GENERAL NOTES:

1. NAUTILUS ROLLING SHUTTER SYSTEM SHOWN ON THIS PRODUCT EVALUATION DOCUMENT (P.E.D.) HAS BEEN VERIFIED FOR COMPLIANCE IN ACCORDANCE WITH THE 2007 EDITION OF THE FLORIDA BUILDING CODE.

2. NAUTILUS ROLLING SHUTTER SYSTEM 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 SHUTTER WILL BE INSTALLED, AND FOR A DIRECTIONALITY FACTOR Kd=0.85, IN ACCORDANCE WITH ASCE 7-05 STANDARD.
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 SPACINGS TO WOOD HAVE BEEN DETERMINED IN ACCORDANCE WITH N.D.S. 2005.
NAUTILUS ROLLING SHUTTER SYSTEM'S ADEQUACY FOR IMPACT AND CYCLIC RESISTANCE HAS BEEN VERIFIED IN ACCORDANCE WITH SECTION 1609.1.2 OF THE ABOVE MENTIONED CODE AS AMERICAN TEST LAB OF SOUTH FLORIDA. REPORT # 1030.01-08 AS PER ASTM E 1996-05, E 1886-05 AND E 330 STANDARDS, QUALIFYING INSTALLATIONS FOR WIND ZONES 1, 2, 3 & 4, MISSILE TYPE D AND ONLY APPLICABLE TO BASIC PROTECTION INSTALLATIONS, AS DEFINED BY SECTIONS 6.2.1.1, 6.2.1.2 AND 8.3 OF ASTM E 1996-05. SEE NOTES † & ‡ ON SHEETS 19 & 20 FOR ADDITIONAL LIMITATIONS.

3. ALL ALUMINUM EXTRUSIONS SHALL BE 6063-T6 ALLOY (UNLESS OTHERWISE NOTED), SEE SHEET 2.

4. ALL SCREWS (EXCEPT END RETENTION SCREW Ⓒ) 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.

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

6. NAUTILUS ROLLING SHUTTER SYSTEM BEARS U.S. PATENTS #6,095,225 AND #7,409,980.

7. ANCHORS TO WALL FOR Ⓓ SIDE RAIL SHALL BE AS FOLLOWS:

   (A) TO EXISTING POURED CONCRETE: MIN. 3000 p.s.i. COMPRESSIVE STRENGTH.

   -5/16"ø TAPCON XL ANCHORS AS MANUFACTURED BY ITW BUILDEX, INC.
   -3/8"ø KWIK BOLT 3 ANCHORS AS MANUFACTURED BY HILTI, INC.

   A.1) MINIMUM EMBEDMENT INTO POURED CONCRETE SHALL BE:
   2 1/4" FOR 5/16"ø TAPCON XL ANCHORS & 2 1/2" FOR 3/8"ø KWIK BOLT 3 ANCHORS.
   NO EMBEDMENT INTO STUCCO SHALL BE CONSIDERED AS PART OF THE REQUIRED EMBEDMENT.

   A.2) MINIMUM EDGE DISTANCE (E.D.) INTO POURED CONCRETE SHALL BE:
   4" FOR 5/16"ø TAPCON XL ANCHORS & 5" FOR 3/8"ø KWIK BOLT 3 ANCHORS. 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 OR FLOOR, ANCHORS SHALL BE LONG ENOUGH TO REACH THE MAIN STRUCTURE BEHIND SUCH PANELS.

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

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

   B.1) MINIMUM EMBEDMENT OF 5/16"ø 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"ø 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 OR FLOOR, ANCHORS SHALL BE LONG ENOUGH TO REACH THE MAIN STRUCTURE BEHIND SUCH PANELS.

   (C) TO EXISTING WOOD FRAME BUILDING: SPRUCE PINE-FIR-SOUTH (G=0.36), DOUGLAS-FIR-SOUTH (G=0.46) OR SOUTHERN PINE #2 W/ G = 0.55 MIN.

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

   C.1) MINIMUM EMBEDMENT OF TAPCON XL ANCHORS, INTO THE WOOD FRAME UNIT SHALL BE 2 1/2" PHYSICAL THREADED PENETRATION.
   NO EMBEDMENT INTO FINISH MATERIAL SHALL BE CONSIDERED AS PART OF THE REQUIRED EMBEDMENT.

   C.2) MINIMUM EDGE DISTANCE (E.D.) OF TAPCON 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 OR FLOOR, ANCHORS SHALL BE LONG ENOUGH TO REACH THE MAIN STRUCTURE BEHIND SUCH PANELS.

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

9. ANCHORS REQUIRED FOR STORM BARS CONNECTIONS SHALL BE AS SPECIFIED ON APPLICABLE SECTIONS SHOWN ON SHEET 9.

   -3/8"ø x1 1/4" CALK-INS MANUFACTURED BY POWER FASTENERS, INC.
   -1/4"ø x3/4" SOLID-SET MANUFACTURED BY ALL POINT, INC.
   -3/8"ø KWIK BOLT TZ MANUFACTURED BY HILTI, INC.
   -5/16"ø TAPCON MANUFACTURED BY ITW BUILDEX, 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	EMBEDMENT GROUT FILLED OR CONCRETE BLOCK
3/8"ø x1 1/4" CALK-IN	3 3/4"	4 1/2"	1 1/4" (3000 psi)	NOT ALLOWED
1/4"ø x3/4" SOLID-SET	3"	3"	7/8" (3000 psi)	NOT ALLOWED
3/8"ø KWIK BOLT TZ	9"	4"	2 1/2" (3000 psi)	NOT ALLOWED
5/16"ø TAPCON XL	3 3/4"	3 1/8"	2 1/4" (2899 psi)	NOT ALLOWED

10. ANCHORS REQUIRED FOR MULLION CONNECTIONS SHALL BE AS SPECIFIED ON APPLICABLE SECTIONS SHOWN ON SHEETS 10, 11, 12 & 13.

    -KWIK BOLT TZ EXPANSION ANCHORS 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.

OR ANCHOR	SPACING @ 100%	EDGE DISTANCE @ 100%	EMBEDMENT CONCRETE	EMBEDMENT GROUT FILLED CONCRETE BLOCK
3/4"ø KWIK BOLT TZ	27"	9"	4 3/4" (3000 psi)	NOT ALLOWED

11. 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.

12. 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, CONCRETE BLOCK OR WOOD FRAME BUILDINGS.

13. SHUTTER'S INSTALLATION SHALL COMPLY WITH ALL SPECS INDICATED IN THIS DRAWING PLUS ANY BUILDING AND ZONING REGULATIONS PROVIDED BY THE JURISDICTION WHERE PERMIT IS APPLIED TO.

14. LIFTING MECHANISM NOT PART OF THIS APPROVAL, BUT SHALL BE CERTIFIED BY AN INDEPENDENT TESTING AGENCY.

15. (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 FLORIDA REGISTERED ENGINEER OR ARCHITECT WHICH WILL BECOME THE ENGINEER OF RECORD (E.O.R.) FOR THE PROJECT AND WHO WILL BE RESPONSIBLE FOR THE PROPER USE OF THE P.E.D. ENGINEER OF RECORD, ACTING AS A DELEGATED ENGINEER TO THE P.E.D. ENGINEER, SHALL SUBMIT TO THIS LATTER THE SITE SPECIFIC DRAWINGS FOR REVIEW.

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

16. SHUTTER MANUFACTURER'S LABEL SHALL BE LOCATED ON A READILY VISIBLE LOCATION AT SHUTTER IN ACCORDANCE WITH SECTION 1714.8.3 OF FLORIDA BUILDING CODE. ONE LABEL SHALL BE PLACED FOR EVERY OPENING. LABELING TO COMPLY WITH SECTION 1714.8.2 OF THE FLORIDA BUILDING CODE.

WALTER A. TILLIT LICENSE No. 44167 STATE OF FLORIDA
MAR 0 8 2009
P.E. SEAL/SIGNATURE/DATE

FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)

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Nautilus
Rolling Shutter System

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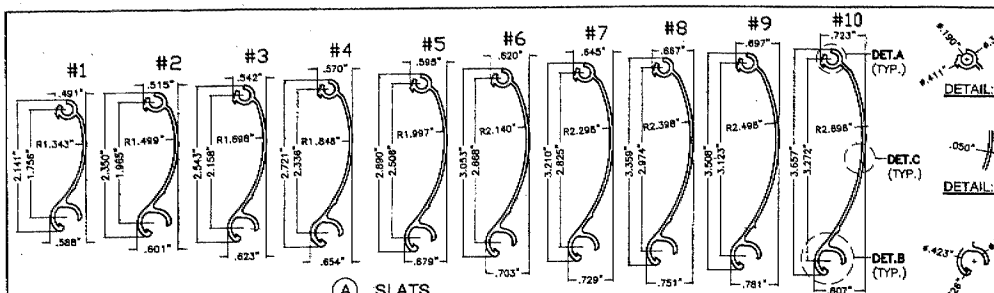
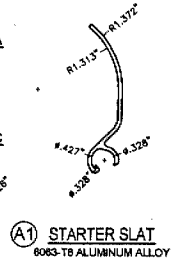
REV. No	DESCRIPTION	DATE	REV. No	DESCRIPTION	DATE
1			4		
2			5		

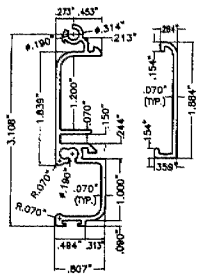
DRAWN BY: M.C.V./L.G.
11/18/08 DATE
08-255 DRAWING No
SHEET 1 OF 26



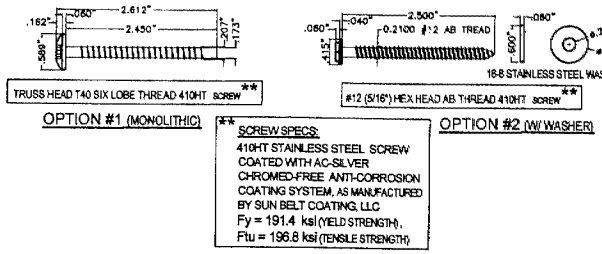
(A) SLATS
6063-T6 ALUMINUM ALLOY
Fy= 31.5 ksi (min.)
SCALE: 1/2" = 1"



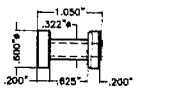
(A1) STARTER SLAT
6063-T6 ALUMINUM ALLOY
SCALE: 1/2" = 1"



(B) BASE SLAT
6063-T6 ALUMINUM ALLOY
SCALE: 1/2" = 1"

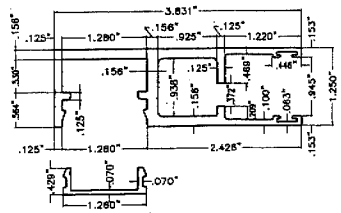


** SCREW SPECS:
410HT STAINLESS STEEL SCREW COATED WITH AC-SILVER CHROMED-FREE ANTI-CORROSION COATING SYSTEM, AS MANUFACTURED BY SUN BELT COATING, LLC
Fy = 191.4 ksi (YELD STRENGTH),
Ftu = 196.8 ksi (TENSILE STRENGTH)

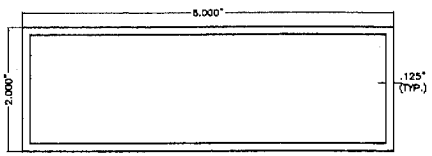


ACETAL BUSHING ***
(USE W/ OPTIONS #1 AND #2)

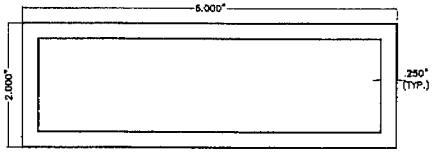
*** BUSHING SPECS:
DENSITY: 1.4 g/cm³
TENSILE MODULUS: 377 ksi
TENSILE STRESS AT YIELD: 9,135 ksi
FLEXURAL MODULUS: 580 ksi
IZOD NOTCHED IMPACT: 6.5 kJ/m²



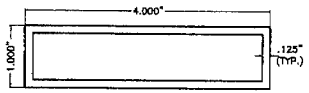
(D) SIDE RAIL *
6063-T6 ALUMINUM ALLOY
SCALE: 1/2" = 1"



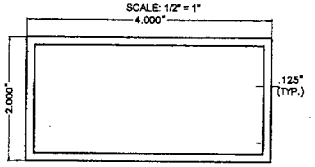
(E) BUILD-OUT TUBE
6063-T6 ALUMINUM ALLOY
SCALE: 1/2" = 1"



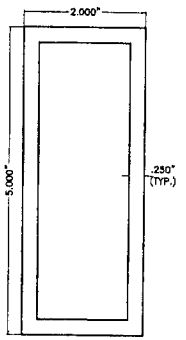
(E1) BUILD-OUT TUBE
6063-T6 ALUMINUM ALLOY
SCALE: 1/2" = 1"



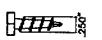
(E2) BUILD-OUT TUBE
6063-T6 ALUMINUM ALLOY
SCALE: 1/2" = 1"



(E3) BUILD-OUT TUBE
6063-T6 ALUMINUM ALLOY
SCALE: 1/2" = 1"

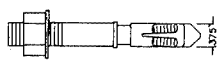


(K) STORM BAR
6061-T6 ALUMINUM ALLOY
SCALE: 1/2" = 1"



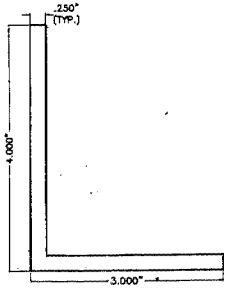
(H) 1/4"Øx3/4" ITW/BUILDEX TEK SCREW
CARBON STEEL
SCALE: 1/2" = 1"

(I) 5/16"Ø ITW/BUILDEX TAPCON XL ANCHOR
CARBON STEEL
SCALE: 1/2" = 1"

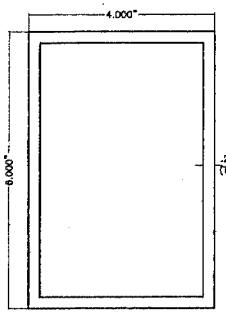


(J) 3/8"Ø HILTI, INC. KWIK BOLT 3 ANCHOR
CARBON STEEL
SCALE: 1/2" = 1"

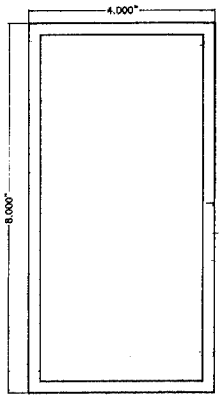
* MUST BE REVIEWED BY SHUTTER MANUFACTURER TO ALLOW FOR A MINIMUM 0.050" CLEARANCE BETWEEN SCREW HEAD AND CAVITY WALL AT NON HURRICANE POSITIONS.



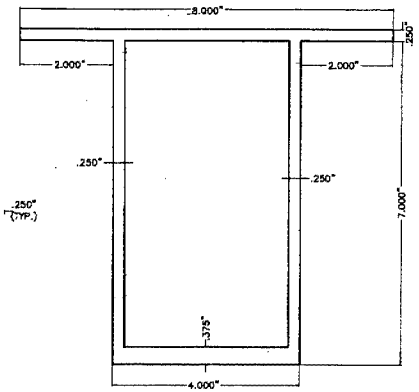
(F) TRAPPED ANGLE
6063-T6 ALUMINUM ALLOY
SCALE: 1/2" = 1"



(G) 4x6 MULLION
6061-T6 ALUMINUM ALLOY
SCALE: 3/8" = 1"



(G1) 4x8 MULLION
6061-T6 ALUMINUM ALLOY
SCALE: 3/8" = 1"



(G2) 4x7 MULLION
6061-T6 ALUMINUM ALLOY
SCALE: 3/8" = 1"

FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)

COMPONENTS

WALTER A. TILLIT JR. LICENSE NO. 44167 STATE OF FLORIDA
MAR 03 2009
P.E. SEAL, SIGNATURE/DATE

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Nautilus
Rolling Shutter System

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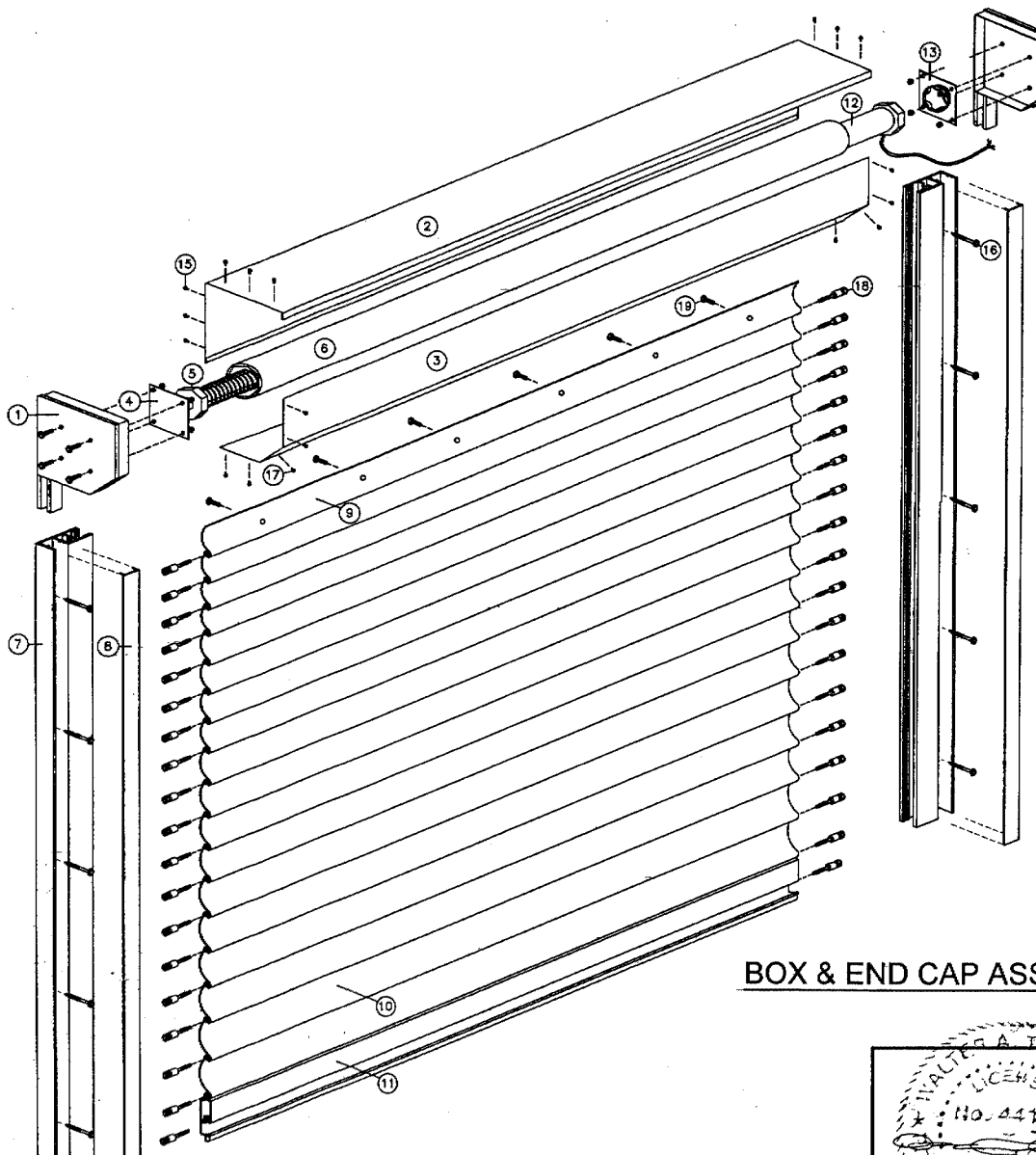
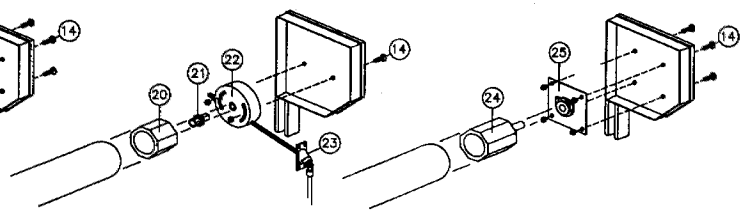
DRAWN BY: M.C.V./L.G.
11/18/08 DATE
08-255 DRAWING No
SHEET 2 OF 26





1	SIDE/END CAP
2	HOUSING (BACK & TOP) .040 THICK
3	HOUSING (FRONT & BOTTOM) .040 THICK
4	SPRING BRACKET
5	SPRING ASSEMBLY
6	60 MM OCTAGONAL AXLE
7	SIDE RAIL (MAIN SECTION)
8	SIDE RAIL (COVER SECTION)
9	ALUMINUM STARTER SLAT
10	ALUMINUM SLATS 1-10
11	ALUMINUM BASE SLAT
12	TUBULAR MOTOR
13	MOTOR BRACKET
14	SPRING, GEAR & MOTOR BRACKET BOLTS
15	HOUSING (BACK & TOP) FASTENERS
16	SIDE RAIL (MAIN SECTION) FASTENERS
17	HOUSING (FRONT & BOTTOM) FASTENERS
18	END RETENTION ASSEMBLY
19	OCTAGONAL AXLE FASTENERS
20	60MM OCTAGONAL DRIVE CROWN
21	CONNECTOR SLEEVE
22	GEAR - PLASTIC OR ZAMAC CASING
23	UNIVERSAL WITH DRIVE SHAFT
24	60MM OCTAGONAL IDLER END
25	IDLER BRACKET WITH BEARING

BOX & END CAP ASSEMBLY COMPONENTS

FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)

