

**GENERAL NOTES:**

1. ROLL-UP SHUTTER SHOWN ON THIS PRODUCT EVALUATION DOCUMENT (P.E.D.) HAS BEEN VERIFIED FOR COMPLIANCE IN ACCORDANCE WITH THE 2014 (5th EDITION) OF THE FLORIDA BUILDING CODE. THIS ROLL-UP SHUTTER SHALL NOT BE INSTALLED AT HIGH VELOCITY HURRICANE ZONES (MIAMI-DADE/BROWARD COUNTIES).

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 7-10 FOR INSTALLATIONS UNDER 2014 FBC AND SHALL NOT EXCEED THE MAXIMUM (A.S.D.) DESIGN PRESSURE RATINGS INDICATED ON SHEETS 10, 11, 15 THRU 19.

IN ORDER TO VERIFY THE ABOVE CONDITION, ULTIMATE DESIGN WIND LOADS DETERMINED PER ASCE 7-10 SHALL BE FIRST REDUCED TO A.S.D. DESIGN WIND LOADS BY MULTIPLYING THEM BY 0.6 IN ORDER TO COMPARE THESE W/ MAX. (A.S.D.) DESIGN PRESSURE RATINGS INDICATED ON SHEETS 10, 11, 15 THRU 19.

IN ORDER TO VERIFY THAT COMPONENTS AND ANCHORS ON THIS P.E.D. AS TESTED WERE NOT OVER STRESSED, A 33% INCREASE IN ALLOWABLE STRESS FOR WIND LOADS WAS NOT USED IN THEIR ANALYSIS. FASTENERS SPACING TO WOOD HAS BEEN DETERMINED IN ACCORDANCE WITH N.D.S. 2012. ROLL-UP 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 FENESTRATION TESTING LAB. REPORTS # 5908, 5905 AND 6235 AS PER ASTM E 1886-05, E 1996 AND E 330-02 STANDARDS, QUALIFYING INSTALLATIONS FOR WIND ZONES 1, 2, 3 & 4, MISSILE TYPE D, APPLICABLE TO BASIC PROTECTION ONLY, INSTALLATIONS AT NON ESSENTIAL FACILITIES AS DEFINED BY SECTIONS 6.2.1.1, 6.2.1.2 AND 8.3 OF ASTM E 1996 SEE NOTES \*, Δ ON SHEETS 12 & 18 FOR ADDITIONAL LIMITATIONS.

2. ALL ALUMINUM EXTRUSIONS SHALL BE AS INDICATED ON SHEET 2.

3. EVERY OTHER SLAT SHALL INCLUDE WIND LOCKS AT EACH END (SEE COMPONENTS SHEET). EVERY SLAT (A) ADJACENT AND ABOVE BOTTOM SLAT (A) MUST INCLUDE WIND LOCKS.

4. ALL SCREWS (EXCEPT COMPONENT (C1)) TO BE STAINLESS STEEL 304 OR 316 SERIES WITH 50 ksi YIELD STRENGTH AND 90 ksi TENSILE STRENGTH OR CORROSION RESISTANT COATED CARBON STEEL AS PER DIN 50018. ALL S.D.S. ARE TEK SCREWS MANUFACTURED BY ITW BUILDEX & SHALL COMPLY W/ FLORIDA BUILDING CODE SECTION 2411.3.3.4.

5. BOLTS TO BE ASTM A-307, GALVANIZED OR AISI 304 OR 316 SERIES STAINLESS STEEL WITH 36 ksi MINIMUM YIELD STRENGTH.

6. ANCHORS TO WALL FOR (B1), (B2), (B3) & (B4) SIDE RAILS SHALL BE AS FOLLOWS: (UNLESS OTHERWISE NOTED)

(A) TO EXISTING POURED CONCRETE: MIN.  $f'_c = 2899$  p.s.i. COMPRESSIVE STRENGTH.

-5/16"Ø CARBON STEEL TAPCON XL ANCHORS AS MANUFACTURED BY ITW BUILDEX, INC.

- A.1) MINIMUM EMBEDMENT OF 5/16" TAPCON XL ANCHORS INTO POURED CONCRETE SHALL BE 2 1/4". NO EMBEDMENT INTO STUCCO SHALL BE CONSIDERED AS PART OF THE REQUIRED EMBEDMENT.
- A.2) MINIMUM EDGE DISTANCE (E.D.) OF TAPCON XL ANCHORS INTO POURED CONCRETE SHALL BE 4". EDGE DISTANCE IS BEYOND ANY FINISH MATERIAL.
- A.3) IN CASE THAT PRECAST STONE, PRECAST CONCRETE OR BRICK PANELS, VENEER OR PAVERS BE FOUND ON THE EXISTING WALL, ANCHORS SHALL BE LONG ENOUGH TO REACH THE MAIN SUBSTRATE BEHIND SUCH PANELS. MINIMUM EMBEDMENT SHALL BE AS INDICATED ON NOTE A.1 ABOVE.

(B) TO EXISTING GROUT FILLED CELL CONCRETE BLOCK WALL: ASTM C-90

-5/16"Ø CARBON STEEL TAPCON XL ANCHORS, AS MANUFACTURED BY ITW BUILDEX, INC.

- B.1) MINIMUM EMBEDMENT OF 5/16" TAPCON XL ANCHORS, INTO THE GROUT FILLED CELL CONCRETE BLOCK UNIT SHALL BE 2 1/4". NO EMBEDMENT INTO STUCCO SHALL BE CONSIDERED AS PART OF THE REQUIRED EMBEDMENT.
- B.2) MINIMUM EDGE DISTANCE (E.D.) OF 5/16" TAPCON XL ANCHORS INTO GROUT FILLED CELL CONCRETE BLOCK SHALL BE 4". EDGE DISTANCE IS BEYOND ANY FINISH MATERIAL.
- B.3) IN CASE THAT PRECAST STONE, PRECAST CONCRETE OR BRICK PANELS, VENEER OR PAVERS BE FOUND ON THE EXISTING WALL, ANCHORS SHALL BE LONG ENOUGH TO REACH THE MAIN SUBSTRATE BEHIND SUCH PANELS. MINIMUM EMBEDMENT SHALL BE AS INDICATED ON NOTE B.1 ABOVE.

(C) TO EXISTING WOOD FRAME BUILDING: SOUTHERN PINE #2 W/  $G=0.55$  MIN., DOUGLAS FIR-SOUTH ( $G=0.46$ ) OR SPRUCE PINE-FIR SOUTH, ( $G=0.36$ ). SHEATHING TO BE MIN. 1/2" PLYWOOD OR 7/16" O.S.B. WITH LIMITATIONS AS PER SHEET 18

-5/16"Ø CARBON STEEL ULTRACON ANCHORS, AS MANUFACTURED BY ELCO CONSTRUCTION PRODUCTS, INC.

- C.1) MINIMUM PENETRATION OF ULTRACON ANCHORS, INTO THE WOOD FRAME UNIT SHALL BE 2 1/2". (MUST INCLUDE 2" THREADED LENGTH) NO PENETRATION INTO STUCCO SHALL BE CONSIDERED AS PART OF THE REQUIRED PENETRATION.
- C.2) MINIMUM EDGE DISTANCE (E.D.) OF ULTRACON ANCHORS, INTO WOOD SHALL BE 2". EDGE DISTANCE IS BEYOND ANY FINISH MATERIAL.
- C.3) IN CASE THAT PRECAST STONE, PRECAST CONCRETE OR BRICK PANELS, VENEER OR PAVERS BE FOUND ON THE EXISTING WALL, ANCHORS SHALL BE LONG ENOUGH TO REACH THE MAIN SUBSTRATE BEHIND SUCH PANELS. MINIMUM THREADED PENETRATION SHALL BE AS INDICATED ON NOTE C.1 ABOVE.

- 7. ANCHORS SHALL BE INSTALLED FOLLOWING ALL OF THE RECOMMENDATIONS AND SPECIFICATIONS OF THE ANCHOR'S MANUFACTURER.
- 8. ANCHORS REQUIRED FOR MULLION CONNECTIONS SHALL BE AS SPECIFIED ON APPLICABLE SECTIONS SHOWN ON SHEETS 13 & 14 RESPECTIVELY.

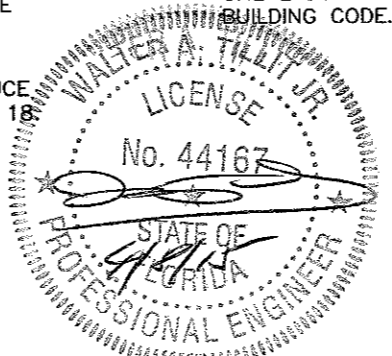
-3/4"Ø KWIK BOLT TZ EXPANSION ANCHOR TO BE AS MANUFACTURED BY HILTI, INC.

MINIMUM EDGE DISTANCE AND SPACING FOR ABOVE MENTIONED ANCHORS SHALL BE AS INDICATED BELOW OR AT ABOVE MENTIONED SHEET. EDGE DISTANCE AND EMBEDMENTS ARE BEYOND ANY FINISH MATERIAL.

| ANCHOR       | SPACING @ 100% | EDGE DISTANCE @ 100% | EMBEDMENT         |                                |
|--------------|----------------|----------------------|-------------------|--------------------------------|
|              |                |                      | CONCRETE          | GROUT FILLED OR CONCRETE BLOCK |
| KWIK BOLT TZ | 27"            | 9"                   | 4 3/4" (3000 psi) | -                              |

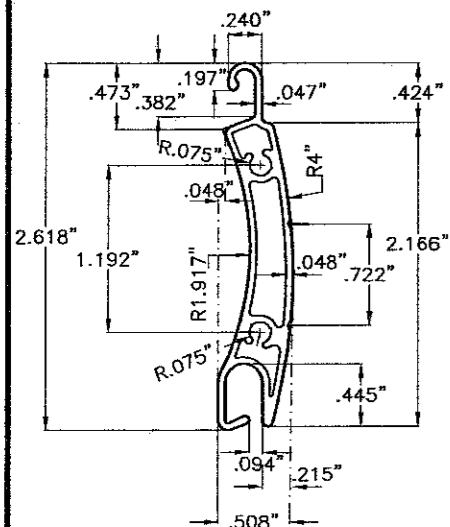
- 9. THE INSTALLATION CONTRACTOR IS TO SEAL/CAULK ALL SHUTTER COMPONENT EDGES WHICH REMAIN IN CONTINUOUS CONTACT WITH THE BUILDING TO PREVENT WIND/RAIN INTRUSION. CAULK AND SEAL SHUTTER TRACKS ALL AROUND FULL LENGTH.
- 10. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY THE SOUNDNESS OF THE STRUCTURE WHERE SHUTTER IS TO BE ATTACHED TO INSURE PROPER ANCHORAGE. THIS SHUTTER SHALL ONLY BE ATTACHED TO CONCRETE, GROUT FILLED CELL CONCRETE BLOCK OR WOOD FRAME BUILDINGS.
- 11. ROLL-UP SHUTTERS INSTALLATION SHALL COMPLY WITH SPECS INDICATED IN THIS DRAWING PLUS ANY BUILDING AND ZONING REGULATIONS PROVIDED BY THE JURISDICTION WHERE PERMIT IS APPLIED TO.
- 12. ROLL-UP MECHANISM NOT PART OF THIS APPROVAL, BUT SHALL BE CERTIFIED BY AN INDEPENDENT TESTING AGENCY.
- 13. (a) THIS P.E.D. PREPARED BY THIS ENGINEER IS GENERIC AND DOES NOT PROVIDE INFORMATION FOR A SITE SPECIFIC PROJECT; i.e. WHERE THE SITE CONDITIONS DEVIATE FROM THE P.E.D.
- (b) CONTRACTOR TO BE RESPONSIBLE FOR THE SELECTION, PURCHASE AND INSTALLATION INCLUDING LIFE SAFETY OF THIS PRODUCT, BASED ON THIS P.E.D. PROVIDED HE/SHE DOES NOT DEVIATE FROM THE CONDITIONS DETAILED ON THIS DOCUMENT. CONSTRUCTION SAFETY AT SITE IS THE CONTRACTOR'S RESPONSIBILITY.
- (c) THIS P.E.D. WILL BE CONSIDERED INVALID IF ALTERED BY ANY MEANS.
- (d) SITE SPECIFIC PROJECTS SHALL BE PREPARED BY A 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) THIS P.E.D. SHALL BEAR THE DATE AND ORIGINAL SEAL AND SIGNATURE OF THE PROFESSIONAL ENGINEER OF RECORD THAT PREPARED IT.
- 14. SHUTTER MANUFACTURER'S LABEL SHALL BE LOCATED ON A READILY VISIBLE LOCATION AT ROLL-UP SHUTTER IN ACCORDANCE WITH SECTION 1710.8.3 OF FLORIDA BUILDING CODE. ONE LABEL SHALL BE PLACED FOR EVERY OPENING. LABELING TO COMPLY WITH SECTION 1710.8.2 OF THE FLORIDA BUILDING CODE.

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



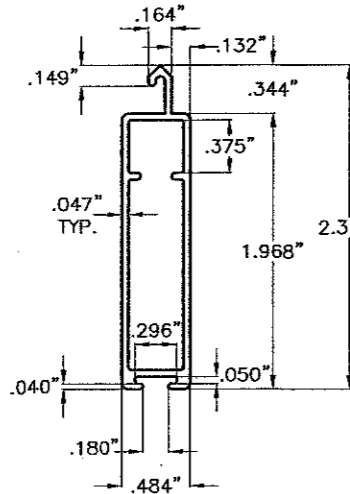
FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)

| <p>©2015 TILTECO INC.</p> <p><b>TILTECO INC.</b></p> <p>TILLIT TESTING &amp; ENGINEERING COMPANY<br/>         6355 N.W. 36th St., Ste. 305 - VIRGINIA GARDENS, FL 33166<br/>         Phone : (305) 871-1530 . Fax : (305) 871-1531<br/>         e-mail: tilteco@aol.com<br/>         EB-0006719<br/>         WALTER A. TILLIT Jr., P.E.<br/>         FLORIDA Lic. # 44167</p>                      | <p><b>ROLL 55-X SLAT END RETENTION ROLL-UP SHUTTER</b></p> <p><b>ROLLAC SHUTTER OF TEXAS, INC.</b></p> <p>5331 ORANGE STREET<br/>         PEARLAND, TX. 77581<br/>         PH:(281) 485-1911. FAX:(281) 485-0839</p> | <p>F.R.L.<br/>DRAWN BY</p> <p>04/02/15<br/>DATE</p> <p>15-060<br/>DRAWING N°</p> |        |             |      |        |             |      |   |            |          |   |  |  |   |  |  |   |  |  |
|--|--|--|--------|-------------|------|--------|-------------|------|---|------------|----------|---|--|--|---|--|--|---|--|--|
| <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>REV N°</th> <th>DESCRIPTION</th> <th>DATE</th> <th>REV N°</th> <th>DESCRIPTION</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>OLD 11-236</td> <td>04/02/15</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 N° | DESCRIPTION | DATE | REV N° | DESCRIPTION | DATE | 1 | OLD 11-236 | 04/02/15 | 3 |  |  | 2 |  |  | 4 |  |  |
| REV N°   | DESCRIPTION  | DATE   | REV N° | DESCRIPTION | DATE |        |             |      |   |            |          |   |  |  |   |  |  |   |  |  |
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| 2  |  |  | 4      |             |      |        |             |      |   |            |          |   |  |  |   |  |  |   |  |  |
| <p>SHEET 1 OF 19</p>   |  |  |        |             |      |        |             |      |   |            |          |   |  |  |   |  |  |   |  |  |



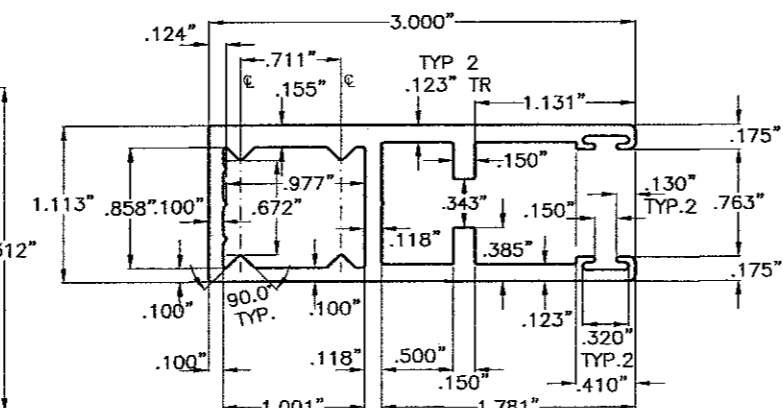
**(A) SLAT**

6061-T6 OR 6005-T5 ALUMINUM ALLOY  
SCALE: 3/4" = 1"

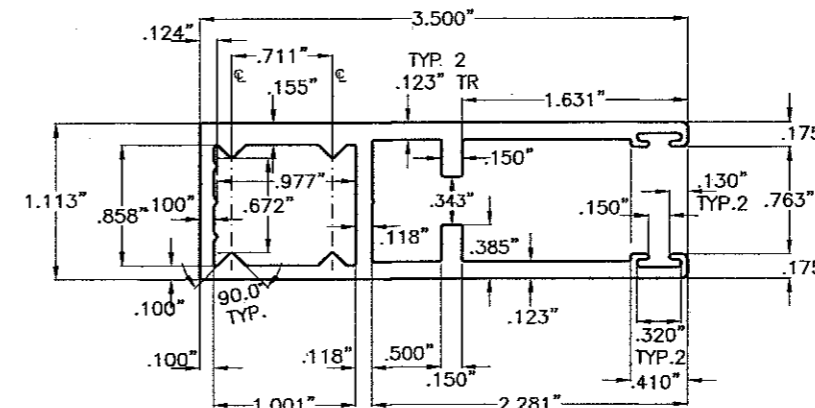


**(A1) BOTTOM SLAT**

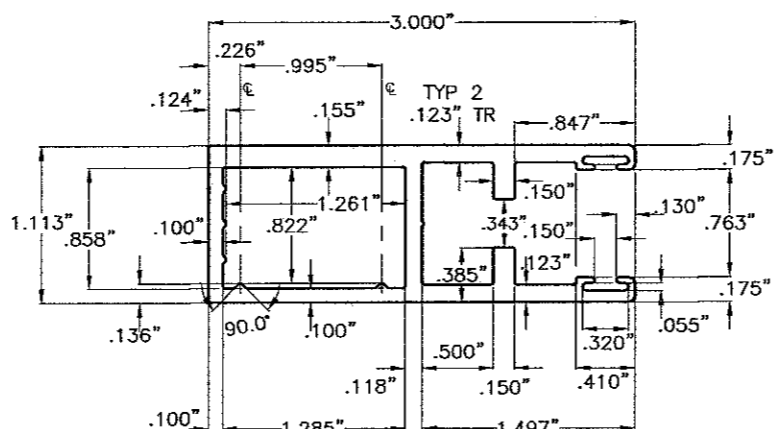
6063-T6 ALUMINUM ALLOY  
SCALE: 3/4" = 1"



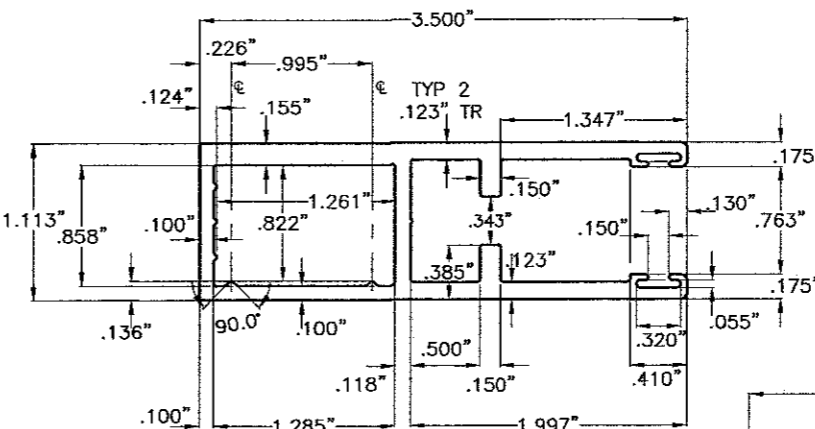
**(B1) TYPE 1 SIDE RAIL**



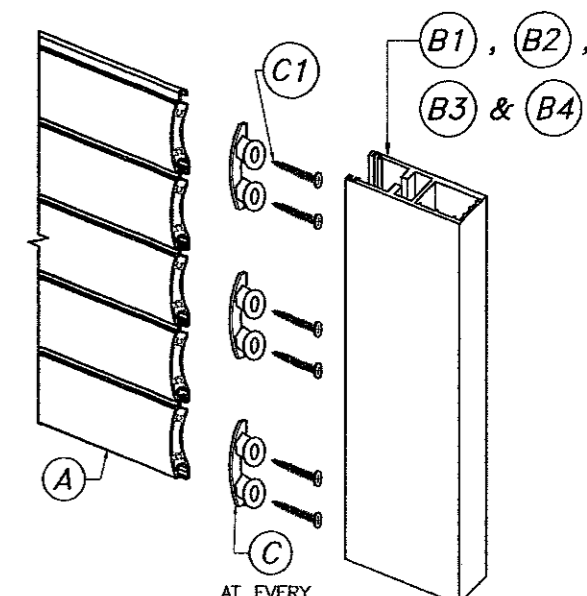
**(B3) TYPE 3 SIDE RAIL**



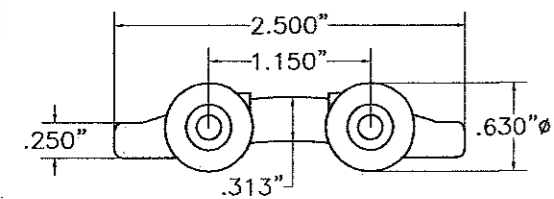
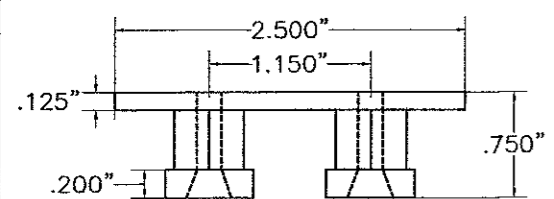
**(B2) TYPE 2 SIDE RAIL**



**(B4) TYPE 4 SIDE RAIL**

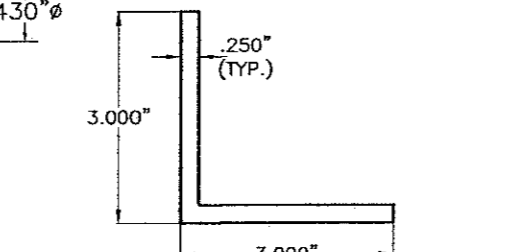
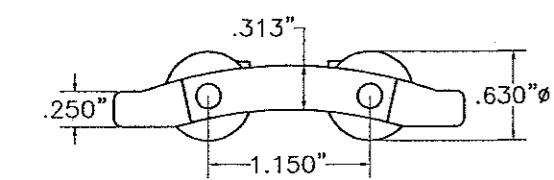


**SLAT ASSEMBLY DETAIL:**  
N.T.S.



**(C) WIND LOCK:**

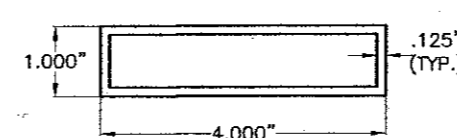
RIGID NYLON Ft<sub>u</sub> = 5001 psi.  
SCALE: 3/4" = 1"



**(D) ALUMINUM INSIDE MOUNT ANGLE**

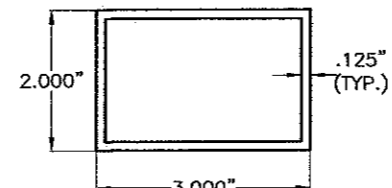
6063-T6 ALUMINUM ALLOY  
SCALE: 3/8" = 1"

**SIDE RAILS:**  
6005-T5 ALUMINUM ALLOY  
SCALE: 3/4" = 1"



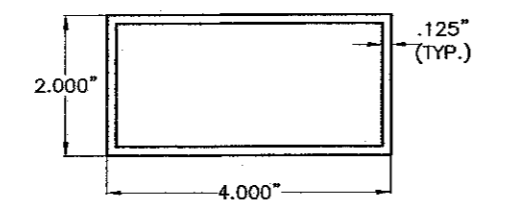
**(E1) ALUMINUM BUILD-OUT TUBE**

6063-T6 ALUMINUM ALLOY  
SCALE: 3/8" = 1"



