

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 2004 EDITION OF THE FLORIDA BUILDING CODE WITH THE 2005 AND 2006 SUPPLEMENTS.
2. THIS ACCORDION SHUTTER SYSTEM MAY BE INSTALLED AT HIGH VELOCITY HURRICANE ZONES CORRESPONDING TO BROWARD COUNTY. DESIGN WIND LOADS SHALL BE DETERMINED AS PER SECTION 1620 OF THE ABOVE MENTIONED 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, IN ORDER TO VERIFY THAT ANCHORS ON THIS P.E.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 1609.1.4 OF THE ABOVE MENTIONED CODE AS PER ALL REPORTS:
 - HV BLADE ① #0214.01-03, #0715.01-03, #1004.01-05, #1214.01-05 AND 0317.02-06 AS PER HIGH VELOCITY HURRICANE ZONE TAS-201, TAS-202 AND TAS-203 PROTOCOLS
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-HIT 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 SHEET 2. MINIMUM YIELD STRENGTH FOR 6063-T6 ALLOY IS 30.0 KSI.
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 : 7, 8 AND 9.
8. THIS BERTHA H.V. ACCORDION SHUTTER SYSTEM BEARS A U.S. PATENT #6779,582. 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 CENTERPIECES AND ENGAGE OR LOCK ALL HV LOOKS.
11. SHUTTER'S MANUFACTURER LABEL SHALL BE PLACED ON A READILY VISIBLE LOCATION. ONE LABEL SHALL BE PLACED FOR EVERY OPENING. LABEL SHALL READ AS FOLLOWS:

EASTERN METAL SUPPLY, INC.
LAKEWORTH, FL.
FLORIDA STATEWIDE PRODUCT 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. THIS P.E.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.E.D.
14. CONTRACTOR TO BE RESPONSIBLE FOR THE SELECTION, PURCHASE AND INSTALLATION INCLUDING LIFE SAFETY OF THIS PRODUCT, BASED ON THIS P.E.D., PROVIDED HE/SHE DOES NOT DEVIATE FROM THE CONDITIONS DETAILED ON THIS DOCUMENT. CONSTRUCTION SAFETY AT SITE IS THE CONTRACTOR'S RESPONSIBILITY.
15. THIS P.E.O. WILL BE CONSIDERED INVALID IF ALTERED BY ANY MEANS.
16. SITE SPECIFIC PROJECTS SHALL BE PREPARED BY A FLORIDA REGISTERED ENGINEER OR ARCHITECT WHICH WILL BECOME THE ENGINEER OF RECORD (E.O.R.) FOR THE PROJECT AND WHO WILL BE RESPONSIBLE FOR THE PROPER USE OF THE P.E.O. ENGINEER OF RECORD, ACTING AS A DELEGATED ENGINEER TO THE P.E.O. ENGINEER SHALL SUBMIT TO THIS LATTER THE SITE SPECIFIC DRAWINGS FOR REVIEW.
17. THIS P.E.O. SHALL BEAR THE DATE AND ORIGINAL SEAL AND SIGNATURE OF THE PROFESSIONAL ENGINEER OF RECORD THAT PREPARED IT.

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BERTHA HV™


Accordion Shutter System

REV. NO.	DESCRIPTION	DATE	Drawn by: F.P.	DATE: 04/18/07
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10				



TILECO INC.

TILTIT TESTING & ENGINEERING COMPANY
8399 N.W. 36th St., Ste. 305, Vero Beach, Florida, 32986
Phone : (305)871-1530 ; Fax : (305)871-1531
e-mail: tileco@tileco.com
EB-0008719
WALTER A. TILIT JR., P. E.
Florida Lic. # 44187



WALTER A. TILIT JR., P. E.
No. 44187
State of Florida

EASTERN METAL SUPPLY, INC.
(ASSA # 1)

3600 23 AVE. SOUTH
LAKEWORTH, FL 33461
PH: (361)533-6061 FAX: (361)388-4780

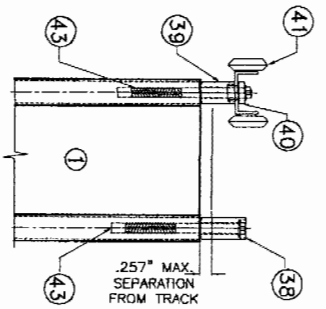
P.E. SEAL/SIGNATURE/DATE

SHUTTER ASSEMBLY SCHEDULE FOR HV ① AND HV ② BLADES.

