

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 2003 EDITIONS OF THE INTERNATIONAL BUILDING CODE, (I.B.C.) AND INTERNATIONAL RESIDENTIAL CODE, (I.R.C.) WITH THE 2003 TEXAS REVISIONS, EFFECTIVE JANUARY 1, 2005. BERTHA H.V. ACCORDION SHUTTER SYSTEM SHALL BE INSTALLED AT SEAWARD AND INLAND AREAS, AS DEFINED BY THE TEXAS DEPARTMENT OF INSURANCE. DESIGN WIND LOADS SHALL BE DETERMINED AS PER SECTION 1609 OF THE INTERNATIONAL BUILDING CODE, FOR A BASIC WIND SPEED AS REQUIRED BY THE JURISDICTION WHERE SHUTTER WILL BE INSTALLED, AND FOR A DIRECTIONALITY FACTOR $K_d = 0.85$, IN ACCORDANCE WITH ASCE 7-02 STANDARD. BERTHA H.V. ACCORDION SHUTTER SYSTEM ADEQUACY FOR IMPACT AND CYCLIC RESISTANCE HAS BEEN VERIFIED IN ACCORDANCE WITH SECTIONS 1609.1.4 AND R301.2.1.2 OF THE ABOVE MENTIONED CODES RESPECTIVELY, AS PER AMERICAN TEST LAB REPORTS #0214.01-03, #0715.01-03, #1004.01-05, #1214.01-05 AND 0317.02-06, PER ASTM E 1886, E 1996 AND E 330 STANDARDS AND FLORIDA HIGH VELOCITY HURRICANE ZONE PROTOCOLS TAS 201, 202 AND 203.
2. 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.
3. ALL ALUMINUM EXTRUSIONS SHALL BE ALUMINUM ASSOCIATION ALLOY AND TEMPER AS INDICATED ON SHEET 2. MINIMUM YIELD STRENGTH FOR 6063-T6 ALLOY IS 30.0 ksi.
4. ALL SCREWS AND BOLTS INSTALLED AT SEAWARD AREAS TO BE STAINLESS STEEL 304 OR 316 AISI SERIES AND MEET ASTM A167, OR HOT DIPPED GALVANIZED (AFTER FABRICATION) CARBON STEEL AS PER ASTM A123 OR ASTM A153, OR HOT DIPPED GALVANIZED OR GALVANNEALED (PRIOR TO FABRICATION) AND MEET ASTM A653 WITH 50 ksi YIELD STRENGTH AND 90 ksi TENSILE STRENGTH, PER 2003 TEXAS REVISIONS TO SECTION 1716.1.1 OF THE 2003 I.B.C. AND SECTION R324.1.1 OF THE 2003 I.R.C.
5. ALL SCREWS AND BOLTS INSTALLED AT INLAND AREAS TO BE STAINLESS STEEL 304 OR 316 AISI SERIES AND MEET ASTM A167, OR HOT DIPPED GALVANIZED (AFTER FABRICATION) CARBON STEEL AS PER ASTM A123 OR ASTM A153, OR HOT DIPPED GALVANIZED OR GALVANNEALED (PRIOR TO FABRICATION) AND MEET ASTM A653; HOT DIP GALVANIZED OR ELECTRO GALVANIZED PER ASTM A641, MECHANICALLY DEPOSITED ZINC COATINGS PER ASTM B695 OR ELECTRO DEPOSITED ZINC COATINGS PER ASTM B633, PER THE 2003 TEXAS REVISIONS TO SECTION 1716.1.2 OF THE 2003 I.B.C. AND TO SECTION R324.1.2. OF THE 2003 I.R.C
6. SEE THE FOLLOWING SHEETS FOR ANCHOR SPECIFICATIONS: HV BLADE ① : 7, 8 AND 9.
7. 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.
8. 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.
9. 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 CENTERMATES AND ENGAGE OR LOCK ALL HV LOCKS.
10. 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.
11. (a) THIS PRODUCT EVALUATION DOCUMENT (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 PRODUCT EVALUATION DOCUMENT, PROVIDED HE/SHE DOES NOT DEVIATE FROM THE CONDITIONS DETAILED ON THIS DOCUMENT. CONSTRUCTION SAFETY AT SITE IS THE CONTRACTOR'S RESPONSIBILITY.
- (c) THIS PRODUCT EVALUATION DOCUMENT WILL BE CONSIDERED INVALID IF ALTERED BY ANY MEANS.
- (d) SITE SPECIFIC PROJECTS SHALL BE PREPARED BY A PROFESSIONAL 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) THIS 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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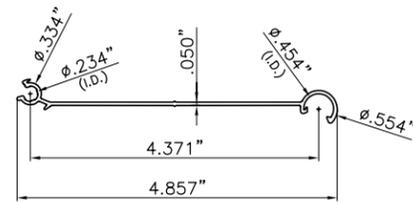


TILLIT TESTING & ENGINEERING COMPANY
6355 N.W. 36th. St., Ste. 305, VIRGINIA GARDENS, FLORIDA 33166
Phone : (305)871-1530 . Fax : (305)871-1531
e-mail: tilteco@aol.com
EB-0006719
WALTER A. TILLIT Jr. P. E.
FLORIDA Lic. # 44167