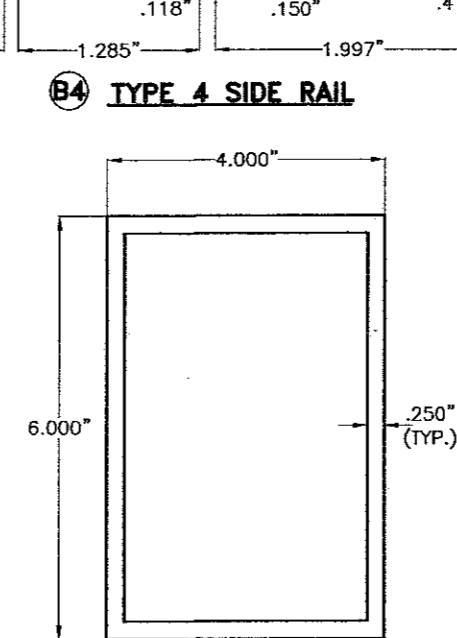
**(E2) ALUMINUM BUILD-OUT TUBE**

6063-T6 ALUMINUM ALLOY  
SCALE: 3/8" = 1"



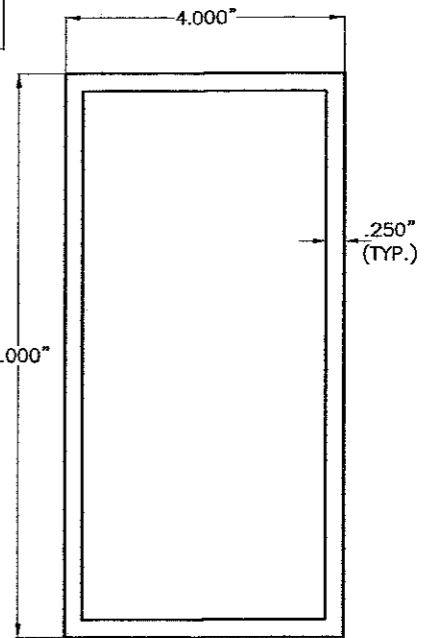
**(E) ALUMINUM BUILD-OUT TUBE**

6063-T6 ALUMINUM ALLOY  
SCALE: 3/8" = 1"



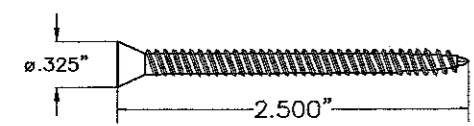
**(F) TYPE 1 MULLION**

6061-T6 ALUMINUM ALLOY  
SCALE: 3/8" = 1"



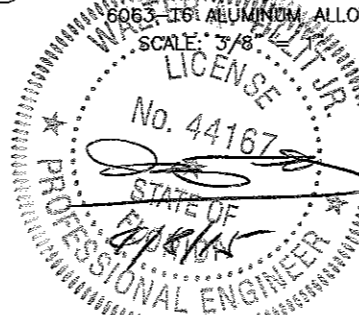
**(G) TYPE 2 MULLION**

6061-T6 ALUMINUM ALLOY  
SCALE: 3/8" = 1"



**(C1) WIND LOCK SCREW:**

(2) #8-18 x 2 1/2" F.H. S.S. AISI 410 SERIES,  
COATED WITH ROLLAC-1000 CHROMED-FREE  
ANTI-CORROSION COATING SYSTEM; MANUFACTURED  
AND APPLIED BY SUN BELT COATING, LLC  
(Min. F<sub>y</sub> = 121.1 ksi, Min. F<sub>t</sub> = 164.6 ksi)  
SCALE: 3/4" = 1"

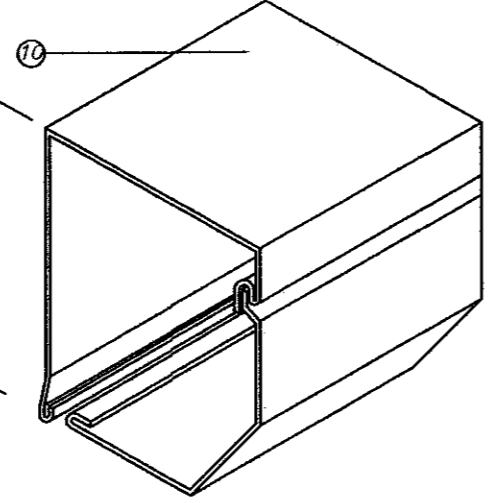


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**TILTECO inc.**  
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WALTER A. TILLIT JR., P.E.  
FLORIDA Lic. # 44167

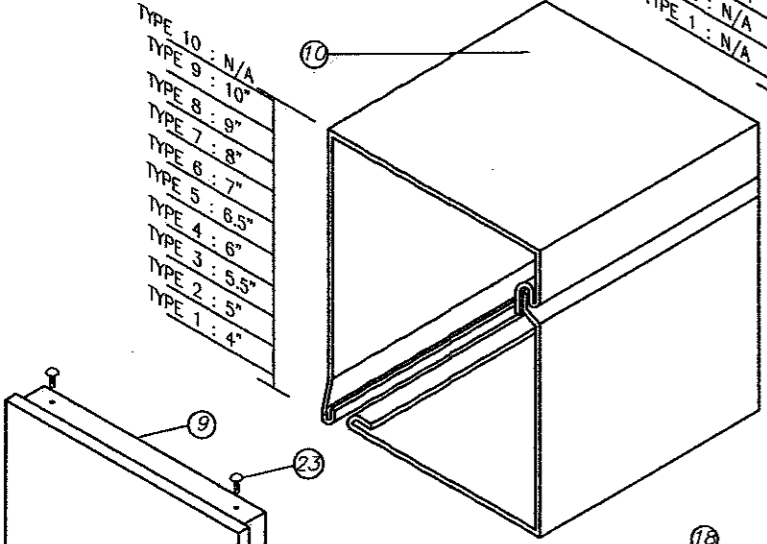
FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)

|  |             |                      |
|--|-------------|----------------------|
| RLL 55-X SLAT END RETENTION<br>ROLL-UP SHUTTER                                     |             | F.R.L.<br>DRAWN BY   |
| ROLLAC SHUTTER OF TEXAS, INC.  |             | 04/02/15<br>DATE     |
| 5331 ORANGE STREET<br>PEARLAND, TX. 77581<br>PH:(281) 485-1911, FAX:(281) 485-0839 |             | 15-060<br>DRAWING N° |
| REV N°   | DESCRIPTION | DATE                 |
| 1  | OLD 11-239  | 04/02/15             |
| 2  |             |                      |
| REV N°   | DESCRIPTION | DATE                 |
| 3  |             |                      |
| 4  |             |                      |
| SHEET 2 OF 19  |             |                      |

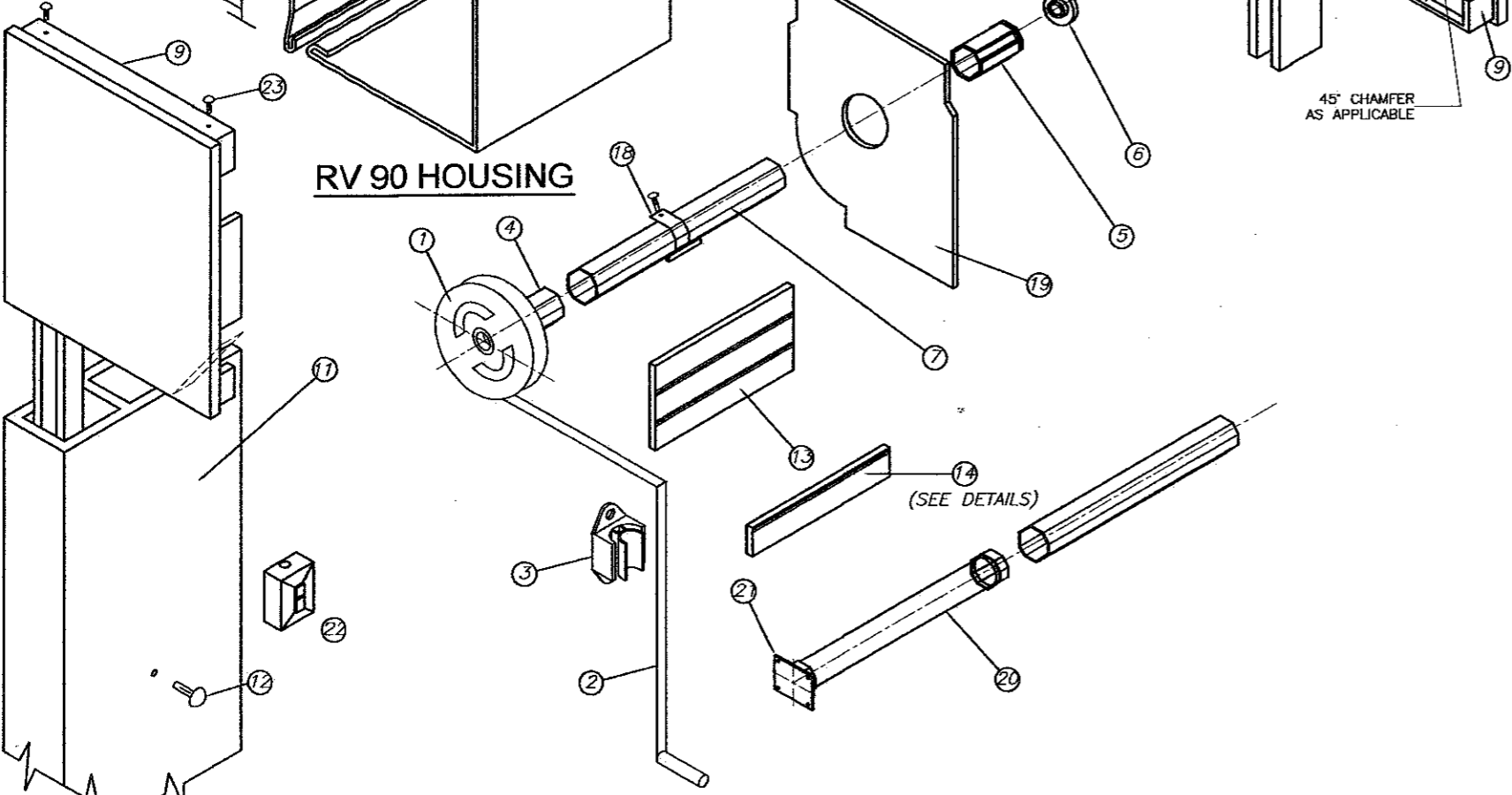
- TYPE 10 : 12"
- TYPE 9 : 10"
- TYPE 8 : 9"
- TYPE 7 : 8"
- TYPE 6 : 8"
- TYPE 5 : 7"
- TYPE 4 : 6.5"
- TYPE 3 : 6"
- TYPE 2 : N/A
- TYPE 1 : N/A



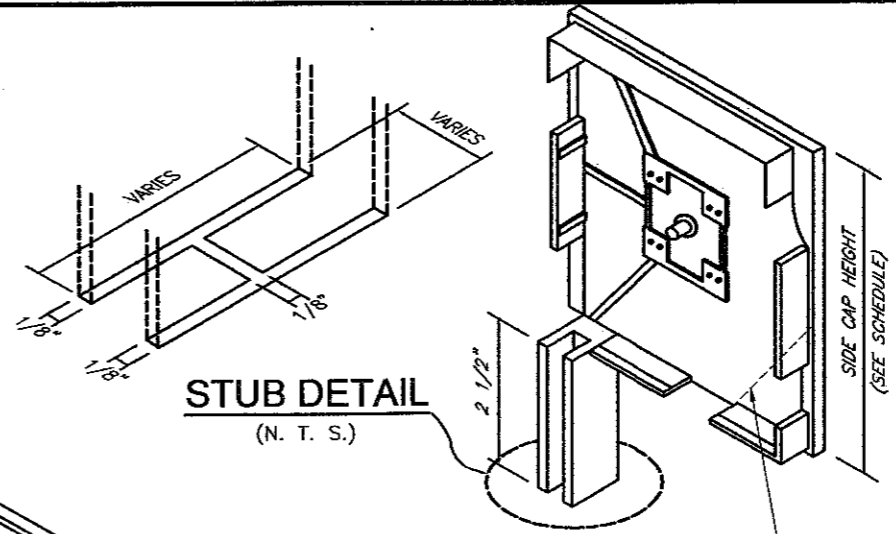
**RV 45 & RV 45/S  
HOUSINGS**



**RV 90 HOUSING**



**(H) BOX COMPONENTS AND ASSEMBLY DETAIL  
END CAP SYSTEM**  
(SEE NOTE 12 ON SHEET 1)



**STUB DETAIL**  
(N. T. S.)

**(H) SIDE CAPS:**

45° CHAMFER  
AS APPLICABLE

**COMPONENTS FOR GEAR OPERATED SYSTEM**

- ① - GEAR
- ② - UNIVERSAL & CRANK
- ③ - CRANK HOLDER(OPTIONAL)
- ④ - GEAR INSERT(GEAR TO AXLE CONNECTOR)
- ⑤ - IDLER INSERT
- ⑥ - BALL BEARING
- ⑦ - OCTAGONAL AXLE \*
- ⑧ - SIDE/END CAP \*
- ⑨ - HOUSING(FRONT & BOTTOM), 0.040" THICK
- ⑩ - SIDE RAIL
- ⑪ - PLUG-BUTTONS
- ⑫ - ALUMINUM SLATS
- ⑬ - BASE SLAT
- ⑭ - PLASTIC STOPS(OPTIONAL)
- ⑮ - SIDE LOCKS(OPTIONAL)
- ⑯ - STAPLES(OPTIONAL)
- ⑰ - SPRINGLOCK HANGER
- ⑱ - SAFETY PLATES

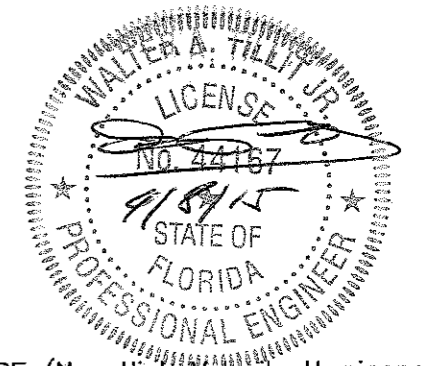
**ADDITIONAL COMPONENTS FOR  
MOTORIZED OPERATED SYSTEM**

- ⑳ - TUBULAR MOTOR
- ㉑ - MOTOR BRACKET
- ㉒ - SWITCH

**FASTENERS**

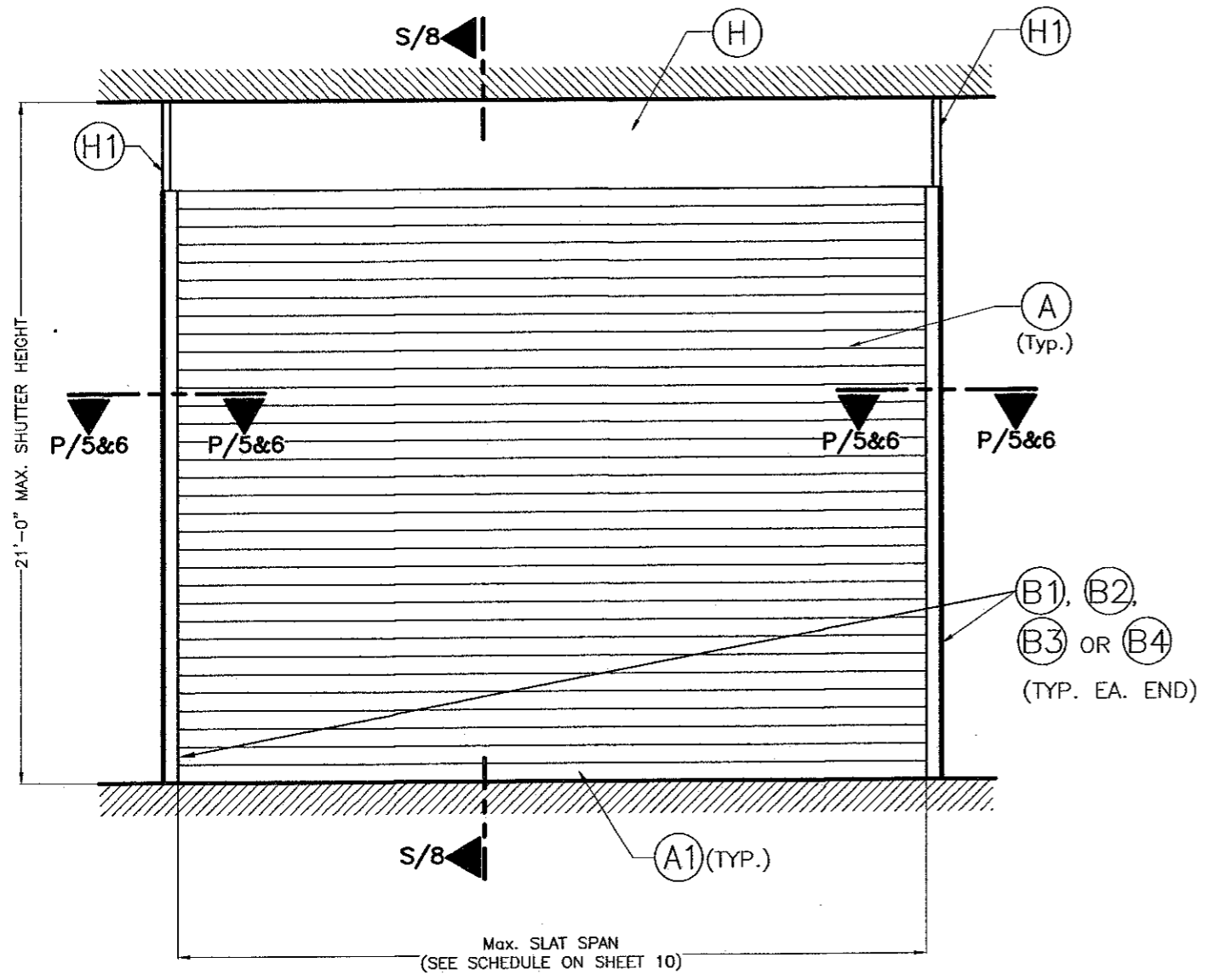
- ㉓ - 3/16" ALUMINUM POP RIVETS(6 REQ'D EA. SIDE CAP) : 2 @ TOP, 2 @ REAR, 2 @ BOTTOM

\* SHALL BE CAPABLE TO SUSTAIN SLAT'S WEIGHT AND ASSURE LIFTING MECHANISM (SEE NOTE 12/1)



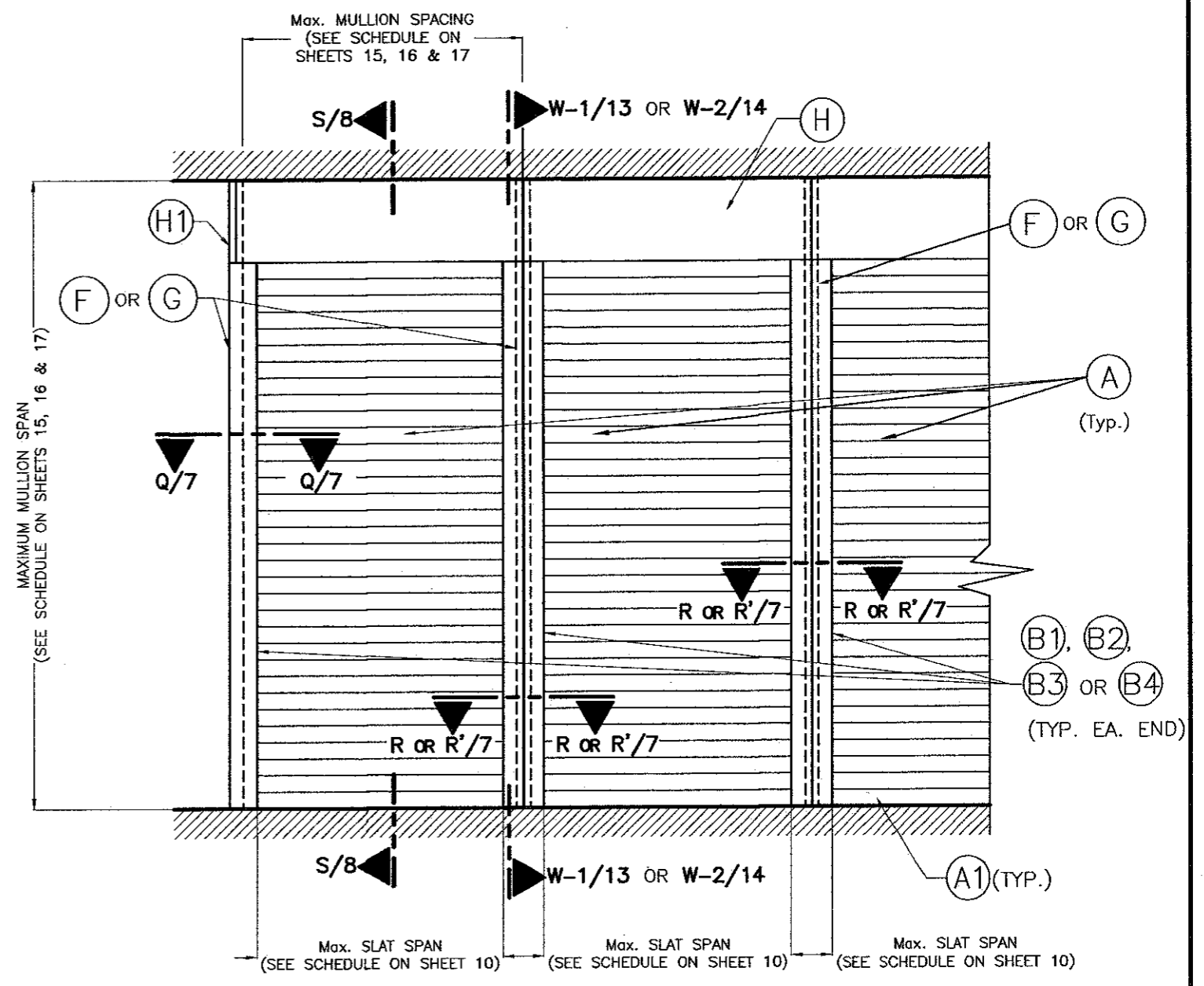
FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)

|  |             |   |        |                    |      |
|--|-------------|---|--------|--------------------|------|
| <p><b>TILTECO INC.</b><br/>TILLIT TESTING &amp; ENGINEERING COMPANY<br/>6355 N.W. 36th St., Ste. 305 - VIRGINIA GARDENS, FL 33168<br/>Phone : (305) 871-1530 , Fax : (305) 871-1531<br/>e-mail: tilteco@aol.com<br/>EB-0006719<br/>WALTER A. TILLIT Jr., P.E.<br/>FLORIDA Lic. # 44167</p> |             | <p><b>RLL 55-X SLAT END RETENTION<br/>ROLL-UP SHUTTER</b></p>   |        | F.R.L.<br>DRAWN BY |      |
|  |             | <p><b>ROLLAC SHUTTER OF TEXAS, INC.</b></p> <p>5331 ORANGE STREET<br/>PEARLAND, TX, 77581<br/>PH:(281) 485-1911, FAX:(281) 485-0839</p> |        | 04/02/15<br>DATE   |      |
|  |             | <p>15-060<br/>DRAWING N°</p>  |        |                    |      |
| REV N°   | DESCRIPTION | DATE  | REV N° | DESCRIPTION        | DATE |
| 1  | OLD 11-230  | 04/02/15  | 3      |                    |      |
| 2  |             |   | 4      |                    |      |



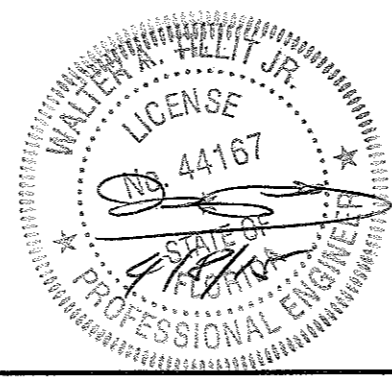
**TYPICAL SINGLE UNIT ELEVATION:  
INSTALLATION INTO POURED CONCRETE,  
GROUT FILLED CELL CONCRETE BLOCK & WOOD**

