

**GENERAL NOTES:**

1. BERTHA H.V. BAHAMA SHUTTER SHOWN ON THIS PRODUCT EVALUATION DOCUMENT (P.E.D.) HAS BEEN VERIFIED FOR COMPLIANCE IN ACCORDANCE WITH THE 2023 (8th EDITION) OF THE FLORIDA BUILDING CODE. THIS BAHAMA SHUTTER SHALL NOT BE INSTALLED AT HIGH VELOCITY HURRICANE ZONES. (MIAMI DADE/ BROWARD COUNTY)  
 DESIGN WIND LOADS SHALL BE DETERMINED AS PER SECTION 1609 OF THE ABOVE MENTIONED CODE, FOR A BASIC WIND SPEED AS REQUIRED BY THE JURISDICTION WHERE THESE SHUTTERS WILL BE INSTALLED FOR A DIRECTIONALITY FACTOR  $K_d=0.85$ . USING ASCE 7-22 AND SHALL NOT EXCEED THE MAXIMUM (A.S.D.) DESIGN PRESSURE RATINGS INDICATED ON NOTE 2.  
 IN ORDER TO VERIFY THE ABOVE CONDITION, ULTIMATE DESIGN WIND LOADS DETERMINED PER ASCE 7-22 SHALL BE FIRST REDUCED TO A.S.D. DESIGN WIND LOADS BY MULTIPLYING THEM BY 0.6 IN ORDER TO COMPARE THESE W/ MAX. (A.S.D.) DESIGN PRESSURE RATINGS INDICATED ON NOTE 2.  
 IN ORDER TO VERIFY THAT ANCHORS ON THIS P.E.D., AS TESTED, WERE NOT OVERSTRESSED, A 33% INCREASE IN ALLOWABLE STRESS FOR WIND LOADS WAS NOT USED IN THEIR ANALYSIS. HOWEVER, FOR CONNECTIONS INTO WOOD, A 1.60 WIND LOAD DURATION FACTOR WAS USED TO CALCULATE SCREWS SPACINGS. BERTHA H.V. BAHAMA SHUTTER'S ADEQUACY FOR IMPACT AND CYCLIC RESISTANCE HAS BEEN VERIFIED IN ACCORDANCE WITH SECTION 1609.1.2 OF THE ABOVE MENTIONED CODE AS PER ATL REPORTS # 0510.01-06 , 0621.01-07 AND 1222.01-20 AS PER ASTM E 1886, ASTM E 1996 AND ASTM E-330 STANDARDS, QUALIFIED FOR WIND ZONE 3, MISSILE TYPE D & SMALL MISSILE, BASIC PROTECTION ONLY.
2. SEE MAXIMUM A.S.D. DESIGN PRESSURE RATINGS & MAXIMUM SHUTTER DIMENSIONS ON SCHEDULE ON SCHEDULE ON SHEET 7.
3. ALL ALUMINUM EXTRUSIONS SHALL BE ALUMINUM ASSOCIATION 6063-T6 ALLOY AND TEMPER, WITH  $F_y = 25.0$  ksi MINIMUM (UNLESS OTHERWISE NOTED). ALL ALUMINUM EXTRUSIONS IN CONTACT WITH DISSIMILAR MATERIALS SHALL COMPLY WITH SECTION III-6 OF THE 2020 ALUMINUM DESIGN MANUAL.
4. ALL SCREWS TO BE STAINLESS STEEL 304 OR 316 AISI SERIES WITH 50 ksi YIELD POINT AND 90 ksi TENSILE STRENGTH AND SHALL COMPLY W/ FLORIDA BUILDING CODE SECTION 2411.3.3.4.
5. BOLTS TO BE AISI 304 SERIES STAINLESS STEEL WITH 35 ksi MINIMUM YIELD STRENGTH.
6. ALL ALUMINUM POP RIVETS TO BE 5052 ALUMINUM ALLOY WITH ALUMINUM MANDREL.
7. ANCHORS TO WALL SHALL BE AS FOLLOWS: (UNLESS OTHERWISE NOTED)

- (A) TO EXISTING WOOD UNITS: SOUTHERN PINE No.2,  $G=0.55$ .
- 1/4"Ø TAPCON ANCHORS AS MANUFACTURED BY I.T.W. BUILDEX, INC.
  - 1/4"Ø x 1 7/16" PANELMATE INSERTS AS MANUFACTURED BY ELCO CONSTRUCTION PRODUCTS.

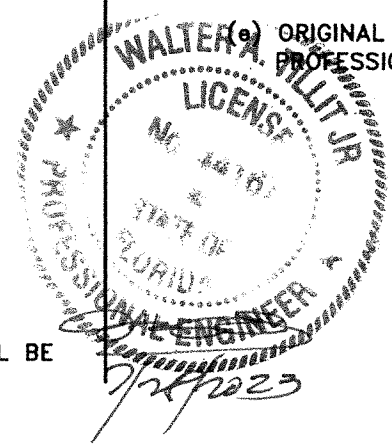
**NOTES:**

- A.1) MINIMUM THREADED PENETRATION OF TAPCON ANCHORS INTO WOOD SHALL BE 1 1/2".
  - A.2) MINIMUM THREADED PENETRATION OF PANELMATE INSERT INTO WOOD SHALL BE 1 5/8".
  - A.3) IN CASE THAT PRECAST STONE OR PRECAST CONCRETE PANELS BE FOUND ON THE EXISTING WALL, ANCHORS SHALL BE LONG ENOUGH TO REACH THE MAIN STRUCTURE BEHIND SUCH PANELS. ANCHORAGE SHALL BE AS INDICATED ON NOTES A.1 AND A.2).
- (B) TO EXISTING POURED MIN.  $f'_c=3192$  psi. CONCRETE OR CONCRETE ASTM C-90 BLOCK UNITS:
- 1/4"Ø TAPCON ANCHORS AS MANUFACTURED BY I.T.W. BUILDEX, INC.
  - 1/4"Øx3/4" ALL POINTS SOLID-SET ANCHORS AS DISTRIBUTED BY ALL POINTS SCREW, BOLT & SPECIALTY COMPANY.
  - 1/4"Øx1 7/16" PANELMATE INSERTS AS MANUFACTURED BY ELCO FASTENING SYSTEMS, LLC.
- B.1) MINIMUM EMBEDMENT OF TAPCON ANCHORS INTO POURED CONCRETE SHALL BE 1 3/4" OR CONCRETE HOLLOW BLOCK SHALL BE 1 1/4".
  - B.2) MINIMUM EMBEDMENT OF 1/4"Øx3/4" ALL POINTS SOLID-SET ANCHORS INTO POURED CONCRETE SHALL BE 7/8" OR INTO CONCRETE HOLLOW BLOCK SHALL BE ENTIRELY EMBEDDED.  
 NO EMBEDMENT INTO STUCCO SHALL BE PERMITTED. 1/4"Ø-20 S.S. MACHINE SCREW USED SHALL BE 1 1/2" LONG MINIMUM SHOULD STUCCO EXIST, AND 1" MINIMUM FOR WALLS WITH NO STUCCO.

- B.3) MINIMUM EMBEDMENT OF PANELMATE INSERTS INTO CONCRETE OR CONCRETE BLOCK SHALL BE 1 5/8" FOR CONCRETE AND 1 1/4" FOR BLOCK, RESPECTIVELY. 1/4"Ø-20 S.S. TRUSS HEAD MACHINE SCREW USED SHALL BE 1 1/4" LONG SHOULD STUCCO EXIST, AND 1" MINIMUM FOR WALLS WITH NO STUCCO.
  - B.4) IN CASE THAT PRECAST STONE OR PRECAST CONCRETE PANELS BE FOUND ON THE EXISTING WALL, ANCHORS SHALL BE LONG ENOUGH TO REACH THE MAIN STRUCTURE BEHIND SUCH PANELS. ANCHORAGE SHALL BE AS INDICATED ON NOTES B.1, B.2 AND B.3).
- (C) ANCHORS SHALL BE INSTALLED FOLLOWING ALL OF THE RECOMMENDATIONS AND SPECIFICATIONS OF THE ANCHOR'S MANUFACTURER.
8. EACH SHUTTER SHALL HAVE A LEGIBLE AND READILY VISIBLE MARKING INSTRUCTING OWNER OR TENANT TO SECURE SHUTTER WITH SILL BRACKETS DURING PERIODS OF HURRICANE WARNINGS.
  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 IN CONTINUOUS CONTACT WITH THE BUILDING TO PREVENT WIND/RAIN INTRUSION.
  10. BERTHA H.V. BAHAMA SHUTTER'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. SHUTTER'S MANUFACTURER LABEL SHALL BE LOCATED ON A READILY VISIBLE LOCATION AT EXPOSED SURFACE OF THE BAHAMA FRAME (C), (D) OR (E) IN ACCORDANCE WITH SECTION 1709.9.3 OF FLORIDA BUILDING CODE. ONE LABEL SHALL BE PLACED FOR EVERY OPENING. LABELING TO COMPLY WITH SECTION 1709.9.2 OF THE FLORIDA BUILDING CODE.
  12. (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 FLORIDA REGISTERED ENGINEER OR ARCHITECT WHICH WILL BECOME THE ENGINEER OF RECORD (E.O.R.) FOR THE PROJECT AND WHO WILL BE RESPONSIBLE FOR THE PROPER USE OF THE P.E.D. ENGINEER OF RECORD, ACTING AS A DELEGATED ENGINEER TO THE P.E.D. ENGINEER, SHALL SUBMIT TO THIS LATTER THE SITE SPECIFIC DRAWINGS FOR REVIEW.

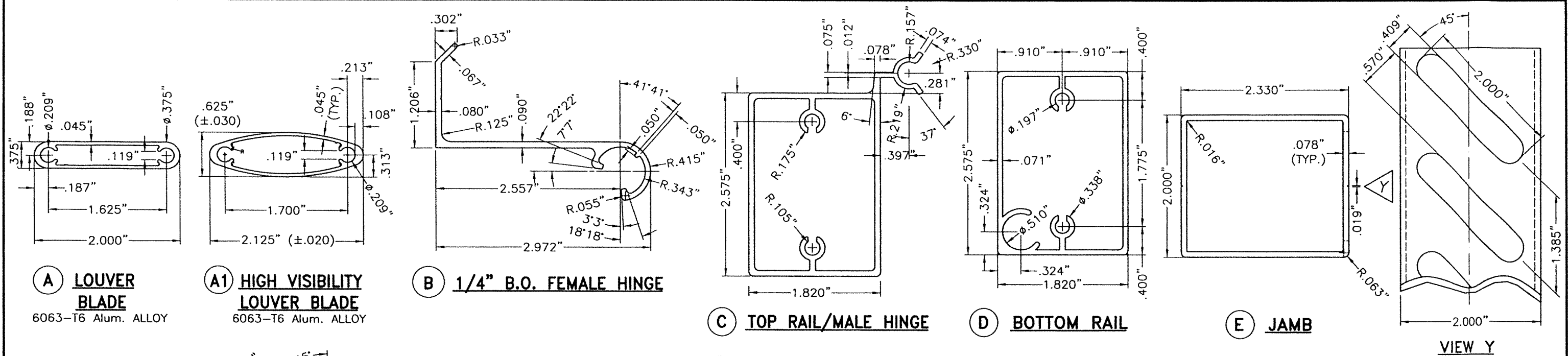
(e) ORIGINAL P.E.D. SHALL BEAR THE DATE AND ORIGINAL SEAL AND SIGNATURE OF THE PROFESSIONAL ENGINEER OF RECORD THAT PREPARED IT.