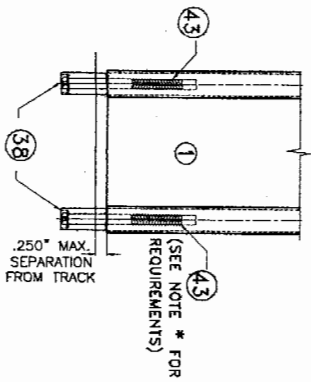
①	HV BLADE 1
③⑧	HV LONG RECESSED NYLON BUSHING
③⑨	HV SHORT RECESSED NYLON BUSHING
④①	HV WHEEL CARRIAGE AISI 302-303 SERIES Ø.870"x3/16" THICK NYLON WHEEL.
④②	HV 1 3/4" ACCORDION PIN W/ #8 HEAD *
④③	HV 2 3/4" ACCORDION PIN W/ #8 HEAD *

*** 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 ④③ 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.

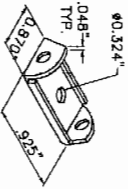


EXTERIOR



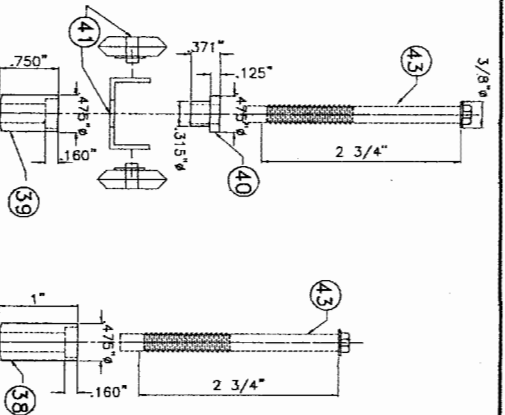
TYPICAL SHUTTER ASSEMBLY

SCALE: 3/8" = 1"



WHEEL CARRIAGE DETAIL

N.T.S.



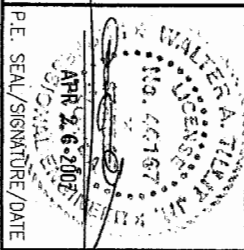
EXTERIOR

ASSEMBLY LAYOUT

N.T.S.

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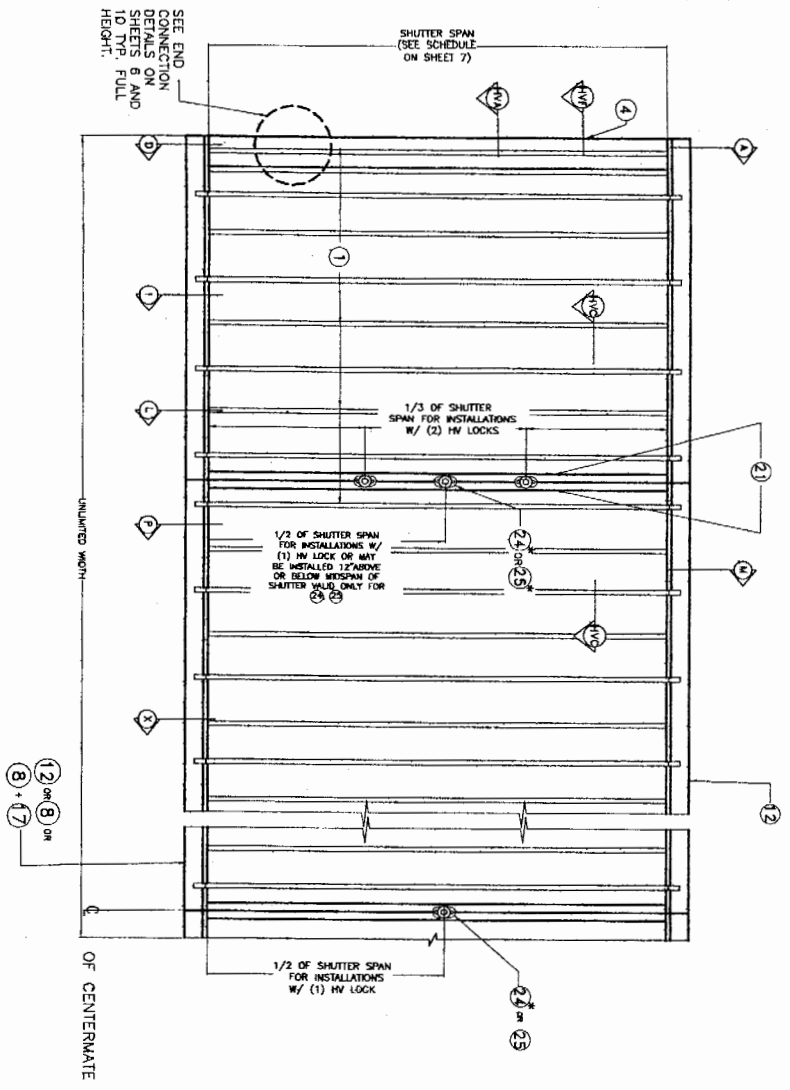
TILTECO INC.
 TILLIT TESTING & ENGINEERING COMPANY
 6333 N.W. 56th St., Ste 303, Miramar Gardens, Florida 33166
 Phone: (305)871-1334 Fax: (305)871-1331
 e-mail: TTE@tilteco.com
 WALTER A. TILLIT Jr., P. E.
 Florida Lic. # 44167

