOCKER FOR "T" LOCK CENTERMATE

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



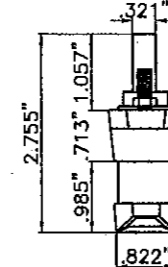
28 HV MALE "T" LOCK CENTERMATE

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



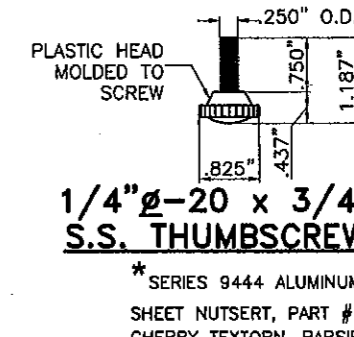
29 HV FEMALE "T" LOCK CENTERMATE

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.

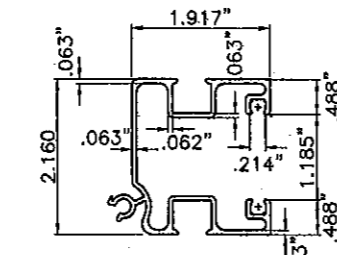
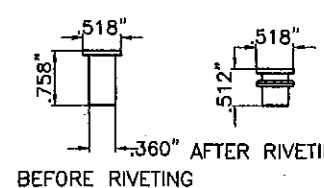


26 HV ALTERNATIVE LOCK

QUALIFIED FOR USE W/ HV BLADE ① ONLY.

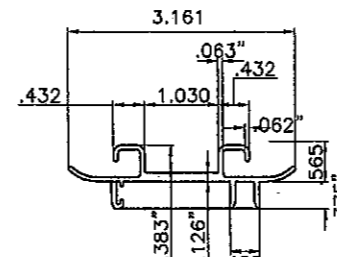
1/4" ø-20 x 3/4" S.S. THUMBSCREW 1/4" ø-20 RIVNUT*

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



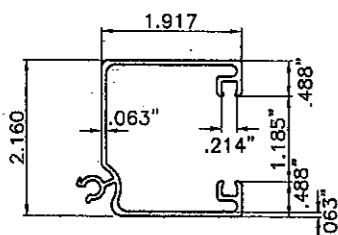
32 HD CENTERMATE W/ LOCKING ROD

QUALIFIED FOR USE W/ HV BLADE ① & ②
6063-T6 ALLOY AND TEMPER



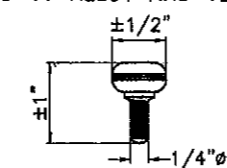
33 HD CENTERMATE'S INSERT

QUALIFIED FOR USE W/ HV BLADE ①, ①A & ②
6063-T6 ALLOY AND TEMPER



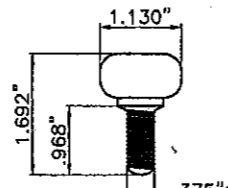
31 HD CENTERMATE W/ NO LOCKING ROD

QUALIFIED FOR USE W/ HV BLADE ① & ②
6063-T6 ALLOY AND TEMPER



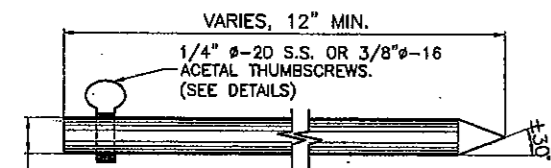
37 HV 1/4" ø-20 AISI 304 SERIES S.S. THUMBSCREWS

QUALIFIED FOR USE W/ HV BLADE ① & ②



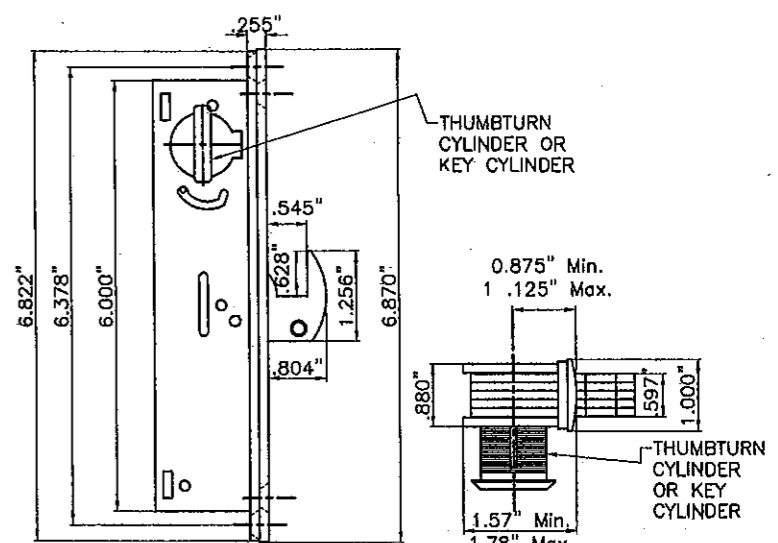
36 HV 3/8" ø-16 ACETAL THUMBSCREWS

QUALIFIED FOR USE W/ HV BLADE ① & ②



35 LOCKING ROD

QUALIFIED FOR USE W/ HV BLADE ①, ①A & ②
6063-T6 ALLOY AND TEMPER



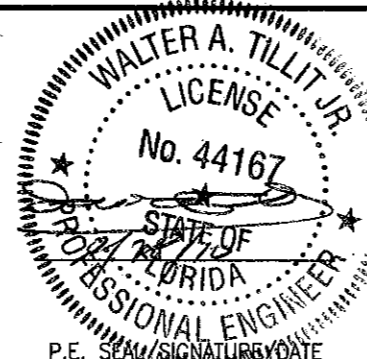
34 HD LOCK

BY REGENT HARDWARE MORTISE LOCKS SERIES 2333 HOOK BOLT LOCK.
QUALIFIED FOR USE W/ HV BLADE ① & ②

FLORIDA BUILDING CODE (High Velocity Hurricane Zone)

PRODUCT REVISED as complying with the Florida Building Code Acceptance No 10-0930.15 Expiration Date 03/09/2016
By *Walter A. Tillit Jr.*
Miami Dade Product Control Division

MIAMI-DADE COUNTY



TILLIT TESTING & ENGINEERING COMPANY
6355 N.W. 36th St., Ste. 305, VIRGINIA GARDENS, FLORIDA 33166
Phone : (305)871-1530 . Fax : (305)871-1531
e-mail: tiltco@aol.com
EB-0D06719
WALTER A. TILLIT JR. P.E.
FLORIDA Lic. # 44167

ALUM-SHUTTERS & GLASS, INC.

(ASSA # 384)

2205 W. 80TH STREET, BAY#2
HIALEAH, FLORIDA 33016

PHONE: (305) 819-5555. FAX: (305) 819-5556

© 2009 EASTERN METAL SUPPLY, INC.

BERTHA HV™
Accordion Shutter System

REV.No	DESCRIPTION	DATE	DRAWN BY:	L.G.
1				DATE: 09/23/10
2				DRAWING No
3				10-086
4				SHEET
5				3 OF 28
6				

SHUTTER ASSEMBLY SCHEDULE FOR HV ①, HV ①A AND HV ② BLADES.

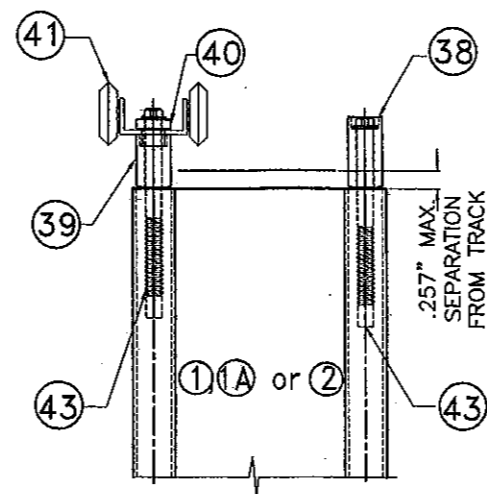
①	HV BLADE 1
①A	HV BLADE 1A
②	HV BLADE 2
③8	HV LONG RECESSED NYLON BUSHING
③9	HV SHORT RECESSED NYLON BUSHING
④0	HV NYLON HAT WASHER
④1	HV WHEEL CARRIAGE AISI 302-303 SERIES ø.870"x3/16" THICK NYLON WHEEL. 0.188"ø AISI 302 SERIES S.S. RIVETS
④2	HV 1 3/4" ACCORDION PIN W/ #8 HEAD *
④3	HV 2 3/4" ACCORDION PIN W/ #8 HEAD *
④4	POLYCARBONATE IMPACT RESISTANT HV WINDOW (SEE SHEET 27)

*** HV PIN REQUIREMENTS AT EXTERIOR BLADE KNUCKLE FOR HV ①, HV ①A & HV ② BLADES.**

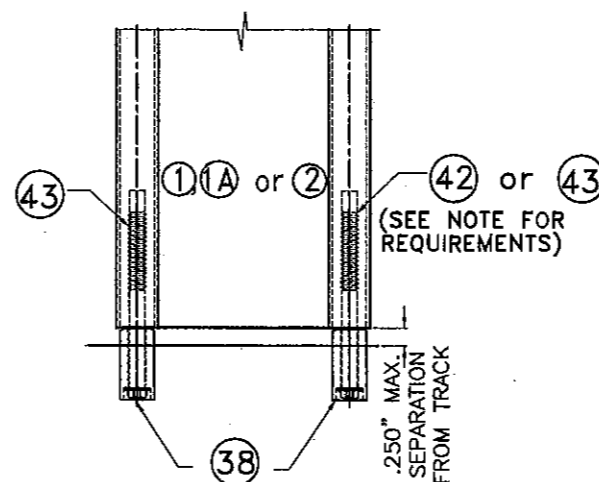
(1) HV PIN ④3 SHALL ALWAYS BE USED AT ALL EXTERIOR BOTTOM KNUCKLES OF HV ACCORDION SYSTEM W/ HV ① OR HV ①A BLADE.

(2) HV PIN ④2 MAY BE USED IN LIEU OF ④3 AND ONLY AT EXTERIOR BOTTOM KNUCKLES OF HV ACCORDION SYSTEM W/ HV ② BLADE WHEN CORRESPONDING TO INSTALLATIONS "CC" AND "DD", SHEET 22.

(3) HV PIN ④2 OR ④3 W/ 1/2" O.D. 1/16" THICK S.S. WASHER SHALL BE USED FOR DIRECT MOUNT INSTALLATION PER DETAIL X, SHEETS 11 & 24.

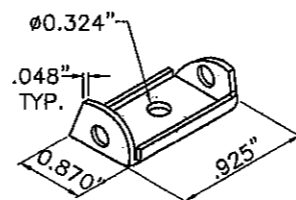


EXTERIOR



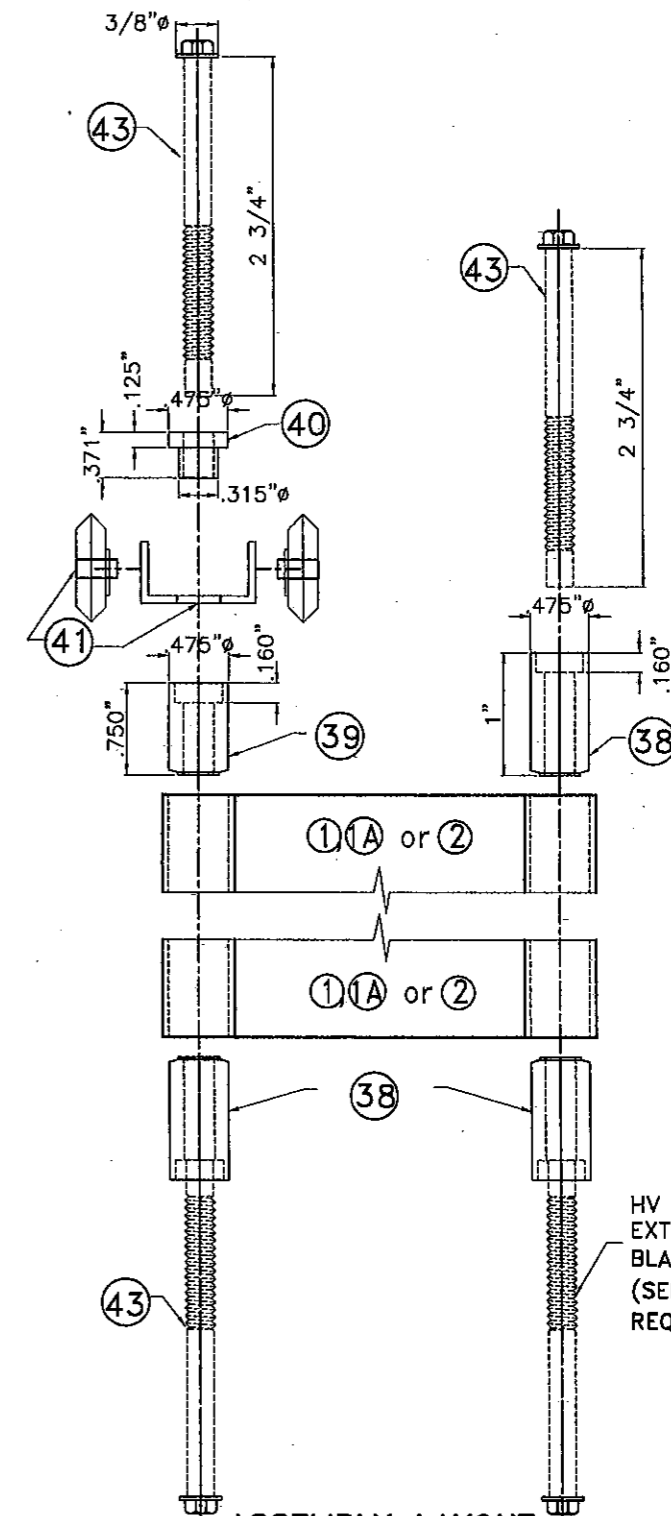
TYPICAL SHUTTER ASSEMBLY

SCALE: 3/8" = 1"



WHEEL CARRIAGE DETAIL

N.T.S.



EXTERIOR

HV PIN ④2 OR ④3 AT EXTERIOR BLADE'S KNUCKLE. (SEE NOTE * FOR REQUIREMENTS)

ASSEMBLY LAYOUT

N.T.S.

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(ASSA # 384)

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HALEAH, FLORIDA 33016

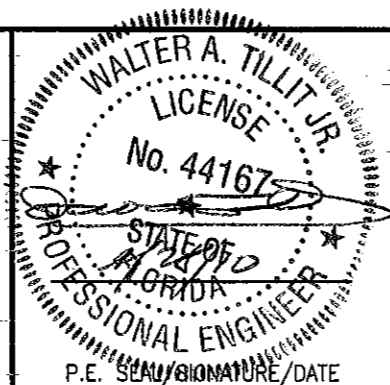
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BERTHA HV™
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3			SHEET 4 OF 28
4			
5			
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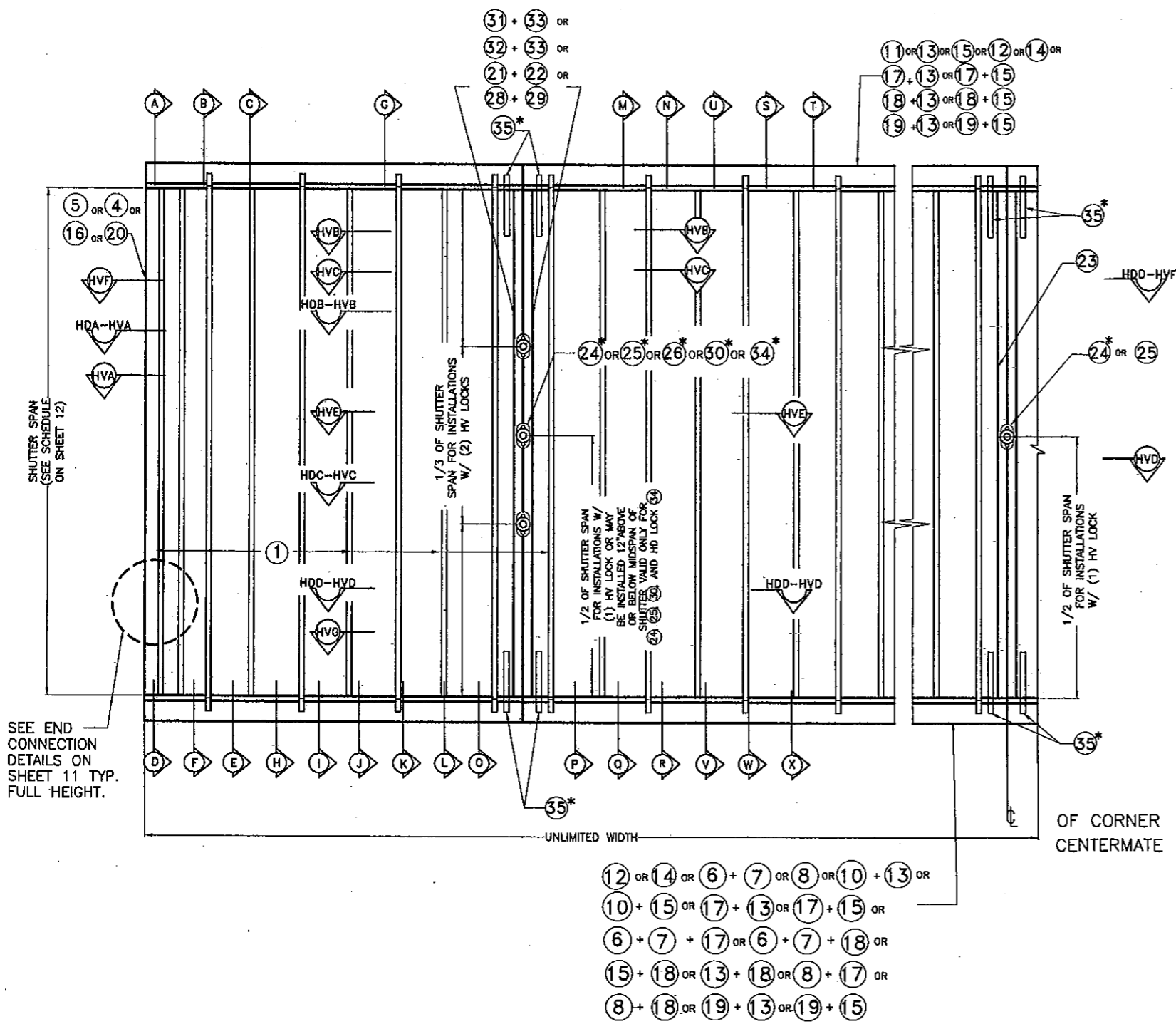
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Expiration Date 03/09/2016
By *Walter A. Tillit Jr.*
Miami Dade Product Control
Division

MIAMI-DADE COUNTY



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

P.E. SIGNATURE/DATE



TYPICAL ① HV BLADE SHUTTER ELEVATION
N.T.S.

*** NOTES ON HV LOCKS AND CENTERMATES:**

- MANDATORY CONDITION #1:** ONE HV LOCK 24 OR 25 SHALL BE USED AT 1/2 OF SHUTTER SPAN FOR ANY SPAN OR 12" ABOVE OR BELOW 1/2 OF SHUTTER SPAN FOR SPANS UP TO 105", AND FOR INSTALLATIONS AT ANY ELEVATION. HV LOCK 24 OR 25 MAY BE USED AS AN INSIDE OR OUTSIDE LOCK, ATTACHED TO 21 OR 22 CENTERMATES W/(2) 1/4"φ-20 x 1/2" LONG FLAT HEAD S.S. M.S. LOCATION OF LOCK SHALL BE AS INDICATED ON TYPICAL SHUTTER ELEVATION.
- LIMITED MANDATORY CONDITION #2 ALTERNATE TO MANDATORY CONDITION #1 (VALID ONLY FOR FLOOR/CEILING INSTALLATIONS):** TWO HV LOCKS 24 OR 25 OR ONE HV LOCK 24 OR 25 W/ TWO LOCKING RODS 35 AT TOP & BOTTOM SHALL BE USED FOR ANY SPAN AND INSTALLATION AT ANY ELEVATION. HV LOCK 24 OR 25 SHALL BE ATTACHED TO 21 OR 22 CENTERMATES W/ SAME SPECIFICATIONS AS PER MANDATORY CONDITION #1. LOCATION OF LOCK/LOCKS AS APPLICABLE SHALL BE AS INDICATED ON TYPICAL SHUTTER ELEVATION. MAXIMUM SHUTTER SPAN SHALL BE DETERMINED AS PER SCHEDULE #3 ON SHEET 12.
- OPTIONAL CONDITION #1:** IF DESIRED, FOR BETTER PERFORMANCE OR FOR SECURITY PURPOSES, UP TO TWO HV LOCKS 24, 25 OR 26 MAY BE USED AS AN INSIDE OR OUTSIDE LOCK. CONNECTION OF LOCKS TO CENTERMATES 21 OR 22 SHALL BE AS INDICATED ON NOTE (1) ABOVE. LOCATION OF LOCKS SHALL BE AS INDICATED ON TYPICAL SHUTTER ELEVATION.
- OPTIONAL CONDITION #2 (VALID ONLY WHEN MANDATORY CONDITION #1 OR LIMITED MANDATORY CONDITION #2 IS USED W/TWO H.V. LOCKS):** LOCKING RODS 35 ARE NOT REQUIRED AT HURRICANE POSITION, BUT MAY BE USED IF DESIRED TO ENHANCE SHUTTER PERFORMANCE. LOCKING RODS 35 OR AN ALTERNATIVE DEVICE MAY ALSO BE USED AT STACKING POSITION (NON HURRICANE POSITION).
- MANDATORY CONDITION #2:** ONE HV LOCK 24 OR 25 SHALL BE USED AT CORNER CENTERMATES FOR ANY SPAN AND INSTALLATIONS AT ANY ELEVATION. HV LOCK 24 OR 25 SHALL BE USED AS AN OUTSIDE OR INSIDE LOCK, ATTACHED TO 23 CORNER CENTERMATE W/(2) 1/4"φ-20 x 1/2" LONG FLAT HEAD S.S. M.S. TWO LOCKING RODS 35 AT TOP & BOTTOM SHALL BE USED. LOCATION OF LOCK SHALL BE AS INDICATED ON TYPICAL SHUTTER ELEVATION. MAXIMUM SHUTTER SPAN SHALL BE DETERMINED AS PER SCHEDULES SHOWN ON SHEET 12.
- FIRST ALTERNATE TO MANDATORY CONDITION #1 VALID ONLY FOR HV LOCK 26 W/ SYMMETRICAL CENTERMATES 21 OR 22:** ONE ALTERNATE HV LOCK 26 MAY BE USED IN LIEU OF HV LOCK 24 OR 25 FOR ANY SPAN AND INSTALLATIONS AT ANY ELEVATION. ALTERNATE LOCK 26 MAY BE USED AS AN INSIDE OR OUTSIDE LOCK. ATTACHMENT OF 1/4"φ-20x3/4" S.S. THUMBSCREW TO 21 OR 22 CENTERMATES SHALL BE MADE W/ 1/4"φ-20x3/4" ALUM. RIVNUT AS SHOWN ON SECTION HVE, SHEET 8. ONE LOCK SHALL BE USED AT 1/2 OF SHUTTER SPAN OR TWO LOCKS AT 1/3 OF SHUTTER SPAN.

***NOTES ON HV "T" LOCKS AND CENTERMATES:**

- SECOND ALTERNATE TO MANDATORY CONDITION #1 VALID ONLY FOR HV "T" LOCK 30 AND CENTERMATES 28 AND 29:** ONE ALTERNATE HV "T" LOCK 30 MAY BE INSTALLED IN LIEU OF HV LOCKS 24 OR 25 FOR ANY SPAN AND INSTALLATION AT ANY ELEVATION. ALTERNATE LOCK 30 MAY BE USED AS AN INSIDE OR OUTSIDE LOCK. ATTACHMENT OF LOCK 30 INCLUDES USING REINFORCING LOCKER 27, AS SHOWN ON SECTION HVG, SHEET 9, WHICH MUST BE CONNECTED TO CENTERMATES 28 AND 29 W/ 1/4"φ-20 x 1 1/2" LONG S.S. THREADED BOLT W/ 7/8"φ x 3/32" WINGNUT OR W/ 1/4"φ-20x1" S.S.M.S. INTO A 1/4"φx 5/8" RIVNUT. LOCK MAY BE INSTALLED AT MIDSPAN OR 12" MAXIMUM ABOVE AND BELOW MIDSPAN. USE OF TWO LOCKING RODS 35 TOP AND BOTOM IS MANDATORY.

***NOTES ON HD LOCKS & CENTERMATES:**

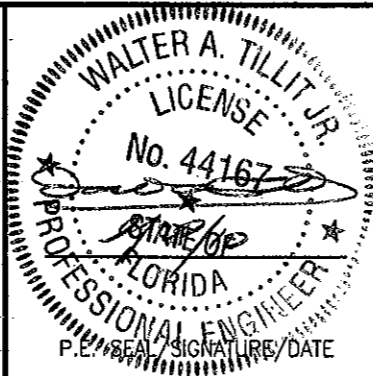
- HD LOCK 34 W/ HD CENTERMATES 31 OR 32 W/ 33:** ONE ALTERNATE HD LOCK 34 MAYBE USED IN LIEU OF HV LOCKS 24 OR 25 FOR ANY SPAN AND INSTALLATIONS AT ANY ELEVATION. ALTERNATE HD LOCK 34 MAY BE USED AS AN INSIDE OR OUTSIDE LOCK. ATTACHMENT OF HD LOCK 34 TO 33 IS W/ 3 #8 x 3/8" F.H. S.S.M.S., AND INCLUDES REINFORCEMENT INSERT 33 AS SHOWN ON SECTIONS HDB-HVB AND HDC-HVC, SHEET 10. LOCK MAY BE INSTALLED AT MIDSPAN OR 12" MAXIMUM BELOW OR ABOVE MIDSPAN. USE OF LOCKING RODS 35 IS COMPLETELY OPTIONAL.