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



**FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)**

© 2023 TILTECO, INC.		ASSA / BERTHA H.V. BAHAMA SHUTTER (LARGE MISSILE & SMALL MISSILE)		Y.M. DRAWN BY
<b>TILTECO INC.</b>		AMERICAN SHUTTER SYSTEMS ASSOC., INC.		7/28/2023 DATE
TILLIT TESTING & ENGINEERING COMPANY 6355 N.W. 38th St., Ste. 305 VIRGINIA GARDENS, FLORIDA 33166 Phone: (305)871-1530 Fax: (305)871-1531 e-mail: tilteco@aol.com CA-0006719 WALTER A. TILLIT Jr., P. E. FLORIDA Lic. # 44167		4268 WESTROADS DRIVE WEST PALM BEACH, FLORIDA 33407 PH: (800)432-2204 FAX: (561)209-8380		<b>23-139</b> DRAWING No
REV. No	DESCRIPTION	DATE	REV. No	DESCRIPTION
1	OLD 20-166	7/28/23	3	
2			4	
				SHEET 1 OF 7



**A LOUVER BLADE**  
6063-T6 Alum. ALLOY

**A1 HIGH VISIBILITY LOUVER BLADE**  
6063-T6 Alum. ALLOY

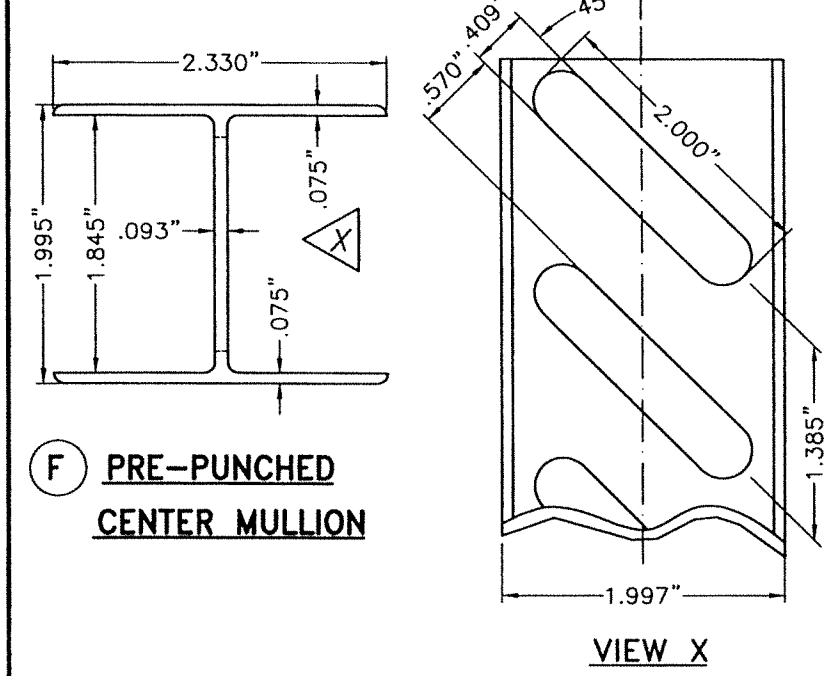
**B 1/4\"/>**

**C TOP RAIL/MALE HINGE**

**D BOTTOM RAIL**

**E JAMB**

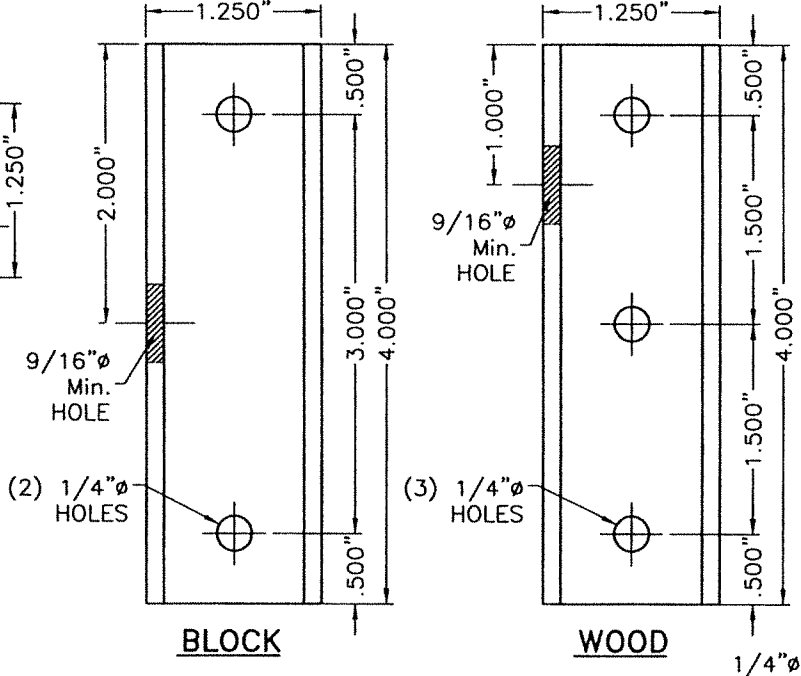
**VIEW Y**



**F PRE-PUNCHED CENTER MULLION**

**G CHANNEL**

**VIEW X**



**H LOCKING ROD AT EXTERIOR FIXATION**

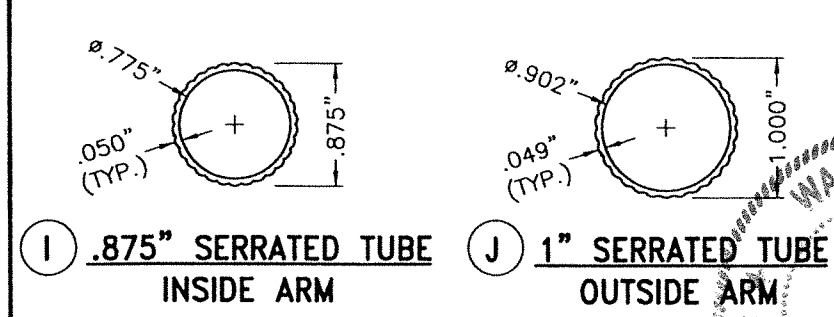
**H LOCKING ROD AT INTERIOR FIXATION**

**VIEWS Z**

**BLOCK**

**WOOD**

1/4"φ-20x1" LONG  
S.S. THUMBSCREW OR  
3/8"φ-16x1" LONG  
ACETAL THUMBSCREW.



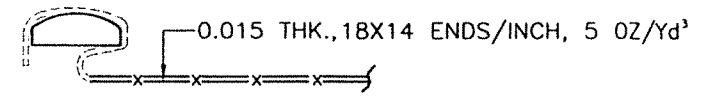
**I .875\"/>**

**J 1\"/>**

**K CAMEL BACK HINGE**

**L SCREEN SPLINE FLANGE FOR M**

6005-T5 Alum. ALLOY

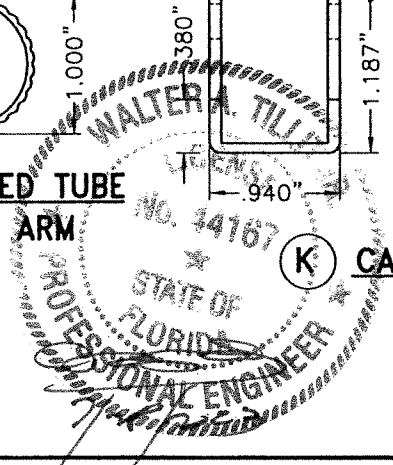


**M PVC COATED FIBERGLASS SCREEN**

18.0 Lb TEAR WARP CAPACITY  
(MODEL 1814013 FIB, By ADFORS-ST-GOBAIN)

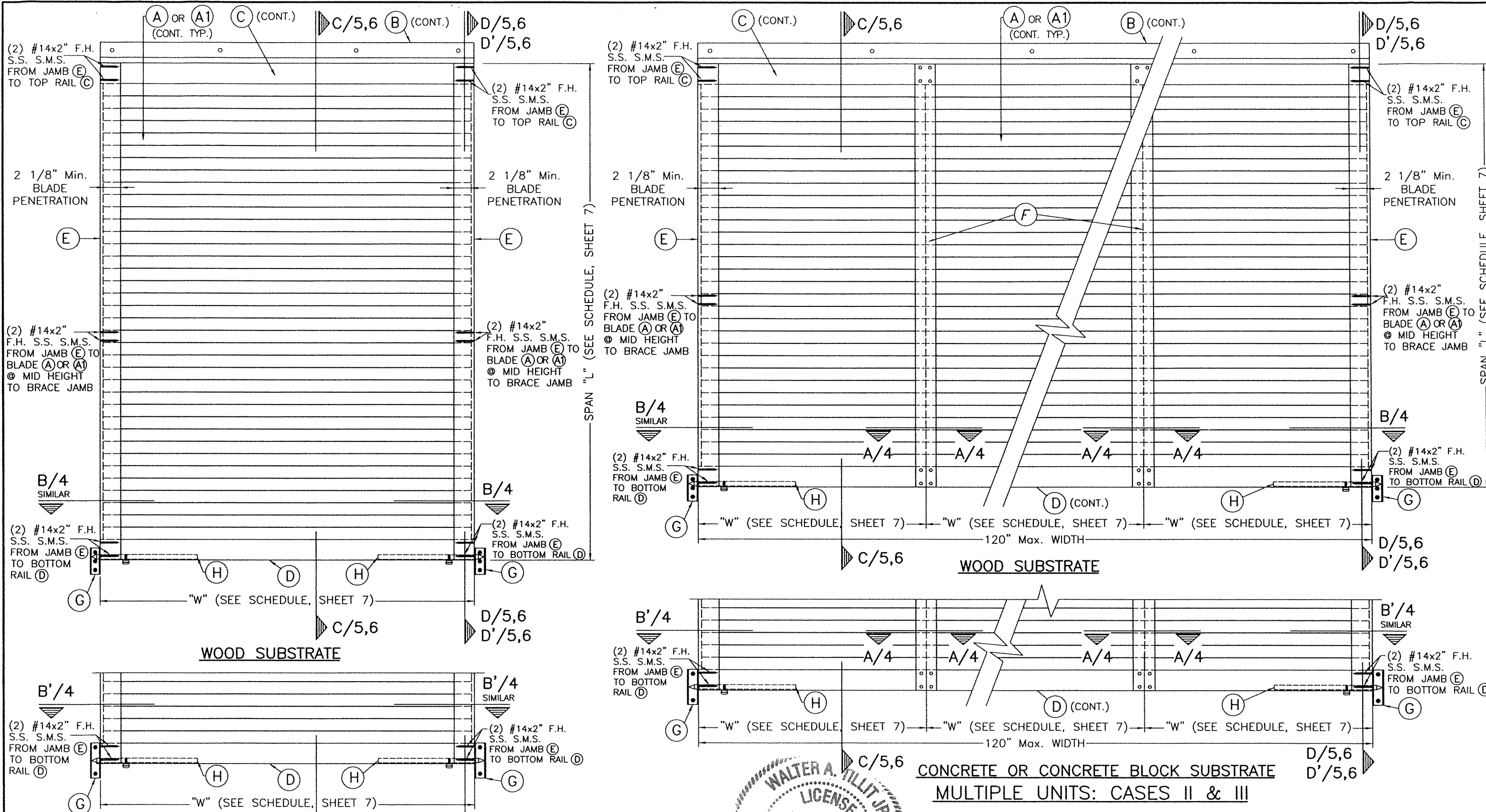
**COMPONENTS**

SCALE: 3/4" = 1"



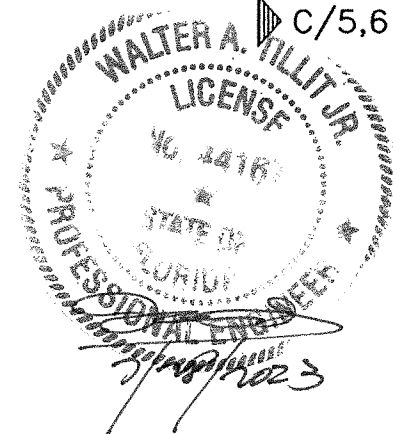
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1	OLD 20-166	7/28/23	3		
2			4		



SPAN "L" (SEE SCHEDULE, SHEET 7)

SPAN "L" (SEE SCHEDULE, SHEET 7)



CONCRETE OR CONCRETE BLOCK SUBSTRATE  
SINGLE UNITS: CASE I

EXTERIOR ELEVATIONS FOR INSTALLATIONS  
WITH EXTERIOR LOCKING ROD (H) FIXATION

N.T.S.