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

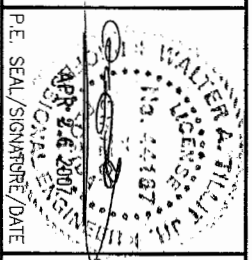
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DATE: 04/18/07
 DRAWING No 07-085
 SHEET 3 OF 10



TYPICAL SHUTTER ELEVATION
N.T.S.

- * NOTES ON HV LOCKS AND CENTERMATES:**
- MANDATORY CONDITION #1:** ONE HV LOCK (2) or (3) SHALL BE USED AT 1/2 OF SHUTTER SPAN FOR ANY SPAN OR 1/2" ABOVE OR BELOW 1/2 OF SHUTTER SPAN FOR SPANS UP TO 90" AND FOR INSTALLATIONS AT ANY ELEVATION. HV LOCK (2) or (3) MAY BE USED AS AN INSIDE OR OUTSIDE LOCK, ATTACHED TO (2) CENTERMATE W/ (2) 1/4" x 20 x 1/2" LONG FLAT HEAD S.S. W.S. LOCATION OF LOCK SHALL BE AS INDICATED ON TYPICAL SHUTTER ELEVATION.
 - OPTIONAL CONDITION #1:** IF DESIRED, FOR BETTER PERFORMANCE OR FOR SECURITY PURPOSES, UP TO TWO HV LOCKS (2) OR (3) MAY BE USED AS AN INSIDE OR OUTSIDE LOCK. CONNECTION OF LOCKS TO CENTERMATES (2) SHALL BE AS INDICATED ON NOTE (1) ABOVE.
- LOCATION OF LOCKS SHALL BE AS INDICATED ON TYPICAL SHUTTER ELEVATION.



TILECO INC.
TILLIT TESTING & ENGINEERING COMPANY
5335 N.W. 38th St., Ste. 305, Virginia Gardens, Florida 33166
Phone: (305)871-1530, Fax: (305)871-1531
e-mail: tileco@earthlink.net
WALTER A. TILLIT, Jr., P. E.
Florida Lic. # 44187

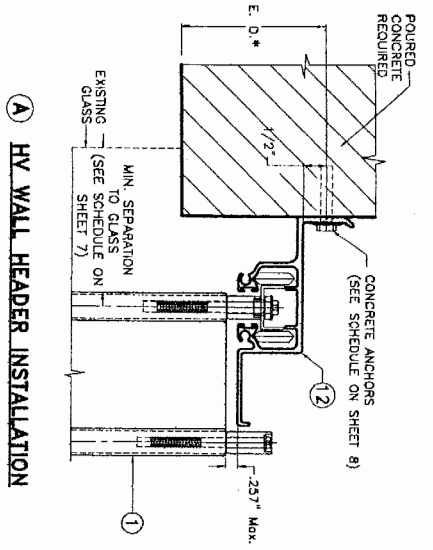
EASTERN METAL SUPPLY, INC.
(ASSA # 1)
3600 23 AVE. SOUTH
LAKEWORTH, FL 33461
PH: (561)533-6061 FAX: (561)588-4780