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MAR 03 2009
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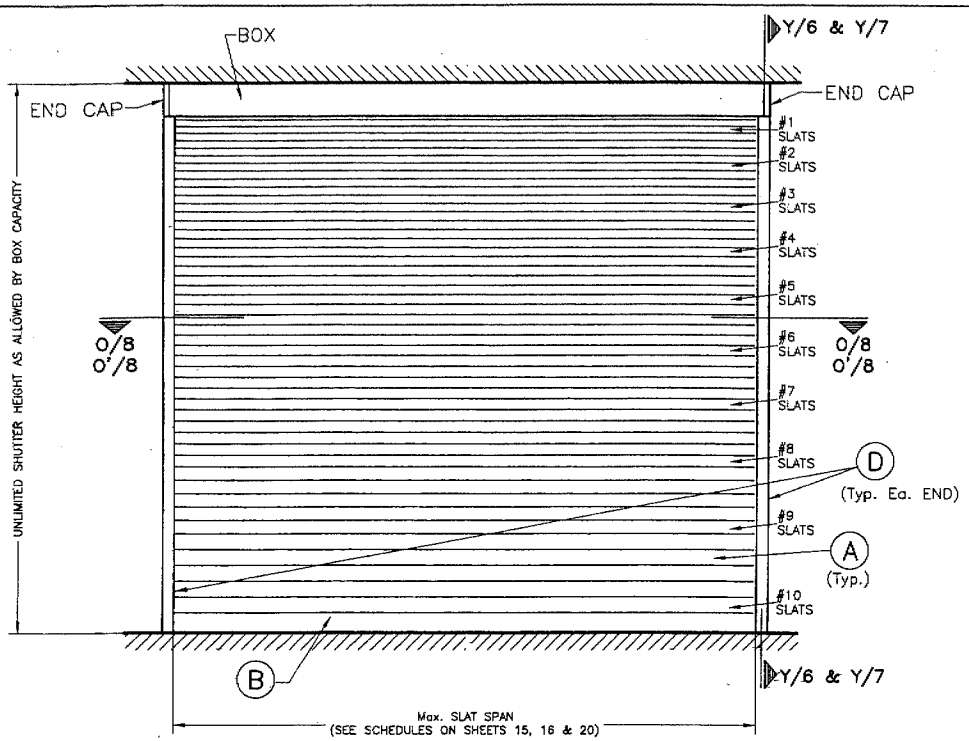
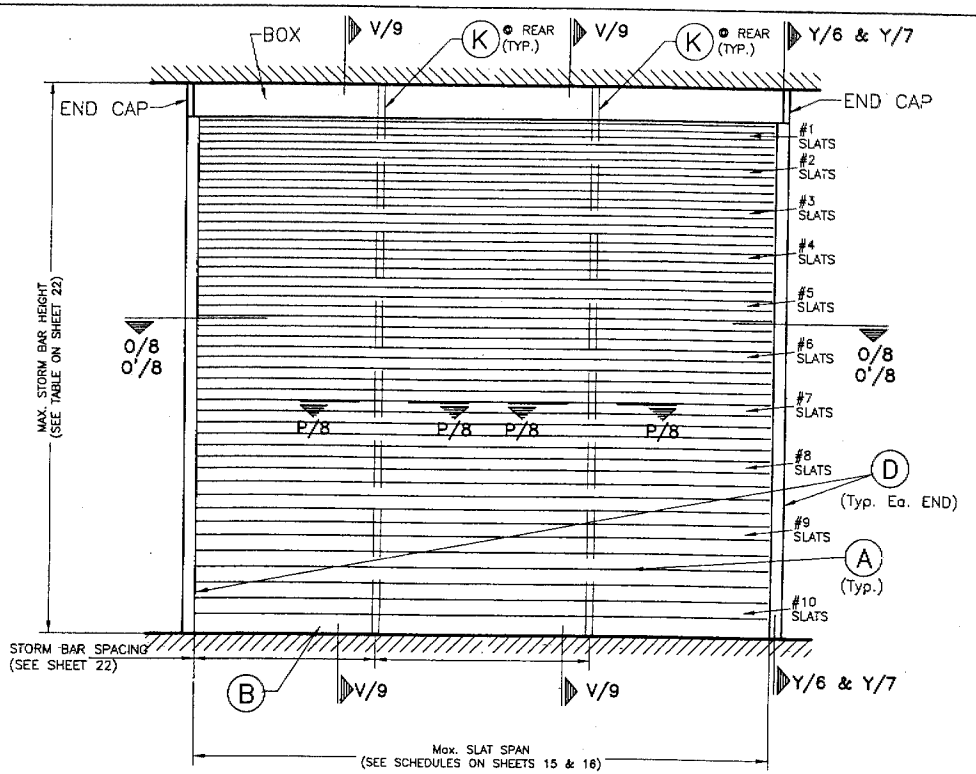
SHEET 3 OF 26



TYPICAL SINGLE UNIT ELEVATION W/O STORM BARS *, **

NOTE: SEE SHEETS 2 & 3 FOR COMPONENTS NOMENCLATURE.

N.T.S.



TYPICAL SINGLE UNIT ELEVATION W/ STORM BARS *

NOTE: SEE SHEETS 2 & 3 FOR COMPONENTS NOMENCLATURE.

N.T.S.

PROCEDURE FOR SLAT INSTALLATION GIVEN A SHUTTER HEIGHT:

* CASE 1: SHUTTER HEIGHT EQUAL OR LESS THAN 11'-0" APPLICABLE TO INSTALLATIONS W/O STORM BARS, W/ STORM BARS OR W/ STORM BARS & MULLIONS W/ HEIGHTS UP TO 11'-0".

(a) CURTAIN SHALL START W/ #1 SLATS AT TOP, FOLLOWED BY #2, #3, ... THEREAFTER, ALL THE WAY DOWN. EACH SLAT # SHALL CONSIST OF MIN. FIVE (5) SLATS OF THAT SLAT NUMBER. PROCEDURE FOR ADDING SLATS DOWNWARD BELOW #1 SLAT SHALL BE CONTINUED UNTIL TOTAL SHUTTER HEIGHT IS COMPLETED. QUANTITY OF FINAL SLAT NUMBER INSTALLED BEFORE BOTTOM SLAT (B) MAY VARY WITH SHUTTER'S HEIGHT.

(b) BOTTOM SLAT (B) MUST BE ALWAYS INSTALLED.

** CASE 2: SHUTTER HEIGHT LARGER THAN 11'-0" APPLICABLE TO INSTALLATIONS W/O STORM BARS AND W/ OR W/O MULLIONS W/ HEIGHTS LARGER THAN 11'-0".

(a) CURTAIN SHALL START W/ #1 SLATS AT TOP, FOLLOWED BY #2, #3, ... THEREAFTER, ALL THE WAY DOWN. EACH SLAT # SHALL CONSIST OF MIN. FIVE (5) SLATS OF THAT SLAT NUMBER. PROCEDURE FOR ADDING SLATS DOWNWARD BELOW #1 SLAT SHALL BE CONTINUED UNTIL #10 SLAT IS INSTALLED. AFTER #10 SLAT IS INSTALLED, ADDITIONAL #10 SLATS MUST BE USED TO COMPLETE THE TOTAL SHUTTER HEIGHT.

(b) BOTTOM SLAT (B) MUST BE ALWAYS INSTALLED.

FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)

WALTER A. TILLIT JR. LICENSE No. 44167 STATE OF FLORIDA
MAR 03 2009
P.E. SEAL/SIGNATURE/DATE

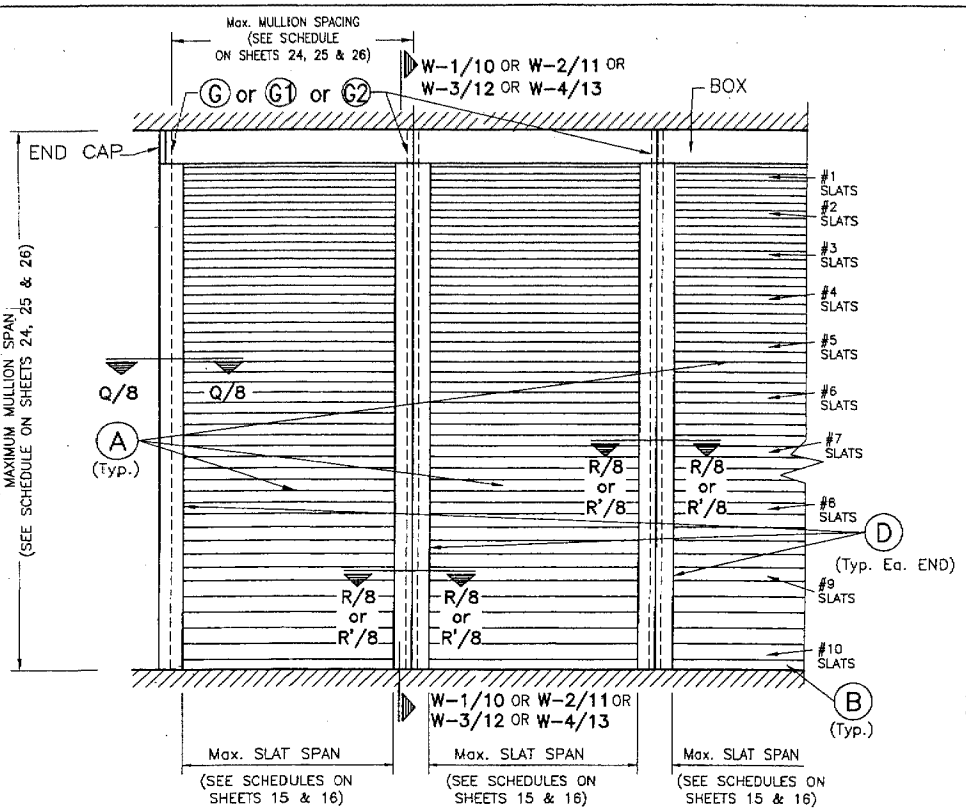
TILTECO INC.
TILLIT TESTING & ENGINEERING COMPANY
6355 N.W. 36th. St., Ste. 305, VIRGINIA GARDENS, FL 33166
Phone : (305)871-1530 , Fax : (305)871-1531
e-mail: tilteco@aol.com
EB-0008719
WALTER A. TILLIT Jr. P.E.
FLORIDA Lic. # 44167

Nautilus
Rolling Shutter System

EXPERT SHUTTER SERVICES INC.
1626 S.W. BILTMORE STREET
PORT ST. LUCIE, FL. 34984
PHONE: (800) 749-9056 , FAX: (772) 871-0990

REV. No	DESCRIPTION	DATE	REV. No	DESCRIPTION	DATE
1			4		
2			5		

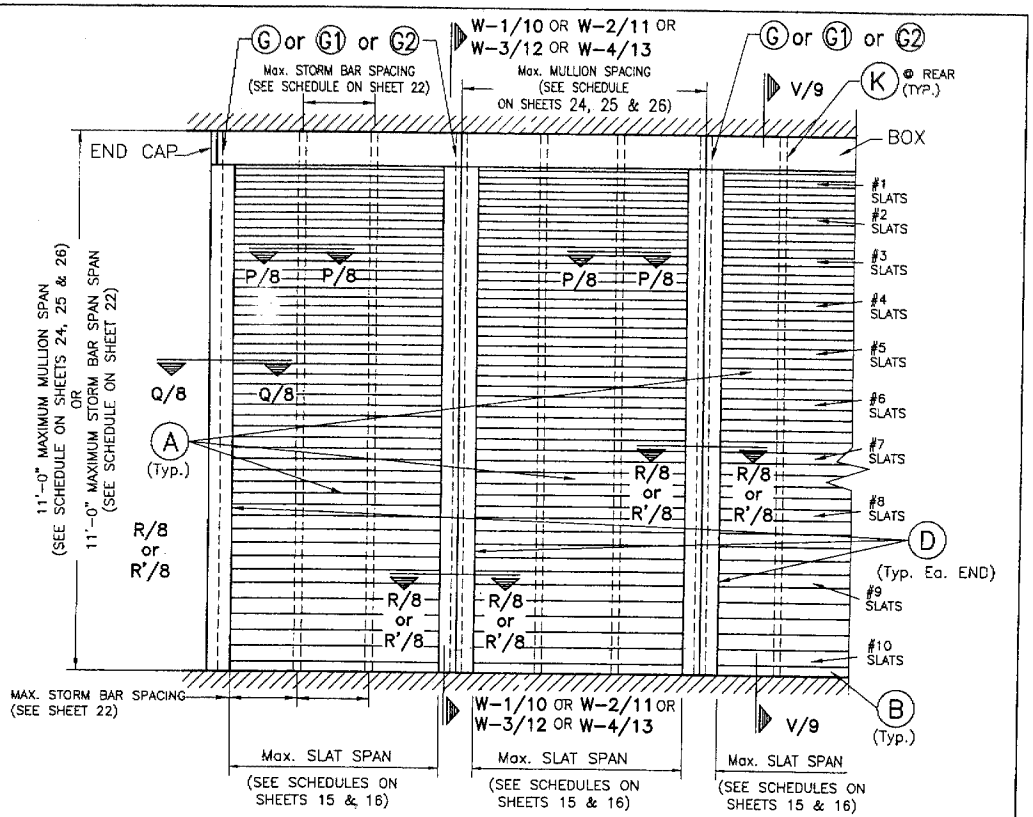
DRAWN BY: M.C.V./L.G.
11/18/08 DATE
08-255 DRAWING No
SHEET 4 OF 26



TYPICAL CONSECUTIVE SINGLE UNIT ELEVATION *, **
W/ MULLION & W/O STORM BARS

NOTE: SEE SHEETS 2 & 3 FOR COMPONENTS NOMENCLATURE.

N.T.S.



TYPICAL CONSECUTIVE SINGLE UNIT ELEVATION *
W/ MULLION & W/ STORM BARS

NOTE: SEE SHEETS 2 & 3 FOR COMPONENTS NOMENCLATURE.

N.T.S.

PROCEDURE FOR SLAT INSTALLATION GIVEN A SHUTTER HEIGHT:

* CASE 1: SHUTTER HEIGHT EQUAL OR LESS THAN 11'-0". APPLICABLE TO INSTALLATIONS W/O STORM BARS, W/ STORM BARS OR W/ STORM BARS & MULLIONS W/ HEIGHTS UP TO 11'-0".

(a) CURTAIN SHALL START W/ #1 SLATS AT TOP, FOLLOWED BY #2, #3, ... THEREAFTER ALL THE WAY DOWN. EACH SLAT # SHALL CONSIST OF FIVE (5) SLATS OF THAT SLAT NUMBER. PROCEDURE FOR ADDING SLATS DOWNWARD BELOW #1 SLAT SHALL BE CONTINUE UNTIL TOTAL SHUTTER HEIGHT IS COMPLETED. QUANTITY OF FINAL SLAT NUMBER INSTALLED BEFORE BOTTOM SLAT (B) MAY VARY WITH SHUTTER'S HEIGHT.

(b) BOTTOM SLAT (B) MUST BE ALWAYS INSTALLED.

** CASE 2: SHUTTER HEIGHT LARGER THAN 11'-0" APPLICABLE TO INSTALLATION W/O STORM BAR AND W/ MULLIONS W/ HEIGHTS LARGER THAN 11'-0".

(a) CURTAIN SHALL START W/ #1 SLATS AT TOP, FOLLOWED BY #2, #3, ... THEREAFTER ALL THE WAY DOWN. EACH SLAT # SHALL CONSIST OF FIVE (5) SLATS OF THAT SLAT NUMBER. PROCEDURE FOR ADDING SLATS DOWNWARD BELOW #1 SLAT SHALL BE CONTINUE UNTIL #10 SLAT IS INSTALLED. AFTER #10 SLAT IS INSTALLED, ADDITIONAL #10 SLATS MUST BE USED TO COMPLETE THE TOTAL SHUTTER HEIGHT.

(b) BOTTOM SLAT (B) MUST BE ALWAYS INSTALLED.

FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)

WALTER A. TILLIT JR. LICENSE NO. 44167 STATE OF FLORIDA
MAR 03 2008
P.E. SEAL/SIGNATURE/DATE

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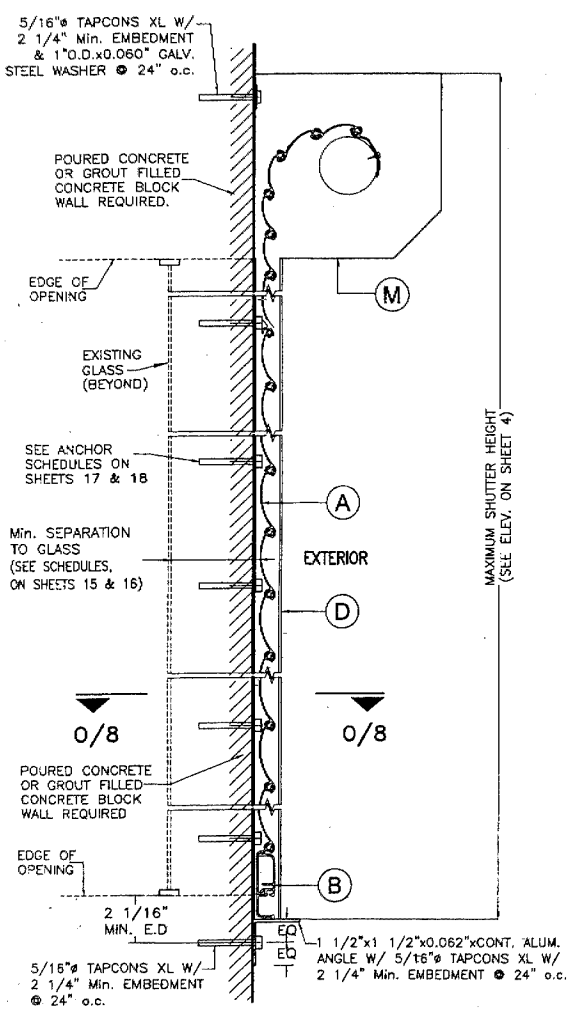
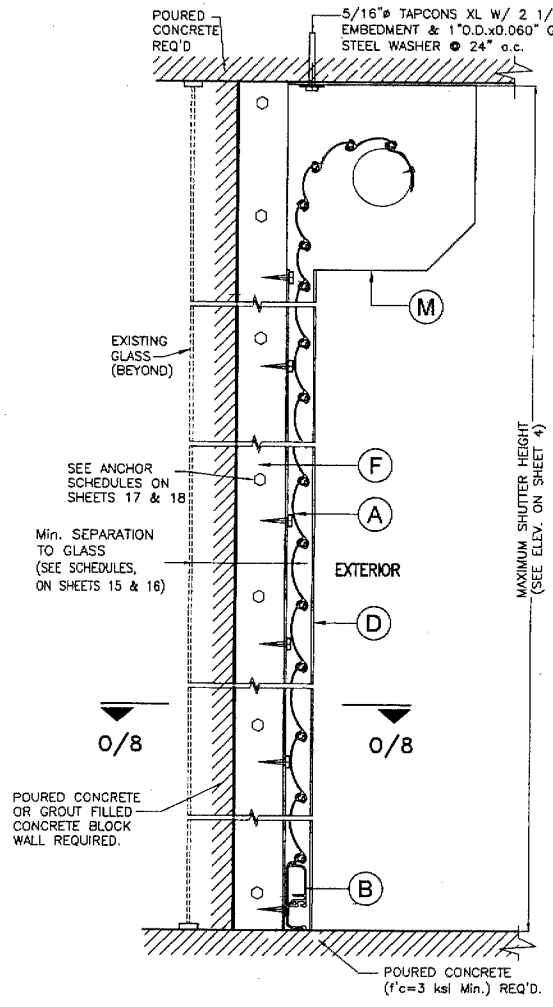
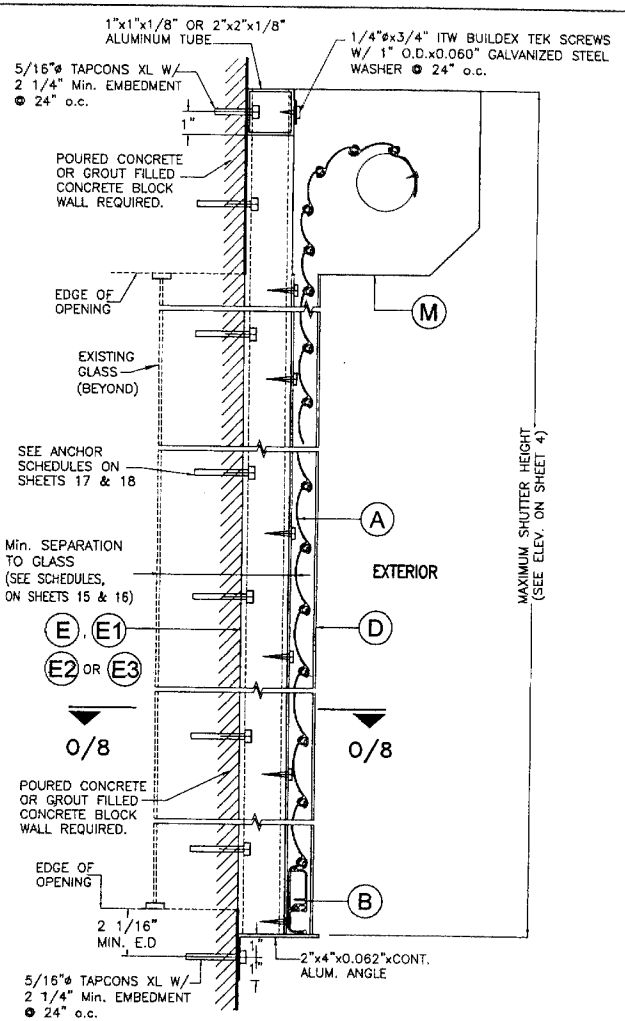
11/18/08 DATE
08-255 DRAWING No
SHEET 5 OF 26



WALL MOUNTING



FLOOR/CEILING / TRAPPED MOUNTING



BUILD-OUT MOUNTING

SECTIONS Y–Y

INSTALLATION DETAILS ON EXISTING POURED CONCRETE OR GROUT FILLED CELL CONCRETE BLOCK BUILDINGS

SCALE: 3/16" = 1"

FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)

WALTER A. TILLIT JR. LICENSE No. 44167 STATE OF FLORIDA
MAR 03 2009
P.E. SEAL/SIGNATURE/DATE

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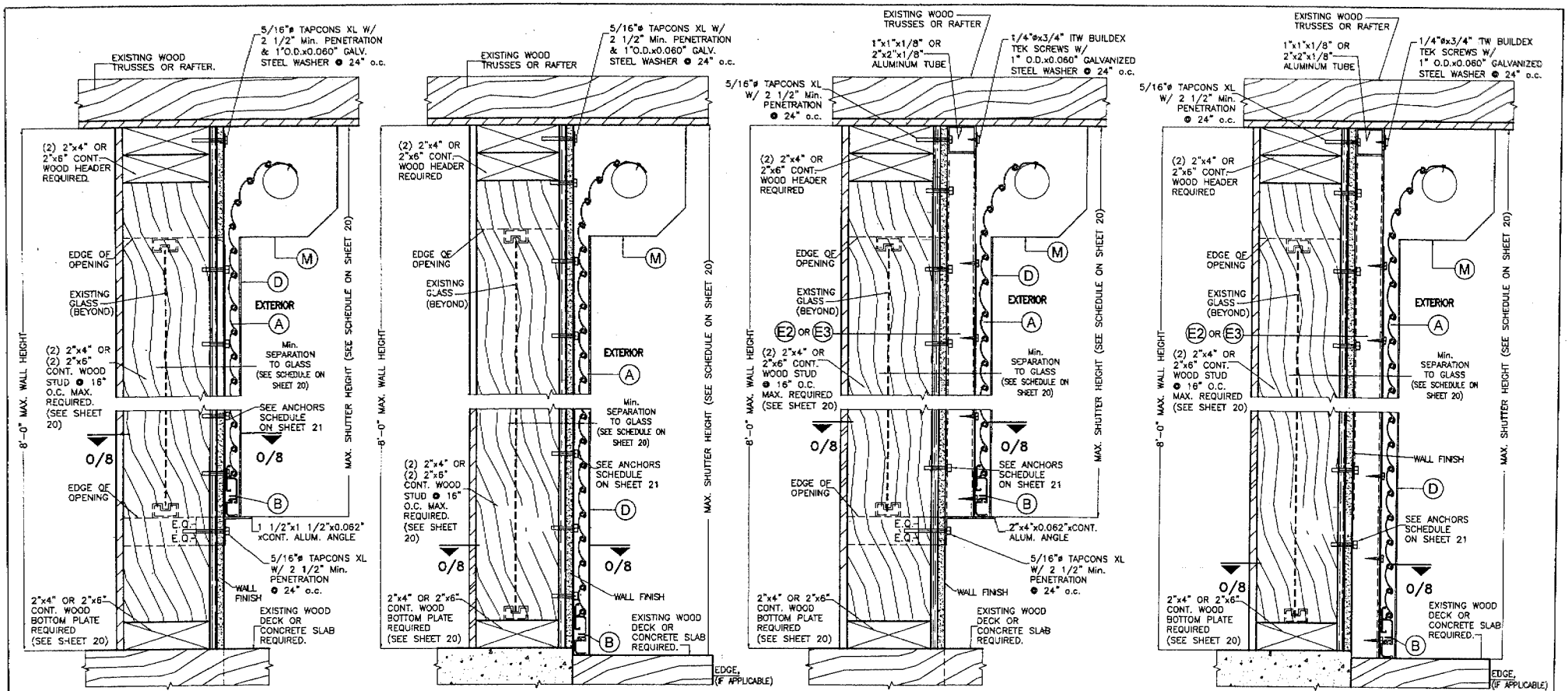
11/18/08 DATE
08-255 DRAWING No
SHEET 6 OF 26



SECTIONS Y-Y

INSTALLATION DETAILS ON EXISTING WOOD BUILDINGS

N.T.S.

FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)

WALTER A. TILLIT JR. LICENSE No. 44167 STATE OF FLORIDA MAR 03 2009 PE SEAL/SIGNATURE/DATE

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2			5		

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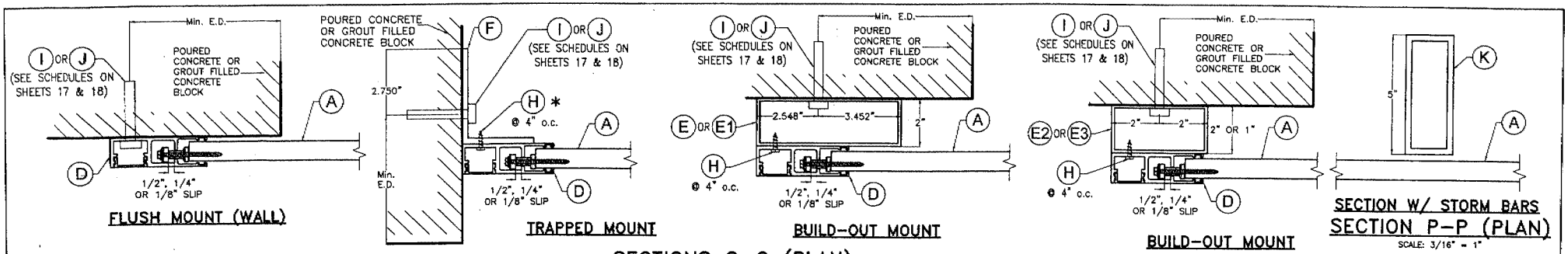
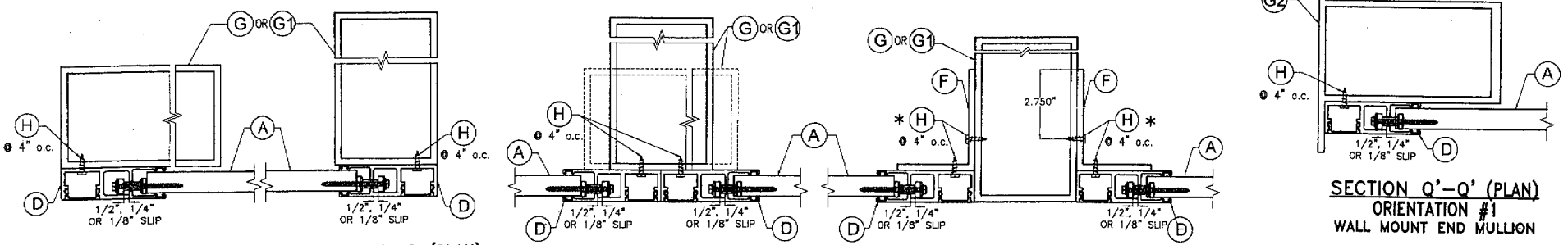
11/18/08 DATE
08-255 DRAWING No
SHEET 7 OF 25



SECTIONS O-O (PLAN)

INSTALLATION DETAILS INTO EXISTING POURED CONCRETE OR GROUT FILLED CONCRETE BLOCK BUILDINGS

SCALE: 1/4" = 1"



SECTION Q-Q (PLAN)
ORIENTATION #1
WALL MOUNT END MULLION

SECTION Q-Q (PLAN)
ORIENTATION #2
WALL MOUNT END MULLION

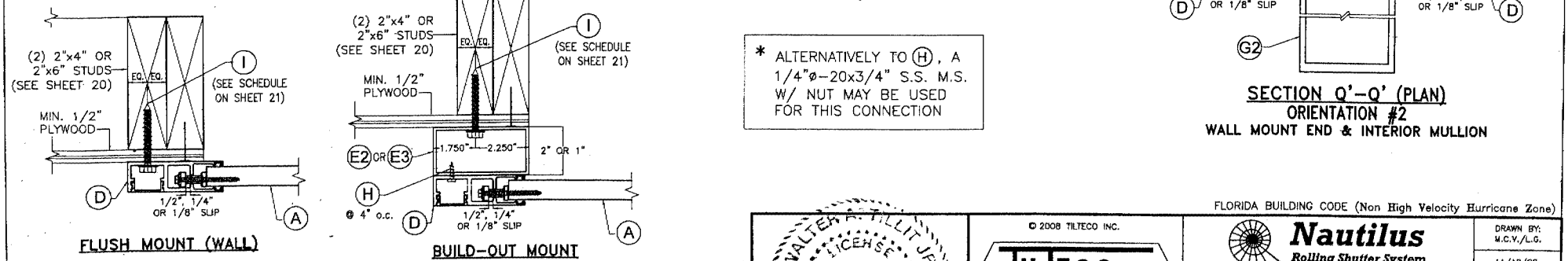
SECTION R-R (PLAN)
ORIENTATIONS #1 & #2
WALL MOUNT INTERIOR MULLION

SECTION R'-R' (PLAN)
ORIENTATION #2
TRAPPED MOUNT INTERIOR MULLION

SECTION Q'-Q' (PLAN)
ORIENTATION #1
WALL MOUNT END MULLION

INSTALLATION DETAILS INTO MULLIONS G, G1, G2

SCALE: 1/4" = 1"



SECTION Q'-Q' (PLAN)
ORIENTATION #2
WALL MOUNT END & INTERIOR MULLION

* ALTERNATIVELY TO (H), A 1/4"ø-20x3/4" S.S. M.S. W/ NUT MAY BE USED FOR THIS CONNECTION

SECTIONS O'-O' (PLAN)

INSTALLATION DETAILS INTO EXISTING WOOD BUILDINGS

SCALE: 1/4" = 1"

FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)

WALTER A. TILLIT JR. LICENSE No. 44167 STATE OF FLORIDA
MAR 03 2009
P.E. SEAL/SIGNATURE/DATE

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Nautilus
Rolling Shutter System

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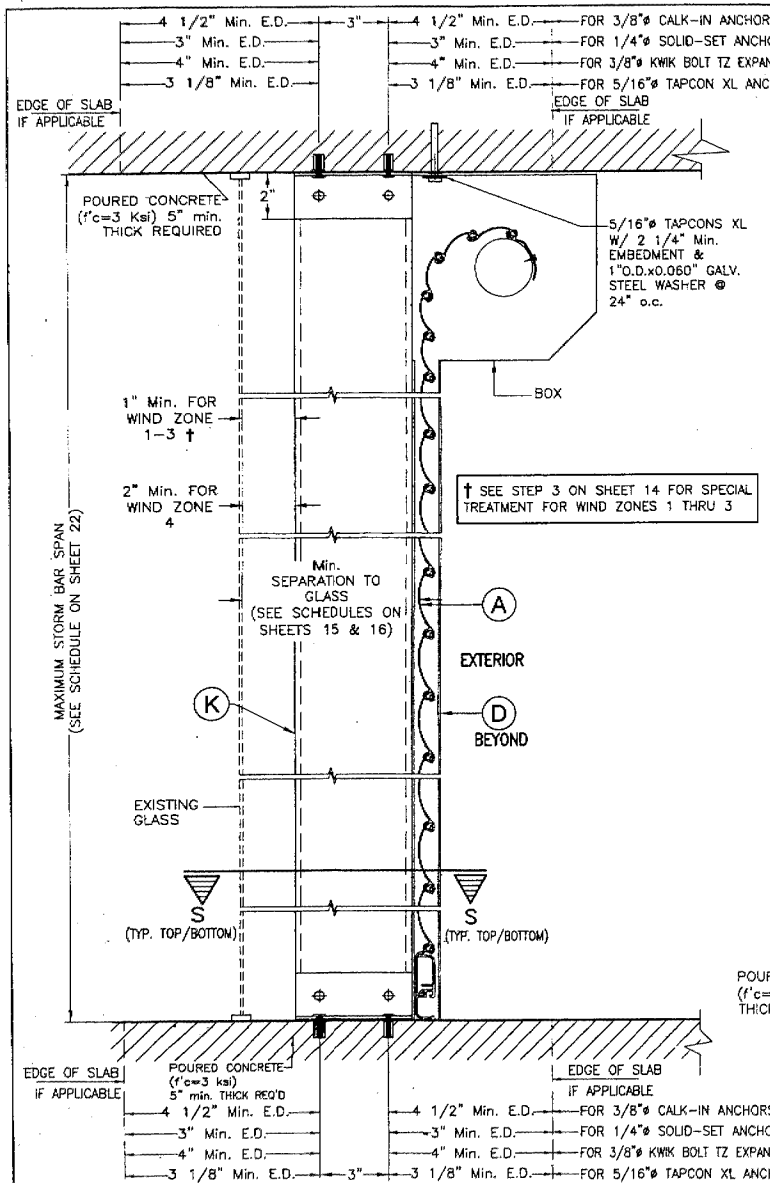
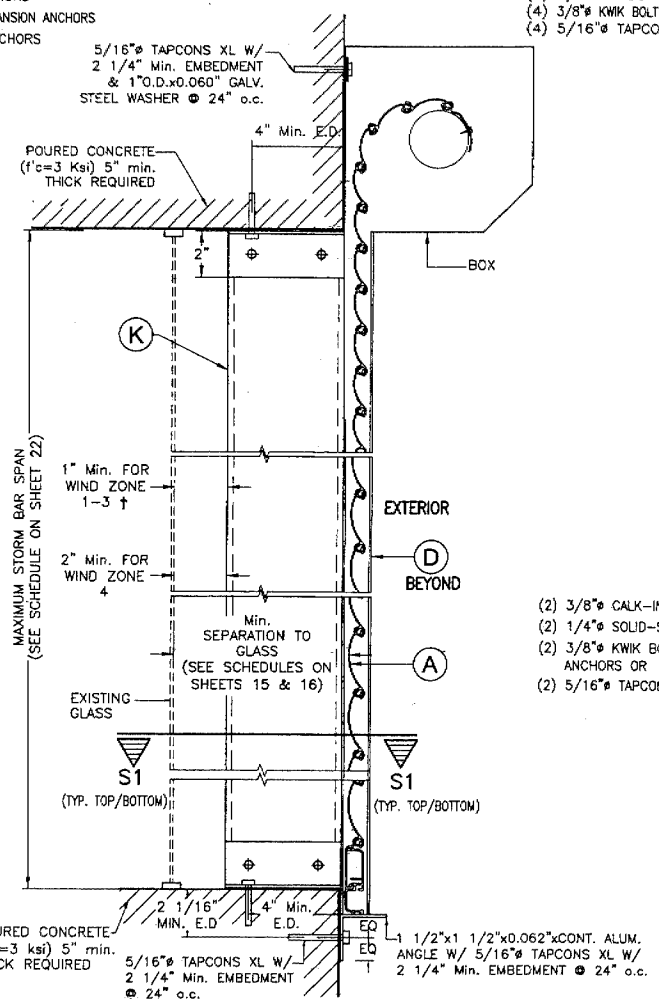
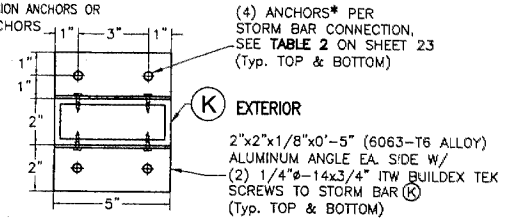
11/18/08 DATE
08-255 DRAWING No
SHEET 8 OF 26





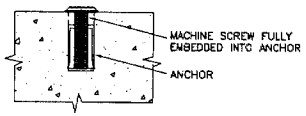
WALL MOUNTING

(4) 3/8"ø CALK-IN ANCHORS OR
(4) 1/4"ø SOLID-SET ANCHORS OR
(4) 3/8"ø KWIK BOLT TZ EXPANSION ANCHORS OR
(4) 5/16"ø TAPCON XL ANCHORS



(4) ANCHORS* PER STORM BAR CONNECTION, SEE **TABLE 2** ON SHEET 23 (Typ. TOP & BOTTOM)

SECTION S - S

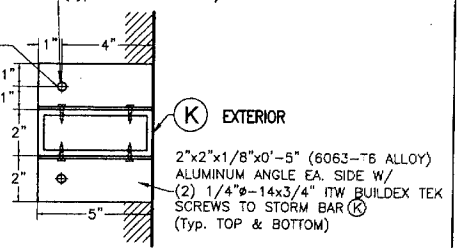


DETAIL A

* 1/4" ø-20 OR 3/8" ø-16 MACHINE SCREWS USED JOINTLY W/ 1/4"ø x 3/4" SOLID-SET OR 3/8"ø x 1 1/4" CALK-IN ANCHORS RESPECTIVELY SHALL BE LEFT TOGETHER W/ ANCHORS AT THE TIME STORM BARS ARE REMOVED. (SEE DET. A).

(2) ANCHORS* PER STORM BAR CONNECTION, SEE **TABLE 3** ON SHEET 23 (Typ. TOP & BOTTOM)

(2) 3/8"ø CALK-IN ANCHORS OR
(2) 1/4"ø SOLID-SET ANCHORS OR
(2) 3/8"ø KWIK BOLT TZ EXPANSION ANCHORS OR
(2) 5/16"ø TAPCON XL ANCHORS



SECTION S1 - S1

FLOOR TO CEILING / TRAPPED AND WALL MOUNTING : STORM BAR (K)

SECTIONS V

SCALE: 3/16" = 1"

FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)

WALTER A. TILLIT JR. LICENSE No. 44167 STATE OF FLORIDA MAR 0 3 2009 P.E. SEAL/SIGNATURE/DATE

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Nautilus *Rolling Shutter System*

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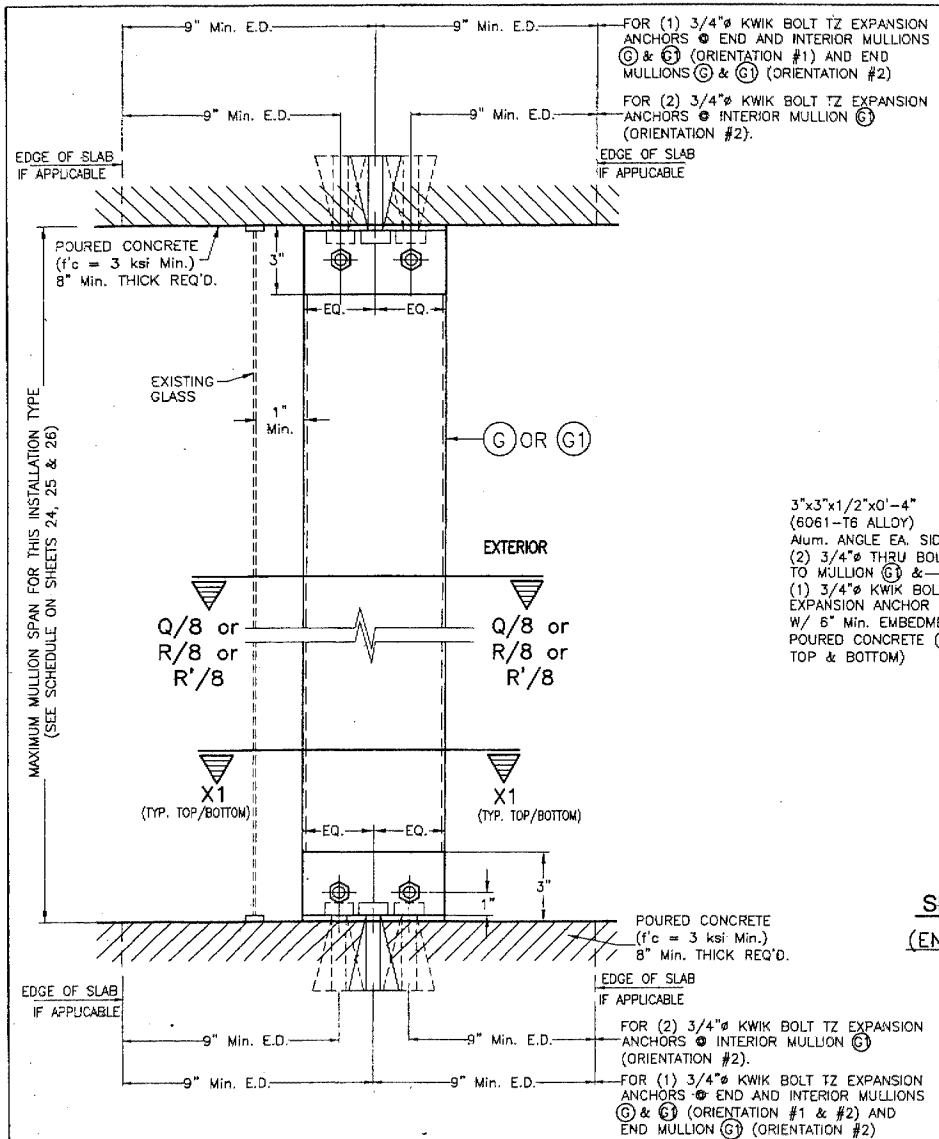
SHEET 9 OF 26

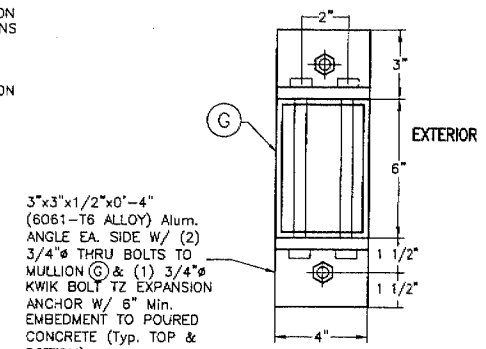


FLOOR TO CEILING / TRAPPED MOUNTING : MULLIONS G OR G1

SECTIONS W-1

END & INTERIOR TRAPPED MOUNTED MULLION INSTALLATION *

SCALE: 1/8" = 1"

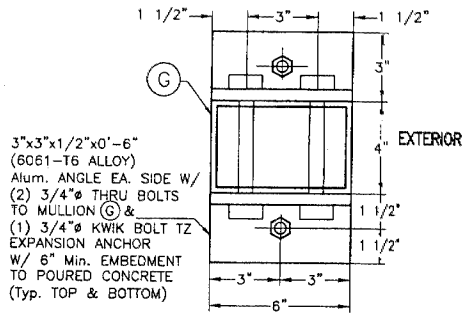


SECTION X1-X1 W/ G *

(END & INTERIOR MULLION)

(W/ ORIENTATION # 1)

(6"x4")

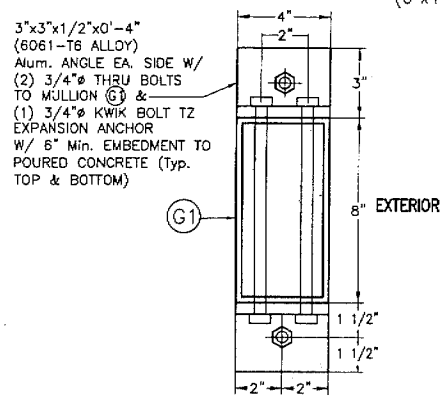


ALTERNATIVE SECTION X1-X1 W/ G *

(END & INTERIOR MULLION)

(W/ ORIENTATION # 2)

(4"x6")

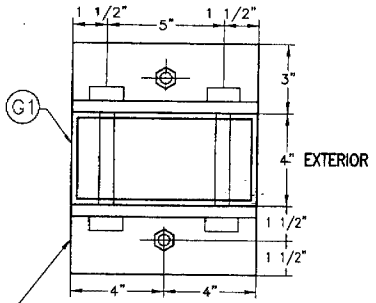


SECTION X1-X1 W/ G1 *

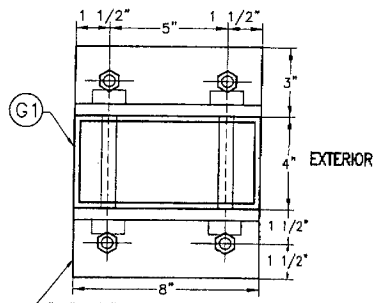
(END & INTERIOR MULLION)

(W/ ORIENTATION # 1)

(8"x4")



(END MULLION ONLY)



(INTERIOR MULLION ONLY)

ALTERNATIVES SECTION X1-X1 W/ G1 *

(W/ ORIENTATION # 2)

(4"x8")

* SIDE RAIL D AND BOX NOT SHOWN FOR CLARITY

FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)