CONCRETE OR CONCRETE BLOCK SUBSTRATE  
MULTIPLE UNITS: CASES II & III

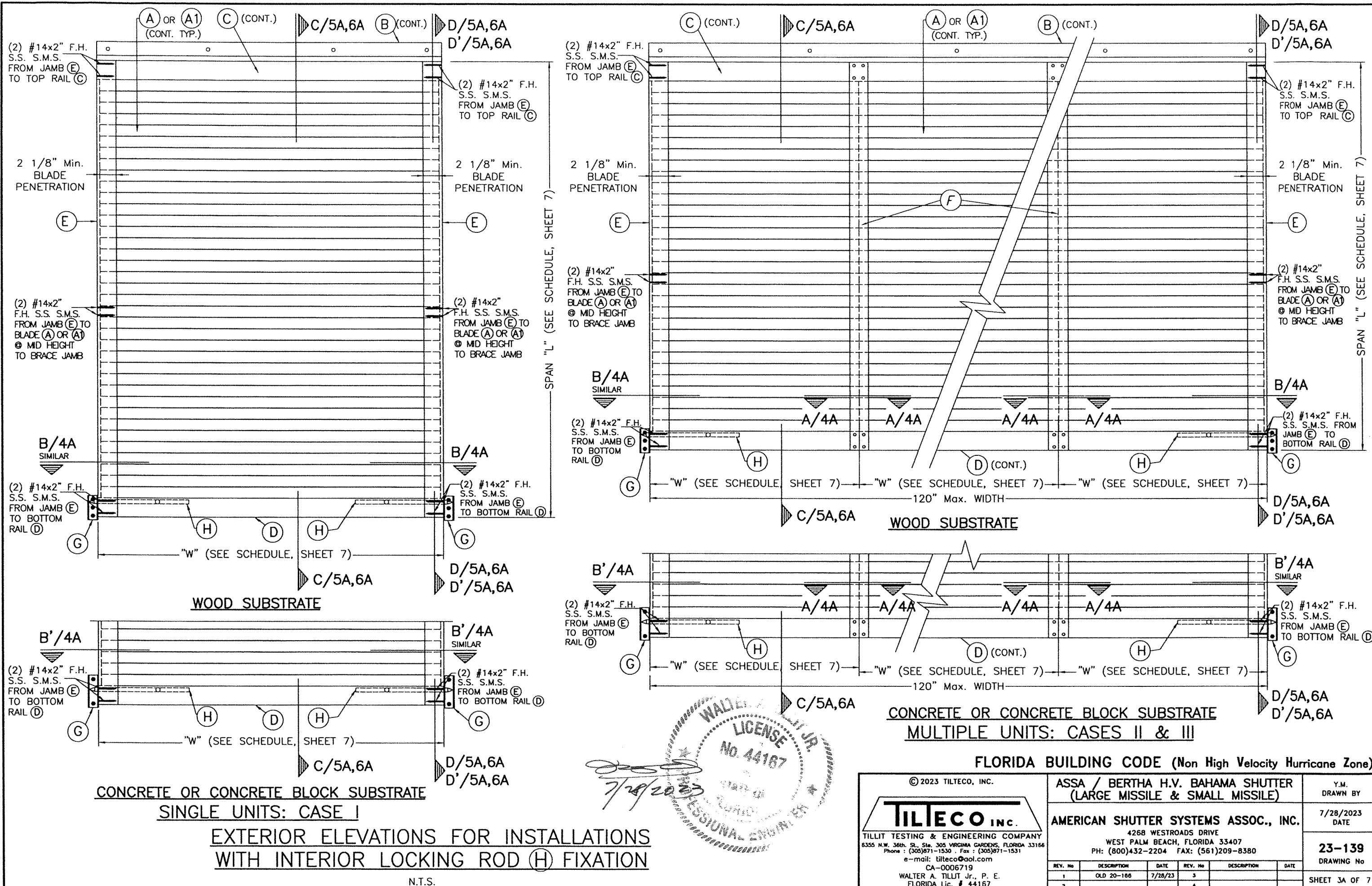
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23-139 DRAWING No		SHEET 3 OF 7			
REV. No	DESCRIPTION	DATE	REV. No	DESCRIPTION	DATE
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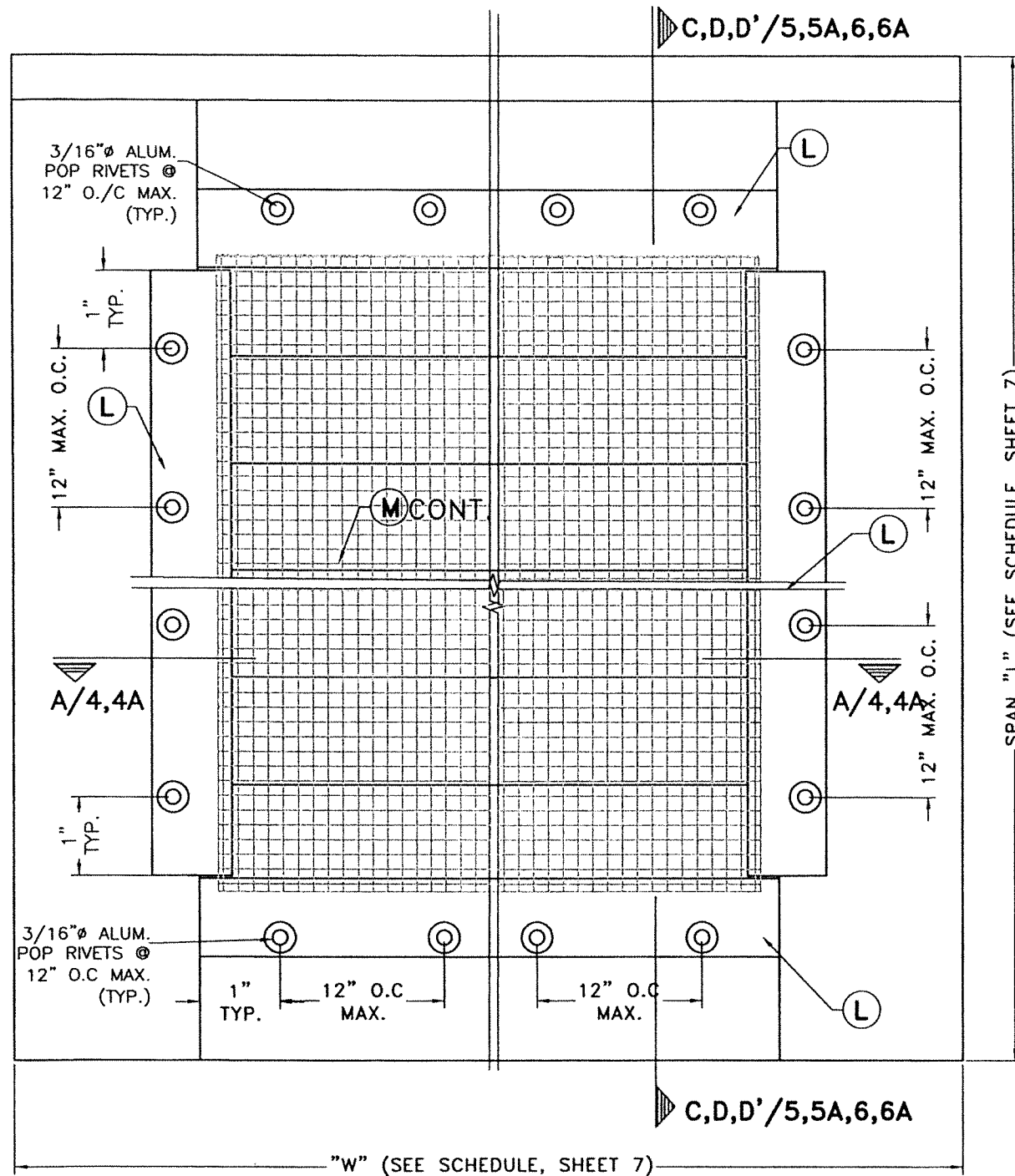
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**23-139** DRAWING No  
 SHEET 3A OF 7

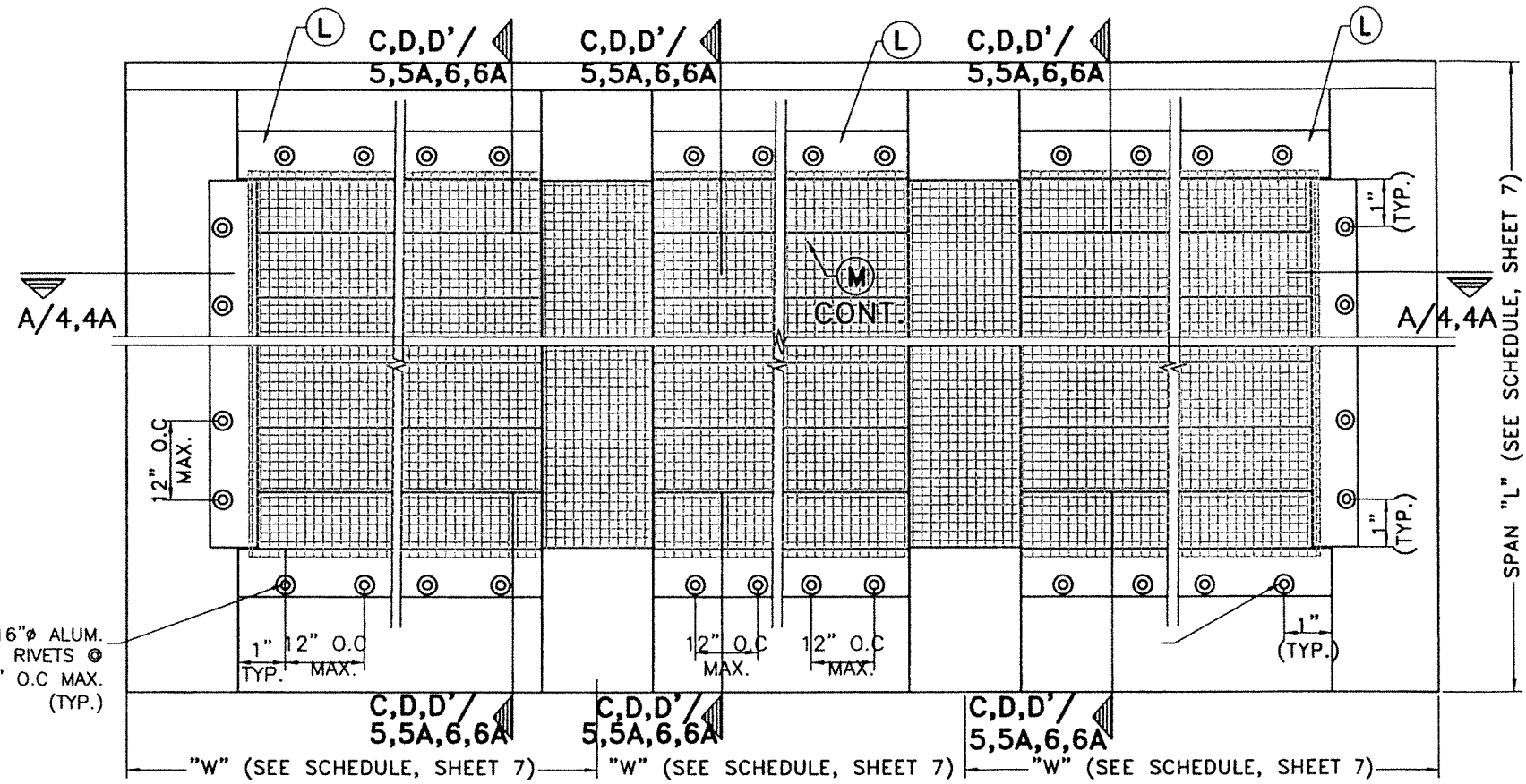
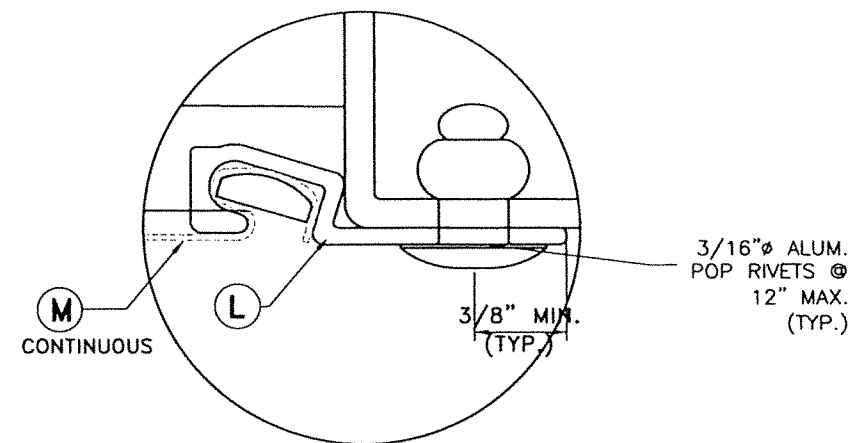
**EXTERIOR ELEVATIONS FOR INSTALLATIONS  
 WITH INTERIOR LOCKING ROD (H) FIXATION**

N.T.S.