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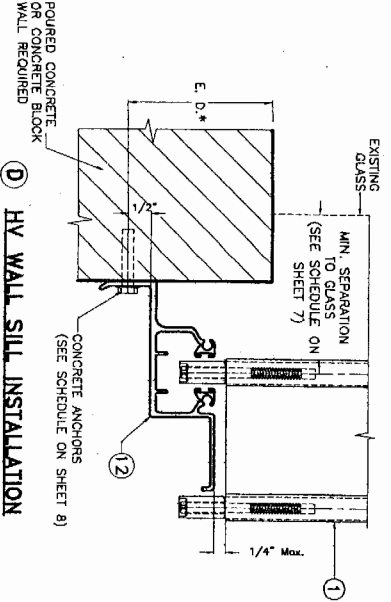
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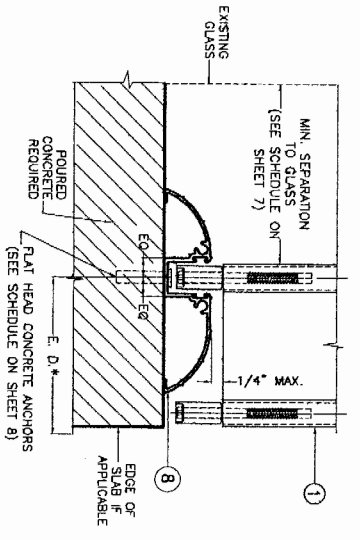
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SHEET 4 OF 10



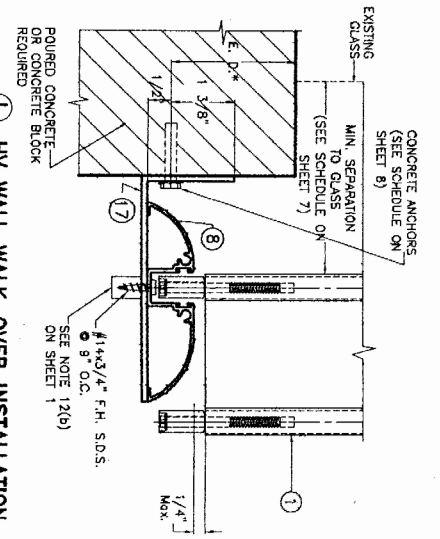
A HV WALL HEADER INSTALLATION



D HV WALL SILL INSTALLATION



I HV WALK-OVER INSTALLATION



L HV WALL WALK-OVER INSTALLATION

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

* E. D. = EDGE DISTANCE (SEE SPECIFICATIONS ON SHEET 7)

INSTALLATION DETAILS

WALTER A. TILLIT
 LICENSE NO. 44167
 PROFESSIONAL ENGINEER
 APR 26 2006
 P.E. SEAL/SIGNATURE/DATE

TILECO INC.
 TILLIT TESTING & ENGINEERING COMPANY
 355 N.W. 36th St., 316, 303, WINDY GARDENS, FLORIDA 33166
 Phone: (305)871-1153 Fax: (305)871-1531
 E-mail: tileco@tileco.com
 WALTER A. TILLIT, J. P. E.
 FLORIDA LIC. # 44167

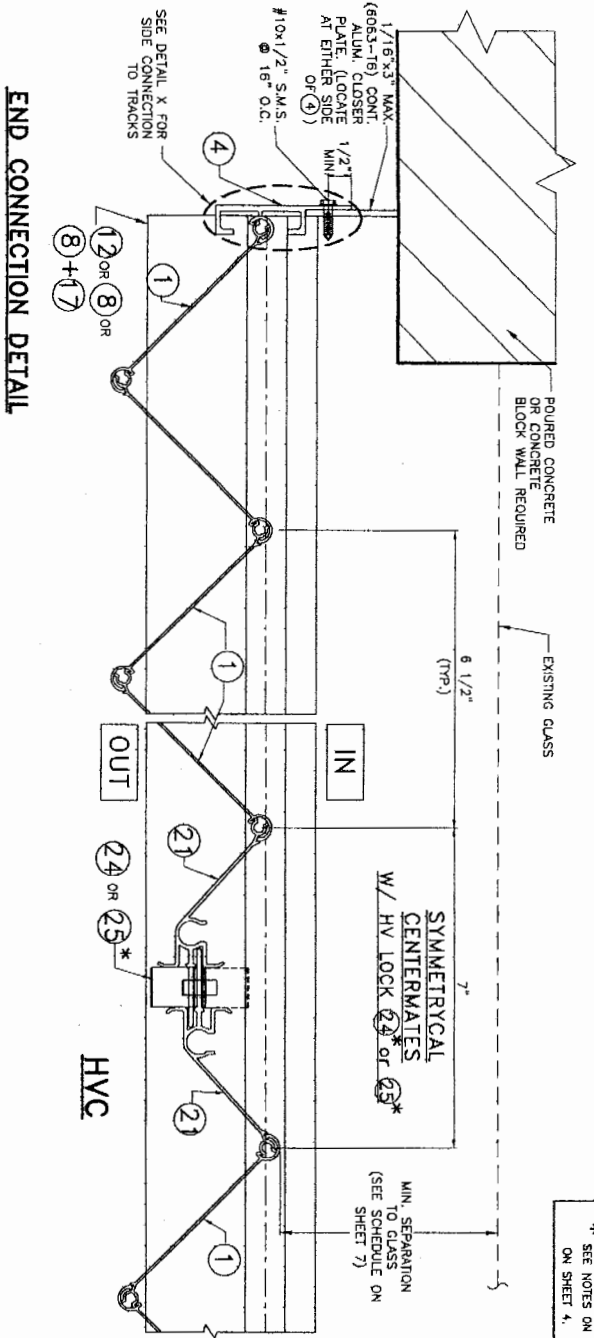
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 (ASSA # 1)
 3800 23 AVE. SOUTH
 LAKEWORTH, FL 33461
 PH: (561)533-6061 FAX: (561)588-4780