WALTER A. TILLIT JR. LICENSE No. 44167 STATE OF FLORIDA ENGINEER

MAR 0 3 2009

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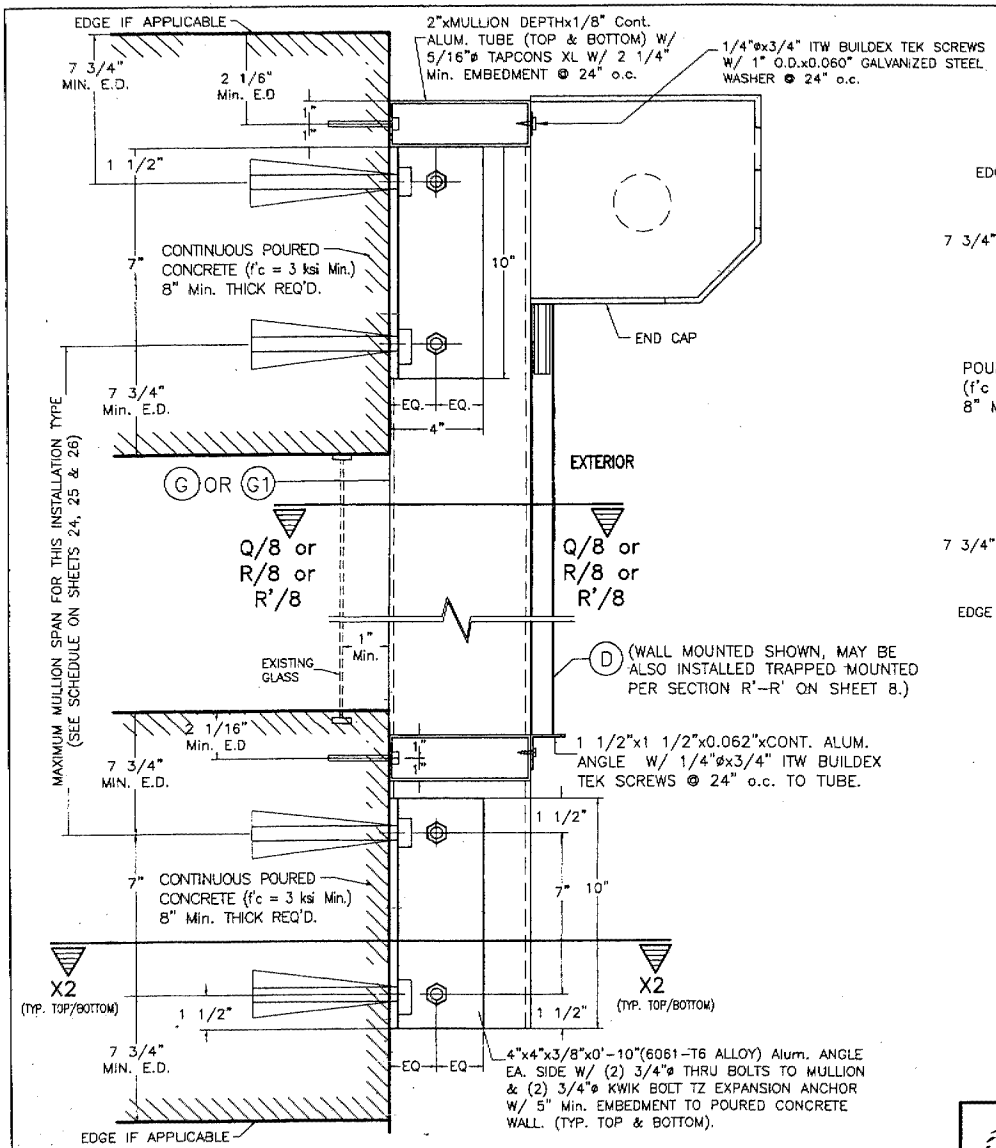
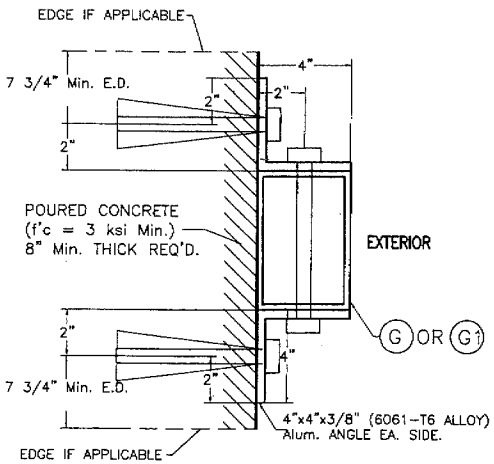


WALL MOUNTING : MULLIONS G OR G1
POURED CONCRETE WALL
SECTION W-2

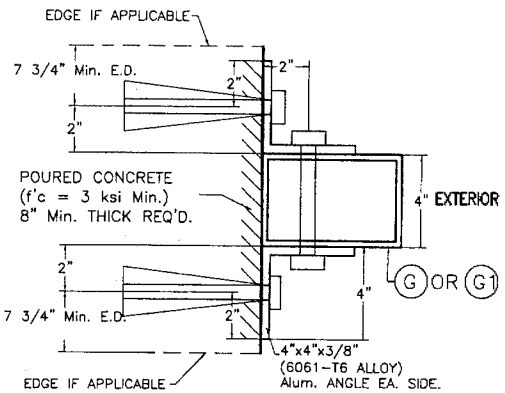
END & INTERIOR WALL MOUNTED MULLION INSTALLATION

SCALE: 1/8" = 1"



SECTION X2-X2 W/ G OR G1*

(END & INTERIOR MULLION)
(W/ ORIENTATION # 1)
(6"x4" or 8"x4")



ALTERNATIVE SECTION X2-X2 W/ G OR G1*

(END & INTERIOR MULLION)
(W/ ORIENTATION # 2)
(4"x6" or 4"x8")

* SIDE RAIL D NOT SHOWN FOR CLARITY

FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)

WALTER A. TILLIT JR. LICENSE NO. 44167 STATE OF FLORIDA
MARCH 13, 2009
PE SEAL/SIGNATURE/DATE

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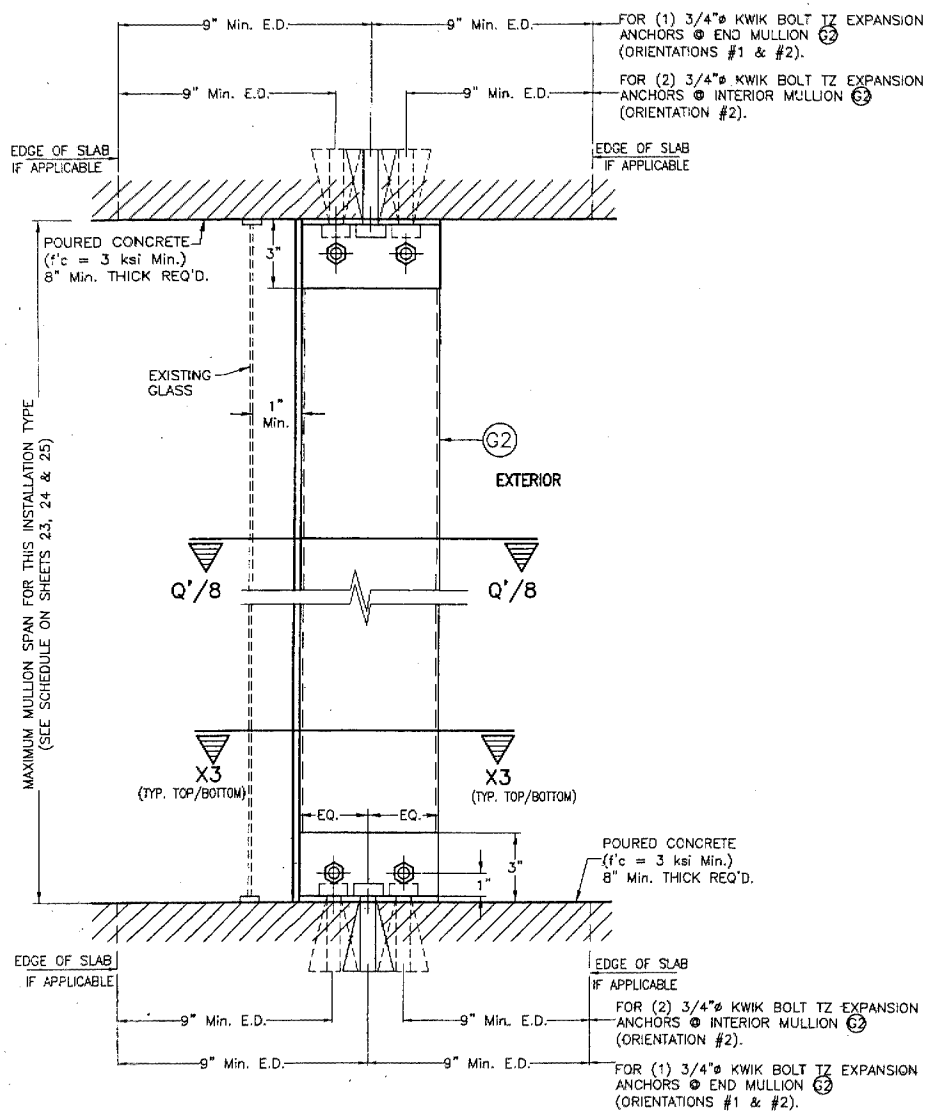
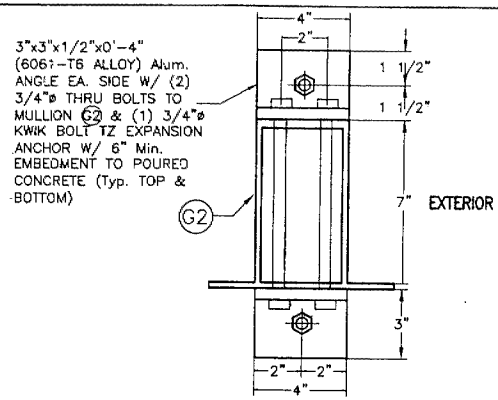


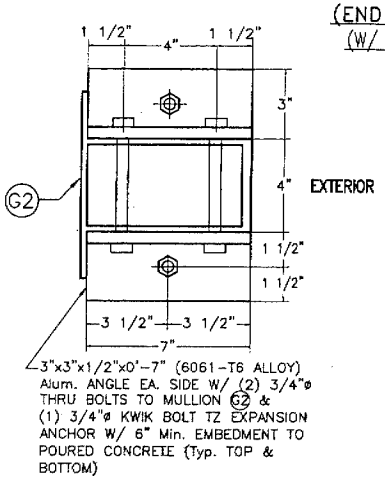
FLOOR TO CEILING / TRAPPED MOUNTING : MULLION G2
SECTION W-3

END & INTERIOR TRAPPED MOUNTED MULLION INSTALLATION *

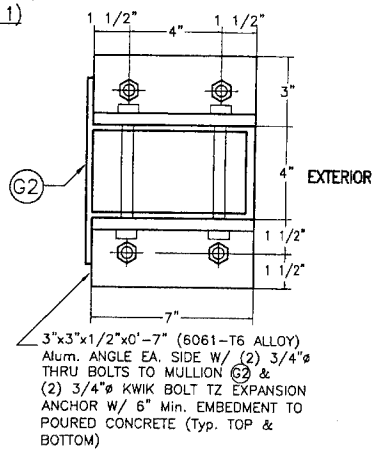
SCALE: 1/8" = 1"



SECTION X3-X3 W/ G2 *
(END MULLION ONLY)
(W/ ORIENTATION # 1)
(7"x4")



(END MULLION ONY)



(INTERIOR MULLION ONLY)

ALTERNATIVE SECTIONS X3-X3 W/ G2 *
(W/ ORIENTATION # 2)
(4"x7")

* SIDE RAIL D AND BOX NOT SHOWN FOR CLARITY.

FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)

WALTER A. TILLIT JR. LICENSE No. 44167 STATE OF FLORIDA
MAR 0 3 2009
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Nautilus *Rolling Shutter System*

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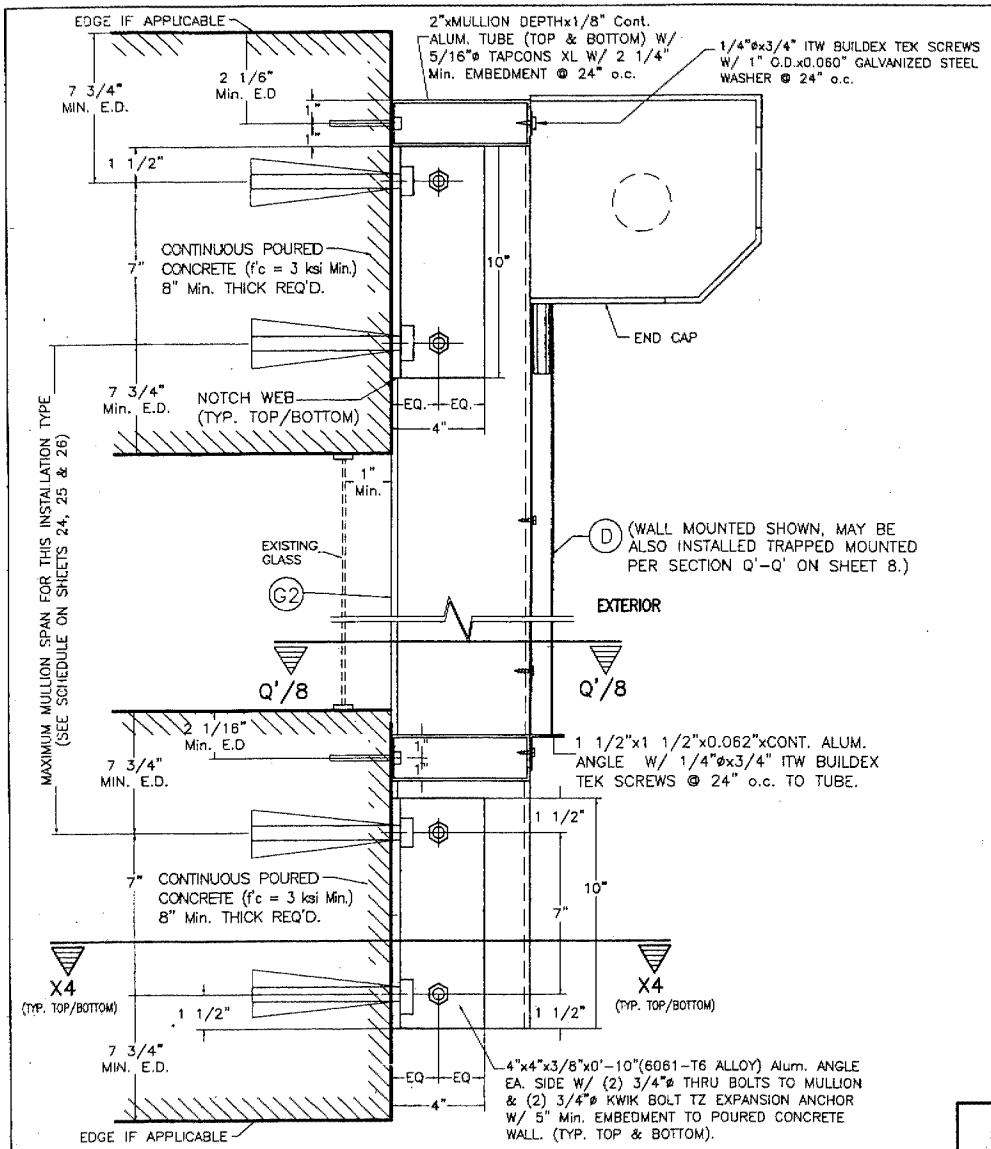
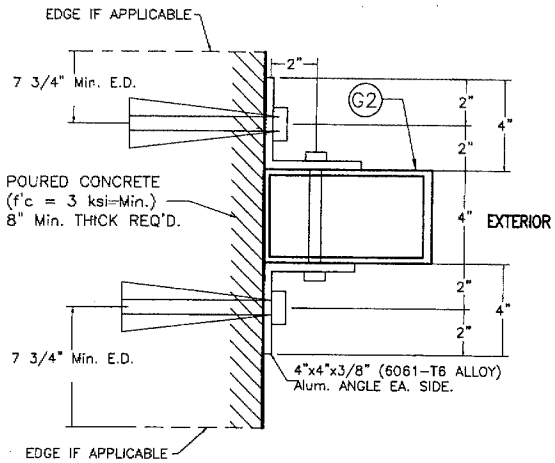
11/18/08 DATE
08-255 DRAWING No
SHEET 12 OF 26



WALL MOUNTING : MULLION (G2)
POURED CONCRETE WALL
SECTION W-4

END & INTERIOR WALL MOUNTED MULLION INSTALLATION

SCALE: 1/8" = 1"



SECTION X4-X4 W/ (G2) *
(END & INTERIOR MULLION)
(W/ ORIENTATION # 2)
(4"x7")

* SIDE RAIL (D) NOT SHOWN FOR CLARITY

FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)

WALTER A. TILLIT JR. LICENSE No. 44167 STATE OF FLORIDA PROFESSIONAL ENGINEER
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P.E. SEAL / SIGNATURE / DATE

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11/18/08 DATE
08-255 DRAWING No
SHEET 13 OF 26

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 DESIGN LOAD (p.s.f.) FOR THE OPENING AND DESIRED SHUTTER SPAN "L" (ft) TO PROTECT IT (SEE GENERAL NOTE #2, SHEET 1).

STEP 2: ENTER TO CHARTS I (Ia OR Ib) THRU IV ON SHEETS 15 & 16 TO DETERMINE, BASED ON AN ASSUMED SLAT SLIP (in), ANCHOR TYPE AT SIDE RAILS; 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 LOAD AND DESIRED SHUTTER SPAN.

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

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

  LMAX: THIS IS THE MAXIMUM ALLOWABLE SHUTTER SPAN FOR WHICH A GIVEN SLAT SLIP (1/2", 1/4", 1/8") MAY BE USED, FOR A GIVEN DESIGN LOAD. IN CASE JOB SITE DESIRED SHUTTER SPAN (L) WAS LARGER THAN LMAX, THEN GO TO THE OTHER CHARTS WITH A SHORTER SLAT SLIP AND VERIFY IF (L) IS ALLOWED FOR THAT OTHER SHORTER SLIP.

  LMIN: THIS IS THE MINIMUM ALLOWABLE SHUTTER SPAN FOR WHICH A GIVEN SLIP (1/2", 1/4", 1/8") MAY BE USED, FOR A GIVEN DESIGN LOAD. IN CASE JOB SITE DESIRED SHUTTER SPAN (L) WAS SHORTER THAN LMIN, 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 Ic, IIc, III & IV: PROVIDES SEPARATION TO GLASS FOR SHUTTERS W/O OR W/ STORM BARS (SEE STEP 4) 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 SCHEDULES Va & Vb ON SHEETS 17 & 18. ENTER SCHEDULES WITH FINALLY DETERMINED ANCHOR TYPE, SUBSTRATE, MOUNTING TYPE, DESIGN LOAD & SHUTTER SPAN AND OBTAIN MAXIMUM ANCHOR SPACING (INCHES ON CENTERS). SEE GENERAL NOTE 7 ON SHEET 1 FOR ANCHOR SPECS.

STEP 4: IF SHUTTER INSTALLATION INCLUDES STORM BARS, MULLIONS OR STORM BARS & MULLIONS, THE FOLLOWING MANDATORY ADDITIONAL PROCEDURES ARE APPLICABLE.

PROCEDURE 4a: IF STORM BARS ARE USED

1. MINIMUM SEPARATION TO GLASS FOR SLATS IF STORM BARS ARE USED SHALL BE BASED ON INSTALLATIONS PERFORMED WITHIN ASTM WIND ZONES 1 THRU 4 INDICATED ON CHART Ic. 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 TABLE 1 ON SHEET 22 W/ DESIGN LOAD ; STORM BAR SPACING AND DETERMINE MAXIMUM ALLOWABLE STORM BAR SPAN (HEIGHT).
3. ENTER TABLES 2 OR 3 ON SHEET 23, WITH DESIGN LOAD AND STORM BAR SPACING AND DETERMINE APPLICABLE OPTIONS FOR STORM BAR CONNECTION TO CONCRETE TOP & BOTTOM. OPTIONS PROVIDE ANCHOR SPECS AT ANCHORS TYPE LEGEND FOR VARIOUS ANCHOR TYPES COVERING PERMANENT (ANCHORS A & D) OR REMOVABLE (ANCHORS B & C) INSTALLATIONS & A CHOICE OF 2 OR 4 ANCHORS PER CONNECTION DEPENDING ON LOAD AND STORM BAR SPACING.

PROCEDURE 4b: IF MULLIONS ARE USED BUT W/O STORM BARS

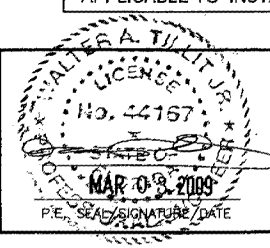
1. MINIMUM SEPARATION TO GLASS FOR SLATS IF MULLIONS ARE USED BUT W/O STORM BARS SHALL BE BASED ON INSTALLATIONS PERFORMED WITHIN ASTM WIND ZONES 1 THRU 4 INDICATED ON CHARTS Ic, IIc, III & IV ON SHEETS 15 & 16. IT SHALL BE MEASURED FROM BACK OF SLATS TO GLASS. FOR INSTALLATIONS WITHIN ASTM WIND ZONES 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 24, 25 & 26 W/ DESIGN LOAD ; MAXIMUM MULLION SPACING (MAX., 12' OR 7'), AND DETERMINE MAXIMUM MULLION SPAN (HEIGHT) W/ ALLOWABLE INTERPOLATION IN BETWEEN SPACINGS FOR A GIVEN (G , G1 , G2), MULLION TYPE & MULLION ORIENTATION.
3. SEE SHEETS 10 THRU 13 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 (G , G1 , G2).

PROCEDURE 4c: IF BOTH STORM BARS & MULLIONS ARE USED

1. MINIMUM SEPARATION TO GLASS FOR SLATS IF BOTH STORM BARS AND MULLIONS ARE USED SHALL BE BASED ON INSTALLATIONS PERFORMED WITHIN ASTM WIND ZONES 1 THRU 4 INDICATED ON CHART Ic, SHEET 15, 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, MINIMUM SEPARATION TO GLASS FOR SLATS SHALL BE IDENTICAL TO WIND ZONE 4 VALUES.
2. ENTER TABLE 1 ON SHEET 22 W/ DESIGN LOAD AND STORM BAR SPACING AND DETERMINE MAXIMUM STORM BAR SPAN (HEIGHT).
3. ENTER TABLES 2 OR 3 ON SHEET 23, WITH DESIGN LOAD AND STORM BAR SPACING AND DETERMINE APPLICABLE OPTIONS FOR STORM BAR CONNECTION TO CONCRETE TOP & BOTTOM. OPTIONS PROVIDE ANCHOR SPECS AT ANCHORS TYPE LEGEND FOR VARIOUS ANCHOR TYPES COVERING PERMANENT (ANCHORS A & D) OR REMOVABLE (ANCHORS B & C) INSTALLATIONS & A CHOICE OF 2 OR 4 ANCHORS PER CONNECTION DEPENDING ON LOAD AND STORM BAR SPACING.
4. ENTER SCHEDULES 1a THRU 2c ON SHEETS 24, 25 & 26 W/ DESIGN LOAD ; MAXIMUM MULLION SPACING (MAX., 12' OR 7'), AND DETERMINE MAXIMUM MULLION SPAN (HEIGHT) W/ ALLOWABLE INTERPOLATION IN BETWEEN SPACINGS FOR A GIVEN (G , G1 , G2), MULLION TYPE & MULLION ORIENTATION.
5. SEE SHEETS 10 THRU 13 FOR MULLION CONNECTION DETAILS AT TOP & BOTTOM FOR FLOOR TO CEILING (TRAPPED) OR WALL MOUNTINGS OF MULLIONS INTO CONCRETE FOR A GIVEN MULLION TYPE (G , G1 , G2).

