MIAMI-DADE

BUILDING CODE COMPLIANCE OFFICE (BCCO)
PRODUCT CONTROL DIVISION

MIAMI-DADE COUNTY, FLORIDA
METRO-DADE FLAGLER BUILDING
140 WEST FLAGLER STREET, SUITE 1603
MIAMI, FLORIDA 33130-1563
(305) 375-2901 FAX (305) 375-2908

NOTICE OF ACCEPTANCE (NOA)

Rolladen, Inc.
550 Ansin Boulevard
Hallandale, FL 33009

SCOPE:

This NOA is being issued under the applicable rules and regulations governing the use of construction materials. The documentation submitted has been reviewed by Miami-Dade County Product Control Division and accepted by the Board of Rules and Appeals (BORA) to be used in Miami Dade County and other areas where allowed by the Authority Having Jurisdiction (AHJ).

This NOA shall not be valid after the expiration date stated below. The Miami-Dade County Product Control Division (In Miami Dade County) and/or the AHJ (in areas other than Miami Dade County) reserve the right to have this product or material tested for quality assurance purposes. If this product or material fails to perform in the accepted manner, the manufacturer will incur the expense of such testing and the AHJ may immediately revoke, modify, or suspend the use of such product or material within their jurisdiction. BORA reserves the right to revoke this acceptance, if it is determined by Miami-Dade County Product Control Division that this product or material fails to meet the requirements of the applicable building code.
This product is approved as described herein, and has been designed to comply with the Florida Building Code including the High Velocity Hurricane Zone.

DESCRIPTION: Extruded Aluminum Roll-Up Shutter

APPROVAL DOCUMENT: Drawing No. 94-55, titled "Several Titles", prepared by Al-Farooq Corporation Inc. dated 07/22/94, with last revision on 12/19/05, sheets 1 through 21 of 21, bearing the Miami-Dade County Product Control Revision stamp with the Notice of Acceptance number and expiration date by the Miami-Dade County Product Control Division.

MISSILE IMPACT RATING: Large and Small Missile Impact

LABELING: Each unit shall bear a permanent label with the manufacturer's name or logo, city, state and the following statement: "Miami-Dade County Product Control Approved", unless otherwise noted herein.

RENEWAL of this NOA shall be considered after a renewal application has been filed and there has been no change in the applicable building code negatively affecting the performance of this product.

TERMINATION of this NOA will occur after the expiration date or if there has been a revision or change in the materials, use, and/or manufacture of the product or process. Misuse of this NOA as an endorsement of any product, for sales, advertising or any other purposes shall automatically terminate this NOA. Failure to comply with any section of this NOA shall be cause for termination and removal of NOA.

ADVERTISEMENT: The NOA number preceded by the words Miami-Dade County, Florida, and followed by the expiration date may be displayed in advertising literature. If any portion of the NOA is displayed, then it shall be done in its entirety.

INSPECTION: A copy of this entire NOA shall be provided to the user by the manufacturer or its distributors and shall be available for inspection at the job site at the request of the Building Official.
This NOA **revises NOA # 03-1110.04 and** consists of this page, evidence page and approval document mentioned above.
The submitted documentation was reviewed by **Candido F. Font, P.E.**

08/11/06

PRODUCT CONTROL ACCEPTED

Rolladen, Inc.

NOTICE OF ACCEPTANCE: EVIDENCE PAGE

A DRAWINGS

1. Drawing prepared by Al-Farooq Corporation, titled "RollShutter Detail, Header Mullion Details, Storm Bar Connection Details, Mullion & Box Details, Post Loading Charts, Top Support Loading Charts, Storm Bar Loading Charts & Deflection Calculation Sheet," Drawing No. **94-55**, dated 07/22/94, with revision "g" dated 12/19/05, Sheets 1 through 21 of 21, signed and sealed by H. Farooq, P.E.

B. TESTS

1. Test report on Large Missile Impact Test per PA 201 and Cyclic Wind Pressure Test per PA 203 of Roll Shutter prepared by Hurricane Engineering & Testing, Inc., Report No. **HETI-94-139** dated 06/0994 signed and sealed by A. Viqar, P.E.
2. Test report on Uniform Static Air Pressure Test per PA 202 of Roll Shutter prepared by Hurricane Engineering & Testing, Inc., Report No. **HETI-94-123, 250, 297, 308 & 325** dated 05/24/94, 08/12/94, 09/16/94, 09/22/94, & 10/04/94 signed and sealed by A. Viqar, P.E. & H. M. Medina, P.E.
3. Test report on Large Missile Impact Test per PA 201 of Roll Shutter prepared by Hurricane Engineering & Testing, Inc., Report No. **HETI-94-297i, 95-325i & 95-461,** dated 09/16/94, 10/05/94 & 06/22/95, signed and sealed by H. M. Medina, PE.

C. CALCULATIONS

1. Mullion and anchor calculations using rational analysis dated November 3, 1994 and revised on November 12, 1994, signed and sealed by H. Farooq, P.E.
2. Mullion and anchor calculations signed and sealed by Humayoun Farooq, PE. on February 22, 1995.
3. Mullions, Storm Bars, Header and anchor calculations prepared by Al-Farooq calculations on 01/31/06 and signed by H. Farooq PE.

D. MATERIAL CERTIFICATIONS

1. Tensile Test Report No. HETI-94-T7 prepared by Hurricane Engineering & Testing, Inc. dated 07/26/94, tested as per ASTM E8-93, signed and sealed by A. Viqar, P.E.
2. Tensile Test Report No. HETI 94-T36 prepared by Hurricane Engineering & Testing, Inc. dated 10/17/94, signed and sealed by H. M. Medina, P.E.
3. Mill Certification of Chemical Composition and Physical Properties prepared by The William Bonnell Co. Inc., die drawing No. Ron-68, dated 07/18/94 for Aluminum Alloy 6063-T6.

E. STATEMENTS

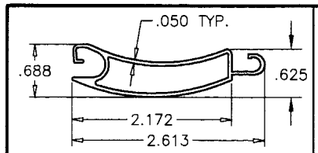
1. Letter of no change issued by Rolladen, Inc. on 05/22/00 signed by T. D. Low and notarized by E. M. Roldan on 06/05/00.
2. Letter of code compliance prepared by Al-Farooq Corporation on 02/02/06 signed and sealed by H. Farooq, PE.

F QUALITY ASSURANCE

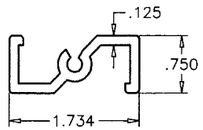
1. Miami-Dade County. Building Code Compliance Office.

08/11/06

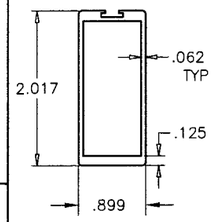
Candido F. Font, P. E.
Senior Product Control Examiner
NOA No 06-0213.01
Expiration Date: September 25, 2008
Approval Date: August 11, 2006



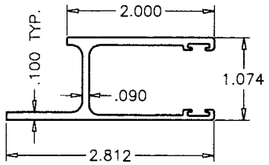
RON-68 SLAT



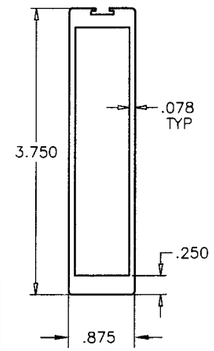
RON-23 INSERT



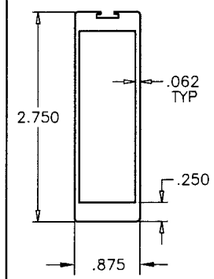
RON-24 STORM BAR



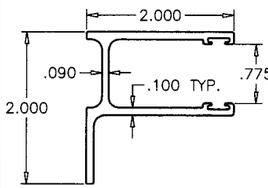
RON-72 TRACK



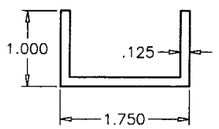
RON-56 STORM BAR



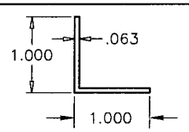
RON-57 STORM BAR



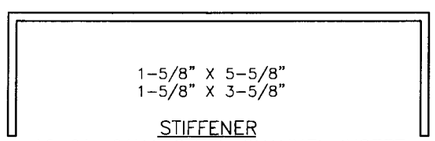
RON-73 TRACK



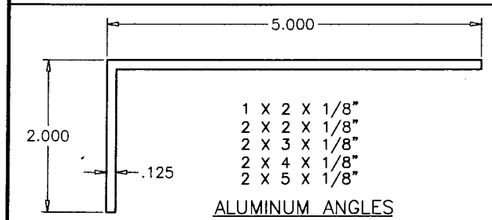
FLOOR SHOE



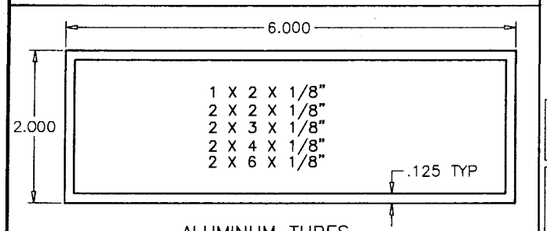
1 x 1 x 1/16"
ALUMINUM ANGLE



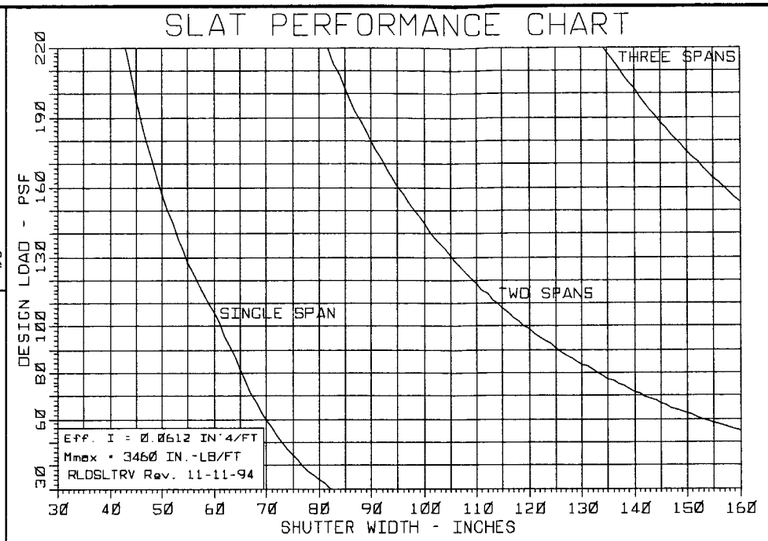
STIFFENER
12 GA. GALV. STEEL CHANNEL INSERT

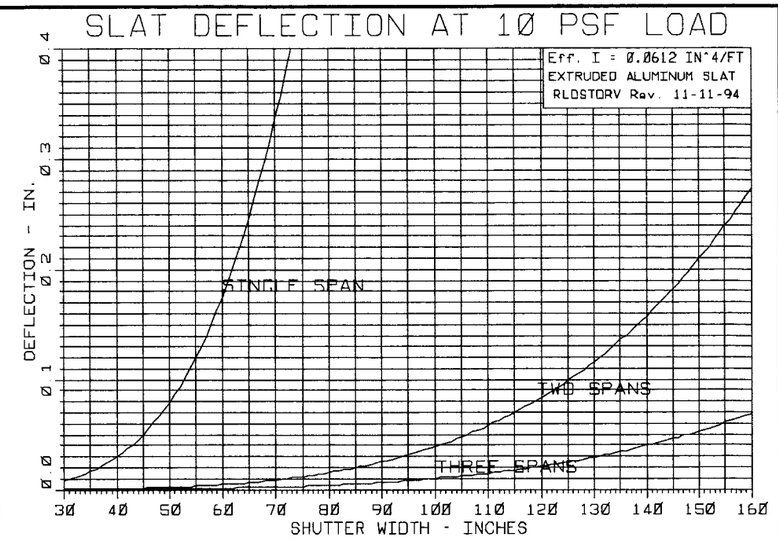


ALUMINUM ANGLES



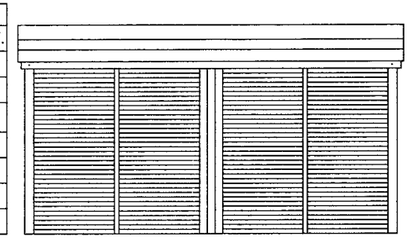
ALUMINUM TUBES





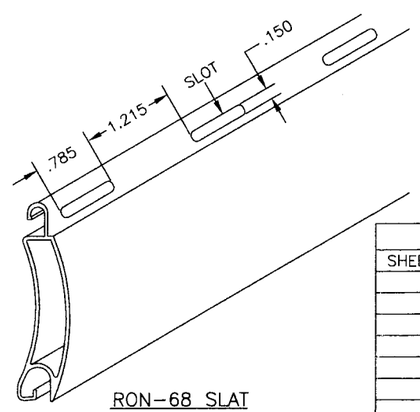
USE SLAT PERFORMANCE CHART TO VERIFY SLAT CAPACITY FOR THE REQUIRED DESIGN LOAD FOR THE PARTICULAR LOCATION.

BOX DIMENSIONS	
SHUTTER HT.	HOOD HT.
48"	8"
73"	9"
95"	10"
119"	11"
148"	12"
181"	13"
216"	14"



TYPICAL ELEVATION

DESCRIPTION	PART #
SLAT RON-68	#1117
TRACK RON-72	#1071
TRACK RON-73	#1070
1x2x1/8" TUBE	#1019
2x2x1/8" TUBE	#1022
2x3x1/8" TUBE	#1024
2x4x1/8" TUBE	#1023
2x6x1/8" TUBE	#1026
1x1x1/16" ANGLE	#1031
1x2x1/8" ANGLE	#1029
2x2x1/8" ANGLE	#1051
2x3x1/8" ANGLE	#5012
2x4x1/8" ANGLE	#5013
2x5x1/8" ANGLE	#5014
1x1-3/4X1/8" CHANNEL	#1058
RON-24 STORM BAR	#1047
RON-57 STORM BAR	#1043
RON-56 STORM BAR	#1044
RON-23 ALUM INSERT	#1046



RON-68 SLAT

FOR OVERALL DEFLECTION CALCULATION USE SHEET 21 OF 21.

FOR INSTALLATION DETAILS SEE SHEETS 2 THRU 7. FOR COMPONENT SIZES/SPANS/DESIGN LOAD RATING SEE SHEET 8 THRU 20.

ANCHORS: EMBEDMENT & EDGE DISTANCES SHOWN ARE BEYOND THE WALL & FLOOR COVERING (STUCCO, TILES, ETC.)

INDEX OF DRAWING	
SHEET NO.	DESCRIPTION
1	EXTRUSIONS DETAILS, NOTES, SLAT GRAPHS
2	SINGLE SPAN DETAILS
3	ANCHOR GRAPHS
4	MULTIPLE SPAN INSTALLATION DETAIL
5	HEADER/MULLION CONNECTION DETAILS
6	STORM BAR ANCHOR DETAILS
7	MULLION & BOX ANCHOR DETAILS
8 THRU 13	POST (MULLION) LOADING CHARTS
14 & 15	TOP SUPPORT LOADING CHARTS
16 THRU 20	STORM BAR LOADING CHARTS
21	CALC. SHEET FOR OVERALL DEFLECTION

GENERAL NOTES

1. THIS PRODUCT HAS BEEN DESIGNED AND TESTED TO COMPLY WITH THE REQUIREMENTS OF THE FLORIDA BUILDING CODE 2004 EDITION INCLUDING HIGH VELOCITY HURRICANE ZONE.
2. DESIGN CRITERIA FOR ALUMINUM, MINIMUM MECHANICAL PROPERTIES, AND SAFETY FACTORS ARE IN ACCORDANCE WITH THE "ALUMINUM CONSTRUCTION MANUAL" LATEST EDITION.
3. ALUMINUM ALLOYS: ALL EXTRUSIONS SHALL BE ALLOY 6063-T6, OR AS NOTED.
4. STEEL SURFACES TO BE PLACED IN CONTACT WITH ALUMINUM SHALL BE GIVEN ONE COAT OF ZINC CHROMATE PRIMER IN ACCORDANCE WITH FEDERAL SPEC. NO. TTP-645, OR BE GALVANIZED.
5. ANCHORS SHALL BE AS LISTED, SPACED AS SHOWN ON DETAILS. ANCHOR EMBEDMENT TO BASE MATERIAL SHALL BE BEYOND WALL DRESSING OR STUCCO.
6. ALL BOLTS, NUTS AND WASHERS SHALL BE STAINLESS STEEL OR ALUMINUM ALLOY 2024-T4 OR 7075-T6, OR PLATED STEEL.
7. SHUTTERS MAY BE MOTOR, TAPE PULLEY, OR GEAR DRIVEN.
8. DESIGN CRITERIA: FOR MULTIPLE SPANS THE COMBINED MAX DEFLECTION OF HEADER, STORM BARS AND SLATS $\leq$ L/30 OR 2". FOR MULLIONS MAX DEFLECTION $\leq$ L/180.
9. ANCHORING OR LOADING CONDITIONS OTHER THAN THOSE SHOWN IN THESE DETAILS ARE NOT PART OF THIS APPROVAL.
10. A LOAD DURATION INCREASE IN ALLOWABLE STRESS IS USED IN DESIGN OF WOOD ANCHORS ONLY.