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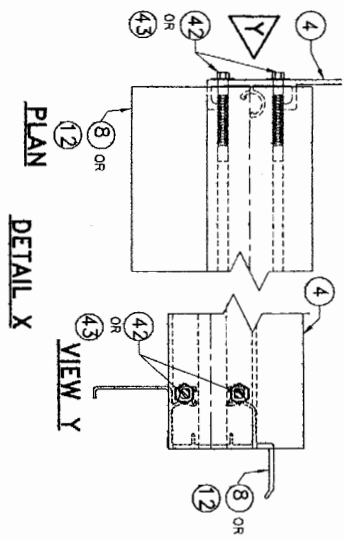
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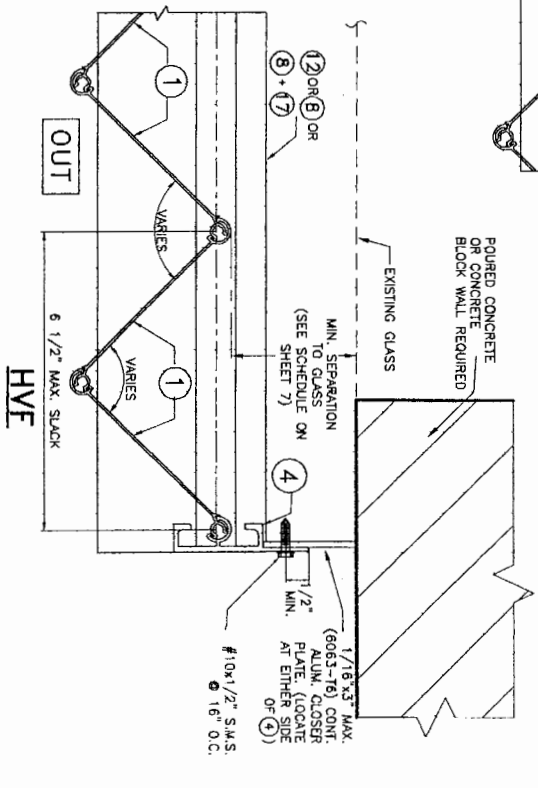
SHEET 5 OF 10



* SEE NOTES ON HV LOOKS (8) OR (9) ON SHEET 4.

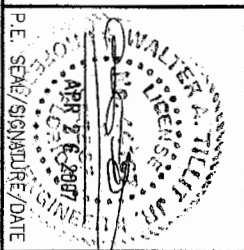


INSTALLATIONS W/ (1) HV BLADE W/ HV CENTERMATE (21) INTO CONCRETE OR CONCRETE BLOCK WALL.



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TILECO INC.
 TILLIT TESTING & ENGINEERING COMPANY
 2555 N.W. 36th St., Ste. 302, Miramar, Florida 33186
 Phone: (305) 871-1530 Fax: (305) 871-1531
 Email: tileco@tileco.com
 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

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Accordion Shutter System
BERTHA HV™
 SHEET 6 OF 10

SCHEDULE #1

MAXIMUM SHUTTER SPAN 1" (ft.)
FOR INSTALLATIONS W/
SYMMETRICAL CENTERMATES (21)
W/ ONE HV LOCK (2) OR (25) ◆

MAXIMUM DESIGN LOAD (psf or -)	CONCRETE & WOOD INSTALLATIONS ▲
75	WALL MOUNTING OR WALL/FLOOR MOUNTING
	1" (ft)
	7'-6"

▲ MAXIMUM SHUTTER SPAN 1" FOR INSTALLATIONS INTO WOOD SHALL BE LIMITED TO 75 psf. DESIGN LOAD.