* PROCEDURE PER STEPS 1 THRU 3 IS SIMILAR FOR INSTALLATIONS INTO WOOD FRAME STRUCTURES. SEE SHEETS 20 & 21 FOR LIMITATIONS APPLICABLE TO INSTALLATIONS INTO WOOD FRAME STRUCTURES.

FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)



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11/18/08 DATE
08-255 DRAWING No
SHEET 14 OF 26

SLAT PERFORMANCE CHARTS Ia, Ib & Ic: (ONLY VALID FOR 1/2" SLIP)

FOR A GIVEN DESIGN LOAD (p.s.f), SHUTTER MOUNT CONDITION INCLUDING ANCHOR TYPE AND FOR INSTALLATIONS W/ OR W/O STORM BARS

CHART Ia					CHART Ib				USE W/ CHARTS Ia & Ib	CHART Ic			
USE MAXIMUM VALUE BETWEEN POSITIVE AND NEGATIVE LOAD										USE MAXIMUM POSITIVE LOAD VALUE			
3/8"Ø KWIK BOLT 3 ANCHOR POURED CONCRETE					5/16"ø TAPCON XL ANCHOR TO POURED CONCRETE OR GROUT FILLED CELL CONCRETE BLOCK				MIN. SLAT SPAN "LMIN." (FT)				
DESIGN LOAD (psf)	MAX. SLAT SPAN "LMAX." (FT)				MAX. SLAT SPAN "LMAX." (FT)					REQUIRED-MIN. SEPARATION TO GLASS MEASURED TO BACK OF SLAT (in)			
	WALL MOUNT SEE NOTES *	TRAPPED MOUNT SEE NOTES *	BUILD-OUT MOUNT W/ (E1) & (E2) SEE NOTES *	BUILD-OUT MOUNT W/ (E3) SEE NOTES *	WALL MOUNT SEE NOTES *	TRAPPED MOUNT SEE NOTES *	BUILD-OUT MOUNT W/ (E1) & (E2) SEE NOTES *	BUILD-OUT MOUNT W/ (E3) SEE NOTES *	WALL, TRAPPED & BUILD-OUT MOUNT W/ (E1), (E2) & (E3) SEE NOTES *	W/O STORM BARS		W/ STORM BARS	
										WIND ZONES 1-3	WIND ZONE 4	WIND ZONES 1-3	WIND ZONE 4
30.0	20'-0"	20'-0"	20'-0"	20'-0"	20'-0"	20'-0"	20'-0"	18'-0"	8'-1"	1"	14 1/2"	6"	7"
35.0	20'-0"	19'-10"	20'-0"	18'-0"	20'-0"	19'-6"	19'-0"	16'-3"	7'-9"	1"	14 1/2"	6"	7"
40.0	20'-0"	19'-8"	19'-7"	16'-6"	20'-0"	19'-0"	17'-4"	14'-10"	7'-5"	1"	14 1/2"	6"	7"
45.0	20'-0"	19'-6"	18'-0"	15'-3"	20'-0"	18'-5"	16'-0"	13'-9"	7'-2"	1"	14 1/2"	6"	7"
50.0	20'-0"	19'-4"	16'-9"	14'-2"	19'-1"	17'-2"	14'-10"	12'-10"	7'-0"	1"	14 1/2"	6"	7"
55.0	20'-0"	19'-2"	15'-8"	13'-4"	17'-9"	16'-1"	13'-11"	12'-1"	6'-9"	1"	14 1/2"	6"	7"
60.0	19'-5"	17'-11"	14'-9"	12'-7"	16'-9"	15'-2"	13'-2"	11'-5"	6'-9"	1"	14 1/2"	6"	7"
65.0	18'-4"	16'-10"	13'-11"	11'-11"	15'-9"	14'-4"	12'-5"	10'-11"	6'-9"	1"	14"	6"	7"
70.0	17'-4"	15'-11"	13'-3"	11'-4"	15'-0"	13-8"	11'-10"	10'-4"	6'-9"	1"	13 1/2"	6"	7"
75.0	16'-6"	15'-1"	12'-7"	10'-10"	14'-3"	13'-1"	11'-4"	9'-11"	6'-9"	1"	13 1/2"	6"	7"
80.0	15'-9"	14'-4"	12'-0"	10'-5"	13'-7"	12'-6"	10'-10"	9'-7"	6'-9"	1"	13"	6"	7"
85.0	15'-0"	13'-9"	11'-7"	10'-0"	13'-0"	12'-1"	10'-5"	9'-3"	6'-9"	1"	13"	6"	7"
90.0	14'-2"	13'-2"	11'-2"	9'-8"	12'-6"	11'-7"	10'-1"	8'-11"	6'-9"	1"	12 1/2"	6"	7"
95.0	13'-5"	12'-8"	10'-9"	9'-4"	12'-0"	11'-3"	9'-9"	8'-7"	6'-9"	1"	12 1/2"	6"	7"
100.0	12'-9"	12'-2"	10'-5"	9'-1"	11'-8"	10'-10"	9'-5"	8'-4"	6'-9"	1"	12"	6"	7"
105.0	12'-2"	11'-9"	10'-1"	8'-9"	11'-3"	10'-6"	9'-2"	8'-2"	6'-9"	1"	11 1/2"	6"	7"
110.0	11'-7"	11'-4"	9'-9"	8'-6"	10'-11"	10'-3"	8'-10"	7'-11"	6'-9"	1"	11 1/2"	6"	7"
115.0	11'-1"	11'-0"	9'-6"	8'-4"	10'-7"	10'-0"	8'-8"	7'-8"	6'-9"	1"	11 1/2"	6"	7"
120.0	10'-8"	10'-8"	9'-3"	8'-2"	10'-3"	9'-8"	8'-5"	7'-6"	6'-9"	1"	11"	6"	7"
125.0	10'-2"	10'-2"	9'-0"	7'-11"	10'-0"	9'-5"	8'-2"	7'-4"	6'-9"	1"	11"	6"	7"
130.0	9'-10"	9'-10"	8'-9"	7'-9"	9'-9"	9'-2"	8'-0"	7'-2"	6'-9"	1"	10 1/2"	6"	7"
135.0	9'-5"	9'-5"	8'-6"	7'-7"	9'-6"	8'-11"	7'-10"	7'-1"	6'-9"	1"	10 1/2"	6"	7"
140.0	9'-1"	9'-1"	8'-4"	7'-5"	9'-1"	8'-9"	7'-8"	6'-11"	6'-9"	1"	10 1/2"	6"	7"
145.0	8'-10"	8'-10"	8'-2"	7'-3"	8'-10"	8'-6"	7'-6"	-	6'-9"	1"	10"	6"	7"
150.0	8'-6"	8'-6"	8'-0"	7'-2"	8'-6"	8'-4"	7'-4"	-	6'-9"	1"	10"	6"	7"
155.0	8'-3"	8'-3"	7'-10"	7'-0"	8'-3"	8'-1"	7'-2"	-	6'-9"	1"	10"	6"	7"
160.0	8'-0"	8'-0"	7'-8"	6'-10"	8'-0"	7'-11"	7'-1"	-	6'-9"	1"	10"	6"	7"

* NOTES:

1. ABOVE INDICATED MAX. SLAT SPANS MAY BE USED AS LONG AS ANCHOR SPACING SCHEDULES ON SHEETS 17 & 18 INDICATE THAT AN ANCHOR SPACING IS AVAILABLE FOR THE CORRESPONDING SLAT SPAN AND DESIGN LOAD.
2. REQUIRES SIDE RAILS FASTENED TO EXISTING STRUCTURE WITH **3/8"ø KWIK BOLT 3 ANCHOR OR 5/16"ø TAPCON XL ANCHOR**, INTO POURED CONCRETE OR GROUT FILLED CELL CONCRETE BLOCK, OR WITH 1/4"ø TEK SCREWS AT MULLIONS CONNECTION. VALID FOR WALL MOUNTED, TRAPPED MOUNTED, AND BUILD-OUT MOUNTED.
3. MAXIMUM SLAT SPANS FOR INTERMEDIATE LOADS MAY BE DETERMINED BY LINEAR INTERPOLATION BETWEEN END VALUES.

FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)

WALTER A. TILLIT JR. LICENSE No. 44167 STATE OF FLORIDA MAR 30 2009 P.E. SEAL/SIGNATURE/DATE

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11/18/08 DATE
08-255 DRAWING No

SLAT PERFORMANCE CHARTS IIa, IIb & IIc: (ONLY VALID FOR 1/4" SLIP)

FOR A GIVEN DESIGN LOAD (p.s.f), SHUTTER MOUNT CONDITION INCLUDING ANCHOR TYPE AND FOR INSTALLATIONS W/O STORM BARS

CHART IIa				CHART IIb				USE W/ CHARTS Ia & Ib	CHART IIc	
USE MAXIMUM VALUE BETWEEN POSITIVE AND NEGATIVE LOAD									USE MAXIMUM POSITIVE LOAD VALUE	
3/8"Ø KWIK BOLT 3 ANCHOR POURED CONCRETE				5/16"ø TAPCON XL ANCHOR TO POURED CONCRETE OR GROUT FILLED CELL CONCRETE BLOCK				MIN. SLAT SPAN "LMIN." (FT)	(3/8"ø KWIK BOLT 3 ANCHOR & 5/16"ø TAPCON XL ANCHOR)	
DESIGN LOAD (psf)	MAX. SLAT SPAN "LMAX." (FT)				MAX. SLAT SPAN "LMAX." (FT)					REQUIRED MIN. SEPARATION TO GLASS MEASURED TO BACK OF SLAT (in)	
	WALL MOUNT SEE NOTES *	TRAPPED MOUNT SEE NOTES *	BUILD-OUT MOUNT W/ (E) & (E2) SEE NOTES *	BUILD-OUT MOUNT W/ (E3) SEE NOTES *	WALL MOUNT SEE NOTES *	TRAPPED MOUNT SEE NOTES *	BUILD-OUT MOUNT W/ (E) & (E2) SEE NOTES *	BUILD-OUT MOUNT W/ (E3) SEE NOTES *	WALL, TRAPPED & BUILD-OUT MOUNT W/ (E) (E2) & (E3) SEE NOTES *	W/O STORM BARS	
										WIND ZONES 1-3	WIND ZONE 4
30.0	8'-3"	8'-3"	8'-3"	8'-3"	8'-3"	8'-3"	8'-3"	8'-3"	7'-7"		
35.0	7'-9"	7'-9"	7'-9"	7'-9"	7'-9"	7'-9"	7'-9"	7'-9"	7'-3"		
40.0	7'-7"	7'-7"	7'-7"	7'-7"	7'-7"	7'-7"	7'-7"	7'-7"	7'-0"		
45.0	7'-4"	7'-4"	7'-4"	7'-4"	7'-4"	7'-4"	7'-4"	7'-4"	6'-9"		
50.0	7'-3"	7'-3"	7'-3"	7'-3"	7'-3"	7'-3"	7'-3"	7'-3"	6'-6"		
55.0	7'-3"	7'-3"	7'-3"	7'-3"	7'-3"	7'-3"	7'-3"	7'-3"	6'-4"		
60.0	7'-3"	7'-3"	7'-3"	7'-3"	7'-3"	7'-3"	7'-3"	7'-3"	6'-2"		
65.0	7'-3"	7'-3"	7'-3"	7'-3"	7'-3"	7'-3"	7'-3"	7'-3"	6'-1"		
70.0	7'-3"	7'-3"	7'-3"	7'-3"	7'-3"	7'-3"	7'-3"	7'-3"	5'-11"		
75.0	7'-3"	7'-3"	7'-3"	7'-3"	7'-3"	7'-3"	7'-3"	7'-3"	5'-10"		
80.0	7'-3"	7'-3"	7'-3"	7'-3"	7'-3"	7'-3"	7'-3"	7'-3"	5'-10"		
85.0	7'-3"	7'-3"	7'-3"	7'-3"	7'-3"	7'-3"	7'-3"	7'-3"	5'-10"		
90.0	7'-3"	7'-3"	7'-3"	7'-3"	7'-3"	7'-3"	7'-3"	7'-3"	5'-10"		
95.0	7'-3"	7'-3"	7'-3"	7'-3"	7'-3"	7'-3"	7'-3"	7'-3"	5'-10"		
100.0	7'-2"	7'-2"	7'-2"	7'-2"	7'-2"	7'-2"	7'-2"	7'-2"	5'-10"		
105.0	7'-0"	7'-0"	7'-0"	7'-0"	7'-0"	7'-0"	7'-0"	7'-0"	5'-10"		
110.0	6'-10"	6'-10"	6'-10"	6'-10"	6'-10"	6'-10"	6'-10"	6'-10"	5'-10"		
115.0	6'-8"	6'-8"	6'-8"	6'-8"	6'-8"	6'-8"	6'-8"	6'-8"	5'-10"		
120.0	6'-6"	6'-6"	6'-6"	6'-6"	6'-6"	6'-6"	6'-6"	6'-6"	5'-9"		
125.0	6'-4"	6'-4"	6'-4"	6'-4"	6'-4"	6'-4"	6'-4"	6'-4"	5'-7"		
130.0	6'-3"	6'-3"	6'-3"	6'-3"	6'-3"	6'-3"	6'-3"	6'-3"	5'-6"		
135.0	6'-1"	6'-1"	6'-1"	6'-1"	6'-1"	6'-1"	6'-1"	6'-1"	5'-5"		
140.0	6'-0"	6'-0"	6'-0"	6'-0"	6'-0"	6'-0"	6'-0"	6'-0"	5'-4"		
145.0	6'-0"	6'-0"	6'-0"	6'-0"	6'-0"	6'-0"	6'-0"	5'-11"	5'-3"		
150.0	6'-0"	6'-0"	6'-0"	6'-0"	6'-0"	6'-0"	6'-0"	5'-10"	5'-2"	1"	5"
155.0	6'-0"	6'-0"	6'-0"	6'-0"	6'-0"	6'-0"	6'-0"	5'-8"	5'-1"		
160.0	6'-0"	6'-0"	6'-0"	5'-11"	6'-0"	6'-0"	6'-0"	5'-7"	5'-0"		

SLAT PERFORMANCE CHART III: (ONLY VALID FOR 1/8" SLIP)

FOR A GIVEN DESIGN LOAD (p.s.f), SHUTTER MOUNT CONDITION INCLUDING ANCHOR TYPE AND FOR INSTALLATIONS W/O STORM BARS

3/8"Ø KWIK BOLT 3 ANCHOR POURED CONCRETE & 5/16"ø TAPCON XL ANCHOR TO POURED CONCRETE OR GROUT FILLED CELL CONCRETE BLOCK				
USE MAXIMUM VALUE BETWEEN POSITIVE AND NEGATIVE LOAD			USE MAXIMUM POSITIVE LOAD VALUE	
DESIGN LOAD (psf)	MAX. SLAT SPAN "LMAX." (FT)	MIN. SLAT SPAN "LMIN." (FT)	REQUIRED MIN. SEPARATION TO GLASS MEASURED TO BACK OF SLAT (in)	
	WALL, TRAPPED & BUILD-OUT MOUNT W/ (E) (E2) & (E3) SEE NOTES *	WALL, TRAPPED & BUILD-OUT MOUNT W/ (E) (E2) & (E3) SEE NOTES *	W/O STORM BARS	
			WIND ZONES 1-3	WIND ZONE 4
30.0	7'-6"	6'-7"		
35.0	7'-2"	6'-4"		
40.0	6'-9"	6'-1"		
45.0	6'-8"	5'-11"	1"	8 1/8"
50.0	6'-5"	5'-9"		
55.0	6'-3"	5'-7"		
60.0	6'-1"	5'-5"		
65.0	6'-0"	5'-4"		
70.0	5'-10"	5'-2"		
75.0	5'-9"	5'-1"		
80.0	5'-9"	5'-0"		
85.0	5'-9"	4'-11"		
90.0	5'-9"	4'-10"		
95.0	5'-9"	4'-9"		
100.0	5'-9"	4'-8"		
105.0	5'-9"	4'-8"		
110.0	5'-9"	4'-7"	1"	5"
115.0	5'-9"	4'-6"		
120.0	5'-8"	4'-6"		
125.0	5'-6"	4'-5"		
130.0	5'-5"	4'-4"		
135.0	5'-4"	4'-4"		
140.0	5'-3"	4'-3"		
145.0	5'-2"	4'-3"		
150.0	5'-1"	4'-3"		
155.0	5'-0"	4'-3"		
160.0	4'-11"	4'-3"		

SLAT PERFORMANCE CHART IV: (LESS THAN 1/8" SLIP)

FOR A GIVEN DESIGN LOAD (p.s.f), SHUTTER MOUNT CONDITION INCLUDING ANCHOR TYPE AND FOR INSTALLATIONS W/O STORM BARS

3/8"Ø KWIK BOLT 3 ANCHOR POURED CONCRETE & 5/16"ø TAPCON XL ANCHOR TO POURED CONCRETE OR GROUT FILLED CELL CONCRETE BLOCK				
USE MAXIMUM VALUE BETWEEN POSITIVE AND NEGATIVE LOAD			USE MAXIMUM POSITIVE LOAD VALUE	
DESIGN LOAD (psf)	MAX. SLAT SPAN "LMAX." (FT)	MIN. SLAT SPAN "LMIN." (FT)	REQUIRED MIN. SEPARATION TO GLASS MEASURED TO BACK OF SLAT (in)	
	WALL, TRAPPED & BUILD-OUT MOUNT W/ (E) (E2) & (E3) SEE NOTES *	WALL, TRAPPED & BUILD-OUT MOUNT W/ (E) (E2) & (E3) SEE NOTES *	W/O STORM BARS	
			WIND ZONES 1-3	WIND ZONE 4
30.0	6'-6"			
35.0	6'-3"			
40.0	6'-0"			
45.0	5'-10"			
50.0	5'-9"			
55.0	5'-7"			
60.0	5'-5"			
65.0	5'-4"			
70.0	5'-3"			
75.0	5'-1"			
80.0	4'-11"			
85.0	4'-10"			
90.0	4'-8"	0'-0"	1"	5"
95.0	4'-6"			
100.0	4'-5"			
105.0	4'-4"			
110.0	4'-3"			
115.0	4'-1"			
120.0	4'-0"			
125.0	3'-11"			
130.0	3'-11"			
135.0	3'-10"			
140.0	3'-9"			
145.0	3'-8"			
150.0	3'-7"			
155.0	3'-7"			
160.0	3'-6"			

* NOTES:

1. ABOVE INDICATED MAX. SLAT SPANS MAY BE USED AS LONG AS ANCHOR SPACING SCHEDULES ON SHEETS 17 & 18 INDICATE THAT AN ANCHOR SPACING IS AVAILABLE FOR THE CORRESPONDING SLAT SPAN AND DESIGN LOAD.
2. REQUIRES SIDE RAILS FASTENED TO EXISTING STRUCTURE WITH **3/8"ø KWIK BOLT 3 ANCHOR OR 5/16"ø TAPCON XL ANCHOR** INTO POURED CONCRETE OR GROUT FILLED CELL CONCRETE BLOCK, OR WITH 1/4"ø TEK SCREWS AT MULLIONS CONNECTION. VALID FOR WALL MOUNTED, TRAPPED MOUNTED, AND BUILD-OUT MOUNTED.
3. MAXIMUM SLAT SPANS FOR INTERMEDIATE LOADS MAY BE DETERMINED BY LINEAR INTERPOLATION BETWEEN END VALUES.

FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)

WALTER A. TILLIT JR. LICENSE No. 44167 STATE OF FLORIDA PROFESSIONAL ENGINEER
MAR 0 9 2009
P.E. SEAL/SIGNATURE/DATE

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Nautilus Rolling Shutter System

EXPERT SHUTTER SERVICES INC.
1626 S.W. BILTMORE STREET
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DRAWN BY: M.C.V./L.G.
11/18/08 DATE
08-255 DRAWING No
SHEET 16 OF 26

MAX. ANCHOR'S SPACING SCHEDULE Va

FOR A GIVEN SHUTTER MOUNTING TYPE, W/ 3/8"Ø KWIK BOLT 3 ANCHORS TO POURED CONCRETE WALL, DESIGN LOAD & SLAT SPAN RANGE †

WALL MOUNT

DESIGN LOAD RANGE (p.s.f.)	SLAT SPAN RANGE							
	0'–4' †	> 4'–5' †	> 5'–6' †	> 6'–7' †	> 7'–9' †	> 9'–12' †	> 12'–16' †	> 16'–20' †
≤ 30.0	9"	9"	9"	9"	9"	9"	9"	9"
>31–40	9"	9"	9"	9"	9"	9"	9"	8"
>41–60	9"	9"	9"	9"	9"	9"	7"	5 5/8"
>61–80	9"	9"	9"	9"	9"	8"	5 5/8"	5 5/8"
>81–105	9"	9"	9"	9"	9"	6 1/2"	5 5/8"	–
>106–120	9"	9"	9"	9"	8"	6"	–	–
>121–140	9"	9"	9"	8"	7"	6"	–	–
>141–160	9"	9"	9"	7"	7"	–	–	–

SLAT SPAN DEFINITION

† NOTE:
MAX. SLAT SPAN FOR A GIVEN DESIGN LOAD SHALL NEVER EXCEED MAX. SLAT SPAN INDICATED ON SLAT PERFORMANCE CHART ON SHEETS 15 & 16.