NOTES: SEE SHEETS 2 & 3 FOR  
COMPONENTS NOMENCLATURE.  
N.T.S



**TYPICAL CONSECUTIVE SINGLE UNIT ELEVATION W/ MULLIONS:  
INSTALLATION INTO POURED CONCRETE**

NOTES: SEE SHEETS 2 & 3 FOR COMPONENTS NOMENCLATURE.  
N.T.S



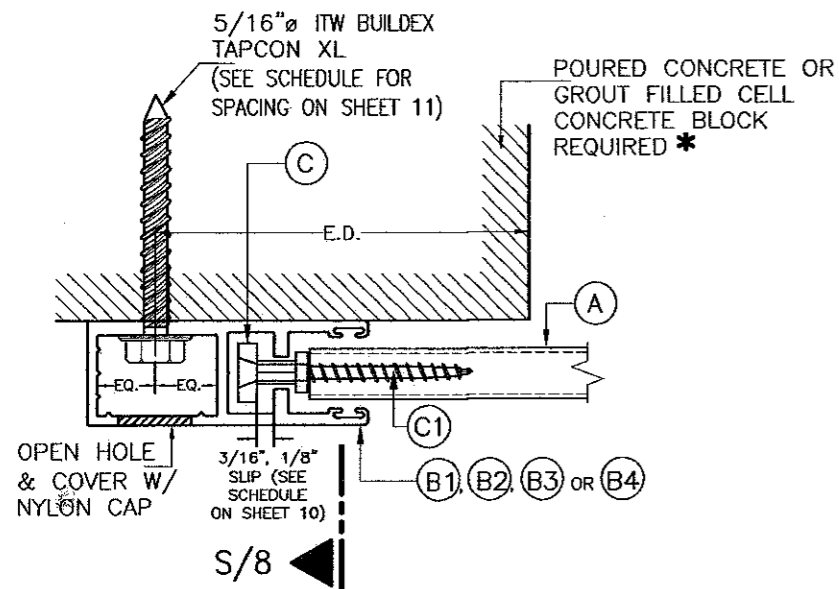
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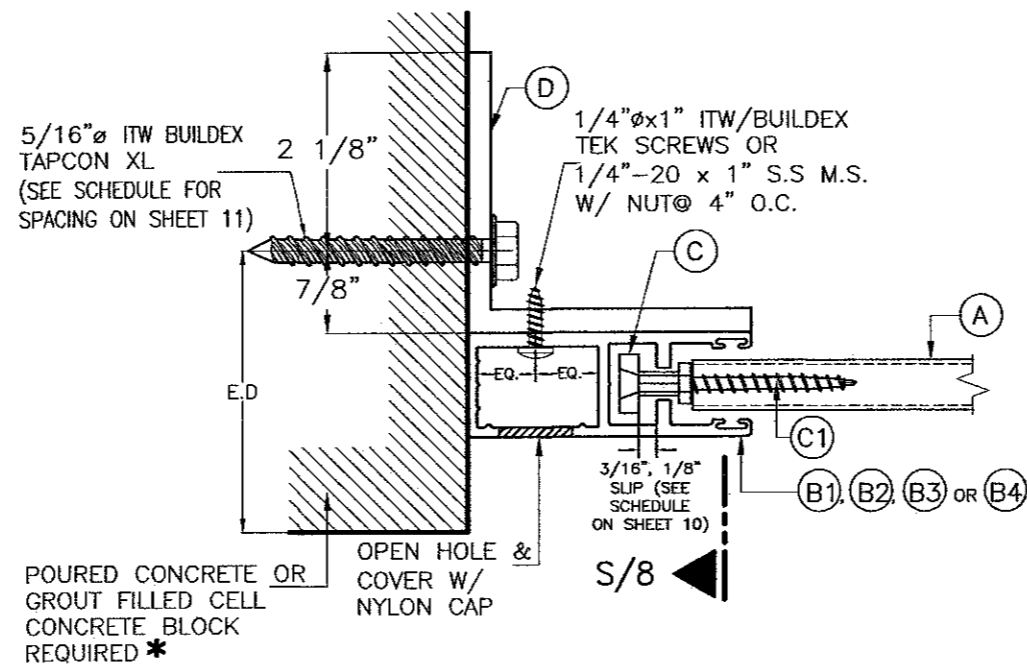
TILLIT TESTING & ENGINEERING COMPANY  
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Phone: (305) 871-1530, Fax: (305) 871-1531  
e-mail: tilteco@aol.com  
EB-0006719  
WALTER A. TILLIT Jr., P.E.  
FLORIDA Lic. # 44167

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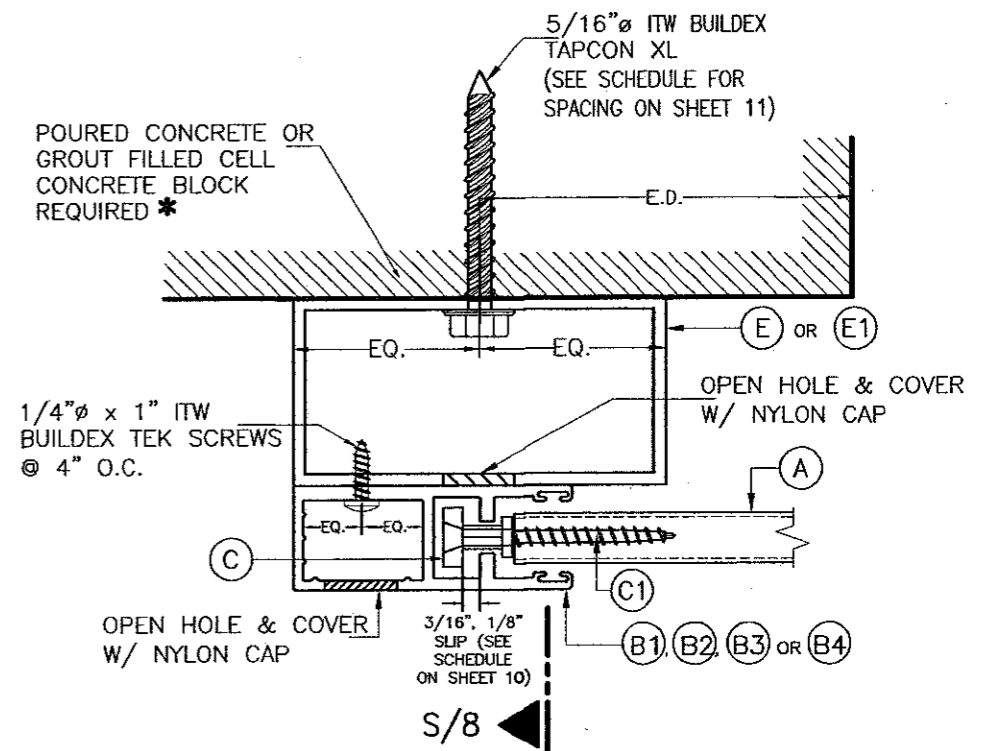
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|--|-------------|----------|----------------------|-------------|------|
| <b>ROLL 55-X SLAT END RETENTION<br/>ROLL-UP SHUTTER</b>                            |             |          | F.R.L.<br>DRAWN BY   |             |      |
| <b>ROLLAC SHUTTER OF TEXAS, INC.</b>   |             |          | 04/02/15<br>DATE     |             |      |
| 5331 ORANGE STREET<br>PEARLAND, TX. 77581<br>PH:(281) 485-1911, FAX:(281) 485-0839 |             |          | 15-060<br>DRAWING N° |             |      |
| REV N°   | DESCRIPTION | DATE     | REV N°               | DESCRIPTION | DATE |
| 1  | OLD 11-239  | 04/02/15 | 3                    |             |      |
| 2  |             |          | 4                    |             |      |
| SHEET 4 OF 19  |             |          |                      |             |      |



**SECTION P-P (1):  
WALL MOUNT**



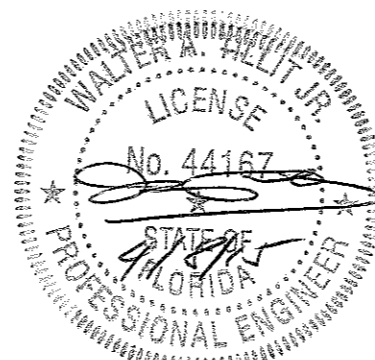
**SECTION P-P (2):  
INSIDE WALL MOUNT**



**SECTION P-P (3):  
BUILD-OUT MOUNT**

**SIDE RAIL CONNECTIONS  
TO POURED CONCRETE OR GROUT FILLED CELL  
CONCRETE BLOCK**

SCALE: 1/2" = 1"



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|  |             |          |                      |             |      |
|--|-------------|----------|----------------------|-------------|------|
| RLL 55-X SLAT END RETENTION<br>ROLL-UP SHUTTER                                     |             |          | F.R.L.<br>DRAWN BY   |             |      |
| ROLLAC SHUTTER OF TEXAS, INC.  |             |          | 04/02/15<br>DATE     |             |      |
| 5331 ORANGE STREET<br>PEARLAND, TX. 77581<br>PH:(281) 485-1911, FAX:(281) 485-0839 |             |          | 15-060<br>DRAWING N° |             |      |
| REV N°   | DESCRIPTION | DATE     | REV N°               | DESCRIPTION | DATE |
| 1  | OLD 11-238  | 04/02/15 | 3                    |             |      |
| 2  |             |          | 4                    |             |      |

SHEET 5 OF 19

(2) 2"x4" OR 2"x6" STUDS  
REQ'D. @ JAMB. (SEE NOTE  
(\*) BELOW.

MIN. 1/2" PLYWOOD OR  
7/16" O.S.B. REQ'D. (SEE  
NOTE (\*) BELOW.

5/16"Ø ELCO CONSTRUCTION  
PRODUCTS ULTRACON ANCHORS (SEE  
SCHEDULE FOR SPACING ON SHEET 19)

OPEN HOLE  
& COVER W/  
NYLON CAP

3/16", 1/8"  
SLIP (SEE  
SCHEDULE  
ON SHEET 18)

S/8

**SECTION P-P (1):  
WALL MOUNT**

(2) 2"x4" OR 2"x6" STUDS  
REQ'D. @ JAMB. (SEE NOTE  
(\*) BELOW.

MIN. 1/2" PLYWOOD OR  
7/16" O.S.B. REQ'D. (SEE  
NOTE (\*) BELOW.

5/16"Ø ELCO CONSTRUCTION  
PRODUCTS ULTRACON ANCHORS (SEE  
SCHEDULE FOR SPACING ON SHEET 19)

1/4"Ø x 1" ITW BUILDDEX  
TEK SCREWS  
@ 4" O.C.

3/4" — 2 1/4"

OPEN HOLE & COVER  
W/ NYLON CAP

OPEN HOLE  
& COVER W/  
NYLON CAP

3/16", 1/8"  
SLIP (SEE  
SCHEDULE  
ON SHEET 18)

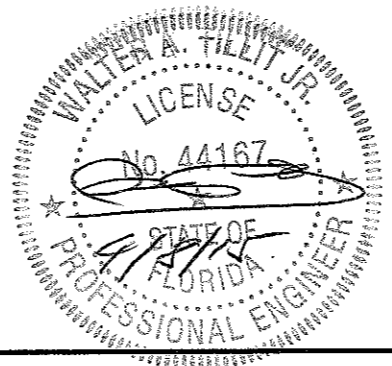
S/8

**SECTION P-P (2):  
BUILD-OUT MOUNT**

**SIDE RAIL CONNECTIONS  
TO WOOD WALL**

SCALE: 1/2" = 1"

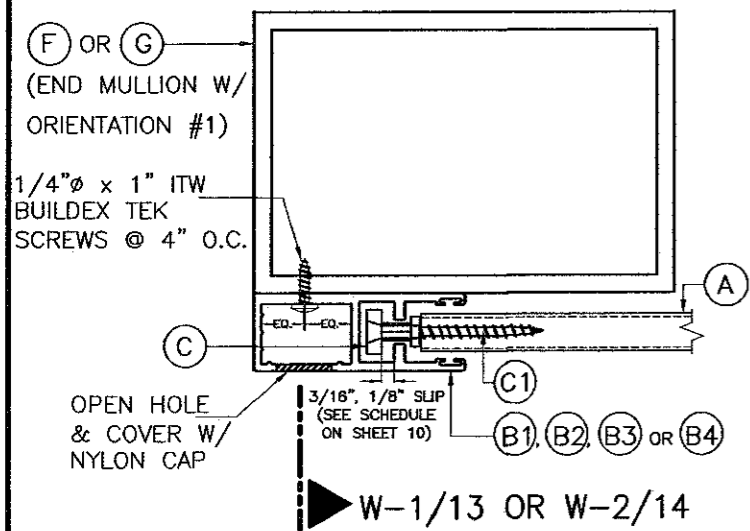
(\* SEE LIMITATIONS FOR SHUTTER SPAN AND  
DESIGN PRESSURE RATING ON SHEET 18.



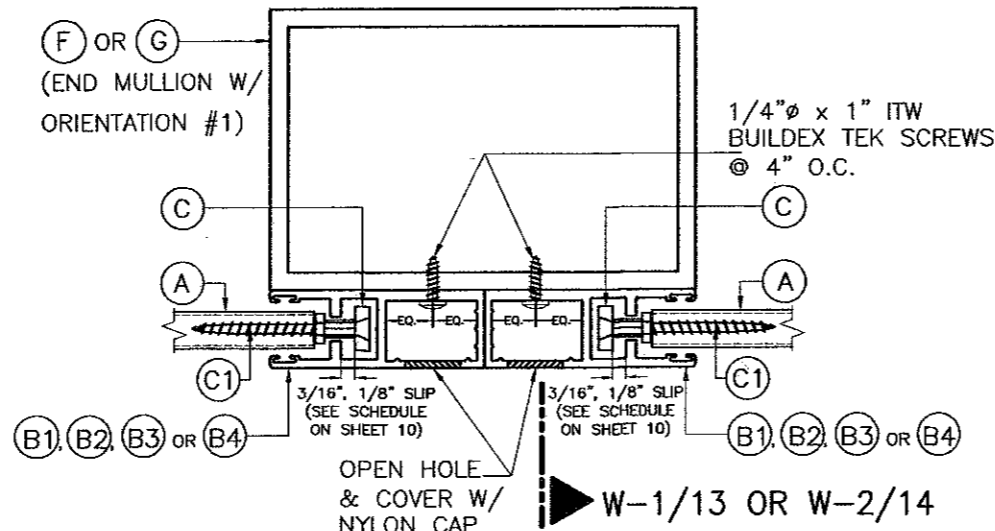
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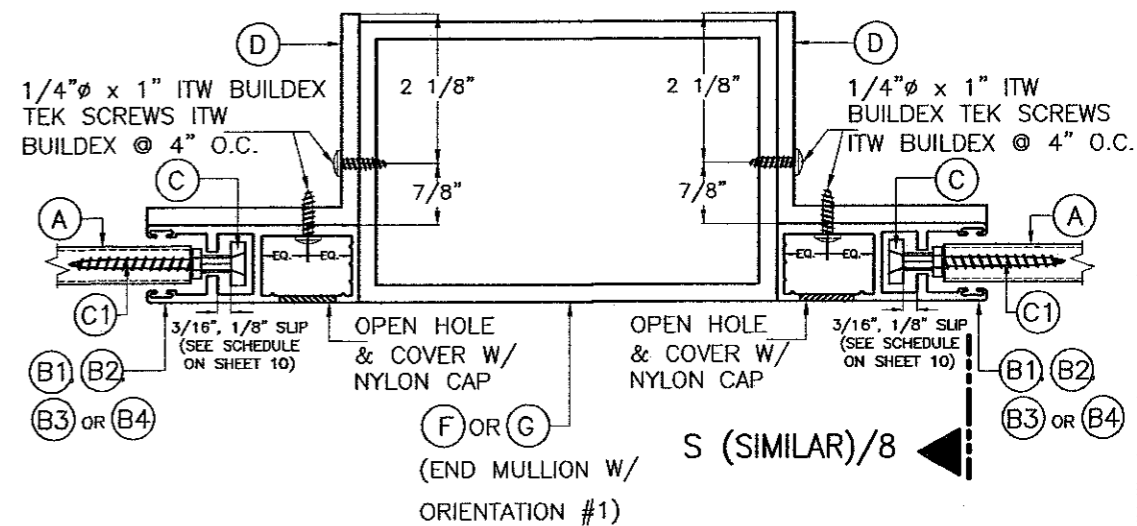
|  |                   |                      |
|--|-------------------|----------------------|
| RLI 55-X SLAT END RETENTION<br>ROLL-UP SHUTTER                                     |                   | F.R.L.<br>DRAWN BY   |
| ROLLAC SHUTTER OF TEXAS, INC.  |                   | 04/02/15<br>DATE     |
| 5331 ORANGE STREET<br>PEARLAND, TX, 77581<br>PH:(281) 485-1911, FAX:(281) 485-0839 |                   | 15-060<br>DRAWING N° |
| REV N°   | DESCRIPTION       | DATE                 |
| 1  | ADD. 2x4's/2x6's. | 4/22/19              |
| 2  |                   |                      |



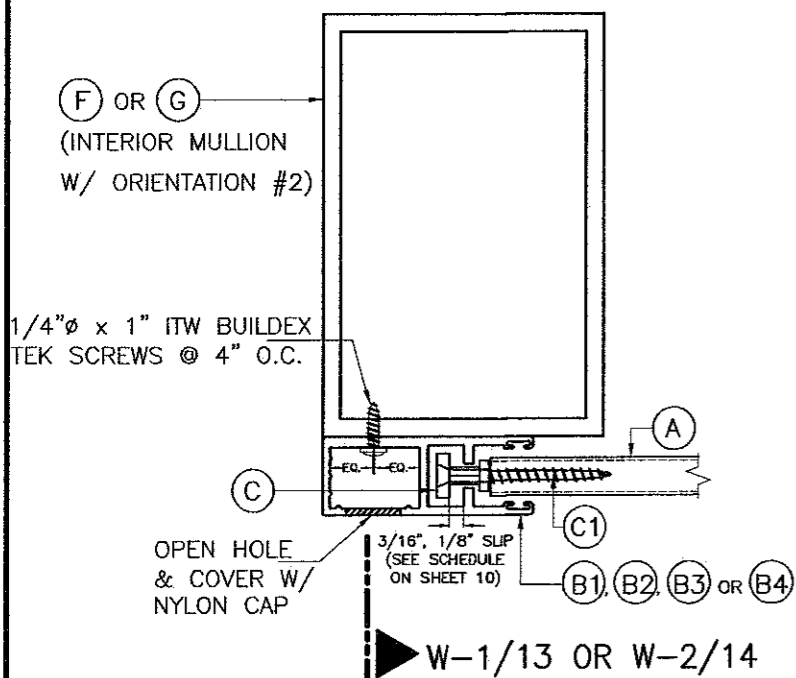
**SECTION Q-Q:  
MULLION MOUNT (FACE MOUNT)**



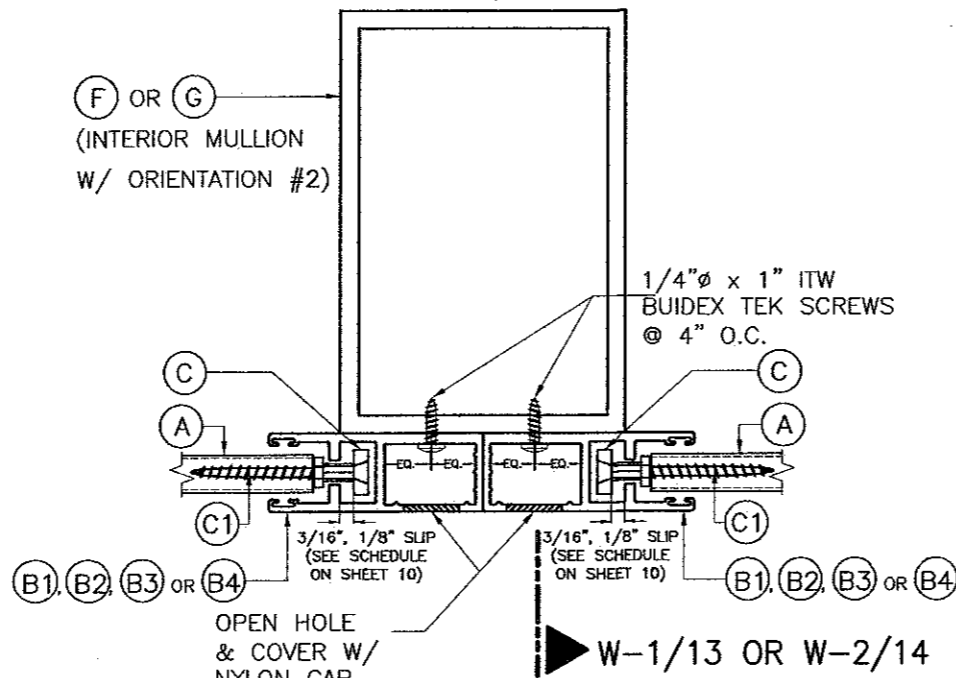
**SECTION R-R:  
MULLION MOUNT (FACE MOUNT)**



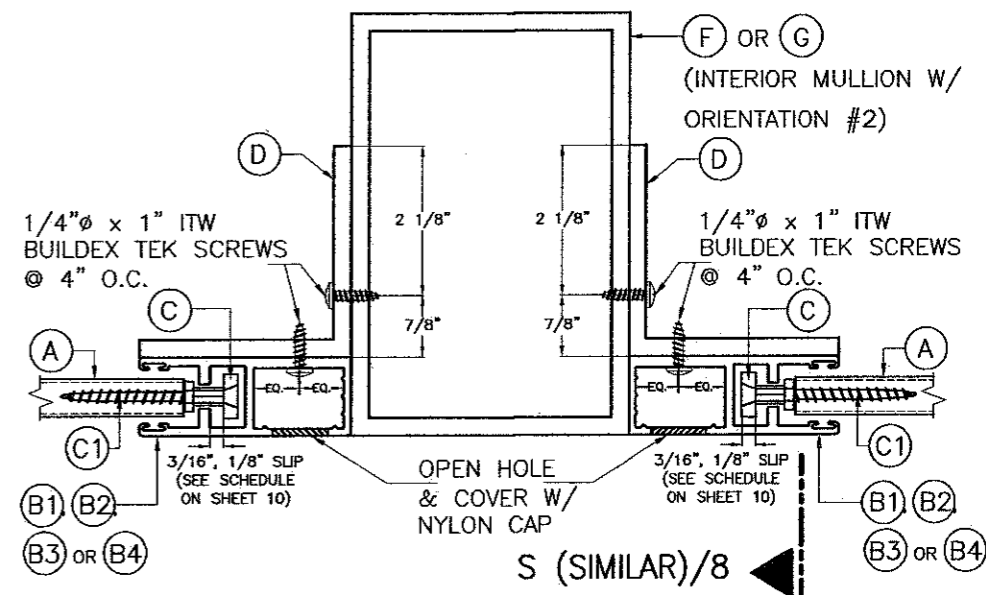
**SECTION R'-R':  
MULLION MOUNT (INSIDE MOUNT)**



**SECTION Q-Q:  
MULLION MOUNT (FACE MOUNT)**



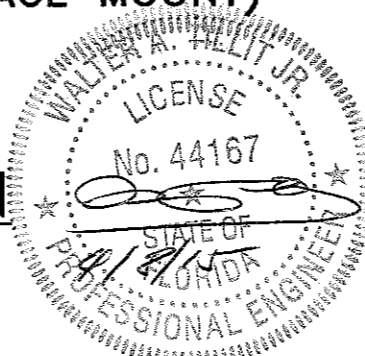
**SECTION R-R:  
MULLION MOUNT (FACE MOUNT)**