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By *Walter A. Tillit Jr.*
Miami Dade Product Control
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e-mail: tilteco@aol.com
EB-0006719
WALTER A. TILLIT Jr. P.E.
FLORIDA Lic. # 44167

**ALUM-SHUTTERS &
GLASS, INC.**

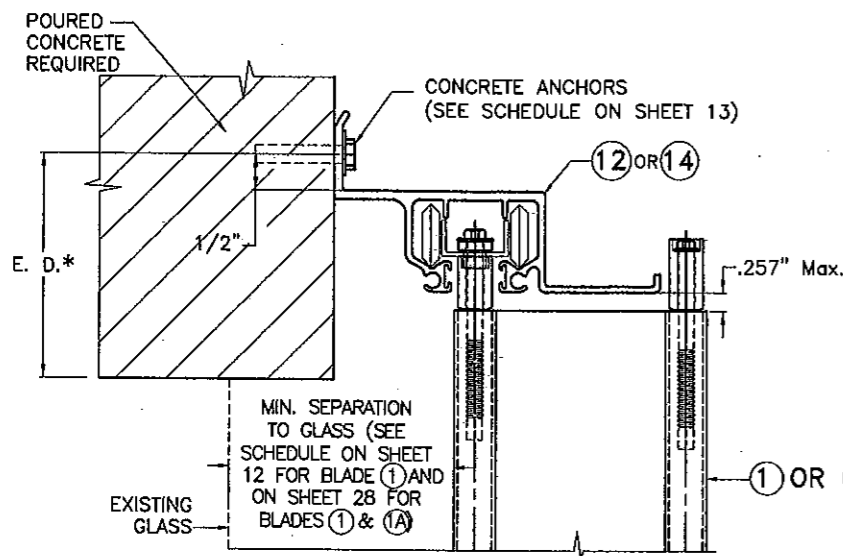
(ASSA # 384)

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HIALEAH, FLORIDA 33016

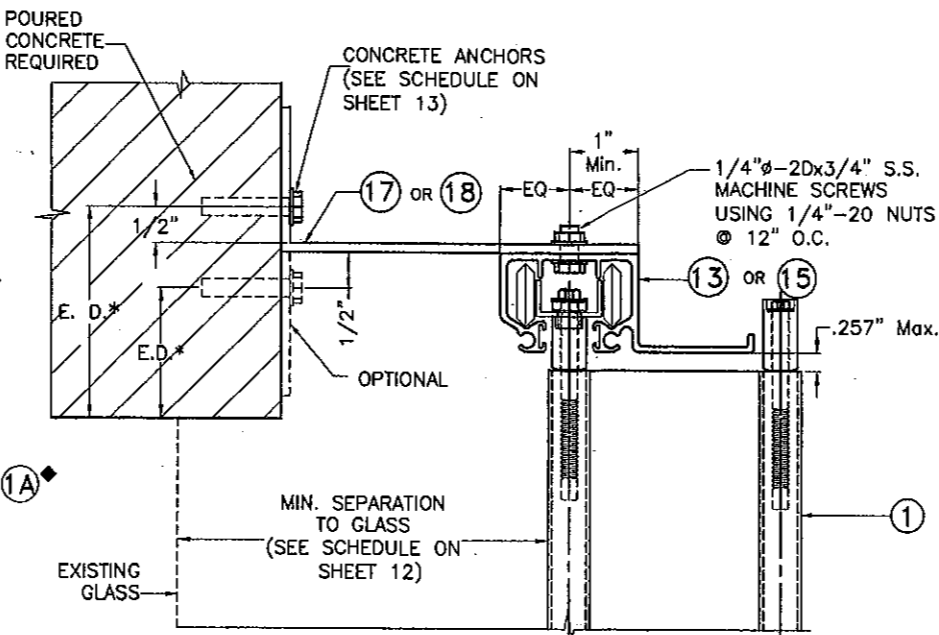
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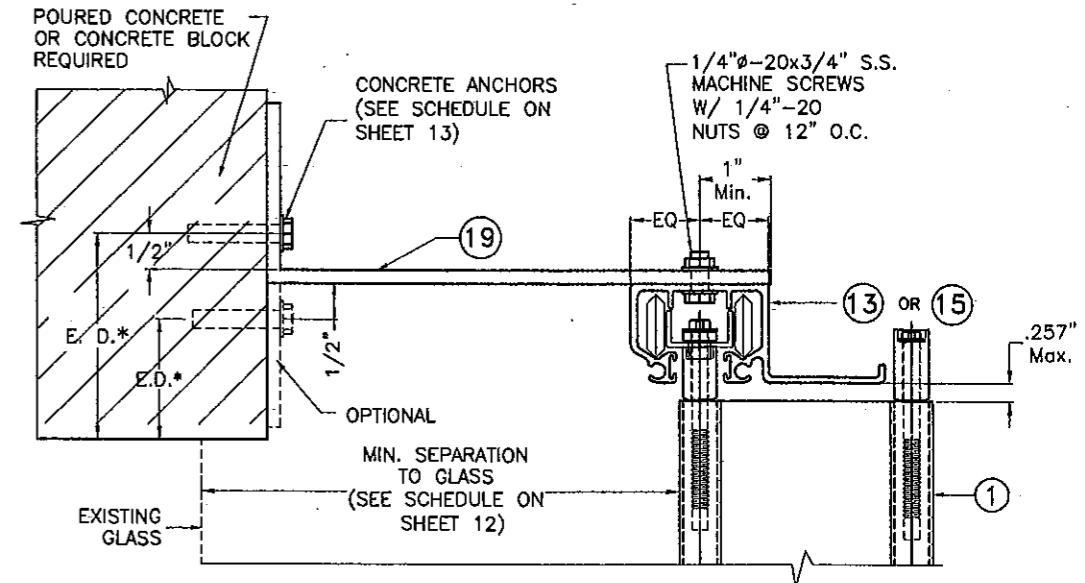
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3				10-086
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5				5 OF 28
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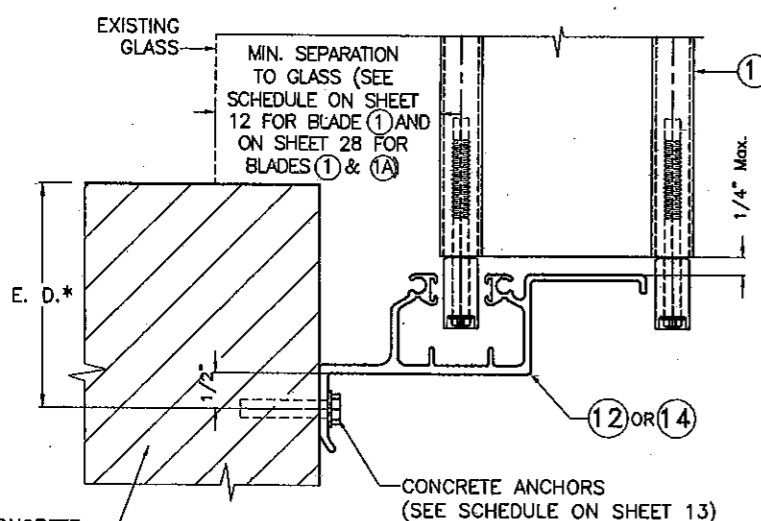
A HV WALL HEADER INSTALLATION



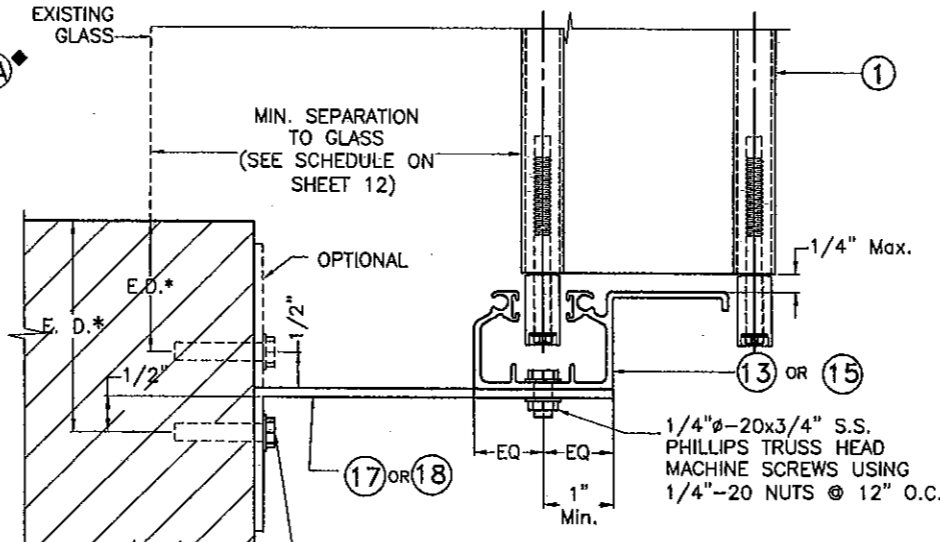
B HV WALL HEADER INSTALLATION



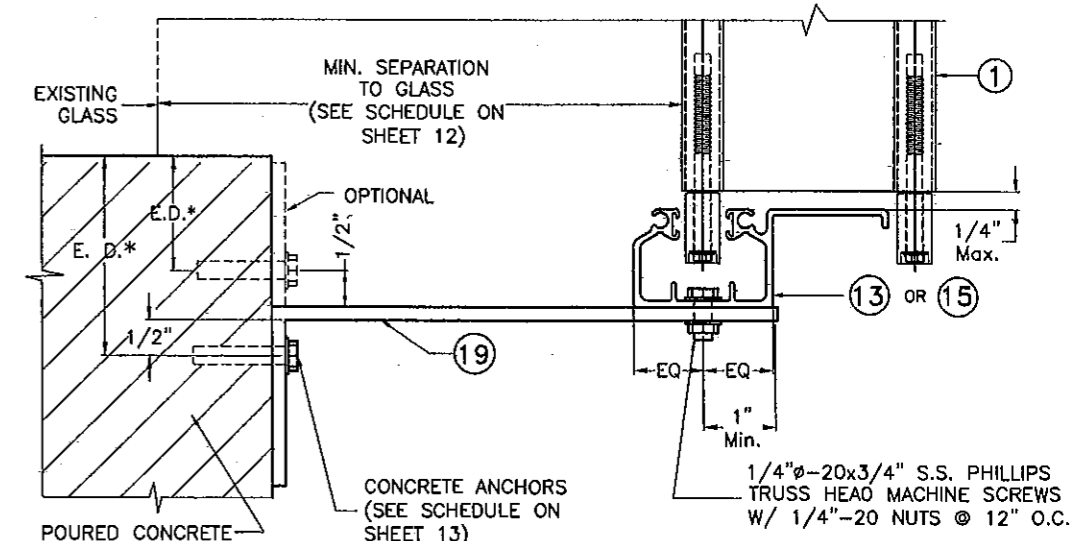
C HV WALL HEADER INSTALLATION



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.

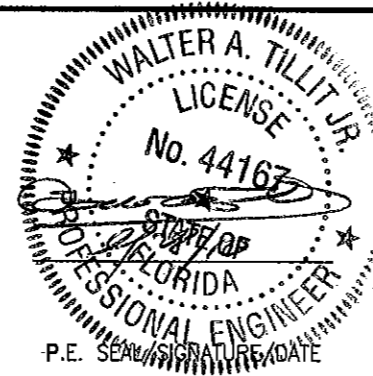
* E. D. = EDGE DISTANCE
 (SEE SPECIFICATIONS ON SHEET 14)

◆ SEE LIMITATIONS OF USE FOR BLADE (1A) ON SHEET 28

INSTALLATION DETAILS W/ (1) HV BLADE & ((1) HV + (1A) HV BLADES) AS APPLICABLE

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 e-mail: tilteco@aol.com
 EB-0006719
 WALTER A. TILLIT Jr. P.E.
 FLORIDA Lic. # 44167

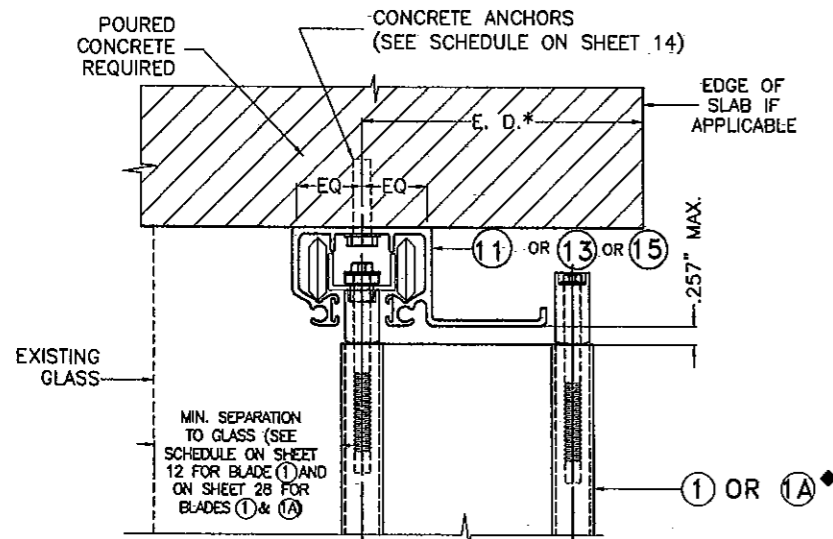
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 (ASSA # 384)
 2205 W. 80TH STREET, BAY#2
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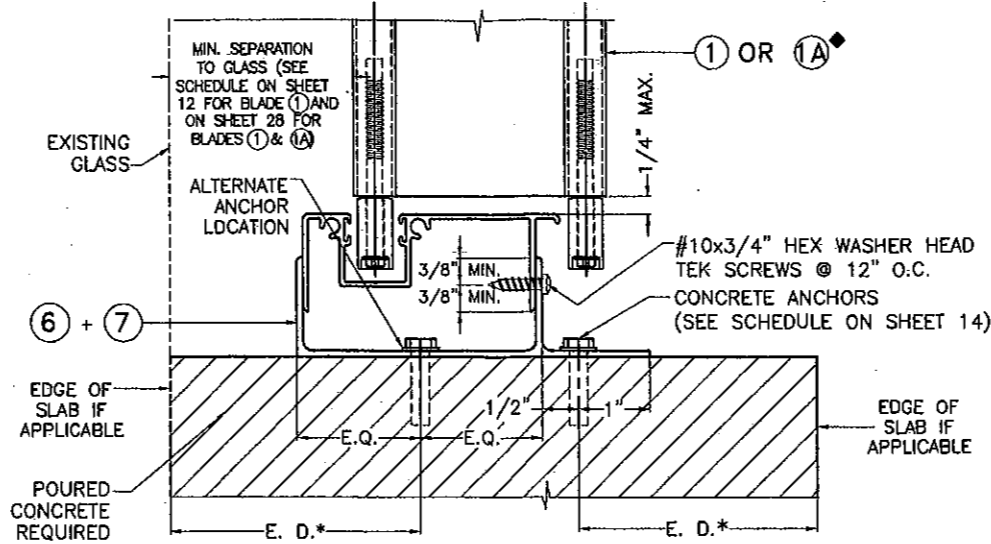
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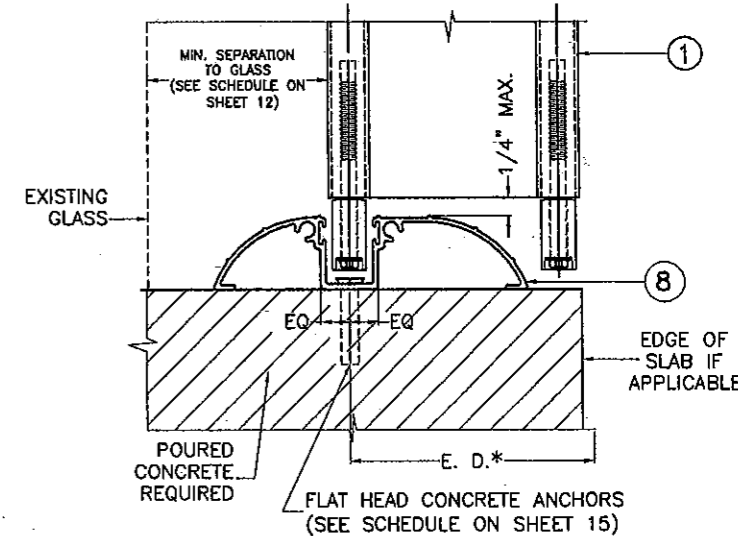
DATE: 09/23/10
 DRAWING No 10-086
 SHEET 6 OF 28



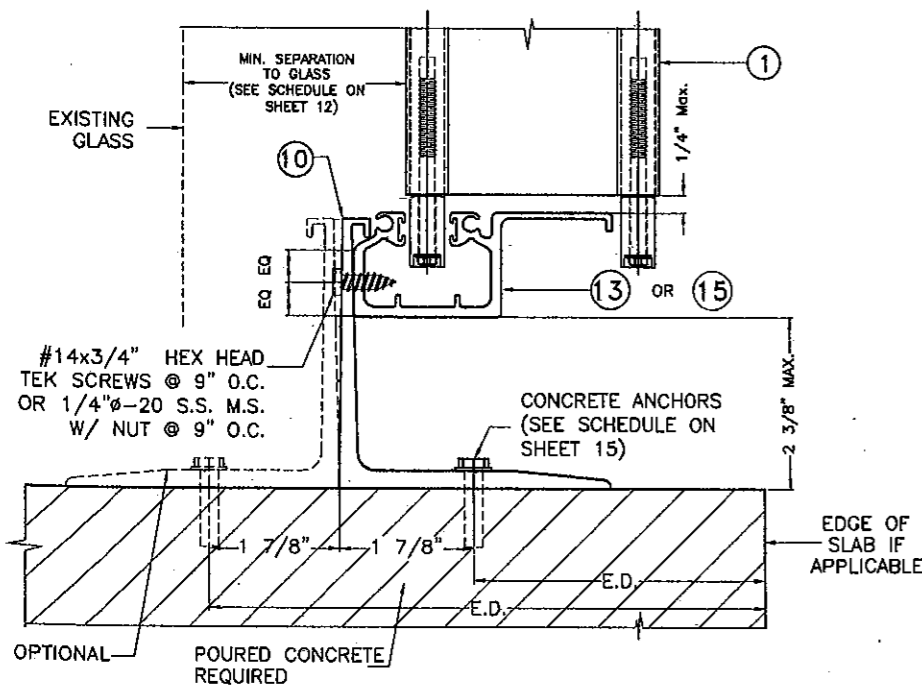
G HV CEILING INSTALLATION



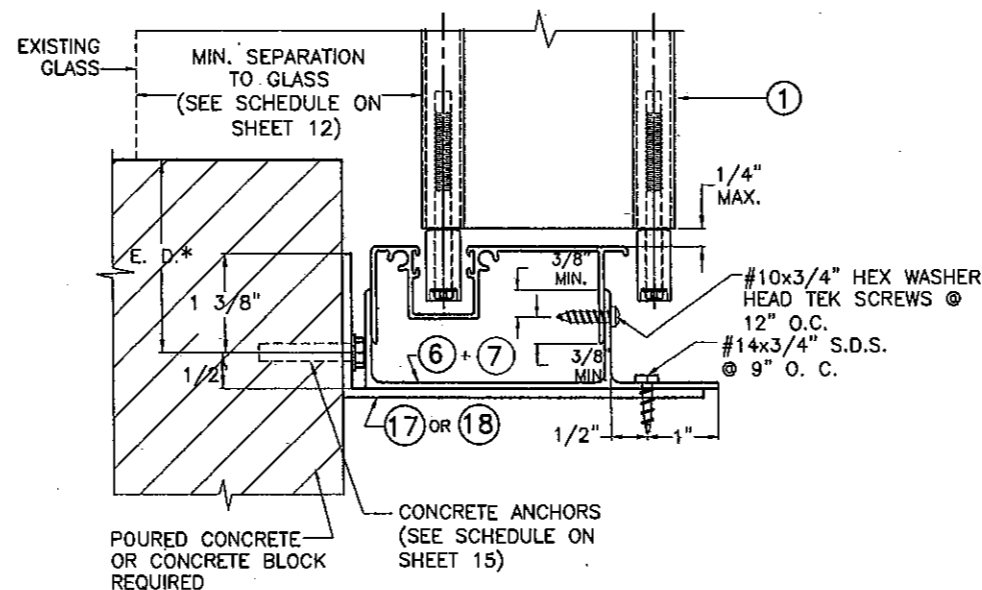
H HV FLOOR INSTALLATION †



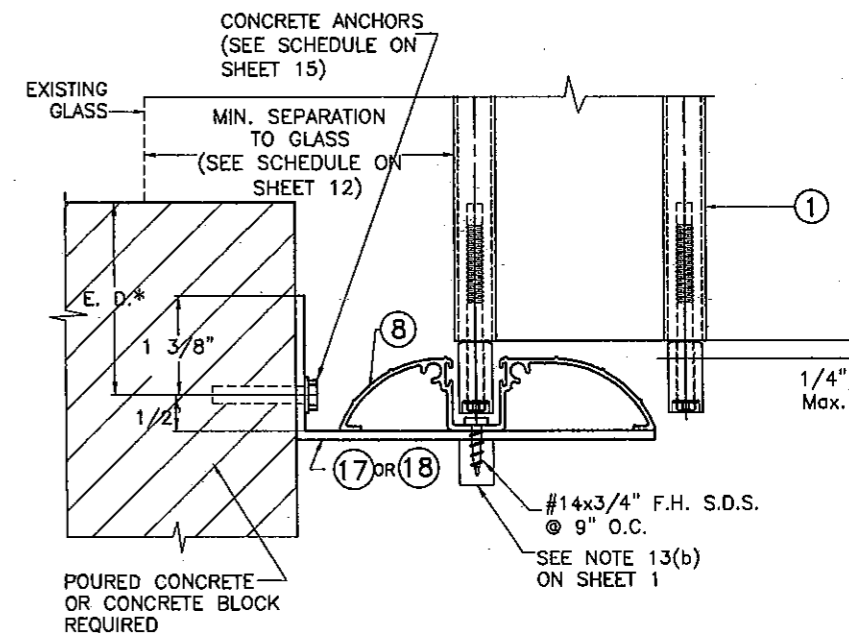
I HV WALK-OVER INSTALLATION



J HV RAINGUARD INSTALLATION †



K HV WALL FLOOR INSTALLATION



L HV WALL WALK-OVER INSTALLATION

INSTALLATION DETAILS W/ (1) HV BLADE & (1) HV + (1A) HV BLADES) AS APPLICABLE

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 14)

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

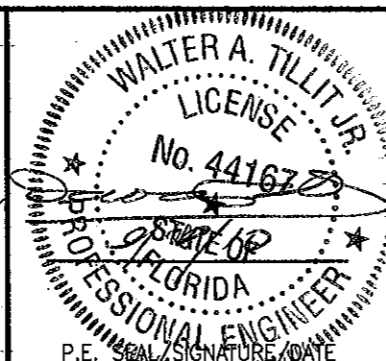
◆ SEE LIMITATIONS OF USE FOR BLADE (1A) ON SHEET 28

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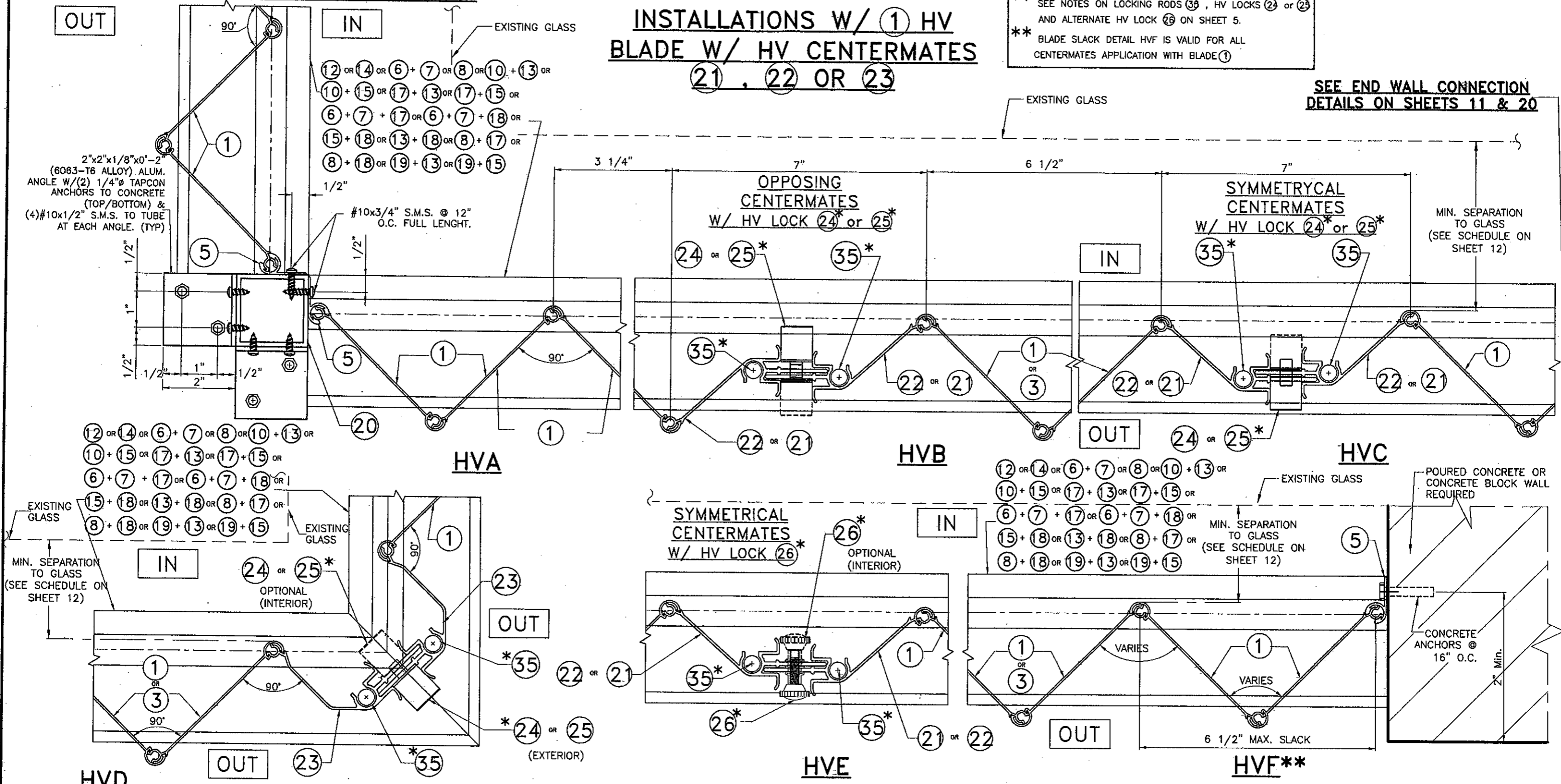
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5				7 OF 28
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SEE END WALL CONNECTION DETAILS ON SHEETS 11 & 20