**INTERIOR ELEVATION A FOR SINGLE UNITS  
HV BAHAMA SCREEN ATTACHMENT**

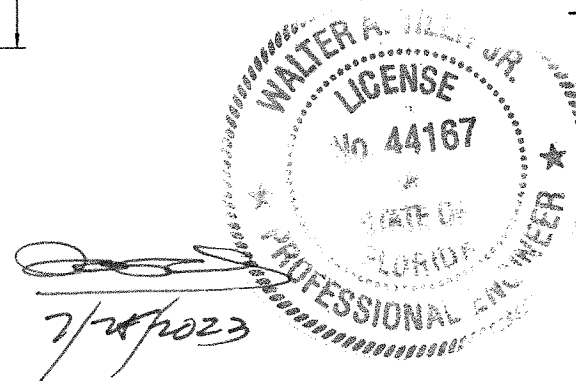
N.T.S.



**INTERIOR ELEVATION A FOR MULTIPLE UNITS  
HV BAHAMA SCREEN ATTACHMENT**

N.T.S.

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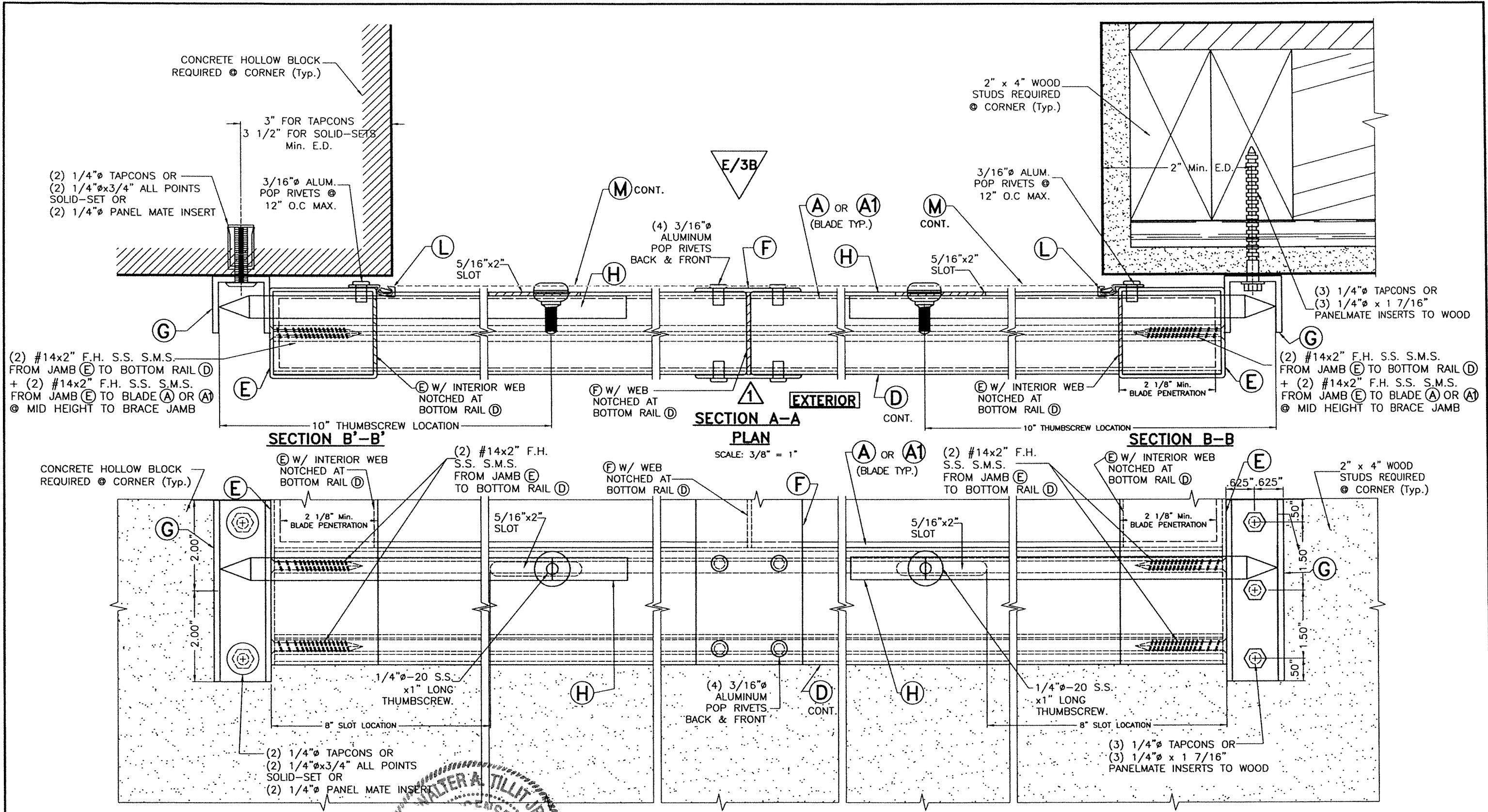
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Y.M.  
DRAWN BY

7/28/2023  
DATE

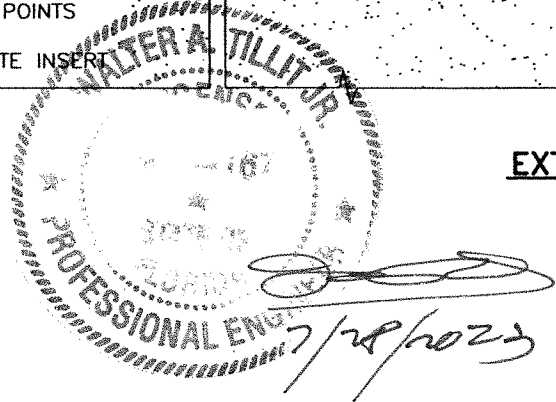
**23-139**  
DRAWING No

SHEET 3B OF 7



**EXTERIOR ELEVATION A**  
SCALE: 3/8" = 1"

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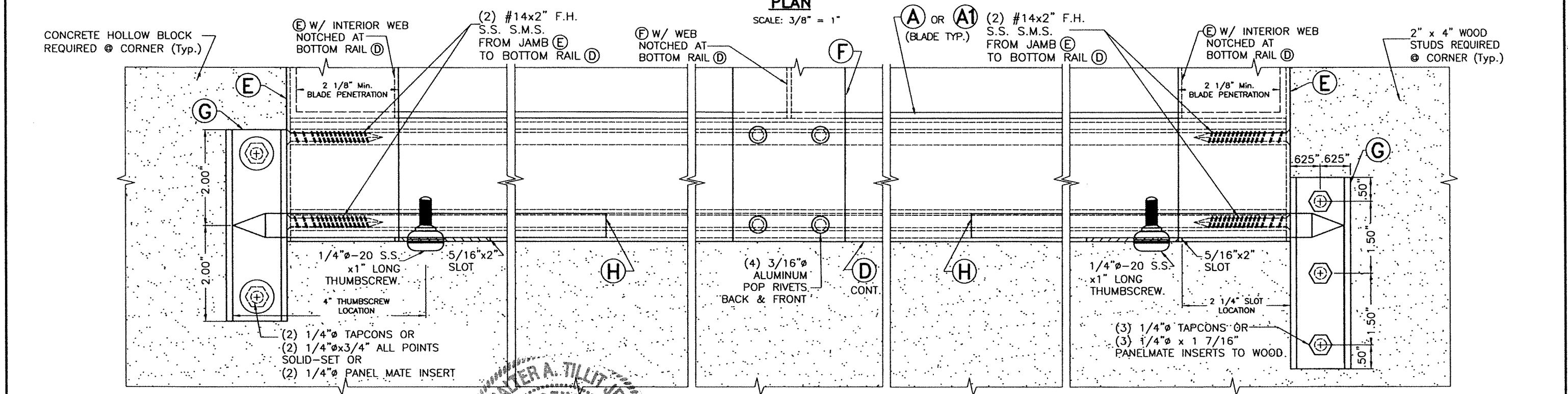
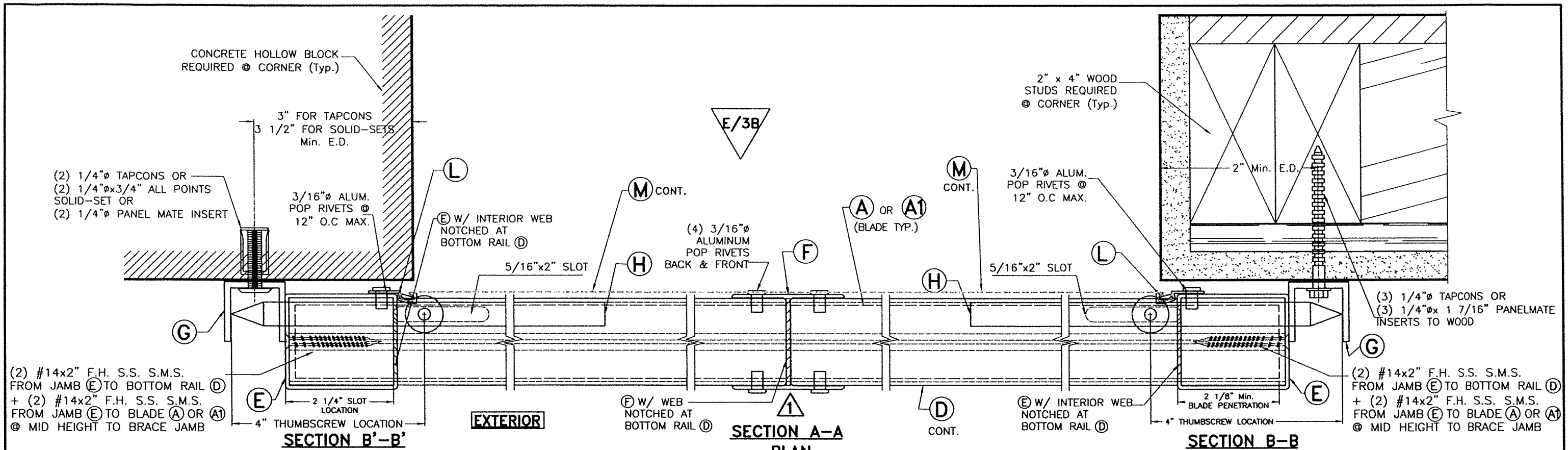
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Y.M. DRAWN BY  
7/28/2023 DATE  
**23-139** DRAWING No  
SHEET 4A OF 7