DESIGN LOADS SHALL BE CALCULATED AS PER REQUIREMENTS OF ASCE 7-98.

PRODUCT MARKING

A LABEL SHALL BE AFFIXED ON UNIT AT RIGHT BOTTOM OF BOX WITH THE FOLLOWING STATEMENT:

#1117 EXTRUDED ALUMINUM ROLLING SHUTTER
"DADE COUNTY PRODUCT CONTROL APPROVED"
MANUFACTURED BY ROLLADEN, INC.

Engr: DR. HUMAYOUN FAROOQ
STRUCTURES
FLA. PE # 16557
C.A.N. 3538

JAN 31 2006

PRODUCT REVISED
06-0213.01
09/25/06

AL-FAROOQ CORPORATION
ENGINEERS, PLANNERS & PRODUCT DESIGN
1235 SW 87 AVE
MIAMI, FLORIDA 33174
TEL. (305) 264-8100 FAX. (305) 262-6978

ROLLUP\94-55RI

RollShutter Details

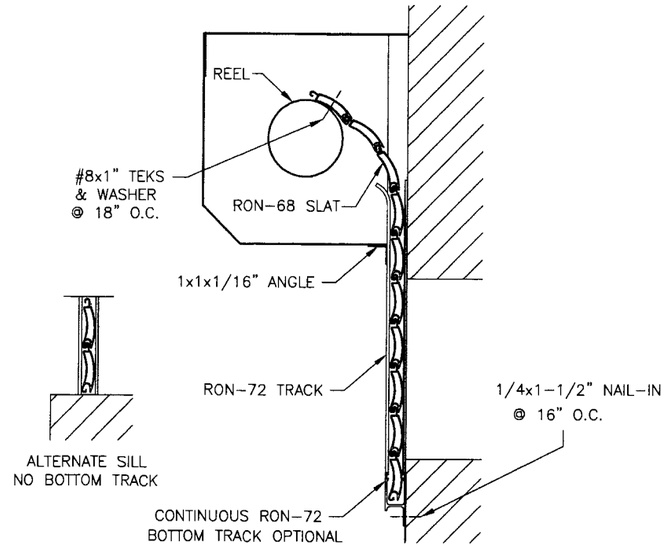
ROLLADEN INC.
550 ANSIN BOULEVARD
HALLANDALE, FL. 33009
(305) 757 - 8591

revisions:

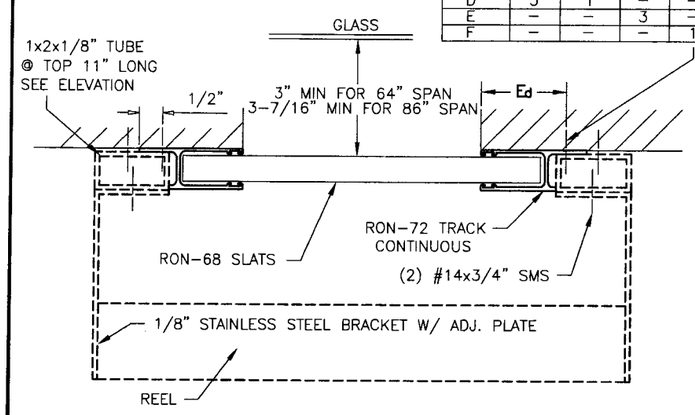
no	date	by	description
C	02.02.95	T.H.	GENERAL REVISION
D	07.02.95	T.H.	SHEET 3 REVISED
E	04.25.03	T.H.	UPDATED FOR FBC & NDS 97
F	10.28.03	T.H.	REV. PER BCCO COMMENTS
G	12.19.05	T.H.	UPDATED FOR 2004 FBC

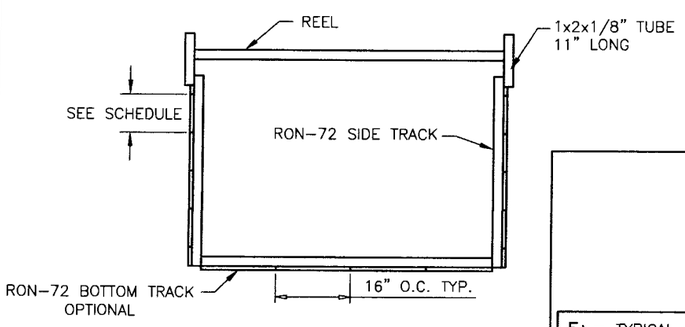
date: 07-22-94
scale: 1/2" = 1"
dr. by: HAMID
chk. by:

drawing no. 94-55



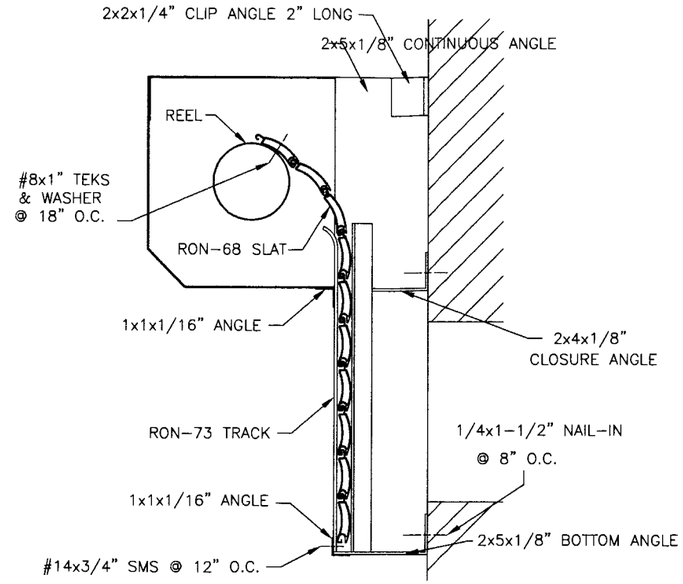
ANCHOR TYPE	CHART TO USE			
	CONC.	BLOCK	WOOD	METAL
A	2	1	–	–
B	1	–	–	–
C	1	1	–	–
D	3	1	–	–
E	–	–	3	–
F	–	–	–	1



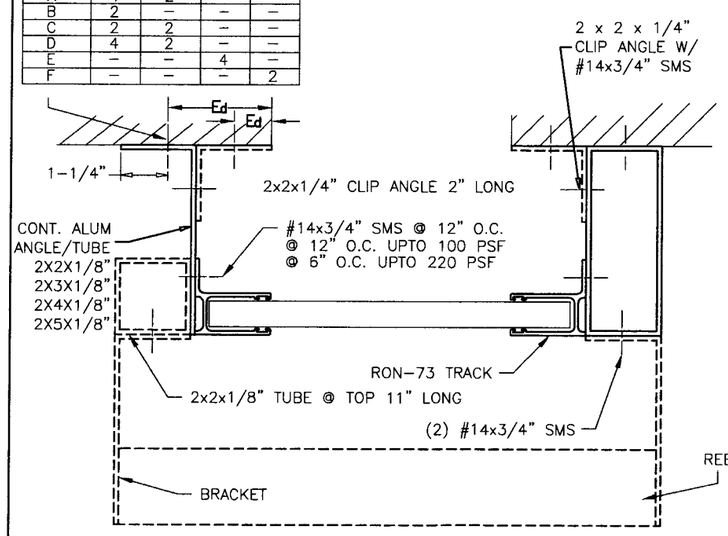


ELEVATION

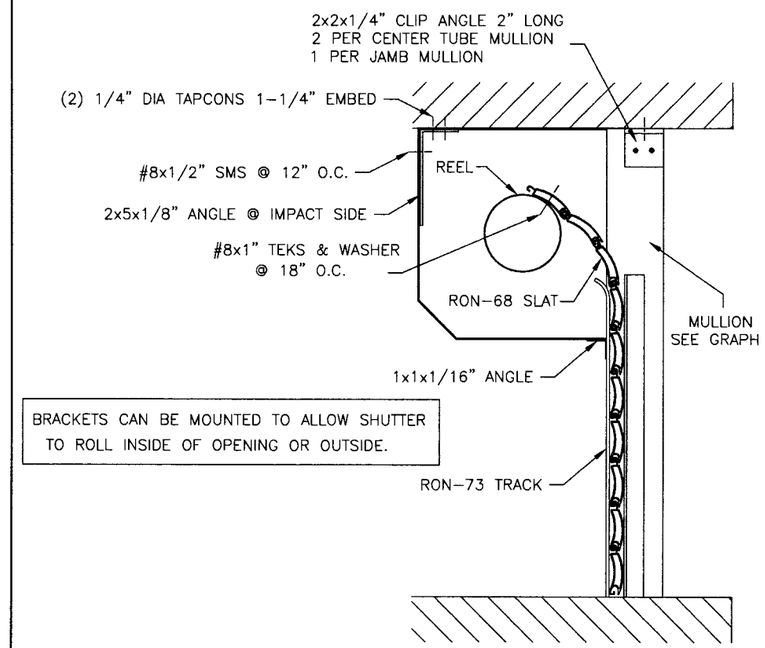
SINGLE SPAN TRACK ON WALL



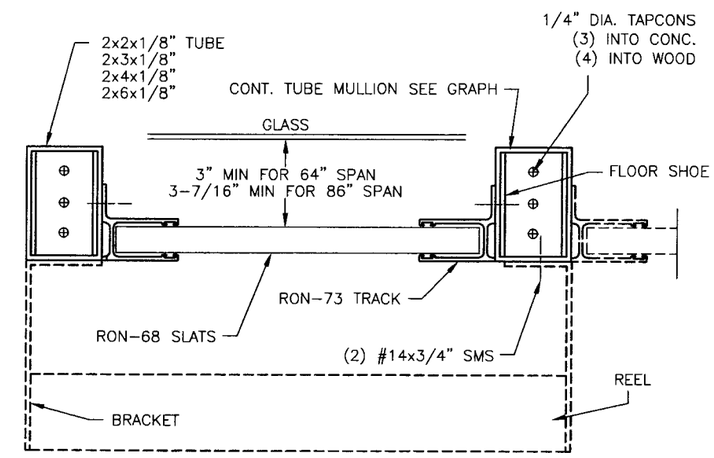
ANCHOR TYPE	CHART TO USE			
	CONC.	BLOCK	WOOD	METAL
A	4	2	–	–
B	2	–	–	–
C	2	2	–	–
D	4	2	–	–
E	–	–	4	–
F	–	–	–	2



SINGLE SPAN WITH BUILT OUT



BRACKETS CAN BE MOUNTED TO ALLOW SHUTTER TO ROLL INSIDE OF OPENING OR OUTSIDE.



SINGLE SPAN SPLIT SHUTTER W/ MULLION

Ed = TYPICAL EDGE DISTANCE
CONC. & BLOCK = 12d (12 ANCHOR DIAMETERS)
WOOD = 5d
FOR LESSER EDGE DISTANCES SEE SHEET 3 OF 21.

ANCHORS: EMBEDMENT & EDGE DISTANCES SHOWN ARE BEYOND THE WALL & FLOOR COVERING (STUCCO, TILES, ETC.)

Engr: DR. HUMAYOUN FAROOQ
STRUCTURES
FLA. PE # 16557
C.A.N. 3538

JAN 31 2006

06-0213 01
08/25/06

AL-FAROOQ CORPORATION
ENGINEERS, PLANNERS & PRODUCT DESIGN
1235 SW 87 AVE
MIAMI, FLORIDA 33174
TEL. (305) 264-8100 FAX. (305) 262-6978

ROLLUP\94-55R1

RollShutter Details

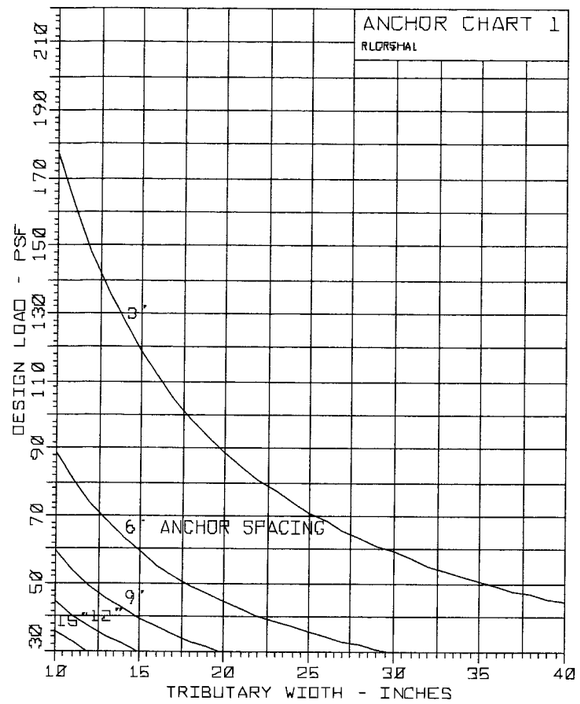
ROLLADEN INC.
550 ANSIN BOULEVARD
HALLANDALE, FL. 33009
(305) 757 - 8591

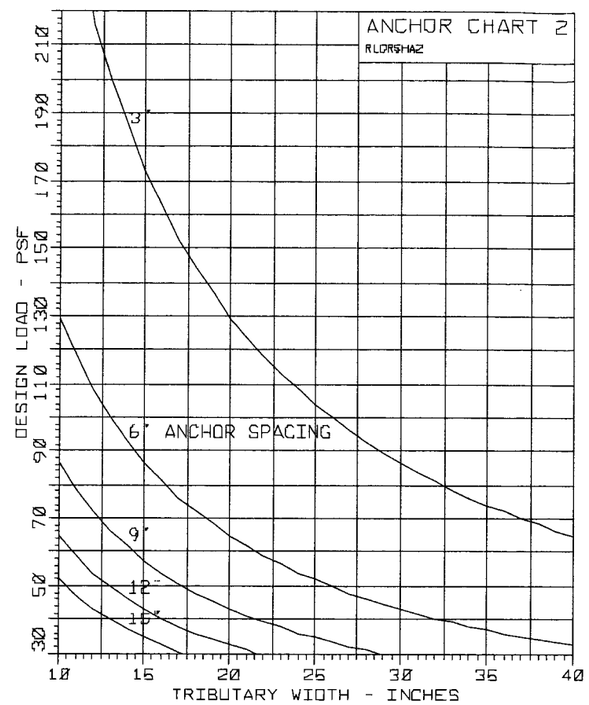
revisions:

no	date	by	description
C	02.02.95	T.H.	GENERAL REVISION
D	07.02.95	T.H.	SHEET 3 REVISED
E	04.25.03	T.H.	ANCHOR CHART'S REV.
F	10.28.03	T.H.	NO CHANGE THIS SHEET
G	12.19.05	T.H.	UPDATED FOR 2004 FBC

date: 07-22-94
scale: 1/2" = 1"
dr. by: HAMID
chk. by:

drawing no.
94-55



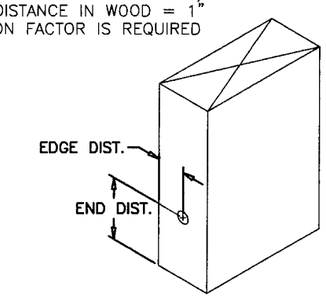


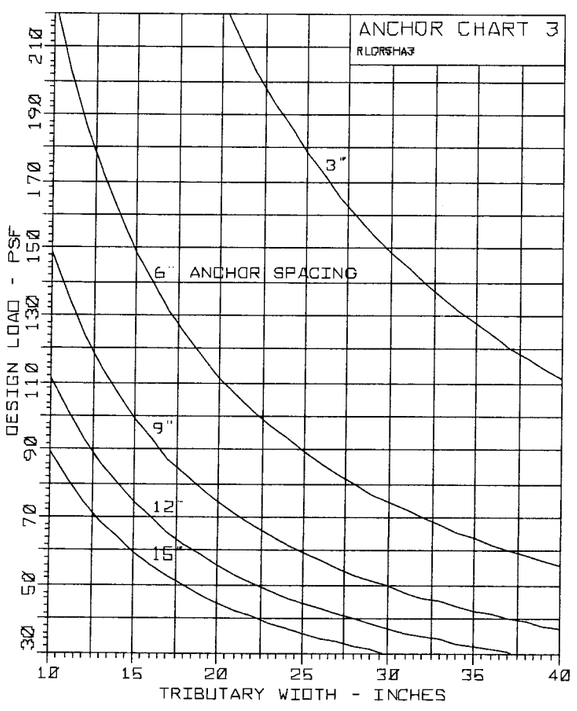
MAXIMUM ANCHOR SPACING IN ALL CASES SHALL NOT EXCEED 8" O.C.