**SECTION R'-R':  
MULLION MOUNT (INSIDE MOUNT)**

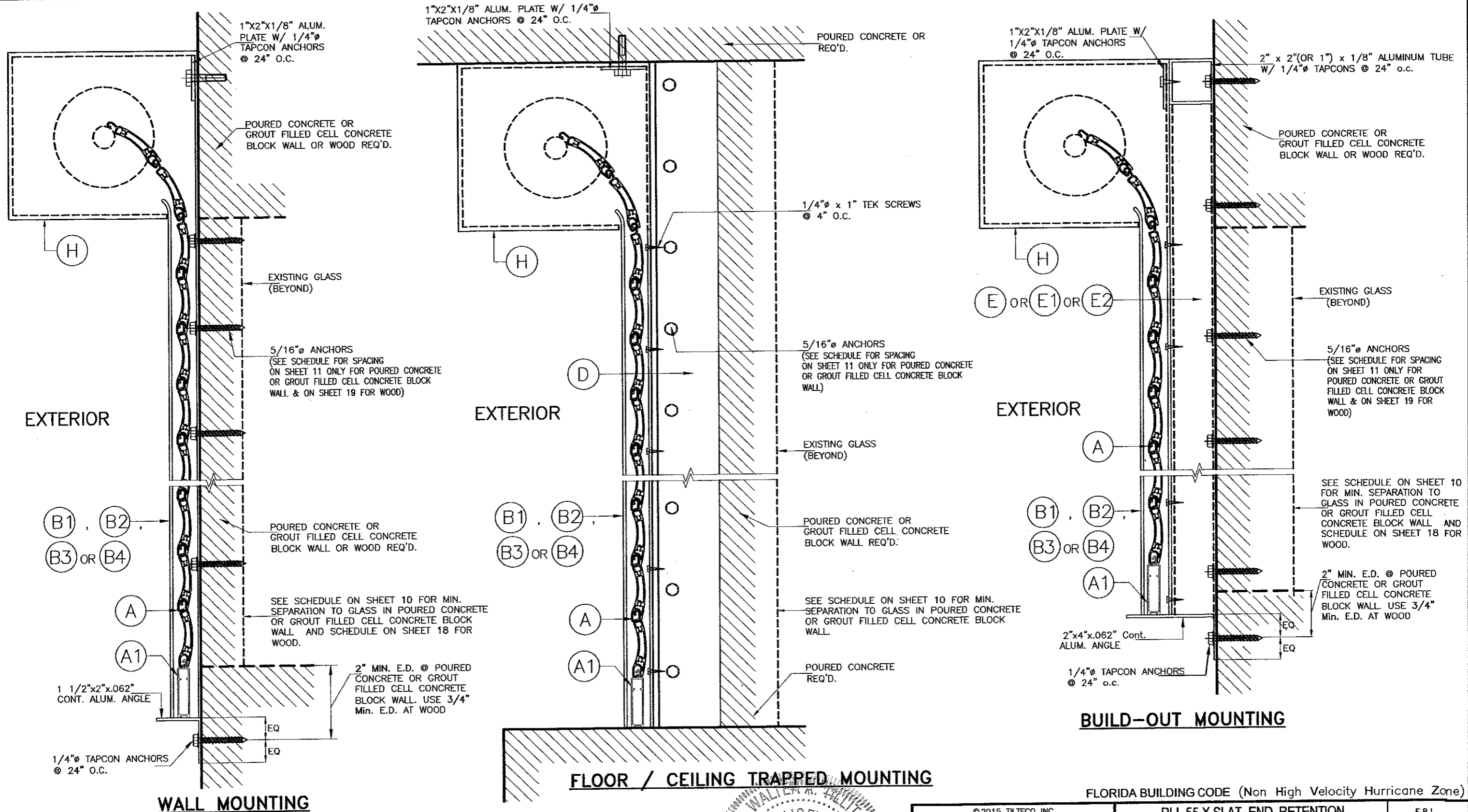
# SIDE RAIL CONNECTION TO MULLIONS

SCALE: 3/8" = 1"



FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)

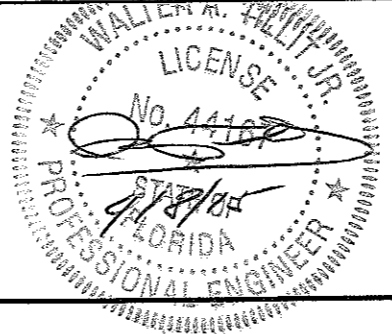
| <p>TILTECO INC.<br/>TILLIT TESTING &amp; ENGINEERING COMPANY<br/>6355 N.W. 36th St., Ste. 305 - VIRGINIA GARDENS, FL 33166<br/>Phone: (305) 871-1530, Fax: (305) 871-1531<br/>e-mail: tilteco@aol.com<br/>EB-0006719<br/>WALTER A. TILLIT Jr., P.E.<br/>FLORIDA Lic. # 44167</p>   |             | <p>RLL 55-X SLAT END RETENTION<br/>ROLL-UP SHUTTER</p> <p>ROLLAC SHUTTER OF TEXAS, INC.<br/>5331 ORANGE STREET<br/>PEARLAND, TX. 77581<br/>PH: (281) 485-1911, FAX: (281) 485-0839</p> | <p>F.R.L.<br/>DRAWN BY</p> <p>04/02/15<br/>DATE</p> <p>15-060<br/>DRAWING N°</p> |             |             |      |   |            |          |   |  |  |   |  |  |   |  |  |                      |  |
|--|-------------|--|--|-------------|-------------|------|---|------------|----------|---|--|--|---|--|--|---|--|--|----------------------|--|
| <table border="1"> <thead> <tr> <th>REV N°</th> <th>DESCRIPTION</th> <th>DATE</th> <th>REV N°</th> <th>DESCRIPTION</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>OLD 11-230</td> <td>04/02/15</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 N°      | DESCRIPTION  | DATE   | REV N°      | DESCRIPTION | DATE | 1 | OLD 11-230 | 04/02/15 | 3 |  |  | 2 |  |  | 4 |  |  | <p>SHEET 7 OF 19</p> |  |
| REV N°   | DESCRIPTION | DATE   | REV N°   | DESCRIPTION | DATE        |      |   |            |          |   |  |  |   |  |  |   |  |  |                      |  |
| 1  | OLD 11-230  | 04/02/15   | 3  |             |             |      |   |            |          |   |  |  |   |  |  |   |  |  |                      |  |
| 2  |             |  | 4  |             |             |      |   |            |          |   |  |  |   |  |  |   |  |  |                      |  |



**SECTION S-S**

N.T.S

**INSTALLATION DETAILS ON EXISTING POURED CONCRETE OR GROUT FILLED CELL CONCRETE BLOCK WALL OR WOOD**



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 e-mail: tilteco@aol.com  
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 WALTER A. TILLIT JR., P.E.  
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5331 ORANGE STREET  
 PEARLAND, TX. 77581  
 PH: (281) 485-1911, FAX: (281) 485-0839

| REV # | DESCRIPTION | DATE     | REV # | DESCRIPTION | DATE |
|-------|-------------|----------|-------|-------------|------|
| 1     | OLD 11-239  | 04/02/15 | 3     |             |      |
| 2     |             |          | 4     |             |      |

|                    |          |
|--------------------|----------|
| F.R.L.<br>DRAWN BY |          |
| DATE               | 04/02/15 |
| DRAWING #          | 15-060   |
| SHEET              | 8 OF 19  |



**TYPICAL MANDATORY PROCEDURE FOR VERIFYING SHUTTER CODE COMPLIANCE  
RELATED TO ITS INSTALLATION INTO EXISTING POURED CONCRETE OR  
GROUT FILLED CELL CONCRETE BLOCK STRUCTURES (\*)**

**STEP 1:** OBTAIN JOB SITE'S A.S.D. DESIGN LOAD (p.s.f.) FOR THE OPENING AND DESIRED SHUTTER SPAN "L" (ft) TO PROTECT IT (SEE GENERAL NOTE #1, ON SHEET 1).

**STEP 2:** ENTER TO CHARTS I THRU III ON SHEET 10 TO DETERMINE, BASED ON AN ASSUMED SLAT SLIP (in); A.S.D. DESIGN LOAD (p.s.f.); AND SHUTTER SPAN "L" (ft) ; THE REQUIRED FINAL SLAT SLIP THAT SLATS MUST BE INSTALLED WITH TO MEET THE REQUIRED A.S.D. LOAD AND DESIRED SHUTTER SPAN.

THE FOLLOWING INFORMATION IS PROVIDED AT CHARTS I THRU III TO PROCEED WITH SHUTTER INSTALLATION VERIFICATION:

- ENTER A.S.D. DESIGN LOAD: SEE STEP (1) ABOVE.
- FOR A SPECIFIC SHUTTER MOUNTING INSTALLATION TYPE, THE FOLLOWING DEFINITIONS FOR SLAT SPAN SHALL BE CONSIDERED:

**L<sub>MAX</sub>:** THIS IS THE MAXIMUM ALLOWABLE SHUTTER SPAN FOR WHICH A GIVEN SLAT SLIP (3/16", 1/8" OR LESS THAN 1/8") MAY BE USED, FOR A GIVEN A.S.D. DESIGN LOAD.

**L<sub>MIN</sub>:** THIS IS THE MINIMUM ALLOWABLE SHUTTER SPAN FOR WHICH A GIVEN SLIP (3/16", 1/8" OR LESS THAN 1/8") MAY BE USED, FOR A GIVEN A.S.D. DESIGN LOAD. IN CASE JOB SITE DESIRED SHUTTER SPAN (L) WAS SHORTER THAN L<sub>MIN</sub>, THEN GO TO THE OTHER CHARTS WITH A SHORTER SLAT SLIP AND VERIFY THAT (L) IS ALLOWED FOR THAT OTHER SHORTER SLIP.

- MINIMUM REQUIRED SEPARATION TO GLASS IS PROVIDED ON CHARTS I, II & III: PROVIDES SEPARATION TO GLASS FOR SHUTTERS WITH OR WITHOUT MULLIONS BASED ON SHUTTER INSTALLATIONS WITHIN WIND ZONES 1 THRU 4, AS DEFINED BY ASTM E 1996-05, SECTION 6.2.2.

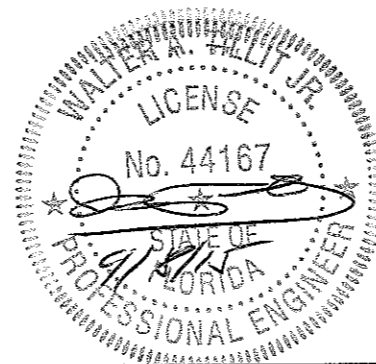
**STEP 3:** OBTAIN INFORMATION ON SHUTTER'S SIDE RAIL ANCHOR SPACING REQUIREMENTS FOR CONNECTION TO EXISTING STRUCTURE FROM ANCHOR SCHEDULE IV ON SHEET 11. ENTER SCHEDULE WITH FINALLY DETERMINED SUBSTRATE, MOUNTING TYPE, DESIGN LOAD & SHUTTER SPAN AND OBTAIN MAXIMUM ANCHOR SPACING (INCHES ON CENTERS). SEE GENERAL NOTE 6 ON SHEET 1 FOR ANCHOR SPECS.

**STEP 4:** IF SHUTTER INSTALLATION INCLUDES MULLIONS, THE FOLLOWING MANDATORY ADDITIONAL PROCEDURE IS APPLICABLE.

**PROCEDURE 4g:** IF MULLIONS ARE USED

1. MINIMUM SEPARATION TO GLASS FOR SLATS IF MULLIONS ARE USED SHALL BE BASED ON INSTALLATIONS PERFORMED WITHIN ASTM WIND ZONES 1 THRU 4 INDICATED ON CHARTS I, II & III ON SHEET 10. IT SHALL BE MEASURED FROM BACK OF SLATS TO GLASS. FOR INSTALLATIONS WITHIN ASTM WIND ZONES 1 THRU 3 WHERE MINIMIZING OF THE PROBABILITY OF BREACHING OF GLASS IS DESIRED EVEN THOUGH IT IS NOT REQUIRED BY THE FLORIDA BUILDING CODE, MINIMUM SEPARATION TO GLASS FOR SLATS SHALL BE IDENTICAL TO WIND ZONE 4 VALUES.
2. ENTER SCHEDULES 1a THRU 2c ON SHEETS 15, 16 & 17 W/ A.S.D. DESIGN LOAD ; MAXIMUM MULLION SPACING (MAX., 12' OR 7'), AND DETERMINE MAXIMUM MULLION SPAN (HEIGHT) W/ ALLOWABLE INTERPOLATION IN BETWEEN SPACINGS FOR A GIVEN F & G , MULLION TYPE & MULLION ORIENTATION.
3. SEE SHEETS 13 & 14 FOR REQUIRED MULLION CONNECTION DETAILS AT TOP & BOTTOM FOR FLOOR TO CEILING (TRAPPED) OR WALL MOUNTINGS OF MULLIONS INTO CONCRETE FOR A GIVEN MULLION TYPE (F) & (G).

\* PROCEDURE PER STEPS 1 THRU 3 IS SIMILAR FOR INSTALLATIONS INTO WOOD FRAME STRUCTURES. SEE SHEETS 18 & 19 FOR LIMITATIONS APPLICABLE TO INSTALLATIONS INTO WOOD FRAME STRUCTURES.



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FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)

|  |             |                      |
|--|-------------|----------------------|
| RLL 55-X SLAT END RETENTION<br>ROLL-UP SHUTTER                                     |             | F.R.L.<br>DRAWN BY   |
| ROLLAC SHUTTER OF TEXAS, INC.  |             | 04/02/15<br>DATE     |
| 5331 ORANGE STREET<br>PEARLAND, TX. 77581<br>PH:(281) 485-1911, FAX:(281) 485-0839 |             | 15-060<br>DRAWING N° |
| REV N°   | DESCRIPTION | DATE                 |
| 1  | OLD 11-239  | 04/02/15             |
| 2  |             |                      |
| REV N°   | DESCRIPTION | DATE                 |
| 3  |             |                      |
| 4  |             |                      |
| SHEET 9 OF 19  |             |                      |

# SLAT PERFORMANCE CHARTS I, II & III:

## VALID FOR INSTALLATION INTO POURED CONCRETE, GROUT FILLED CELL CONCRETE BLOCK OR MULLIONS

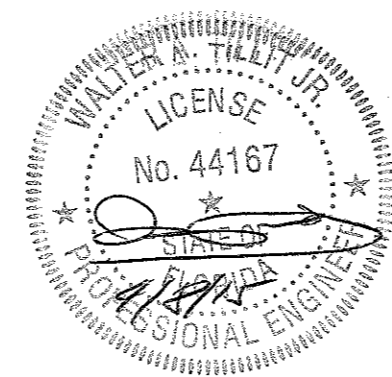
FOR A GIVEN A.S.D. DESIGN LOAD (p.s.f.) AND SHUTTER MOUNT CONDITION

| CHART I (ONLY VALID FOR 3/16" SLIP)                         |                         |                            |                                     |                                     |  |                               |             |
|---|-------------------------|----------------------------|-------------------------------------|-------------------------------------|--|-------------------------------|-------------|
| USE MAXIMUM VALUE BETWEEN POSITIVE AND NEGATIVE A.S.D. LOAD |                         |                            |                                     |                                     | USE MAXIMUM POSITIVE LOAD VALUE                          |                               |             |
| MAXIMUM A.S.D. DESIGN PRESSURE RATING (p.s.f.)              | MAX. SLAT SPAN          |                            |                                     |                                     | REQUIRED MIN. SLAT SPAN                                  | MIN. SEPARATION TO GLASS (in) |             |
|   | WALL MOUNT (SEE NOTES*) | TRAPPED MOUNT (SEE NOTES*) | BUILD-OUT MOUNT W/ (E) (SEE NOTES*) | BUILD-OUT MOUNT W/ (E) (SEE NOTES*) | WALL TRAPPED & BUILD-OUT MOUNT W/ (E) & (E) (SEE NOTES*) | WIND ZONE 1, 2 & 3            | WIND ZONE 4 |
| 30.0  | 19'-8"                  | 19'-8"                     | 16'-6"                              | 13'-11"                             | 6'-6"  | 1"                            | 12.00"      |
| 35.0  | 18'-3"                  | 18'-3"                     | 14'-11"                             | 12'-7"                              | 6'-3"  | 1"                            | 12.00"      |
| 40.0  | 16'-8"                  | 16'-8"                     | 13'-7"                              | 11'-6"                              | 6'-0"  | 1"                            | 12.00"      |
| 45.0  | 15'-3"                  | 15'-3"                     | 12'-6"                              | 10'-9"                              | 5'-9"  | 1"                            | 12.00"      |
| 50.0  | 14'-3"                  | 14'-3"                     | 11'-8"                              | 10'-0"                              | 5'-7"  | 1"                            | 12.00"      |
| 55.0  | 13'-3"                  | 13'-3"                     | 11'-0"                              | 9'-6"                               | 5'-6"  | 1"                            | 12.00"      |
| 60.0  | 12'-6"                  | 12'-6"                     | 10'-4"                              | 9'-0"                               | 5'-4"  | 1"                            | 12.00"      |
| 65.0  | 11'-11"                 | 11'-11"                    | 9'-10"                              | 8'-6"                               | 5'-3"  | 1"                            | 9 3/4"      |
| 70.0  | 11'-5"                  | 11'-5"                     | 9'-5"                               | 8'-2"                               | 5'-1"  | 1"                            | 9 3/4"      |
| 75.0  | 10'-11"                 | 10'-11"                    | 9'-0"                               | 7'-11"                              | 5'-0"  | 1"                            | 9 3/4"      |
| 80.0  | 10'-5"                  | 10'-5"                     | 8'-8"                               | 7'-7"                               | 4'-11"   | 1"                            | 9 3/4"      |
| 85.0  | 10'-0"                  | 10'-0"                     | 8'-3"                               | 7'-4"                               | 4'-10"   | 1"                            | 9 3/4"      |
| 90.0  | 9'-6"                   | 9'-6"                      | 8'-0"                               | 7'-1"                               | 4'-9"  | 1"                            | 9 3/4"      |
| 95.0  | 9'-3"                   | 9'-2"                      | 7'-9"                               | 6'-11"                              | 4'-8"  | 1"                            | 9 3/4"      |
| 100.0   | 8'-11"                  | 8'-10"                     | 7'-6"                               | 6'-9"                               | 4'-7"  | 1"                            | 9 3/4"      |
| 105.0   | 8'-9"                   | 8'-6"                      | 7'-3"                               | 6'-6"                               | 4'-7"  | 1"                            | 9 3/4"      |
| 110.0   | 8'-6"                   | 8'-3"                      | 7'-1"                               | 6'-5"                               | 4'-6"  | 1"                            | 9 3/4"      |
| 115.0   | 8'-3"                   | 8'-0"                      | 6'-11"                              | 6'-3"                               | 4'-5"  | 1"                            | 9 3/4"      |
| 120.0   | 8'-0"                   | 7'-9"                      | 6'-9"                               | 6'-1"                               | 4'-5"  | 1"                            | 9 3/4"      |
| 125.0   | 7'-10"                  | 7'-6"                      | 6'-7"                               | 6'-0"                               | 4'-4"  | 1"                            | 9 3/4"      |
| 130.0   | 7'-8"                   | 7'-5"                      | 6'-5"                               | 5'-10"                              | 4'-3"  | 1"                            | 9 3/4"      |
| 135.0   | 7'-6"                   | 7'-2"                      | 6'-3"                               | 5'-9"                               | 4'-3"  | 1"                            | 9 3/4"      |
| 140.0   | 7'-3"                   | 7'-0"                      | 6'-2"                               | 5'-8"                               | 4'-2"  | 1"                            | 9 3/4"      |
| 145.0   | 7'-2"                   | 6'-10"                     | 6'-0"                               | 5'-6"                               | 4'-2"  | 1"                            | 9 3/4"      |
| 150.0   | 7'-0"                   | 6'-8"                      | 6'-0"                               | 5'-5"                               | 4'-1"  | 1"                            | 9 3/4"      |
| 155.0   | 6'-10"                  | 6'-6"                      | 5'-10"                              | 5'-4"                               | 4'-1"  | 1"                            | 9 3/4"      |
| 160.0   | 6'-9"                   | 6'-5"                      | 5'-9"                               | 5'-3"                               | 4'-1"  | 1"                            | 7"          |

| CHART II (ONLY VALID FOR 1/8" SLIP)                         |                         |                            |                                     |                                     |  |                               |             |
|---|-------------------------|----------------------------|-------------------------------------|-------------------------------------|--|-------------------------------|-------------|
| USE MAXIMUM VALUE BETWEEN POSITIVE AND NEGATIVE A.S.D. LOAD |                         |                            |                                     |                                     | USE MAXIMUM POSITIVE LOAD VALUE                          |                               |             |
| MAXIMUM A.S.D. DESIGN PRESSURE RATING (p.s.f.)              | MAX. SLAT SPAN          |                            |                                     |                                     | REQUIRED MIN. SLAT SPAN                                  | MIN. SEPARATION TO GLASS (in) |             |
|   | WALL MOUNT (SEE NOTES*) | TRAPPED MOUNT (SEE NOTES*) | BUILD-OUT MOUNT W/ (E) (SEE NOTES*) | BUILD-OUT MOUNT W/ (E) (SEE NOTES*) | WALL TRAPPED & BUILD-OUT MOUNT W/ (E) & (E) (SEE NOTES*) | WIND ZONE 1, 2 & 3            | WIND ZONE 4 |
| 30.0  | 18'-3"                  | 18'-3"                     | 15'-0"                              | 12'-7"                              | 6'-2"  | 1"                            | 12.00"      |
| 35.0  | 16'-4"                  | 16'-4"                     | 13'-5"                              | 11'-5"                              | 5'-10"   | 1"                            | 12.00"      |
| 40.0  | 14'-11"                 | 14'-11"                    | 12'-3"                              | 10'-5"                              | 5'-8"  | 1"                            | 12.00"      |
| 45.0  | 13'-9"                  | 13'-9"                     | 11'-4"                              | 9'-9"                               | 5'-6"  | 1"                            | 12.00"      |
| 50.0  | 12'-9"                  | 12'-9"                     | 10'-7"                              | 9'-1"                               | 5'-4"  | 1"                            | 12.00"      |
| 55.0  | 12'-0"                  | 12'-0"                     | 9'-11"                              | 8'-7"                               | 5'-2"  | 1"                            | 12.00"      |
| 60.0  | 11'-4"                  | 11'-4"                     | 9'-5"                               | 8'-2"                               | 5'-0"  | 1"                            | 9 3/4"      |
| 65.0  | 10'-9"                  | 10'-9"                     | 8'-11"                              | 7'-10"                              | 4'-11"   | 1"                            | 9 3/4"      |
| 70.0  | 10'-2"                  | 10'-2"                     | 8'-6"                               | 7'-6"                               | 4'-10"   | 1"                            | 9 3/4"      |
| 75.0  | 9'-9"                   | 9'-9"                      | 8'-2"                               | 7'-2"                               | 4'-9"  | 1"                            | 9 3/4"      |
| 80.0  | 9'-4"                   | 9'-4"                      | 7'-10"                              | 6'-11"                              | 4'-8"  | 1"                            | 9 3/4"      |
| 85.0  | 9'-0"                   | 9'-0"                      | 7'-7"                               | 6'-9"                               | 4'-7"  | 1"                            | 9 3/4"      |
| 90.0  | 8'-8"                   | 8'-8"                      | 7'-4"                               | 6'-6"                               | 4'-6"  | 1"                            | 9 3/4"      |
| 95.0  | 8'-5"                   | 8'-5"                      | 7'-1"                               | 6'-4"                               | 4'-5"  | 1"                            | 9 3/4"      |
| 100.0   | 8'-2"                   | 8'-2"                      | 6'-10"                              | 6'-2"                               | 4'-4"  | 1"                            | 9 3/4"      |
| 105.0   | 7'-11"                  | 7'-10"                     | 6'-8"                               | 6'-0"                               | 4'-4"  | 1"                            | 9 3/4"      |
| 110.0   | 7'-8"                   | 7'-8"                      | 6'-6"                               | 5'-10"                              | 4'-3"  | 1"                            | 9 3/4"      |
| 115.0   | 7'-6"                   | 7'-5"                      | 6'-4"                               | 5'-9"                               | 4'-2"  | 1"                            | 9 3/4"      |
| 120.0   | 7'-3"                   | 7'-2"                      | 6'-2"                               | 5'-7"                               | 4'-2"  | 1"                            | 9 3/4"      |
| 125.0   | 7'-1"                   | 7'-0"                      | 6'-1"                               | 5'-6"                               | 4'-1"  | 1"                            | 9 3/4"      |
| 130.0   | 6'-11"                  | 6'-10"                     | 5'-11"                              | 5'-5"                               | 4'-1"  | 1"                            | 9 3/4"      |
| 135.0   | 6'-9"                   | 6'-8"                      | 5'-10"                              | 5'-3"                               | 4'-0"  | 1"                            | 7"          |
| 140.0   | 6'-8"                   | 6'-6"                      | 5'-8"                               | 5'-2"                               | 4'-0"  | 1"                            | 7"          |
| 145.0   | 6'-6"                   | 6'-4"                      | 5'-7"                               | 5'-1"                               | 3'-11"   | 1"                            | 7"          |
| 150.0   | 6'-5"                   | 6'-2"                      | 5'-6"                               | 5'-0"                               | 3'-11"   | 1"                            | 7"          |
| 155.0   | 6'-3"                   | 6'-1"                      | 5'-5"                               | 4'-11"                              | 3'-10"   | 1"                            | 7"          |
| 160.0   | 6'-2"                   | 5'-11"                     | 5'-4"                               | 4'-10"                              | 3'-10"   | 1"                            | 7"          |