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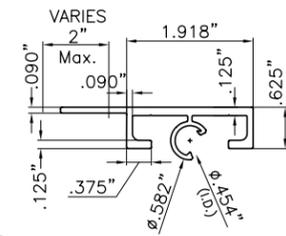
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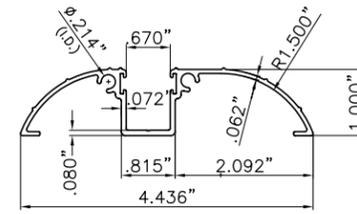
1 HV BLADE

COVERED UNDER US PATENT # 5458179
6063-T6 ALLOY AND TEMPER



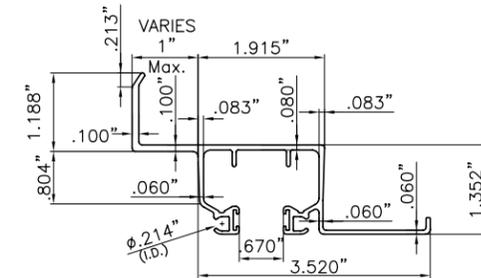
4 HV DIRECT MOUNT

6063-T6 ALLOY AND TEMPER



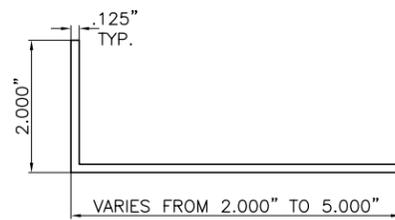
8 HV WALK-OVER TRACK

6063-T6 ALLOY AND TEMPER



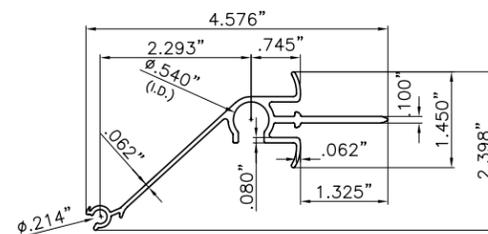
12 HV HEADER/SILL

6063-T6 ALLOY AND TEMPER



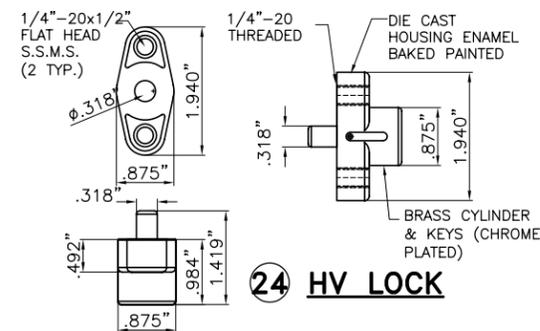
17 B.O. WALL ANGLE

6063-T6 ALLOY AND TEMPER

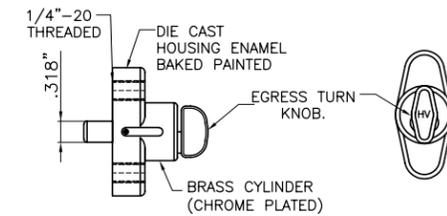


21 HV CENTERMATE

6063-T6 ALLOY AND TEMPER



24 HV LOCK



25 HV EGRESS LOCK

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e-mail: tilteco@aol.com
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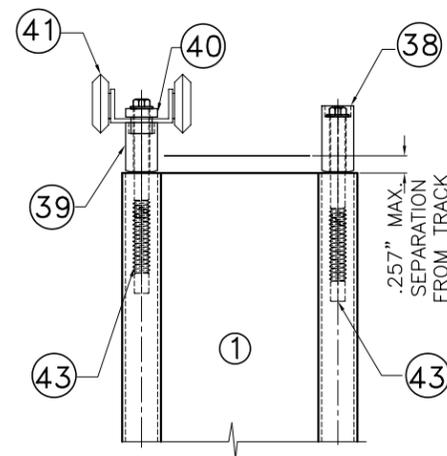
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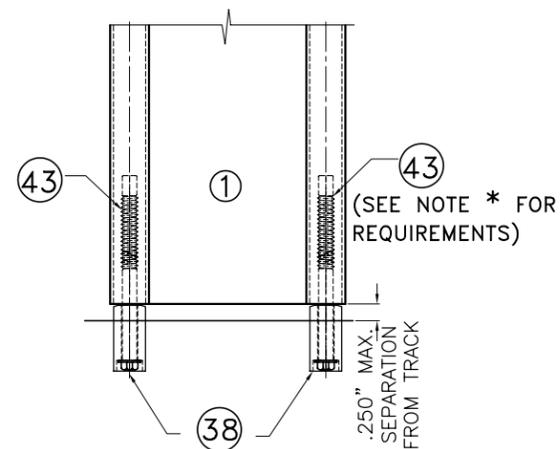
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SHUTTER ASSEMBLY SCHEDULE FOR HV ① AND HV ② BLADES.