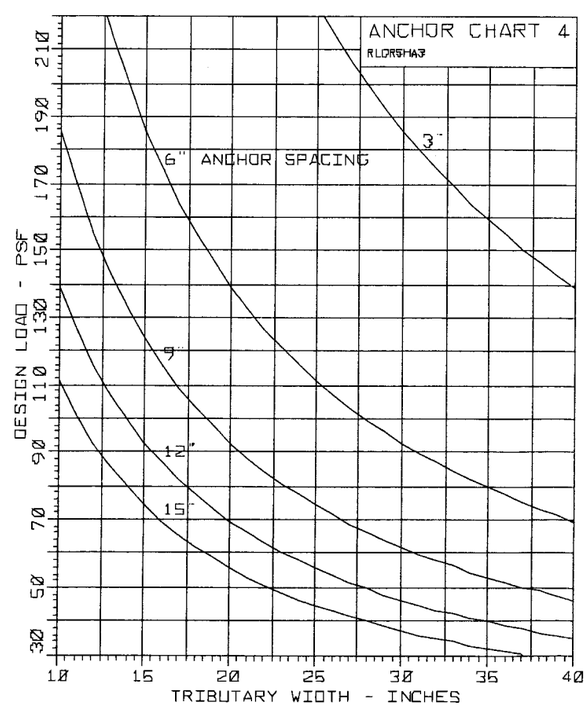
$$\text{TRIBUTARY WIDTH} = \frac{\text{SW}}{2 \times (\text{\# OF SPANS})}$$

FASTENER SPACING IN MASONRY					
CHARTS ARE BASED ON TYPICAL EDGE DISTANCE = 12d. FOR LESSER EDGE DISTANCE DECREASE SPACING BY MULTIPLYING WITH THE FACTOR BELOW					
EDGE DIST.	12d=3"	10d=2-1/2"	8d=2"	6d=1-1/2"	5d=1-1/4"
FACTOR	1.00	0.86	0.71	0.57	0.50
EXAMPLE: FOR 3" EDGE DIST. SPACING = 12" O.C. (FROM CHART) FOR 2" EDGE DIST. SPACING = 12 X .71 = 8.5 O.C.					

TYPICAL EDGE DISTANCE IN WOOD = 3/4"
TYPICAL END DISTANCE IN WOOD = 1"
NO REDUCTION FACTOR IS REQUIRED







TYPICAL ANCHORS:

ANCHOR (A) = 1/4" DIA. TAPCONS
1-3/4" EMBEDMENT INTO 3000 PSI CONC.
1-1/4" EMBEDMENT INTO C-90 BLOCK

ANCHOR (B) = #14 SMS W/ RAWL SCRU-LEAD
1-1/2" EMBEDMENT INTO 3000 PSI CONC.

ANCHOR (C) = 1/4" ZAMAC NAILIN ANCHORS
1-1/4" EMBEDMENT INTO 3000 PSI CONC.
OR C-90 BLOCK

ANCHOR (D) = 1/4" RAWL CALK-IN ANCHOR
TOTAL ANCHOR BODY INTO 3000 PSI CONC.
OR C-90 BLOCK

ANCHOR (E) = 1/4" DIA. TAPCONS
1-1/2" MIN PENETRATION INTO WOOD (S.G.=0.55)

ANCHOR (F) #14 SMS OR SELF DRILLING (TEKS) SCREWS
INTO METAL STRUCTURES
(STEEL OR ALUMINUM 1/8" MIN. THICK.)

NOTE: ANCHORS EMBEDMENT SHOWN IS BEYOND WALL & FLOOR COVERINGS (STUCCO, TILES, ETC.)

PRODUCT REVISED
06-02.13.01
09/25/08

Engr: DR. HUMAYOUN FAROOQ
STRUCTURES
FLA. PE # 16557
C.A.N. 3538

JAN 31 2006

AL-FAROOQ CORPORATION
ENGINEERS, PLANNERS & PRODUCT DESIGN
1235 SW 87 AVE
MIAMI, FLORIDA 33174
TEL. (305) 264-8100 FAX. (305) 262-6978
ROLLUP\94-55RI

RollShutter Details

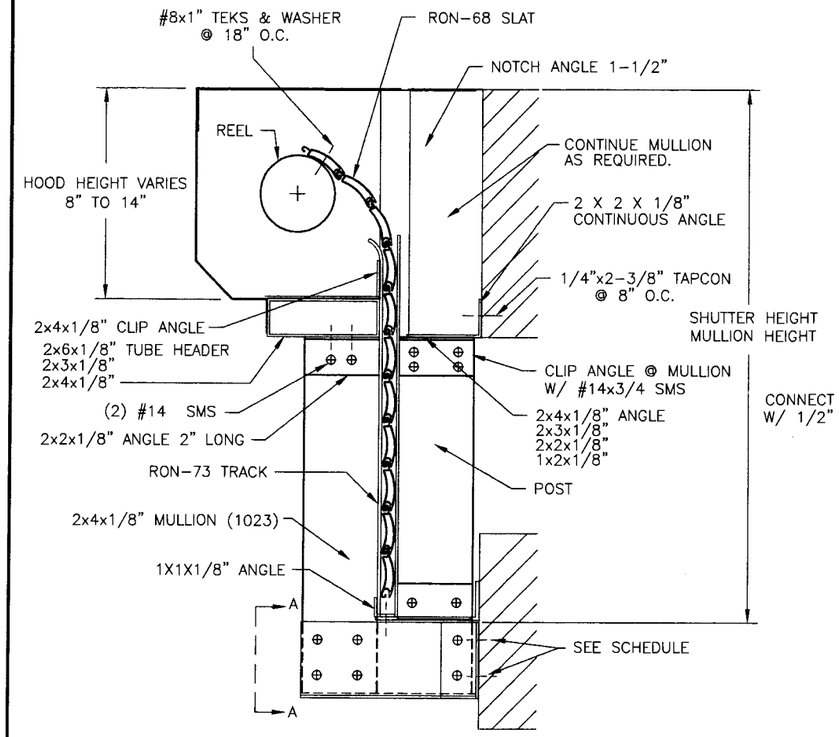
ROLLADEN INC.
550 ANSIN BOULEVARD
HALLANDALE, FL. 33009
(305) 757 - 8591

revisions:

no	date	by	description
C	02.02.95	T.H.	GENERAL REVISION
D	07.02.95	T.H.	SHEET 3 REVISED
E	04.25.03	T.H.	WOOD S.G. REV.
F	10.28.03	T.H.	REV. PER BCCO COMMENTS
G	12.19.05	T.H.	UPDATED FOR 2004 FBC

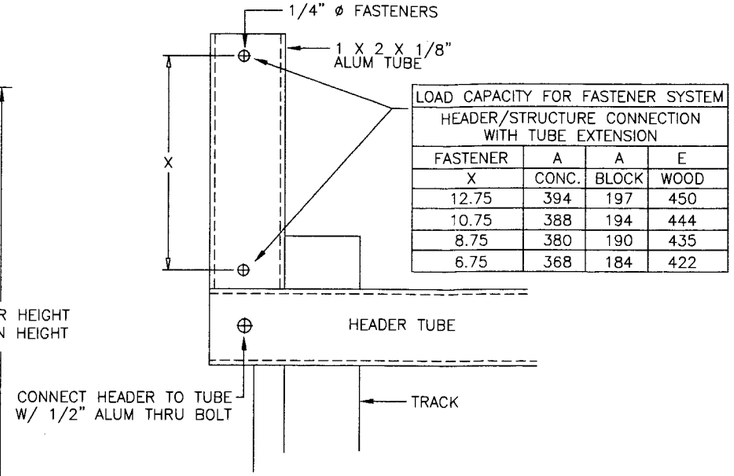
date: 07-22-94
scale: 1/2" = 1"
dr. by: HAMID
chk. by:

drawing no.
94-55



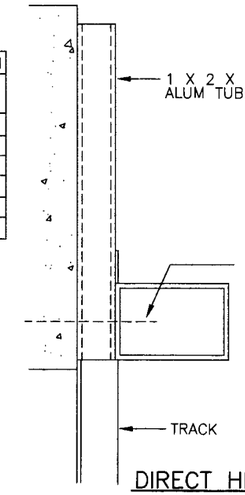
MULTIPLE SPAN SECTION

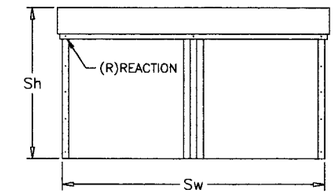
FOR MULLION ANCHOR SEE DETAIL



LOAD CAPACITY FOR FASTENER SYSTEM HEADER/STRUCTURE CONNECTION WITH TUBE EXTENSION			
FASTENER	A	A	E
X	CONC.	BLOCK	WOOD
12.75	394	197	450
10.75	388	194	444
8.75	380	190	435
6.75	368	184	422

HEADER/STRUCTURE CONNECTION WITH TUBE EXTENSION



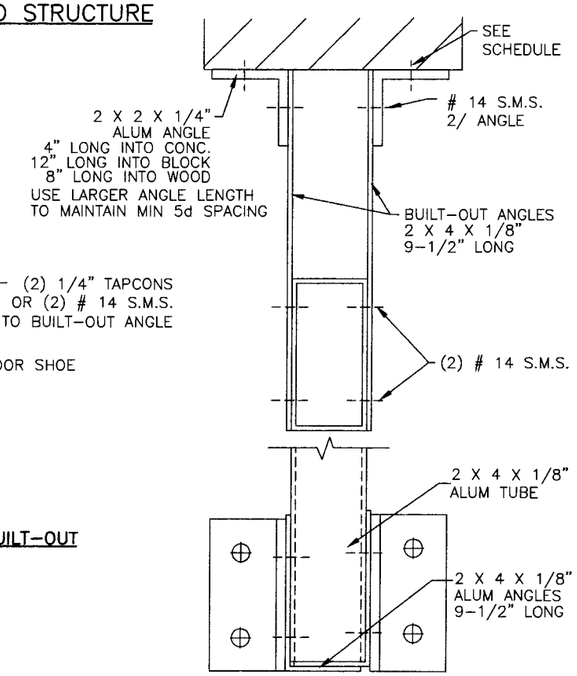


ADDITIONAL CAPACITY OF DIRECT FASTENER			
STRUCTURE	FASTENER	EMBED	P1
CONC.	3/8"øKWIK BOLT	2-1/2"	1290
	1/2"øKWIK BOLT	3-1/2"	2130
	5/8"øKWIK BOLT	4"	2850
BLOCK	1/4" SLEEVE ANCHOR	1-1/8"	350
	5/16" SLEEVE ANCHOR	1-1/4"	375
	3/8" SLEEVE ANCHOR	1-1/2"	438
WOOD	1/4" DIA. TAPCONS	1-1/2"	499

DIRECT HEADER CONNECTION TO STRUCTURE

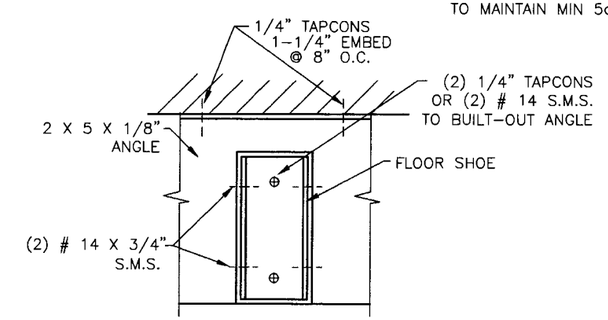
$$\text{REACTION} = R = \frac{1}{4} \times Sh \times Sw \times Pd$$

USE DIRECT CONNECTION AND/OR TUBE EXTENSION CAPACITY CHART TO DETERMINE ALLOWABLE CAPACITY.
FOR COMBINATION OF DIRECT ANCHOR AND TUBE EXTENSION USE THE TOTAL CAPACITY AS THE SUM OF THE TWO TYPES



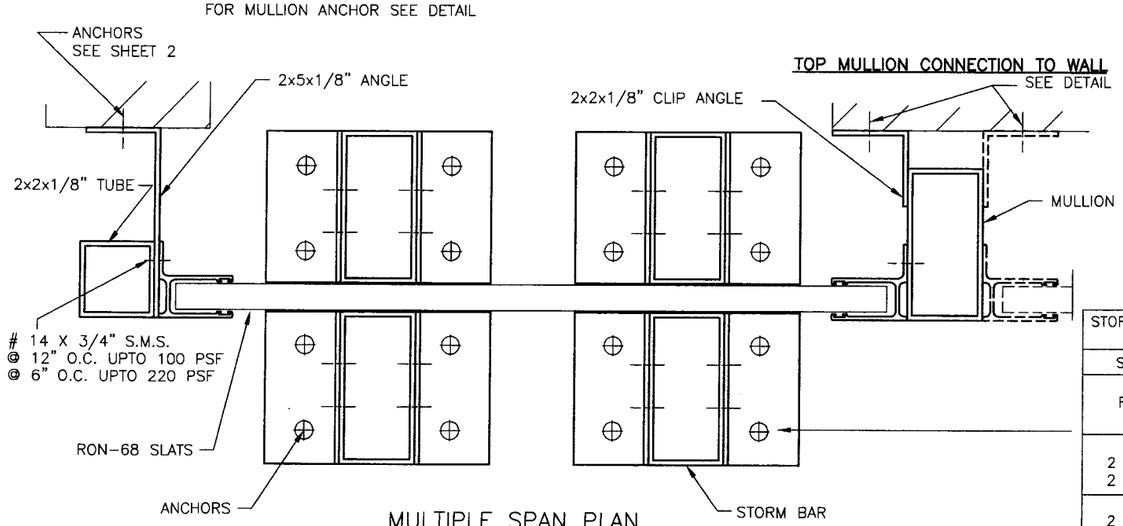
STORM BAR BOTTOM CONNECTION

VIEW "A-A"



BOTTOM MULLION CONNECTION TO BUILT-OUT

TOP MULLION CONNECTION TO WALL



MULTIPLE SPAN PLAN
HEADER NOT SHOWN

STORM BAR CONNECTION TO FLOOR & CEILING NO. OF FASTENERS REQD. EACH SIDE			
STORM BARS	FASTENERS	CONC.	WOOD
RON 24 RON 24&23 RON 57	A, D	2	–
	E	–	2
RON 56 2 X 2 X 1/8" 2 X 3 X 1/8"	A, D	2	–
	E	–	3
2 X 4 X 1/8"	A, D	2	–
	E	–	3
2 X 4 X 1/8" W/ STIFFENER	A, D	2	–
	E	–	4
2 X 6 X 1/8"	A, D	3	–
	E	–	5
2 X 6 X 1/8" W/ STIFFENER	A, D	3	–
	E	–	6

NO. OF FASTENERS IN WOOD ON EACH SIDE MAY BE CALCULATED AS.

$$\# \text{ REQD.} = \frac{\text{LOAD ON STORM BAR ANCHOR}}{232 \times 2}$$

PRODUCT REVISED
Meets the Florida
06-0213.01
09/25/08
Hurricane Product Coalitnd
Director

Engr: DR. HUMAYOUN FAROOQ
STRUCTURES
FLA. PE # 16557
C.A.N. 3538

JAN 31 2006

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ROLLUP\94-55RI

RollShutter Details

ROLLADEN INC.
550 ANSIN BOULEVARD
HALLANDALE, FL. 33009
(305) 757 - 8591

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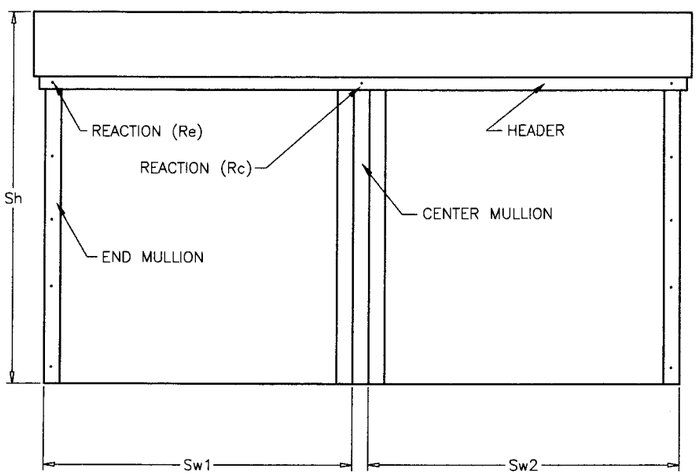
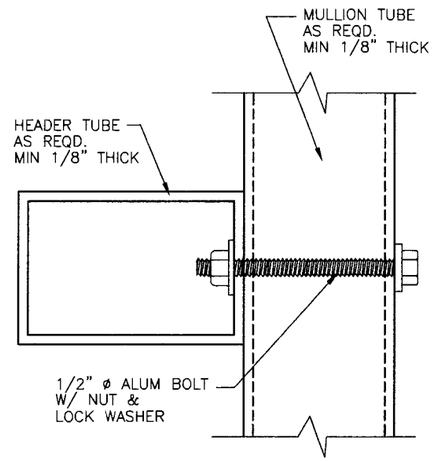
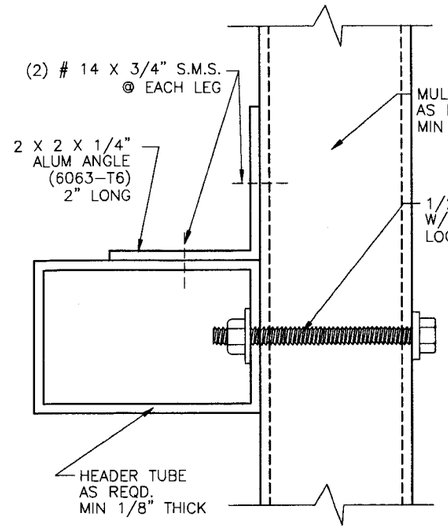
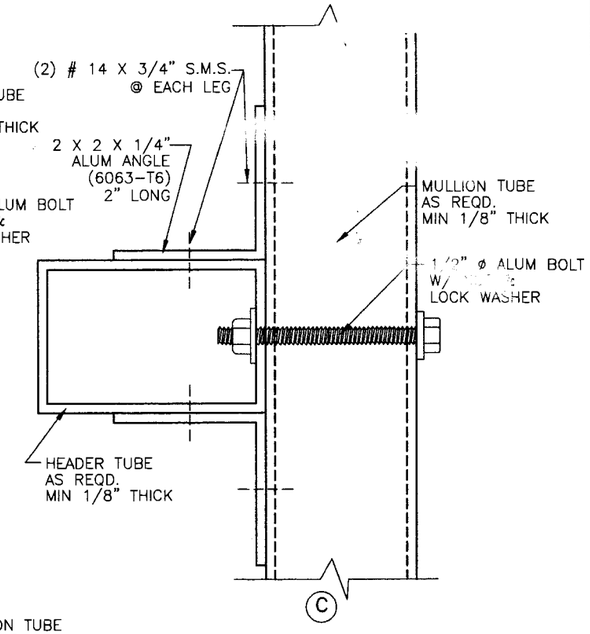