WALTER A. TILLIT JR.  
 LICENSE  
 NO. 14167  
 PROFESSIONAL ENGINEER  
 7/28/2023

**EXTERIOR ELEVATION 1**  
 SCALE: 3/8" = 1"

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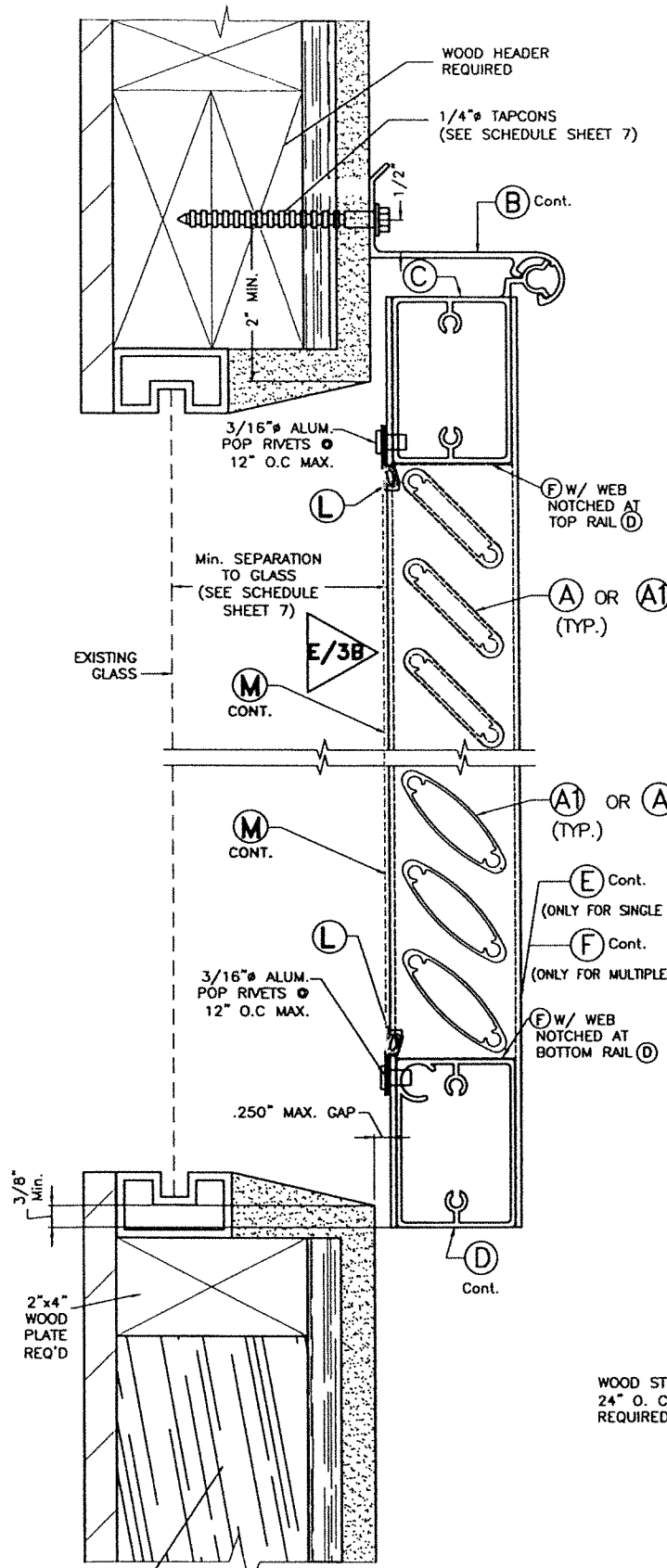
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Y.M.  
DRAWN BY