①	HV BLADE 1
③⑧	HV LONG RECESSED NYLON BUSHING
③⑨	HV SHORT RECESSED NYLON BUSHING
④①	HV NYLON HAT WASHER
④②	HV WHEEL CARRIAGE AISI 302-303 SERIES Ø.870"x3/16" THICK NYLON WHEEL. 0.188"Ø AISI 302 SERIES S.S. RIVETS
④③	HV 1 3/4" ACCORDION PIN W/ #8 HEAD *
④④	HV 2 3/4" ACCORDION PIN W/ #8 HEAD *

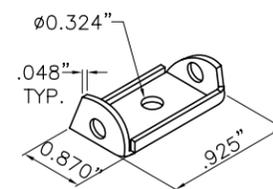


EXTERIOR



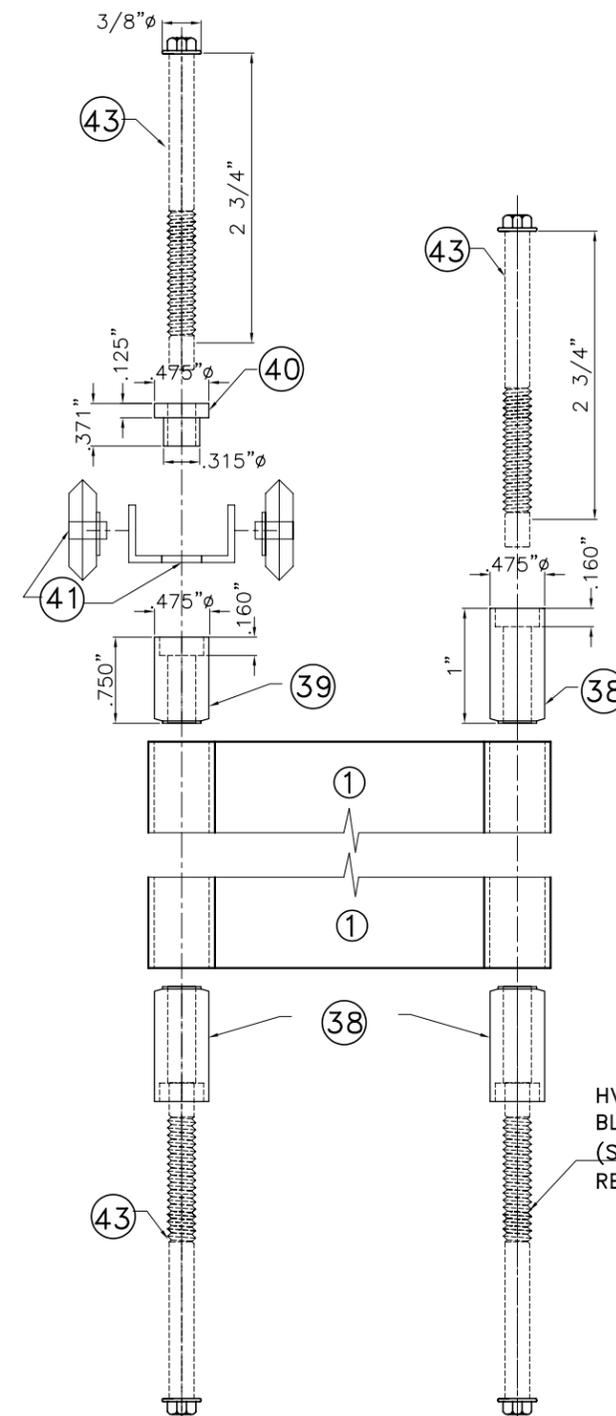
TYPICAL SHUTTER ASSEMBLY

SCALE: 3/8" = 1"



WHEEL CARRIAGE DETAIL

N.T.S.



EXTERIOR

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

ASSEMBLY LAYOUT

N.T.S.

* HV PIN REQUIREMENTS AT EXTERIOR BLADE KNUCKLE

(1) HV PIN ④③ SHALL ALWAYS BE USED AT ALL EXTERIOR BOTTOM KNUCKLES.

(2) HV PIN ④② OR ④④ W/ 1/2" O.D. 1/16" THICK S.S. WASHER SHALL BE USED FOR DIRECT MOUNT INSTALLATION PER DETAIL X, SHEETS 6 AND 10.