(A)



(B)



(C)

DESIGN LOAD = Pd = PSF

Sh	Sw1	Sw2

HEADER CONNECTION TO CENTER MULLION

$$Rc = \frac{Sh\ (Sw1 + Sw2)\ Pd}{4}$$

$$Rc = \frac{\qquad}{4} =$$

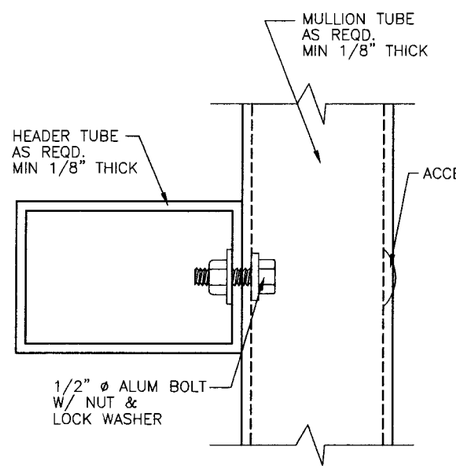
HEADER CONNECTION TO END MULLION

$$Re = \frac{Sh\ (Sw1\ OR\ Sw2)\ Pd}{4}$$

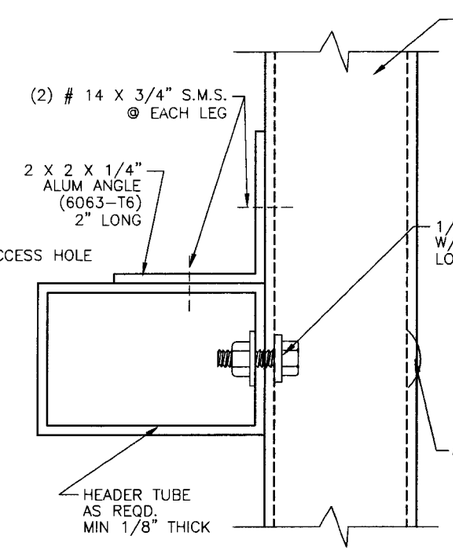
$$Re = \frac{\qquad}{4} =$$

FOR Re/Rc< 3000 lbs USE CONNECTION DETAIL (A)
Re/Rc< 3721 lbs USE CONNECTION DETAIL (B)
Re/Rc< 4442 lbs USE CONNECTION DETAIL (C)

ALL DIMENSIONS SHOWN Sh, Sw, Sw1 ETC. ARE IN FEET.



ALT. (A)



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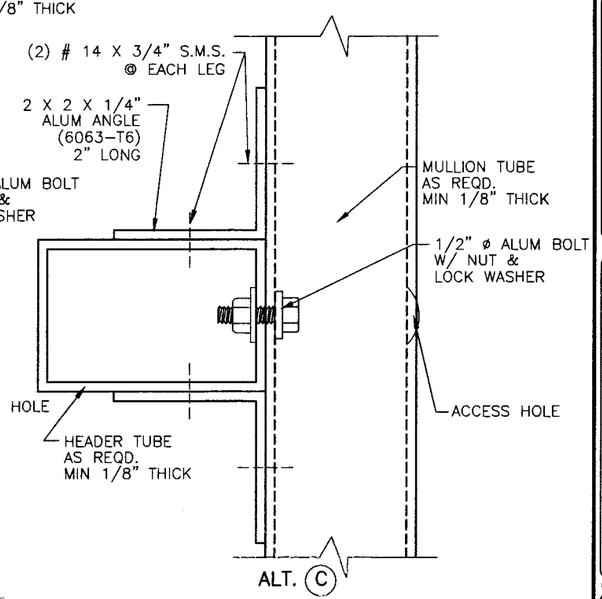

ALT. (C)

PROFESSIONAL ENGINEER REGISTERED
State of Florida
06-0013.01
09/25/08
Engineering Business Certificate of Authorization

Engr: DR. HUMAYOUN FAROOQ
STRUCTURES
FLA. PE # 16557
C.A.N. 3338

JAN 31 2006

HEADER/MULLION CONNECTION DETAILS

AL-FAROOQ CORPORATION
ENGINEERS, PLANNERS & PRODUCT DESIGN
1235 SW 87 AVE
MIAMI, FLORIDA 33174
TEL. (305) 264-8100 FAX. (305) 262-6978
ROLLUP\94-55RI

HEADER/MULLION DETAILS

ROLLADEN INC.
550 ANSIN BOULEVARD
HALLANDALE, FL. 33009
(305) 757 - 8591

revisions:

no	date	by	description
C	02.02.95	T.H.	GENERAL REVISION
D	07.02.95	T.H.	SHEET 3 REVISED
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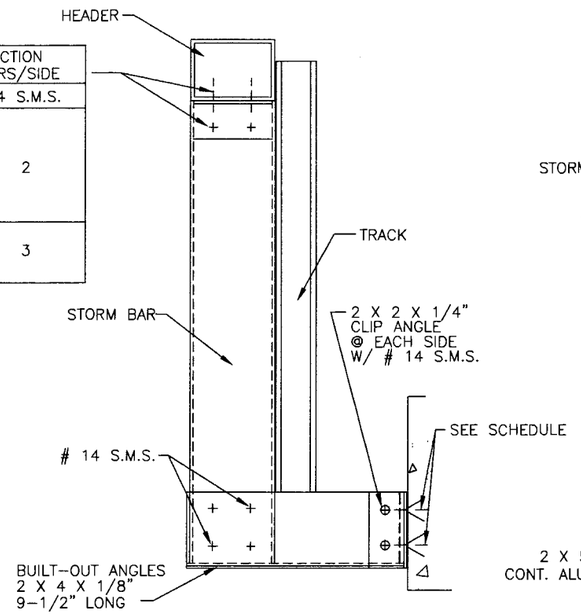
F	10.28.03	T.H.	NO CHANGE THIS SHEET
G	12.19.05	T.H.	NO CHANGE THIS SHEET

date: 07-22-94
scale: 1/2" = 1"
dr. by: HAMID
chk. by:

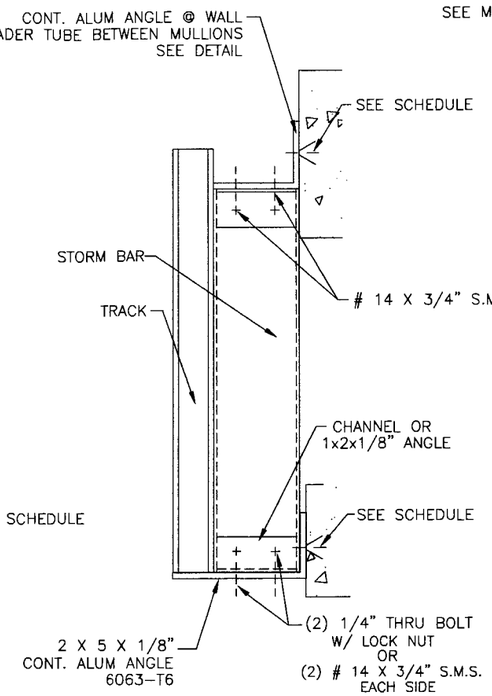
drawing no.
94-55

sheet 5 of 21

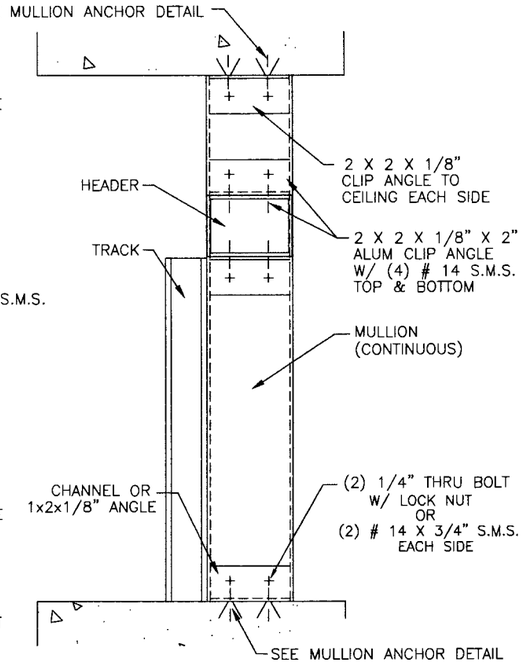
CLIP ANGLE CONNECTION NUMBER OF FASTENERS/SIDE	
STORM BAR SIZE	# 14 S.M.S.
RON-24 RON-24&23 RON-57 RON-56 2 X 2 X 1/8" 2 X 3 X 1/8" 2 X 4 X 1/8"	2
2 X 6 X 1/8" 2 X 6 X 1/8" W/ STIFFENER	3



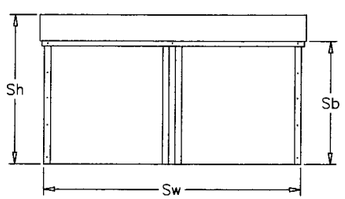
OUTSIDE STORM BAR
BUILT-OUT ANCHOR DETAIL



INSIDE STORM BAR TO WALL
ANCHOR DETAIL



INSIDE/OUTSIDE STORM BAR
MULLION TO FLOOR ANCHOR DETAIL



STORM BAR WALL ANCHOR CAPACITY (Lbs)					
ANGLE LENGTH (IN.)	# ANCHORS/SIDE	ANCHOR TYPE	BASE MATERIAL	ALUM ANGLE 2 X 2 X 1/4"	ALUM ANGLE 2 X 2 X 1/8"
2	1	A	CONC.	545	278
		D	BLOCK	273	273
		E	WOOD	624	278
3	2	A	CONC.	763	417
		D	BLOCK	382	382
		E	WOOD	1248	417
4	2	A	CONC.	1090	556
		D	BLOCK	545	545
		E	WOOD	1248	556
5	3	A	CONC.	1226	695
		D	BLOCK	613	613
		E	WOOD	1871	695

$$\text{LOAD ON STORM BAR ANCHOR} = P = \frac{Sw \times Sb \times Pd \times \text{FACTOR}}{2 \times (\ \#\ \text{OF SPANS})}$$

IF P > CAPACITY OF FASTENERS SHOWN, ANCHORAGE SYSTEM SHALL BE DESIGNED ON JOB TO JOB BASIS.

FACTOR = 1.25 FOR 2 SPANS
= 1.10 FOR 3 SPANS
Sb = STORM BAR HEIGHT

ALL DIMENSIONS SHOWN Sh, Sw, Sb ETC. ARE IN FEET.

Engr: DR. HUMAYOUN FAROOQ
STRUCTURES
FLA. PE # 16557
C.A.N. 3538

JAN 31 2006

PRODUCT APPROVED
Miami-Dade County, Florida
06-0213.01
09/25/08
Miami-Dade Product Control Division

AL-FAROOQ CORPORATION
ENGINEERS, PLANNERS & PRODUCT DESIGN
1235 SW 87 AVE
MIAMI, FLORIDA 33174
TEL. (305) 264-8100 FAX. (305) 262-6978

ROLLUP\94-55RI

STORM BAR CONNECTION DETAILS

ROLLADEN INC.
550 ANSIN BOULEVARD
HALLANDALE, FL. 33009
(305) 757 - 8591

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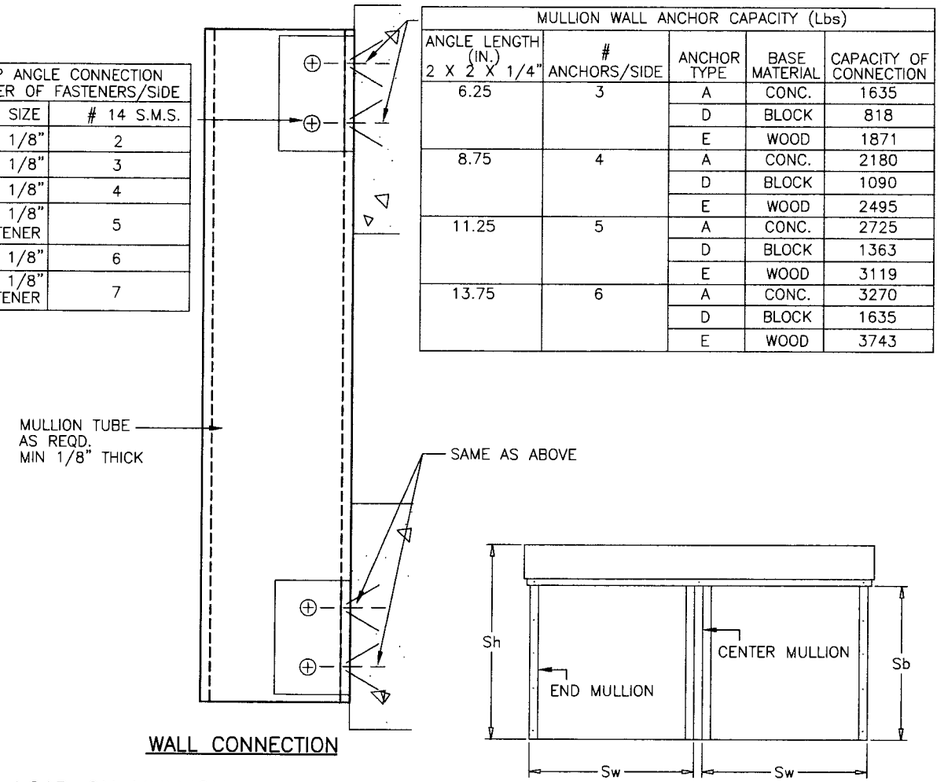
date: 07-22-94
scale: 1/2" = 1"
dr. by: HAMID
chk. by:

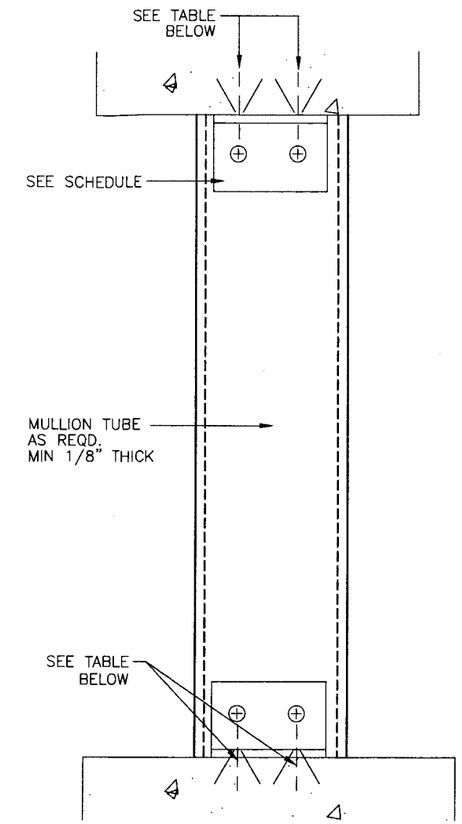
drawing no.
94-55

CLIP ANGLE CONNECTION NUMBER OF FASTENERS/SIDE	
MULLION SIZE	# 14 S.M.S.
2 X 2 X 1/8"	2
2 X 3 X 1/8"	3
2 X 4 X 1/8"	4
2 X 4 X 1/8" W/ STIFFENER	5
2 X 6 X 1/8"	6
2 X 6 X 1/8" W/ STIFFENER	7

MULLION WALL ANCHOR CAPACITY (Lbs)				
ANGLE LENGTH (IN.) 2 X 2 X 1/4"	# ANCHORS/SIDE	ANCHOR TYPE	BASE MATERIAL	CAPACITY OF CONNECTION
6.25	3	A	CONC.	1635
		D	BLOCK	818
		E	WOOD	1871
8.75	4	A	CONC.	2180
		D	BLOCK	1090
		E	WOOD	2495
11.25	5	A	CONC.	2725
		D	BLOCK	1363
		E	WOOD	3119
13.75	6	A	CONC.	3270
		D	BLOCK	1635
		E	WOOD	3743



WALL CONNECTION



SLAB CONNECTION

TOTAL LOAD ON MULLION

$P = \frac{Sh \times Sw}{4} Pd =$ Lbs (END MULLION)

$P = \frac{Sh \times Sw}{2} Pd =$ Lbs (CENTER MULLION)

LOAD AT ANCHOR

AT TOP = Pt = $\frac{P * Sb}{Sh}$ = Lbs

AT BOTTOM = Pb = P − Pt = Lbs

IF Pt OR Pb > ANCHOR CAPACITY OF FASTENER SHOWN
ANCHORAGE SYSTEM SHALL BE DESIGNED ON JOB TO JOB BASIS.