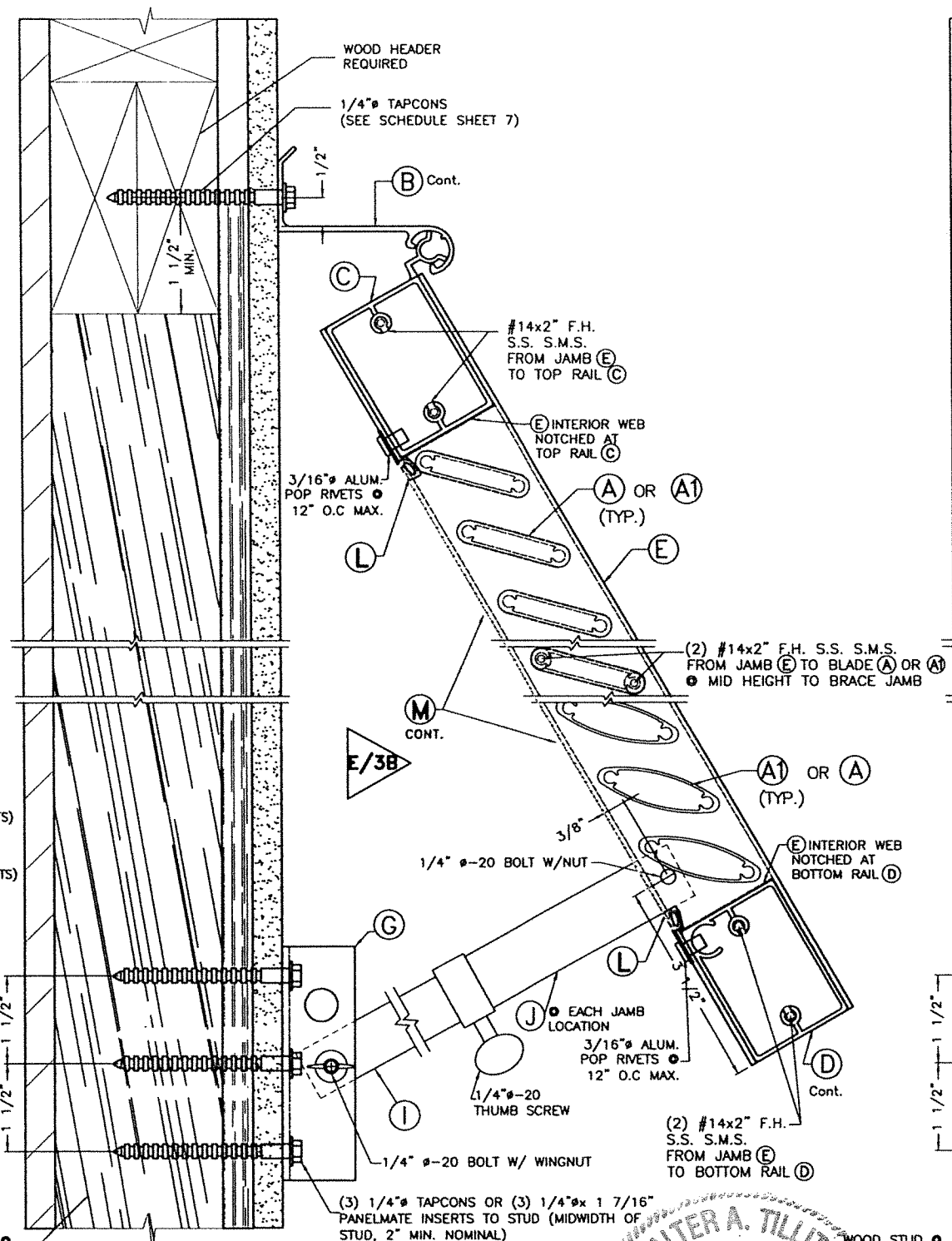
7/28/2023  
DATE

**23-139**  
DRAWING No

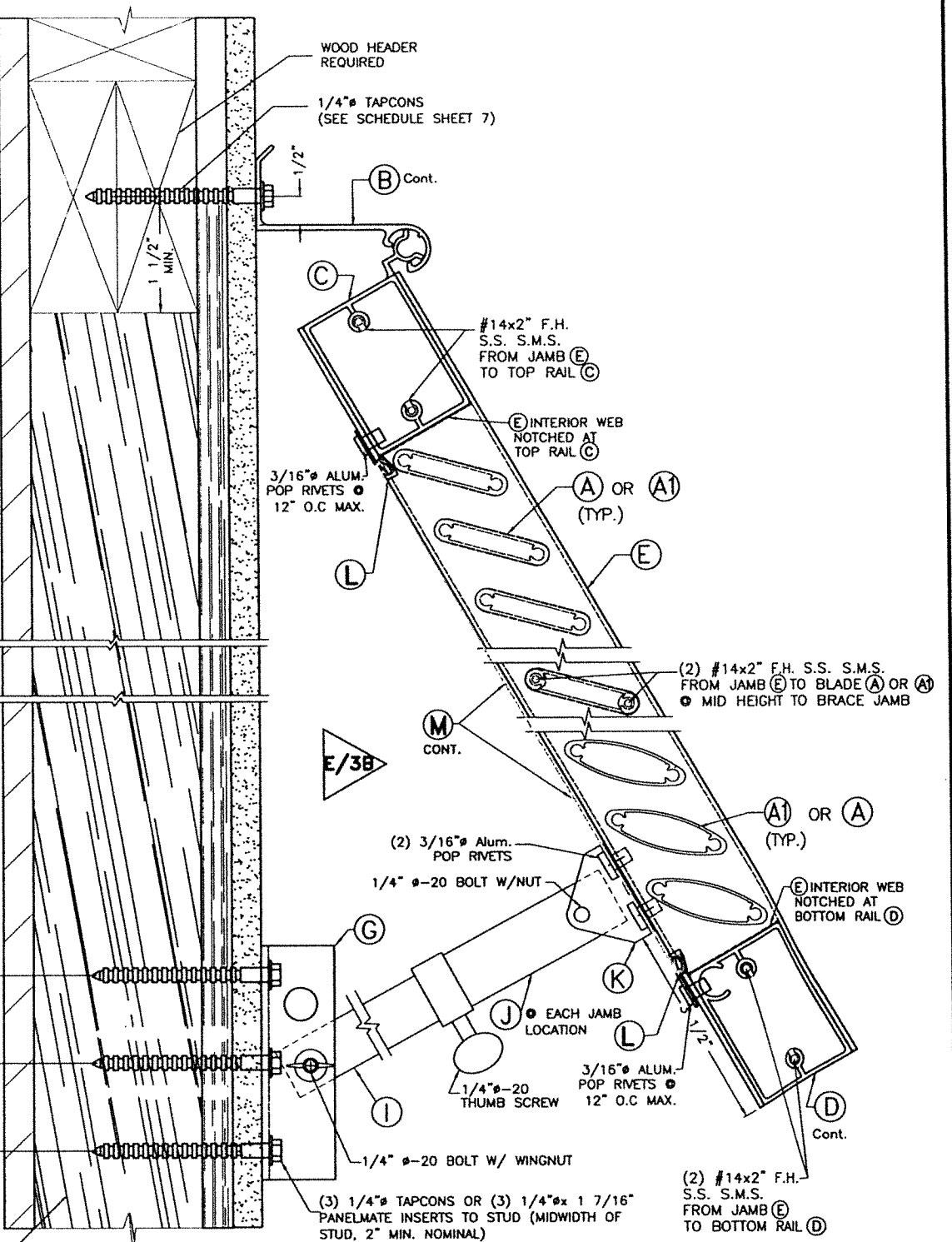
SHEET 4 OF 7



**SECTION C - C**  
(WALL MOUNT)  
HURRICANE POSITION  
SCALE: 3/8" = 1"

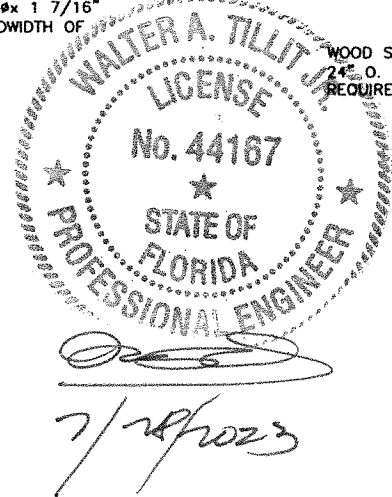


**SECTION D - D**  
(WALL MOUNT)  
NON HURRICANE POSITION  
SCALE: 3/8" = 1"



**ALTERNATE SECTION D' - D'**  
(WALL MOUNT)  
NON HURRICANE POSITION  
SCALE: 3/8" = 1"

**CONNECTION TO WOOD W/ ALTERNATE INTERIOR  
LOCKING ROD (H) FIXATION**



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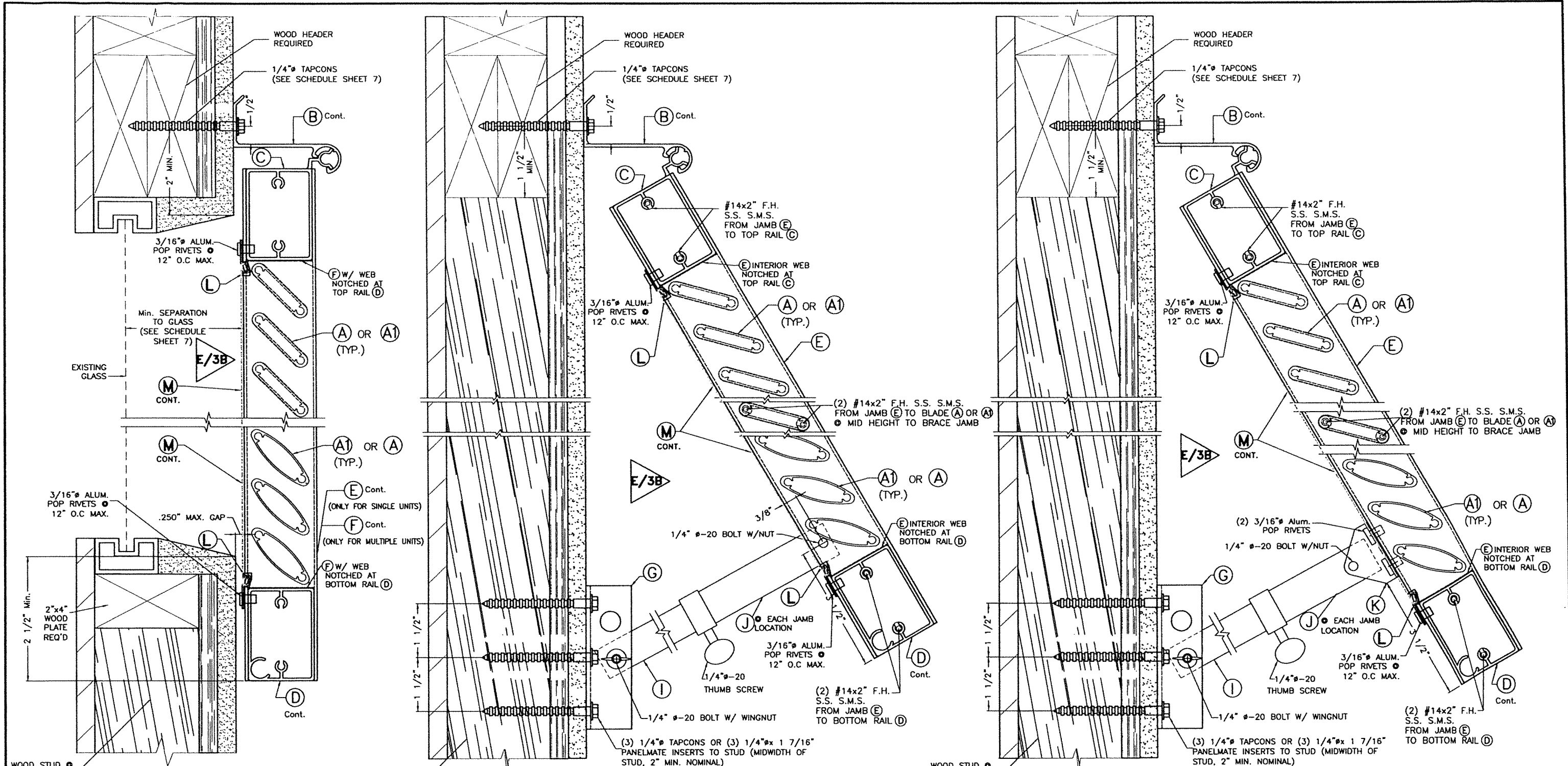
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Y.M. DRAWN BY  
7/28/2023 DATE  
**23-139** DRAWING No  
SHEET 5A OF 7



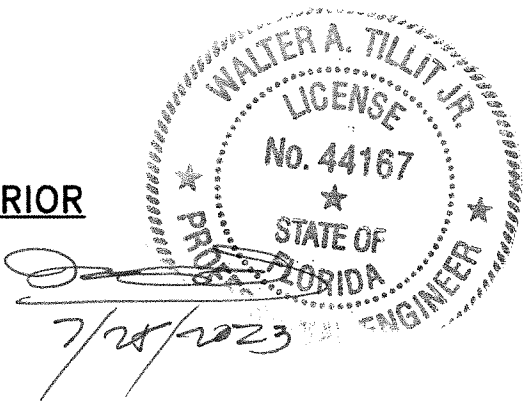


**SECTION C - C**  
(WALL MOUNT)  
HURRICANE POSITION  
SCALE: 3/8" = 1"

**SECTION D - D**  
(WALL MOUNT)  
NON HURRICANE POSITION  
SCALE: 3/8" = 1"

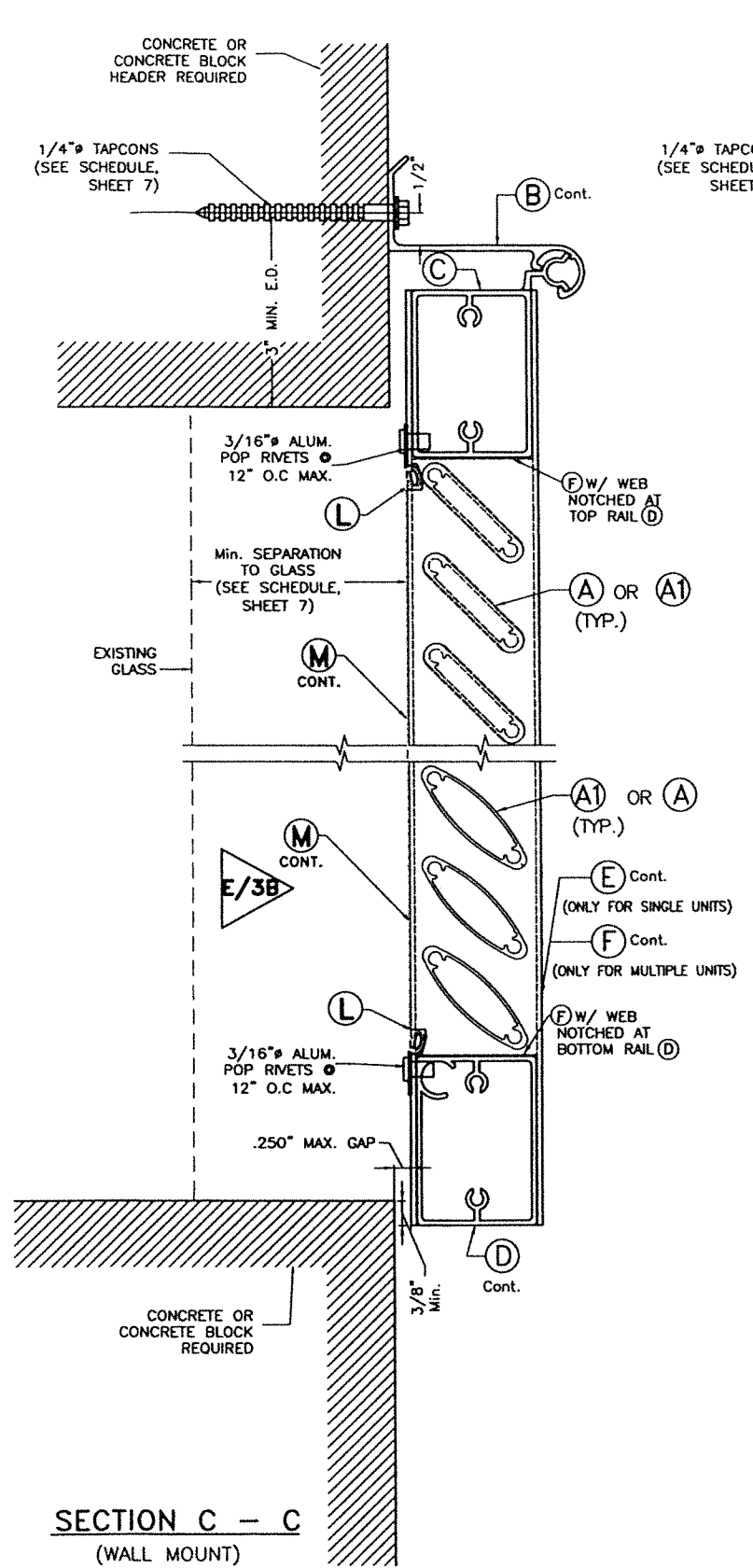
**ALTERNATE SECTION D'-D'**  
(WALL MOUNT)  
NON HURRICANE POSITION  
SCALE: 3/8" = 1"