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

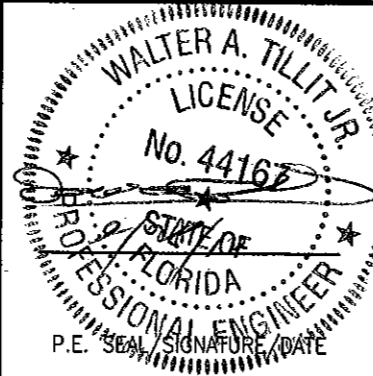
* SEE NOTES ON LOCKING RODS ③⑤, HV LOCKS ②④ OR ②⑤ AND ALTERNATE HV LOCK ②⑥ ON SHEET 5.
 ** BLADE SLACK DETAIL HVF IS VALID FOR ALL CENTERMATES APPLICATION WITH BLADE ①

SEE END WALL CONNECTION DETAILS ON SHEETS 11 & 20



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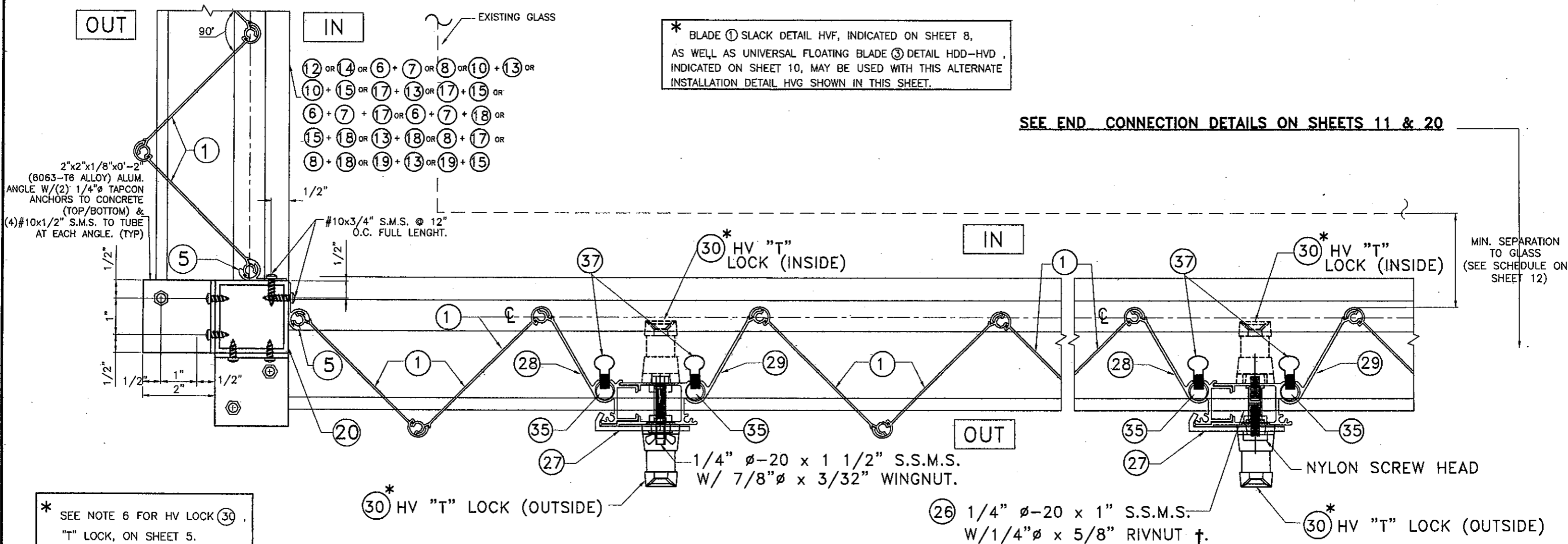
DATE: 09/23/10
 DRAWING No 10-086
 SHEET 8 OF 28

MIAMI-DADE COUNTY

ALTERNATE INSTALLATION W/HV "T" LOCK $\textcircled{30}$, HV MALE/FEMALE "T" LOCKS CENTERMATES $\textcircled{28}$, $\textcircled{29}$ & LOCKERS $\textcircled{27}$ W/ $\textcircled{1}$ HV BLADE *

SEE END CONNECTION DETAILS ON SHEETS 11 & 20

SEE END CONNECTION DETAILS ON SHEETS 11 & 20



* SEE NOTE 6 FOR HV LOCK $\textcircled{30}$ "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.

HVG*

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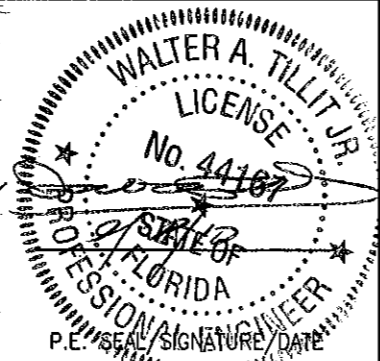
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9 OF 28

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SEE END WALL CONNECTION DETAILS ON SHEETS 11 & 20

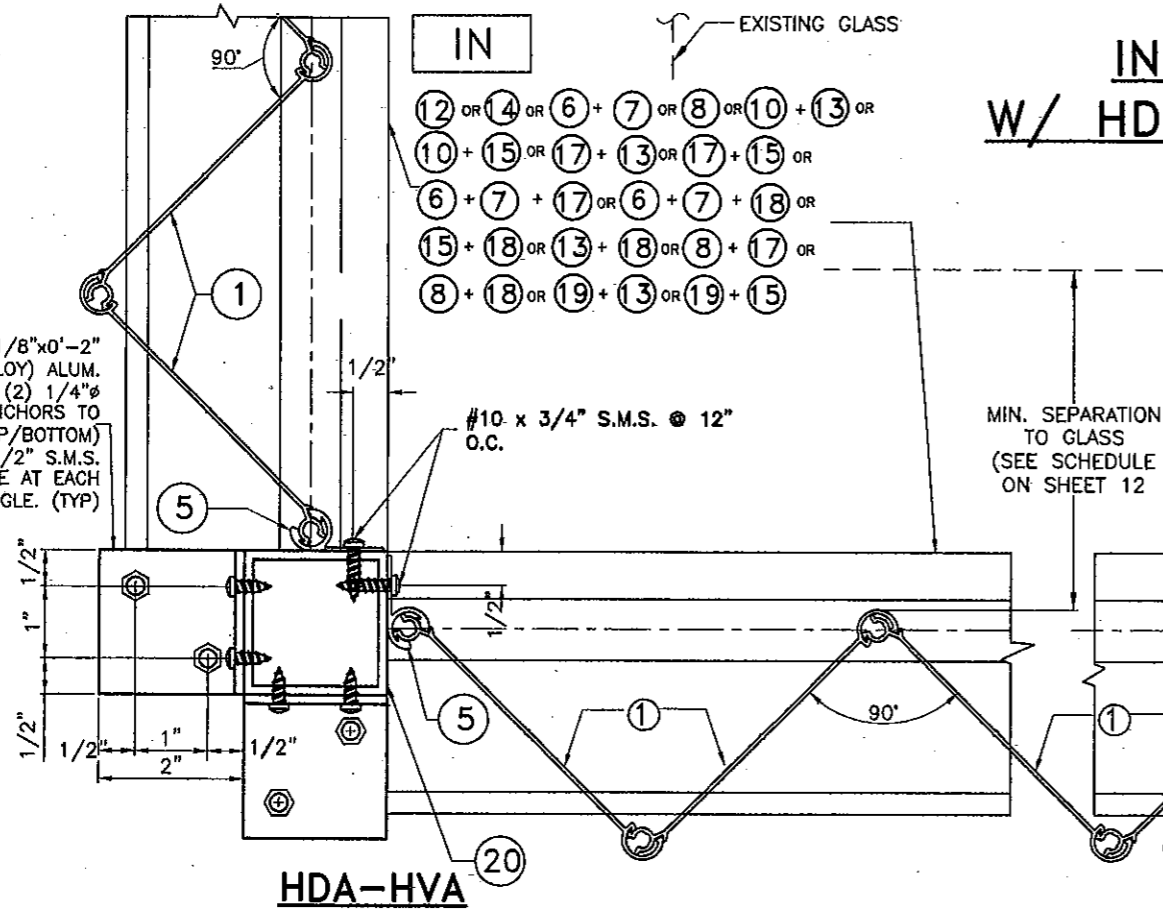
OUT

IN

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

SEE END WALL CONNECTION
DETAILS ON SHEETS 11 & 20

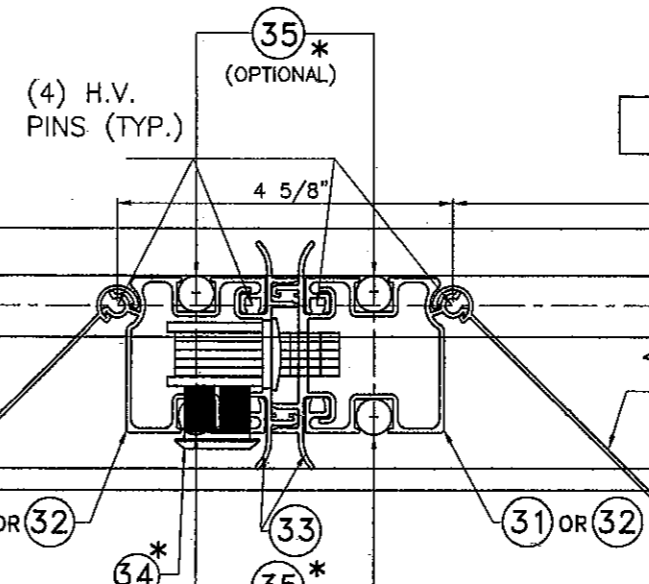
2"x2"x1/8"x0'-2"
(6063-T6 ALLOY) ALUM.
ANGLE W/ (2) 1/4"Ø
TAPCON ANCHORS TO
CONCRETE (TOP/BOTTOM)
& (4) #14x1/2" S.M.S.
TO TUBE AT EACH
ANGLE. (TYP)



HDA-HVA ②①

EXISTING GLASS

MIN. SEPARATION
TO GLASS
(SEE SCHEDULE
ON SHEET 12)



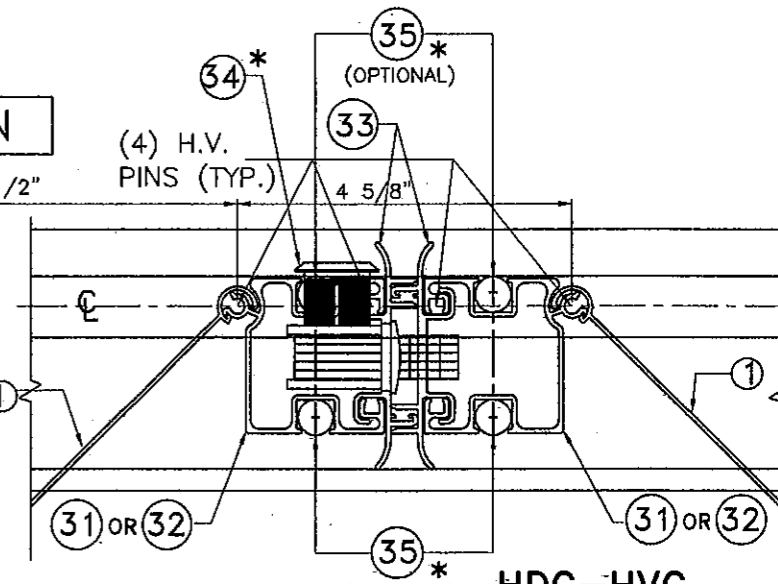
HDB-HVB
SYMMETRICAL HD CENTERMATES
W/ ③④* LOCK (EXTERIOR)

IN

6 1/2"

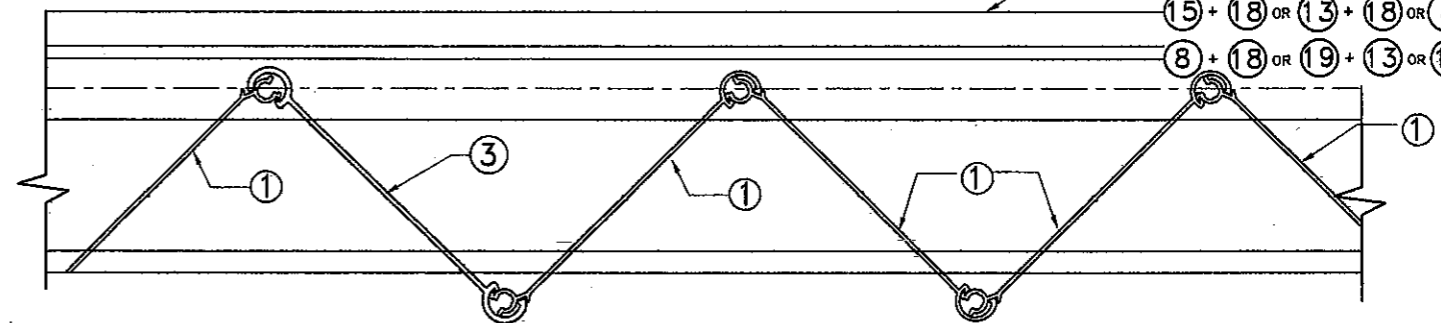
OUT

EXISTING GLASS



HDC-HVC
SYMMETRICAL HD CENTERMATES
W/ ③④* LOCK (INTERIOR)

- ⑫ OR ⑭ OR ⑥ + ⑦ OR ⑧ OR ⑩ + ⑬ OR
- ⑩ + ⑮ OR ⑰ + ⑬ OR ⑰ + ⑮ OR
- ⑥ + ⑦ + ⑰ OR ⑥ + ⑦ + ⑱ OR
- ⑮ + ⑱ OR ⑬ + ⑱ OR ⑧ + ⑱ OR
- ⑧ + ⑱ OR ⑲ + ⑬ OR ⑲ + ⑮



HDD-HVD**

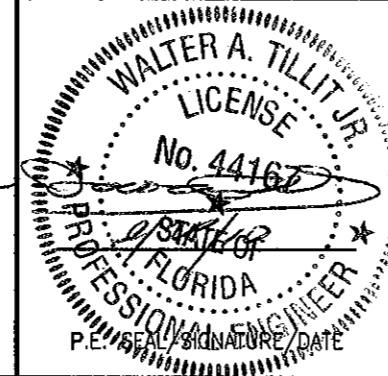
* SEE NOTES ON LOCKING RODS ③⑤ & HD ③④ LOCKS ON SHEET 5
** UNIVERSAL FLOATING BLADE ③ DETAIL HDD-HVD IS
VALID FOR ALL CENTERMATES APPLICATIONS WITH BLADE ①

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Miami Dade Product Control
Division

MIAMI-DADE COUNTY



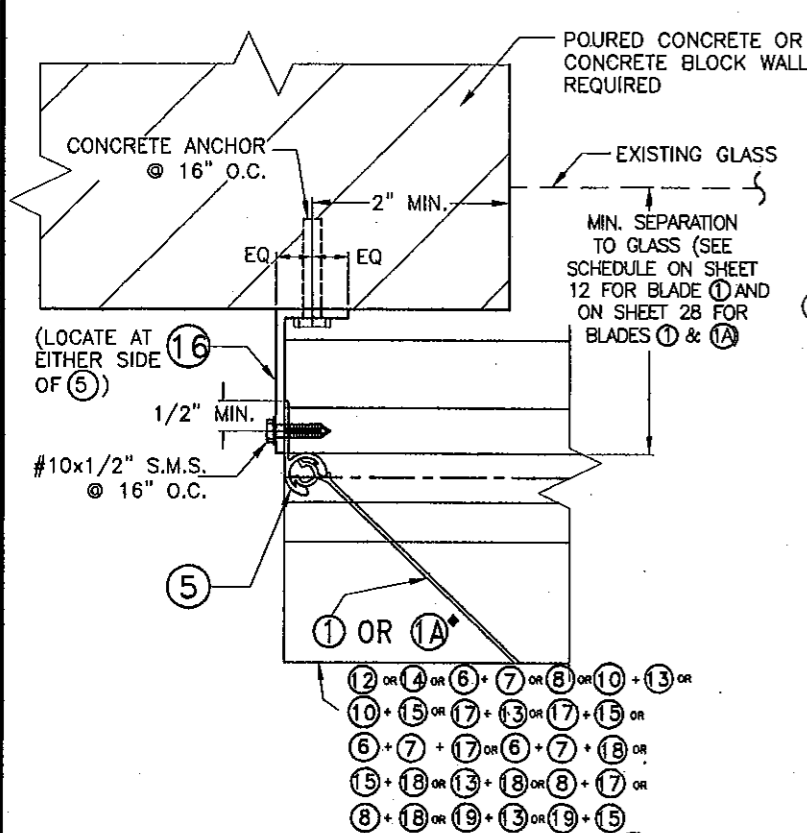
TILLIT TESTING & ENGINEERING COMPANY
6355 N.W. 36th St., Ste. 305, VIRGINIA GARDENS, FLORIDA 33166
Phone : (305)871-1530 . Fax : (305)871-1531
e-mail: tilteco@aol.com
EB-0006719
WALTER A. TILLIT Jr. P.E.
FLORIDA Lic. # 44167

ALUM-SHUTTERS &
GLASS, INC.

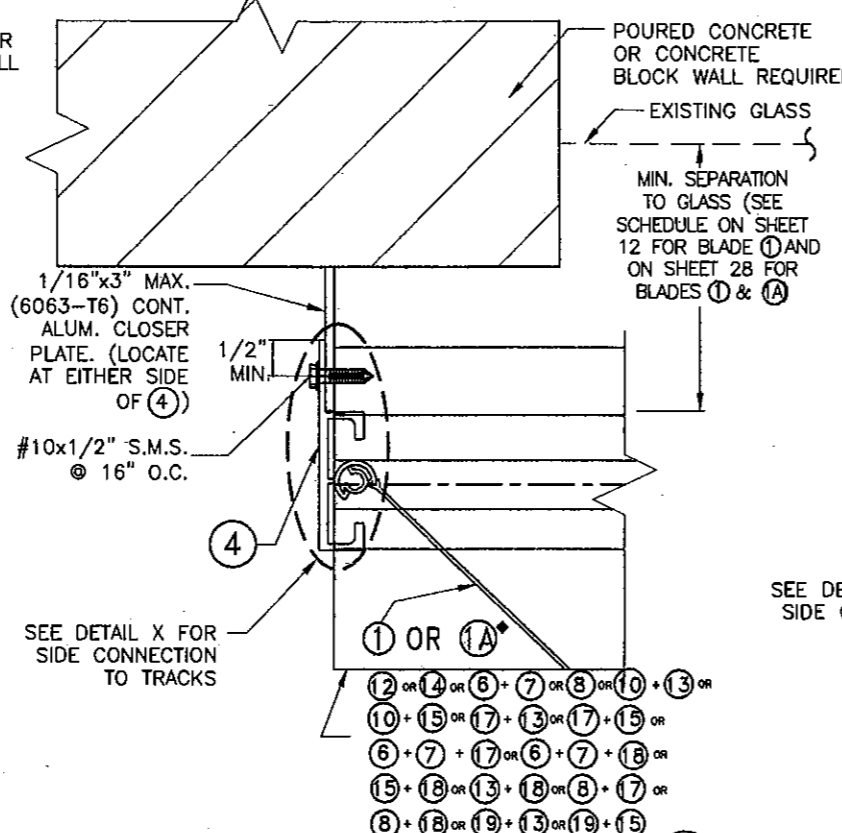
(ASSA # 384)
2205 W. 80TH STREET, BAY#2
HIALEAH, FLORIDA 33016
PHONE: (305) 819-5555. FAX: (305) 819-5556

BERTHA HV™
Accordion Shutter System

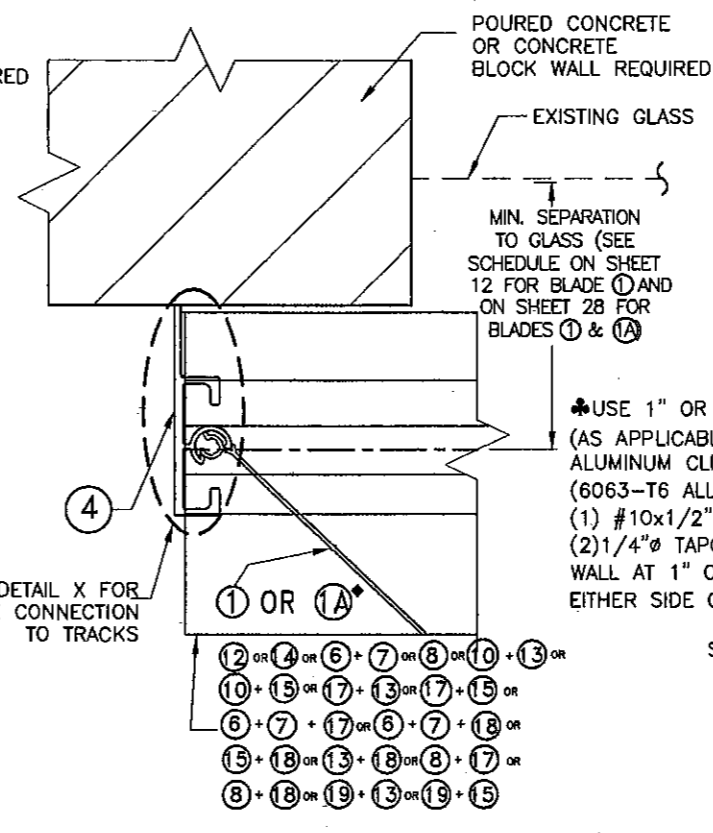
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1			DATE: 09/23/10
2			
3			
4			DRAWING No 10-086
5			SHEET
6			10 OF 28



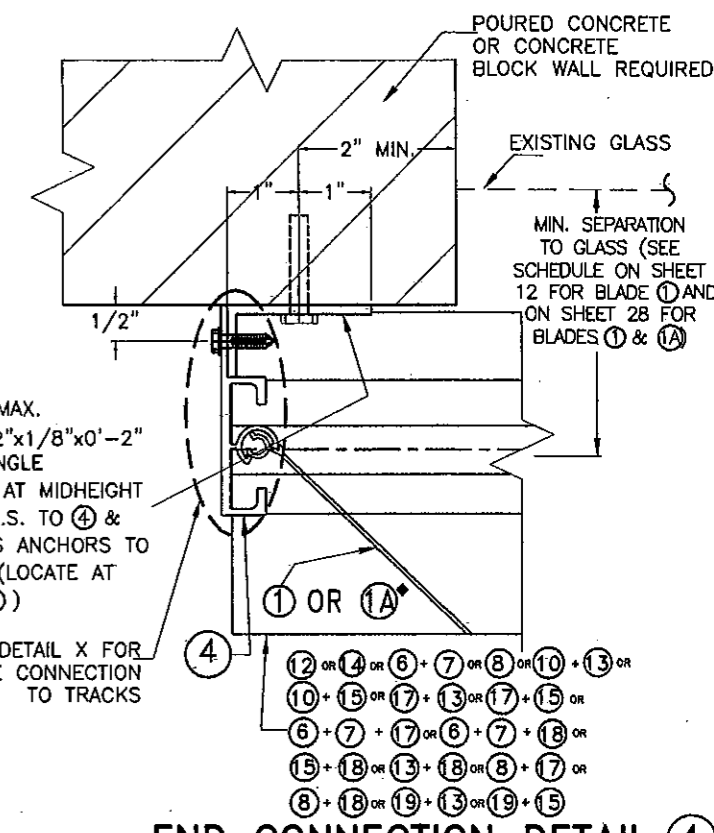
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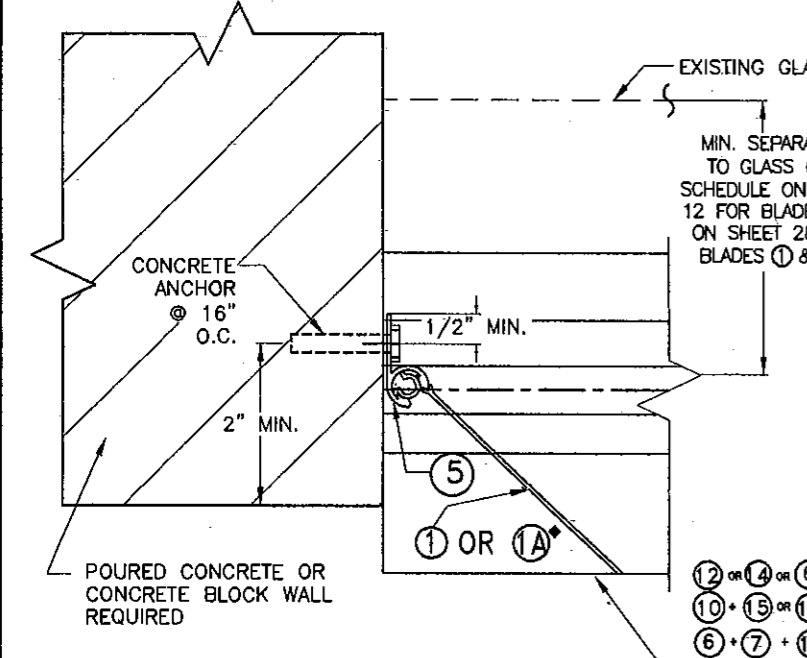
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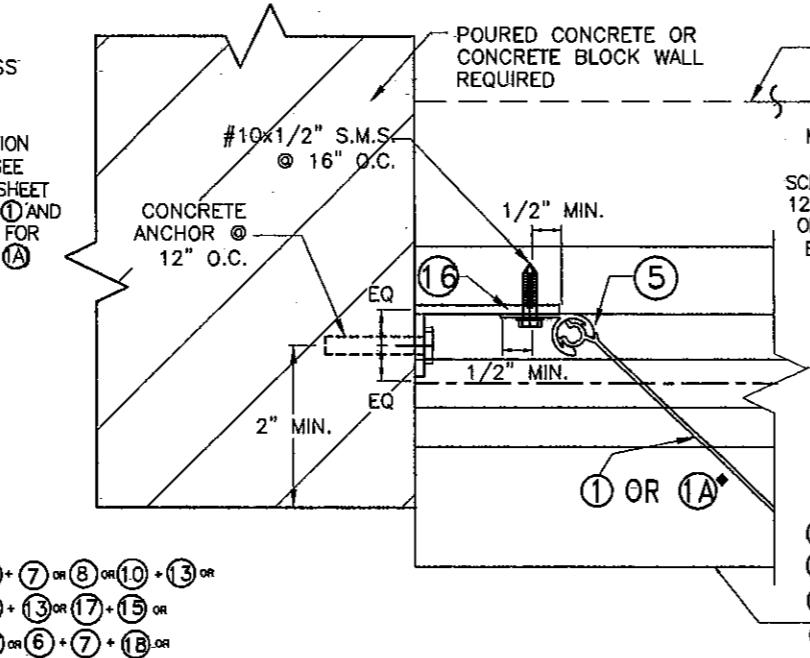
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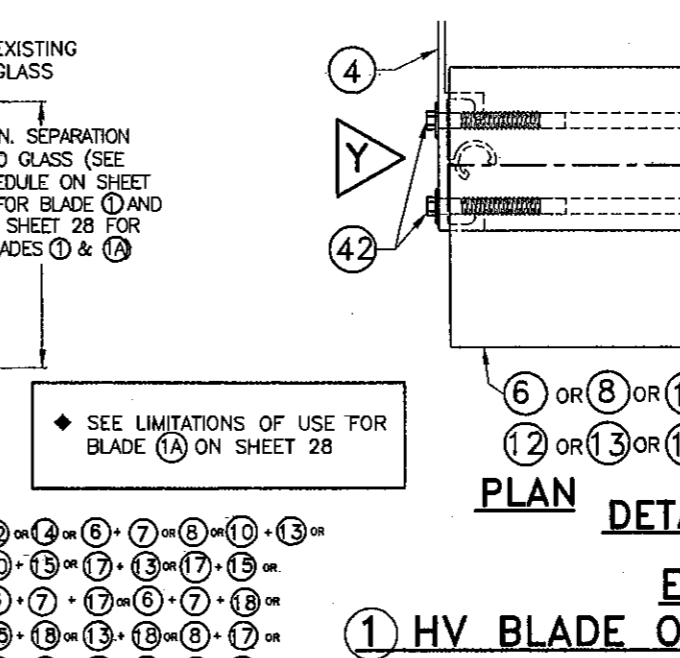
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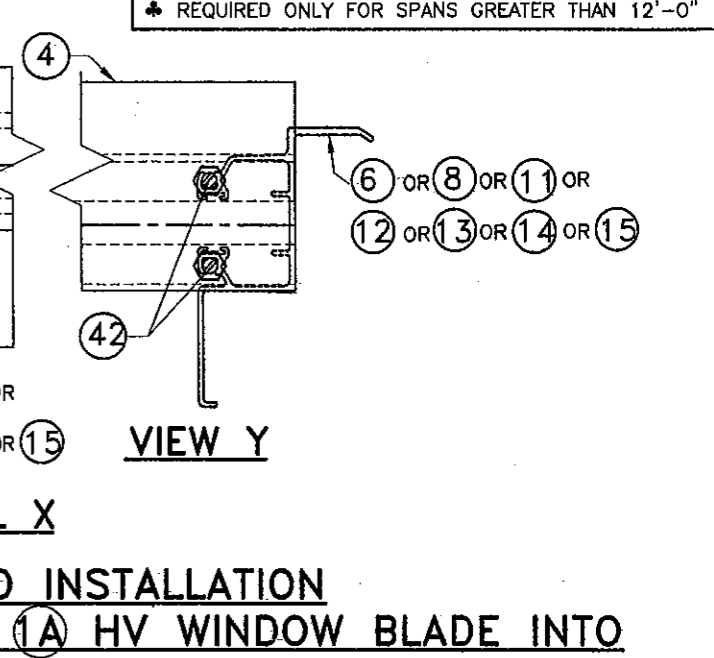
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END CONNECTION DETAIL 6