MULLION CONNECTION TO FLOOR & CEILING NO. OF FASTENERS REQD. EACH SIDE					
MULLION SIZE	FASTENER TYPE	TOP		BOTTOM	
		CONC.	WOOD	CONC.	WOOD
2 X 2 X 1/8" 2 X 3 X 1/8"	A	2	–	1	–
	B	4	–	3	–
	C	2	–	2	–
	E	–	3	–	2
2 X 4 X 1/8"	A	3	–	2	–
	B	7	–	5	–
	C	4	–	3	–
	E	–	5	–	3
2 X 4 X 1/8" W/ STIFFENER	1/2" ø KWIK BOLT	1	–	1	–
2 X 6 X 1/8" 2 X 6 X 1/8" W/ STIFFENER	1/2" ø KWIK BOLT	2	–	1	–

ANCHOR DESCRIPTION:

ANCHOR (A) = 1/4" DIA. TAPCONS
1-3/4" EMBEDMENT INTO 3000 PSI CONC.
1-1/4" EMBEDMENT INTO C-90 BLOCK

ANCHOR (B) = #14 SMS W/ RAWL SCRU-LEAD
1-1/2" EMBEDMENT INTO 3000 PSI CONC.

ANCHOR (C) = 1/4" ZAMAC NAILIN ANCHORS
1-1/4" EMBEDMENT INTO 3000 PSI CONC.
OR C-90 BLOCK

ANCHOR (D) = 1/4" RAWL CALK-IN ANCHOR
TOTAL ANCHOR BODY INTO 3000 PSI CONC.
OR C-90 BLOCK

ANCHOR (E) = 1/4" DIA. TAPCONS
1-1/2" MIN PENETRATION INTO WOOD (S.G.=0.55)

NOTE: ANCHORS EMBEDMENT SHOWN IS BEYOND WALL & FLOOR COVERINGS (STUCCO, TILES, ETC.)

PRODUCT REVISED
Approved for use with the Florida
06-0213.01
09/25/08
Wind Load Product Control
Florida

Engr: DR. HUMAYOUN FAROOQ
STRUCTURES
FLA. PE # 16557
C.A.N. 3538

JAN 31 2006

ALL DIMENSIONS SHOWN Sh, Sw, Sb ETC. ARE IN FEET.

AL-FAROOQ CORPORATION
ENGINEERS, PLANNERS & PRODUCT DESIGN
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ROLLUP\94-55RI

MULLION & BOX DETAILS

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550 ANSIN BOULEVARD
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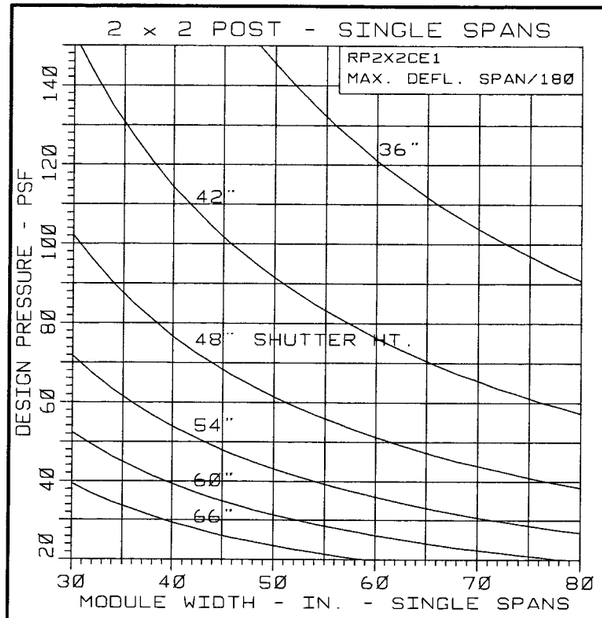
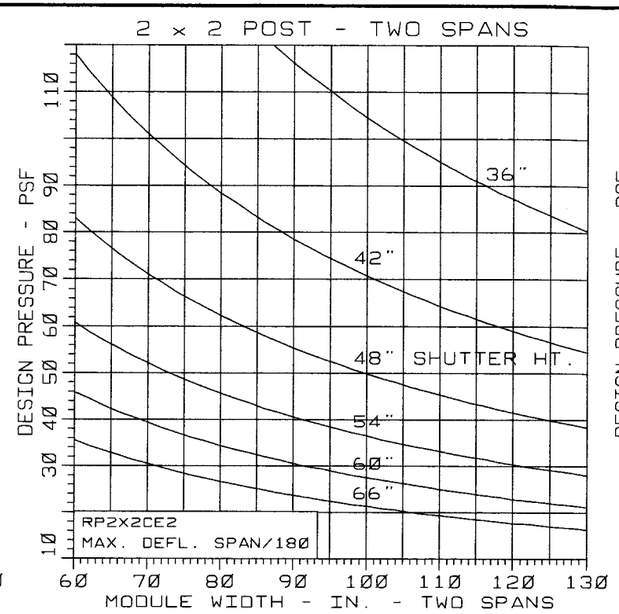
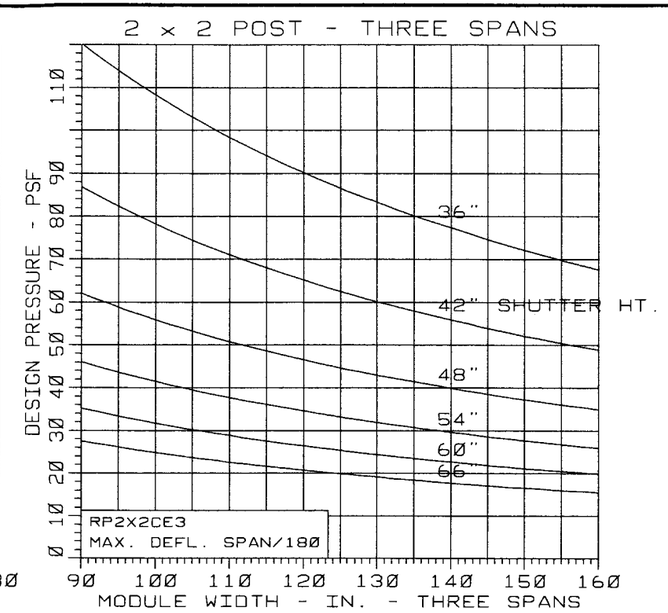
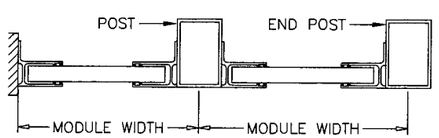
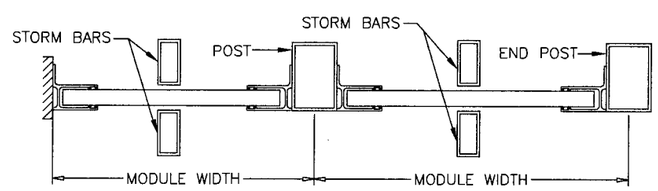




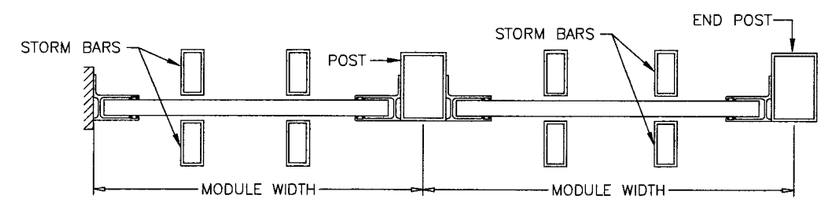




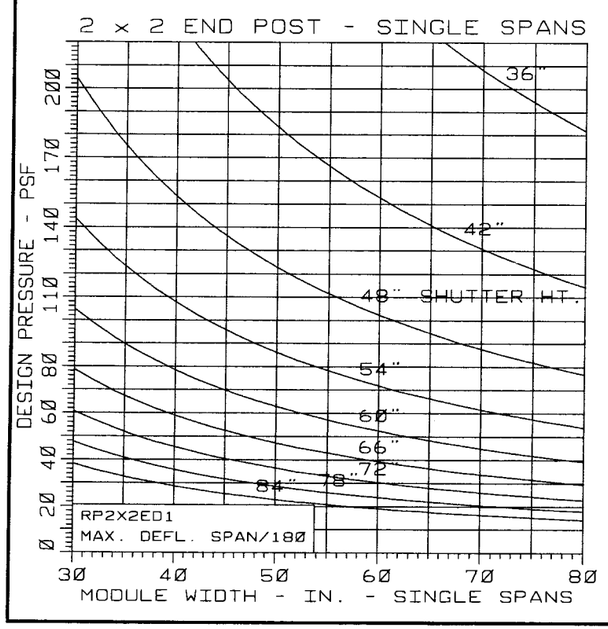
SINGLE SPANS

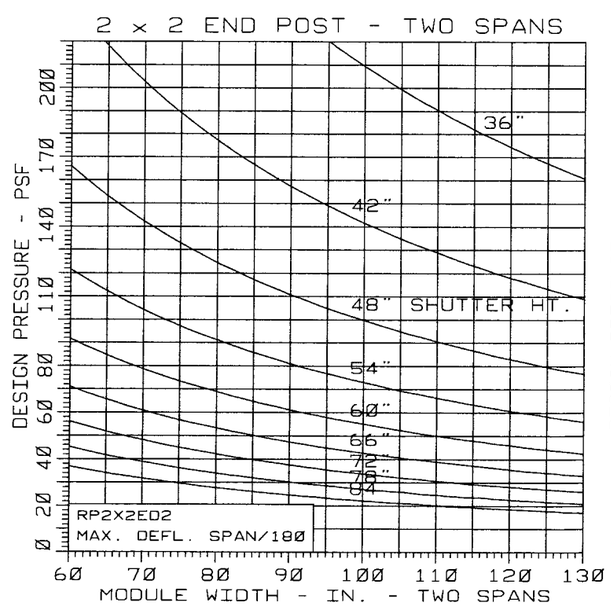


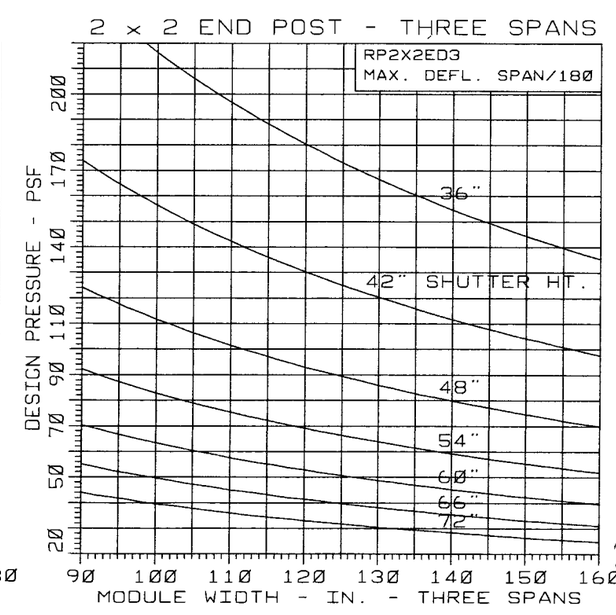
TWO SPANS



THREE SPANS







PRODUCT APPROVED
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09/22/08
By
Miami-Dade Product Control Division

Engr: DR. HUMAYOUN FAROOQ
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FLA. PE # 16557
C.A.N. 3538

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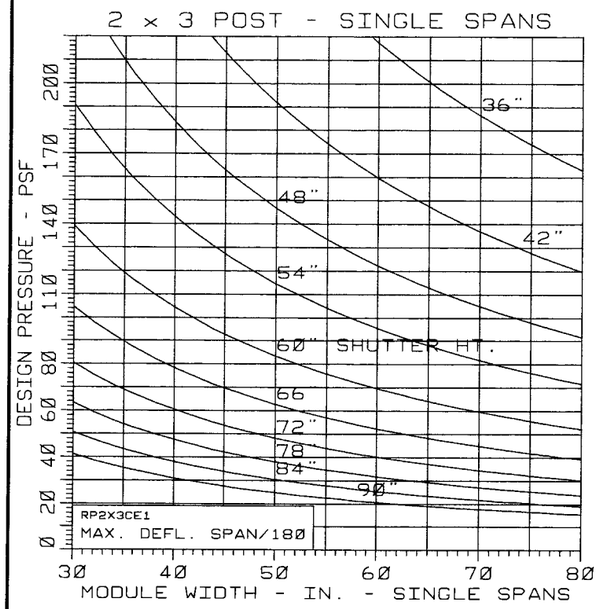

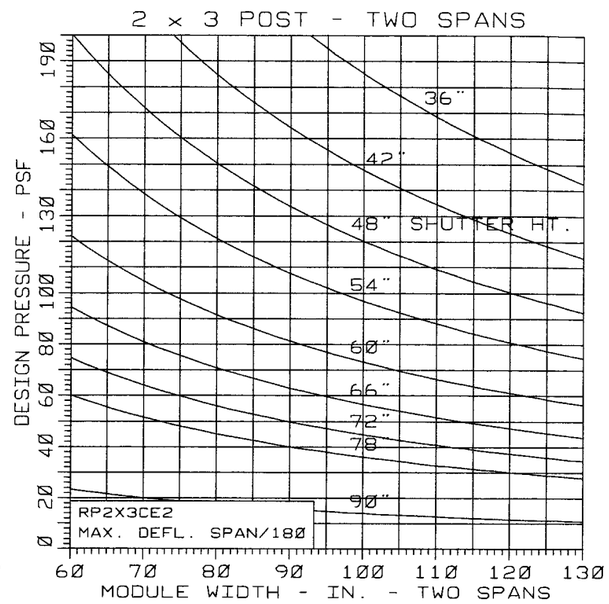

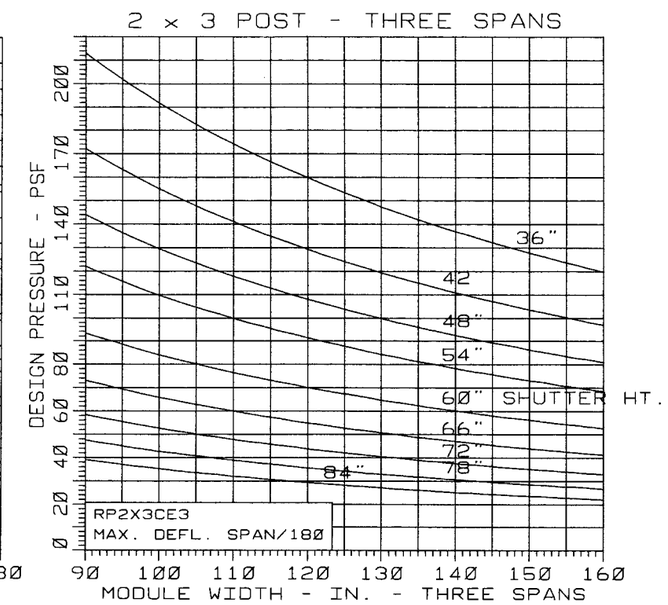

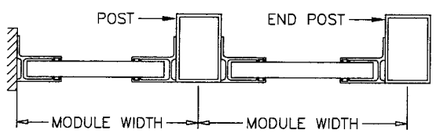

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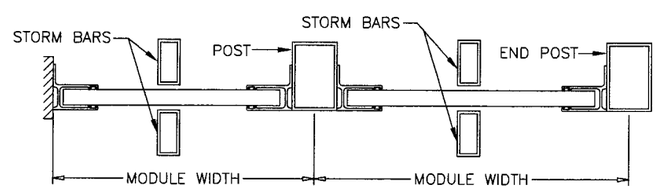

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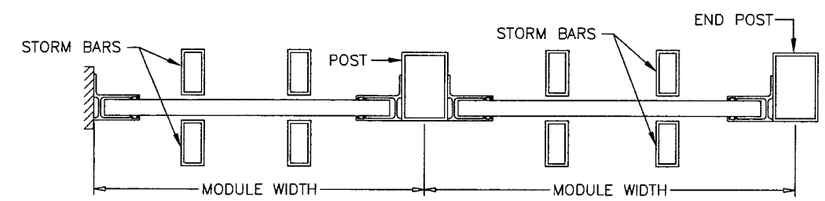