**CONNECTION TO WOOD W/ EXTERIOR  
LOCKING ROD (H) FIXATION**

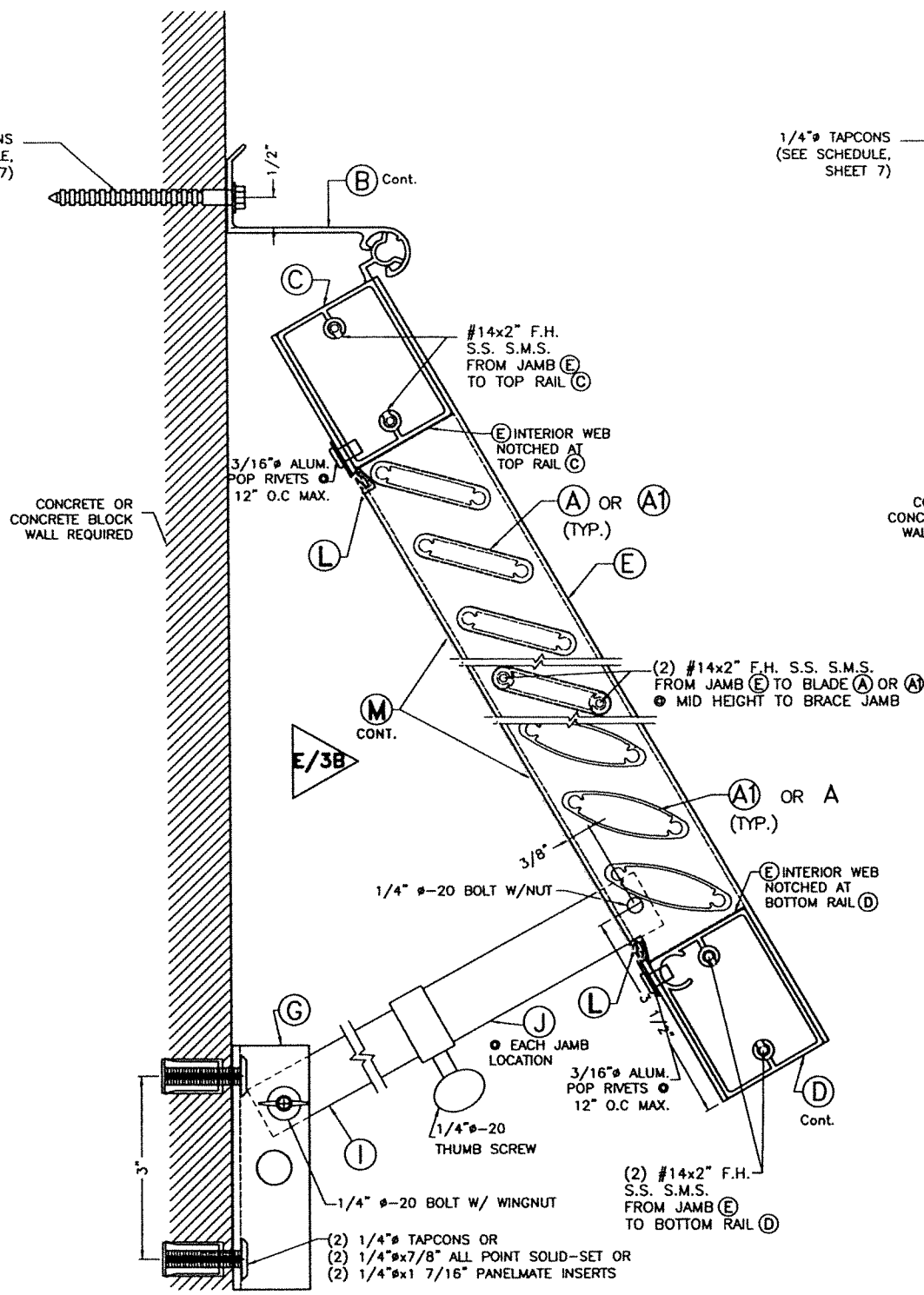


**FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)**

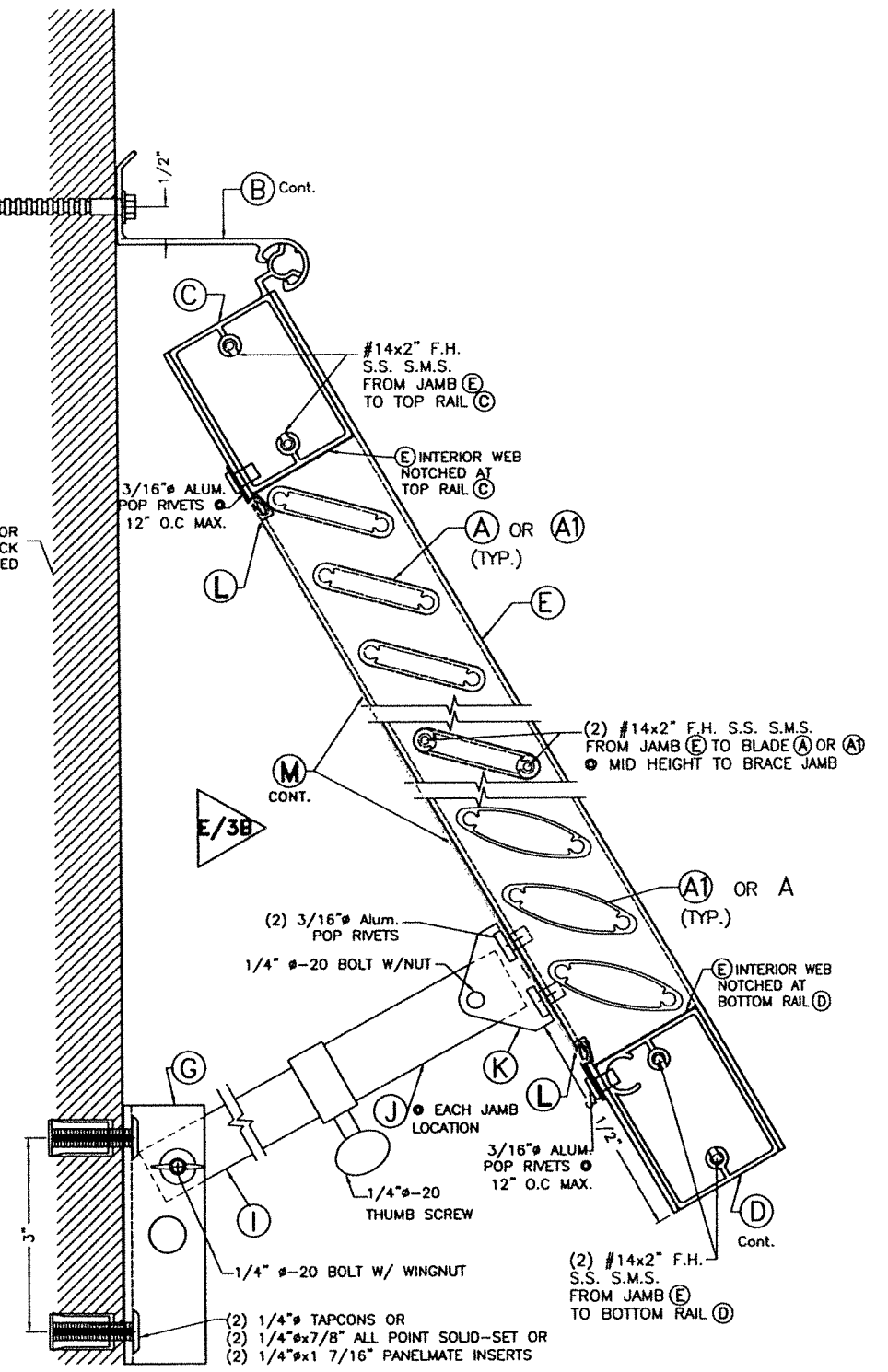
<p>© 2023 TILTECO, INC.</p> <p><b>TILTECO INC.</b></p> <p>TILLIT TESTING &amp; ENGINEERING COMPANY          6355 N.W. 36th St., Ste. 305 VIRGINIA GARDENS, FLORIDA 33166          Phone : (305)871-1530 · Fax : (305)871-1531          e-mail: tilteco@aol.com          CA-0006719          WALTER A. TILLIT Jr., P. E.          FLORIDA Lic. # 44167</p>		<p>ASSA / BERTHA H.V. BAHAMA SHUTTER (LARGE MISSILE &amp; SMALL MISSILE)</p> <p><b>AMERICAN SHUTTER SYSTEMS ASSOC., INC.</b></p> <p>4268 WESTROADS DRIVE          WEST PALM BEACH, FLORIDA 33407          PH: (800)432-2204 FAX: (561)209-8380</p>	<p>Y.M. DRAWN BY</p> <p>7/28/2023 DATE</p> <p><b>23-139</b> DRAWING No</p>																		
<table border="1"> <thead> <tr> <th>REV. No</th> <th>DESCRIPTION</th> <th>DATE</th> <th>REV. No</th> <th>DESCRIPTION</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>OLD 20-186</td> <td>7/28/23</td> <td>3</td> <td></td> <td></td> </tr> <tr> <td>2</td> <td></td> <td></td> <td>4</td> <td></td> <td></td> </tr> </tbody> </table>	REV. No	DESCRIPTION	DATE	REV. No	DESCRIPTION	DATE	1	OLD 20-186	7/28/23	3			2			4			<p>SHEET 5 OF 7</p>		
REV. No	DESCRIPTION	DATE	REV. No	DESCRIPTION	DATE																
1	OLD 20-186	7/28/23	3																		
2			4																		



**SECTION C - C**  
(WALL MOUNT)  
HURRICANE POSITION  
SCALE: 3/8" = 1"



**SECTION D - D**  
(WALL MOUNT)  
NON HURRICANE POSITION  
SCALE: 3/8" = 1"



**ALTERNATE SECTION D'-D'**  
(WALL MOUNT)  
NON HURRICANE POSITION  
SCALE: 3/8" = 1"  
**FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)**

**CONNECTION TO CONCRETE OR CONCRETE BLOCK  
W/ INTERIOR LOCKING ROD (H) FIXATION**

WALTER A. TILLIT JR.  
LICENSE  
No. 44167  
STATE OF FLORIDA  
PROFESSIONAL ENGINEER  
7/28/2023

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**TILTECO INC.**

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PH: (800)432-2204 FAX: (561)209-8380

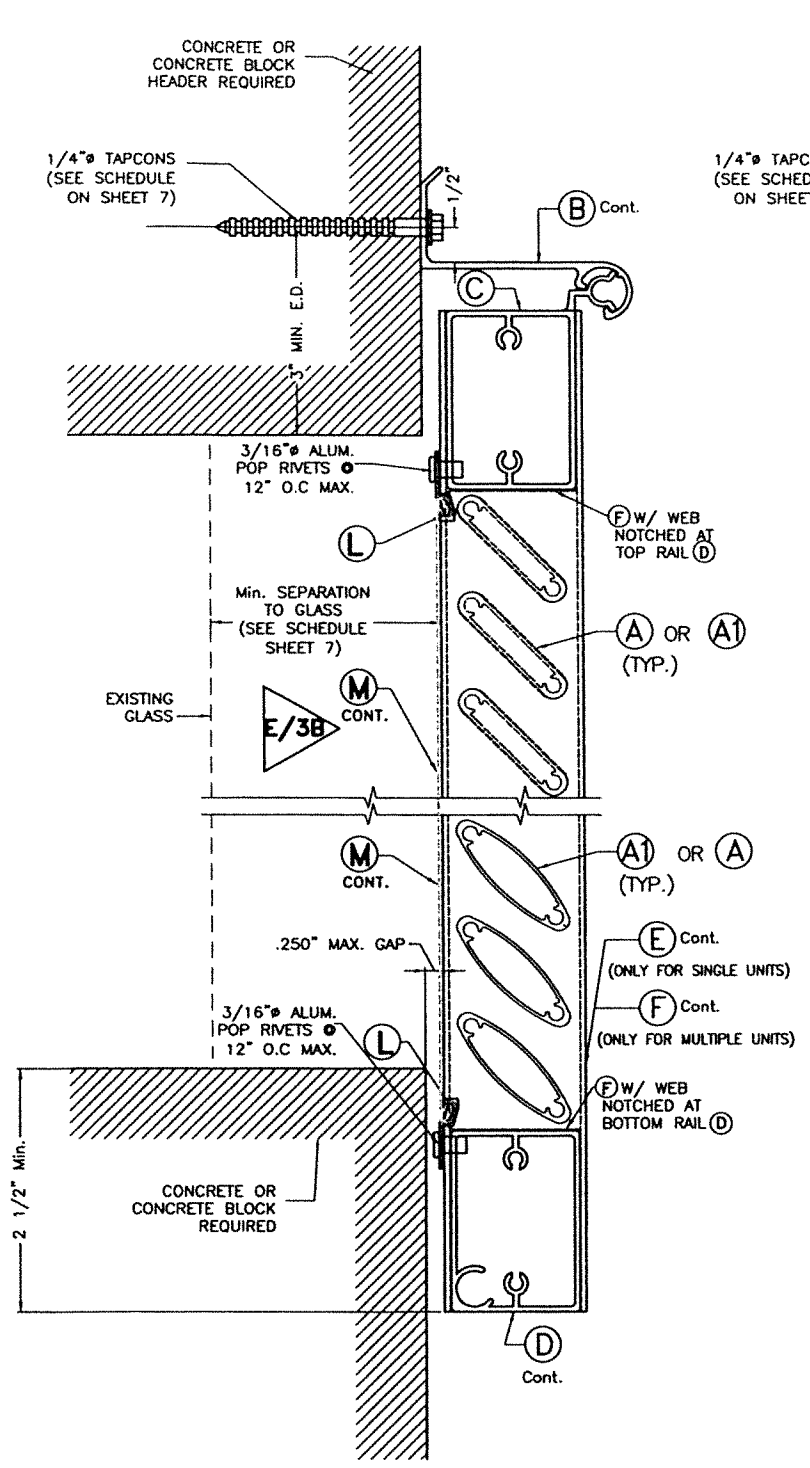
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2			4		