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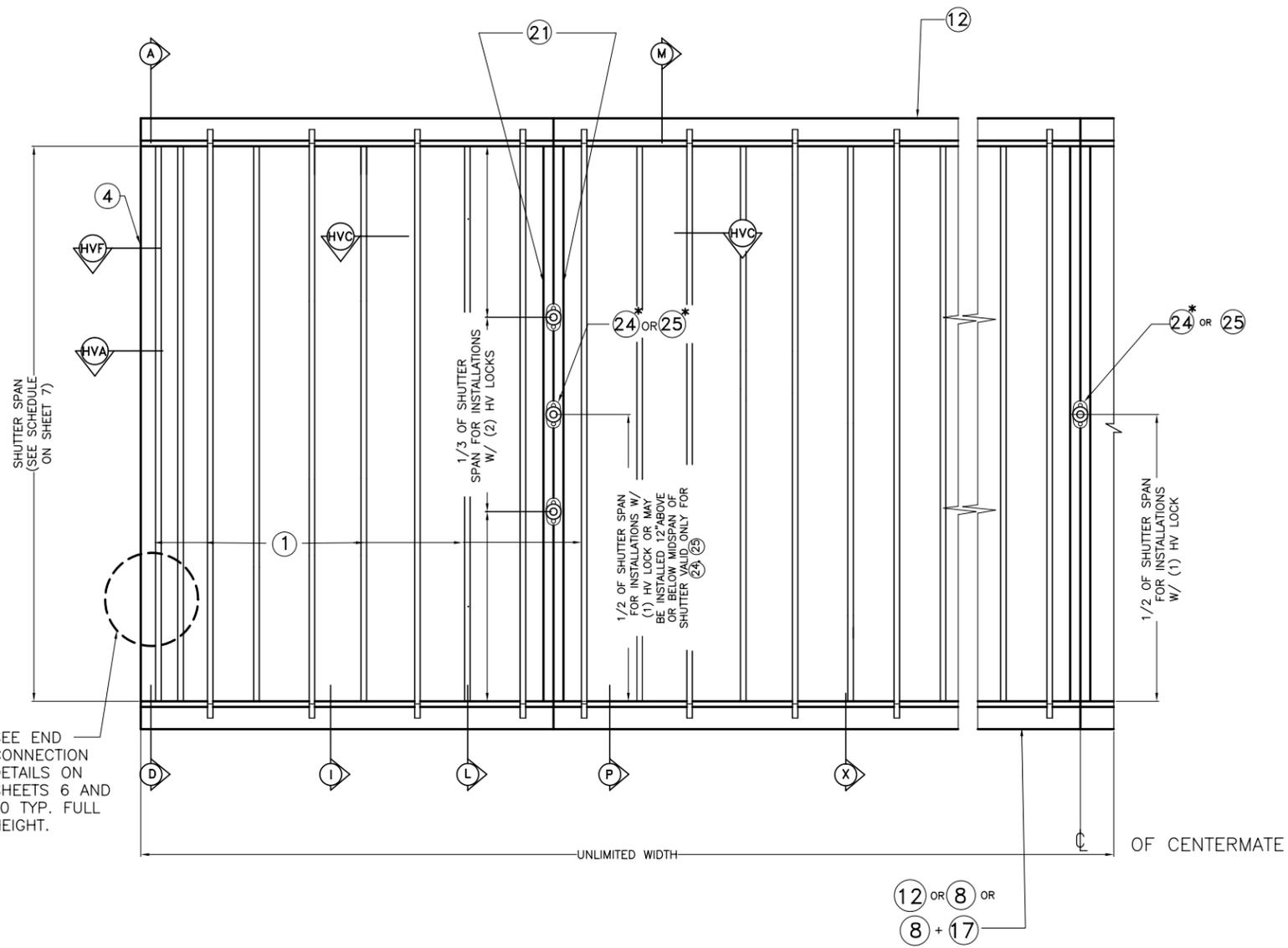


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*** NOTES ON HV LOCKS AND CENTERMATES:**

1. **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 90", AND FOR INSTALLATIONS AT ANY ELEVATION. HV LOCK (24) or (25) MAY BE USED AS AN INSIDE OR OUTSIDE LOCK, ATTACHED TO (21) CENTERMATE 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.

2. **OPTIONAL CONDITION #1:** IF DESIRED, FOR BETTER PERFORMANCE OR FOR SECURITY PURPOSES, UP TO TWO HV LOCKS (24) OR (25) MAY BE USED AS AN INSIDE OR OUTSIDE LOCK. CONNECTION OF LOCKS TO CENTERMATES (21) SHALL BE AS INDICATED ON NOTE (1) ABOVE. LOCATION OF LOCKS SHALL BE AS INDICATED ON TYPICAL SHUTTER ELEVATION.

TYPICAL SHUTTER ELEVATION
N.T.S.

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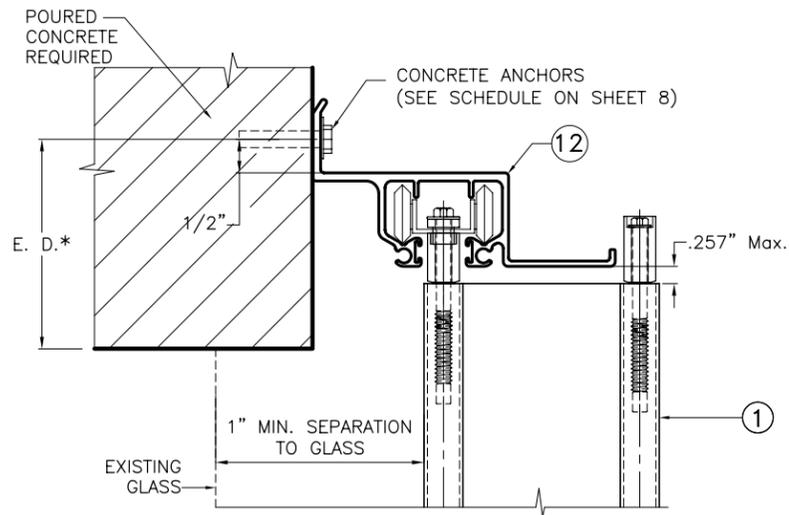