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

◆ SEPARATION TO GLASS REQUIREMENTS
SEE BELOW FOR MINIMUM SEPARATION TO GLASS SCHEDULE FOR SHUTTERS INSTALLED WITHIN THE FIRST 30'-0" ELEVATION OF BUILDING MEASURED AT BOTTOM OF SHUTTER.

MINIMUM SEPARATION TO GLASS SCHEDULE: SHUTTER W/ ONE LOCK	90° OR LESS
SHUTTER SPAN	INSTALLATION W/ SYMMETRICAL CENTERMATES
	3 5/16"
MINIMUM SEPARATION TO GLASS SCHEDULE: SHUTTER W/ TWO LOCKS	90° OR LESS
SHUTTER SPAN	INSTALLATION W/ SYMMETRICAL CENTERMATES
	2 3/4"

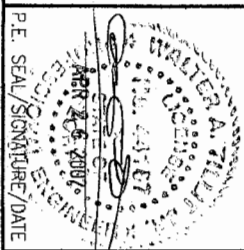
***SPECIFICATIONS ON ANCHOR REQUIREMENTS: POURED CONCRETE OR CONCRETE BLOCK SUBSTRATES**

1. ANCHORS TO WALL SHALL BE AS FOLLOWS:
 - (A) TO EXISTING POURED CONCRETE: (Min. f'c = 3 ksi)
 - 1/4" TAPCON ANCHORS, AS MANUFACTURED BY LITM, RAISE/ RED HEAD.
2. ANCHORS TO CONCRETE BLOCK SHALL BE AS FOLLOWS:
 - (A) 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 VENT. SIDING OR EPS CONSULT THIS ENGINEER.
 - (B) TO EXISTING CONCRETE BLOCK WALL: ASTM C-90
 - 1/4" TAPCON ANCHORS, AS MANUFACTURED BY LITM, RAISE/ RED HEAD.
3. MINIMUM EMBEDMENT INTO CONCRETE BLOCK OF TAPCON ANCHORS IS 1 1/4".
4. 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 VENT. SIDING OR EPS CONSULT THIS ENGINEER.
5. ANCHORS SHALL BE INSTALLED FOLLOWING ALL OF THE RECOMMENDATIONS AND SPECIFICATIONS OF THE ANCHORS MANUFACTURER.
6. 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" 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
3"	1/4" TAPCON
2 1/2"	0.83
2"	0.68
	0.50



TILECO INC.
TULLIT TESTING & ENGINEERING COMPANY
3555 N.W. 36th St., Suite 305, Miramar, Florida 33166
Phone: (305)971-1530 Fax: (305)971-1531
E-mail: tileco@tullit.com
WALTER A. TULLIT, Jr., P. E.
FLORIDA Lic. # 44167

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(ASSA # 1)
3600 23 AVE. SOUTH
LAKEWORTH, FL 33461
PH: (561)533-6061 FAX: (561)588-4780

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SHEET 7 OF 10

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 W/ ②					POURED CONCRETE/CONCRETE BLOCK W/ ②				
	30	40	60	75	90	30	40	60	75	90
3'-0" OR LESS	14	12	10	9	9	14	12	10	9	9
4'-0"	14	12	10	9	9	14	12	10	9	9
5'-0"	14	12	10	9	9	14	12	10	9	9
6'-0"	14	12	10	9	9	14	12	10	8	8
7'-0"	14	12	10	9	9	14	12	9	5	5
7'-6"	14	12	10	8	8	14	11.5	7	3	3

MAXIMUM SPAN (ft)	POURED CONCRETE ① WALL OVER MOUNTING					POURED CONCRETE/CONCRETE BLOCK ① WALL/WALK OVER MOUNTING				
	30	40	60	75	90	30	40	60	75	90
3'-0" OR LESS	14	12	10	9	9	5	5	5	5	5
4'-0"	14	12	10	9	9	5	5	5	5	5
5'-0"	14	12	10	9	9	5	5	5	5	5
6'-0"	14	12	10	9	9	5	5	5	5	5
7'-0"	14	12	10	9	9	5	5	5	5	5
7'-6"	14	12	10	8	8	5	5	5	5	5