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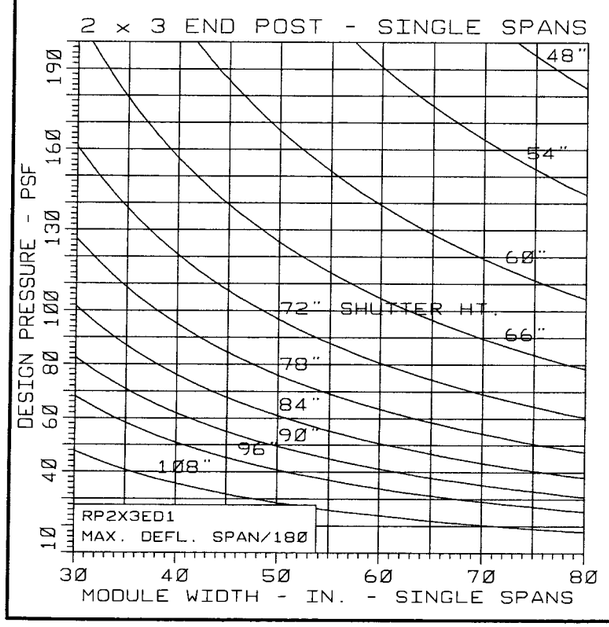

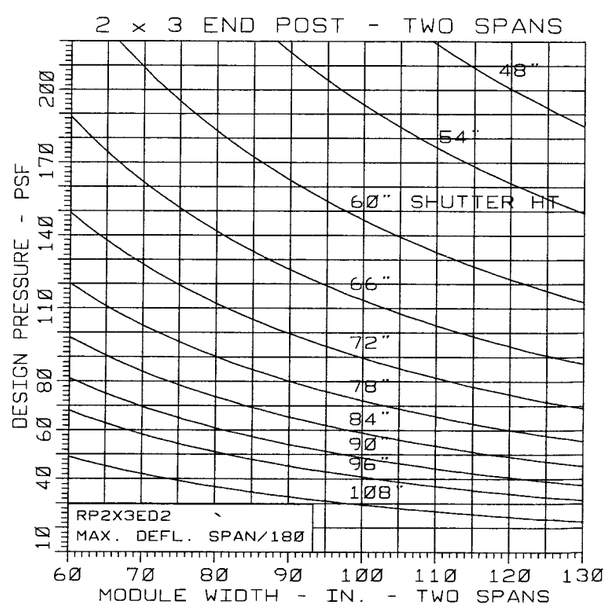

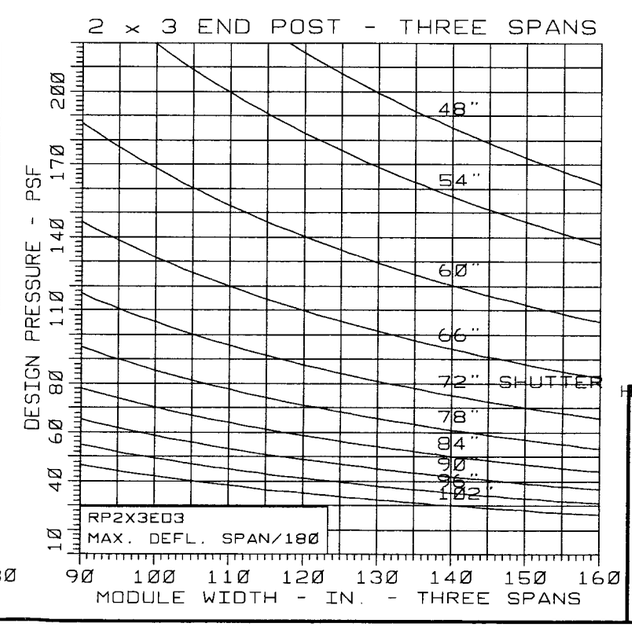

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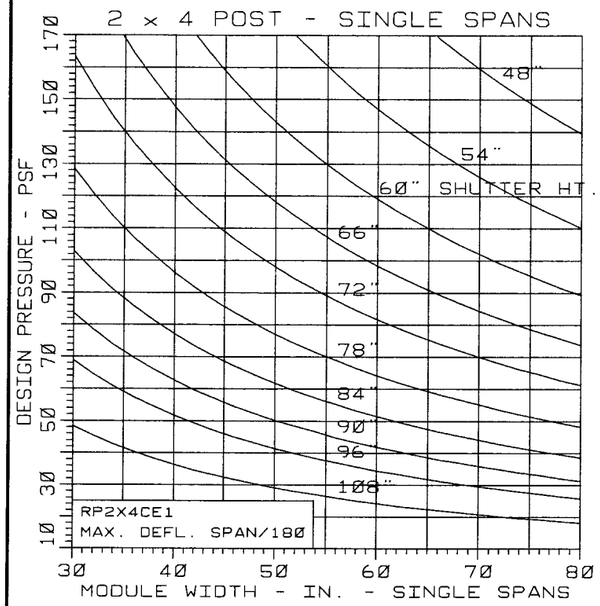

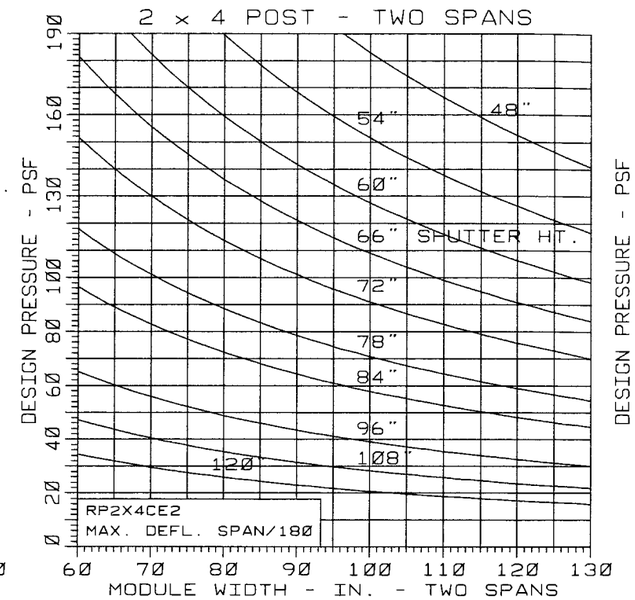

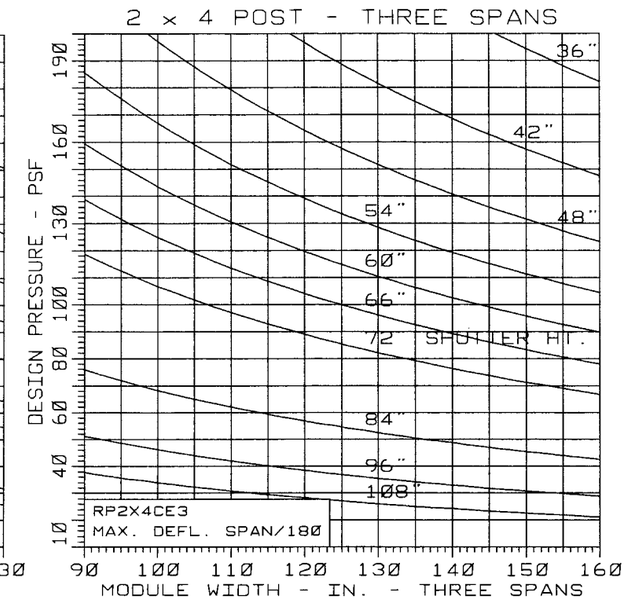

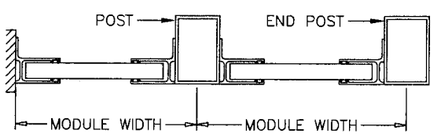

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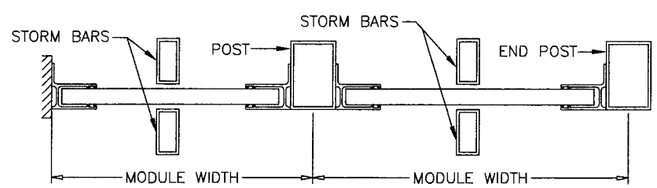

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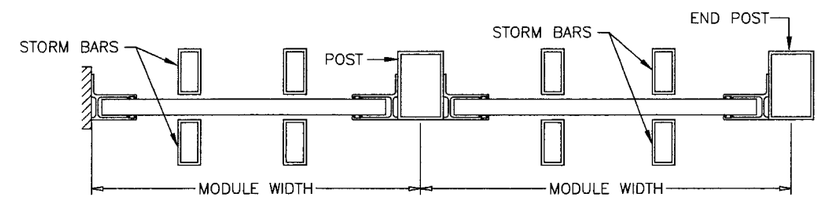

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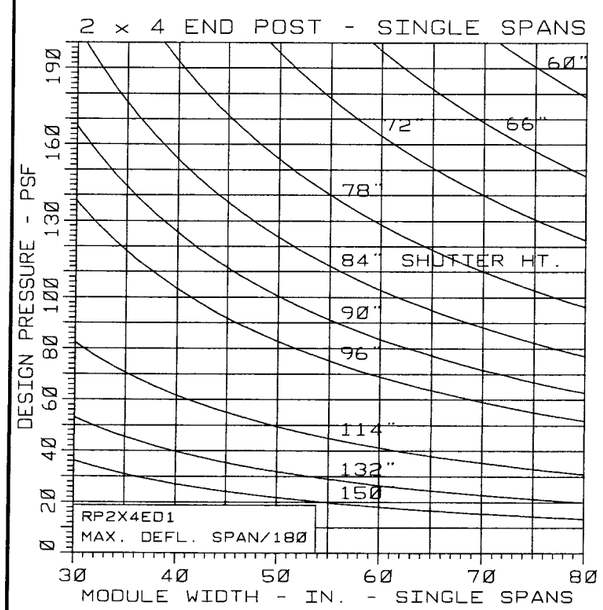

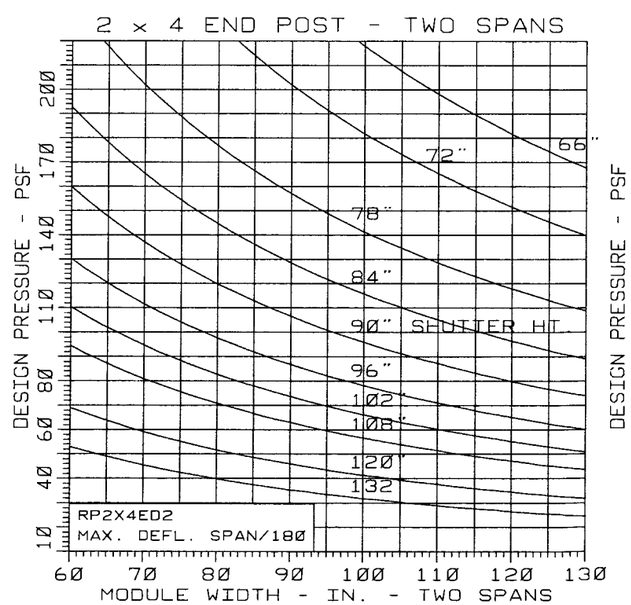

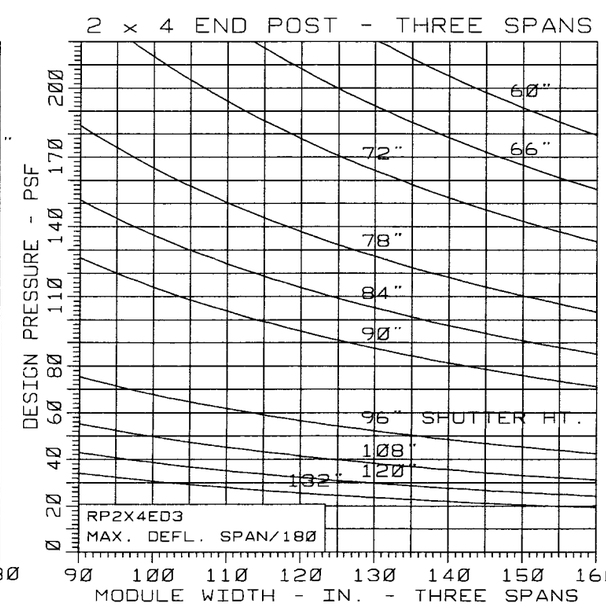

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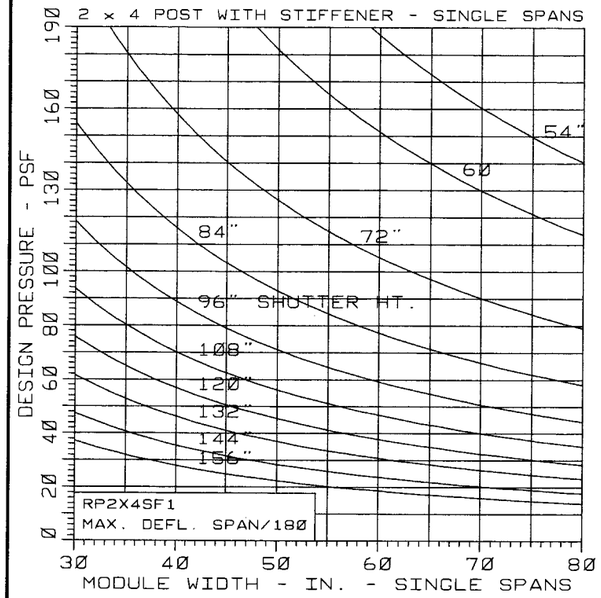

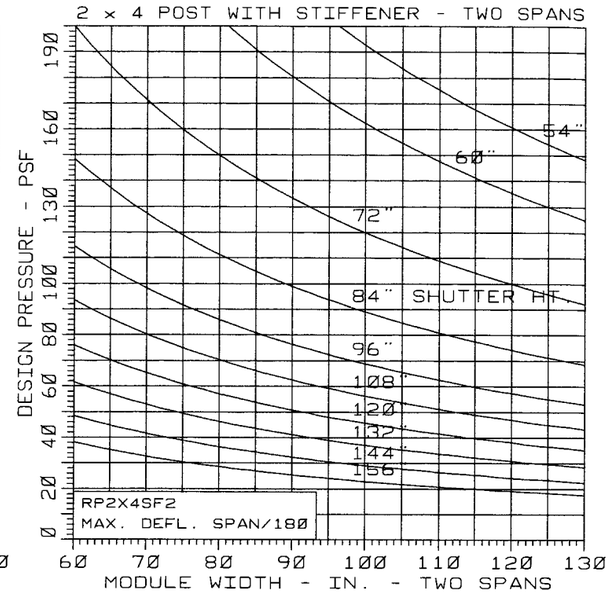

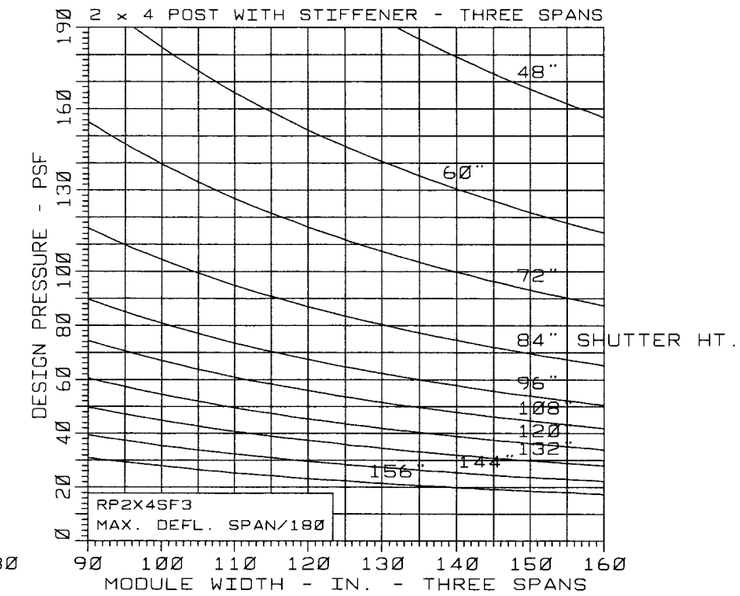

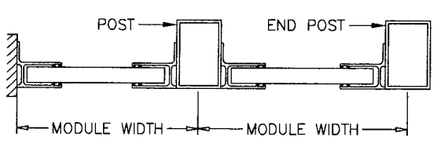

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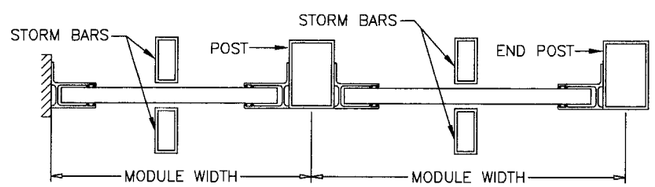

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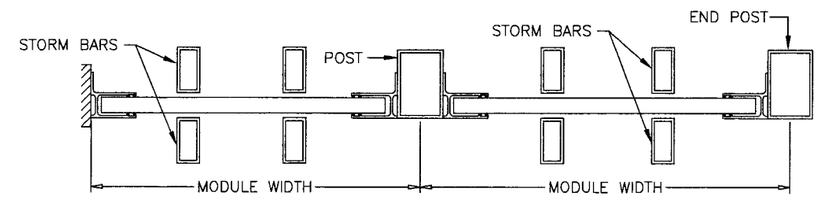