PLAN DETAIL X



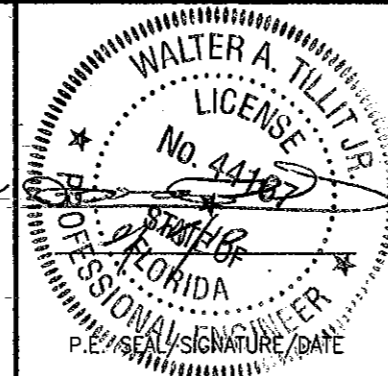
VIEW Y

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

FLORIDA BUILDING CODE (High Velocity Hurricane Zone)

PRODUCT REVISED as complying with the Florida Building Code
 Acceptance No 10-0930-15
 Expiration Date 03/09/2016
 By *Walter A. Tillit Jr.*
 Miami Dade Product Control Division

MIAMI-DADE COUNTY



TILLIT TESTING & ENGINEERING COMPANY
 6355 N.W. 36th St., Ste. 305, VIRGINIA GARDENS, FLORIDA 33166
 Phone : (305)871-1530 Fax : (305)871-1531
 e-mail: tilteco@aol.com
 EB-0006719
 WALTER A. TILLIT Jr. P.E.
 FLORIDA Lic. # 44167

ALUM-SHUTTERS & GLASS, INC.
 (ASSA # 384)

2205 W. 80TH STREET, BAY#2
 HIALEAH, FLORIDA 33016
 PHONE: (305) 819-5555. FAX: (305) 819-5556

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BERTHA HV™
 Accordion Shutter System

REV.No	DESCRIPTION	DATE	DRAWN BY:	L.G.
1				DATE: 09/23/10
2				DRAWING No
3				10-086
4				SHEET
5				11 OF 28
6				

ANCHORS SPACING LEGEND

TAPCON
ALL POINTS SOLID-SET
WEDGE-BOLT

**MAXIMUM DESIGN PRESSURE RATING (p.s.f.) AND CORRESPONDING MAXIMUM ANCHOR* SPACING (in.) SCHEDULE
FOR A GIVEN MAX. SHUTTER SPAN, DESIGN NEGATIVE LOAD AND A CORRESPONDING MOUNTING TYPE
FOR CONCRETE OR CONCRETE BLOCK INSTALLATIONS**
(SEE MOUNTINGS A, B, C, D AND F ON SHEET 6)

* SEE ANCHOR SPECIFICATIONS ON SHEET 14

MAXIMUM SPAN (ft)	POURED CONCRETE																		POURED CONCRETE/CONCRETE BLOCK																																																																													
	A WALL HEADER MOUNTING W/12						A WALL HEADER MOUNTING W/14						B WALL HEADER MOUNTING						D WALL SILL MOUNTING W/12						D WALL SILL MOUNTING W/14						C & F WALL HEADER/SILL MOUNTING																																																																	
	NEGATIVE DESIGN LOAD (psf)						NEGATIVE DESIGN LOAD (psf)						NEGATIVE DESIGN LOAD (psf)						NEGATIVE DESIGN LOAD (psf)						NEGATIVE DESIGN LOAD (psf)						NEGATIVE DESIGN LOAD (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	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	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	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	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	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																
4'-0"	14	12	10	9	8	8	6	4.5	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	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
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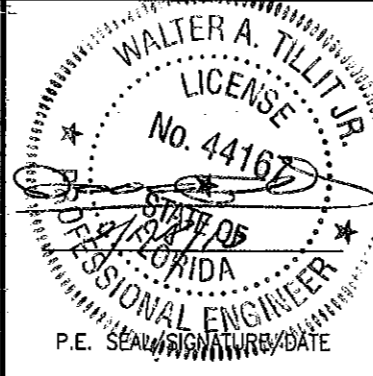
◆ SEE LIMITATIONS OF USE FOR BLADE 1A ON SHEET 28

NOTE:
† VALID ONLY FOR POURED CONCRETE, NOT CONCRETE BLOCK

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

FLORIDA BUILDING CODE (High Velocity Hurricane Zone)

PRODUCT REVISED as complying with the Florida Building Code
Acceptance No 10-0930.15
Expiration Date 03/09/2016
By *[Signature]*
Miami Dade Product Control
MIAMI-DADE COUNTY



TILECO INC.
TILLIT TESTING & ENGINEERING COMPANY
6355 N.W. 36th St., Ste. 305, VIRGINIA GARDENS, FLORIDA 33166
Phone : (305)871-1530 Fax : (305)871-1531
e-mail: tiltco@aol.com
EB-0006719
WALTER A. TILLIT JR. P.E.
FLORIDA Lic. # 44167

ALUM-SHUTTERS & GLASS, INC.
(ASSA # 384)
2205 W. 80TH STREET, BAY#2
HIALEAH, FLORIDA 33016
PHONE: (305) 819-5555. FAX: (305) 819-5556

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1				
2				
3				
4				
5				
6				

DATE: 09/23/10
DRAWING No
10-086
SHEET
13 OF 28

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

(SEE MOUNTINGS ON SHEETS 18 & 19).

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																							
	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																							
	NEGATIVE DESIGN LOAD (psf)			NEGATIVE DESIGN LOAD (psf)			NEGATIVE DESIGN LOAD (psf)			NEGATIVE DESIGN LOAD (psf)			NEGATIVE DESIGN LOAD (psf)			NEGATIVE DESIGN LOAD (psf)			NEGATIVE DESIGN LOAD (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						
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
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	8	6	6	6	6	6	6	6	5	4	4	4	3
5'-0"	12	10	10	9	8	8	6	6	6	6	5.5	5.5	12	10	10	9	8	8	6	6	6	6	5	5	12	10	10	9	8	7	6	6	6	6	5	5	6	5	4	4	4	3
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	-
7'-0"	12	10	10	9	6.5	4	6	6	6	5.5	4.5	4	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	-	-
8'-0"	12	10	10	7.5	4.5	3	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	-	-	-
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	-	-	-
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	-	-	-	-
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'-0"	12	10	4.5	-	-	-	6	6	4	-	-	-	12	10	3.5	-	-	-	6	5	3.5	-	-	-	12	10	-	-	-	-	6	5	3.5	-	-	-	6	5	-	-	-	-
13'-0"	12	10	-	-	-	-	6	6	-	-	-	-	12	10	-	-	-	-	6	4.5	-	-	-	-	12	7.5	-	-	-	-	6	4.5	-	-	-	-	6	4.5	-	-	-	-
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15'-0"	12	-	-	-	-	-	6	-	-	-	-	-	12	-	-	-	-	-	5	-	-	-	-	-	12	-	-	-	-	-	5	-	-	-	-	-	6	-	-	-	-	-
16'-0"	12	-	-	-	-	-	6	-	-	-	-	-	12	-	-	-	-	-	5	-	-	-	-	-	11.5	-	-	-	-	-	5	-	-	-	-	-	6	-	-	-	-	-

+ NOTES ON ANCHORS REQUIREMENTS: WOOD SUBSTRATES.

- ANCHORS TO WALL, FLOOR OR SOLID WOOD SOFFIT SHALL BE AS FOLLOWS:
- 1/4" TAPCON ANCHORS, AS MANUFACTURED BY I.T.W. BUILDEX W/ MINIMUM EMBEDMENT AS INDICATED AT EACH SECTION ON SHEETS 18 & 19.
EXCEPTION: SEE NOTE 2 BELOW.
- ANCHORS TO HOLLOW CEILING SHALL BE AS PER MOUNTING TYPE U, SHEET 19 AND SHALL CONSIST OF LAG SCREWS AS PER NDS 2005 SPECIFICATIONS.
- SUBSTRATE SHALL CONSIST OF THE FOLLOWING:
-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)
- ANCHORS SHALL BE INSTALLED FOLLOWING ALL OF THE RECOMMENDATIONS AND SPECIFICATIONS OF THE ANCHOR'S MANUFACTURER.

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

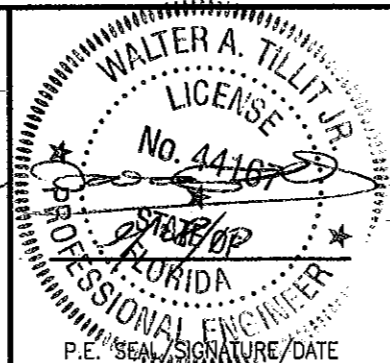
◆ SEE LIMITATIONS OF USE OF
BLADE ①A ON SHEET 28

FLORIDA BUILDING CODE (High Velocity Hurricane Zone)

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PRODUCT REVISED
as complying with the Florida
Building Code
Acceptance No. **10-0930-15**
Expiration Date **03/09/2016**
By *Walter A. Tillit Jr.*
Miami Dade Product Control
Division

MIAMI-DADE COUNTY



TILLIT TESTING & ENGINEERING COMPANY
6355 N.W. 36th. St., Ste. 305, VIRGINIA GARDENS, FLORIDA 33166
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WALTER A. TILLIT Jr. P.E.
FLORIDA Lic. # 44167

**ALUM-SHUTTERS &
GLASS, INC.**

(ASSA # 384)

2205 W. 80TH STREET, BAY#2
HIALEAH, FLORIDA 33016

PHONE: (305) 819-5555. FAX: (305) 819-5556

**BERTHA HV™
Accordion Shutter System**

REV.No	DESCRIPTION	DATE	DRAWN BY:	L.G.
1				DATE: 09/23/10
2				DRAWING No
3				10-086
4				SHEET
5				16 OF 28
6				

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

(SEE MOUNTINGS ON SHEET 19).

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					
	B.O. WALL MOUNTINGS S & V						B.O. WALL MOUNTINGS S & V						B.O. WALL MOUNTINGS S & V					
	NEGATIVE DESIGN LOAD (psf)						NEGATIVE DESIGN LOAD (psf)						NEGATIVE DESIGN LOAD (psf)					
	30	40	60	75	90	105	30	40	60	75	90	105	30	40	60	75	90	105
3'-0" OR LESS	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
4'-0"	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12
5'-0"	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	10.5
6'-0"	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	12	10	8.5
7'-0"	12	12	12	12	12	12	12	12	12	12	12	10.5	12	12	12	10.5	8.5	7.5
8'-0"	12	12	12	12	12	12	12	12	12	12	11	9.5	12	12	11.5	9	7.5	6.5
9'-0"	12	12	12	12	12	10.5	12	12	12	11.5	9.5	8.5	12	12	10	8	6.5	5.5
10'-0"	12	12	12	12	11.5	9.5	12	12	12	10.5	8.5	7.5	12	12	9	7	6	5
11'-0"	12	12	12	12	10	8.5	12	12	12	9.5	8	7	12	12	8	6.5	5.5	4.5
12'-0"	12	12	12	11.5	9.5	8	12	12	11	8.5	7	6	12	11.5	7.5	6	5	4
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14'-0"	12	12	12	9.5	8	6	12	12	9.5	7.5	6	4.5	12	9.5	6.5	5	4	3
15'-0"	12	12	11	9	7.5	5	12	12	8.5	7	6	4	12	9	6	5	4	-
16'-0"	12	12	10.5	8.5	6.5	4	12	12	8	6.5	5	3	11.5	8.5	5.5	4.5	3.5	-

+ NOTES ON ANCHORS REQUIREMENTS: WOOD SUBSTRATES.

- ANCHORS TO WALL, FLOOR OR SOLID WOOD SOFFIT SHALL BE AS FOLLOWS:
- 1/4" TAPCON ANCHORS, AS MANUFACTURED BY I.T.W. BUILDDEX W/ MINIMUM EMBEDMENT AS INDICATED AT EACH SECTION ON SHEETS 18 & 19.
EXCEPTION: SEE NOTE 2 BELOW.
- ANCHORS TO HOLLOW CEILING SHALL BE AS PER MOUNTING TYPE U, SHEET 19 AND SHALL CONSIST OF LAG SCREWS AS PER NDS 2005 SPECIFICATIONS.
- SUBSTRATE SHALL CONSIST OF THE FOLLOWING:
- 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)
- ANCHORS SHALL BE INSTALLED FOLLOWING ALL OF THE RECOMMENDATIONS AND SPECIFICATIONS OF THE ANCHOR'S MANUFACTURER.

① HV BLADE ONLY

FLORIDA BUILDING CODE (High Velocity Hurricane Zone)

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ALUM-SHUTTERS & GLASS, INC.

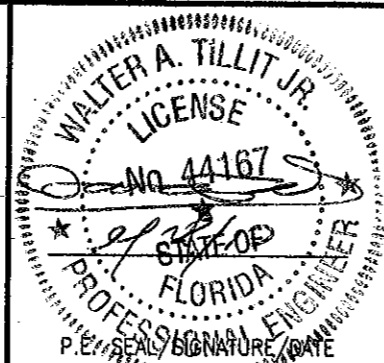
(ASSA # 384)

2205 W. 80TH STREET, BAY#2
HIALEAH, FLORIDA 33018

PHONE: (305) 819-5555. FAX: (305) 819-5556

PRODUCT REVISED
as complying with the Florida
Building Code
Acceptance No 10-0930-15
Expiration Date 03/09/2016
By *Walter A. Tillit Jr.*
Miami Dade Product Control
Division

MIAMI-DADE COUNTY



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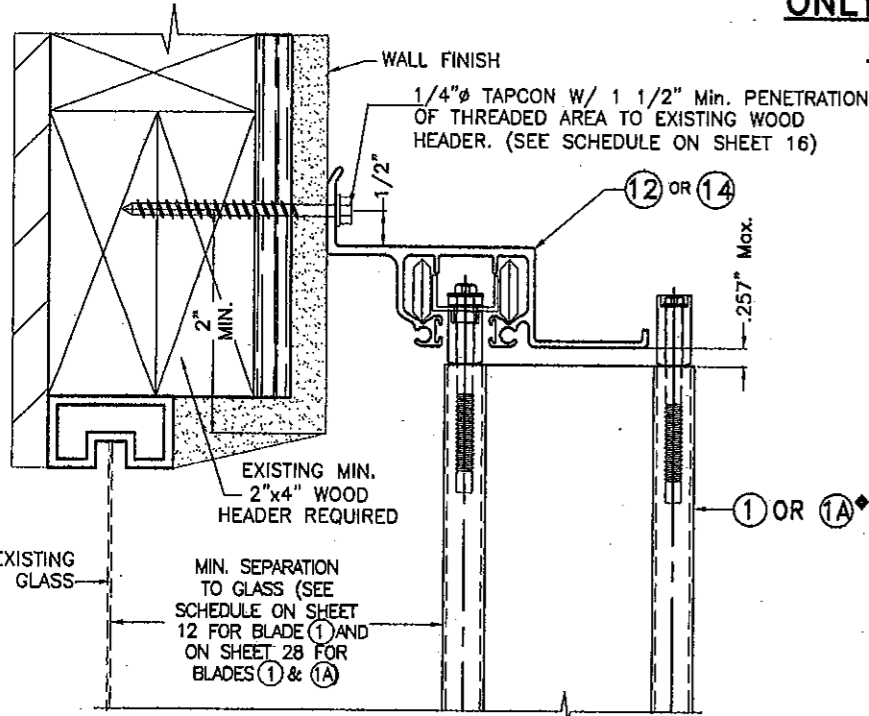
BERTHA HV™
Accordion Shutter System

REV.No	DESCRIPTION	DATE	DRAWN BY:	L.G.
1				
2				
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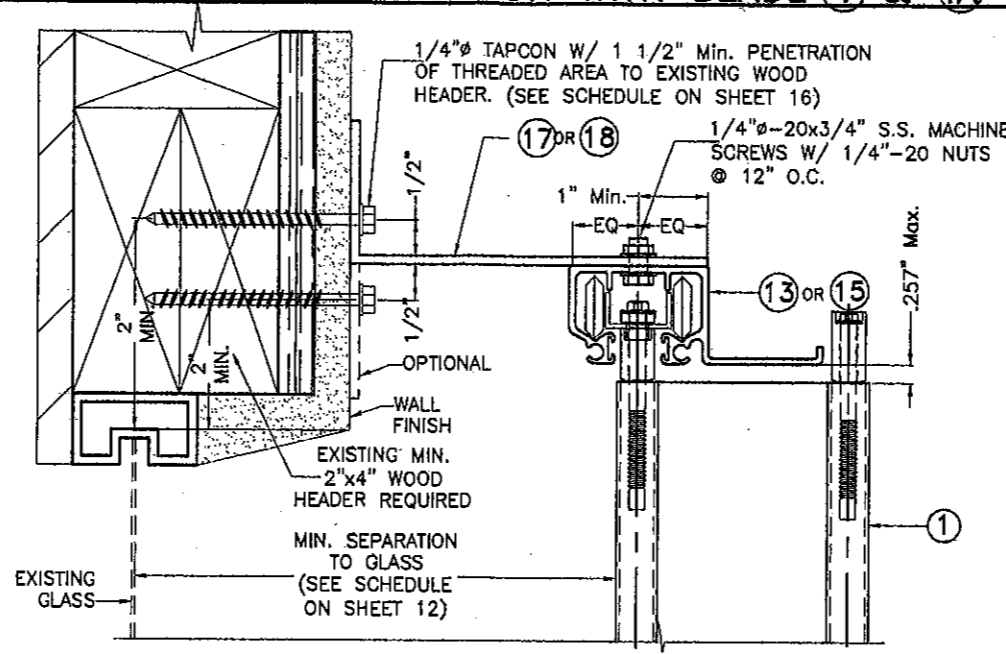
DATE: 09/23/10
DRAWING No
10-086
SHEET
17 OF 28

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

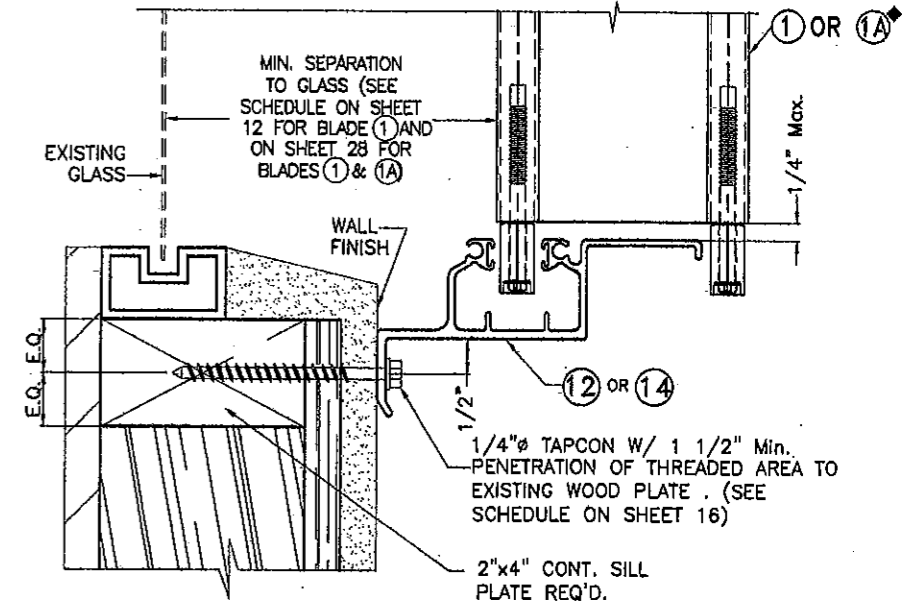
MAX. SHUTTER SPAN L+ OR L- FOR INSTALLATIONS INTO WOOD WITH HV BLADE ① ONLY SHALL BE LIMITED TO 105.0 psf. DESIGN LOAD. SEE SHEET 28 FOR MAX SPAN & DESIGN LOAD FOR INSTALLATION WITH BLADE ① & ①A WORKING IN UNISON