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EB-0006719
WALTER A. TILLIT Jr. P. E.
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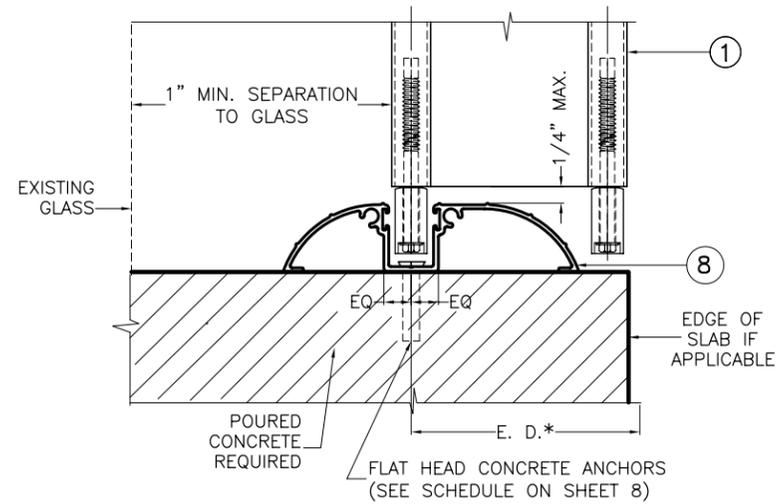
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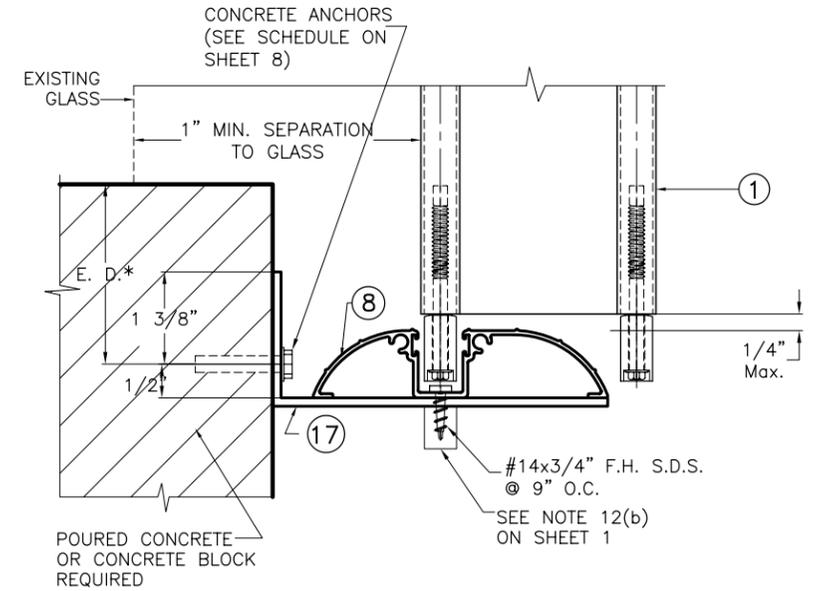
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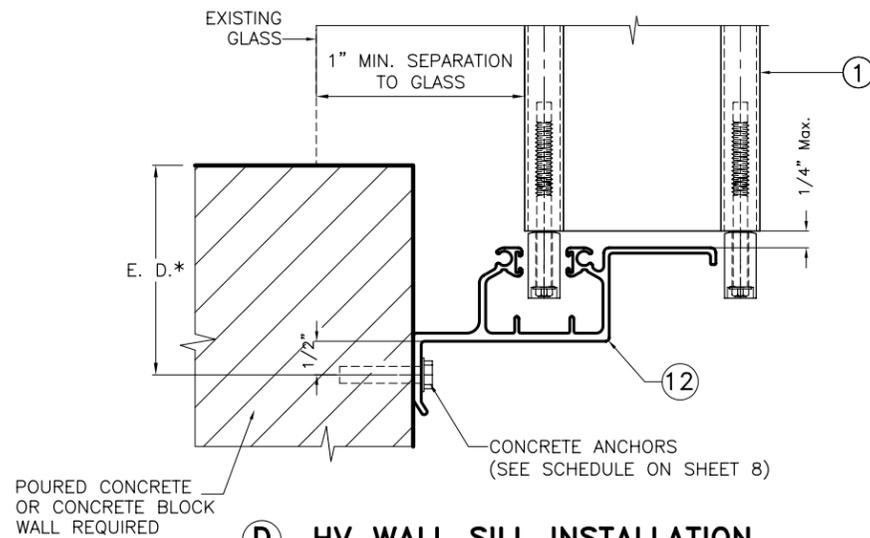
(A) HV WALL HEADER INSTALLATION



(I) HV WALK-OVER INSTALLATION



(L) HV WALL WALK-OVER INSTALLATION



(D) HV WALL SILL INSTALLATION

NOTE FOR COMBINATION OF SECTIONS:
 1- SEE SHEET 3 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 7)

INSTALLATION DETAILS

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 EB-0006719
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EASTERN METAL SUPPLY, INC.
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 LAKEWORTH, FL 33461
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SCHEDULE #1

MAXIMUM SHUTTER SPAN "L" (ft.) FOR INSTALLATIONS W/ SYMMETRICAL CENTERMATES, (21) W/ ONE HV LOCK (24) or (25) ◆	
MAXIMUM DESIGN LOAD (p.s.f.) (+ OR -)	CONCRETE & WOOD INSTALLATIONS ▲
	WALL MOUNTING OR WALL/FLOOR MOUNTING "L" (ft)
75	7'-6"

▲ MAXIMUM SHUTTER SPAN "L" FOR INSTALLATIONS INTO WOOD SHALL BE LIMITED TO 75 psf. DESIGN LOAD.

INSTALLATION LEGEND		
	CONCRETE & MANSORY	WOOD
WALL MOUNTING	A & L.	M & P.
FLOOR/CEILING MOUNTING	I	X

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

1. ANCHORS TO WALL SHALL BE AS FOLLOWS:
 (A) TO EXISTING POURED CONCRETE: (Min. f'c = 3 ksi)
 - 1/4"Ø TAPCON ANCHORS, AS MANUFACTURED BY I.T.W. RAMSET/ RED HEAD.