| CHART III (ONLY VALID FOR LESS THAN 1/8" SLIP)              |  |  |                                 |             |
|---|--|--|---------------------------------|-------------|
| USE MAXIMUM VALUE BETWEEN POSITIVE AND NEGATIVE A.S.D. LOAD |  |  | USE MAXIMUM POSITIVE LOAD VALUE |             |
| MAXIMUM A.S.D. DESIGN PRESSURE RATING (p.s.f.)              | MAX. SLAT SPAN L <sub>max</sub> (ft)                     | REQUIRED MIN. SLAT SPAN L <sub>min</sub> (ft)            | MIN. SEPARATION TO GLASS (in)   |             |
|   | WALL TRAPPED & BUILD-OUT MOUNT W/ (E) & (E) (SEE NOTES*) | WALL TRAPPED & BUILD-OUT MOUNT W/ (E) & (E) (SEE NOTES*) | WIND ZONE 1, 2 & 3              | WIND ZONE 4 |
| 30.0  | 6'-0"  | 0'-0"  | 1"                              | 7"          |
| 35.0  | 5'-9"  | 0'-0"  | 1"                              | 7"          |
| 40.0  | 5'-5"  | 0'-0"  | 1"                              | 7"          |
| 45.0  | 5'-1"  | 0'-0"  | 1"                              | 7"          |
| 50.0  | 4'-10"   | 0'-0"  | 1"                              | 7"          |
| 55.0  | 4'-7"  | 0'-0"  | 1"                              | 7"          |
| 60.0  | 4'-5"  | 0'-0"  | 1"                              | 7"          |
| 65.0  | 4'-3"  | 0'-0"  | 1"                              | 7"          |
| 70.0  | 4'-1"  | 0'-0"  | 1"                              | 7"          |
| 75.0  | 3'-11"   | 0'-0"  | 1"                              | 7"          |
| 80.0  | 3'-10"   | 0'-0"  | 1"                              | 7"          |
| 85.0  | 3'-8"  | 0'-0"  | 1"                              | 7"          |
| 90.0  | 3'-7"  | 0'-0"  | 1"                              | 7"          |
| 95.0  | 3'-6"  | 0'-0"  | 1"                              | 7"          |
| 100.0   | 3'-5"  | 0'-0"  | 1"                              | 7"          |
| 105.0   | 3'-4"  | 0'-0"  | 1"                              | 7"          |
| 110.0   | 3'-3"  | 0'-0"  | 1"                              | 7"          |
| 115.0   | 3'-2"  | 0'-0"  | 1"                              | 7"          |
| 120.0   | 3'-1"  | 0'-0"  | 1"                              | 7"          |
| 125.0   | 3'-1"  | 0'-0"  | 1"                              | 7"          |
| 130.0   | 3'-0"  | 0'-0"  | 1"                              | 7"          |
| 135.0   | 2'-11"   | 0'-0"  | 1"                              | 7"          |
| 140.0   | 2'-11"   | 0'-0"  | 1"                              | 7"          |
| 145.0   | 2'-10"   | 0'-0"  | 1"                              | 7"          |
| 150.0   | 2'-9"  | 0'-0"  | 1"                              | 7"          |
| 155.0   | 2'-9"  | 0'-0"  | 1"                              | 7"          |
| 160.0   | 2'-8"  | 0'-0"  | 1"                              | 7"          |

- \* NOTES:**
- ABOVE INDICATED MAX. SLAT SPANS MAY BE USED AS LONG AS ANCHOR SPACING SCHEDULES ON SHEET 11 INDICATE THAT A SPACING IS AVAILABLE FOR THE CORRESPONDING SLAT SPAN AND DESIGN LOAD.
  - REQUIRES SIDE RAILS FASTENED TO EXISTING STRUCTURE WITH 5/16" ITW BUILDEX TAPCON XL INTO POURED CONCRETE OR GROUT FILLED CELL CONCRETE BLOCK OR 1/4" TEK SCREWS AT MULLIONS CONNECTION VALID FOR WALL MOUNTED, INSIDE MOUNTED, AND BUILD-OUT MOUNTED.
  - MAXIMUM SLAT SPANS FOR INTERMEDIATE LOADS MAY BE DETERMINED BY LINEAR INTERPOLATION BETWEEN END VALUES.



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EB-0006719  
WALTER A. TILLIT Jr., P.E.  
FLORIDA Lic. # 44167

FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)

|  |             |                      |
|--|-------------|----------------------|
| <b>ROLL 55-X SLAT END RETENTION<br/>ROLL-UP SHUTTER</b>                            |             | F.R.L.<br>DRAWN BY   |
| <b>ROLLAC SHUTTER OF TEXAS, INC.</b>   |             | 04/02/15<br>DATE     |
| 5331 ORANGE STREET<br>PEARLAND, TX. 77581<br>PH:(281) 485-1911, FAX:(281) 485-0839 |             | 15-060<br>DRAWING N° |
| REV N°   | DESCRIPTION | DATE                 |
| 1  | OLD 11-230  | 04/02/15             |
| 2  |             | 4                    |

**MAX. ANCHOR'S SPACING SCHEDULE IV FOR A GIVEN PRODUCT MOUNTING TYPE W/  $\phi$  5/16" ITW BUILDEX  
TAPCON XL ANCHORS TO POURED CONCRETE WALL OR GROUT FILLED CELL CONCRETE BLOCK WALL, A.S.D. DESIGN LOAD & SLAT SPAN  $\spadesuit$   
RANGE**

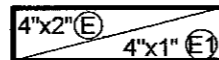
**WALL MOUNT**

| MAXIMUM<br>A.S.D.<br>DESIGN<br>PRESSURE<br>RATING<br>RANGE<br>(p.s.f.) | SLAT SPAN RANGE |            |            |            |            |             |              |                 |
|--|-----------------|------------|------------|------------|------------|-------------|--------------|-----------------|
|  | 0' to 4'        | > 4' to 5' | > 5' to 6' | > 6' to 7' | > 7' to 9' | > 9' to 12' | > 12' to 16' | > 16' to 19'-8" |
| ≤ 30.0   | 6.0"            | 6.0"       | 6.0"       | 8"         | 8"         | 7"          | 4 1/2"       | 4"              |
| >31-40   | 6.0"            | 6.0"       | 6.0"       | 8"         | 8"         | 5"          | 4"           | 3 3/4"          |
| >41-60   | 6.0"            | 6.0"       | 6.0"       | 8"         | 5 1/2"     | 4"          | 4"           | —               |
| >61-80   | 6.0"            | 6.0"       | 6.0"       | 6"         | 4"         | 3 3/4"      | —            | —               |
| >81-105  | 6.0"            | 6.0"       | 6.0"       | 4 1/2"     | 3 3/4"     | 3 3/4"      | —            | —               |
| >106-120   | 6.0"            | 6.0"       | 5 1/2"     | 4"         | 3 3/4"     | —           | —            | —               |
| >121-140   | 6.0"            | 6.0"       | 4 1/2"     | 3 3/4"     | 3 3/4"     | —           | —            | —               |
| >141-160   | 6.0"            | 6.0"       | 4"         | 3 3/4"     | 3 3/4"     | —           | —            | —               |

**TRAPPED MOUNT**

| MAXIMUM<br>A.S.D.<br>DESIGN<br>PRESSURE<br>RATING<br>RANGE<br>(p.s.f.) | SLAT SPAN RANGE |            |            |            |            |             |              |                 |
|--|-----------------|------------|------------|------------|------------|-------------|--------------|-----------------|
|  | 0' to 4'        | > 4' to 5' | > 5' to 6' | > 6' to 7' | > 7' to 9' | > 9' to 12' | > 12' to 16' | > 16' to 19'-8" |
| ≤ 30.0   | 6"              | 6"         | 6"         | 8"         | 8"         | 6 1/2"      | 4 1/2"       | 4"              |
| >31-40   | 6"              | 6"         | 6"         | 8"         | 7 1/2"     | 5"          | 4"           | 4"              |
| >41-60   | 6"              | 6"         | 6"         | 7 1/2"     | 5"         | 3 3/4"      | 3 3/4"       | —               |
| >61-80   | 6"              | 6"         | 6"         | 5 1/2"     | 4"         | 3 3/4"      | —            | —               |
| >81-105  | 6"              | 6"         | 6"         | 4"         | 3 3/4"     | 3 3/4"      | —            | —               |
| >106-120   | 6"              | 6"         | 5 1/2"     | 4"         | 3 3/4"     | —           | —            | —               |
| >121-140   | 6"              | 6"         | 1/2"       | 3 3/4"     | 3 3/4"     | —           | —            | —               |
| >141-160   | 6"              | 6"         | 4"         | 3 3/4"     | —          | —           | —            | —               |

**4" x 2" OR 4" x 1" BUILD-OUT MOUNT**



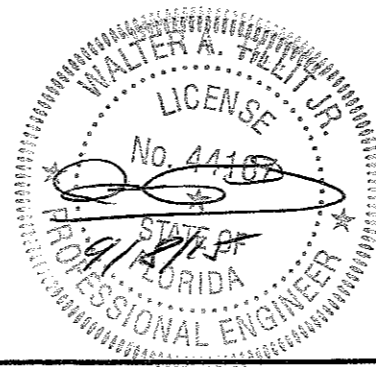
| MAXIMUM<br>A.S.D.<br>DESIGN<br>PRESSURE<br>RATING<br>RANGE<br>(p.s.f.) | SLAT SPAN RANGE |            |            |            |            |             |              |                 |        |        |        |        |        |   |        |
|--|-----------------|------------|------------|------------|------------|-------------|--------------|-----------------|--------|--------|--------|--------|--------|---|--------|
|  | 0' to 4'        | > 4' to 5' | > 5' to 6' | > 6' to 7' | > 7' to 9' | > 9' to 12' | > 12' to 16' | > 16' to 19'-8" |        |        |        |        |        |   |        |
| ≤ 30.0   | 6"              | 6"         | 6"         | 6"         | 6"         | 8"          | 8"           | 7"              | 8"     | 4"     | 5      | 3 3/4" | 3 3/4" | — | 3 3/4" |
| >31-40   | 6"              | 6"         | 6"         | 6"         | 6"         | 8"          | 8"           | 5"              | 6"     | 3 3/4" | 3 3/4" | 3 3/4" | 3 3/4" | — | —      |
| >41-60   | 6"              | 6"         | 6"         | 6"         | 6"         | 5"          | 6 1/2"       | 3 3/4"          | 4"     | 3 3/4" | 3 3/4" | —      | 3 3/4" | — | —      |
| >61-80   | 6"              | 6"         | 6"         | 6"         | 5 1/2"     | 6"          | 3 3/4"       | 4 1/2"          | 3 3/4" | 3 3/4" | —      | 3 3/4" | —      | — | —      |
| >81-105  | 6"              | 6"         | 6"         | 6"         | 3 3/4"     | 4 1/2"      | 3 3/4"       | 3 3/4"          | 3 3/4" | —      | —      | —      | —      | — | —      |
| >106-120   | 6"              | 6"         | 6"         | 6"         | 3 3/4"     | 4"          | 3 3/4"       | 3 3/4"          | —      | 3 3/4" | —      | —      | —      | — | —      |
| >121-140   | 6"              | 6"         | 6"         | 6"         | 3 3/4"     | 3 3/4"      | 3 3/4"       | 3 3/4"          | —      | —      | —      | —      | —      | — | —      |
| >141-160   | 6"              | 6"         | 6"         | 6"         | 3 3/4"     | 3 3/4"      | 3 3/4"       | —               | —      | —      | —      | —      | —      | — | —      |



**SLAT SPAN DEFINITION**

**♠ NOTE:**

MAX. SPAN FOR SLAT FOR A GIVEN A.S.D. DESIGN LOAD SHALL **NEVER** EXCEED MAX. SLAT SPAN INDICATED ON SLAT PERFORMANCE CHART ON SHEET 10.



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EB-0006719  
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FLORIDA Lic. # 44167

FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)

|  |             |          |                      |             |      |
|--|-------------|----------|----------------------|-------------|------|
| ROLL 55-X SLAT END RETENTION<br>ROLL-UP SHUTTER                                    |             |          | F.R.L.<br>DRAWN BY   |             |      |
| ROLLAC SHUTTER OF TEXAS, INC.  |             |          | 04/02/15<br>DATE     |             |      |
| 5331 ORANGE STREET<br>PEARLAND, TX. 77581<br>PH:(281) 485-1911, FAX:(281) 485-0839 |             |          | 15-060<br>DRAWING N° |             |      |
| REV N°   | DESCRIPTION | DATE     | REV N°               | DESCRIPTION | DATE |
| 1  | OLD 11-238  | 04/02/15 | 3                    |             |      |
| 2  |             |          | 4                    |             |      |

SHEET 11 OF 19

**SCHEDULE V:**

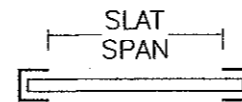
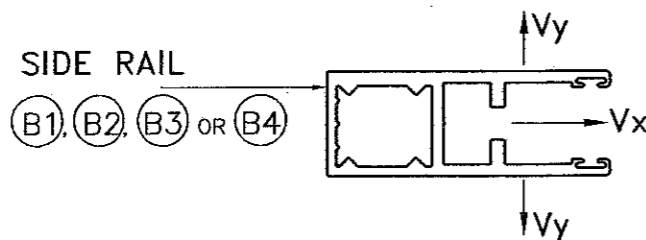
**V<sub>x</sub> FORCES (Lb/ft) & V<sub>y</sub> FORCES (Lb/ft) ACTING AT JAMBS FOR A A.S.D. DESIGN LOAD RANGE SLAT SPAN RANGE FOR POURED CONCRETE OR GROUT FILLED CELL CONCRETE BLOCK WALL BUILDINGS**

(USE MAXIMUM VALUE BETWEEN POSITIVE AND NEGATIVE A.S.D. LOAD)

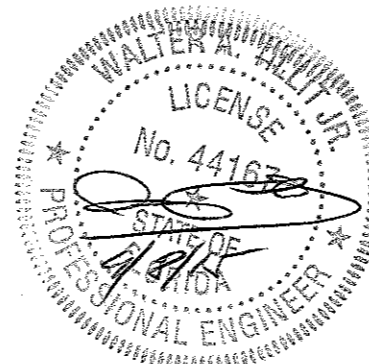
| MAXIMUM A.S.D. DESIGN PRESSURE RATING RANGE (p.s.f) | SLAT SPAN RANGE |                |                |                |                |                |                |                |                |                |                |                |                |                |                |                |
|---|-----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|----------------|
|   | 0' to 4'        |                | >4' to 5'      |                | > 5' to 6'     |                | > 6' to 7'     |                | > 7' to 9'     |                | > 9' to 12'    |                | > 12' to 16'   |                | >16' to 19'-8" |                |
|   | V <sub>x</sub>  | V <sub>y</sub> | V <sub>x</sub> | V <sub>y</sub> | V <sub>x</sub> | V <sub>y</sub> | V <sub>x</sub> | V <sub>y</sub> | V <sub>x</sub> | V <sub>y</sub> | V <sub>x</sub> | V <sub>y</sub> | V <sub>x</sub> | V <sub>y</sub> | V <sub>x</sub> | V <sub>y</sub> |
| ≤ 30.0  | 10              | 60             | 10             | 75             | 191            | 90             | 141            | 105            | 528            | 135            | 979            | 180            | 1523           | 240            | 2011           | 295            |
| >31-40  | 10              | 80             | 10             | 100            | 20             | 120            | 319            | 140            | 764            | 180            | 1314           | 240            | 1994           | 320            | 2106           | 333            |
| >41-60  | 10              | 120            | 10             | 150            | 312            | 180            | 658            | 210            | 1219           | 270            | 1955           | 360            | 2073           | 375            | -              | -              |
| >61-80  | 10              | 153            | 26             | 197            | 585            | 240            | 983            | 280            | 1656           | 360            | 2094           | 417            | -              | -              | -              | -              |
| >81-105   | 10              | 175            | 58             | 241            | 914            | 315            | 1375           | 368            | 2088           | 459            | 2088           | 425            | -              | -              | -              | -              |
| >106-120  | 10              | 185            | 67             | 265            | 1106           | 360            | 1605           | 420            | 2061           | 480            | -              | -              | -              | -              | -              | -              |
| >121-140  | 10              | 204            | 67             | 292            | 1358           | 420            | 1907           | 490            | 2036           | 508            | -              | -              | -              | -              | -              | -              |
| >141-160  | 10              | 213            | 96             | 327            | 1606           | 480            | 2059           | 540            | 2055           | 525            | -              | -              | -              | -              | -              | -              |

**\*NOTE:**

IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR OR PERMIT HOLDER TO VERIFY THAT EXISTING STRUCTURE IS DESIGNED TO SUPPORT V<sub>x</sub> AND V<sub>y</sub> FORCES IN POUNDS PER UNIT FOOT OF SHUTTER HEIGHT AT BOTH JAMBS. SEE THIS SHEET FOR V<sub>x</sub> & V<sub>y</sub> VALUES.



**SLAT SPAN DEFINITION**



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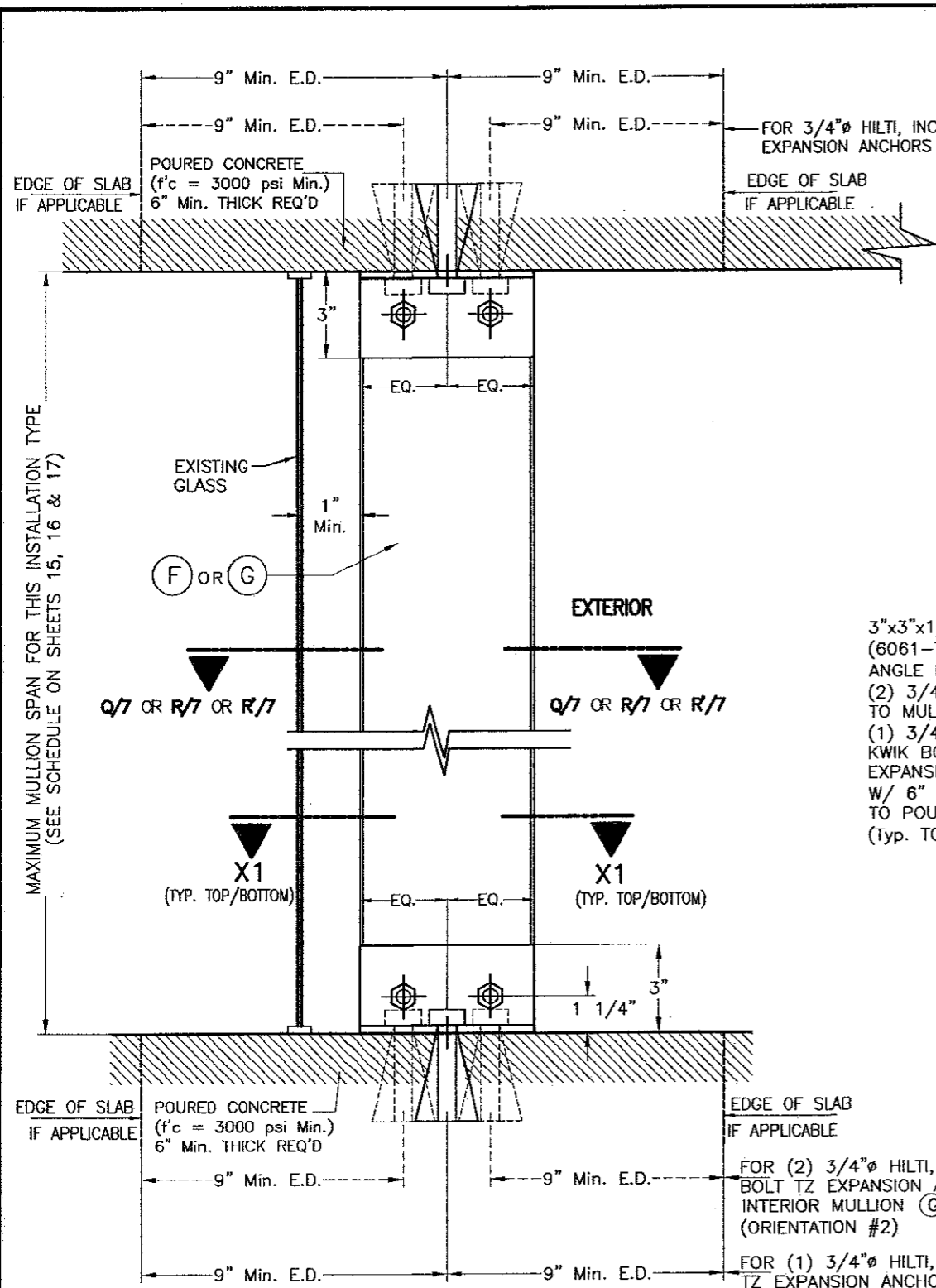
**TILTECO INC.**

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EB-0008719  
WALTER A. TILLIT Jr., P.E.  
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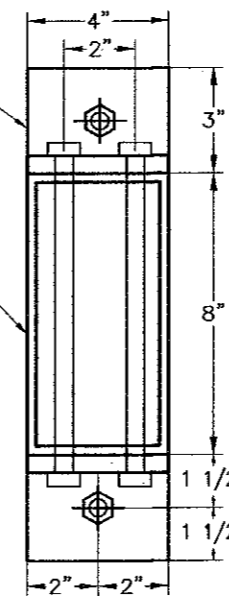
FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)

|   |             |          |        |             |                   |
|---|-------------|----------|--------|-------------|-------------------|
| ROLL 55-X SLAT END RETENTION ROLL-UP SHUTTER                                    |             |          |        |             | F.R.L. DRAWN BY   |
| ROLLAC SHUTTER OF TEXAS, INC.   |             |          |        |             | 04/02/15 DATE     |
| 5331 ORANGE STREET PEARLAND, TX. 77581<br>PH:(281) 485-1911, FAX:(281) 485-0839 |             |          |        |             | 15-060 DRAWING N° |
| REV N°  | DESCRIPTION | DATE     | REV N° | DESCRIPTION | DATE              |
| 1   | OLD 11-238  | 04/02/15 | 3      |             |                   |
| 2   |             |          | 4      |             |                   |

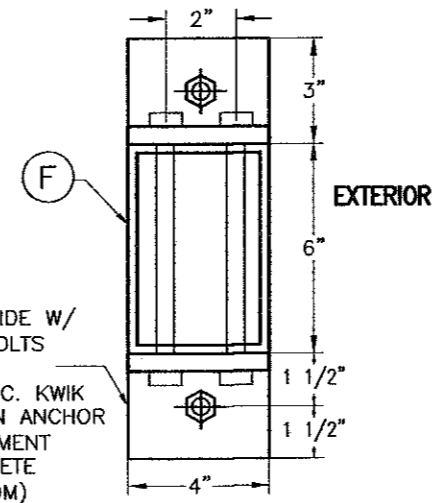
SHEET 12 OF 19



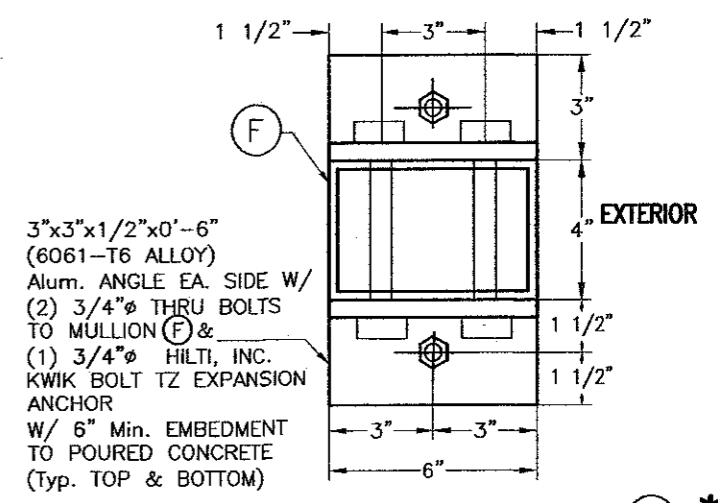
3"x3"x1/2"x0'-4"  
(6061-T6 ALLOY) Alum.  
ANGLE EA. SIDE W/  
(2) 3/4" THRU BOLTS  
TO MULLION (C) &  
(1) 3/4" HILTI, INC.  
KWIK BOLT TZ  
EXPANSION ANCHOR  
W/ 6" Min. EMBEDMENT  
TO POURED CONCRETE  
(Typ. TOP & BOTTOM)