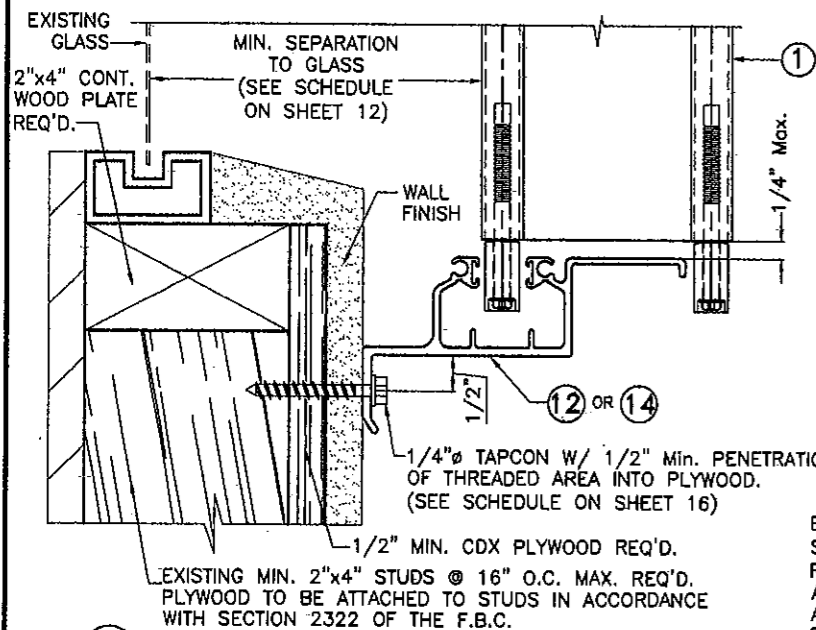
M HV WALL HEADER INSTALLATION



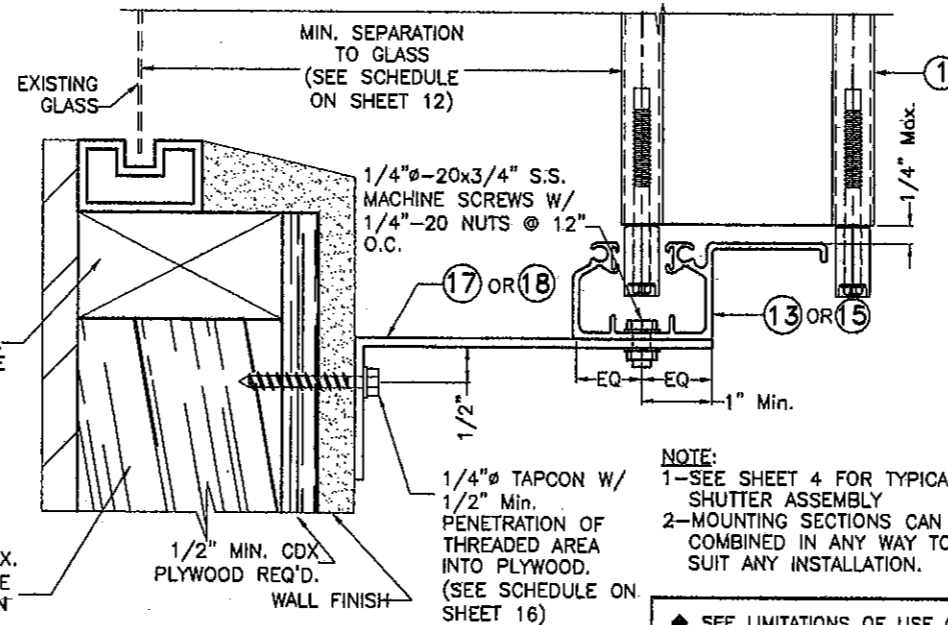
N HV WALL HEADER INSTALLATION



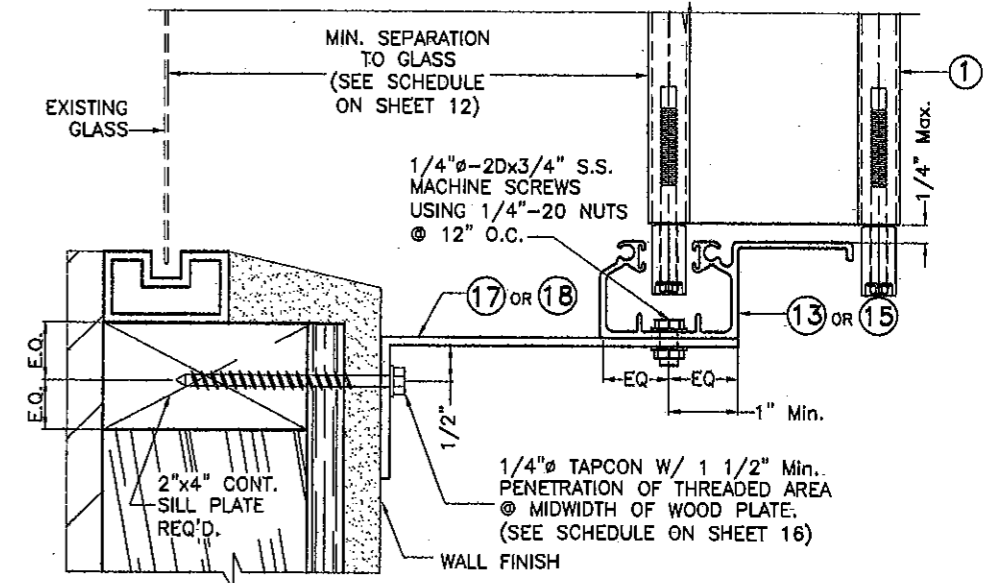
O HV WALL SILL INSTALLATION



P HV WALL SILL INSTALLATION



Q HV WALL SILL INSTALLATION



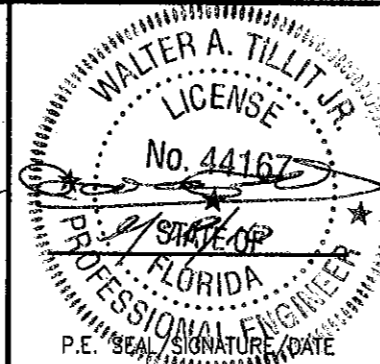
R HV WALL SILL INSTALLATION

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 28

FLORIDA BUILDING CODE (High Velocity Hurricane Zone)

PRODUCT REVISED
 as complying with the Florida
 Building Code
 Acceptance No 10-0930.15
 Expiration Date 03/09/2016
 By *Healy A. Mohr*
 Miami Dade Product Control
 Division

MIAMI-DADE COUNTY



TILLIT TESTING & ENGINEERING COMPANY
 8355 N.W. 38th. St., Ste. 305, VIRGINIA GARDENS, FLORIDA 33166
 Phone : (305)871-1530 . Fax : (305)871-1531
 e-mail: tilteco@aol.com
 EB-0006719
 WALTER A. TILLIT Jr. P.E.
 FLORIDA Lic. # 44167

**ALUM-SHUTTERS &
 GLASS, INC.**

(ASSA # 384)

2205 W. 80TH STREET, BAY#2
 HIALEAH, FLORIDA 33016

PHONE: (305) 819-5555. FAX: (305) 819-5556

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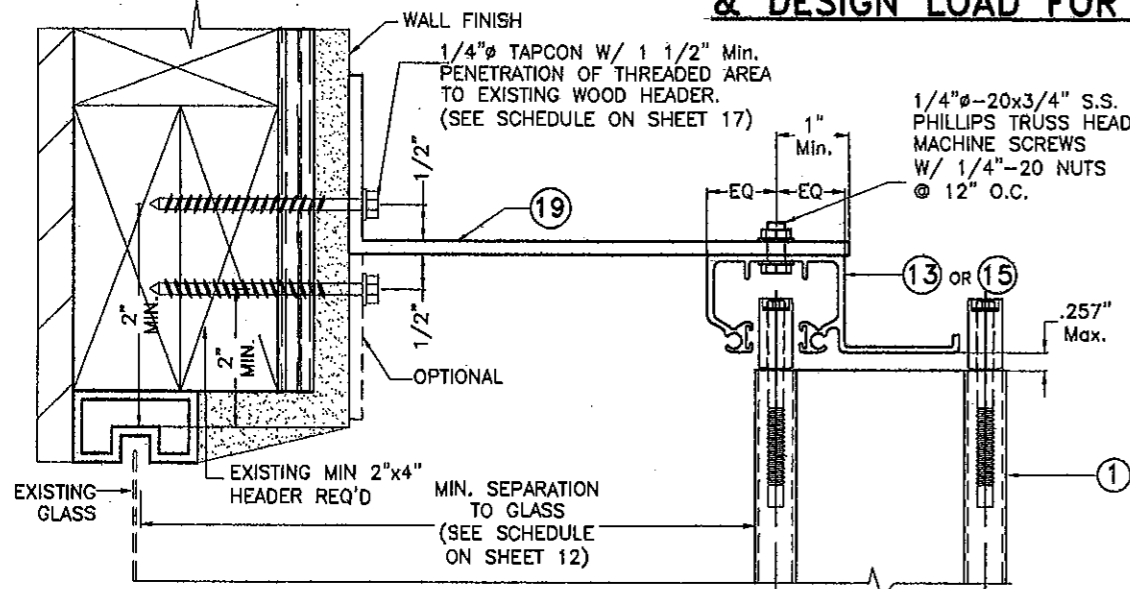
BERTHA HV™
 Accordion Shutter System

REV.No	DESCRIPTION	DATE	DRAWN BY: L.G.
1			
2			
3			
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5			
6			

DATE: 09/23/10
 DRAWING No
10-086
 SHEET
18 OF 28

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

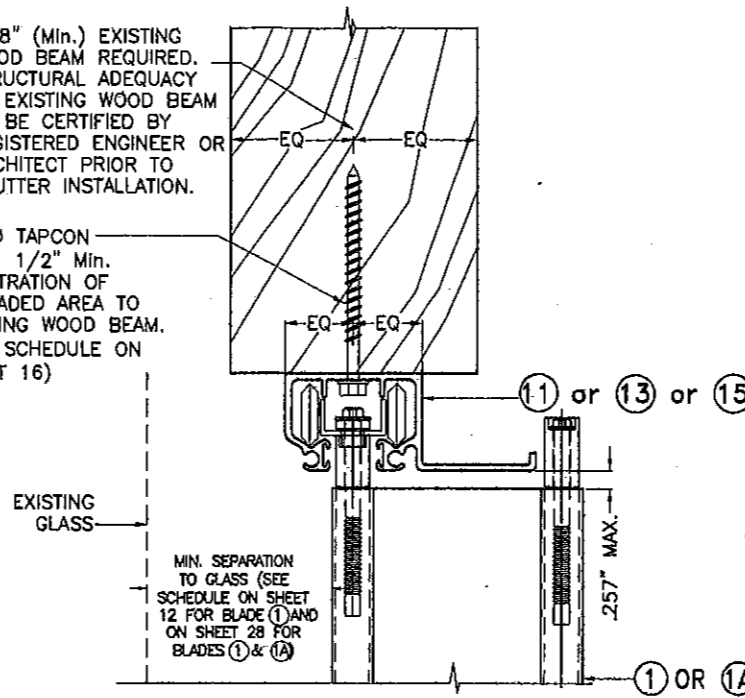
MAX. SHUTTER SPAN L+ OR L- FOR INSTALLATIONS INTO WOOD WITH HV BLADE ① ONLY SHALL BE LIMITED TO 105.0 psf. DESIGN LOAD. SEE SHEET 28 FOR MAX SPAN & DESIGN LOAD FOR INSTALLATION WITH BLADE ① & ①A WORKING IN UNISON



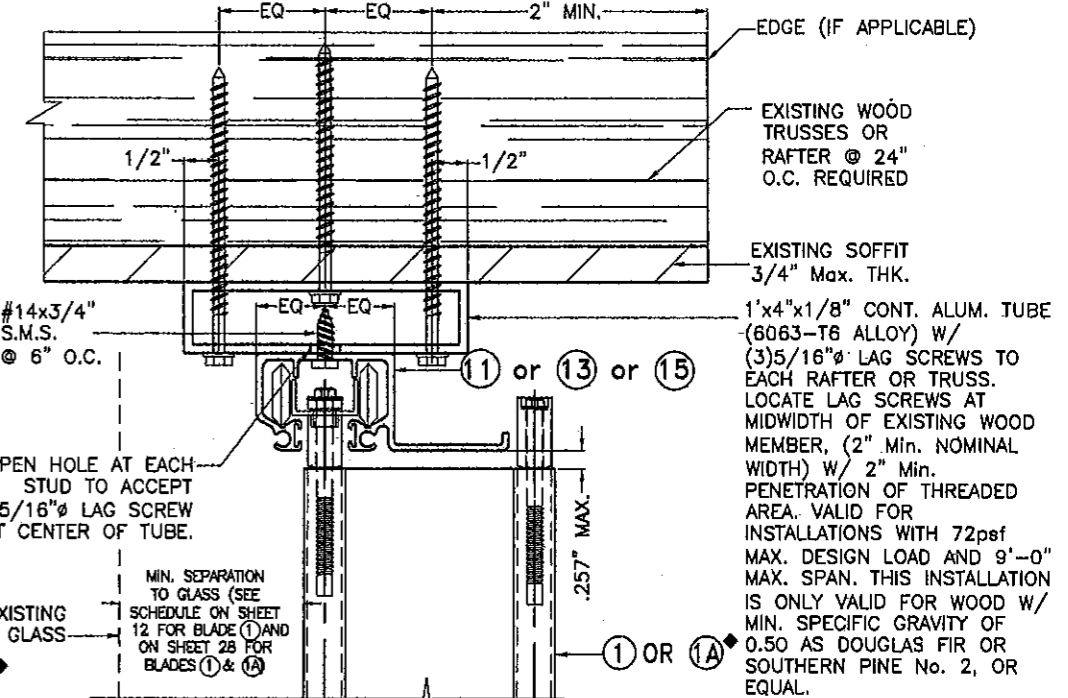
① HV WALL HEADER INSTALLATION

4"x8" (Min.) EXISTING WOOD BEAM REQUIRED. STRUCTURAL ADEQUACY OF EXISTING WOOD BEAM TO BE CERTIFIED BY REGISTERED ENGINEER OR ARCHITECT PRIOR TO SHUTTER INSTALLATION.

1/4" TAPCON W/ 1 1/2" Min. PENETRATION OF THREADED AREA TO EXISTING WOOD BEAM. (SEE SCHEDULE ON SHEET 16)

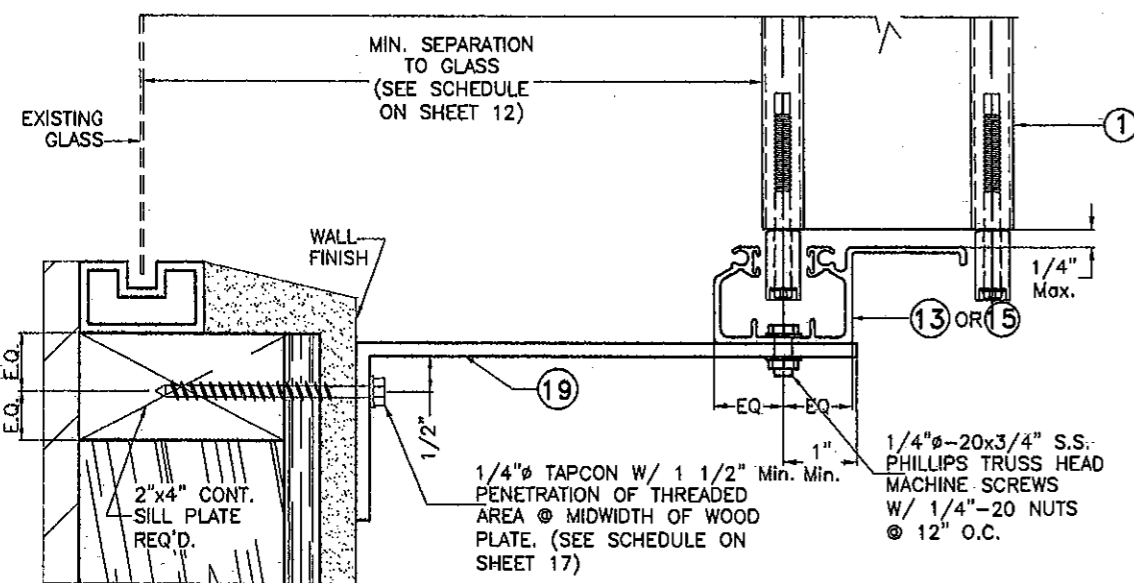


① HV CEILING INSTALLATION

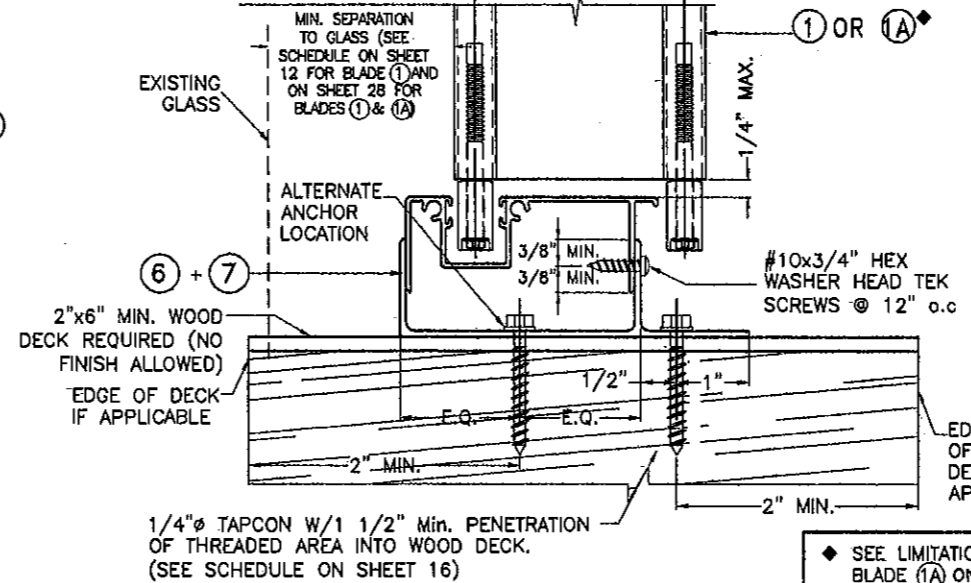


① HV CEILING INSTALLATION

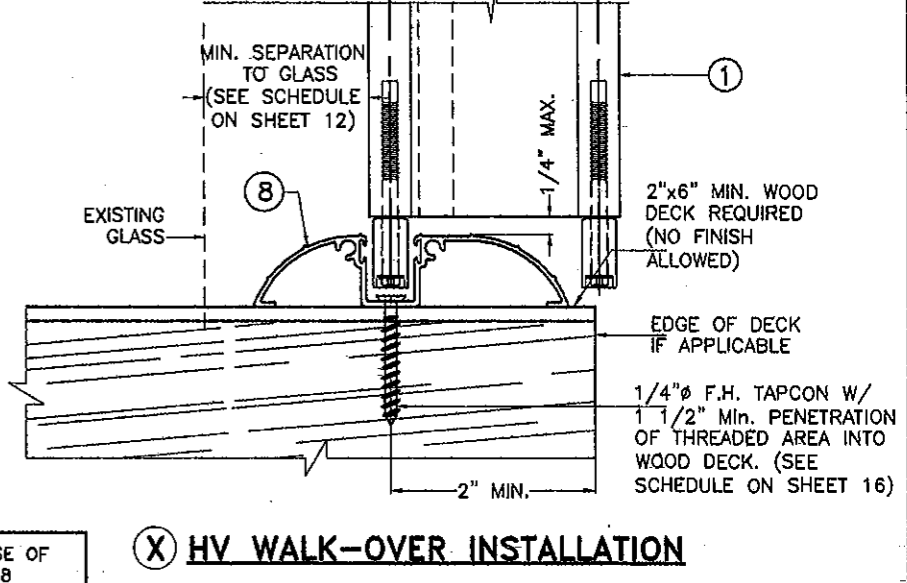
NOTES:
1-SEE SHEET 4 FOR TYPICAL SHUTTER ASSEMBLY
2-MOUNTING SECTIONS CAN BE COMBINED IN ANY WAY TO SUIT ANY INSTALLATION.



① HV WALL SILL INSTALLATION



① HV FLOOR INSTALLATION

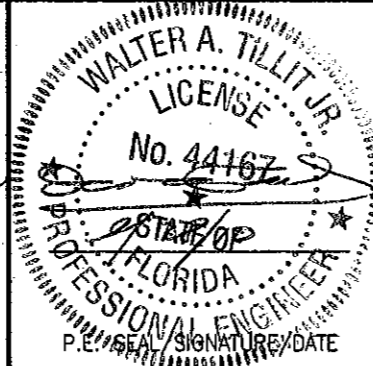


① HV WALK-OVER INSTALLATION

♦ SEE LIMITATIONS OF USE OF BLADE ①A ON SHEET 28

PRODUCT REVISED as complying with the Florida Building Code
Acceptance No 10-0930.15
Expiration Date 03/09/2016
By *Helmut A. Tillit*
Miami Dade Product Control Division

MIAMI-DADE COUNTY



TILLIT TESTING & ENGINEERING COMPANY
8355 N.W. 38th. St., Ste. 305, VIRGINIA GARDENS, FLORIDA 33186
Phone : (305)871-1530 . Fax : (305)871-1531
e-mail: tilteco@aol.com
EB-0006719
WALTER A. TILLIT JR. P.E.
FLORIDA Lic. # 44167

ALUM-SHUTTERS & GLASS, INC.
(ASSA # 384)

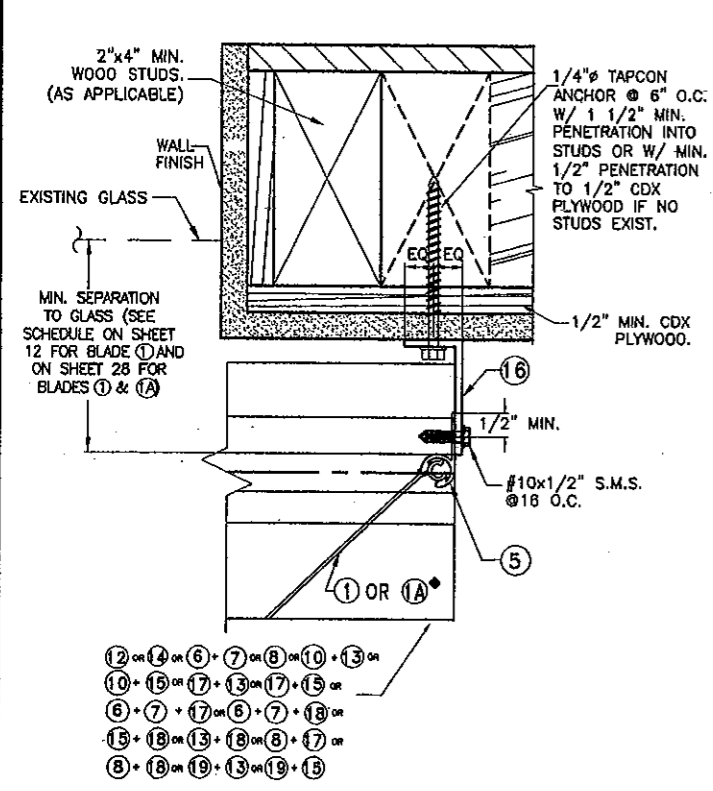
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HIALEAH, FLORIDA 33016
PHONE: (305) 819-5555. FAX: (305) 819-5556

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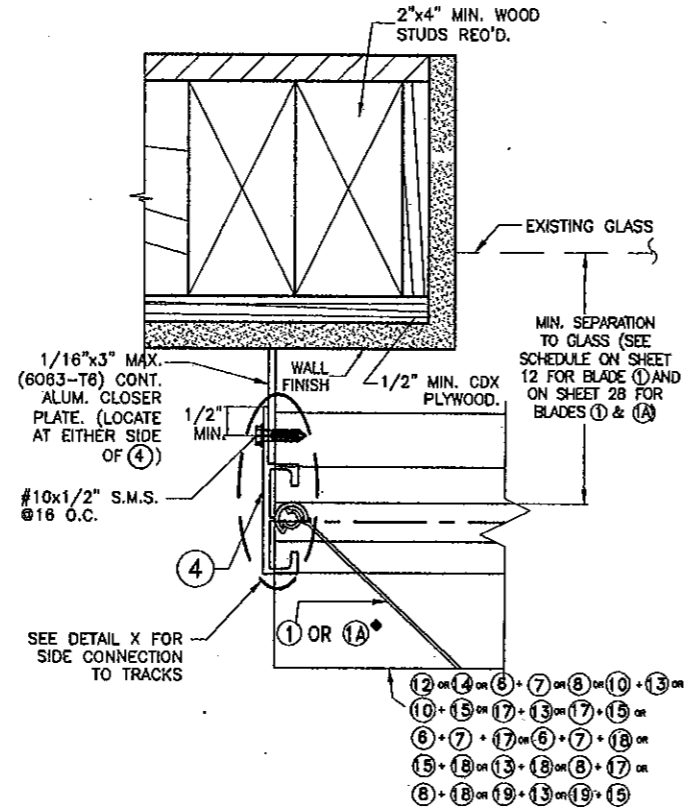
BERTHA HV™
Accordion Shutter System

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1			DATE: 09/23/10
2			DRAWING No
3			10-086
4			SHEET
5			19 OF 28
6			

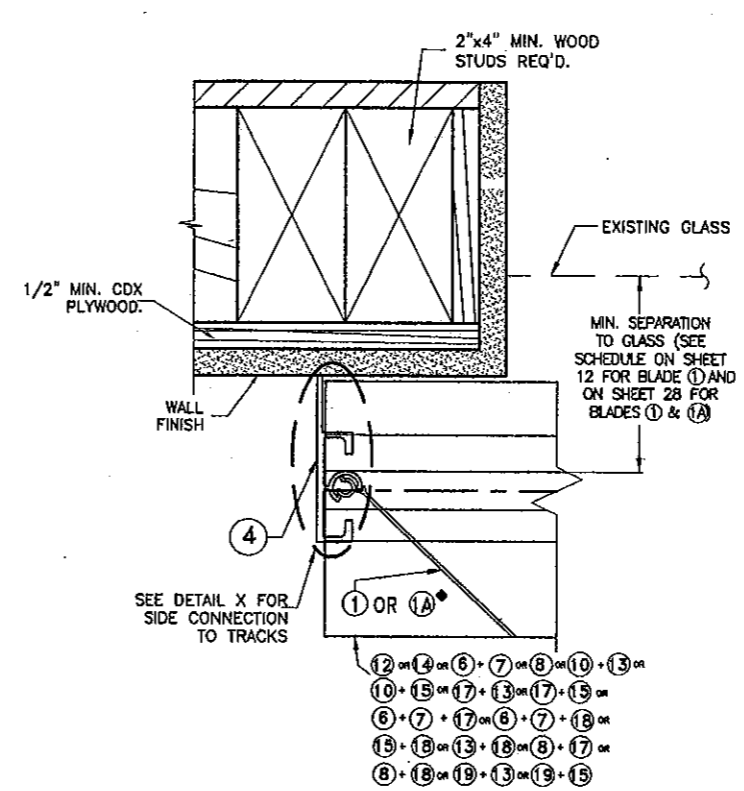
END INSTALLATIONS ① HV & ①A HV ♦ BLADES INTO 2"x4" MIN. WOOD STUDS.