NOTES:
 A.1) MINIMUM EMBEDMENT INTO POURED CONCRETE OF TAPCON ANCHORS IS 1 3/4".

A.2) 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) TO EXISTING CONCRETE BLOCK WALL: ASTM C-90.
 - 1/4"Ø TAPCON ANCHORS, AS MANUFACTURED BY I.T.W. RAMSET/ RED HEAD.

NOTES:
 B.1) MINIMUM EMBEDMENT INTO CONCRETE BLOCK OF TAPCON ANCHORS, IS 1 1/4".

B.2) 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 B.1) ABOVE. FOR INSTALLATIONS ON VINYL SIDING OR EIFS CONSULT THIS ENGINEER.

(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 ANCHOR.

EDGE DISTANCE VERSUS SPACING FOR ANCHORS	
MAXIMUM ANCHOR SPACINGS ARE VALID FOR 3 1/2" EDGE DISTANCE FOR 1/4"Ø TAPCON FOR E. D. LESS THAN THE ABOVE MENTIONED, 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 BELOW:	
ACTUAL E. D.	FACTOR
	1/4"Ø TAPCON
	MIN. SPACING = 3"
3"	0.83
2 1/2"	0.66
2"	0.50

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**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, D, I AND L ON SHEET 5)

* SEE ANCHOR
SPECIFICATIONS
ON SHEET 7

MAXIMUM SPAN (ft)	POURED CONCRETE				POURED CONCRETE/CONCRETE BLOCK			
	(A) WALL HEADER MOUNTING W/ ②				(D) WALL SILL MOUNTING W/ ②			
	NEGATIVE DESIGN LOAD (psf)				NEGATIVE DESIGN LOAD (psf)			
	30	40	60	75	30	40	60	75
3'-0" OR LESS	14	12	10	9	14	12	10	9
4'-0"	14	12	10	9	14	12	10	9
5'-0"	14	12	10	9	14	12	10	9
6'-0"	14	12	10	9	14	12	10	8
7'-0"	14	12	10	9	14	12	9	5
7'-6"	14	12	10	8	14	11.5	7	3

MAXIMUM SPAN (ft)	POURED CONCRETE				POURED CONCRETE/CONCRETE BLOCK			
	① WALL OVER MOUNTING				③ WALL/WALK OVER MOUNTING			
	NEGATIVE DESIGN LOAD (psf)				NEGATIVE DESIGN LOAD (psf)			
	30	40	60	75	30	40	60	75
3'-0" OR LESS	14	12	10	9	5	5	5	5
4'-0"	14	12	10	9	5	5	5	5
5'-0"	14	12	10	9	5	5	5	5
6'-0"	14	12	10	9	5	5	5	5
7'-0"	14	12	10	9	5	5	5	5
7'-6"	14	12	10	8	5	5	5	5

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6			

P.E. SEAL/SIGNATURE/DATE

**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 10).

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, O				FLOOR MOUNTINGS X				WALL MOUNTINGS M, O				FLOOR MOUNTINGS X				WALL MOUNTINGS M, O				FLOOR MOUNTINGS X				WALL MOUNTINGS P			
	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	30	40	60	75	30	40	60	75	30	40	60	75	30	40	60	75	30	40	60	75	30	40	60	75
3'-0" OR LESS	12	10	10	9	6	6	6	6	12	10	10	9	6	6	6	6	12	10	10	9	6	6	6	6	6	5	4	4
4'-0"	12	10	10	9	6	6	6	6	12	10	10	9	6	6	6	6	12	10	10	9	6	6	6	6	6	5	4	4
5'-0"	12	10	10	9	6	6	6	6	12	10	10	9	6	6	6	6	12	10	10	9	6	6	6	6	6	5	4	4
6'-0"	12	10	10	9	6	6	6	6	12	10	10	9	6	6	6	5.5	12	10	10	9	6	6	6	6	6	5	4	4
7'-0"	12	10	10	9	6	6	6	5.5	12	10	10	9	6	6	6	5	12	10	10	7	6	6	6	5	6	5	4	4
7'-6"	12	10	10	7.5	6	6	6	5	12	10	10	6	6	6	5	4.5	12	10	10	4	6	6	5	4.5	6	5	4	-

+ NOTES ON ANCHORS REQUIREMENTS: WOOD SUBSTRATES.

1. ANCHORS TO WALL, FLOOR OR SOLID WOOD SOFFIT SHALL BE AS FOLLOWS:

- 1/4"Ø TAPCON ANCHORS, AS MANUFACTURED BY I.T.W. BUILDEX W/ MINIMUM EMBEDMENT AS INDICATED AT EACH SECTION ON SHEET 10.
EXCEPTION: SEE NOTE 2 BELOW.