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6			SHEET 8 OF 10

TILTECO INC.
TILLET TESTING & ENGINEERING COMPANY
355 N.W. 36th. St., Ste. 305, VIRGINIA GARDENS, FLORIDA 33166
Phone: (305)871-1530 · Fax: (305)871-1531
e-mail: tilteco@tillco.com
WALTER A. TILLET, P. E.
FLORIDA Lic. # 44167

WALTER A. TILLET
P. E.
APR 26 2007
P.E. SEAL/SIGNATURE/DATE

EASTERN METAL SUPPLY, INC.
(ASSA # 1)
3600 23 AVE. SOUTH
LAKEWORTH, FL 33461
PH: (561)533-6061 FAX: (561)588-4780

**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.**

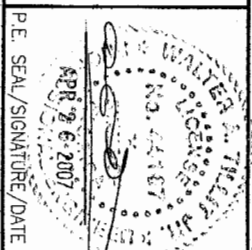
(SEE MOUNTINGS ON SHEET 10).

SUBSTRATE

MAXIMUM SPAN (ft)	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 M, O	FLOOR MOUNTINGS X			
30	40	60	75	30	40	60	75	30	40	60	75
3'-0" OR LESS	12	10	9	6	6	6	6	12	10	10	9
4'-0"	12	10	9	6	6	6	6	12	10	10	9
5'-0"	12	10	9	6	6	6	6	12	10	10	9
6'-0"	12	10	9	6	6	6	6	12	10	10	9
7'-0"	12	10	9	6	6	6	6	12	10	10	9
7'-6"	12	10	9	6	6	6	6	12	10	10	9

+ NOTES ON ANCHORS, REQUIREMENTS, WOOD SUBSTRATES.

- ANCHORS TO WALL, FLOOR OR SOLID WOOD SOFTIT SHALL BE AS FOLLOWS:
- 1/4" TAPCON ANCHORS, AS MANUFACTURED BY I.T.W. BULDEX W/ MINIMUM EMBEDMENT AS INDICATED AT EACH SECTION ON SHEET 10.
EXCEPTION: SEE NOTE 2 BELOW.
- 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.



TILECO INC.
TULLIT TESTING & ENGINEERING COMPANY
285 N.W. 36th St., Ste. 302, Miramar, Florida 33186
Phone: (305)871-1530 Fax: (305)871-1531
www.tileco.com
EB-000879
WALTER A. TULLIT JR., P. E.
FLORIDA Lic. # 44187

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

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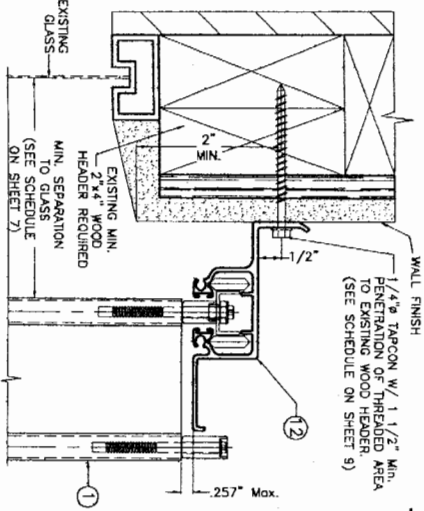
REV. No	DESCRIPTION	DATE	Drawn by: F.P.	DATE: 04/18/07
1				
2				
3				
4				
5				
6				

DRAWING No
07-085

SHEET
9 OF 10

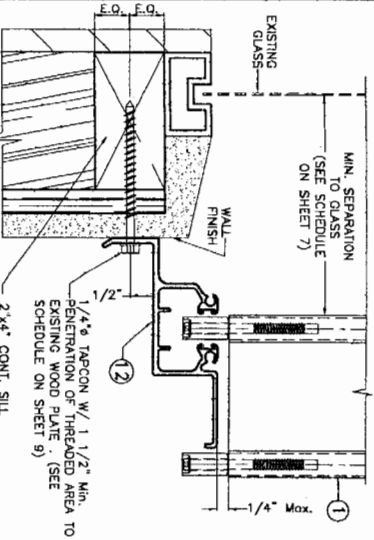
F.B.C.(High Velocity Hurricane Zone)