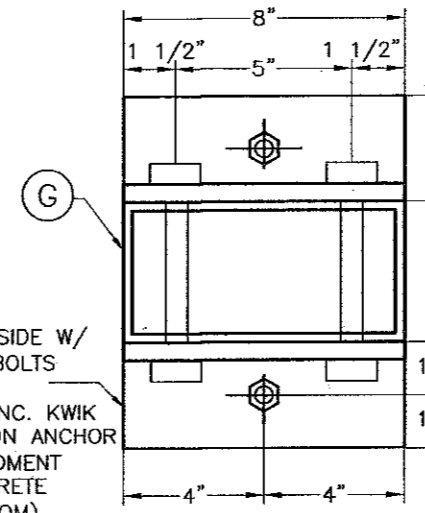
**SECTION X1-X1 W/ (G) \***  
(END & INTERIOR MULLION  
W/ ORIENTATION # 1)



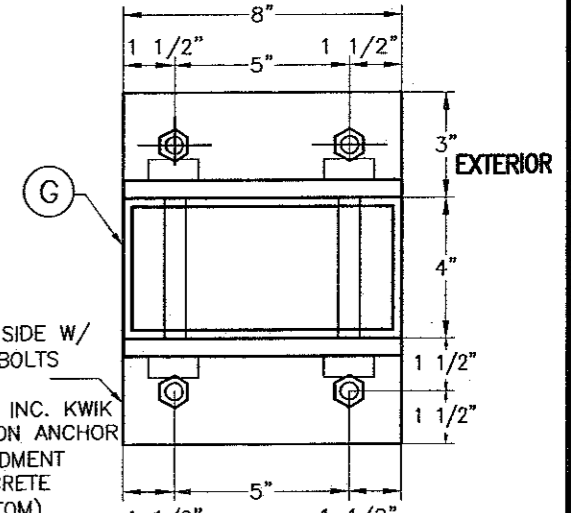
**SECTION X1-X1 W/ (F) \***  
(END & INTERIOR MULLION  
W/ ORIENTATION # 1)



**ALTERNATIVE SECTION X1-X1 W/ (F) \***  
(END & INTERIOR MULLION  
W/ ORIENTATION # 2)



**END MULLION ONLY**



**INTERIOR MULLION ONLY**

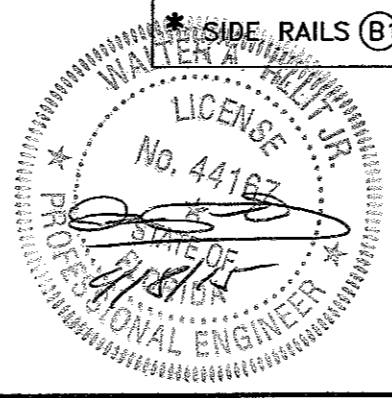
**ALTERNATIVE SECTION X1-X1 W/ (G) \***  
(W/ ORIENTATION # 2)

**FLOOR TO CEILING / TRAPPED MOUNTING:  
MULLION (F) OR (G)  
SECTION W-1 \***

# END & INTERIOR TRAPPED MOUNTED MULLION INSTALLATION

SCALE: 3/16" = 1"

\* SIDE RAILS (B1), (B2), (B3) OR (B4) AND BOX NOT SHOWN FOR CLARITY.



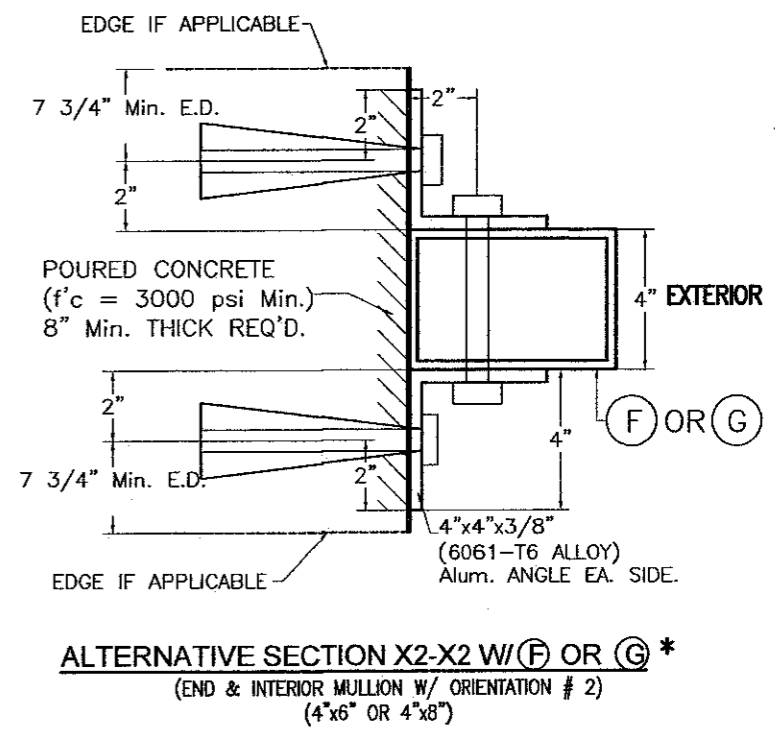
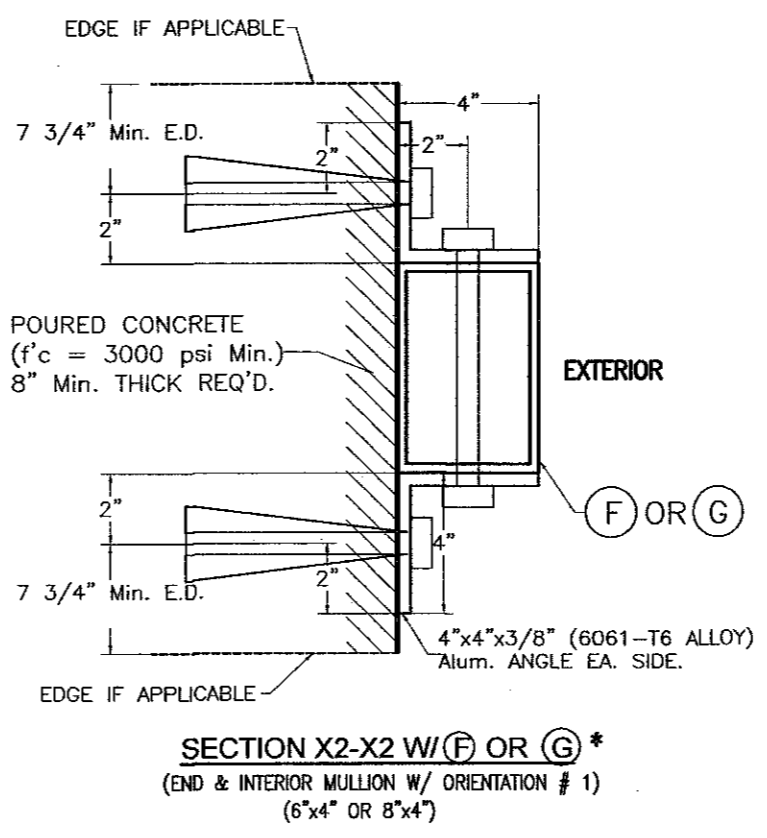
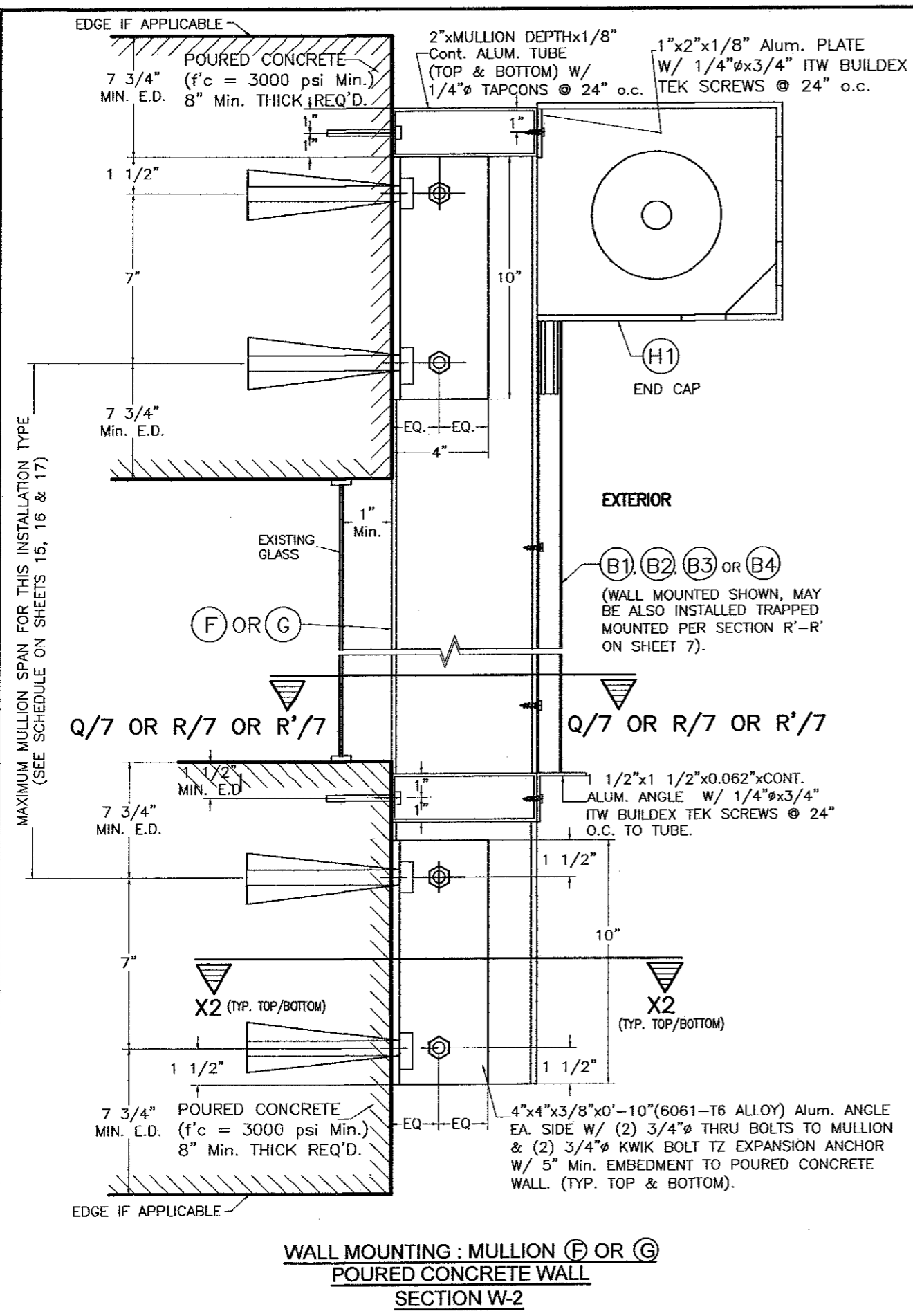
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**TILTECO INC.**

TILLIT TESTING & ENGINEERING COMPANY  
6355 N.W. 36th St., Ste. 305 - VIRGINIA GARDENS, FL 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

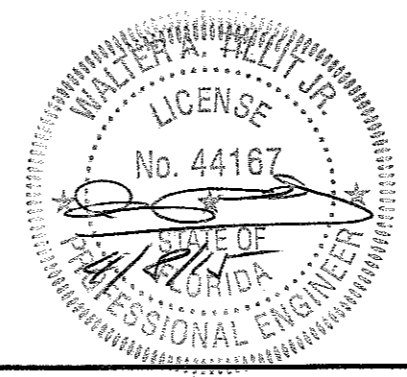
FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)

|  |             |                      |
|--|-------------|----------------------|
| RLL 55-X SLAT END RETENTION<br>ROLL-UP SHUTTER                                       |             | F.R.L.<br>DRAWN BY   |
| ROLLAC SHUTTER OF TEXAS, INC.  |             | 04/02/15<br>DATE     |
| 5331 ORANGE STREET<br>PEARLAND, TX. 77581<br>PH: (281) 485-1911, FAX: (281) 485-0839 |             | 15-060<br>DRAWING N° |
| REV N°   | DESCRIPTION | DATE                 |
| 1  | OLD 11-239  | 04/02/15             |
| 2  |             |                      |
| REV N°   | DESCRIPTION | DATE                 |
| 3  |             |                      |
| 4  |             |                      |
| SHEET 13 OF 19   |             |                      |



\* SIDE RAILS (B1), (B2), (B3) OR (B4) NOT SHOWN FOR CLARITY.

**END & INTERIOR WALL MOUNTED MULLION INSTALLATION**  
SCALE: 1/8" = 1"



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FLORIDA Lic. # 44167

FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)

|  |             |          |                      |             |      |
|--|-------------|----------|----------------------|-------------|------|
| RLL 55-X SLAT END RETENTION<br>ROLL-UP SHUTTER                                       |             |          | F.R.L.<br>DRAWN BY   |             |      |
| ROLLAC SHUTTER OF TEXAS, INC.  |             |          | 04/02/15<br>DATE     |             |      |
| 5931 ORANGE STREET<br>PEARLAND, TX, 77581<br>PH: (281) 485-1911, FAX: (281) 485-0839 |             |          | 15-060<br>DRAWING N° |             |      |
| REV N°   | DESCRIPTION | DATE     | REV N°               | DESCRIPTION | DATE |
| 1  | OLD 11-239  | 04/02/15 | 3                    |             |      |
| 2  |             |          | 4                    |             |      |

**SCHEDULE 1a**

**FLOOR TO CEILING (TRAPPED) MOUNTING**

**MAX. SPAN (ft.) FOR END AND INTERIOR MULLION FOR A GIVEN A.S.D. DESIGN LOAD (p.s.f.) AND A MAX. MULLION SPACING (ft.) \*  
VALID ONLY FOR INSTALLATIONS INTO CONCRETE**

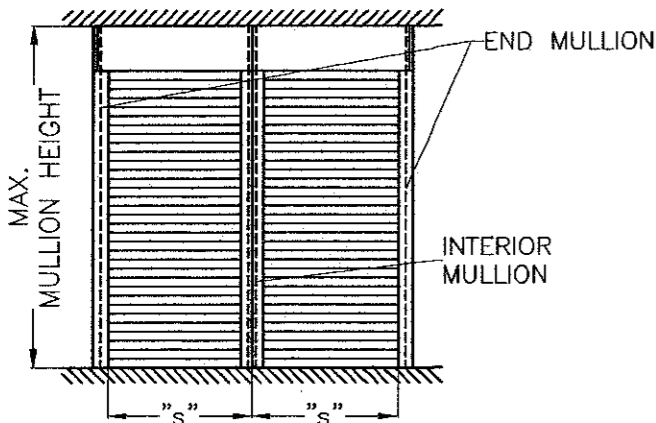
| MAXIMUM A.S.D. DESIGN PRESSURE RATING RANGE (p.s.f.) | MAXIMUM MULLION SPACING (ft) * | MAXIMUM MULLION SPAN (ft.) |          |                      |          |                      |          |                      |          |
|--|--------------------------------|----------------------------|----------|----------------------|----------|----------------------|----------|----------------------|----------|
|  |                                | ⓕ 4"x6"x1/4" MULLION       |          |                      |          | ⓐ 4"x8"x1/4" MULLION |          |                      |          |
|  |                                | ORIENTATION #1 (⇐) ‡       |          | ORIENTATION #2 (⇐) ‡ |          | ORIENTATION #1 (⇐) ‡ |          | ORIENTATION #2 (⇐) ‡ |          |
|  |                                | END                        | INTERIOR | END                  | INTERIOR | END                  | INTERIOR | END                  | INTERIOR |
| 30.0   | 19'-8"                         | 6'-9"                      | 9'-9"    | 6'-2"                | 12'-0"   | 8'-1"                | 10'-7"   | 7'-1"                | 12'-0"   |
| 35.0   | 18'-3"                         | 6'-7"                      | 9'-6"    | 6'-1"                | 11'-9"   | 7'-10"               | 10'-4"   | 6'-11"               | 12'-0"   |
| 40.0   | 16'-8"                         | 6'-7"                      | 9'-5"    | 6'-1"                | 11'-7"   | 7'-10"               | 10'-2"   | 6'-11"               | 12'-0"   |
| 45.0   | 15'-3"                         | 6'-7"                      | 9'-3"    | 6'-1"                | 11'-6"   | 7'-10"               | 10'-1"   | 6'-11"               | 12'-0"   |
| 50.0   | 14'-3"                         | 6'-7"                      | 9'-2"    | 6'-0"                | 11'-4"   | 7'-9"                | 10'-0"   | 6'-11"               | 12'-0"   |
| 55.0   | 13'-3"                         | 6'-7"                      | 9'-1"    | 6'-1"                | 11'-3"   | 7'-10"               | 9'-11"   | 6'-11"               | 12'-0"   |
| 60.0   | 12'-6"                         | 6'-7"                      | 9'-0"    | 6'-0"                | 11'-2"   | 7'-9"                | 9'-10"   | 6'-11"               | 12'-0"   |
| 65.0   | 11'-11"                        | 6'-6"                      | 8'-11"   | 6'-0"                | 11'-1"   | 7'-9"                | 9'-8"    | 6'-11"               | 12'-0"   |
| 70.0   | 11'-5"                         | 6'-6"                      | 8'-10"   | 6'-0"                | 10'-11"  | 7'-8"                | 9'-7"    | 6'-10"               | 12'-0"   |
| 75.0   | 10'-11"                        | 6'-6"                      | 8'-9"    | 6'-0"                | 10'-10"  | 7'-8"                | 9'-6"    | 6'-10"               | 12'-0"   |
| 80.0   | 10'-5"                         | 6'-6"                      | 8'-9"    | 6'-0"                | 10'-9"   | 7'-8"                | 9'-6"    | 6'-10"               | 12'-0"   |
| 85.0   | 10'-0"                         | 6'-5"                      | 8'-8"    | 6'-0"                | 10'-8"   | 7'-8"                | 9'-5"    | 6'-10"               | 12'-0"   |
| 90.0   | 9'-6"                          | 6'-6"                      | 8'-8"    | 6'-0"                | 10'-8"   | 7'-9"                | 9'-5"    | 6'-11"               | 12'-0"   |
| 95.0   | 9'-3"                          | 6'-6"                      | 8'-7"    | 6'-0"                | 10'-7"   | 7'-8"                | 9'-4"    | 6'-10"               | 12'-0"   |
| 100.0  | 8'-11"                         | 6'-6"                      | 8'-6"    | 6'-0"                | 10'-7"   | 7'-8"                | 9'-3"    | 6'-11"               | 12'-0"   |
| 105.0  | 8'-9"                          | 6'-5"                      | 8'-5"    | 5'-11"               | 10'-5"   | 7'-7"                | 9'-2"    | 6'-10"               | 12'-0"   |
| 110.0  | 8'-6"                          | 6'-5"                      | 8'-4"    | 5'-11"               | 10'-4"   | 7'-7"                | 9'-1"    | 6'-10"               | 12'-0"   |
| 115.0  | 8'-3"                          | 6'-5"                      | 8'-4"    | 5'-11"               | 10'-4"   | 7'-7"                | 9'-1"    | 6'-10"               | 12'-0"   |
| 120.0  | 8'-0"                          | 6'-5"                      | 8'-4"    | 5'-11"               | 10'-3"   | 7'-7"                | 9'-0"    | 6'-10"               | 12'-0"   |
| 125.0  | 7'-10"                         | 6'-5"                      | 8'-3"    | 5'-11"               | 10'-2"   | 7'-7"                | 9'-0"    | 6'-10"               | 12'-0"   |
| 130.0  | 7'-8"                          | 6'-5"                      | 8'-3"    | 5'-11"               | 10'-0"   | 7'-7"                | 8'-11"   | 6'-10"               | 12'-0"   |
| 135.0  | 7'-6"                          | 6'-4"                      | 8'-2"    | 5'-11"               | 9'-10"   | 7'-6"                | 8'-10"   | 6'-9"                | 12'-0"   |
| 140.0  | 7'-3"                          | 6'-5"                      | 8'-2"    | 5'-11"               | 9'-9"    | 7'-7"                | 8'-10"   | 6'-10"               | 12'-0"   |
| 145.0  | 7'-2"                          | 6'-4"                      | 8'-1"    | 5'-11"               | 9'-7"    | 7'-6"                | 8'-10"   | 6'-10"               | 12'-0"   |
| 150.0  | 7'-0"                          | 6'-4"                      | 8'-1"    | 5'-11"               | 9'-5"    | 7'-6"                | 8'-9"    | 6'-10"               | 12'-0"   |
| 155.0  | 6'-10"                         | 6'-4"                      | 8'-0"    | 5'-11"               | 9'-4"    | 7'-6"                | 8'-9"    | 6'-10"               | 12'-0"   |
| 160.0  | 6'-9"                          | 6'-4"                      | 8'-0"    | 5'-11"               | 9'-2"    | 7'-6"                | 8'-8"    | 6'-9"                | 12'-0"   |

**SCHEDULE 2a**

**WALL MOUNTING**

**MAX. SPAN (ft.) FOR END AND INTERIOR MULLION FOR A GIVEN A.S.D. DESIGN LOAD (p.s.f.) AND A MAX. MULLION SPACING (ft.) \*  
VALID ONLY FOR INSTALLATIONS INTO CONCRETE**