2. 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)

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

T.D.I. 2003

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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

EASTERN METAL SUPPLY, INC.
(ASSA # 1)

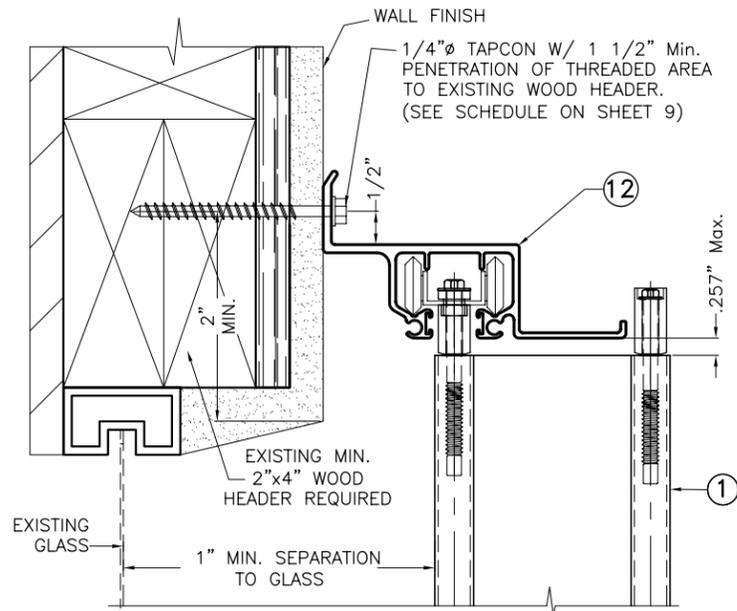
3600 23 AVE. SOUTH
LAKEWORTH, FL 33461
PH: (561)533-6061 FAX: (561)588-4780

BERTHA HV™
Accordion Shutter System

REV. No	DESCRIPTION	DATE	Drawn by: F.P.
1			DATE: 04/30/07
2			DRAWING No 07-111
3			
4			SHEET 9 OF 10
5			
6			

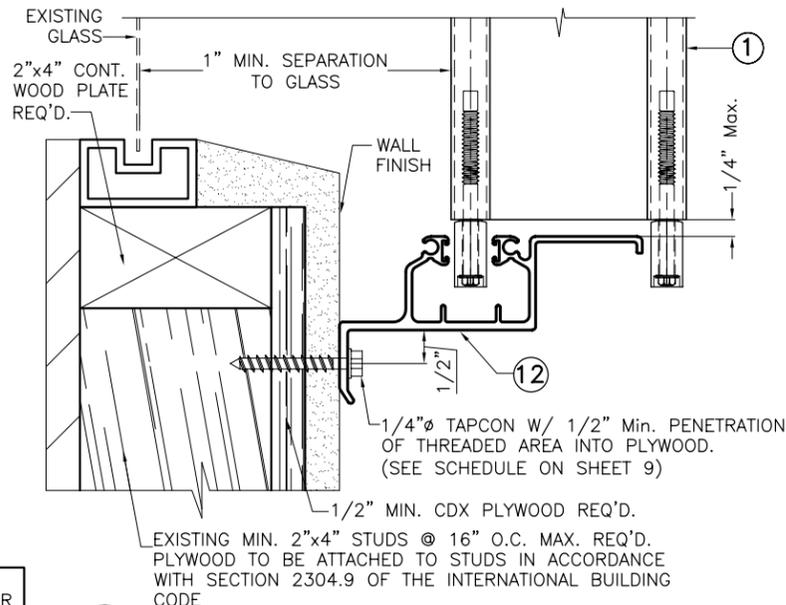
P.E. SEAL/SIGNATURE/DATE

INSTALLATION DETAILS ON EXISTING WOOD BUILDINGS FOR ① HV BLADE
MAX. SHUTTER SPAN L FOR INSTALLATIONS INTO WOOD SHALL BE LIMITED
TO 75.0 psf. DESIGN LOAD