**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**

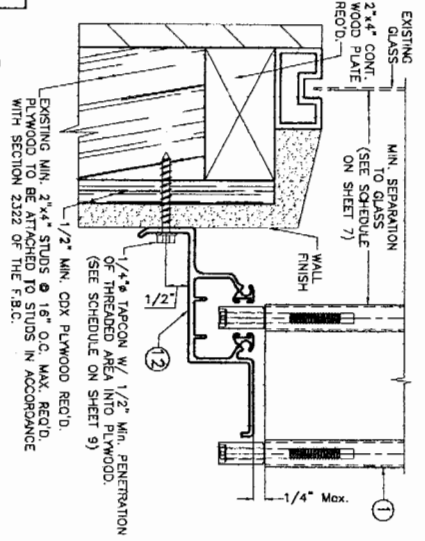


M HV WALL HEADER INSTALLATION

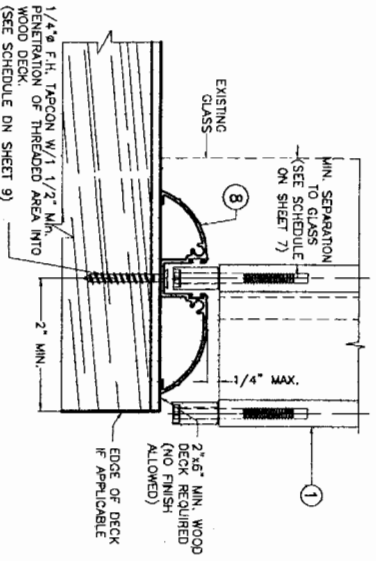
NOTE:
1- SEE DETAIL 1 FOR TYPICAL SHUTTER
2- INSTALLING SECTIONS CAN BE
COMBINED IN ANY WAY TO SUIT ANY
INSTALLATION.



O HV WALL SILL INSTALLATION

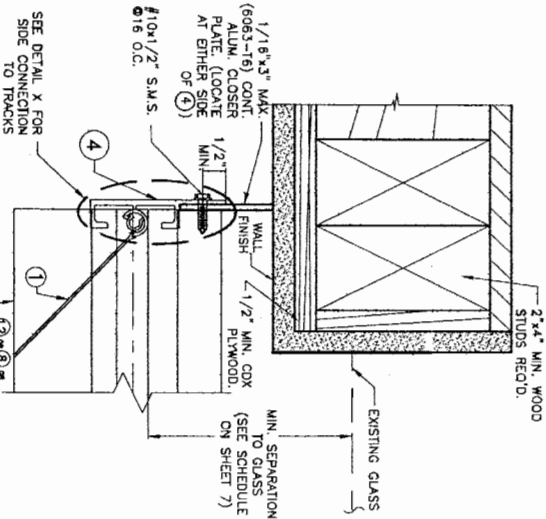


P HV WALL SILL INSTALLATION

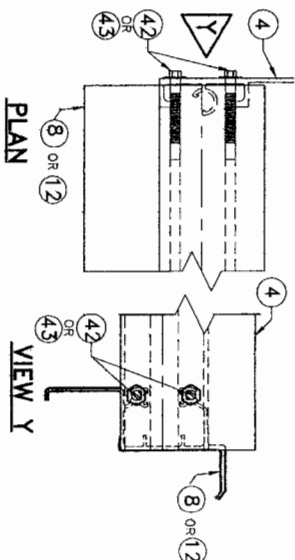


X HV WALK-OVER INSTALLATION

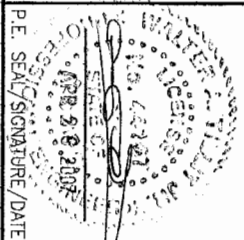
**END INSTALLATIONS FOR (1) HV BLADE INTO
2\"/>**



END CONNECTION DETAIL 8



**DETAIL X
F.B.C. (High Velocity Hurricane Zone)
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TILECO INC.
TULLIT TESTING & ENGINEERING COMPANY
6335 NW 36th St., Ste. 303, Virginia Gardens, Florida 33166
Phone: (305) 871-1530 Fax: (305) 871-1531
www.tileco.com
E-mail: 0008719@tileco.com
WALTER A. TULLIT, JR., P. E.
FLORIDA Lic. # 44187

EASTERN METAL SUPPLY, INC.
(ASSA # 1)
3600 23 AVE. SOUTH
LAKEWORTH, FL 33461
PH: (561) 533-6061 FAX: (561) 588-4780

REV. NO.	DESCRIPTION	DATE	Drawn By: F.P.
1		DATE: 04/18/07	
2			
3	DRAWING NO	07-085	
4			
5			
6			

BERTHA HV™
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SHEET 10 OF 10