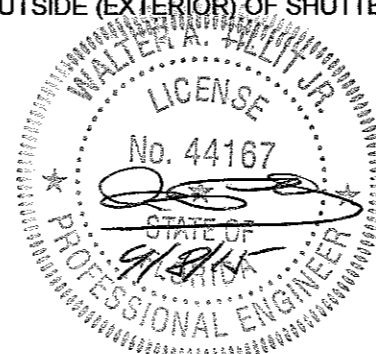
| MAXIMUM A.S.D. DESIGN PRESSURE RATING RANGE (p.s.f.) | MAXIMUM MULLION SPACING (ft) * | MAXIMUM MULLION SPAN (ft.) |          |                      |          |                      |          |                      |          |
|--|--------------------------------|----------------------------|----------|----------------------|----------|----------------------|----------|----------------------|----------|
|  |                                | ⓕ 4"x6"x1/4" MULLION       |          |                      |          | ⓐ 4"x8"x1/4" MULLION |          |                      |          |
|  |                                | ORIENTATION #1 (⇐) ‡       |          | ORIENTATION #2 (⇐) ‡ |          | ORIENTATION #1 (⇐) ‡ |          | ORIENTATION #2 (⇐) ‡ |          |
|  |                                | END                        | INTERIOR | END                  | INTERIOR | END                  | INTERIOR | END                  | INTERIOR |
| 30.0   | 19'-8"                         | 6'-9"                      | 9'-9"    | 6'-2"                | 12'-0"   | 8'-1"                | 10'-7"   | 7'-1"                | 12'-0"   |
| 35.0   | 18'-3"                         | 6'-7"                      | 9'-6"    | 6'-1"                | 11'-9"   | 7'-10"               | 10'-4"   | 6'-11"               | 12'-0"   |
| 40.0   | 16'-8"                         | 6'-7"                      | 9'-5"    | 6'-1"                | 11'-7"   | 7'-10"               | 10'-2"   | 6'-11"               | 12'-0"   |
| 45.0   | 15'-3"                         | 6'-7"                      | 9'-3"    | 6'-1"                | 11'-6"   | 7'-10"               | 10'-1"   | 6'-11"               | 12'-0"   |
| 50.0   | 14'-3"                         | 6'-7"                      | 9'-2"    | 6'-0"                | 11'-4"   | 7'-9"                | 10'-0"   | 6'-11"               | 12'-0"   |
| 55.0   | 13'-3"                         | 6'-7"                      | 9'-1"    | 6'-1"                | 11'-3"   | 7'-10"               | 9'-11"   | 6'-11"               | 12'-0"   |
| 60.0   | 12'-6"                         | 6'-7"                      | 9'-0"    | 6'-0"                | 11'-2"   | 7'-9"                | 9'-10"   | 6'-11"               | 12'-0"   |
| 65.0   | 11'-11"                        | 6'-6"                      | 8'-11"   | 6'-0"                | 11'-1"   | 7'-9"                | 9'-8"    | 6'-11"               | 12'-0"   |
| 70.0   | 11'-5"                         | 6'-6"                      | 8'-10"   | 6'-0"                | 10'-11"  | 7'-8"                | 9'-7"    | 6'-10"               | 12'-0"   |
| 75.0   | 10'-11"                        | 6'-6"                      | 8'-9"    | 6'-0"                | 10'-10"  | 7'-8"                | 9'-6"    | 6'-10"               | 12'-0"   |
| 80.0   | 10'-5"                         | 6'-6"                      | 8'-9"    | 6'-0"                | 10'-9"   | 7'-8"                | 9'-6"    | 6'-10"               | 12'-0"   |
| 85.0   | 10'-0"                         | 6'-5"                      | 8'-8"    | 6'-0"                | 10'-8"   | 7'-8"                | 9'-5"    | 6'-10"               | 12'-0"   |
| 90.0   | 9'-6"                          | 6'-6"                      | 8'-8"    | 6'-0"                | 10'-8"   | 7'-9"                | 9'-5"    | 6'-11"               | 12'-0"   |
| 95.0   | 9'-3"                          | 6'-6"                      | 8'-7"    | 6'-0"                | 10'-7"   | 7'-8"                | 9'-4"    | 6'-10"               | 12'-0"   |
| 100.0  | 8'-11"                         | 6'-6"                      | 8'-6"    | 6'-0"                | 10'-7"   | 7'-8"                | 9'-3"    | 6'-11"               | 12'-0"   |
| 105.0  | 8'-9"                          | 6'-5"                      | 8'-5"    | 5'-11"               | 10'-5"   | 7'-7"                | 9'-2"    | 6'-10"               | 12'-0"   |
| 110.0  | 8'-6"                          | 6'-5"                      | 8'-5"    | 5'-11"               | 10'-4"   | 7'-7"                | 9'-1"    | 6'-10"               | 12'-0"   |
| 115.0  | 8'-3"                          | 6'-5"                      | 8'-4"    | 5'-11"               | 10'-4"   | 7'-7"                | 9'-1"    | 6'-10"               | 12'-0"   |
| 120.0  | 8'-0"                          | 6'-5"                      | 8'-4"    | 5'-11"               | 10'-3"   | 7'-7"                | 9'-0"    | 6'-10"               | 12'-0"   |
| 125.0  | 7'-10"                         | 6'-4"                      | 8'-3"    | 5'-11"               | 10'-3"   | 7'-7"                | 9'-0"    | 6'-10"               | 12'-0"   |
| 130.0  | 7'-8"                          | 6'-5"                      | 8'-3"    | 5'-11"               | 10'-2"   | 7'-7"                | 8'-11"   | 6'-10"               | 12'-0"   |
| 135.0  | 7'-6"                          | 6'-4"                      | 8'-2"    | 5'-11"               | 10'-1"   | 7'-6"                | 8'-10"   | 6'-9"                | 12'-0"   |
| 140.0  | 7'-3"                          | 6'-5"                      | 8'-2"    | 5'-11"               | 10'-1"   | 7'-7"                | 8'-10"   | 6'-10"               | 12'-0"   |
| 145.0  | 7'-2"                          | 6'-4"                      | 8'-1"    | 5'-11"               | 10'-0"   | 7'-6"                | 8'-10"   | 6'-10"               | 12'-0"   |
| 150.0  | 7'-0"                          | 6'-4"                      | 8'-1"    | 5'-11"               | 10'-0"   | 7'-6"                | 8'-9"    | 6'-10"               | 12'-0"   |
| 155.0  | 6'-10"                         | 6'-4"                      | 8'-0"    | 5'-11"               | 9'-11"   | 7'-6"                | 8'-9"    | 6'-10"               | 12'-0"   |
| 160.0  | 6'-9"                          | 6'-4"                      | 8'-0"    | 5'-11"               | 9'-11"   | 7'-6"                | 8'-8"    | 6'-9"                | 12'-5"   |



**MULLION SPACING: "s"**

\* MAXIMUM MULLION SPACING SHALL BE SUCH THAT MAX SLAT SPAN FOR THAT A.S.D. DESIGN LOAD SHALL NOT BE EXCEEDED.

‡ MULLION ORIENTATION IS AS SEEN FROM THE OUTSIDE (EXTERIOR) OF SHUTTER.



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FLORIDA Lic. # 44167

FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)

**ROLLAC SHUTTER OF TEXAS, INC.**

5331 ORANGE STREET  
PEARLAND, TX. 77581  
PH:(281) 485-1911, FAX:(281) 485-0839

| REV # | DESCRIPTION | DATE     | REV # | DESCRIPTION | DATE |
|-------|-------------|----------|-------|-------------|------|
| 1     | OLD 11-238  | 04/02/15 | 3     |             |      |
| 2     |             |          | 4     |             |      |

F.R.L. DRAWN BY  
04/02/15 DATE  
15-060 DRAWING N°  
SHEET 15 OF 19

**SCHEDULE 1b**

**FLOOR TO CEILING (TRAPPED) MOUNTING**

**MAX. SPAN (ft.) FOR END AND INTERIOR MULLION FOR A GIVEN A.S.D. DESIGN LOAD (p.s.f.) AND A 12'-0" MAX. MULLION SPACING (ft.) \***  
**VALID ONLY FOR INSTALLATIONS INTO CONCRETE**

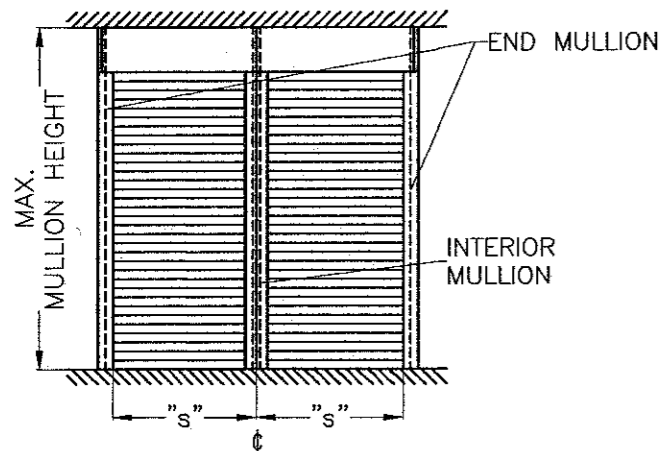
| MAXIMUM A.S.D. DESIGN PRESSURE RATING RANGE (p.s.f.) | MAXIMUM MULLION SPACING (ft) * | MAXIMUM MULLION SPAN (ft.) |          |                      |          |                      |          |                      |          |
|--|--------------------------------|----------------------------|----------|----------------------|----------|----------------------|----------|----------------------|----------|
|  |                                | ⓕ 4"x6"x1/4" MULLION       |          |                      |          | ⓐ 4"x8"x1/4" MULLION |          |                      |          |
|  |                                | ORIENTATION #1 (⇐) ‡       |          | ORIENTATION #2 (⇐) ‡ |          | ORIENTATION #1 (⇐) ‡ |          | ORIENTATION #2 (⇐) ‡ |          |
|  |                                | END                        | INTERIOR | END                  | INTERIOR | END                  | INTERIOR | END                  | INTERIOR |
| 30.0   | 12'-0"                         | 9'-6"                      | 11'-6"   | 8'-3"                | 12'-0"   | 11'-4"               | 12'-0"   | 9'-0"                | 12'-0"   |
| 35.0   | 12'-0"                         | 8'-10"                     | 10'-11"  | 7'-10"               | 12'-0"   | 10'-5"               | 11'-11"  | 8'-6"                | 12'-0"   |
| 40.0   | 12'-0"                         | 8'-3"                      | 10'-5"   | 7'-6"                | 12'-0"   | 9'-9"                | 11'-4"   | 9'-6"                | 12'-0"   |
| 45.0   | 12'-0"                         | 7'-9"                      | 10'-1"   | 7'-2"                | 12'-0"   | 9'-3"                | 10'-11"  | 9'-1"                | 12'-0"   |
| 50.0   | 12'-0"                         | 7'-4"                      | 9'-8"    | 6'-9"                | 12'-0"   | 8'-9"                | 10'-7"   | 8'-9"                | 12'-0"   |
| 55.0   | 12'-0"                         | 7'-0"                      | 9'-5"    | 6'-6"                | 11'-8"   | 8'-4"                | 10'-3"   | 8'-6"                | 12'-0"   |
| 60.0   | 12'-0"                         | 6'-9"                      | 9'-2"    | 6'-3"                | 11'-4"   | 8'-0"                | 9'-11"   | 8'-3"                | 12'-0"   |
| 65.0   | 12'-0"                         | 6'-6"                      | 8'-11"   | 6'-0"                | 11'-0"   | 7'-8"                | 9'-8"    | 8'-0"                | 12'-0"   |

**SCHEDULE 2b**

**WALL MOUNTING**

**MAX. SPAN (ft.) FOR END AND INTERIOR MULLION FOR A GIVEN A.S.D. DESIGN LOAD (p.s.f.) AND A 12'-0" MAX. MULLION SPACING (ft.) \***  
**VALID ONLY FOR INSTALLATIONS INTO CONCRETE**

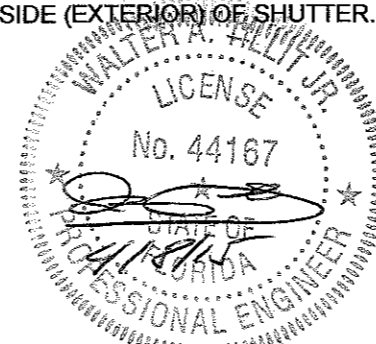
| MAXIMUM A.S.D. DESIGN PRESSURE RATING RANGE (p.s.f.) | MAXIMUM MULLION SPACING (ft) * | MAXIMUM MULLION SPAN (ft.) |          |                      |          |                      |          |                      |          |
|--|--------------------------------|----------------------------|----------|----------------------|----------|----------------------|----------|----------------------|----------|
|  |                                | ⓕ 4"x6"x1/4" MULLION       |          |                      |          | ⓐ 4"x8"x1/4" MULLION |          |                      |          |
|  |                                | ORIENTATION #1 (⇐) ‡       |          | ORIENTATION #2 (⇐) ‡ |          | ORIENTATION #1 (⇐) ‡ |          | ORIENTATION #2 (⇐) ‡ |          |
|  |                                | END                        | INTERIOR | END                  | INTERIOR | END                  | INTERIOR | END                  | INTERIOR |
| 30.0   | 12'-0"                         | 8'-3"                      | 11'-6"   | 8'-3"                | 12'-0"   | 11'-4"               | 12'-0"   | 9'-0"                | 12'-0"   |
| 35.0   | 12'-0"                         | 7'-10"                     | 10'-11"  | 7'-10"               | 12'-0"   | 10'-5"               | 11'-11"  | 8'-6"                | 12'-0"   |
| 40.0   | 12'-0"                         | 7'-6"                      | 10'-5"   | 7'-6"                | 12'-0"   | 9'-9"                | 11'-4"   | 8'-2"                | 12'-0"   |
| 45.0   | 12'-0"                         | 7'-2"                      | 10'-1"   | 7'-2"                | 12'-0"   | 9'-3"                | 10'-11"  | 7'-10"               | 12'-0"   |
| 50.0   | 12'-0"                         | 6'-9"                      | 9'-8"    | 6'-9"                | 12'-0"   | 8'-9"                | 10'-7"   | 7'-7"                | 12'-0"   |
| 55.0   | 12'-0"                         | 6'-6"                      | 9'-5"    | 6'-6"                | 11'-8"   | 8'-4"                | 10'-3"   | 7'-4"                | 12'-0"   |
| 60.0   | 12'-0"                         | 6'-3"                      | 9'-2"    | 6'-3"                | 11'-4"   | 8'-0"                | 9'-11"   | 7'-1"                | 12'-0"   |
| 65.0   | 12'-0"                         | 6'-0"                      | 8'-11"   | 6'-0"                | 11'-0"   | 7'-8"                | 9'-8"    | 6'-10"               | 12'-0"   |



\* MAXIMUM MULLION SPACING SHALL BE SUCH THAT MAX SLAT SPAN FOR THAT A.S.D. DESIGN LOAD SHALL NOT BE EXCEEDED.

‡ MULLION ORIENTATION IS AS SEEN FROM THE OUTSIDE (EXTERIOR) OF SHUTTER.

**MULLION SPACING: "s"**



FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)

|  |                           |  |  |                     |                |
|--|---------------------------|--|--|---------------------|----------------|
| ©2015 TILTECO INC.<br><br><b>TILTECO INC.</b><br>TILLIT TESTING & ENGINEERING COMPANY<br>6355 N.W. 36th St., Ste. 305 - VIRGINIA GARDENS, FL 33166<br>Phone : (305) 871-1530 , Fax : (305) 871-1531<br>e-mail: tilteco@aol.com<br>EB-0006719<br>WALTER A. TILLIT Jr., P.E.<br>FLORIDA Lic. # 44167 |                           | RLL 55-X SLAT END RETENTION<br>ROLL-UP SHUTTER<br><b>ROLLAC SHUTTER OF TEXAS, INC.</b><br>5331 ORANGE STREET<br>PEARLAND, TX. 77581<br>PH:(281) 485-1911, FAX:(281) 485-0839 | F.R.L.<br>DRAWN BY<br>04/02/15<br>DATE<br>15-060<br>DRAWING N° |                     |                |
| REV N°<br>1<br>2   | DESCRIPTION<br>OLD 11-239 | DATE<br>04/02/15   | REV N°<br>3<br>4   | DESCRIPTION<br>DATE | SHEET 16 OF 19 |



**SCHEDULE 1c**

**FLOOR TO CEILING (TRAPPED) MOUNTING**

**MAX. SPAN (ft.) FOR END AND INTERIOR MULLION FOR A GIVEN A.S.D. DESIGN LOAD (p.s.f.) AND A 7'-0" MAX. MULLION SPACING (ft.) \***

**VALID ONLY FOR INSTALLATIONS INTO CONCRETE**

| MAXIMUM A.S.D. DESIGN PRESSURE RATING RANGE (p.s.f.) | MAXIMUM MULLION SPACING (ft) * | MAXIMUM MULLION SPAN (ft.) |          |                      |          |                      |          |                      |          |
|--|--------------------------------|----------------------------|----------|----------------------|----------|----------------------|----------|----------------------|----------|
|  |                                | ⓕ 4"x6"x1/4" MULLION       |          |                      |          | ⓐ 4"x8"x1/4" MULLION |          |                      |          |
|  |                                | ORIENTATION #1 (⇐) ‡       |          | ORIENTATION #2 (⇐) ‡ |          | ORIENTATION #1 (⇐) ‡ |          | ORIENTATION #2 (⇐) ‡ |          |
|  |                                | END                        | INTERIOR | END                  | INTERIOR | END                  | INTERIOR | END                  | INTERIOR |
| 30.0   | 7'-0"                          | 12'-0"                     | 12'-0"   | 12'-0"               | 12'-0"   | 12'-0"               | 12'-0"   | 12'-0"               | 12'-0"   |
| 35.0   | 7'-0"                          | 12'-0"                     | 12'-0"   | 12'-0"               | 12'-0"   | 12'-0"               | 12'-0"   | 12'-0"               | 12'-0"   |
| 40.0   | 7'-0"                          | 12'-0"                     | 12'-0"   | 12'-0"               | 12'-0"   | 12'-0"               | 12'-0"   | 12'-0"               | 12'-0"   |
| 45.0   | 7'-0"                          | 12'-0"                     | 12'-0"   | 11'-1"               | 12'-0"   | 12'-0"               | 12'-0"   | 12'-0"               | 12'-0"   |
| 50.0   | 7'-0"                          | 12'-0"                     | 11'-7"   | 10'-5"               | 12'-0"   | 12'-0"               | 12'-0"   | 11'-3"               | 12'-0"   |
| 55.0   | 7'-0"                          | 11'-7"                     | 11'-3"   | 9'-10"               | 12'-0"   | 12'-0"               | 12'-0"   | 10'-8"               | 12'-0"   |
| 60.0   | 7'-0"                          | 10'-11"                    | 10'-11"  | 9'-5"                | 12'-0"   | 12'-0"               | 11'-11"  | 10'-3"               | 12'-0"   |
| 65.0   | 7'-0"                          | 10'-4"                     | 10'-8"   | 9'-1"                | 12'-0"   | 12'-0"               | 11'-7"   | 9'-10"               | 12'-0"   |
| 70.0   | 7'-0"                          | 9'-10"                     | 10'-5"   | 8'-9"                | 12'-0"   | 11'-7"               | 11'-3"   | 9'-6"                | 12'-0"   |
| 75.0   | 7'-0"                          | 9'-5"                      | 10'-2"   | 8'-6"                | 12'-0"   | 11'-2"               | 11'-0"   | 9'-3"                | 12'-0"   |
| 80.0   | 7'-0"                          | 9'-1"                      | 9'-11"   | 8'-3"                | 12'-0"   | 10'-8"               | 10'-10"  | 8'-11"               | 12'-0"   |
| 85.0   | 7'-0"                          | 8'-9"                      | 9'-9"    | 8'-0"                | 12'-0"   | 10'-4"               | 10'-7"   | 8'-9"                | 12'-0"   |
| 90.0   | 7'-0"                          | 8'-5"                      | 9'-7"    | 7'-10"               | 11'-10"  | 10'-0"               | 10'-5"   | 8'-6"                | 12'-0"   |
| 95.0   | 7'-0"                          | 8'-2"                      | 9'-5"    | 7'-8"                | 11'-7"   | 9'-8"                | 10'-2"   | 8'-4"                | 12'-0"   |
| 100.0  | 7'-0"                          | 7'-10"                     | 9'-3"    | 7'-5"                | 11'-5"   | 9'-5"                | 10'-0"   | 8'-2"                | 12'-0"   |
| 105.0  | 7'-0"                          | 7'-9"                      | 9'-1"    | 7'-2"                | 11'-3"   | 9'-1"                | 9'-10"   | 8'-0"                | 12'-0"   |
| 110.0  | 7'-0"                          | 7'-6"                      | 8'-11"   | 7'-0"                | 11'-1"   | 8'-11"               | 9'-9"    | 7'-10"               | 12'-0"   |
| 115.0  | 7'-0"                          | 7'-4"                      | 8'-10"   | 6'-10"               | 10'-11"  | 8'-8"                | 9'-7"    | 7'-9"                | 12'-0"   |
| 120.0  | 7'-0"                          | 7'-2"                      | 8'-8"    | 6'-8"                | 10'-9"   | 8'-6"                | 9'-5"    | 7'-7"                | 12'-0"   |
| 125.0  | 7'-0"                          | 7'-0"                      | 8'-7"    | 6'-6"                | 10'-7"   | 8'-3"                | 9'-4"    | 7'-6"                | 12'-0"   |
| 130.0  | 7'-0"                          | 6'-10"                     | 8'-5"    | 6'-5"                | 10'-6"   | 8'-1"                | 9'-2"    | 7'-4"                | 12'-0"   |
| 135.0  | 7'-0"                          | 6'-9"                      | 8'-4"    | 6'-3"                | 10'-4"   | 7'-11"               | 9'-1"    | 7'-2"                | 12'-0"   |
| 140.0  | 7'-0"                          | 6'-7"                      | 8'-3"    | 6'-2"                | 10'-1"   | 7'-9"                | 9'-0"    | 7'-1"                | 12'-0"   |
| 145.0  | 7'-0"                          | 6'-6"                      | 8'-2"    | 6'-0"                | 10'-9"   | 7'-8"                | 8'-10"   | 6'-11"               | 12'-0"   |
| 150.0  | 7'-0"                          | 6'-4"                      | 8'-1"    | 5'-11"               | 10'-5"   | 7'-6"                | 8'-9"    | 6'-10"               | 12'-0"   |

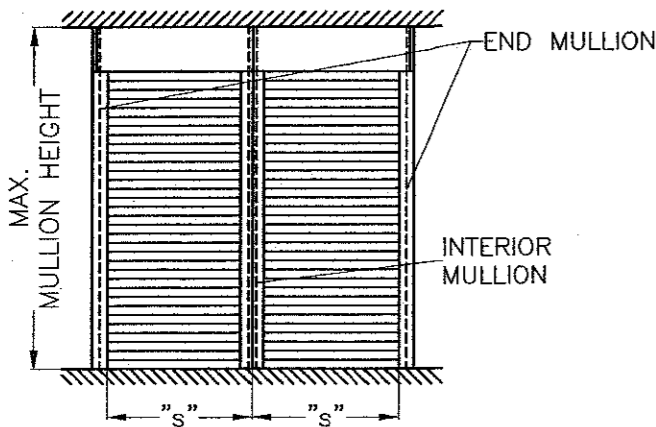
**SCHEDULE 2c**

**WALL MOUNTING**

**MAX. SPAN (ft.) FOR END AND INTERIOR MULLION FOR A GIVEN A.S.D. DESIGN LOAD (p.s.f.) AND A 7'-0" MAX. MULLION SPACING (ft.) \***