Y.M.  
DRAWN BY

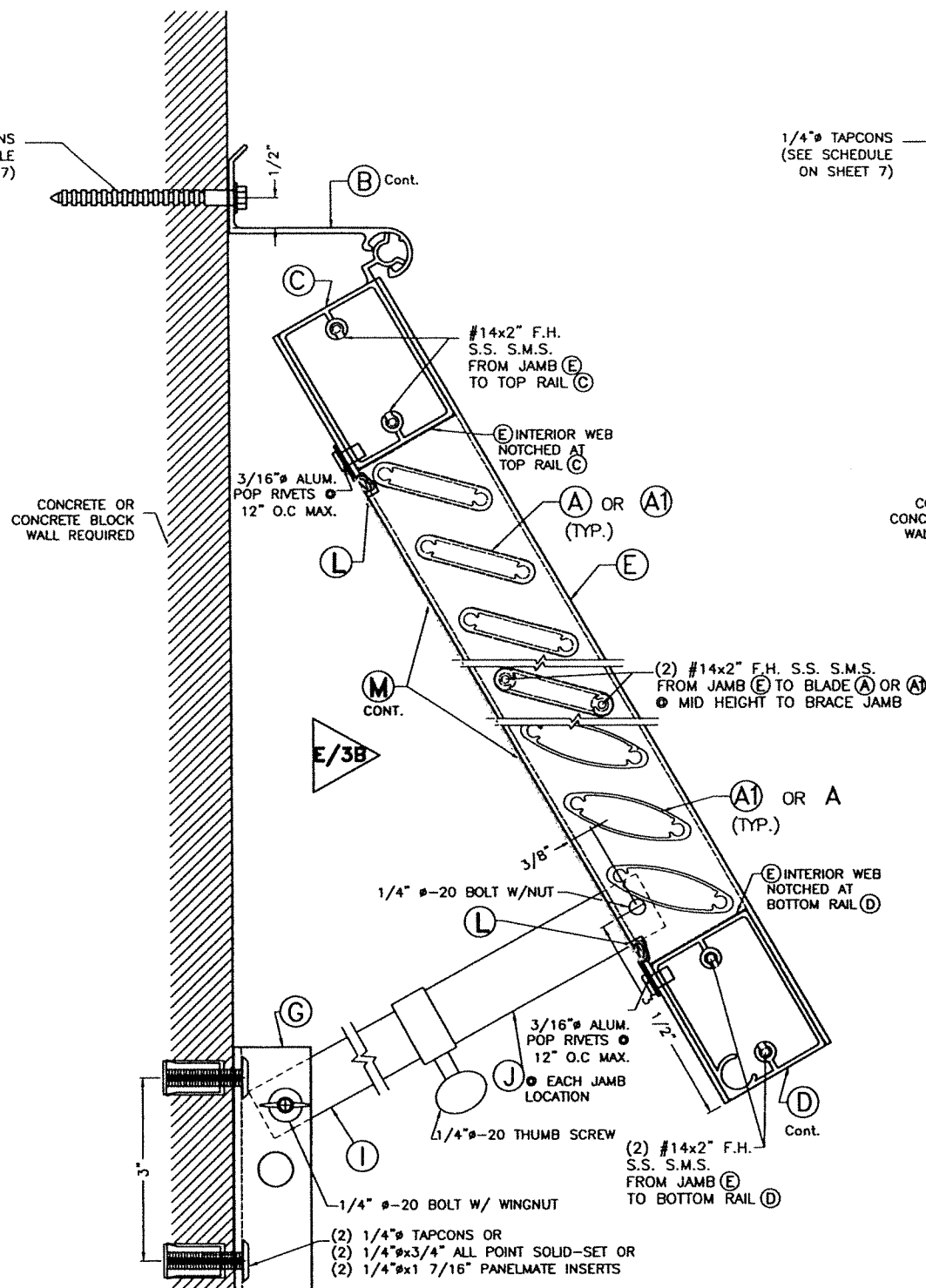
7/28/2023  
DATE

**23-139**  
DRAWING No

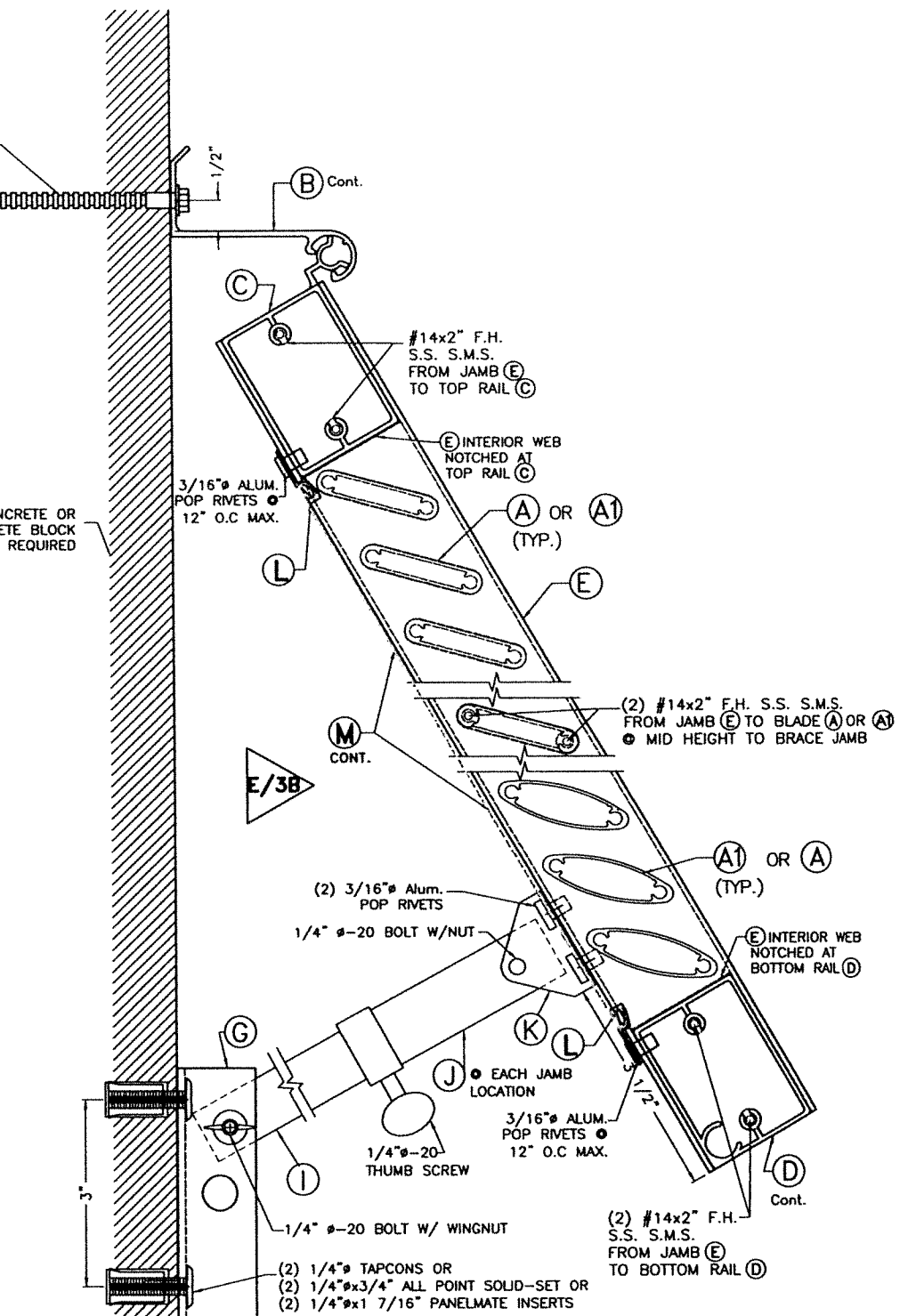
SHEET 6A OF 7



**SECTION C - C**  
(WALL MOUNT)  
HURRICANE POSITION  
SCALE: 3/8" = 1"

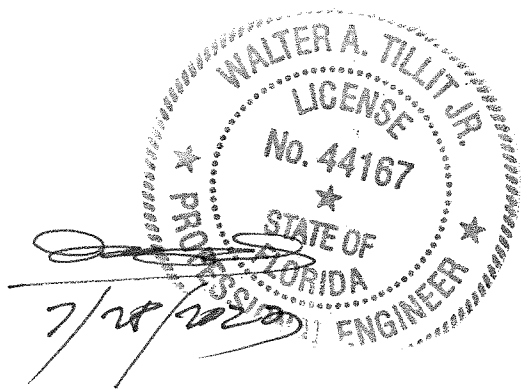


**SECTION D - D**  
(WALL MOUNT)  
NON HURRICANE POSITION  
SCALE: 3/8" = 1"



**ALTERNATE SECTION D'-D'**  
(WALL MOUNT)  
NON HURRICANE POSITION  
SCALE: 3/8" = 1"  
**FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)**

**CONNECTION TO CONCRETE OR CONCRETE BLOCK  
W/ EXTERIOR LOCKING ROD (H) FIXATION**



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REV. No	DESCRIPTION	DATE	REV. No	DESCRIPTION	DATE
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2			4		

Y.M.  
DRAWN BY

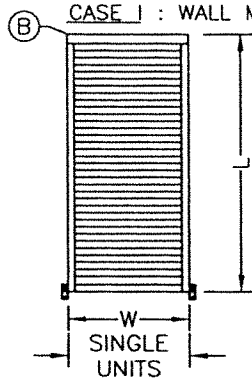
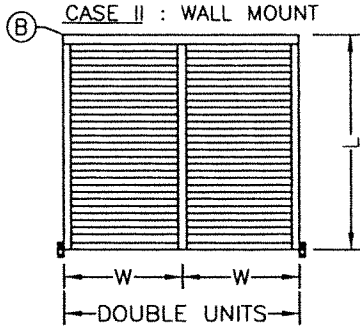
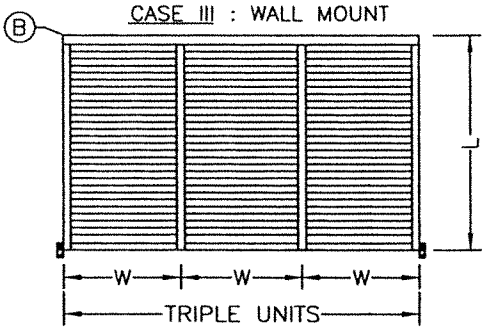
7/28/2023  
DATE

**23-139**  
DRAWING No

SHEET 6 OF 7

**SCHEDULE # 1**

**MAXIMUM SHUTTER SPAN "L" (in), MAXIMUM SHUTTER WIDTH "W" (in) FOR SINGLE (CASE I) & MULTIPLE (CASES II & III) UNITS FOR A CORRESPONDING A.S.D. DESIGN PRESSURE RATING FOR INSTALLATIONS INTO POURED CONCRETE, CONCRETE BLOCK OR WOOD SUBSTRATES**

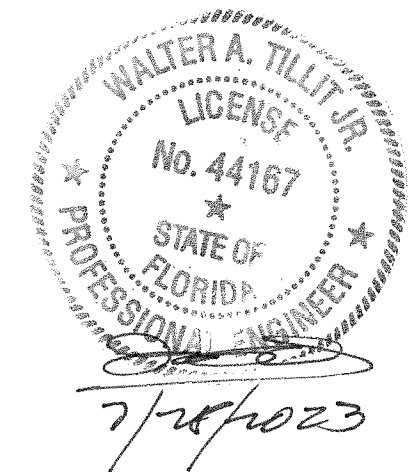
BAHAMA SHUTTER ELEVATIONS	SINGLE UNITS ELEVATION		MULTIPLE UNITS ELEVATIONS		
	CASE I : WALL MOUNT	CASE II : WALL MOUNT	CASE III : WALL MOUNT		
					
CASE	MAXIMUM A.S.D. DESIGN PRESSURE RATING (p.s.f.)	MAXIMUM UNIT WIDTH "W" (IN)	MAXIMUM SPAN "L" (IN)	INTERIOR MULLION TYPE REQUIRED	MINIMUM SEPARATION TO GLASS (IN)
I	+45.0 , -55.0	42"	96"	N/A	4 5/8"
II & III	+45.0 , -50.0	40"	70"	(F)	3 5/8"

**SCHEDULE # 2**


**MAXIMUM ANCHOR SPACING AT TOP FEMALE HINGES (B) FOR SINGLE (CASE I) & MULTIPLE (CASES II & III) UNITS**

**FOR A CORRESPONDING A.S.D. DESIGN PRESSURE RATING & SUBSTRATE TYPE**

CASE	MAXIMUM A.S.D. DESIGN PRESSURE RATING (p.s.f.)	SUBSTRATE	
		WOOD SOUTHERN PINE No.2	POURED CONCRETE OR CONCRETE BLOCK
I	+45.0 , -55.0	12"	7 1/2"
II & III	+45.0 , -50.0	7 1/2"	7 1/2"



**FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)**

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REV. No	DESCRIPTION	DATE	REV. No	DESCRIPTION	DATE
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2			4		