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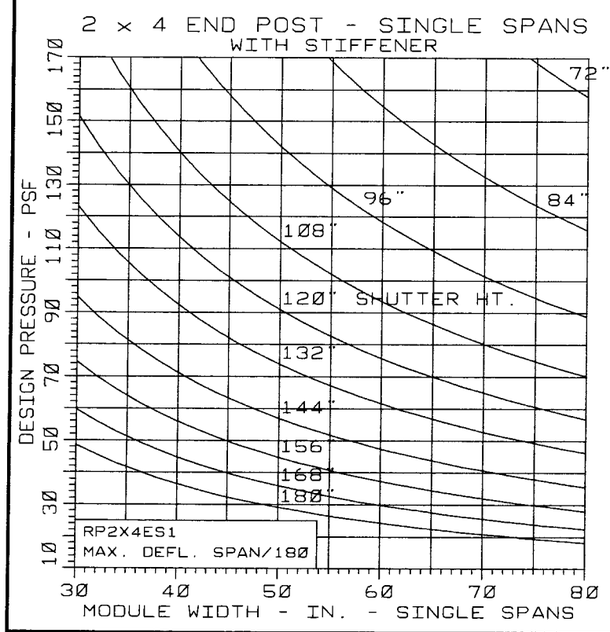

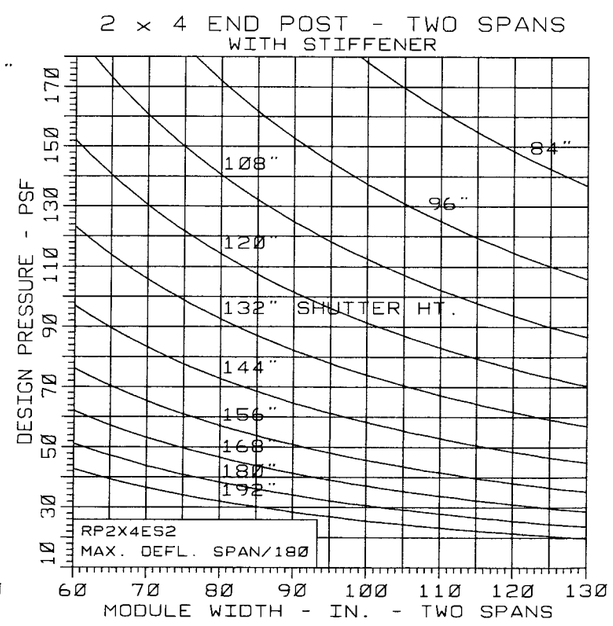

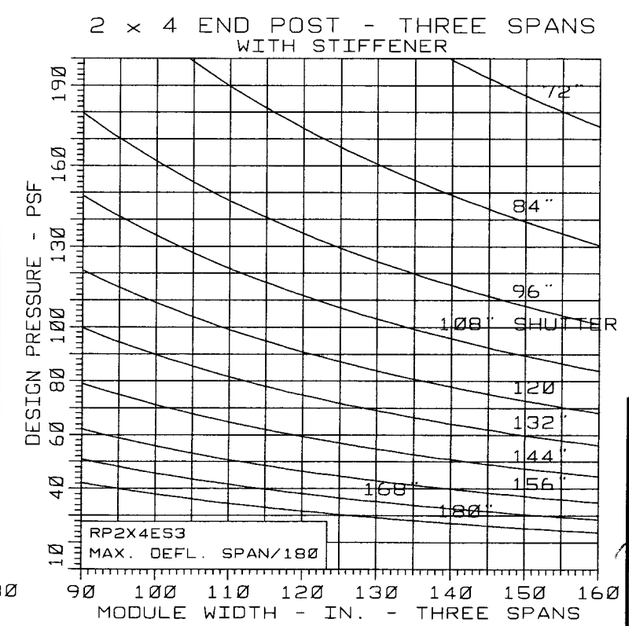

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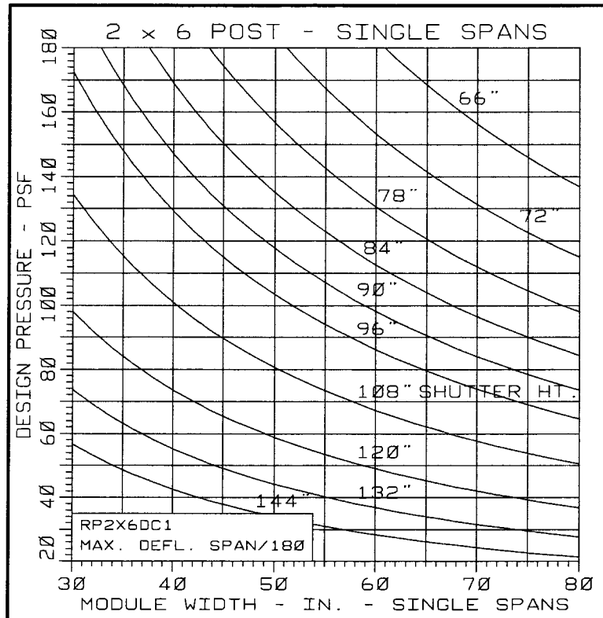

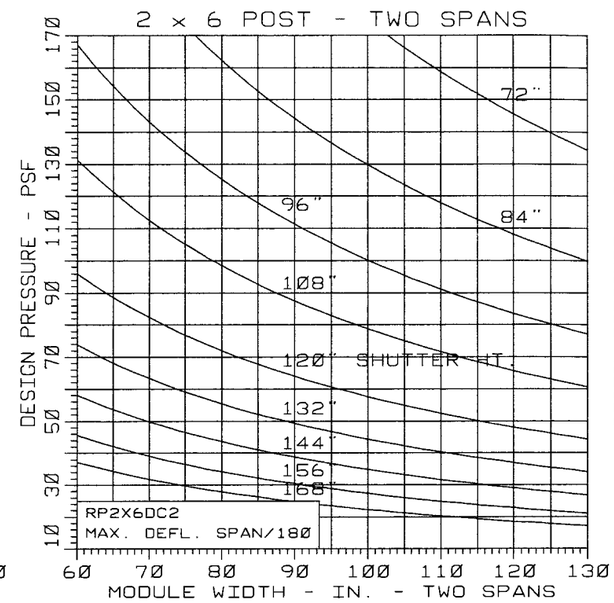

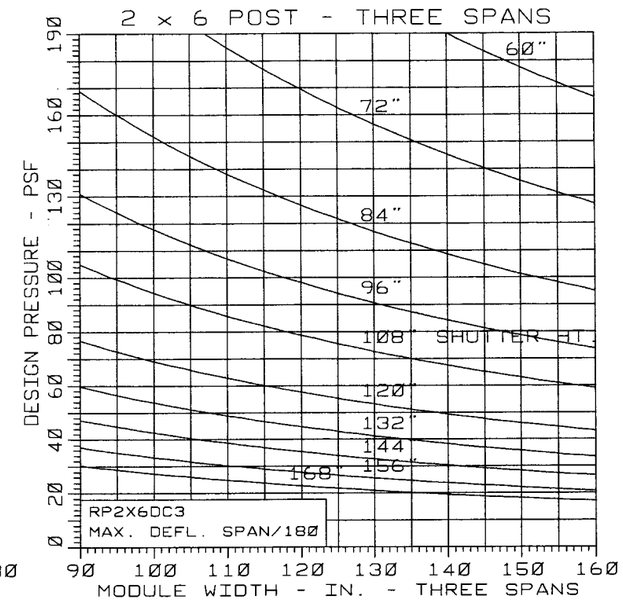

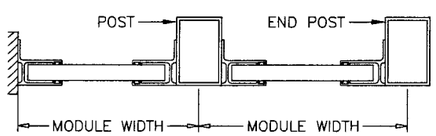

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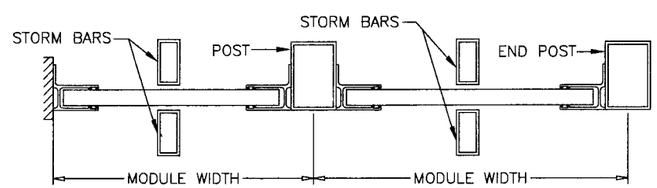

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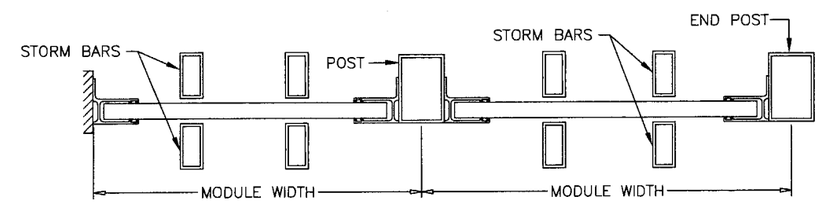

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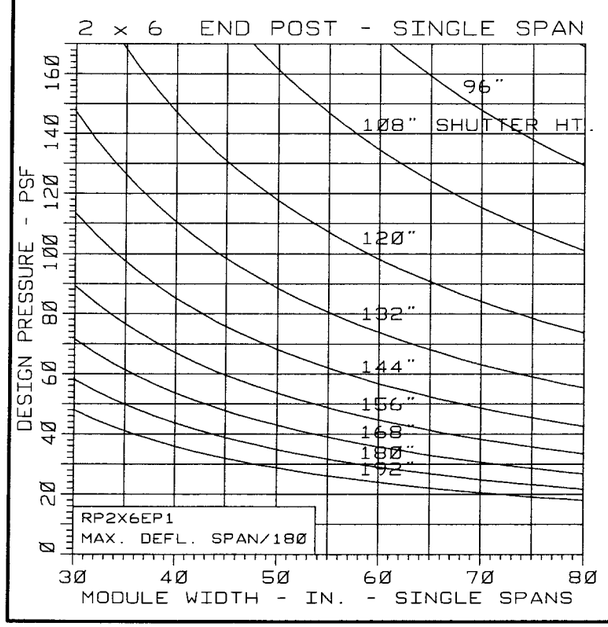

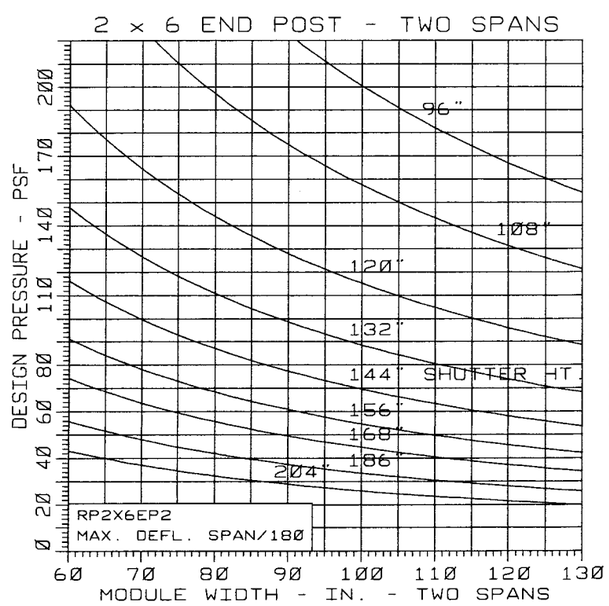

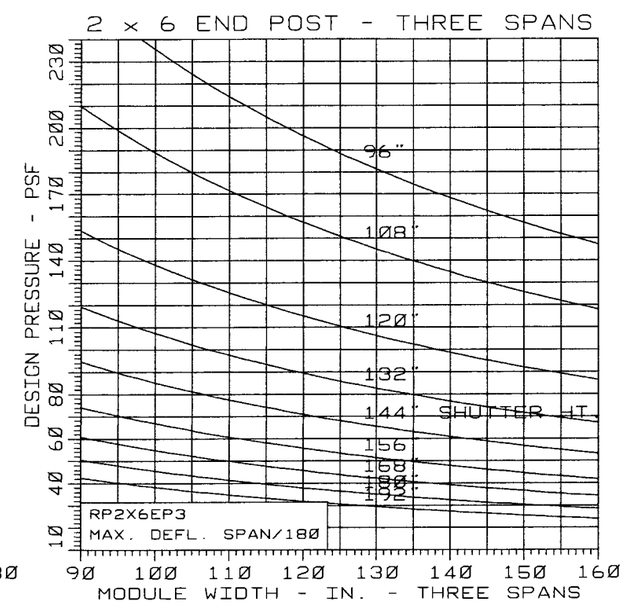

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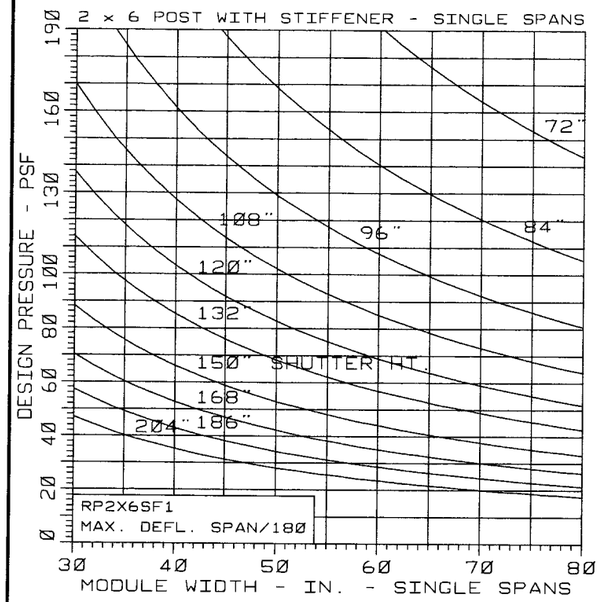

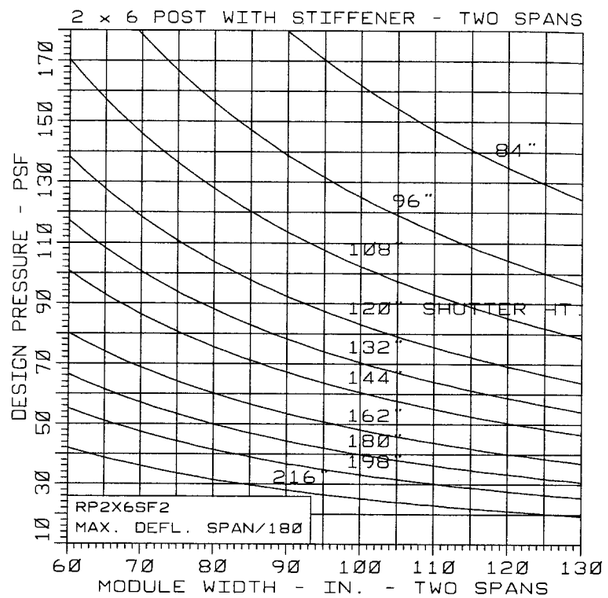

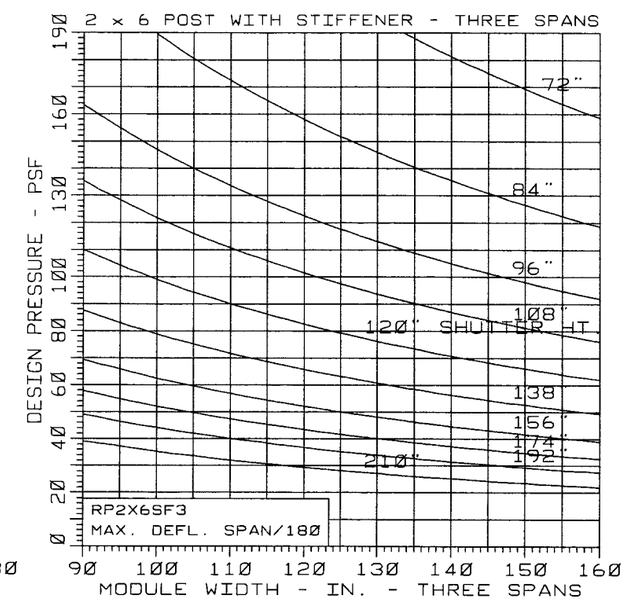

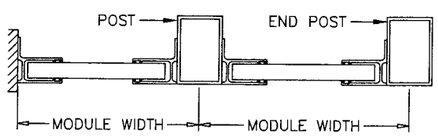

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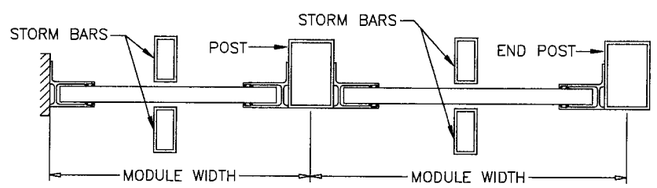

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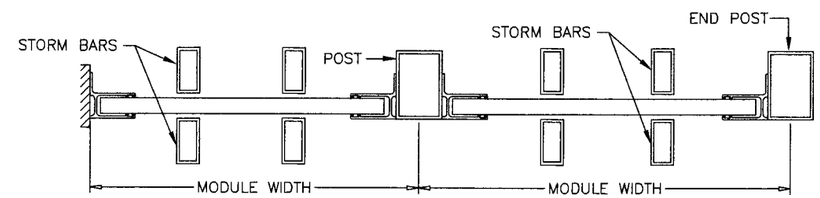