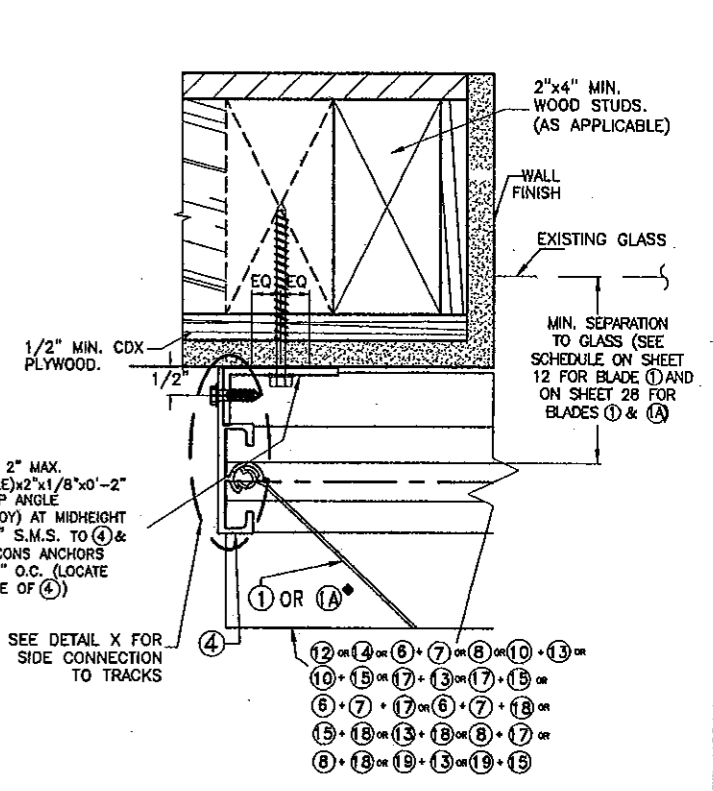
END CONNECTION DETAIL ⑦



END CONNECTION DETAIL ⑧

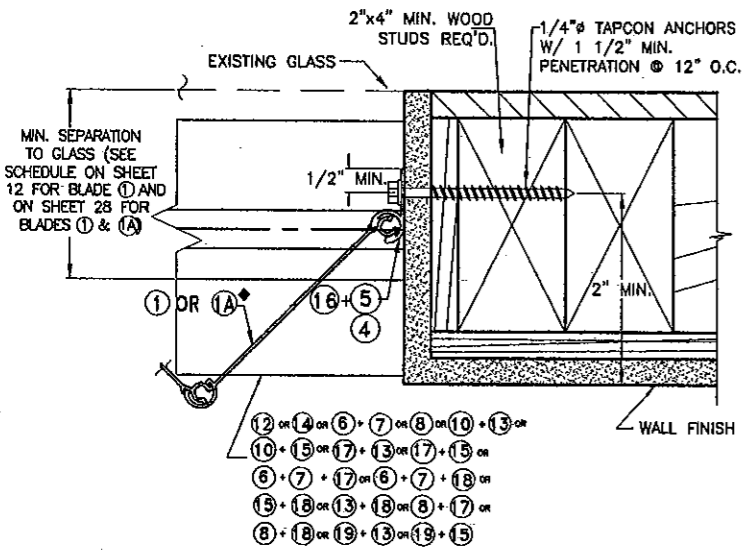


END CONNECTION DETAIL ⑨

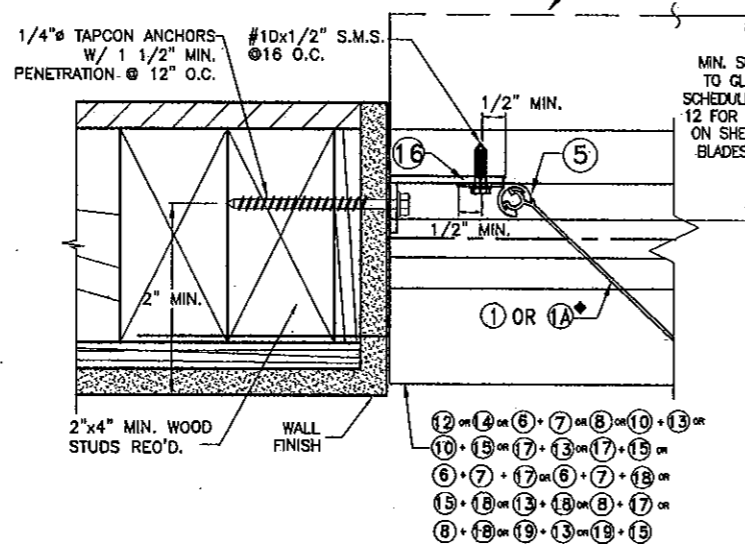


END CONNECTION DETAIL ⑩

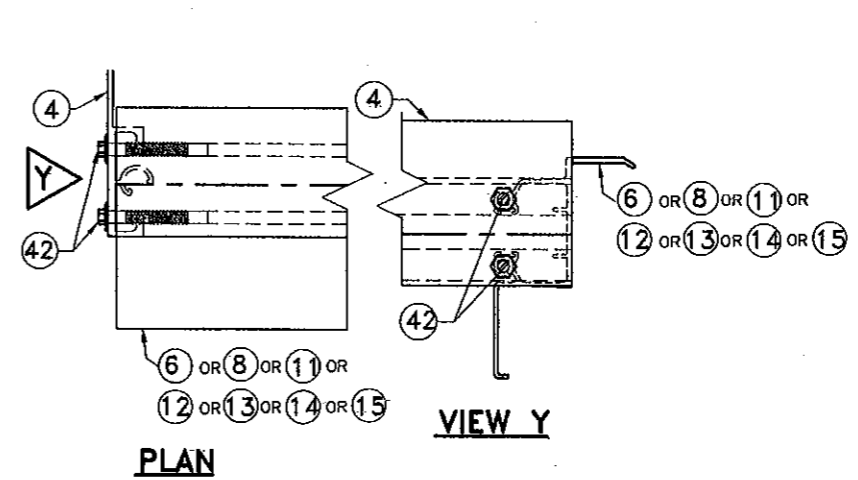
♦ REQUIRED ONLY FOR SPANS GREATER THAN 12'-0"



END CONNECTION DETAIL ⑪



END CONNECTION DETAIL ⑫



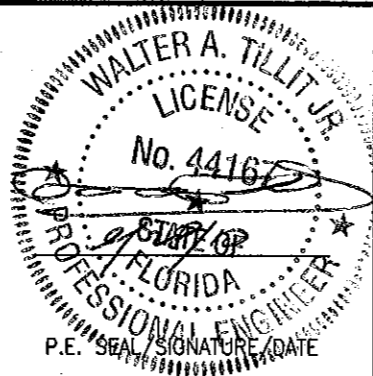
DETAIL X

♦ SEE LIMITATIONS OF USE OF BLADE ①A ON SHEET 28

FLORIDA BUILDING CODE (High Velocity Hurricane Zone)

PRODUCT REVISED as complying with the Florida Building Code
Acceptance No 10-0930.15
Expiration Date 03/09/2016
By *Walter A. Tillit Jr.*
Miami Dade Product Control Division

MIAMI-DADE COUNTY



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6355 N.W. 36th St., Ste. 305, VIRGINIA GARDENS, FLORIDA 33166
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EB-0006719
WALTER A. TILLIT JR. P.E.
FLORIDA Lic. # 44187

ALUM-SHUTTERS & GLASS, INC.
(ASSA # 384)

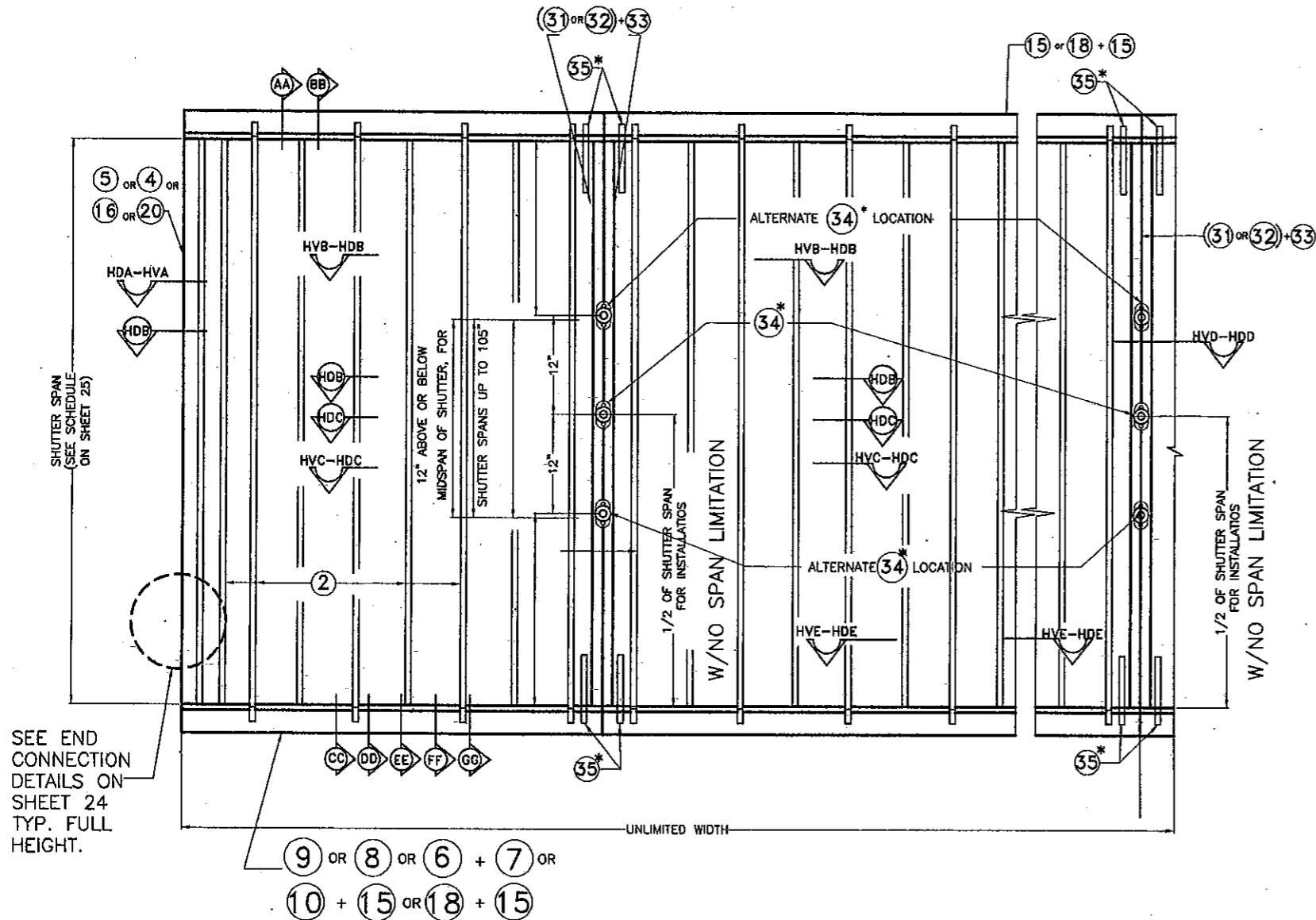
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DATE: 09/23/10
DRAWING No
10-086
SHEET
20 OF 28



*** NOTES ON HD LOCKS AND CENTERMATES:**

1. **MANDATORY CONDITION # 1:** ONE (34) H.D. LOCK SHALL BE USED FOR ANY SPAN AND INSTALLATION AT HEAVY DUTY SYMMETRICAL CENTERMATES, (31) OR (32) + (33) AND AT ANY ELEVATION. (34) H.D. LOCK MAY BE USED AS AN INSIDE OR OUTSIDE LOCK, ATTACHED TO (33) HEAVY DUTY SYMMETRICAL CENTERMATES WITH (3) #8 x 3/8" LONG FLAT HEAD S.S. M.S. LOCKING RODS (35) ARE NOT MANDATORY, i.e. THEY ARE COMPLETELY OPTIONAL.

2. **MANDATORY CONDITION # 2:** LOCATION OF (34) H.D. LOCK SHALL BE AS INDICATED ON SHUTTER ELEVATION, i.e., FOR SHUTTER SPANS UP TO 105". (34) H.D. LOCK MAY BE INSTALLED AT MID HEIGHT OF SHUTTER OR AT 12" ABOVE OR BELOW MID HEIGHT OF SHUTTER. FOR SHUTTER SPANS GREATER THAN 105", (34) H.D. LOCK SHALL BE INSTALLED AT MID HEIGHT OF SHUTTER.

TYPICAL (2) HV BLADE SHUTTER ELEVATION
N.T.S.

SEE END CONNECTION DETAILS ON SHEET 24 TYP. FULL HEIGHT.

FLORIDA BUILDING CODE (High Velocity Hurricane Zone)

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Miami Dade Product Control Division



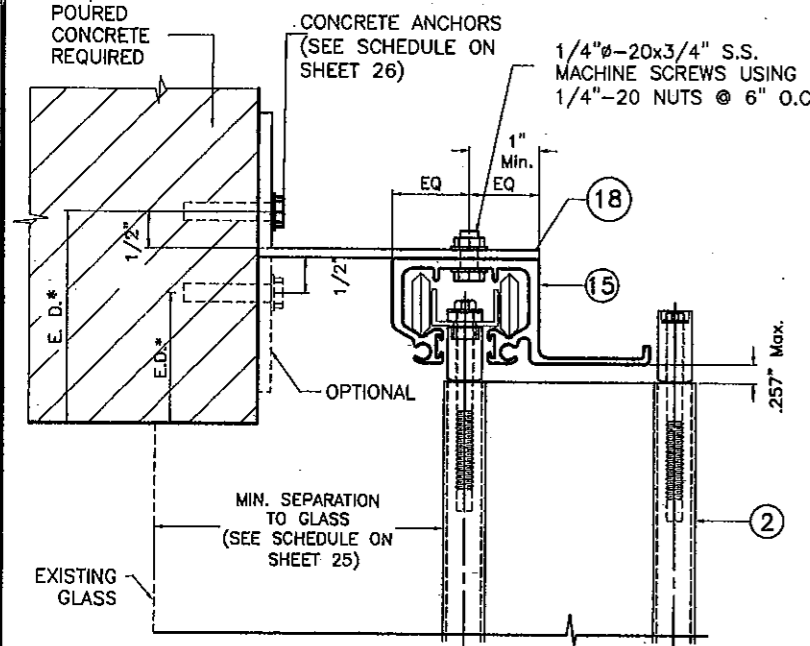
TILTECO INC.
TILLIT TESTING & ENGINEERING COMPANY
6355 N.W. 36th St., Ste. 308, VIRGINIA GARDENS, FLORIDA 33166
Phone : (305)871-1530 . Fax : (305)871-1531
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WALTER A. TILLIT Jr. P.E.
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(ASSA # 384)
2205 W. 80TH STREET, BAY#2
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PHONE: (305) 819-5555. FAX: (305) 819-5556

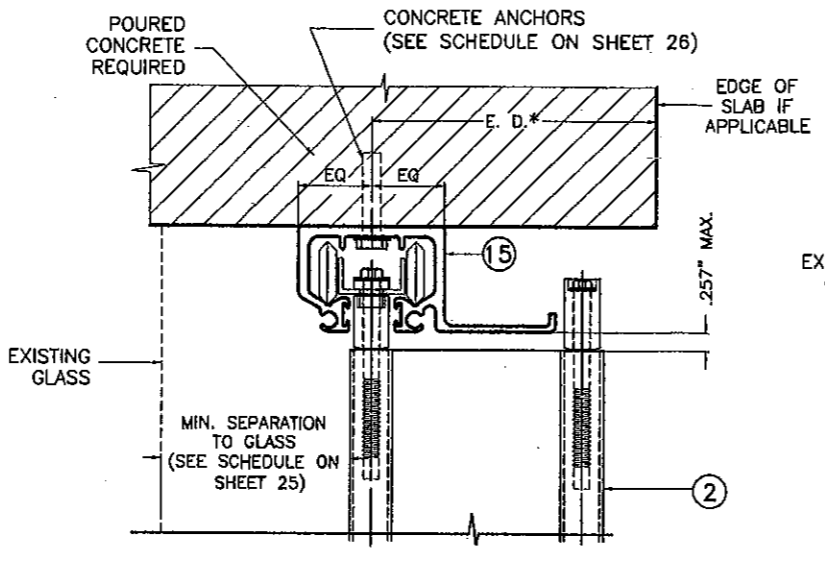
BERTHA HV™
Accordion Shutter System

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1				DATE: 09/23/10
2				DRAWING No
3				10-086
4				SHEET
5				21 OF 28
6				

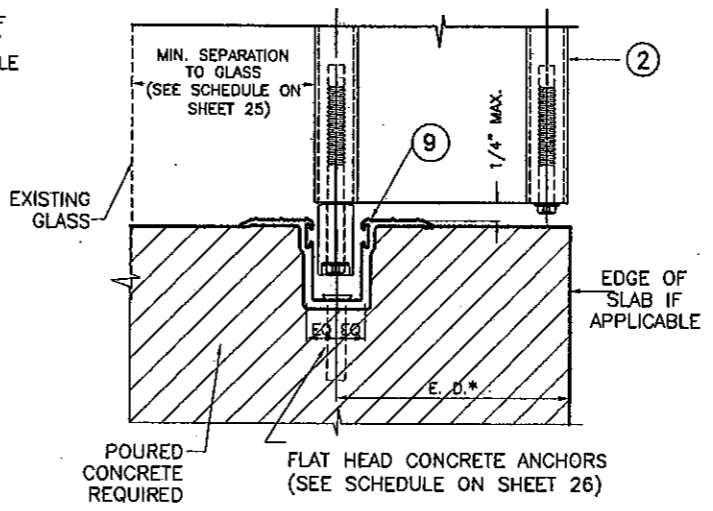
MIAMI-DADE COUNTY



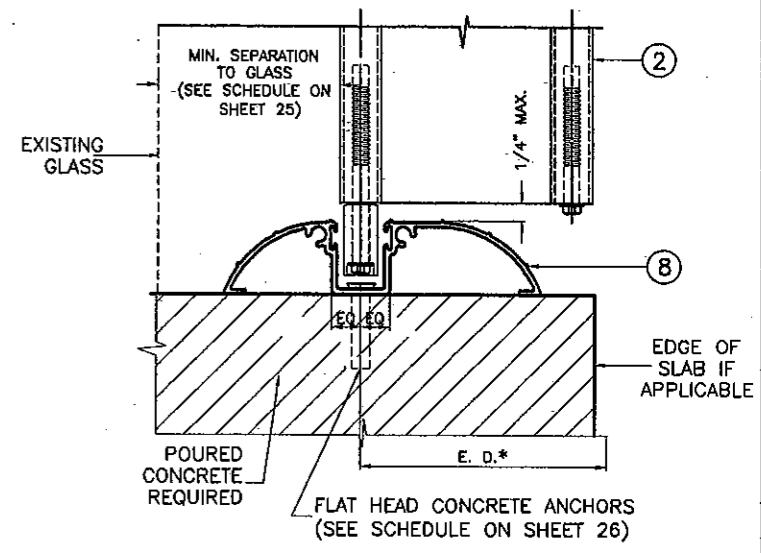
AA HD WALL HEADER INSTALLATION



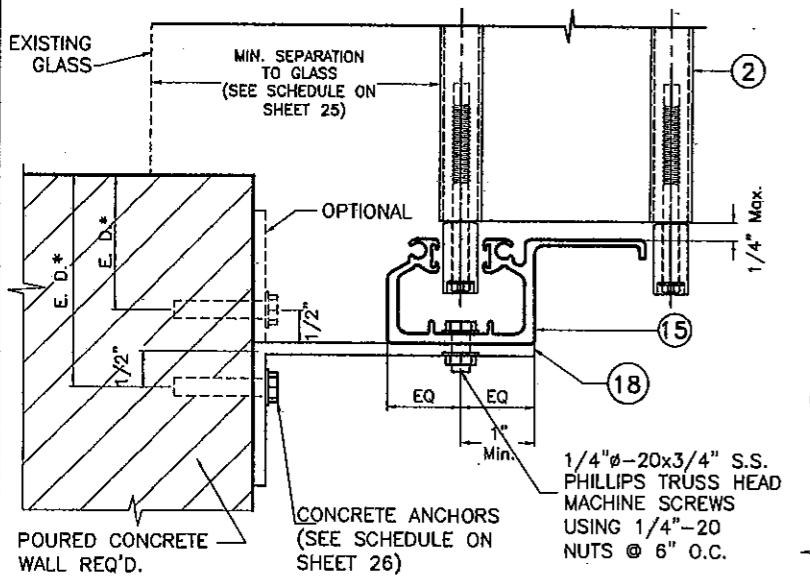
BB HD CEILING INSTALLATION



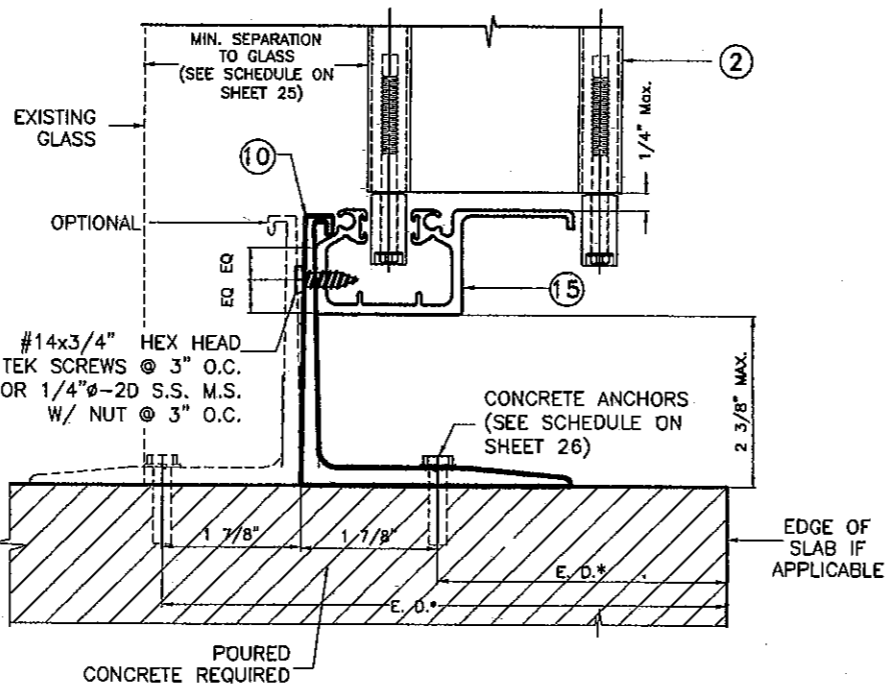
CC HD TRENCH INSTALLATION



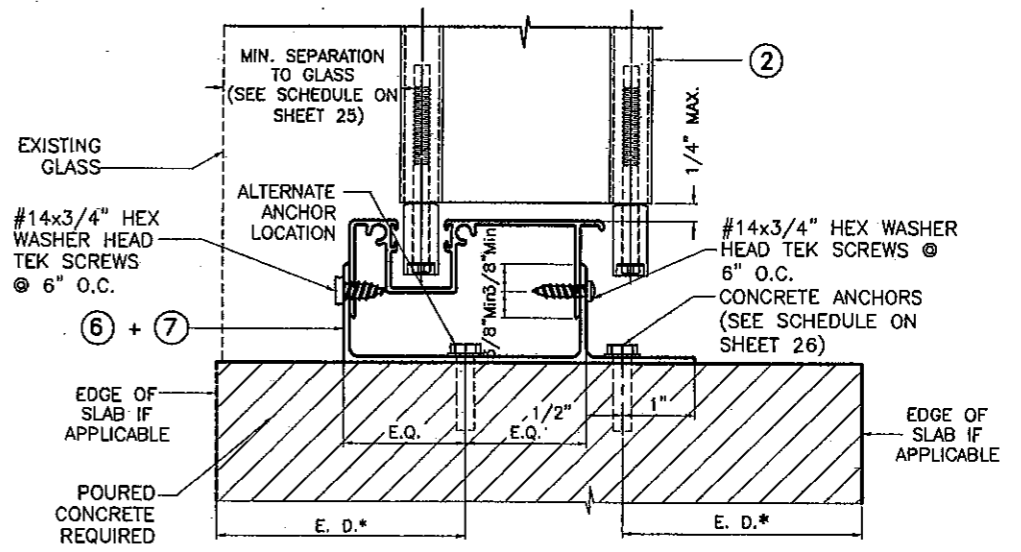
DD HD WALK-OVER INSTALLATION



EE HD WALL SILL INSTALLATION



FF HD RAINGUARD INSTALLATION



GG HD FLOOR INSTALLATION

NOTE FOR COMBINATION OF SECTIONS:
 1- SEE SHEET 21 FOR TYPICAL SHUTTER ASSEMBLY
 2- MOUNTING SECTIONS CAN BE COMBINED IN ANY WAY TO SUIT ANY INSTALLATION.