TRAPPED MOUNT

DESIGN LOAD RANGE (p.s.f.)	SLAT SPAN RANGE							
	0'–4' †	> 4'–5' †	> 5'–6' †	> 6'–7' †	> 7'–9' †	> 9'–12' †	> 12'–16' †	> 16'–20' †
≤ 30.0	9"	9"	9"	9"	9"	9"	9"	9"
>31–40	9"	9"	9"	9"	9"	9"	9"	7"
>41–60	9"	9"	9"	9"	9"	9"	6 1/2"	5 5/8"
>61–80	9"	9"	9"	9"	9"	7"	5 5/8"	5 5/8"
>81–105	9"	9"	9"	9"	8"	6"	5 5/8"	–
>106–120	9"	9"	9"	8 1/2"	7"	5 5/8"	–	–
>121–140	9"	9"	9"	7"	6"	5 5/8"	–	–
>141–160	9"	9"	8"	6"	6"	–	–	–

BUILD-OUT MOUNT

DESIGN LOAD RANGE (p.s.f.)	SLAT SPAN RANGE																							
	0'–4' †			> 4'–5' †			> 5'–6' †			> 6'–7' †			> 7'–9' †			> 9'–12' †			> 12'–16' †			> 16'–20' †		
	(E1)	(E2)	(E3)	(E1)	(E2)	(E3)	(E1)	(E2)	(E3)	(E1)	(E2)	(E3)	(E1)	(E2)	(E3)	(E1)	(E2)	(E3)	(E1)	(E2)	(E3)	(E1)	(E2)	(E3)
≤ 30.0	9"	9"	9"	9"	9"	9"	9"	9"	9"	9"	9"	9"	9"	9"	9"	9"	9"	9"	9"	9"	7 3/4"	7"	7"	5 5/8"
>31–40	9"	9"	9"	9"	9"	9"	9"	9"	9"	9"	9"	9"	9"	9"	9"	9"	9"	9"	7"	7"	6"	5 5/8"	5 5/8"	5 5/8"
>41–60	9"	9"	9"	9"	9"	9"	9"	9"	9"	9"	9"	9"	9"	9"	9"	7 1/2"	7 1/2"	6"	5 5/8"	5 5/8"	5 5/8"	5 5/8"	5 5/8"	–
>61–80	9"	9"	9"	9"	9"	9"	9"	9"	9"	9"	9"	9"	9"	9"	7"	5 5/8"	5 5/8"	5 5/8"	5 5/8"	5 5/8"	–	–	–	–
>81–105	9"	9"	9"	9"	9"	9"	9"	9"	9"	8"	8"	6 1/2"	6 3/4"	6 3/4"	5 5/8"	5 5/8"	5 5/8"	5 5/8"	–	–	–	–	–	–
>106–120	9"	9"	9"	9"	9"	9"	9"	9"	8"	8"	8"	6 1/2"	6"	6"	5 5/8"	5 5/8"	5 5/8"	–	–	–	–	–	–	–
>121–140	9"	9"	9"	9"	9"	7 1/2"	8"	8"	6 1/2"	8"	8"	6"	5 5/8"	5 5/8"	5 5/8"	–	–	–	–	–	–	–	–	–
>141–160	9"	9"	9"	8"	8"	6"	7"	7"	5 5/8"	6 3/4"	6 3/4"	5 5/8"	5 5/8"	5 5/8"	–	–	–	–	–	–	–	–	–	–

FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)

WALTER A. TILLIT JR. LICENSE No. 44167 STATE OF FLORIDA ENGINEER
MAR 03 2009
P.E. SEAL/SIGNATURE/DATE

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Nautilus
Rolling Shutter System

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PHONE: (800) 749-9056 . FAX: (772) 871-0890

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DRAWN BY: M.C.V./L.G.
11/18/08 DATE
08-255 DRAWING No
SHEET 17 OF 26

MAX. ANCHOR'S SPACING SCHEDULE Vb

FOR A GIVEN SHUTTER MOUNTING TYPE, W/ 5/16"Ø TAPCON XL ANCHORS TO POURED CONCRETE WALL OR GROUT FILLED CELL CONCRETE BLOCK WALL, DESIGN LOAD & SLAT SPAN RANGE †

WALL MOUNT

DESIGN LOAD RANGE (p.s.f.)	SLAT SPAN RANGE							
	0'–4' †	> 4'–5' †	> 5'–6' †	> 6'–7' †	> 7'–9' †	> 9'–12' †	> 12'–16' †	> 16'–20' †
≤ 30.0	8"	8"	8"	8"	8"	8"	7 1/2"	5 1/2"
>31–40	8"	8"	8"	8"	8"	8"	6"	4"
>41–60	8"	8"	8"	8"	8"	6"	4"	3 3/4"
>61–80	8"	8"	8"	8"	7"	4 1/2"	3 3/4"	–
>81–105	8"	8"	8"	6 1/2"	5"	3 3/4"	3 3/4"	–
>106–120	8"	8"	8"	5 1/2"	4 1/2"	3 3/4"	–	–
>121–140	8"	7 1/2"	6"	4 1/2"	4"	3 3/4"	–	–
>141–160	8"	6"	5"	4"	4"	–	–	–

TRAPPED MOUNT

DESIGN LOAD RANGE (p.s.f.)	SLAT SPAN RANGE							
	0'–4' †	> 4'–5' †	> 5'–6' †	> 6'–7' †	> 7'–9' †	> 9'–12' †	> 12'–16' †	> 16'–20' †
≤ 30.0	6"	6"	6"	6"	6"	6"	6"	5 1/2"
>31–40	6"	6"	6"	6"	6"	6"	5 1/2"	4 1/2"
>41–60	6"	6"	6"	6"	6"	5 1/2"	4"	4"
>61–80	6"	6"	6"	6"	6"	4"	4"	–
>81–105	6"	6"	6"	6"	4 3/4"	3 3/4"	3 3/4"	–
>106–120	6"	6"	6"	5"	4"	3 3/4"	–	–
>121–140	6"	6"	5 3/4"	4"	3 3/4"	3 3/4"	–	–
>141–160	6"	6"	5"	3 3/4"	3 3/4"	–	–	–

SLAT SPAN DEFINITION

† NOTE:
MAX. SLAT SPAN FOR A GIVEN DESIGN LOAD SHALL NEVER EXCEED MAX. SLAT SPAN INDICATED ON SLAT PERFORMANCE CHART ON SHEETS 15 & 16.

BUILD-OUT MOUNT

DESIGN LOAD RANGE (p.s.f.)	SLAT SPAN RANGE																							
	0'–4' †			> 4'–5' †			> 5'–6' †			> 6'–7' †			> 7'–9' †			> 9'–12' †			> 12'–16' †			> 16'–20' †		
	E1	E2	E3	E1	E2	E3	E1	E2	E3	E1	E2	E3	E1	E2	E3	E1	E2	E3	E1	E2	E3	E1	E2	E3
≤ 30.0	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	5 1/2"	5 1/2"	4 1/2"	4"	4"	3 3/4"
>31–40	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	5"	4"	4"	3 3/4"	3 3/4"	3 3/4"	3 3/4"
>41–60	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	4"	4"	3 3/4"	3 3/4"	3 3/4"	3 3/4"	–	–	–
>61–80	6"	6"	6"	6"	6"	6"	6"	6"	5 1/2"	6"	6"	5"	5"	5"	4"	3 3/4"	3 3/4"	–	3 3/4"	3 3/4"	–	–	–	–
>81–105	6"	6"	6"	6"	6"	6"	6"	6"	5 3/4"	4 1/2"	4 1/2"	3 3/4"	3 3/4"	3 3/4"	3 3/4"	3 3/4"	3 3/4"	–	–	–	–	–	–	–
>106–120	6"	6"	6"	6"	6"	5 1/2"	5 3/4"	5 3/4"	4 1/2"	4 1/2"	4 1/2"	3 3/4"	3 3/4"	3 3/4"	3 3/4"	–	–	–	–	–	–	–	–	–
>121–140	6"	6"	6"	5"	5"	4"	4 3/4"	4 3/4"	3 3/4"	4 1/2"	4 1/2"	3 3/4"	3 3/4"	3 3/4"	–	–	–	–	–	–	–	–	–	–
>141–160	6"	6"	5"	4 1/2"	4 1/2"	3 3/4"	4"	4"	–	4"	4"	–	3 3/4"	3 3/4"	–	–	–	–	–	–	–	–	–	–

FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)

WALTER A. TILLIT JR. LICENSEE No. 44167 STATE OF FLORIDA MAR 03 2009 P.E. SEAL/SIGNATURE/DATE

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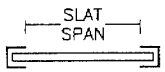
DRAWN BY: M.C.V./L.G.
11/18/08 DATE
08-255 DRAWING No

SCHEDULE Vc:

Vx FORCES (Lb/FT) & Vy FORCES (Lb/FT) ACTING AT JAMBS FOR A DESIGN LOAD RANGE, SLAT SPAN RANGE FOR POURED CONCRETE OR GROUT FILLED CELL CONCRETE BLOCK WALL BUILDINGS *

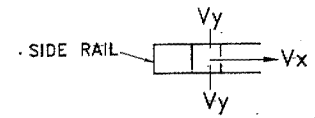
(USE MAXIMUM VALUE BETWEEN POSITIVE AND NEGATIVE LOAD)

DESIGN LOAD RANGE (p.s.f.)	SLAT SPAN RANGE															
	0'–4'		> 4'–5'		> 5'–6'		> 6'–7'		> 7'–9'		> 9'–12'		> 12'–16'		> 16'–20'	
	Vx	Vy	Vx	Vy	Vx	Vy	Vx	Vy	Vx	Vy	Vx	Vy	Vx	Vy	Vx	Vy
≤ 30.0	10	60	10	75	165	90	238	105	421	135	594	180	999	240	1390	300
>31–40	10	80	10	100	386	120	440	140	398	180	823	240	1328	320	1823	400
>41–60	10	120	290	150	794	180	509	210	708	270	1266	360	1962	480	2553	582
>61–80	10	160	616	200	767	240	796	280	1007	360	1695	480	2422	600	2547	596
>81–105	123	210	550	263	711	315	1142	368	1372	473	2009	591	2492	638	–	–
>106–120	313	240	728	300	881	360	1345	420	1587	540	2112	640	–	–	–	–
>121–140	552	280	960	350	1003	420	1612	490	1869	630	2039	635	–	–	–	–
>141–160	781	320	1186	400	1322	480	1873	560	1740	640	–	–	–	–	–	–



SLAT SPAN DEFINITION

* NOTE:
IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR OR PERMIT HOLDER TO VERIFY THAT EXISTING STRUCTURE IS DESIGNED TO SUPPORT Vx AND Vy FORCES IN POUNDS PER UNIT FOOT OF SHUTTER HEIGHT AT BOTH JAMBS.
SEE THIS SHEET FOR Vx & Vy VALUES.



FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)

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11/18/08 DATE
08-255 DRAWING No
SHEET 19 OF 28

SLAT PERFORMANCE CHART Ib1 & Ic1: (ONLY VALID FOR 1/2" SLIP)

FOR A GIVEN MAXIMUM DESIGN PRESSURE RATING (p.s.f) AND SHUTTER MOUNT CONDITION FOR INSTALLATIONS W/O STORM BARS PER DETAIL 2 BELOW

CHART Ib1				USE W/ Ib1	CHART Ic1
USE MAXIMUM VALUE BETWEEN POSITIVE AND NEGATIVE LOAD					USE MAXIMUM POSITIVE LOAD VALUE
5/16"Ø TAPCON XL ANCHOR				MIN. SLAT SPAN "LMIN." (ft)	
DESIGN LOAD (p.s.f.)	MAX. SLAT SPAN "LMAX." (ft)				REQUIRED MIN. SEPARATION TO GLASS MESURED TO BACK OF SLAT (in)
	WALL MOUNT (SEE NOTES Δ)	BUILD-OUT MOUNT W/ E2 (SEE NOTES Δ)	BUILD-OUT MOUNT W/ E3 (SEE NOTES Δ)	WALL TRAPPED & BUILD-OUT MOUNT W/ E2 & E3 SEE NOTES Δ	W/O STORM BARS
					WIND ZONES 1-3 / WIND ZONE 4
30.0 *	10'-0"	10'-0"	10'-0"	8'-1"	1" / 8 1/2"
35.0 **	10'-0"	10'-0"	10'-0"	7'-9"	1" / 8 1/2"
40.0 **	10'-0"	10'-0"	10'-0"	7'-5"	1" / 8 1/2"
45.0 ***	10'-0"	10'-0"	10'-0"	7'-2"	1" / 8 1/2"
50.0 ***	10'-0"	10'-0"	10'-0"	7'-0"	1" / 8 1/2"
55.0 ***	10'-0"	10'-0"	10'-0"	6'-9"	1" / 8 1/2"
60.0 ***	10'-0"	10'-0"	10'-0"	6'-9"	1" / 8 1/2"

SLAT PERFORMANCE CHART IIb1 & IIc1: (ONLY VALID FOR 1/4" SLIP)

FOR A GIVEN MAXIMUM DESIGN PRESSURE RATING (p.s.f) AND SHUTTER MOUNT CONDITION FOR INSTALLATIONS W/O STORM BARS PER DETAIL 2 BELOW

CHART IIb1				USE W/ IIb1	CHART IIc1
USE MAXIMUM VALUE BETWEEN POSITIVE AND NEGATIVE LOAD					USE MAXIMUM POSITIVE LOAD VALUE
5/16"Ø TAPCON XL ANCHOR				MIN. SLAT SPAN "LMIN." (ft)	
DESIGN LOAD (p.s.f.)	REQUIRED MAX. SLAT SPAN "LMAX." (ft)				REQUIRED MIN. SEPARATION TO GLASS MESURED TO BACK OF SLAT (in)
	WALL MOUNT (SEE NOTES Δ)	BUILD-OUT MOUNT W/ E2 (SEE NOTES Δ)	BUILD-OUT MOUNT W/ E3 (SEE NOTES Δ)	WALL TRAPPED & BUILD-OUT MOUNT W/ E2 & E3 SEE NOTES Δ	W/O STORM BARS
					WIND ZONES 1-3 / WIND ZONE 4
30.0 *	8'-3"	8'-3"	8'-3"	7'-7"	1" / 8 1/8"
35.0 **	7'-9"	7'-9"	7'-9"	7'-3"	1" / 8 1/8"
40.0 **	7'-7"	7'-7"	7'-7"	7'-0"	1" / 8 1/8"
45.0 ***	7'-4"	7'-4"	7'-4"	6'-9"	1" / 8 1/8"
50.0 ***	7'-3"	7'-3"	7'-3"	6'-6"	1" / 8 1/8"
55.0 ***	7'-3"	7'-3"	7'-3"	6'-4"	1" / 8 1/8"
60.0 ***	7'-3"	7'-3"	7'-3"	6'-2"	1" / 8 1/8"

MAXIMUM SLAT SPAN AND MINIMUM SEPARATION TO GLASS FOR A GIVEN WOOD GRADE, DESIGN LOAD (p.s.f), SLAT SLIP 1/8" AND SHUTTER MOUNTING TYPE FOR WOOD FRAMES WALLS W/ 2"x4" STUDS, AS PER LIMITATIONS ON DETAIL 1

USE MAXIMUM VALUE BETWEEN POSITIVE AND NEGATIVE LOAD					USE MAXIMUM POSITIVE LOAD VALUE	
WOOD GRADE	DESIGN LOAD (p.s.f.)	MAX. SLAT SPAN "LMAX." (ft)		MIN. SLAT SPAN "LMIN." (FT)	REQUIRED MIN. SEPARATION TO GLASS MESURED TO BACK OF SLAT (in)	
		WALL MOUNT (SEE NOTES Δ)	BUILD-OUT MOUNT W/ E2 (SEE NOTES Δ)	WALL TRAPPED & BUILD-OUT MOUNT W/ E2 & E3 SEE NOTES Δ	W/O STORM BARS	
					WIND ZONES 1-3	WIND ZONE 4
SOUTHERN PINE #2 (G=0.55)	60	4'-5"	4'-5"	0'-0"	1"	5 1/2"
DOUGLAS-FIR-SOUTH (G=0.46)	60	4'-5"	4'-5"			
SPRUCE PINE-FIR-SITH (G=0.36)	60	4'-5"	4'-5"			

SLAT PERFORMANCE CHART IIIb1: (ONLY VALID FOR 1/8" SLIP)

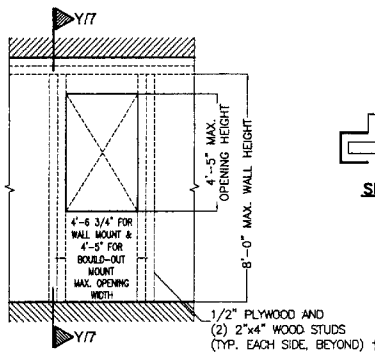
FOR A GIVEN MAXIMUM DESIGN PRESSURE RATING (p.s.f) AND SHUTTER MOUNT CONDITION FOR INSTALLATIONS W/O STORM BARS PER DETAIL 2 BELOW

CHART IIIb1				USE W/ IIIb1	CHART IIIc1
USE MAXIMUM VALUE BETWEEN POSITIVE AND NEGATIVE LOAD					USE MAXIMUM POSITIVE LOAD VALUE
5/16"Ø TAPCON XL ANCHOR				MIN. SLAT SPAN "LMIN." (ft)	
DESIGN LOAD (psf)	MAX. SLAT SPAN "LMAX." (FT)				REQUIRED MIN. SEPARATION TO GLASS MESURED TO BACK OF SLAT (in)
	WALL MOUNT (SEE NOTES Δ)	BUILD-OUT MOUNT W/ E2 (SEE NOTES Δ)	BUILD-OUT MOUNT W/ E3 (SEE NOTES Δ)	WALL TRAPPED & BUILD-OUT MOUNT W/ E2 & E3 SEE NOTES Δ	W/O STORM BARS
					WIND ZONES 1-3 / WIND ZONE 4
30.0 *	7'-6"	7'-6"	7'-6"	6'-7"	1" / 8 1/8"
35.0 **	7'-2"	7'-2"	7'-2"	6'-4"	1" / 8 1/8"
40.0 **	6'-9"	6'-9"	6'-9"	6'-1"	1" / 8 1/8"
45.0 ***	6'-8"	6'-8"	6'-8"	5'-11"	1" / 8 1/8"
50.0 ***	6'-5"	6'-5"	6'-5"	5'-9"	1" / 8 1/8"
55.0 ***	6'-3"	6'-3"	6'-3"	5'-7"	1" / 8 1/8"
60.0 ***	6'-1"	6'-1"	6'-1"	5'-5"	1" / 8 1/8"

SLAT PERFORMANCE CHART IV: (LESS THAN 1/8" SLIP)

FOR A GIVEN DESIGN LOAD (p.s.f), SHUTTER MOUNT CONDITION INCLUDING ANCHOR TYPE AND FOR INSTALLATIONS W/O STORM BARS PER DETAIL 2 BELOW

5/16"ø TAPCON XL ANCHOR				
USE MAXIMUM VALUE BETWEEN POSITIVE AND NEGATIVE LOAD			USE MAXIMUM POSITIVE LOAD VALUE	
DESIGN LOAD (psf)	MAX. SLAT SPAN "LMAX." (FT)	MIN. SLAT SPAN "LMIN." (FT)	REQUIRED MIN. SEPARATION TO GLASS MEASURED TO BACK OF SLAT (in)	
	WALL, TRAPPED & BUILD-OUT MOUNT W/ E2 & E3 SEE NOTES Δ	WALL, TRAPPED & BUILD-OUT MOUNT W/ E2 & E3 SEE NOTES Δ	W/O STORM BARS	
			WIND ZONES 1-3	WIND ZONE 4
30.0 *	6'-6"	0'-0"	1"	5"
35.0 **	6'-3"			
40.0 **	6'-0"			
45.0 ***	5'-10"			
50.0 ***	5'-9"			
55.0 ***	5'-7"			
60.0 ***	5'-5"			



DETAIL 1 (ELEVATION)

SLAT SPAN DEFINITION

Δ NOTES:

1. ABOVE INDICATED MAX. SLAT SPANS MAY BE USED AS LONG AS ANCHOR SPACING SCHEDULES ON SHEET 21 INDICATE THAT A SPACING IS AVAILABLE FOR THE CORRESPONDING SLAT SPAN AND DESIGN LOAD.

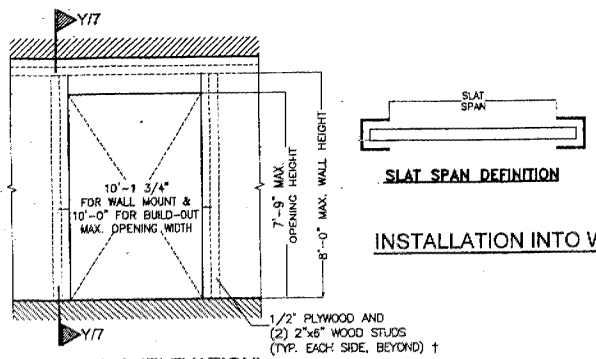
†: WOOD FRAME WALL TO BE BUILT STRICTLY IN ACCORDANCE WITH SPECS GIVEN ON DETAIL AND PROVISIONS FROM CHAPTER 23 OF THE FLORIDA BUILDING CODE. MINIMUM LENGTH OF WALL AT EITHER SIDE OF OPENING SHALL BE 33".