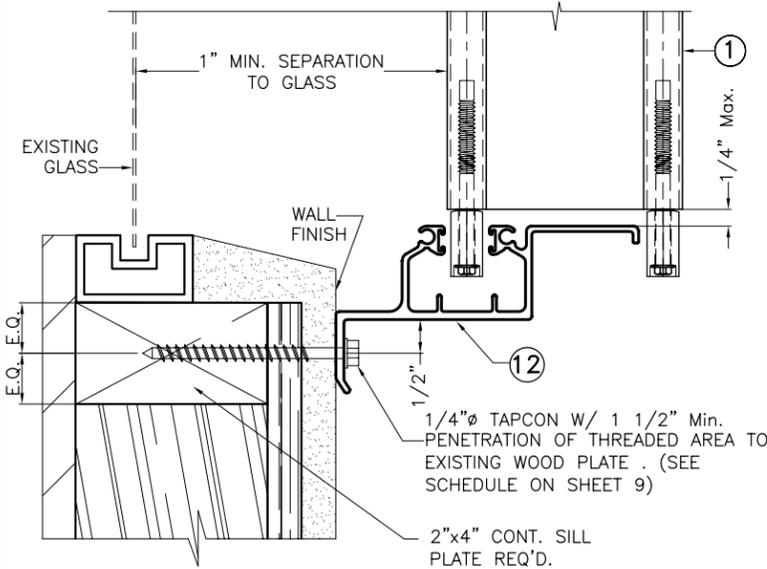


M HV WALL HEADER INSTALLATION

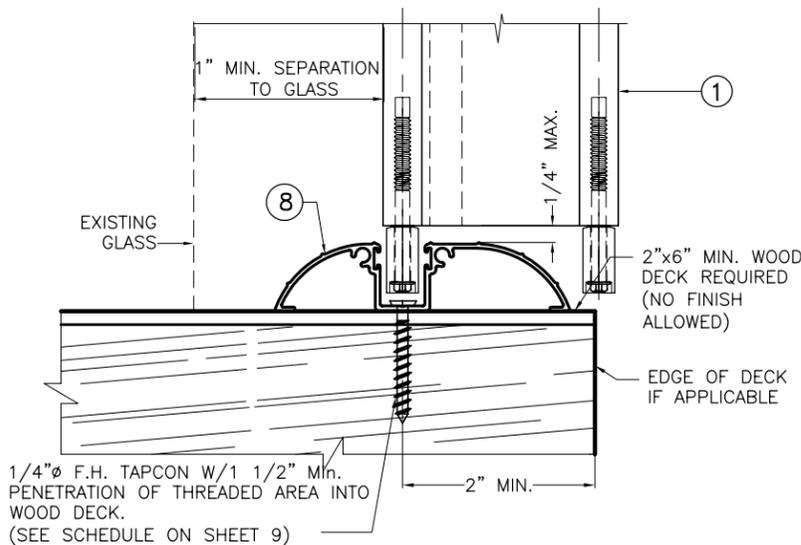
NOTE:
 1-SEE SHEET 3 FOR TYPICAL SHUTTER ASSEMBLY
 2-MOUNTING SECTIONS CAN BE COMBINED IN ANY WAY TO SUIT ANY INSTALLATION.



P HV WALL SILL INSTALLATION

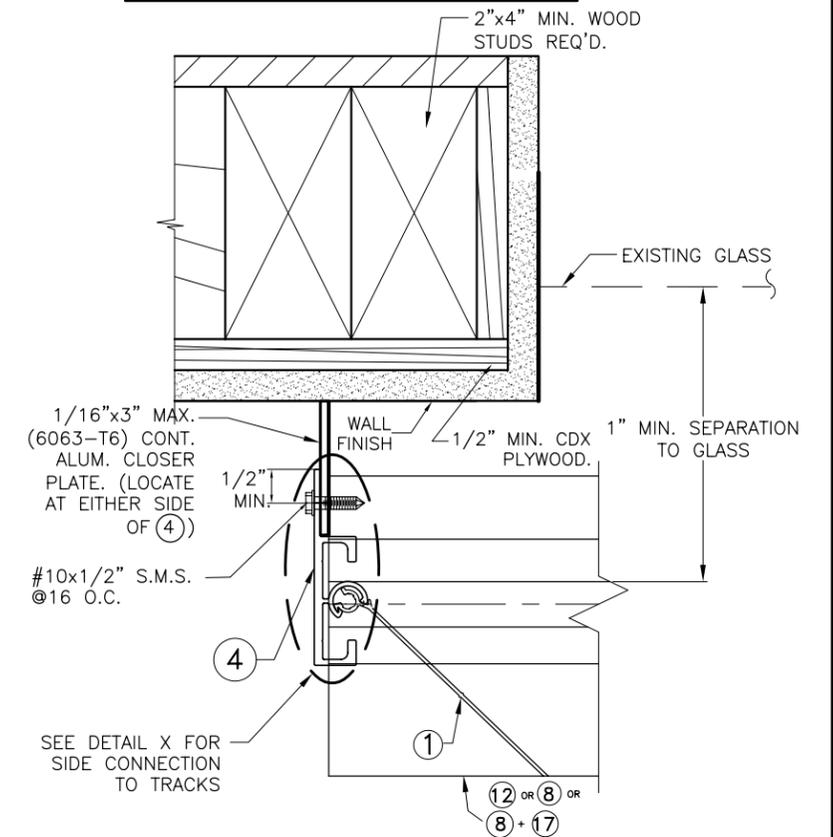


O HV WALL SILL INSTALLATION

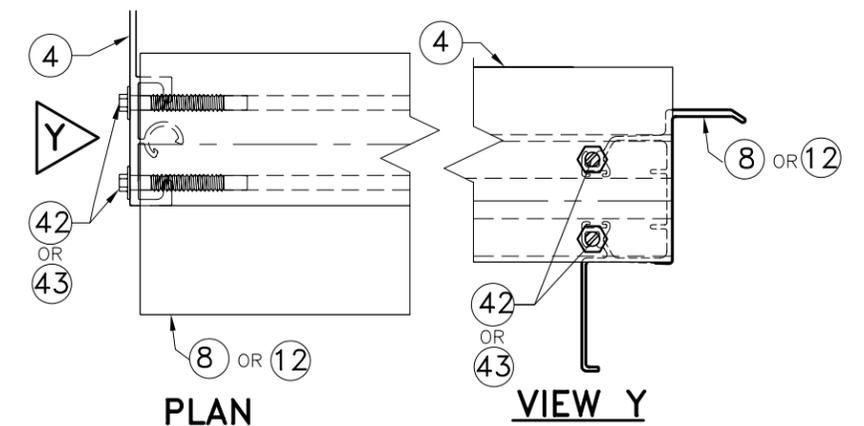


X HV WALK-OVER INSTALLATION

END INSTALLATIONS FOR ① HV BLADE INTO
2"x4" MIN. WOOD STUDS.



END CONNECTION DETAIL ⑧



PLAN

VIEW Y

DETAIL X

T.D.I. 2003

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BERTHA HV™
Accordion Shutter System

REV. No	DESCRIPTION	DATE	Drawn by: F.P.
1			DATE: 04/30/07
2			
3			DRAWING No
4			07-111
5			SHEET
6			10 OF 10



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 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
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 (ASSA # 1)

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 LAKEWORTH, FL 33461
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