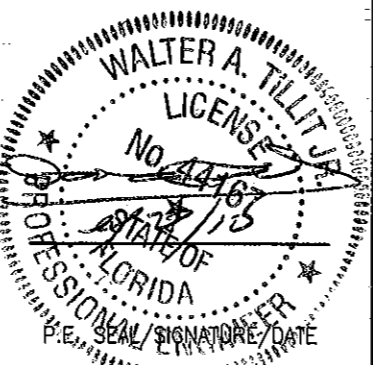
* E. D. = EDGE DISTANCE
 (SEE SPECIFICATIONS ON SHEET 26)

INSTALLATION DETAILS W/ ② HV BLADE
 SCALE: 3/8"=1"

FLORIDA BUILDING CODE (High Velocity Hurricane Zone)

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 By *Walter A. Tillit Jr.*
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 MIAMI-DADE COUNTY



TILTECO INC.
 TILLIT TESTING & ENGINEERING COMPANY
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 WALTER A. TILLIT JR. P.E.
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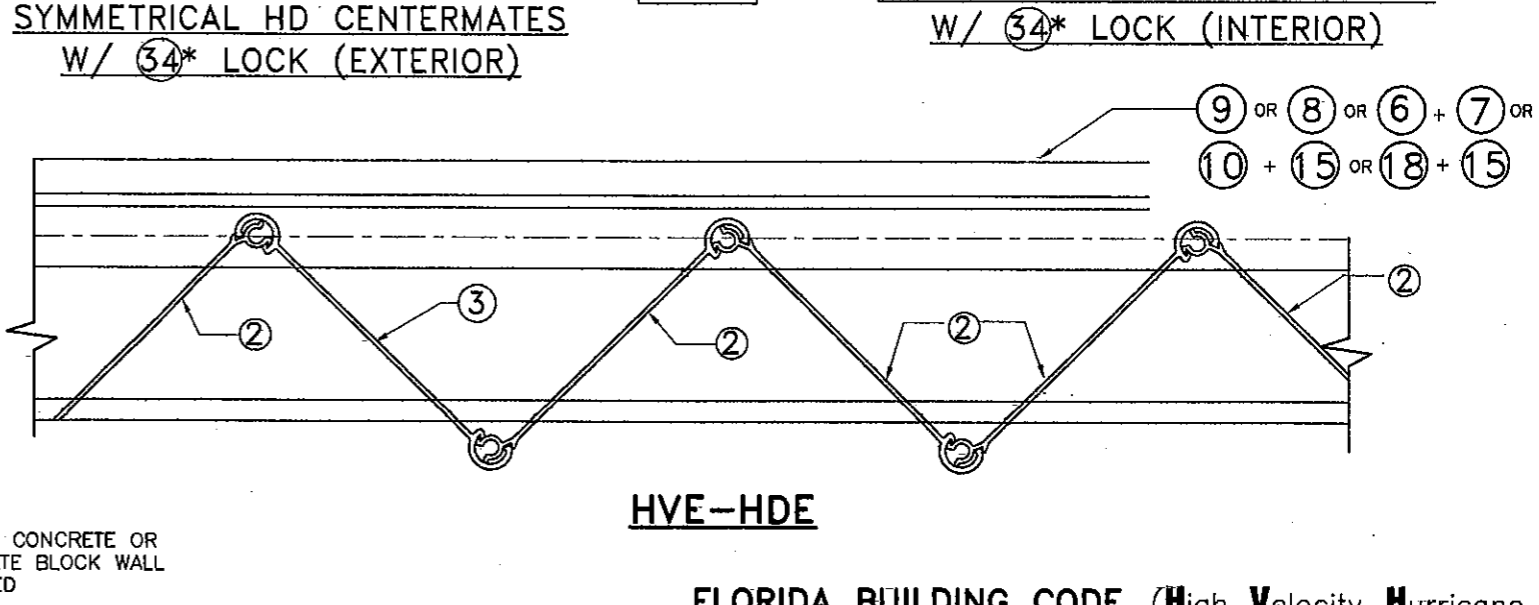
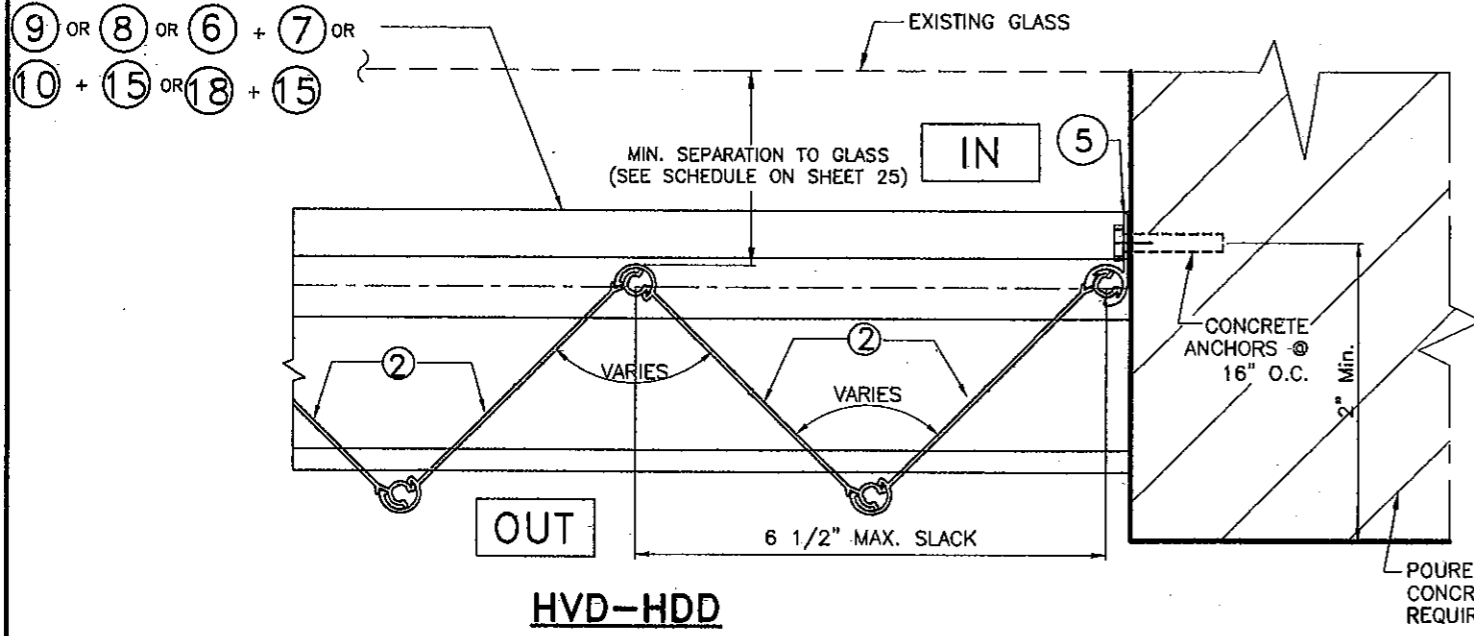
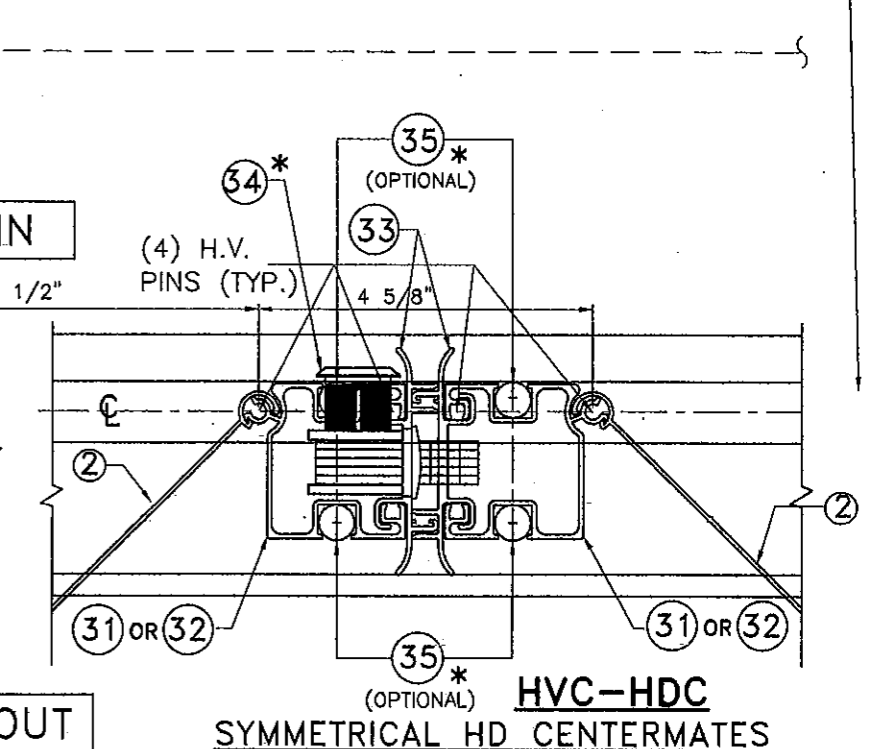
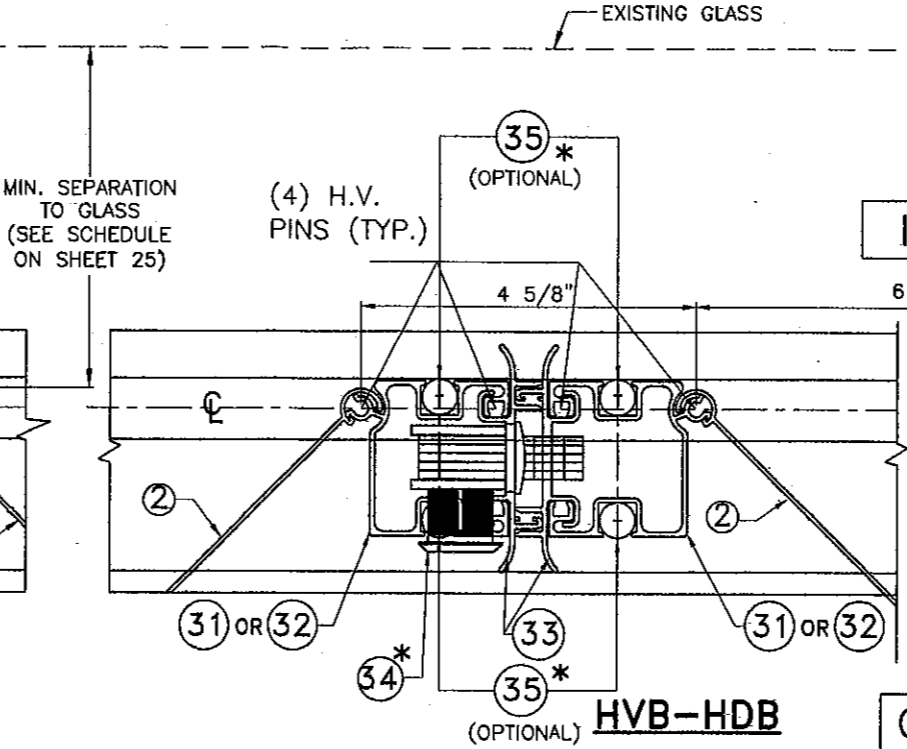
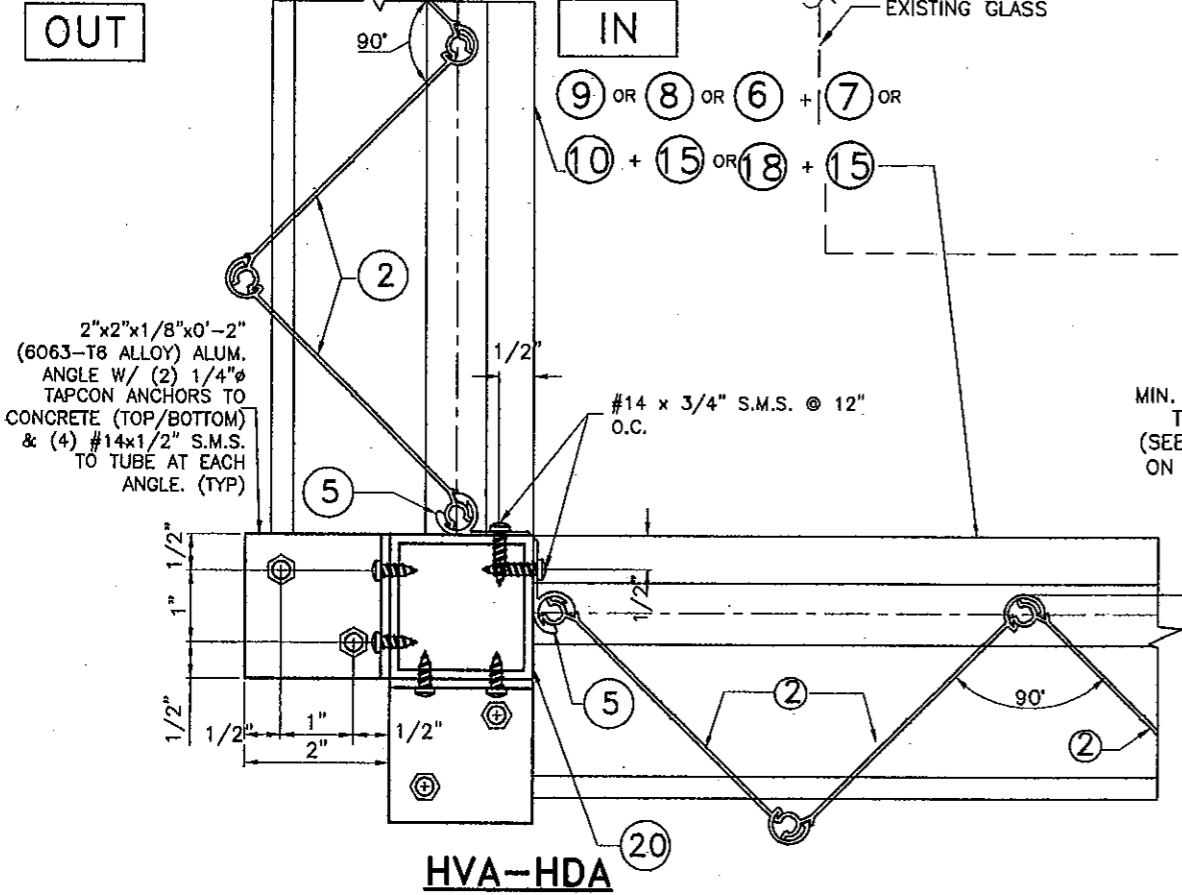
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Accordion Shutter System			
REV.No	DESCRIPTION	DATE	DRAWN BY: L.G.
1			DATE: 09/23/10
2			
3			DRAWING No
4			10-086
5			SHEET
6			22 OF 28

SEE END WALL CONNECTION DETAILS ON SHEET 24

INSTALLATION
② HV BLADE

* SEE NOTES ON LOCKING RODS (35) & HD (34) LOCKS ON SHEET 21

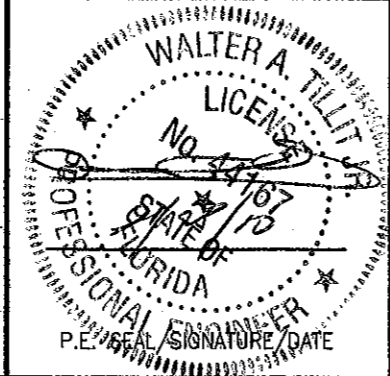
SEE END WALL CONNECTION
DETAILS ON SHEET 24



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Miami Dade Product Control
Division



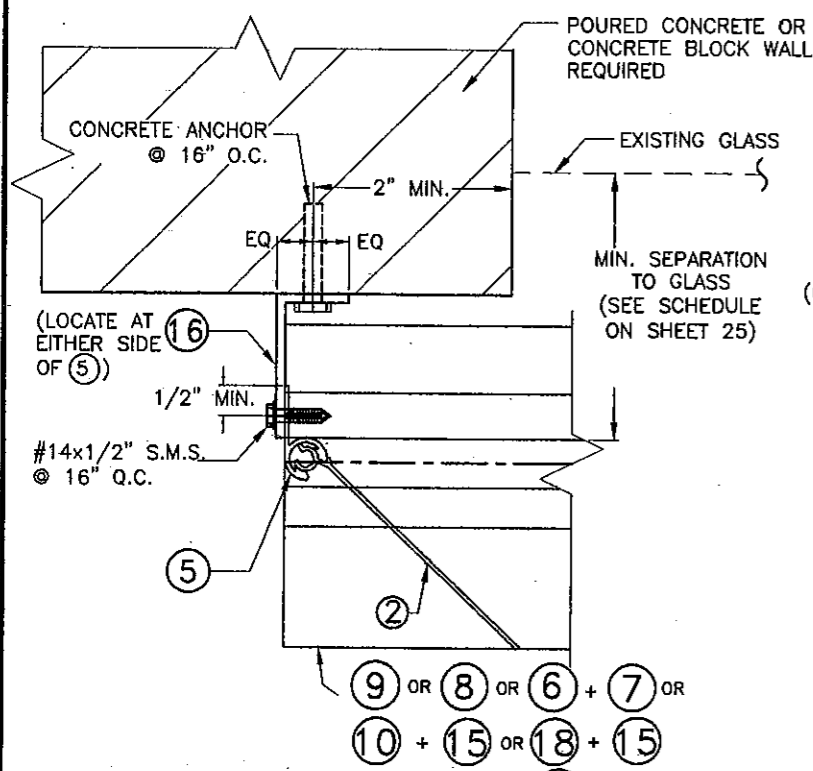
TILTECO INC.
TILLIT TESTING & ENGINEERING COMPANY
6355 N.W. 36th. St., Ste. 305, VIRGINIA GARDENS, FLORIDA 33166
Phone : (305)871-1530 . Fax : (305)871-1531
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EB-0006719
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**ALUM-SHUTTERS &
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2205 W. 80TH STREET, BAY#2
HIALEAH, FLORIDA 33016
PHONE: (305) 819-5555. FAX: (305) 819-5556

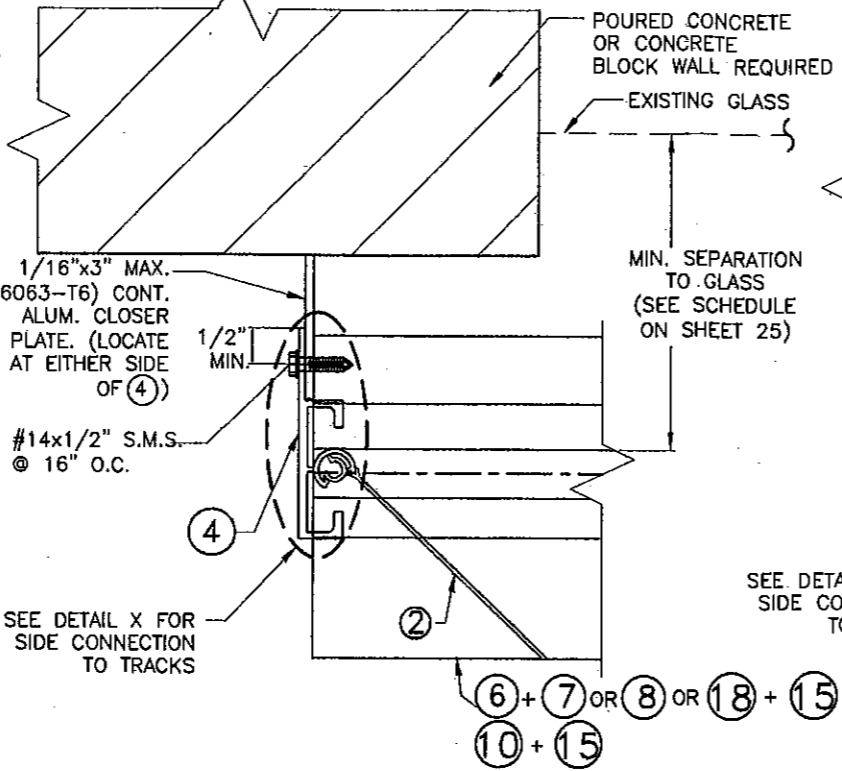
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1			DATE: 09/23/10
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5			23 OF 28
6			

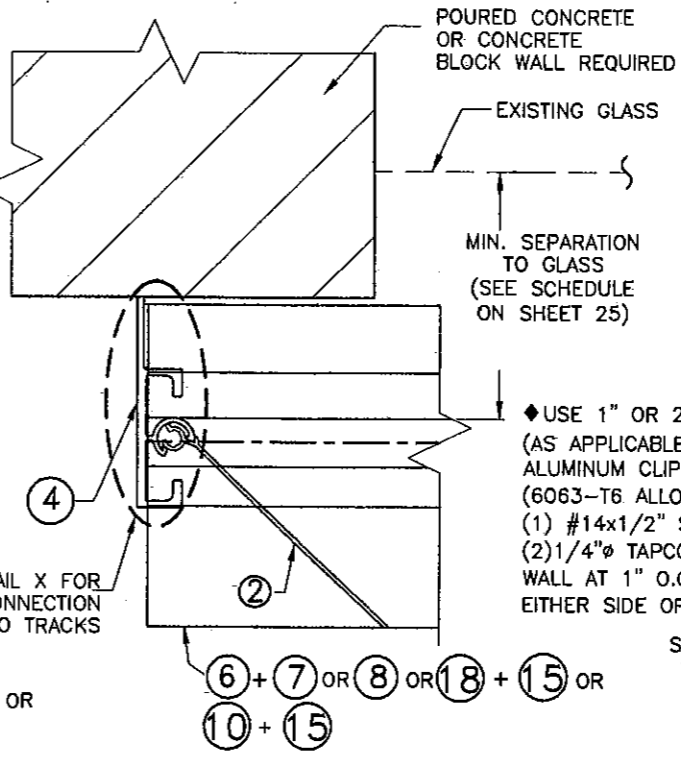
MIAMI-DADE COUNTY



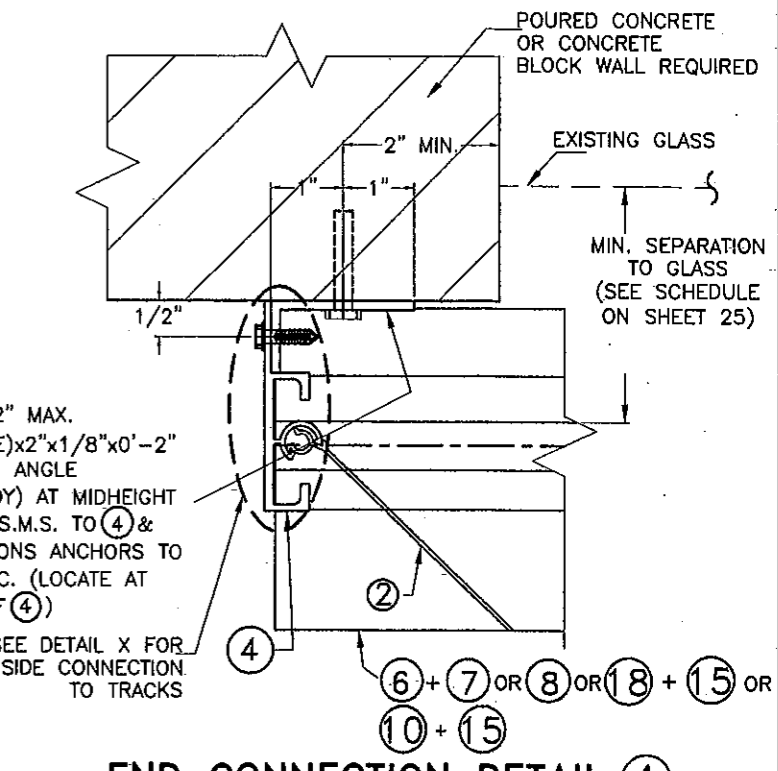
END CONNECTION DETAIL 1



END CONNECTION DETAIL 2

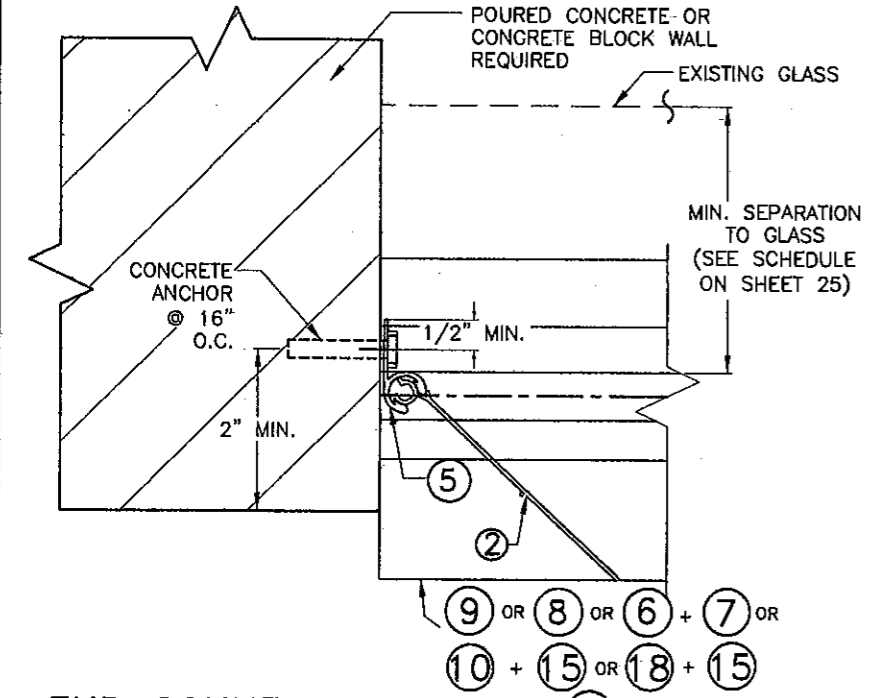


END CONNECTION DETAIL 3

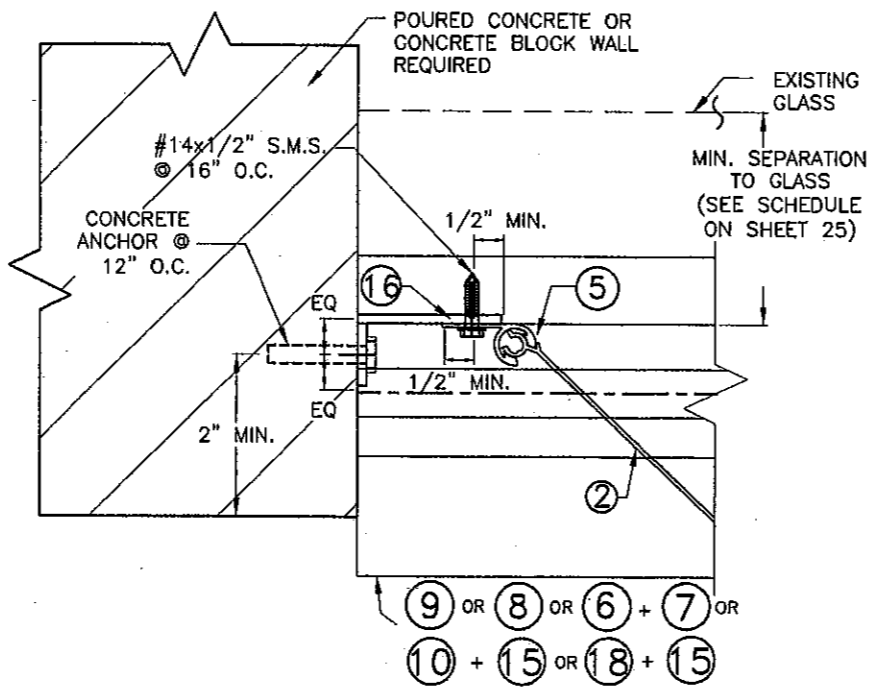


END CONNECTION DETAIL 4

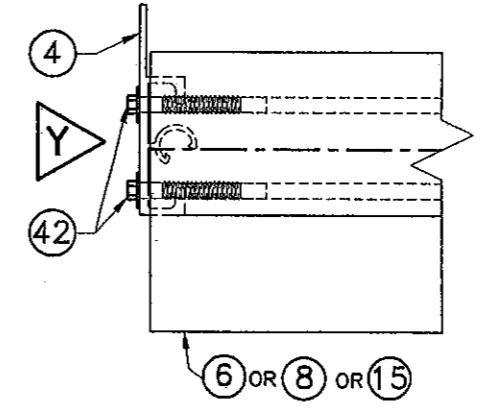
◆ REQUIRED ONLY FOR SPANS GREATER THAN 12'-0"



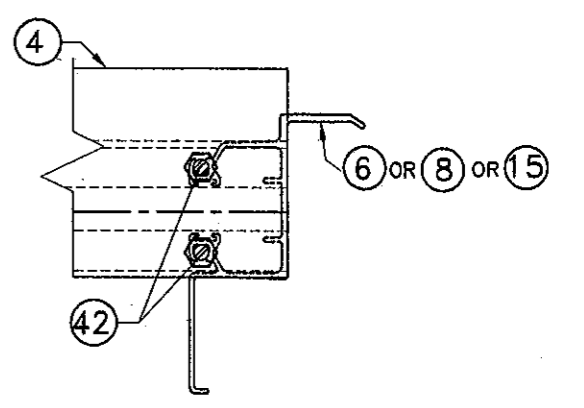
END CONNECTION DETAIL 5



END CONNECTION DETAIL 6



PLAN



VIEW Y

DETAIL X

END INSTALLATION

2 HV BLADE INTO CONCRETE OR CONCRETE BLOCK WALL.

FLORIDA BUILDING CODE (High Velocity Hurricane Zone)

PRODUCT REVISED as complying with the Florida Building Code
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 Expiration Date 03/09/2016
 By *Walter A. Tillit*
 Miami Dade Product Control Division
 MIAMI-DADE COUNTY



TILECO INC.
 TILLIT TESTING & ENGINEERING COMPANY
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 WALTER A. TILLIT Jr. P.E.
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 SHEET 24 OF 28

MAXIMUM SHUTTER SPAN
 "L+" OR "L-" (ft.) *
 INSTALLATIONS W/ SYMMETRICAL
 HD CENTERMATES (31) OR (32),
 W/ ONE HD (34) LOCK & NO
 LOCKING RODS (35) ♦

MAXIMUM DESIGN LOAD (p.s.f.) (+ OR -)	POURED CONCRETE INSTALLATIONS	
	ALL MOUNTING CONDITIONS	
	L + (ft)	L - (ft)
30 OR LESS	15'-5"	18'-0"
35	14'-10"	18'-0"
40	14'-4"	17'-10"
45	13'-11"	17'-6"
50	13'-6"	17'-0"
55	13'-3"	16'-10"
60	12'-11"	16'-2"
65	12'-8"	15'-6"
70	12'-6"	14'-11"
75	12'-3"	14'-5"
80	12'-0"	14'-0"
85	11'-10"	13'-7"
90	11'-6"	13'-2"
95	11'-3"	12'-10"
100	10'-6"	12'-6"
105	10'-0"	12'-2"
110	9'-6"	11'-11"
115	9'-1"	11'-8"
120	8'-9"	11'-5"
125	-	11'-2"
130	-	10'-11"
135	-	10'-9"
140	-	10'-6"
145	-	10'-4"
150	-	10'-2"
155	-	10'-0"
160	-	9'-10"
165	-	9'-9"
170	-	9'-7"
175	-	9'-5"
180	-	9'-4"
185	-	9'-2"
190	-	9'-0"
195	-	8'-9"

* NOTES:

(1) L+: MAXIMUM ALLOWABLE SPAN FOR A GIVEN POSITIVE DESIGN LOAD.
 L-: MAX. ALLOWABLE SPAN FOR A GIVEN NEGATIVE DESIGN LOAD.