MAXIMUM DESIGN LOAD VS WOOD GRADE SCHEDULE:

* VALID FOR DOUGLAS-FIR-SOUTH (G=0.46)
SOUTHERN PINE #2 (G=0.55)
SPRUCE PINE-FIR-SITH (G=0.36)

** VALID FOR DOUGLAS-FIR-SOUTH (G=0.46)
SOUTHERN PINE #2 (G=0.55)

*** VALID FOR SOUTHERN PINE #2 (G=0.55)



DETAIL 2 (ELEVATION)

SLAT SPAN DEFINITION

INSTALLATION INTO WOOD FRAME STRUCTURES

FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)

WALTER A. TILLIT JR. LICENSE No. 44167 STATE OF FLORIDA
MARCH 3 2009
P.E. SEAL/SIGNATURE/DATE

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Rolling Shutter System

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REV. No	DESCRIPTION	DATE	REV. No	DESCRIPTION	DATE
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2			5		

DRAWN BY:	M.C.V./L.G.
11/18/08	DATE
08-255	DRAWING No
SHEET 20 OF 26	

MAX. ANCHOR'S SPACING SCHEDULE VI FOR A GIVEN SHUTTER MOUNTING TYPE, WOOD GRADE, DESIGN LOAD (psf) AND SLAT SPAN RANGE *

WALL MOUNT & BUILD-OUT MOUNT TO 2"x4" WOOD STUD

(SEE DETAIL 1 ON SHEET 20)

WOOD GRADE	MAXIMUM DESIGN LOAD RANGE (p.s.f.)	SLAT SPAN RANGE
		0'-0" to 4'-5" *
SOUTHERN PINE #2 (G=0.55)	≤ 30.0	6"
	40	6"
	50	6"
	60	6"
DOUGLAS-FIR-SOUTH (G=0.46)	≤ 30.0	6"
	40	6"
SPRUCE PINE-FIR-SOUTH (G=0.36)	≤ 30.0	6"

WALL MOUNT TO 2"x6" WOOD STUD WITH MINIMUM 1/2" PLYWOOD

(SEE DETAIL 2 ON SHEET 20)

WOOD GRADE	MAXIMUM DESIGN LOAD RANGE (p.s.f.)	SLAT SPAN RANGE					
		0' to 4' *	> 4' to 5' *	> 5' to 6' *	> 6' to 7' *	> 7' to 9' *	> 9' to 10' *
SOUTHERN PINE #2 (G=0.55)	≤ 30.0	6"	6"	6"	6"	6"	6"
	40	6"	6"	6"	6"	6"	4 3/4"
	50	6"	6"	6"	6"	4 3/4"	3 1/2"
	60	6"	6"	5 3/4"	5 1/4"	3 3/4"	3"
DOUGLAS-FIR-SOUTH (G=0.46)	≤ 30.0	6"	6"	6"	6"	6"	6"
	40	6"	6"	6"	5 1/4"	5 1/4"	4 1/4"
SPRUCE PINE-FIR-SOUTH (G=0.36)	≤ 30.0	6"	6"	6"	6"	6"	5 1/4"

BUILD-OUT MOUNT TO 2"x6" WOOD STUD WITH MINIMUM 1/2" PLYWOOD

(SEE DETAIL 2 ON SHEET 20)

WOOD GRADE	MAXIMUM DESIGN LOAD RANGE (p.s.f.)	SLAT SPAN RANGE											
		0'-4' *		> 4'-5' *		> 5'-6' *		> 6'-7' *		> 7'-9' *		> 9'-10' *	
		BUILD-OUT MOUNT W/ (E2)	BUILD-OUT MOUNT W/ (E3)	BUILD-OUT MOUNT W/ (E2)	BUILD-OUT MOUNT W/ (E3)	BUILD-OUT MOUNT W/ (E2)	BUILD-OUT MOUNT W/ (E3)	BUILD-OUT MOUNT W/ (E2)	BUILD-OUT MOUNT W/ (E3)	BUILD-OUT MOUNT W/ (E2)	BUILD-OUT MOUNT W/ (E3)	BUILD-OUT MOUNT W/ (E2)	BUILD-OUT MOUNT W/ (E3)
SOUTHERN PINE #2 (G=0.55)	≤ 30.0	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"
	40	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	5 1/4"	5 1/4"
	50	6"	6"	6"	6"	6"	6"	6"	6"	5 1/4"	5 1/4"	4"	4"
	60	6"	6"	6"	6"	6"	6"	5 3/4"	5 3/4"	4"	4"	3"	3"
DOUGLAS-FIR-SOUTH (G=0.46)	≤ 30.0	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"
	40	6"	6"	6"	6"	6"	6"	5 1/2"	5 1/2"	5 1/2"	5 1/2"	4 1/2"	4 1/2"
SPRUCE PINE-FIR-SOUTH (G=0.36)	≤ 30.0	6"	6"	6"	6"	6"	6"	6"	6"	6"	6"	5 1/4"	5"

* NOTE:
MAX. SPAN FOR SLAT FOR A GIVEN DESIGN LOAD SHALL NEVER EXCEED MAX. SLAT SPAN INDICATED ON SLAT PERFORMANCE CHARTS ON 20 SHEET.

FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)

WALTER A. TILLIT LICENSE No. 44167 STATE OF FLORIDA MAR 03 2009 P.E. SEAL/SIGNATURE/DATE

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1			4		
2			5		

DRAWN BY: M.C.V./L.G.
11/18/08 DATE
08-255 DRAWING No

TABLE 1

MAX. ALLOWABLE STORM BAR SPAN (ft) FOR A GIVEN DESIGN LOAD (p.s.f.), & A GIVEN STORM BAR SPACING (ft) **

DESIGN LOAD (p.s.f.)	STORM BAR SPACING (FT)									
	2'	2.667'	3'	3.5'	4'	4.5'	5'	5.5'	6'	6.667'
30.0	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"
35.0	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"
40.0	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"
45.0	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"
50.0	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"	11'–0" *
55.0	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"	11'–0" *
60.0	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"	11'–0" *	–
65.0	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"	11'–0" *	–
70.0	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"	11'–0" *	11'–0" *	–
75.0	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"	11'–0" *	–	–
80.0	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"	10'–10" *	–	–
85.0	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"	11'–0" *	–	–	–
90.0	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"	–	–	–	–
95.0	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"	–	–	–	–
100.0	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"	–	–	–	–	–
105.0	11'–0"	11'–0"	11'–0"	11'–0"	11'–0"	–	–	–	–	–
110.0	11'–0"	11'–0"	11'–0"	11'–0"	10'–10"	–	–	–	–	–
115.0	11'–0"	11'–0"	11'–0"	11'–0"	–	–	–	–	–	–
120.0	11'–0"	11'–0"	11'–0"	11'–0"	–	–	–	–	–	–
125.0	11'–0"	11'–0"	11'–0"	10'–10"	–	–	–	–	–	–
130.0	11'–0"	11'–0"	11'–0"	–	–	–	–	–	–	–
135.0	11'–0"	11'–0"	11'–0"	–	–	–	–	–	–	–
140.0	11'–0"	11'–0"	11'–0"	–	–	–	–	–	–	–
145.0	11'–0"	11'–0"	10'–11"	–	–	–	–	–	–	–
150.0	11'–0"	11'–0"	–	–	–	–	–	–	–	–
155.0	11'–0"	11'–0"	–	–	–	–	–	–	–	–
160.0	11'–0"	11'–0"	–	–	–	–	–	–	–	–

THIS REGION IS ONLY VALID FOR INSTALLATIONS W/ 1 OR MORE STORM BARS PER SHUTTER.

*THIS REGION IS ONLY VALID FOR INSTALLATIONS W/ 2 OR MORE STORM BARS PER SHUTTER.

** MEASURED IN BETWEEN CENTER LINES OF STORM BARS IN FEET OR FROM TIP OF SIDE RAIL TO CENTER OF STORM BAR.

FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)

WALTER A. TILLIT JR. LICENSE No. 44167 STATE OF FLORIDA PROFESSIONAL ENGINEER
MAR 03 2009
P.E. SEAL/SIGNATURE/DATE

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REV. No	DESCRIPTION	DATE	REV. No	DESCRIPTION	DATE
1			4		
2			5		

DRAWN BY: M.C.V./L.G.
11/18/08 DATE
08-255 DRAWING No
SHEET 22 OF 28

TABLE 2

REQUIREMENTS FOR STORM BAR CONNECTION TO CONCRETE TOP AND BOTTOM PER SECTION S-S (SHEET 9) FOR A GIVEN DESIGN LOAD (p.s.f.), & STORM BAR SPACING (ft)

DESIGN LOAD (p.s.f.)	STORM BAR SPACING "a" (FT)									
	2'	2.667'	3'	3.5'	4'	4.5'	5'	5.5'	6'	6.667'
30.0	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C,D
35.0	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C,D
40.0	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C,D
45.0	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C
50.0	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C
55.0	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C	A,B,C
60.0	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C	A,B,C	A,B,C
65.0	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C	A,B,C	A,B,C	A,B
70.0	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C	A,B,C	A,B,C	A,B	A
75.0	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C	A,B,C	A,B	A	A
80.0	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C	A,B,C	A,B,C	A	A	A
85.0	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C	A,B,C	A,B	A	A	A
90.0	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C	A,B,C	A,B,C	A	A	A	A
95.0	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C	A,B,C	A,B	A	A	A	A
100.0	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C	A,B,C	A	A	A	A	A
105.0	A,B,C,D	A,B,C,D	A,B,C	A,B,C	A,B	A	A	A	A	A
110.0	A,B,C,D	A,B,C,D	A,B,C	A,B,C	A	A	A	A	A	A
115.0	A,B,C,D	A,B,C,D	A,B,C	A,B,C	A	A	A	A	A	A
120.0	A,B,C,D	A,B,C	A,B,C	A,B	A	A	A	A	A	A
125.0	A,B,C,D	A,B,C	A,B,C	A	A	A	A	A	A	A
130.0	A,B,C,D	A,B,C	A,B,C	A	A	A	A	A	A	A
135.0	A,B,C,D	A,B,C	A,B,C	A	A	A	A	A	A	–
140.0	A,B,C,D	A,B,C	A,B	A	A	A	A	A	A	–
145.0	A,B,C,D	A,B,C	A,B	A	A	A	A	A	A	–
150.0	A,B,C,D	A,B,C	A	A	A	A	A	A	–	–
155.0	A,B,C	A,B	A	A	A	A	A	A	–	–
160.0	A,B,C	A,B	A	A	A	A	A	–	–	–

TABLE 3

REQUIREMENTS FOR STORM BAR CONNECTION TO CONCRETE TOP AND BOTTOM PER SECTION S1-S1 (SHEET 9) FOR A GIVEN DESIGN LOAD (p.s.f.), & STORM BAR SPACING (ft)

DESIGN LOAD (p.s.f.)	STORM BAR SPACING "a" (FT)									
	2'	2.667'	3'	3.5'	4'	4.5'	5'	5.5'	6'	6.667'
30.0	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C	A,B,C	A,B,C
35.0	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C	A,B,C	A,B,C	A,B	A
40.0	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C	A,B,C	A,B,C	A	A	A
45.0	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C	A,B,C	A,B,C	A	A	A	A
50.0	A,B,C,D	A,B,C,D	A,B,C,D	A,B,C	A,B,C	A	A	A	A	A
55.0	A,B,C,D	A,B,C,D	A,B,C	A,B,C	A	A	A	A	A	A
60.0	A,B,C,D	A,B,C	A,B,C	A,B	A	A	A	A	A	A
65.0	A,B,C,D	A,B,C	A,B,C	A	A	A	A	A	A	A
70.0	A,B,C,D	A,B,C	A,B	A	A	A	A	A	A	–
75.0	A,B,C,D	A,B,C	A	A	A	A	A	A	–	–
80.0	A,B,C	A,B	A	A	A	A	A	–	–	–
85.0	A,B,C	A	A	A	A	A	A	–	–	–
90.0	A,B,C	A	A	A	A	A	–	–	–	–
95.0	A,B,C	A	A	A	A	A	–	–	–	–
100.0	A,B,C	A	A	A	A	–	–	–	–	–
105.0	A,B	A	A	A	A	–	–	–	–	–
110.0	A	A	A	A	–	–	–	–	–	–
115.0	A	A	A	A	–	–	–	–	–	–
120.0	A	A	A	A	–	–	–	–	–	–
125.0	A	A	A	–	–	–	–	–	–	–
130.0	A	A	A	–	–	–	–	–	–	–
135.0	A	A	A	–	–	–	–	–	–	–
140.0	A	A	A	–	–	–	–	–	–	–
145.0	A	A	A	–	–	–	–	–	–	–
150.0	A	A	–	–	–	–	–	–	–	–
155.0	A	A	–	–	–	–	–	–	–	–
160.0	A	A	–	–	–	–	–	–	–	–

ANCHORS TYPE LEGEND

A 3/8"ø CARBON STEEL KWIK BOLT TZ EXPANSION ANCHOR W/ 2 1/2" Min. EMBEDMENT* & 5" Min. THICK POURED CONCRETE (f'c = 3000 psi)

B 3/8"øx1 1/4" POWERS CALK-IN ANCHORS W/ 1 1/4" Min. EMBEDMENT* TO POURED CONCRETE (f'c = 3000 psi) & 3/8"ø-16 MACHINE SCREWS

C 1/4"øx3/4" ALL POINTS SOLID-SET ANCHORS W/ 7/8" Min. EMBEDMENT* TO POURED CONCRETE (f'c = 3000 psi) & 1/4"ø-20, 18-8 STAINLESS STEEL MACHINE SCREWS

D 5/16"ø ITW/BUILDEX TAPCON ANCHORS W/ 2 1/4" Min. EMBEDMENT* TO POURED CONCRETE (f'c = 2899 psi)

* EMBEDMENT IS BEYOND ANY FLOOR / CEILING FINISH

WALTER A. TILLIT JR. LICENSE No. 44167 STATE OF FLORIDA PROFESSIONAL ENGINEER
MAR 11 2009
PE SEAL/SIGNATURE/DATE

FLORIDA BUILDING CODE (Non High Velocity Hurricane Zone)

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Nautilus
Rolling Shutter System

EXPERT SHUTTER SERVICES INC.
1626 S.W. BILTMORE STREET
PORT ST. LUCIE, FL. 34984
PHONE: (800) 749-9058 , FAX: (772) 871-0990

REV. No	DESCRIPTION	DATE	REV. No	DESCRIPTION	DATE
1			4		
2			5		

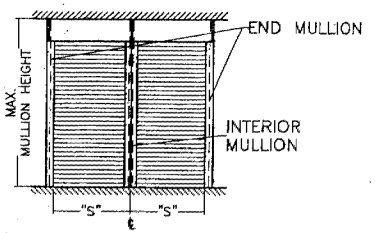
DRAWN BY: M.C.V./L.G.
11/18/08 DATE
C8-255 DRAWING No

SCHEDULE 1a
FLOOR TO CEILING (TRAPPED) MOUNTING
MAX. SPAN (ft) FOR END AND INTERIOR MULLIONS FOR A GIVEN DESIGN LOAD (p.s.f.), & A MAX. MULLION SPACING (ft) *

DESIGN LOAD (p.s.f.)	MAXIMUM MULLION SPACING (ft) *	MAXIMUM MULLION SPAN (FT)											
		(G) 4"x6"x1/4" MULLION				(G1) 4"x8"x1/4" MULLION				(G2) 4"x7"x1/4" THICK (3/8" FLANGE) MULLION			
		ORIENTATION #1 (⟺)†		ORIENTATION #2 (▯)†		ORIENTATION #1 (⟺)†		ORIENTATION #2 (▯)		ORIENTATION #1 (⟺)†		ORIENTATION #2 (▯)†	
		END	INTERIOR	END	INTERIOR	END	INTERIOR	END	INTERIOR	END	INTERIOR	END	INTERIOR
30.0	20'-0"	7'-10"	9'-8"	7'-3"	12'-0"	9'-4"	10'-7"	8'-0"	12'-6"	9'-8"	11'-11"	7'-6"	12'-6"
35.0	20'-0"	7'-4"	9'-3"	6'-9"	11'-5"	8'-8"	10'-0"	7'-7"	12'-6"	8'-11"	11'-0"	6'-11"	12'-6"
40.0	20'-0"	6'-10"	8'-10"	6'-4"	10'-11"	8'-1"	9'-7"	7'-3"	12'-6"	8'-5"	10'-4"	6'-6"	12'-6"
45.0	20'-0"	6'-6"	8'-6"	6'-6"	10'-5"	7'-8"	9'-3"	6'-11"	12'-6"	7'-11"	9'-9"	6'-2"	12'-6"
50.0	20'-0"	6'-2"	8'-2"	6'-0"	9'-11"	7'-4"	8'-11"	6'-7"	12'-6"	7'-4"	9'-3"	5'-11"	12'-6"
55.0	20'-0"	5'-11"	7'-11"	5'-9"	9'-0"	6'-8"	8'-7"	6'-3"	12'-4"	6'-8"	8'-10"	5'-7"	12'-6"
60.0	19'-5"	5'-9"	7'-9"	5'-6"	8'-6"	6'-4"	8'-6"	6'-2"	12'-0"	6'-4"	8'-7"	5'-6"	12'-6"
65.0	18'-4"	5'-9	7'-9"	5'-4"	8'-4"	6'-4"	8'-4"	6'-2	11'-10"	6'-4"	8'-5"	5'-6	12'-6"
70.0	17'-4"	5'-9"	7'-8"	5'-4"	8'-2"	6'-3"	8'-2"	6'-2"	11'-9"	6'-3"	8'-5"	5'-6	12'-6"
75.0	16'-6"	5'-9"	7'-7"	5'-4"	8'-0"	6'-3"	8'-0"	6'-2"	11'-7"	6'-3"	8'-4"	5'-6	12'-5"
80.0	15'-9"	5'-9"	7'-7"	5'-4"	7'-10"	6'-3"	7'-10"	6'-2"	11'-6"	6'-3"	8'-3"	5'-6	12'-4"
85.0	15'-0"	5'-9"	7'-7"	5'-4"	7'-9"	6'-3"	7'-9"	6'-2"	11'-5"	6'-3"	8'-2"	5'-6	12'-3
90.0	14'-2"	5'-10"	7'-7"	5'-5"	7'-9"	6'-4"	7'-9"	6'-3"	11'-5"	6'-4"	8'-2"	5'-7	12'-3
95.0	13'-5"	5'-10"	7'-7"	5'-6"	7'-9"	6'-5"	7'-9"	6'-4"	11'-5"	6'-5"	8'-2"	5'-8	12'-3
100.0	12'-9"	5'-11"	7'-7"	5'-7"	7'-9"	6'-6"	7'-9"	6'-4"	11'-5"	6'-6"	8'-2"	5'-9	12'-3
105.0	12'-2"	6'-0"	7'-7"	5'-7"	7'-9"	6'-7"	7'-9"	6'-5"	11'-5"	6'-7"	8'-2"	5'-9	12'-3
110.0	11'-7"	6'-0"	7'-7"	5'-8"	7'-9"	6'-8"	7'-9"	6'-6"	11'-5"	6'-8"	8'-2"	5'-10"	12'-3
115.0	11'-1"	6'-1"	7'-7"	5'-9"	7'-9"	6'-9"	7'-9"	6'-7"	11'-5"	6'-9"	8'-2"	5'-11"	12'-3
120.0	10'-8"	6'-1"	7'-6"	5'-9"	7'-9"	6'-10"	7'-9"	6'-7"	11'-5"	6'-10"	8'-2"	6'-0"	12'-3
125.0	10'-2"	6'-2"	7'-7"	5'-10"	7'-10"	7'-0"	7'-10"	6'-9"	11'-5"	7'-0"	8'-2"	6'-1"	12'-3
130.0	9'-10"	6'-3"	7'-7"	5'-10"	7'-9"	7'-0"	7'-9"	6'-9"	11'-5"	7'-0"	8'-2"	6'-1"	12'-3
135.0	9'-5"	6'-4"	7'-7"	5'-11"	7'-10"	7'-2"	7'-10"	6'-10"	11'-5"	7'-2"	8'-2"	6'-2"	12'-3
140.0	9'-1"	6'-4"	7'-7"	6'-0"	7'-10"	7'-3"	7'-10"	6'-11"	11'-5"	7'-3"	8'-2"	6'-3"	12'-3
145.0	8'-10"	6'-5"	7'-6"	6'-0"	7'-9"	7'-4"	7'-9"	6'-11"	11'-5"	7'-4"	8'-2"	6'-3"	12'-3
150.0	8'-6"	6'-5"	7'-7"	6'-1"	7'-9"	7'-5"	7'-9"	7'-0"	11'-5"	7'-5"	8'-2"	6'-4"	12'-3
155.0	8'-3"	6'-6"	7'-7"	6'-2"	7'-9"	7'-6"	7'-9"	7'-1"	11'-5"	7'-6"	8'-2"	6'-5"	12'-3
160.0	8'-0"	6'-7"	7'-6"	6'-2"	7'-9"	7'-7"	7'-9"	7'-2"	11'-5"	7'-7"	8'-2"	6'-6"	12'-3

SCHEDULE 2a
WALL MOUNTING
MAX. SPAN (FT) FOR END AND INTERIOR MULLIONS FOR A GIVEN DESIGN LOAD (P.S.F.), & A MAX. MULLION SPACING (FT) *

DESIGN LOAD (p.s.f.)	MAXIMUM MULLION SPACING (ft) *	MAXIMUM MULLION SPAN (FT)									
		(G) 4"x6"x1/4" MULLION				(G1) 4"x8"x1/4" MULLION				(G2) 4"x7"x1/4" THICK (3/8" FLANGE) MULLION	
		ORIENTATION #1 (⟺)†		ORIENTATION #2 (▯)†		ORIENTATION #1 (⟺)†		ORIENTATION #2 (▯)†		ORIENTATION #2 (▯)†	
		END	INTERIOR	END	INTERIOR	END	INTERIOR	END	INTERIOR	END	INTERIOR
30.0	20'-0"	7'-10"	9'-8"	7'-3"	12'-0"	9'-4"	10'-7"	8'-0"	12'-6"	7'-6"	12'-6"
35.0	20'-0"	7'-4"	9'-3"	6'-9"	11'-5"	8'-8"	10'-0"	7'-7"	12'-6"	6'-11"	12'-6"
40.0	20'-0"	6'-10"	8'-10"	6'-4"	10'-11"	8'-1"	9'-7"	7'-3"	12'-6"	6'-6"	12'-6"
45.0	20'-0"	6'-6"	8'-6"	6'-6"	10'-6"	7'-8"	9'-3"	6'-11"	12'-6"	6'-2"	12'-6"
50.0	20'-0"	6'-2"	8'-2"	6'-0"	10'-2"	7'-4"	8'-11"	5'-3"	12'-6"	5'-11"	12'-6"
55.0	20'-0"	5'-11"	7'-11"	5'-9"	9'-10"	7'-0"	8'-7"	4'-10"	12'-4"	5'-7"	12'-6"
60.0	19'-5"	5'-9"	7'-9"	5'-6"	9'-8"	6'-10"	8'-6"	4'-8"	12'-0"	5'-6"	12'-6"
65.0	18'-4"	5'-9	7'-9"	5'-4"	9'-7"	6'-10"	8'-5"	4'-8"	11'-10"	5'-6	12'-6"
70.0	17'-4"	5'-9"	7'-8"	5'-4"	9'-6"	6'-10"	8'-4"	4'-8"	11'-9"	5'-6	12'-6"
75.0	16'-6"	5'-9"	7'-7"	5'-4"	9'-5"	6'-10"	8'-3"	4'-8"	11'-7"	5'-6	12'-5"
80.0	15'-9"	5'-9"	7'-7"	5'-4"	9'-4"	6'-10"	8'-3"	4'-8"	11'-6"	5'-6	12'-4"
85.0	15'-0"	5'-9"	7'-7"	5'-4"	9'-3"	6'-10"	8'-2"	4'-8"	11'-5"	5'-6	12'-3
90.0	14'-2"	5'-10"	7'-7"	5'-5"	9'-3"	6'-11"	8'-3"	4'-10"	11'-5"	5'-7	12'-3
95.0	13'-5"	5'-10"	7'-7"	5'-6"	9'-3"	6'-11"	8'-3"	4'-11"	11'-5"	5'-8	12'-3
100.0	12'-9"	5'-11"	7'-7"	5'-7"	9'-3"	7'-0"	8'-2"	5'-0"	11'-5"	5'-9	12'-3
105.0	12'-2"	6'-0"	7'-7"	5'-7"	9'-3"	7'-1"	8'-2"	5'-1"	11'-5"	5'-9	12'-3
110.0	11'-7"	6'-0"	7'-7"	5'-8"	9'-3"	7'-2"	8'-3"	5'-3"	11'-5"	5'-10"	12'-3
115.0	11'-1"	6'-1"	7'-7"	5'-9"	9'-3"	7'-2"	8'-3"	5'-4"	11'-5"	5'-11"	12'-3
120.0	10'-8"	6'-1"	7'-6"	5'-9"	9'-3"	7'-3"	8'-2"	5'-5"	11'-5"	6'-0"	12'-3
125.0	10'-2"	6'-2"	7'-7"	5'-10"	9'-3"	7'-4"	8'-3"	6'-9"	11'-5"	6'-1"	12'-3
130.0	9'-10"	6'-3"	7'-7"	5'-10"	9'-3"	7'-4"	8'-2"	6'-9"	11'-5"	6'-1"	12'-3
135.0	9'-5"	6'-4"	7'-7"	5'-11"	9'-3"	7'-5"	8'-3"	6'-10"	11'-5"	6'-2"	12'-3
140.0	9'-1"	6'-4"	7'-7"	6'-0"	9'-3"	7'-6"	8'-3"	6'-11"	11'-5"	6'-3"	12'-3
145.0	8'-10"	6'-5"	7'-6"	6'-0"	9'-3"	7'-6"	8'-2"	6'-11"	11'-5"	6'-3"	12'-3
150.0	8'-6"	6'-6"	7'-7"	6'-1"	9'-3"	7'-7"	8'-2"	7'-0"	11'-5"	6'-4"	12'-3
155.0	8'-3"	6'-6"	7'-7"	6'-2"	9'-3"	7'-8"	8'-2"	7'-1"	11'-5"	6'-5"	12'-3
160.0	8'-0"	6'-7"	7'-6"	6'-2"	9'-3"	7'-9"	8'-2"	7'-2"	11'-5"	6'-6"	12'-3