**VALID ONLY FOR INSTALLATIONS INTO CONCRETE**

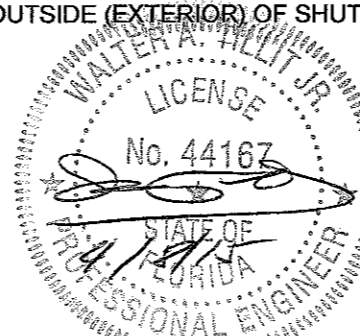
| MAXIMUM A.S.D. DESIGN PRESSURE RATING RANGE (p.s.f.) | MAXIMUM MULLION SPACING (ft) * | MAXIMUM MULLION SPAN (ft.) |          |                      |          |                      |          |                      |          |
|--|--------------------------------|----------------------------|----------|----------------------|----------|----------------------|----------|----------------------|----------|
|  |                                | ⓕ 4"x6"x1/4" MULLION       |          |                      |          | ⓐ 4"x8"x1/4" MULLION |          |                      |          |
|  |                                | ORIENTATION #1 (⇐) ‡       |          | ORIENTATION #2 (⇐) ‡ |          | ORIENTATION #1 (⇐) ‡ |          | ORIENTATION #2 (⇐) ‡ |          |
|  |                                | END                        | INTERIOR | END                  | INTERIOR | END                  | INTERIOR | END                  | INTERIOR |
| 30.0   | 7'-0"                          | 12'-0"                     | 12'-0"   | 12'-0"               | 12'-0"   | 12'-0"               | 12'-0"   | 12'-0"               | 12'-0"   |
| 35.0   | 7'-0"                          | 12'-0"                     | 12'-0"   | 12'-0"               | 12'-0"   | 12'-0"               | 12'-0"   | 12'-0"               | 12'-0"   |
| 40.0   | 7'-0"                          | 12'-0"                     | 12'-0"   | 12'-0"               | 12'-0"   | 12'-0"               | 12'-0"   | 12'-0"               | 12'-0"   |
| 45.0   | 7'-0"                          | 12'-0"                     | 12'-0"   | 11'-1"               | 12'-0"   | 12'-0"               | 12'-0"   | 12'-0"               | 12'-0"   |
| 50.0   | 7'-0"                          | 12'-0"                     | 11'-7"   | 10'-5"               | 12'-0"   | 12'-0"               | 12'-0"   | 11'-3"               | 12'-0"   |
| 55.0   | 7'-0"                          | 11'-7"                     | 11'-3"   | 9'-10"               | 12'-0"   | 12'-0"               | 12'-0"   | 10'-8"               | 12'-0"   |
| 60.0   | 7'-0"                          | 10'-11"                    | 10'-11"  | 9'-5"                | 12'-0"   | 12'-0"               | 11'-11"  | 10'-3"               | 12'-0"   |
| 65.0   | 7'-0"                          | 10'-4"                     | 10'-8"   | 9'-1"                | 12'-0"   | 12'-0"               | 11'-7"   | 9'-10"               | 12'-0"   |
| 70.0   | 7'-0"                          | 9'-10"                     | 10'-5"   | 8'-9"                | 12'-0"   | 11'-7"               | 11'-3"   | 9'-6"                | 12'-0"   |
| 75.0   | 7'-0"                          | 9'-5"                      | 10'-2"   | 8'-6"                | 12'-0"   | 11'-2"               | 11'-0"   | 9'-3"                | 12'-0"   |
| 80.0   | 7'-0"                          | 9'-1"                      | 9'-11"   | 8'-3"                | 12'-0"   | 10'-8"               | 10'-10"  | 8'-11"               | 12'-0"   |
| 85.0   | 7'-0"                          | 8'-9"                      | 9'-9"    | 8'-0"                | 12'-0"   | 10'-4"               | 10'-7"   | 8'-9"                | 12'-0"   |
| 90.0   | 7'-0"                          | 8'-5"                      | 9'-7"    | 7'-10"               | 11'-10"  | 10'-0"               | 10'-5"   | 8'-6"                | 12'-0"   |
| 95.0   | 7'-0"                          | 8'-2"                      | 9'-5"    | 7'-8"                | 11'-7"   | 9'-8"                | 10'-2"   | 8'-4"                | 12'-0"   |
| 100.0  | 7'-0"                          | 7'-10"                     | 9'-3"    | 7'-5"                | 11'-5"   | 9'-5"                | 10'-0"   | 8'-2"                | 12'-0"   |
| 105.0  | 7'-0"                          | 7'-9"                      | 9'-1"    | 7'-2"                | 11'-3"   | 9'-1"                | 9'-10"   | 8'-0"                | 12'-0"   |
| 110.0  | 7'-0"                          | 7'-6"                      | 8'-11"   | 7'-0"                | 11'-1"   | 8'-11"               | 9'-9"    | 7'-10"               | 12'-0"   |
| 115.0  | 7'-0"                          | 7'-4"                      | 8'-10"   | 6'-10"               | 10'-11"  | 8'-8"                | 9'-7"    | 7'-9"                | 12'-0"   |
| 120.0  | 7'-0"                          | 7'-2"                      | 8'-8"    | 6'-8"                | 10'-9"   | 8'-6"                | 9'-5"    | 7'-7"                | 12'-0"   |
| 125.0  | 7'-0"                          | 7'-0"                      | 8'-7"    | 6'-6"                | 10'-7"   | 8'-3"                | 9'-4"    | 7'-6"                | 12'-0"   |
| 130.0  | 7'-0"                          | 6'-10"                     | 8'-5"    | 6'-5"                | 10'-6"   | 8'-1"                | 9'-2"    | 7'-4"                | 12'-0"   |
| 135.0  | 7'-0"                          | 6'-9"                      | 8'-4"    | 6'-3"                | 10'-4"   | 7'-11"               | 9'-1"    | 7'-2"                | 12'-0"   |
| 140.0  | 7'-0"                          | 6'-7"                      | 8'-3"    | 6'-2"                | 10'-3"   | 7'-9"                | 9'-0"    | 7'-1"                | 12'-0"   |
| 145.0  | 7'-0"                          | 6'-6"                      | 8'-2"    | 6'-0"                | 10'-1"   | 7'-8"                | 8'-10"   | 6'-11"               | 12'-0"   |
| 150.0  | 7'-0"                          | 6'-4"                      | 8'-1"    | 5'-11"               | 10'-0"   | 7'-6"                | 8'-9"    | 6'-10"               | 12'-0"   |



**MULLION SPACING: "s"**

\* MAXIMUM MULLION SPACING SHALL BE SUCH THAT MAX SLAT SPAN FOR THAT A.S.D. DESIGN LOAD SHALL NOT BE EXCEEDED.

‡ MULLION ORIENTATION IS AS SEEN FROM THE OUTSIDE (EXTERIOR) OF SHUTTER.



FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)

|  |             |  |       |  |      |
|--|-------------|--|-------|--|------|
| <p>TILTECO INC.<br/>TILLIT TESTING &amp; ENGINEERING COMPANY<br/>6355 N.W. 36th St., Ste. 305 - VIRGINIA GARDENS, FL 33166<br/>Phone: (305) 871-1530, Fax: (305) 871-1531<br/>e-mail: tilteco@aol.com<br/>EB-0006719<br/>WALTER A. TILLIT Jr., P.E.<br/>FLORIDA Lic. # 44167</p> |             | <p>RLL 55-X SLAT END RETENTION ROLL-UP SHUTTER</p> <p><b>ROLLAC SHUTTER OF TEXAS, INC.</b></p> <p>5331 ORANGE STREET<br/>PEARLAND, TX, 77581<br/>PH: (281) 485-1911, FAX: (281) 485-0839</p> |       | <p>F.R.L. DRAWN BY</p> <p>04/02/15 DATE</p> <p>15-060 DRAWING N°</p> |      |
| REV #  | DESCRIPTION | DATE   | REV # | DESCRIPTION  | DATE |
| 1  | OLD 11-236  | 04/02/15   | 3     |  |      |
| 2  |             |  | 4     |  |      |

SHEET 17 OF 19

# SLAT PERFORMANCE CHARTS Ib, IIb & IIIb:

FOR A GIVEN A.S.D. DESIGN LOAD (p.s.f.) AND SHUTTER MOUNT CONDITION PER DETAIL 1 BELOW

**CHART Ib: (ONLY VALID FOR 3/16" SLIP)**

| SHEATHING & STUDS REQUIREMENTS       | MAXIMUM A.S.D. DESIGN PRESSURE RATING (p.s.f.) | USE MAXIMUM VALUE BETWEEN POSITIVE AND NEGATIVE A.S.D. LOAD |         |         |                        |         |         | USE MAXIMUM POSITIVE LOAD VALUE                                 |                |             |
|--------------------------------------|--|---|---------|---------|------------------------|---------|---------|---|----------------|-------------|
|                                      |  | MAX. SLAT SPAN "LMAX." (ft)                                 |         |         |                        |         |         | REQUIRED MIN. SEPARATION TO GLASS MEASURED TO BACK OF SLAT (in) |                |             |
|                                      |  | WALL MOUNT (SEE NOTES Δ)                                    |         |         | BUILD-OUT MOUNT W/ (⊕) |         |         | WALL & BUILD-OUT MOUNT W/ (⊕)                                   |                |             |
|                                      |  | G=0.55*   | G=0.46* | G=0.36* | G=0.55*                | G=0.46* | G=0.36* | G=0.36*, G=0.46*, G=0.55* (SEE NOTES Δ)                         | WIND ZONES 1-3 | WIND ZONE 4 |
| 1/2" PLYWOOD W/ 2"x6" STUDS          | 30.0   | 11'-11"   | 11'-5"  | 10'-3"  | 11'-11"                | 9'-4"   | 8'-4"   | 6'-6"   | 1"             | 9 3/4"      |
|                                      | 35.0   | 11'-11"   | 10'-5"  | -       | 11'-11"                | 8'-7"   | -       | 6'-3"   |                |             |
|                                      | 40.0   | 11'-11"   | 9'-7"   | -       | 10'-11"                | 8'-0"   | -       | 6'-0"   |                |             |
|                                      | 45.0   | 11'-11"   | -       | -       | 10'-0"                 | -       | -       | 5'-9"   |                |             |
|                                      | 50.0   | 11'-11"   | -       | -       | 9'-6"                  | -       | -       | 5'-7"   |                |             |
|                                      | 55.0   | 11'-11"   | -       | -       | 8'-11"                 | -       | -       | 5'-6"   |                |             |
| 7/16" O.S.B. W/ 2"x6" OR 2"x4" STUDS | 30.0   | 10'-0"  | 10'-0"  | 10'-0"  | 10'-0"                 | 9'-4"   | 8'-4"   | 6'-6"   | 1"             | 8 7/8"      |
|                                      | 35.0   | 10'-0"  | 10'-0"  | -       | 10'-0"                 | 8'-7"   | -       | 6'-3"   |                |             |
|                                      | 40.0   | 10'-0"  | 9'-7"   | -       | 10'-0"                 | 8'-0"   | -       | 6'-0"   |                |             |
|                                      | 45.0   | 10'-0"  | -       | -       | 10'-0"                 | -       | -       | 5'-9"   |                |             |
|                                      | 50.0   | 10'-0"  | -       | -       | 9'-6"                  | -       | -       | 5'-7"   |                |             |

**CHART IIb: (ONLY VALID FOR 1/8" SLIP)**

| SHEATHING & STUDS REQUIREMENTS       | MAXIMUM A.S.D. DESIGN PRESSURE RATING (p.s.f.) | USE MAXIMUM VALUE BETWEEN POSITIVE AND NEGATIVE A.S.D. LOAD |         |         |                        |         |         | USE MAXIMUM POSITIVE LOAD VALUE                                 |                |             |
|--------------------------------------|--|---|---------|---------|------------------------|---------|---------|---|----------------|-------------|
|                                      |  | MAX. SLAT SPAN "LMAX." (ft)                                 |         |         |                        |         |         | REQUIRED MIN. SEPARATION TO GLASS MEASURED TO BACK OF SLAT (in) |                |             |
|                                      |  | WALL MOUNT (SEE NOTES Δ)                                    |         |         | BUILD-OUT MOUNT W/ (⊕) |         |         | WALL & BUILD-OUT MOUNT W/ (⊕)                                   |                |             |
|                                      |  | G=0.55*   | G=0.46* | G=0.36* | G=0.55*                | G=0.46* | G=0.36* | G=0.36*, G=0.46*, G=0.55* (SEE NOTES Δ)                         | WIND ZONES 1-3 | WIND ZONE 4 |
| 1/2" PLYWOOD W/ 2"x6" STUDS          | 30.0   | 10'-8"  | 10'-3"  | 9'-4"   | 10'-8"                 | 8'-6"   | 7'-8"   | 6'-2"   | 1"             | 9 3/4"      |
|                                      | 35.0   | 10'-8"  | 9'-5"   | -       | 10'-8"                 | 7'-10"  | -       | 5'-10"  |                |             |
|                                      | 40.0   | 10'-8"  | 8'-8"   | -       | 9'-10"                 | 7'-4"   | -       | 5'-8"   |                |             |
|                                      | 45.0   | 10'-8"  | -       | -       | 9'-0"                  | -       | -       | 5'-6"   |                |             |
|                                      | 50.0   | 10'-8"  | -       | -       | 8'-7"                  | -       | -       | 5'-4"   |                |             |
|                                      | 55.0   | 10'-8"  | -       | -       | 8'-1"                  | -       | -       | 5'-2"   |                |             |
| 7/16" O.S.B. W/ 2"x6" OR 2"x4" STUDS | 30.0   | 10'-0"  | 10'-0"  | 9'-4"   | 10'-0"                 | 8'-6"   | 7'-8"   | 6'-6"   | 1"             | 8 7/8"      |
|                                      | 35.0   | 10'-0"  | 10'-0"  | -       | 10'-0"                 | 7'-10"  | -       | 6'-3"   |                |             |
|                                      | 40.0   | 10'-0"  | 9'-7"   | -       | 10'-0"                 | 7'-4"   | -       | 6'-0"   |                |             |
|                                      | 45.0   | 10'-0"  | -       | -       | 10'-0"                 | -       | -       | 5'-9"   |                |             |
|                                      | 50.0   | 10'-0"  | -       | -       | 9'-6"                  | -       | -       | 5'-7"   |                |             |

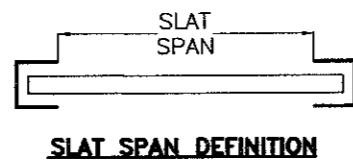
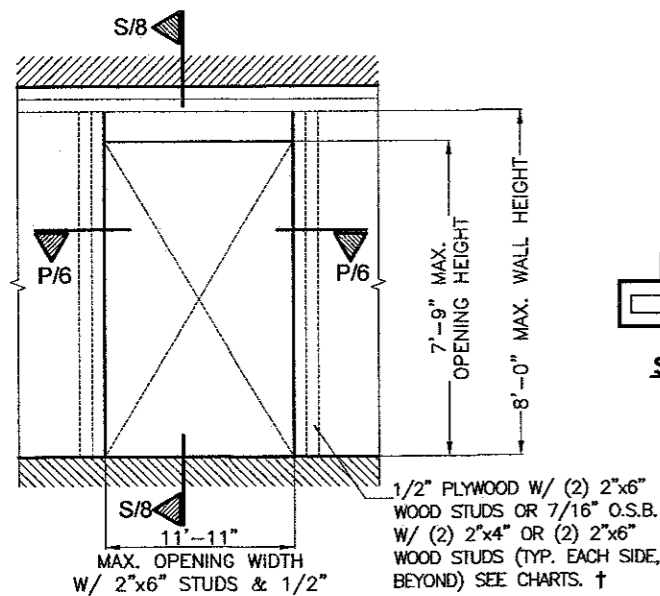
**CHART IIIb: (LESS THAN 1/8" SLIP)**

| SHEATHING & STUDS REQUIREMENTS       | MAXIMUM A.S.D. DESIGN PRESSURE RATING (p.s.f.) | USE MAXIMUM VALUE BETWEEN POSITIVE AND NEGATIVE A.S.D. LOAD              |  | USE MAXIMUM POSITIVE LOAD VALUE                                 |             |       |
|--------------------------------------|--|--|--|---|-------------|-------|
|                                      |  | MAX. SLAT SPAN "LMAX." (FT)  | MIN. SLAT SPAN "LMIN." (FT)  | REQUIRED MIN. SEPARATION TO GLASS MEASURED TO BACK OF SLAT (in) |             |       |
|                                      |  | WALL & BUILD-OUT MOUNT W/ (⊕)<br>G=0.36*, G=0.46*, G=0.55* (SEE NOTES Δ) | WALL & BUILD-OUT MOUNT W/ (⊕)<br>G=0.36*, G=0.46*, G=0.55* (SEE NOTES Δ) | WIND ZONES 1-3  | WIND ZONE 4 |       |
|                                      |  | 1/2" PLYWOOD W/ 2"x6" STUDS  | 30.0   | 6'-0"   | -           | 0'-0" |
| 35.0                                 | 5'-9"  |  | -  |   |             |       |
| 40.0                                 | 5'-5"  |  | -  |   |             |       |
| 45.0                                 | 5'-1"  |  | -  |   |             |       |
| 50.0                                 | 4'-10"   |  | -  |   |             |       |
| 55.0                                 | 4'-7"  |  | -  |   |             |       |
| 7/16" O.S.B. W/ 2"x6" OR 2"x4" STUDS | 30.0   | 6'-0"  | -  | 0'-0"   | 1"          | 7"    |
|                                      | 35.0   | 5'-9"  | -  |   |             |       |
|                                      | 40.0   | 5'-5"  | -  |   |             |       |
|                                      | 50.0   | 4'-10"   | -  |   |             |       |

\*: G=0.55, APPLICABLE TO SOUTHERN YELLOW PINE #2 WOOD GRADE  
 G=0.46, APPLICABLE TO DOUGLAS FIR-SOUTH WOOD GRADE  
 G=0.36, APPLICABLE TO SPRUCE PINE-FIR SOUTH WOOD GRADE

**Δ NOTES:**

- ABOVE INDICATED MAX. SLAT SPANS MAY BE USED AS LONG AS ANCHOR SPACING SCHEDULES ON SHEET 19 INDICATE THAT A SPACING IS AVAILABLE FOR THE CORRESPONDING SLAT SPAN AND A.S.D. DESIGN LOAD.
- WOOD FRAME WALL TO BE BUILT STRICTLY IN ACCORDANCE WITH SPECS GIVEN ON DETAIL 1 AND PROVISIONS FROM CHAPTER 23 OF THE FLORIDA BUILDING CODE. MIN. WALL LENGTH AT EITHER SIDE OF OPENING MUST BE 33 INCHES.
- INSTALLATIONS VALID ONLY FOR SHUTTERS WITHOUT MULLIONS.

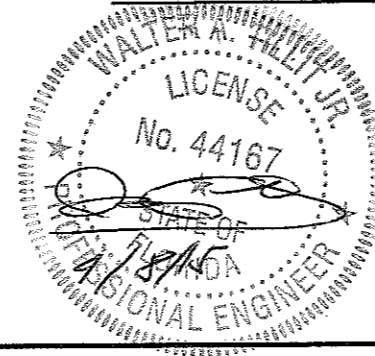


1/2" PLYWOOD W/ (2) 2"x6" WOOD STUDS OR 7/16" O.S.B. W/ (2) 2"x4" OR (2) 2"x6" WOOD STUDS (TYP. EACH SIDE, BEYOND) SEE CHARTS. †

11'-11" MAX. OPENING WIDTH W/ 2"x6" STUDS & 1/2" PLYWOOD OR 10'-0" MAX. W/ 2"x6" OR 2"x4" STUDS W/ 7/16" O.S.B. (SEE CHARTS)

**DETAIL 1 (ELEVATION)**

## INSTALLATIONS INTO WOOD FRAME STRUCTURES



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**TILTECO INC.**

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 EB-0006719  
 WALTER A. TILLIT Jr., P.E.  
 FLORIDA Lic. # 44167

FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)

|   |             |          |        |                   |
|---|-------------|----------|--------|-------------------|
| RLL 55-X SLAT END RETENTION ROLL-UP SHUTTER                                       |             |          |        | F.R.L. DRAWN BY   |
| ROLLAC SHUTTER OF TEXAS, INC.   |             |          |        | 04/02/15 DATE     |
| 5331 ORANGE STREET PEARLAND, TX. 77581<br>PH: (281) 485-1911, FAX: (281) 485-0839 |             |          |        | 15-060 DRAWING N° |
| REV N°  | DESCRIPTION | DATE     | REV N° | DESCRIPTION       |
| 1   | OLD 11-239  | 04/02/15 | 3      |                   |
| 2   |             |          | 4      |                   |

SHEET 18 OF 19

**MAX. ANCHOR'S SPACING SCHEDULE VI FOR A GIVEN PRODUCT MOUNTING TYPE W/ ø 5/16" ELCO CONSTRUCTION  
PRODUCTS ULTRACON ANCHORS TO WOOD GRADE, A.S.D. DESIGN LOAD (psf) AND SLAT SPAN RANGE**

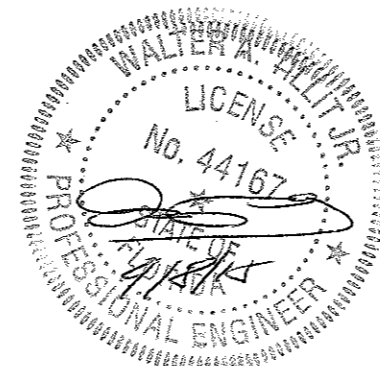
**WALL MOUNT**  
TO 2"x6" WOOD STUD WITH MINIMUM 1/2" PLYWOOD  
OR 2"x4"/2"x6" WOOD STUDS WITH MINIMUM 7/16" O.S.B.  
(SEE DETAIL 1 ON SHEET 18)

**BUILD-OUT MOUNT**  
TO 2"x6" WOOD STUD WITH MINIMUM 1/2" PLYWOOD  
OR 2"x4"/2"x6" WOOD STUDS WITH MINIMUM 7/16" O.S.B.  
(SEE DETAIL 1 ON SHEET 18)

| WOOD GRADE                        | MAXIMUM<br>A.S.D.<br>DESIGN<br>PRESSURE<br>RATING<br>RANGE (p.s.f) | SLAT SPAN RANGE |             |             |             |             |              |                  |
|-----------------------------------|--|-----------------|-------------|-------------|-------------|-------------|--------------|------------------|
|                                   |  | 0' to 4' *      | >4' to 5' * | >5' to 6' * | >6' to 7' * | >7' to 8' * | >8' to 10' * | >10' to 11'-11"* |
| SOUTHERN PINE #2<br>(G=0.55)      | ≤ 30.0   | 6"              | 6"          | 6"          | 6"          | 6"          | 6"           | 6"               |
|                                   | 40   | 6"              | 6"          | 6"          | 6"          | 6"          | 6"           | 5"               |
|                                   | 50   | 6"              | 6"          | 6"          | 6"          | 6"          | 5"           | 4"               |
|                                   | 60   | 6"              | 6"          | 6"          | 6"          | 5"          | 4"           | 3"               |
| DOUGLAS-FIR-SOUTH<br>(G=0.46)     | ≤ 30.0   | 6"              | 6"          | 6"          | 6"          | 5"          | 4"           | 3"               |
|                                   | 40   | 6"              | 6"          | 6"          | 6"          | 3"          | 3"           | -                |
| SPRUCE PINE-FIR-SOUTH<br>(G=0.36) | ≤ 30.0   | 6"              | 6"          | 6"          | 6"          | 4"          | 3"           | 3"               |

| WOOD GRADE                        | MAXIMUM<br>A.S.D.<br>DESIGN<br>PRESSURE<br>RATING<br>RANGE (p.s.f) | SLAT SPAN RANGE              |                              |                              |                              |                              |                              |                              |
|-----------------------------------|--|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|------------------------------|
|                                   |  | 0' to 4' *                   | >4' to 5' *                  | >5' to 6' *                  | >6' to 7' *                  | >7' to 8' *                  | >8' to 10' *                 | >10' to 11'-11"*             |
|                                   |  | BUILD-OUT<br>MOUNT<br>W/ (E) | BUILD-OUT<br>MOUNT<br>W/ (E) | BUILD-OUT<br>MOUNT<br>W/ (E) | BUILD-OUT<br>MOUNT<br>W/ (E) | BUILD-OUT<br>MOUNT<br>W/ (E) | BUILD-OUT<br>MOUNT<br>W/ (E) | BUILD-OUT<br>MOUNT<br>W/ (E) |
| SOUTHERN PINE #2<br>(G=0.55)      | ≤ 30.0   | 6"                           | 6"                           | 6"                           | 6"                           | 6"                           | 5"                           | 3"                           |
|                                   | 40   | 6"                           | 6"                           | 6"                           | 6"                           | 4"                           | 3"                           | 3"                           |
|                                   | 50   | 6"                           | 6"                           | 6"                           | 6"                           | 3"                           | 3"                           | -                            |
|                                   | 60   | 6"                           | 6"                           | 6"                           | 4"                           | 3"                           | -                            | -                            |
| DOUGLAS-FIR-SOUTH<br>(G=0.46)     | ≤ 30.0   | 6"                           | 6"                           | 6"                           | 6"                           | 3"                           | 3"                           | 3"                           |
|                                   | 40   | 6"                           | 6"                           | 6"                           | 5"                           | 3"                           | -                            | -                            |
| SPRUCE PINE-FIR-SOUTH<br>(G=0.36) | ≤ 30.0   | 6"                           | 6"                           | 6"                           | 6"                           | 3"                           | -                            | -                            |

**\* NOTE:**  
MAX. SPAN FOR SLAT FOR A  
GIVEN DESIGN A.S.D. LOAD  
SHALL **NEVER** EXCEED MAX.  
SLAT SPAN INDICATED ON SLAT  
PERFORMANCE CHARTS ON  
SHEET 18.



FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)

|  |             |  |        |                      |      |
|--|-------------|--|--------|----------------------|------|
| ©2015 TILTECO INC.   |             | ROLL 55-X SLAT END RETENTION<br>ROLL-UP SHUTTER                                    |        | F.R.L.<br>DRAWN BY   |      |
| <br><b>TILTECO INC.</b><br>TILLIT TESTING & ENGINEERING COMPANY<br>6355 N.W. 36th St., Ste. 305 - VIRGINIA GARDENS, FL 33166<br>Phone : (305) 871-1530 , Fax : (305) 871-1531<br>e-mail: tilteco@aol.com<br>EB-0006719<br>WALTER A. TILLIT Jr., P.E.<br>FLORIDA Lic. # 44167 |             | ROLLAC SHUTTER OF TEXAS, INC.  |        | 04/02/15<br>DATE     |      |
|  |             | 5331 ORANGE STREET<br>PEARLAND, TX, 77581<br>PH:(281) 485-1911, FAX:(281) 485-0839 |        | 15-060<br>DRAWING N° |      |
| REV N°   | DESCRIPTION | DATE   | REV N° | DESCRIPTION          | DATE |
| 1  | OLD 11-230  | 04/02/15   | 3      |                      |      |
| 2  |             |  | 4      |                      |      |