(2) PROCEDURE TO DETERMINE MAXIMUM SPAN FOR WALL MOUNTINGS OR FLOOR/CEILING:

GIVEN A POSITIVE DESIGN LOAD, DETERMINE MAXIMUM SPAN "L+" FROM SCHEDULE.
 GIVEN A NEGATIVE DESIGN LOAD, 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 W/ FLOOR/CEILING MOUNTINGS:

FOR A GIVEN POSITIVE DESIGN LOAD:
 DETERMINE:
 L1+= MAX. SPAN FOR WALL MOUNTING INSTALLATIONS.
 L2+= MAX. SPAN FOR FLOOR/CEILING MOUNTING INSTALLATIONS.

FOR A GIVEN NEGATIVE DESIGN LOAD:
 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 MAXIMUM DESIGN LOAD TO DETERMINE MAXIMUM ANCHOR SPACING.

♦ SEPARATION TO GLASS REQUIREMENTS

MINIMUM SEPARATION TO GLASS FOR SHUTTERS INSTALLED AT ALL ELEVATIONS OF BUILDING IS 3".

INSTALLATION LEGEND

SUBSTRATE	POURED CONCRETE (SHEET 22)
WALL MOUNTING	AA & EE
FLOOR/CEILING MOUNTING	BB, CC, DD, FF & GG

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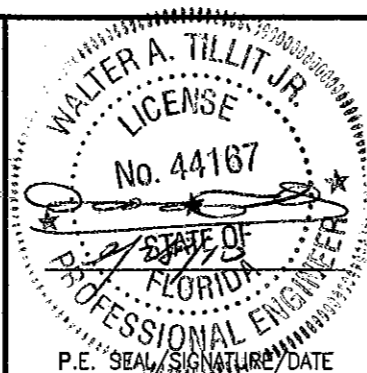
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 By *Walter A. Tillit Jr.*
 Miami Dade Product Control Division

MIAMI-DADE COUNTY



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ANCHORS SPACING LEGEND		MAXIMUM DESIGN PRESSURE RATING (p.s.f.) AND CORRESPONDING MAXIMUM ANCHOR* SPACING (in.) SCHEDULE FOR A GIVEN MAX. SHUTTER SPAN, MAXIMUM DESIGN LOAD AND A CORRESPONDING MOUNTING TYPE FOR CONCRETE INSTALLATIONS				
		POURED CONCRETE				
MAXIMUM SPAN (ft)		ALL MOUNTINGS AA THRU GG (SHEET 22)				
		USE MAXIMUM VALUES BETWEEN POSITIVE AND NEGATIVE LOADS				
		50 OR LESS	>50 TO 90	>90 TO 120	>120 TO 160	>160 TO 195
8'-9" OR LESS	1/4" TAPCON	8"	4 1/2"	3 1/2"	-	-
	5/16" TAPCON XL	12"	8"	6"	4"	3 3/4"
>8'-9" UP TO 12'-1"	1/4" TAPCON	6"	3 1/2"	3" ‡	-	-
	5/16" TAPCON XL	10"	6"	4"	4"	-
>12'-1" UP TO 18'-0"	1/4" TAPCON	4"	3 1/2"	-	-	-
	5/16" TAPCON XL	7 1/2"	5 1/2"	4"	-	-

NOTE:
‡ VALID ONLY FOR UP TO 10'-0" SPAN

***SPECIFICATIONS ON ANCHOR REQUIREMENTS: POURED CONCRETE SUBSTRATE**

(A) ANCHORS TO WALL SHALL BE AS FOLLOWS:

A.1) TO EXISTING POURED CONCRETE: (Min. f'c = 3192 psi)
- 1/4" TAPCON ANCHORS, AS MANUFACTURED BY I.T.W. BUILDEX.
MINIMUM EMBEDMENT INTO POURED CONCRETE OF TAPCON IS 1 3/4".

A.2) TO EXISTING POURED CONCRETE: (Min. f'c = 2899 psi)
- 5/16" TAPCON XL ANCHORS, AS MANUFACTURED BY I.T.W. BUILDEX.
MINIMUM EMBEDMENT INTO POURED CONCRETE OF 5/16" TAPCON XL ANCHORS IS 2 1/4".

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 NOTE A.1) ABOVE. FOR INSTALLATIONS ON VINYL SIDING OR EIFS CONSULT THIS ENGINEER.

(B) ANCHORS SHALL BE INSTALLED FOLLOWING ALL OF THE RECOMMENDATIONS AND SPECIFICATIONS OF THE ANCHOR'S MANUFACTURER.

(C) SEE BELOW FOR MINIMUM REQUIRED EDGE DISTANCE FOR ANCHORS.

MINIMUM REQUIRED EDGE DISTANCE FOR ANCHORS
MAXIMUM ANCHOR SPACINGS ARE VALID FOR
3" EDGE DISTANCE FOR 1/4" TAPCON AND
3 5/8" EDGE DISTANCE FOR 5/16" TAPCON XL.

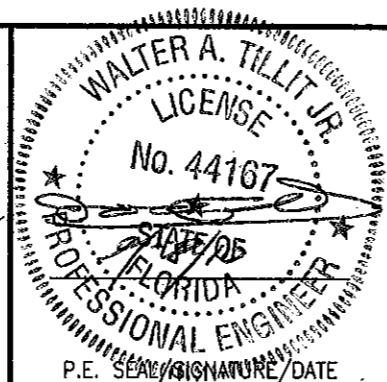
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**ALUM-SHUTTERS &
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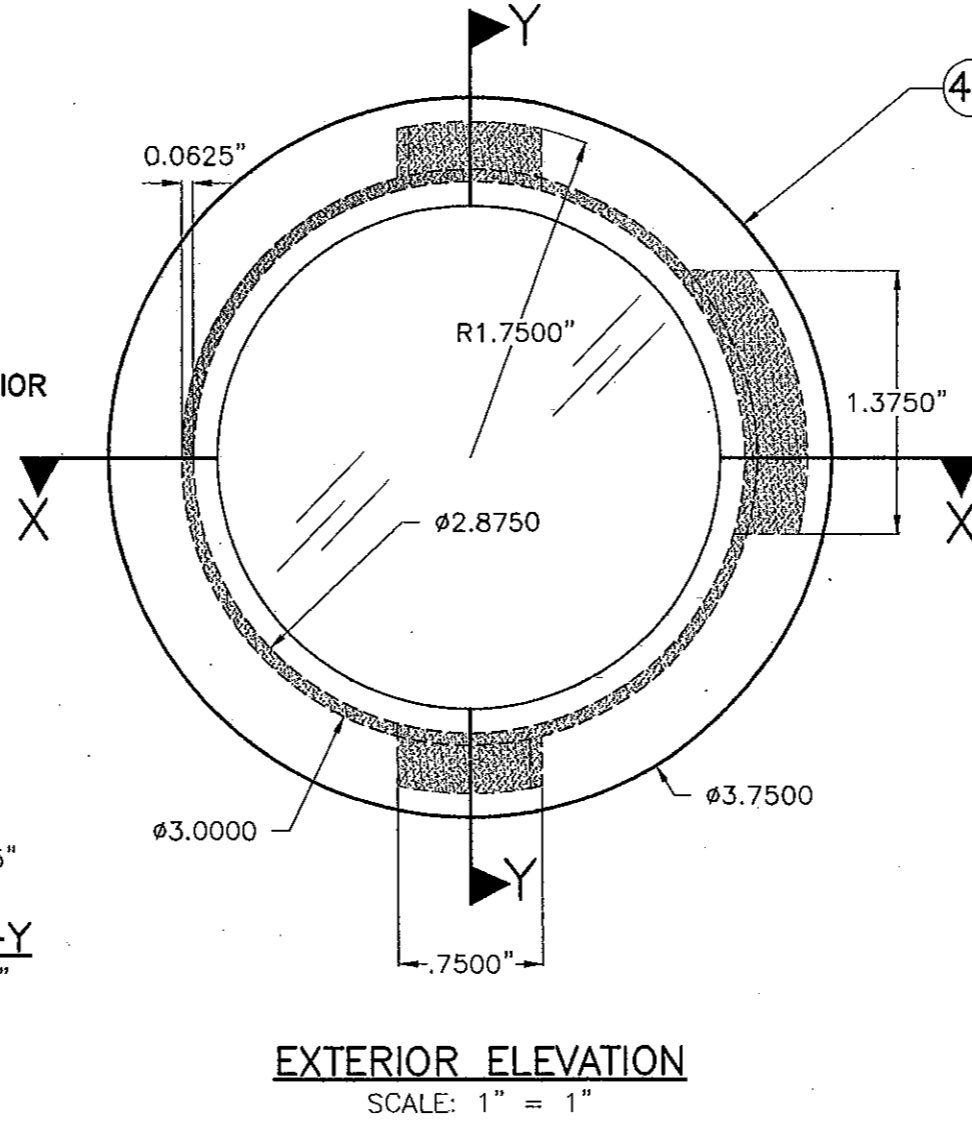
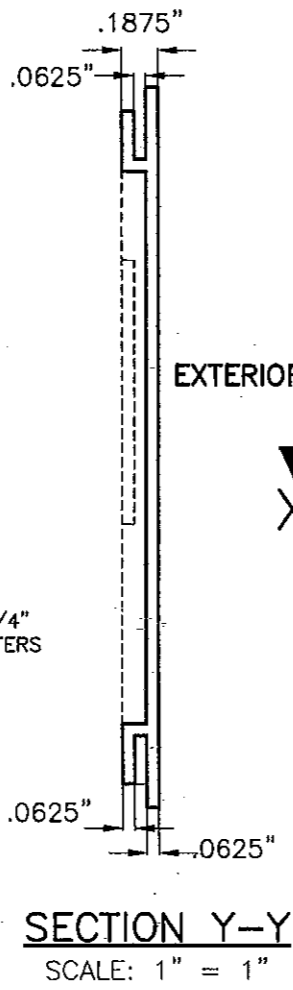
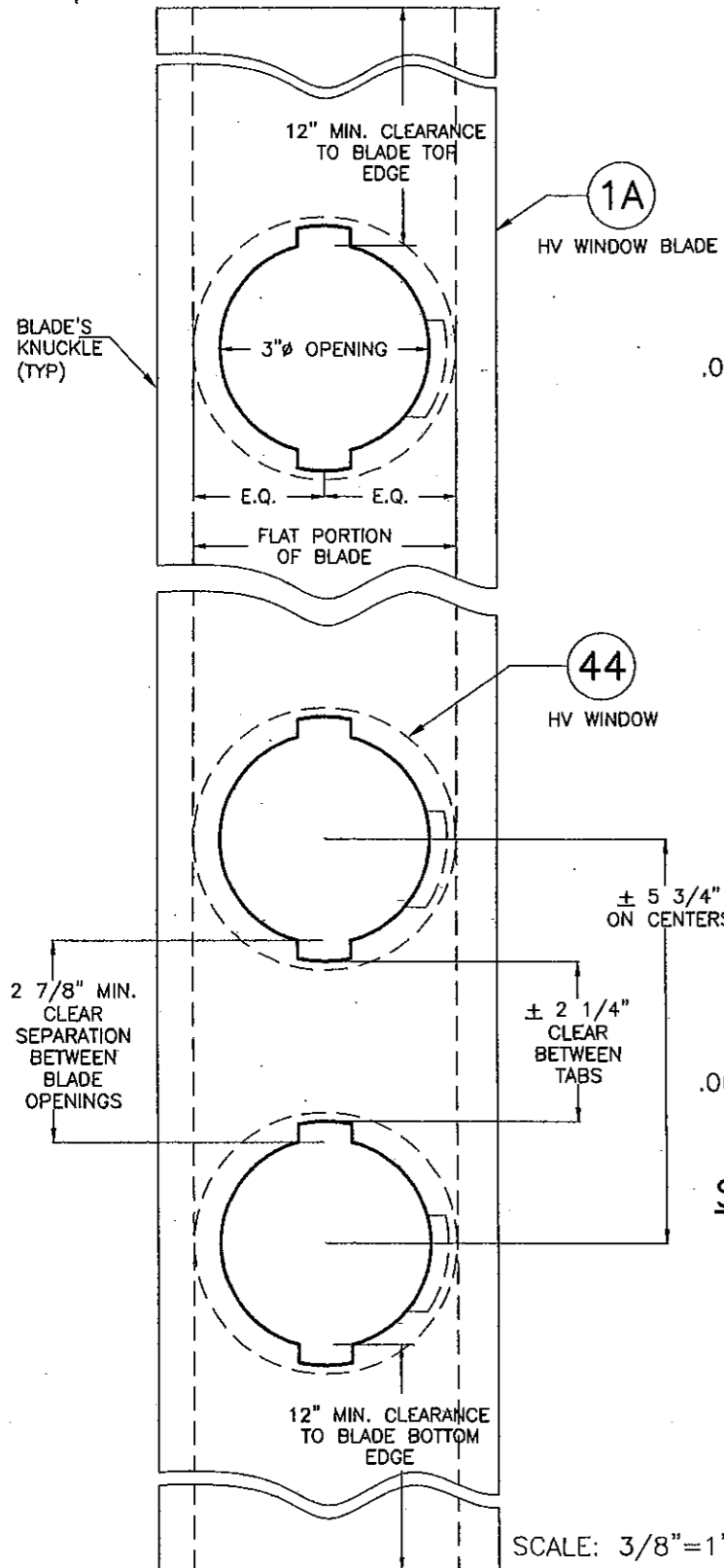
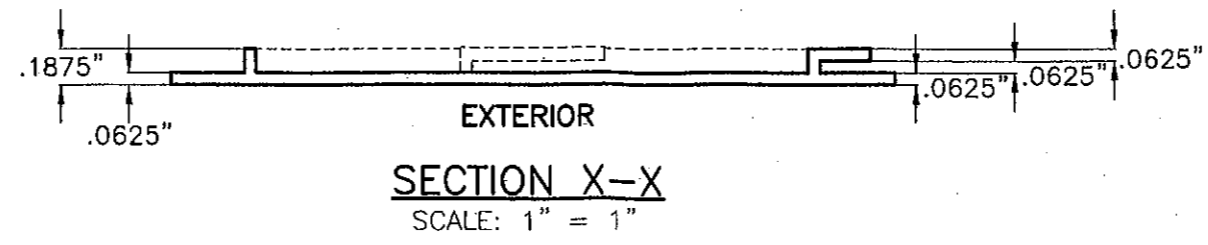
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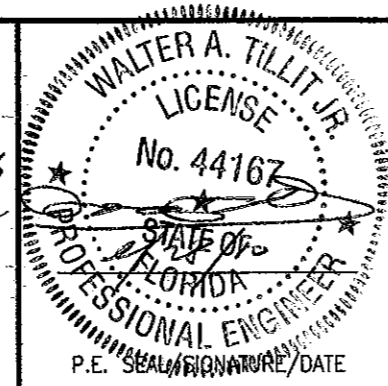
44 POLYCARBONATE IMPACT RESISTANT HV WINDOW
 BAYER MAKROLON 3103 POLYCARBONATE RESINS, UV-STABILIZED GRADE OR SABIC INNOVATIVE PLASTIC LEXAN 103 RESIN (SEE NOTE "F" ON SHEET 28).

POLYCARBONATE SOURCES FOR 44			
TYPICAL PROPERTIES	APPLICABLE STANDARD REFERENCE	RESULT	
		BAYER MATERIAL / SCIENCE LLC. MAKROLON 3103	SABIC INNOVATIVE PLASTIC LEXAN 103 RESIN
PHYSICAL:			
SPECIFIC GRAVITY	ASTM D792	0.043 lb/in ³	0.043 lb/in ³
MECHANICAL:			
TENSILE YIELD STRENGTH	ASTM D638	9,400 p.s.i.	9,500 p.s.i.
FLEXURAL STRENGTH AT YIELD	ASTM D790	12,500 p.s.i.	13,400 p.s.i.
FLEXURAL MODULUS	ASTM D790	340,000 p.s.i.	345,000 p.s.i.
IMPACT:			
NOTCHED IZOD	ASTM D256	18 FT-lb/in	17 FT-lb/in
FIRE BURNING CHARACTERISTICS:			
SMOKE DENSITY	ASTM D2843	47.2 %	64.5 % MAX
RATE OF BURNING	ASTM D635	C-1 CLASS	C-1 CLASS
SELF IGNITION	ASTM D1929	1040 °F	980 °F
WEATHERING:	ASTM G155		
TENSILE STRENGTH AFTER WEATHERING	ASTM 638	9302 p.s.i.	8840 p.s.i.
TENSILE STRESS BEFORE WEATHERING	ASTM 638	8461 p.s.i.	8880 p.s.i.

TYPICAL HV WINDOW BLADE (1A) AND POLYCARBONATE HV WINDOW DETAIL

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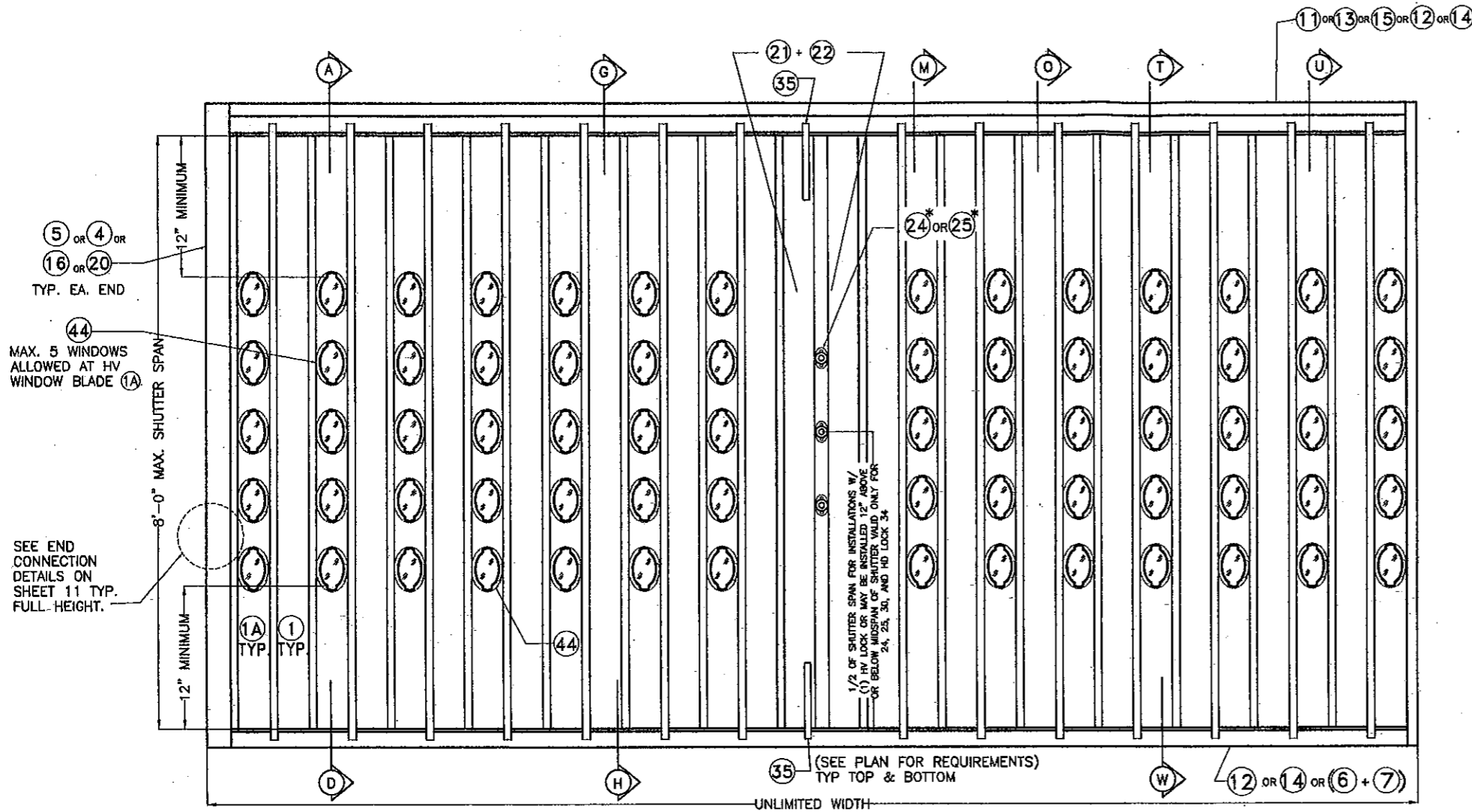
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 TILLIT TESTING & ENGINEERING COMPANY
 6355 N.W. 38th St., Ste. 305, VIRGINIA GARDENS, FLORIDA 33166
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 WALTER A. TILLIT JR. P.E.
 FLORIDA Lic. # 44167

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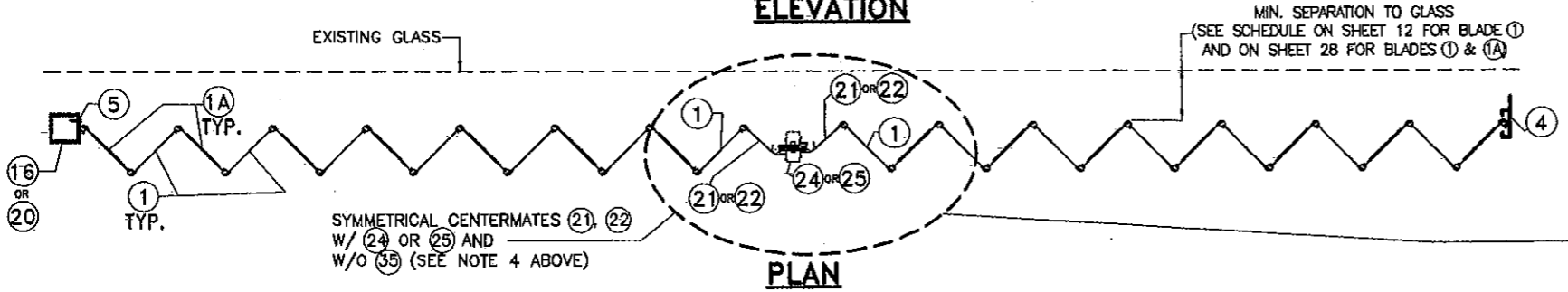
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ELEVATION

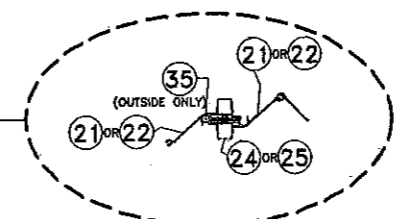


PLAN

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

- * GENERAL LIMITATIONS AND CONDITIONS OF USE FOR BERTHA**
- (1) HV BLADE ACCORDION SHUTTER SYSTEM WORKING IN UNISON WITH HV WINDOW BLADE (1A)**
- MAX. 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 18 & 19.
 - 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"Ø HOLES) FOR (44) PER BLADE AT SPACINGS SHOWN ON SHEET 27.
(B) MIN. CLEARANCE FROM TOP OR BOTTOM EDGE OF HV WINDOW BLADE (1A) OF ANY 3"Ø 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 16, 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 13 & 14 AS LIMITED BY SPAN AND DESIGN LOAD (SEE NOTES 1 & 2 ABOVE).
 - MINIMUM SEPARATION TO GLASS SCHEDULE:
- | SHUTTER SPAN | MINIMUM SEPARATION TO GLASS |
|--------------|-----------------------------|
| 96" Max. | 5" |

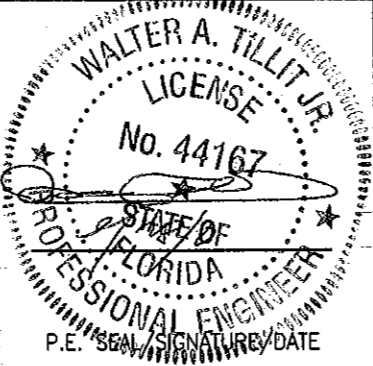
ALTERNATE OPPOSING CENTERMATES (21, 22) W/ (35) (EXTERIOR ONLY) AND W/ (24 OR 25) (SEE NOTE 4 ABOVE)



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