MULLION SPACING: "S"

* MAXIMUM MULLION SPACING SHALL BE SUCH THAT MAX. ALLOWABLE SLAT SPAN FOR THAT 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)

WALTER A. TILLIT JR. LICENSE No. 44137 STATE OF FLORIDA
MAR 03 2009
P.E., SEAL, SIGNATURE, DATE

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PORT ST. LUCIE, FL. 34984
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REV. No	DESCRIPTION	DATE	REV. No	DESCRIPTION	DATE
1			4		
2			5		

DRAWN BY: M.C.V./L.G.
11/18/08 DATE
08-255 DRAWING No
SHEET 24 OF 26

SCHEDULE 1b
FLOOR TO CEILING (TRAPPED) MOUNTING
MAX. SPAN (ft) FOR END AND INTERIOR MULLIONS FOR A GIVEN DESIGN LOAD (p.s.f.), & A 12'-0" MAX. MULLION SPACING (ft) *

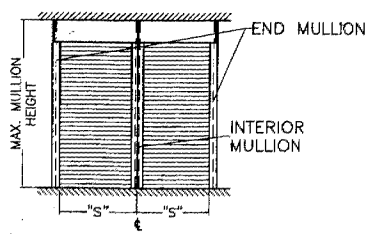
DESIGN LOAD (p.s.f.)	MAXIMUM MULLION SPACING (ft) *	MAXIMUM MULLION SPAN (FT)											
		(G) 4"x6"x1/4" MULLION				(G1) 4"x8"x1/4" MULLION				(G2) 4"x7"x1/4" THICK (3/8" FLANGE) MULLION			
		ORIENTATION #1 (⟺)†		ORIENTATION #2 (▯)†		ORIENTATION #1 (⟺)†		ORIENTATION #2 (▯)†		ORIENTATION #1 (⟺)†		ORIENTATION #2 (▯)†	
		END	INTERIOR	END	INTERIOR	END	INTERIOR	END	INTERIOR	END	INTERIOR	END	INTERIOR
30.0	12'-0"	11'-7"	11'-6"	9'-9"	12'-6"	12'-6"	12'-6"	10'-7"	12'-6"	12'-6"	12'-6"	11'-3"	12'-6"
35.0	12'-0"	10'-7"	10'-11"	9'-2"	12'-6"	12'-6"	11'-11"	10'-0"	12'-6"	12'-6"	12'-6"	10'-4"	12'-6"
40.0	12'-0"	9'-10"	10'-5"	8'-9"	12'-6"	11'-8"	11'-4"	9'-8"	12'-6"	11'-10"	12'-6"	9'-7"	12'-6"
45.0	12'-0"	9'-3"	10'-1"	8'-4"	12'-5"	10'-11"	10'-11"	9'-1"	12'-6"	11'-2"	12'-6"	9'-0"	12'-6"
50.0	12'-0"	8'-9"	9'-8"	8'-1"	12'-0"	10'-4"	10'-7"	8'-9"	12'-6"	10'-7"	11'-11"	8'-6"	12'-6"
55.0	12'-0"	8'-4"	9'-5"	7'-10"	11'-8"	9'-10"	10'-3"	8'-6"	12'-6"	10'-1"	11'-4"	8'-1"	12'-6"
60.0	12'-0"	8'-0"	9'-2"	7'-6"	11'-4"	9'-5"	9'-11"	8'-3"	12'-6"	9'-7"	10'-11"	7'-9"	12'-6"
65.0	12'-0"	7'-8"	8'-11"	7'-2"	11'-0"	9'-1"	9'-8"	8'-0"	12'-6"	9'-3"	10'-5"	7'-5"	12'-6"
70.0	12'-0"	7'-4"	8'-8"	6'-11"	10'-9"	8'-9"	9'-5"	7'-10"	12'-6"	8'-11"	10'-1"	7'-2"	12'-6"
75.0	12'-0"	7'-1"	8'-6"	6'-8"	10'-6"	8'-5"	9'-3"	7'-8"	12'-6"	8'-7"	9'-9"	6'-11"	12'-6"
80.0	12'-0"	6'-11"	8'-4"	6'-5"	10'-3"	8'-2"	9'-0"	7'-5"	12'-6"	8'-4"	9'-5"	6'-8"	12'-6"
85.0	12'-0"	6'-8"	8'-2"	6'-3"	9'-9"	7'-11"	8'-10"	7'-2"	12'-6"	8'-1"	9'-2"	6'-6"	12'-6"
90.0	12'-0"	6'-6"	8'-0"	6'-1"	9'-2"	7'-8"	8'-8"	7'-0"	12'-5"	7'-10"	8'-11"	6'-4"	12'-6"
95.0	12'-0"	6'-4"	7'-10"	5'-11"	8'-8"	7'-5"	8'-6"	6'-10"	12'-1"	7'-5"	8'-8"	6'-2"	12'-6"
100.0	12'-0"	6'-2"	7'-8"	5'-9"	8'-3"	7'-0"	8'-3"	6'-8"	11'-9"	7'-0"	8'-5"	6'-0"	12'-6"
105.0	12'-0"	6'-0"	7'-7"	5'-8"	7'-10"	6'-8"	7'-10"	6'-6"	11'-6"	6'-8"	8'-3"	5'-10"	12'-4"

SCHEDULE 2b
WALL MOUNTING
MAX. SPAN (FT) FOR END AND INTERIOR MULLIONS FOR A GIVEN DESIGN LOAD (P.S.F.), & A 12'-0" MAX. MULLION SPACING (FT) *

DESIGN LOAD (p.s.f.)	MAXIMUM MULLION SPACING (ft) *	MAXIMUM MULLION SPAN (FT)											
		(G) 4"x6"x1/4" MULLION				(G1) 4"x8"x1/4" MULLION				(G2) 4"x7"x1/4" THICK (3/8" FLANGE) MULLION			
		ORIENTATION #1 (⟺)†		ORIENTATION #2 (▯)†		ORIENTATION #1 (⟺)†		ORIENTATION #2 (▯)†		ORIENTATION #1 (⟺)†		ORIENTATION #2 (▯)†	
		END	INTERIOR	END	INTERIOR	END	INTERIOR	END	INTERIOR	END	INTERIOR	END	INTERIOR
30.0	12'-0"	9'-9"	11'-6"	9'-9"	12'-6"	12'-6"	12'-6"	10'-7"	12'-6"	11'-3"	12'-6"		
35.0	12'-0"	9'-2"	10'-11"	9'-2"	12'-6"	12'-6"	11'-11"	10'-0"	12'-6"	10'-4"	12'-6"		
40.0	12'-0"	8'-9"	10'-5"	8'-9"	12'-6"	11'-8"	11'-4"	9'-6"	12'-6"	9'-7"	12'-6"		
45.0	12'-0"	8'-4"	10'-1"	8'-4"	12'-5"	10'-11"	10'-11"	9'-1"	12'-6"	9'-0"	12'-6"		
50.0	12'-0"	8'-1"	9'-8"	8'-1"	12'-0"	10'-4"	10'-7"	8'-9"	12'-6"	8'-6"	12'-6"		
55.0	12'-0"	7'-10"	9'-5"	7'-10"	11'-8"	9'-10"	10'-3"	8'-6"	12'-6"	8'-1"	12'-6"		
60.0	12'-0"	7'-6"	9'-2"	7'-6"	11'-4"	9'-5"	9'-11"	8'-3"	12'-6"	7'-9"	12'-6"		
65.0	12'-0"	7'-2"	8'-11"	7'-2"	11'-0"	9'-1"	9'-8"	8'-0"	12'-6"	7'-5"	12'-6"		
70.0	12'-0"	6'-11"	8'-8"	6'-11"	10'-9"	8'-9"	9'-5"	7'-10"	12'-6"	7'-2"	12'-6"		
75.0	12'-0"	6'-8"	8'-6"	6'-8"	10'-6"	8'-5"	9'-3"	7'-8"	12'-6"	6'-11"	12'-6"		
80.0	12'-0"	6'-5"	8'-4"	6'-5"	10'-3"	8'-2"	9'-0"	7'-5"	12'-6"	6'-8"	12'-6"		
85.0	12'-0"	6'-3"	8'-2"	6'-3"	10'-1"	7'-11"	8'-10"	7'-2"	12'-6"	6'-6"	12'-6"		
90.0	12'-0"	6'-1"	8'-0"	6'-1"	9'-11"	7'-8"	8'-8"	7'-0"	12'-5"	6'-4"	12'-6"		
95.0	12'-0"	5'-11"	7'-10"	5'-11"	9'-8"	7'-6"	8'-6"	6'-10"	12'-1"	6'-2"	12'-6"		
100.0	12'-0"	5'-9"	7'-8"	5'-9"	9'-7"	7'-4"	8'-5"	5'-6"	11'-9"	6'-0"	12'-6"		
105.0	12'-0"	5'-8"	7'-7"	8'-8"	9'-4"	7'-1"	8'-3"	5'-3"	11'-6"	5'-10"	12'-4"		

* MAXIMUM MULLION SPACING SHALL BE SUCH THAT MAX. ALLOWABLE SLAT SPAN FOR THAT 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)

WALTER A. TILLIT LICENSE No. 44167 STATE OF FLORIDA
MAR 31 2009
P.E. SEAL/SIGNATURE/DATE

TILTECO INC.
TILLIT TESTING & ENGINEERING COMPANY
6355 N.W. 36th. St., Ste. 305, VIRONIA GARDENS, FL. 33166
Phone : (305)871-1530 . Fax : (305)871-1531
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EB-0006719
WALTER A. TILLIT Jr. P.E.
FLORIDA Lic. # 44167

Nautilus
Rolling Shutter System

EXPERT SHUTTER SERVICES INC.
1626 S.W. BILTMORE STREET
PORT ST. LUCIE, FL. 34984
PHONE: (800) 749-9056 . FAX: (772) 871-0990

REV. No	DESCRIPTION	DATE	REV. No	DESCRIPTION	DATE
1			4		
2			5		

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11/18/08 DATE
08-255 DRAWING No
SHEET 25 OF 26

SCHEDULE 1c
FLOOR TO CEILING (TRAPPED) MOUNTING
MAX. SPAN (ft) FOR END AND INTERIOR MULLIONS FOR A GIVEN DESIGN LOAD (p.s.f.), & A 7'-0" MAX. MULLION SPACING (ft) *

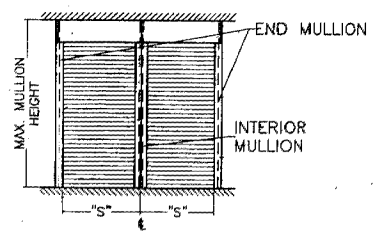
DESIGN LOAD (p.s.f.)	MAXIMUM MULLION SPACING (ft) *	MAXIMUM MULLION SPAN (FT)											
		(G) 4"x6"x1/4" MULLION				(G1) 4"x8"x1/4" MULLION				(G2) 4"x7"x1/4" THICK (3/8" FLANGE) MULLION			
		ORIENTATION #1 (⟺)†		ORIENTATION #2 (▯)†		ORIENTATION #1 (⟺)†		ORIENTATION #2 (▯)†		ORIENTATION #1 (⟺)†		ORIENTATION #2 (▯)†	
		END	INTERIOR	END	INTERIOR	END	INTERIOR	END	INTERIOR	END	INTERIOR	END	INTERIOR
30.0	7'-0"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"
35.0	7'-0"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"
40.0	7'-0"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"
45.0	7'-0"	12'-6"	12'-0"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"
50.0	7'-0"	12'-6"	11'-7"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"
55.0	7'-0"	12'-6"	11'-3"	12'-6"	12'-6"	12'-6"	12'-3"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"
60.0	7'-0"	12'-6"	10'-11"	12'-6"	12'-6"	12'-6"	11'-11"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"
65.0	7'-0"	12'-6"	10'-8"	12'-1"	12'-6"	12'-6"	11'-7"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"
70.0	7'-0"	12'-6"	10'-5"	11'-6"	12'-6"	12'-6"	11'-3"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"
75.0	7'-0"	12'-1"	10'-2"	10'-11"	12'-6"	12'-6"	11'-0"	11'-11"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"
80.0	7'-0"	11'-6"	9'-11"	10'-6"	12'-4"	12'-6"	10'-10"	11'-5"	12'-6"	12'-6"	12'-4"	11'-11"	12'-6"
85.0	7'-0"	11'-0"	9'-9"	10'-2"	12'-1"	12'-6"	10'-7"	11'-0"	12'-6"	12'-6"	12'-0"	11'-4"	12'-6"
90.0	7'-0"	10'-7"	9'-7"	9'-10"	11'-10"	12'-5"	10'-5"	10'-8"	12'-6"	12'-2"	11'-8"	10'-10"	12'-6"
95.0	7'-0"	10'-2"	9'-5"	9'-6"	11'-7"	11'-11"	10'-2"	10'-4"	12'-6"	11'-9"	11'-4"	10'-5"	12'-6"
100.0	7'-0"	9'-10"	9'-3"	9'-3"	11'-5"	11'-6"	10'-0"	10'-1"	12'-6"	11'-5"	11'-0"	10'-1"	12'-6"
105.0	7'-0"	9'-6"	9'-1"	9'-1"	11'-3"	11'-2"	9'-10"	9'-10"	12'-6"	11'-1"	10'-9"	9'-8"	12'-6"
110.0	7'-0"	9'-3"	8'-11"	8'-10"	11'-1"	10'-10"	9'-9"	9'-7"	12'-6"	10'-9"	10'-6"	9'-5"	12'-6"
115.0	7'-0"	9'-0"	8'-10"	8'-7"	10'-11"	10'-7"	9'-7"	9'-5"	12'-6"	10'-5"	10'-3"	9'-1"	12'-6"
120.0	7'-0"	8'-9"	8'-8"	8'-5"	10'-9"	10'-3"	9'-5"	9'-3"	12'-6"	10'-2"	10'-1"	9'-10"	12'-6"
125.0	7'-0"	8'-6"	8'-7"	8'-2"	10'-7"	10'-0"	9'-4"	9'-1"	12'-6"	9'-11"	9'-10"	8'-7"	12'-6"
130.0	7'-0"	8'-4"	8'-5"	8'-0"	10'-6"	9'-9"	9'-2"	8'-11"	12'-6"	9'-9"	9'-8"	8'-5"	12'-6"
135.0	7'-0"	8'-2"	8'-4"	7'-9"	10'-4"	9'-7"	9'-1"	8'-9"	12'-6"	9'-6"	9'-6"	8'-2"	12'-6"
140.0	7'-0"	8'-0"	8'-3"	7'-7"	10'-1"	9'-4"	9'-0"	8'-7"	12'-6"	9'-4"	9'-4"	8'-0"	12'-6"
145.0	7'-0"	7'-10"	8'-2"	7'-5"	9'-9"	9'-2"	8'-10"	8'-6"	12'-6"	9'-2"	9'-2"	7'-10"	12'-6"
150.0	7'-0"	7'-8"	8'-1"	7'-4"	9'-5"	9'-0"	8'-9"	8'-4"	12'-6"	8'-11"	9'-0"	7'-8"	12'-6"
155.0	7'-0"	7'-6"	8'-0"	7'-2"	9'-2"	8'-10"	8'-8"	8'-3"	12'-5"	8'-9"	8'-10"	7'-6"	12'-6"
160.0	7'-0"	7'-4"	7'-11"	7'-0"	8'-10"	8'-8"	8'-7"	8'-1"	12'-2"	8'-8"	8'-9"	7'-5"	12'-6"

SCHEDULE 2c
WALL MOUNTING
MAX. SPAN (FT) FOR END AND INTERIOR MULLIONS FOR A GIVEN DESIGN LOAD (P.S.F.), & AND 7'-0" MAX. MULLION SPACING (FT) *

DESIGN LOAD (p.s.f.)	MAXIMUM MULLION SPACING (ft) *	MAXIMUM MULLION SPAN (FT)											
		(G) 4"x6"x1/4" MULLION				(G1) 4"x8"x1/4" MULLION				(G2) 4"x7"x1/4" THICK (3/8" FLANGE) MULLION			
		ORIENTATION #1 (⟺)†		ORIENTATION #2 (▯)†		ORIENTATION #1 (⟺)†		ORIENTATION #2 (▯)†		ORIENTATION #1 (⟺)†		ORIENTATION #2 (▯)†	
		END	INTERIOR	END	INTERIOR	END	INTERIOR	END	INTERIOR	END	INTERIOR	END	INTERIOR
30.0	7'-0"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"
35.0	7'-0"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"
40.0	7'-0"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"
45.0	7'-0"	12'-6"	12'-0"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"
50.0	7'-0"	12'-6"	11'-7"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"
55.0	7'-0"	12'-6"	11'-3"	12'-6"	12'-6"	12'-6"	12'-3"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"
60.0	7'-0"	12'-6"	10'-11"	12'-6"	12'-6"	12'-6"	11'-11"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"
65.0	7'-0"	12'-6"	10'-8"	12'-1"	12'-6"	12'-6"	11'-7"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"
70.0	7'-0"	12'-6"	10'-5"	11'-6"	12'-6"	12'-6"	11'-3"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"
75.0	7'-0"	12'-1"	10'-2"	10'-11"	12'-6"	12'-6"	11'-0"	11'-11"	12'-6"	12'-6"	12'-6"	12'-6"	12'-6"
80.0	7'-0"	11'-6"	9'-11"	10'-6"	12'-4"	12'-6"	10'-10"	11'-5"	12'-6"	12'-6"	12'-4"	11'-11"	12'-6"
85.0	7'-0"	11'-0"	9'-9"	10'-2"	12'-1"	12'-6"	10'-7"	11'-0"	12'-6"	12'-6"	12'-0"	11'-4"	12'-6"
90.0	7'-0"	10'-7"	9'-7"	9'-10"	11'-10"	12'-5"	10'-5"	10'-8"	12'-6"	12'-2"	11'-8"	10'-10"	12'-6"
95.0	7'-0"	10'-2"	9'-5"	9'-6"	11'-7"	11'-11"	10'-2"	10'-4"	12'-6"	11'-9"	11'-4"	10'-5"	12'-6"
100.0	7'-0"	9'-10"	9'-3"	9'-3"	11'-5"	11'-6"	10'-0"	10'-1"	12'-6"	11'-5"	11'-0"	10'-1"	12'-6"
105.0	7'-0"	9'-6"	9'-1"	9'-1"	11'-3"	11'-2"	9'-10"	9'-10"	12'-6"	11'-1"	10'-9"	9'-8"	12'-6"
110.0	7'-0"	9'-3"	8'-11"	8'-10"	11'-1"	10'-10"	9'-9"	9'-7"	12'-6"	10'-9"	10'-6"	9'-5"	12'-6"
115.0	7'-0"	9'-0"	8'-10"	8'-7"	10'-11"	10'-7"	9'-7"	9'-5"	12'-6"	10'-5"	10'-3"	9'-1"	12'-6"
120.0	7'-0"	8'-9"	8'-8"	8'-5"	10'-9"	10'-3"	9'-5"	9'-3"	12'-6"	10'-2"	10'-1"	9'-10"	12'-6"
125.0	7'-0"	8'-6"	8'-7"	8'-2"	10'-7"	10'-0"	9'-4"	9'-1"	12'-6"	9'-11"	9'-10"	8'-7"	12'-6"
130.0	7'-0"	8'-4"	8'-5"	8'-0"	10'-6"	9'-9"	9'-2"	8'-11"	12'-6"	9'-9"	9'-8"	8'-5"	12'-6"
135.0	7'-0"	8'-2"	8'-4"	7'-9"	10'-4"	9'-7"	9'-1"	8'-9"	12'-6"	9'-6"	9'-6"	8'-2"	12'-6"
140.0	7'-0"	8'-0"	8'-3"	7'-7"	10'-3"	9'-4"	9'-0"	8'-7"	12'-6"	9'-4"	9'-4"	8'-0"	12'-6"
145.0	7'-0"	7'-10"	8'-2"	7'-5"	10'-1"	9'-2"	8'-10"	8'-6"	12'-6"	9'-2"	9'-2"	7'-10"	12'-6"
150.0	7'-0"	7'-8"	8'-1"	7'-4"	10'-0"	9'-0"	8'-9"	8'-4"	12'-6"	8'-11"	9'-0"	7'-8"	12'-6"
155.0	7'-0"	7'-6"	8'-0"	7'-2"	9'-10"	8'-10"	8'-8"	8'-3"	12'-5"	8'-9"	8'-10"	7'-6"	12'-6"
160.0	7'-0"	7'-4"	7'-11"	7'-0"	9'-9"	8'-8"	8'-7"	8'-1"	12'-2"	8'-8"	8'-9"	7'-5"	12'-6"

* MAXIMUM MULLION SPACING SHALL BE SUCH THAT MAX. ALLOWABLE SLAT SPAN FOR THAT 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)

WALTER A. TILLIT JR. LICENSE No. 44167 STATE OF FLORIDA
MAR 03 2009
P.E. SEAL/SIGNATURE/DATE

TILTECO INC.
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REV. No	DESCRIPTION	DATE	REV. No	DESCRIPTION	DATE
1			4		
2			5		

DRAWN BY: M.C.V./L.G.
11/18/08 DATE
08-255 DRAWING No
SHEET 26 OF 26