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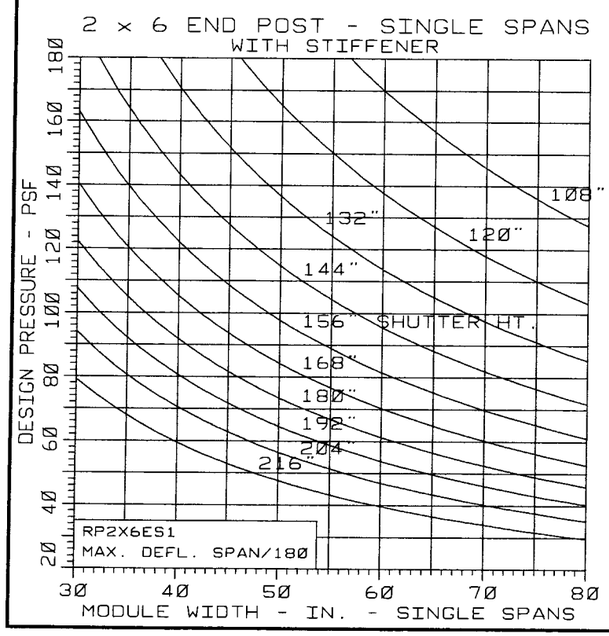

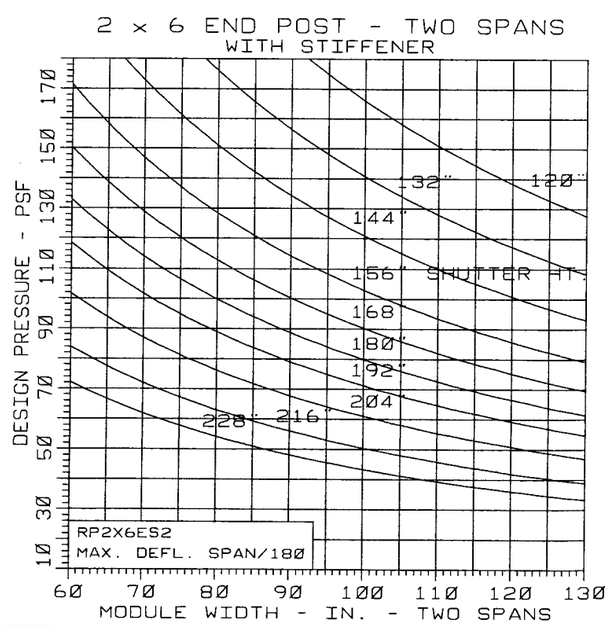

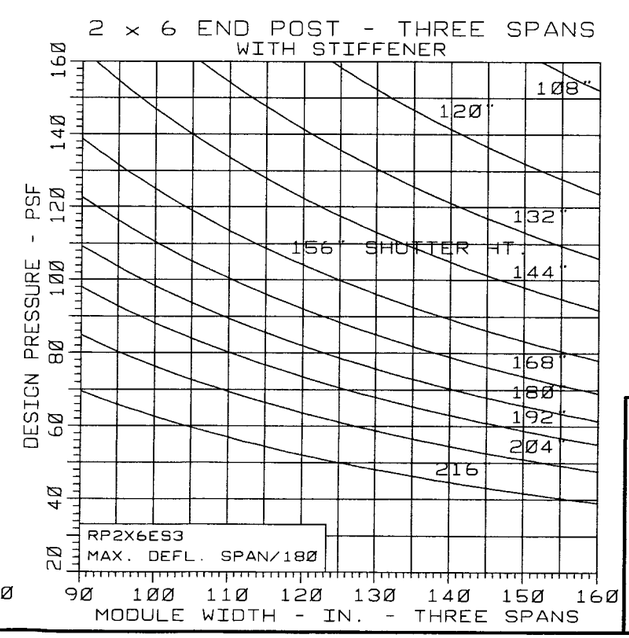

Engr: DR. HUMAYOUN FAROOQ
STRUCTURES
FLA. PE # 16557
C.A.N. 3538

JAN 31 2006

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ENGINEERS, PLANNERS & PRODUCT DESIGN
1235 SW 87 AVE
MIAMI, FLORIDA 33174
TEL. (305) 264-8100 FAX. (305) 262-6978

ROLLUP\94-55RI

POST LOADING CHARTS

ROLLADEN INC.
550 ANSIN BOULEVARD
HALLANDALE, FL. 33009
(305) 757 - 8591

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chk. by:

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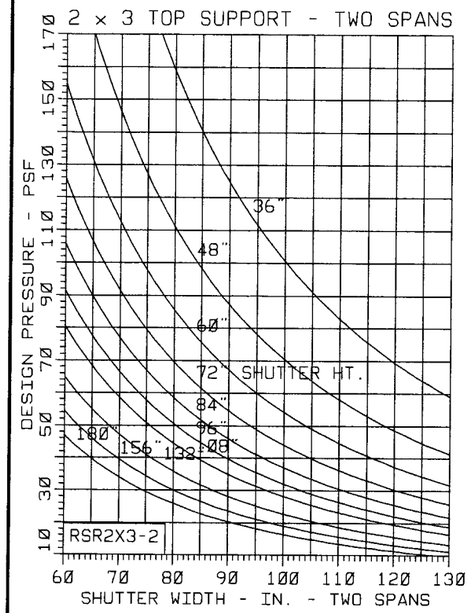

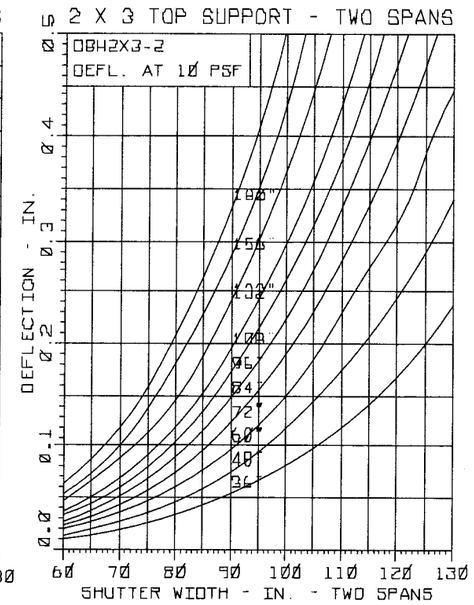

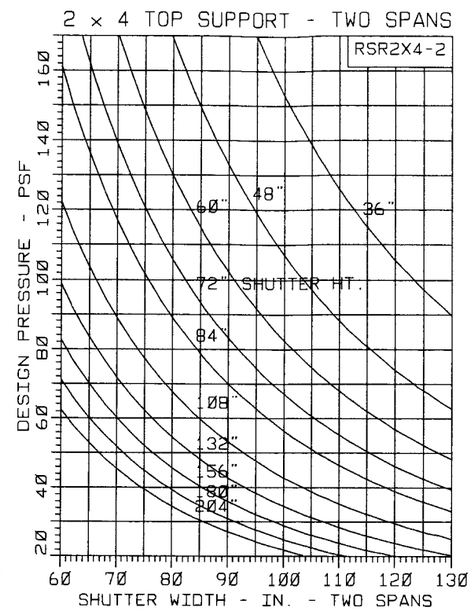

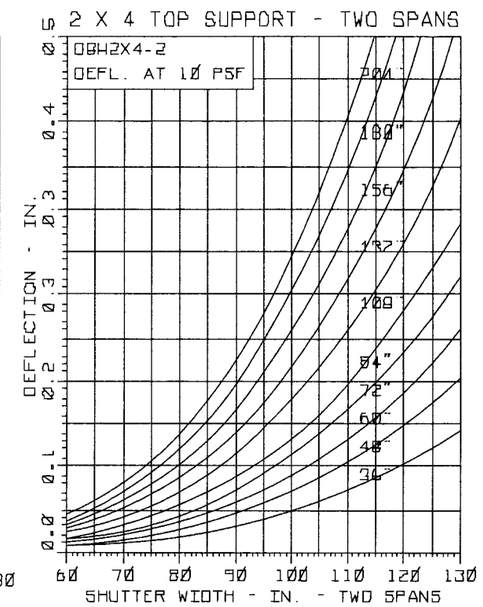

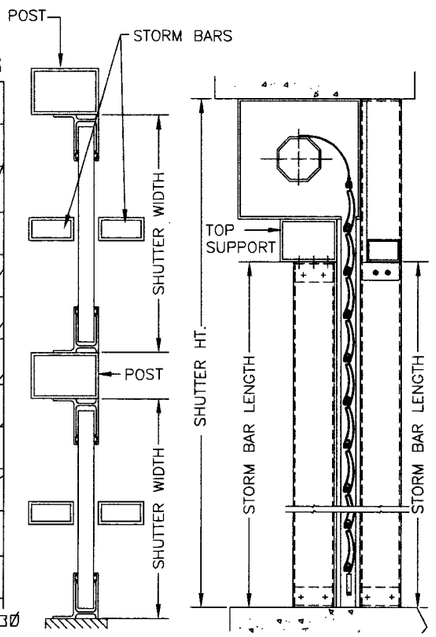

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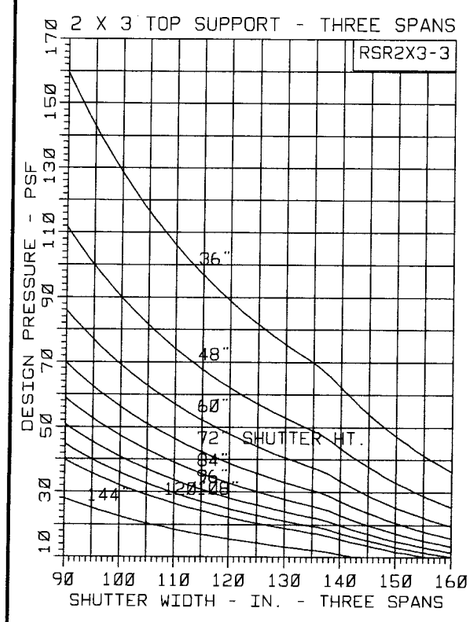

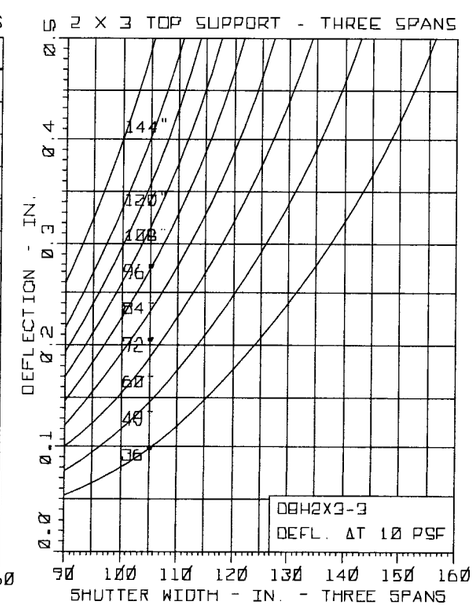

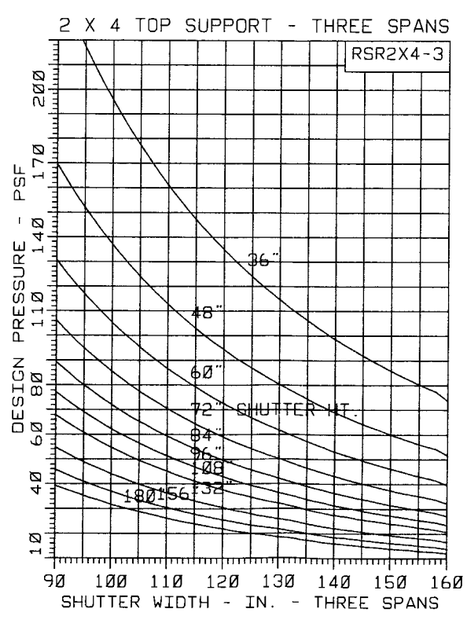

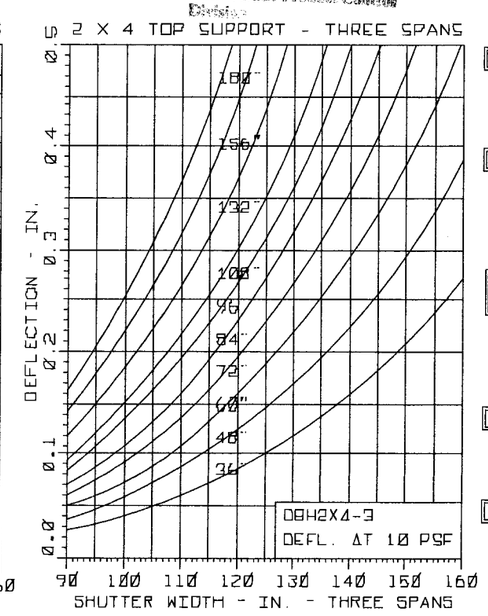

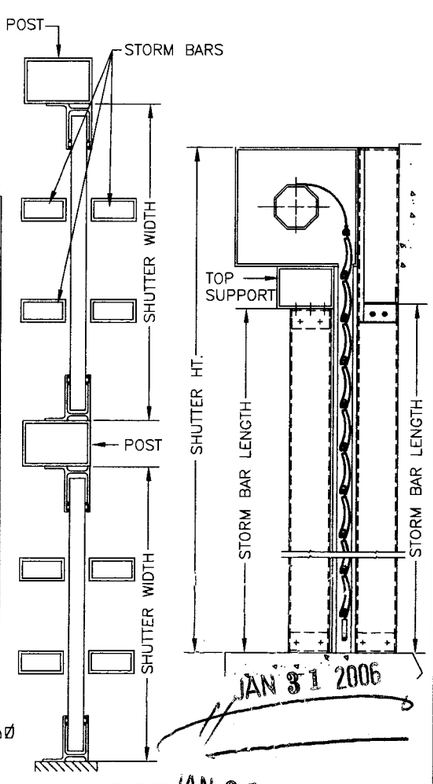

THREE SPANS

PRODUCT CONTROL
Building Code Compliance Office
Date Out
Approved
Approved as Noted
Disapproved
By
Miami-Dade Product Control Division
06-021301
09/25/06
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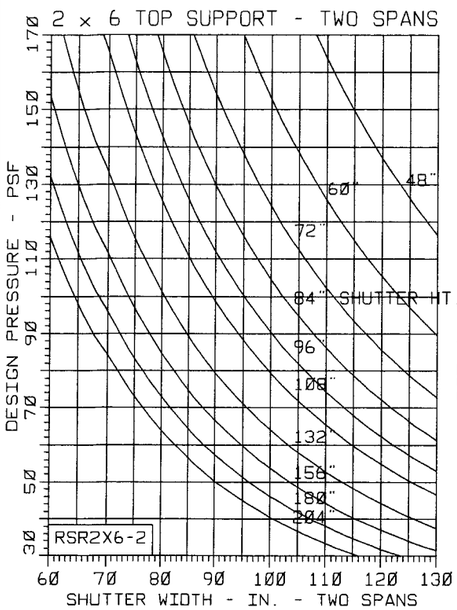

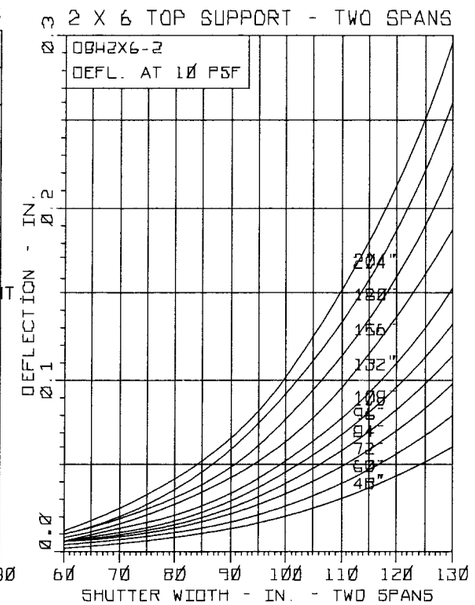

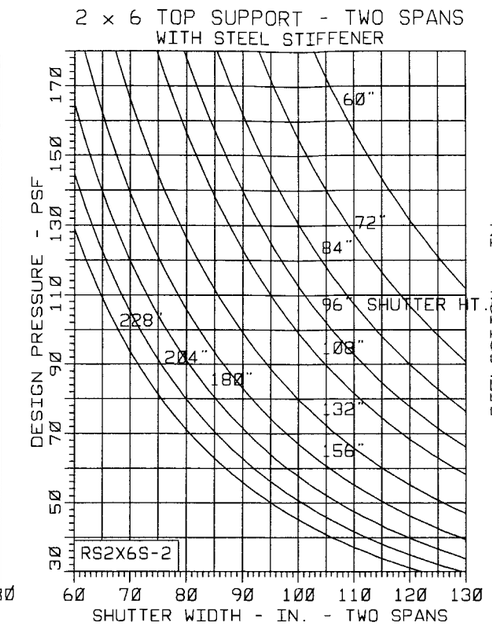

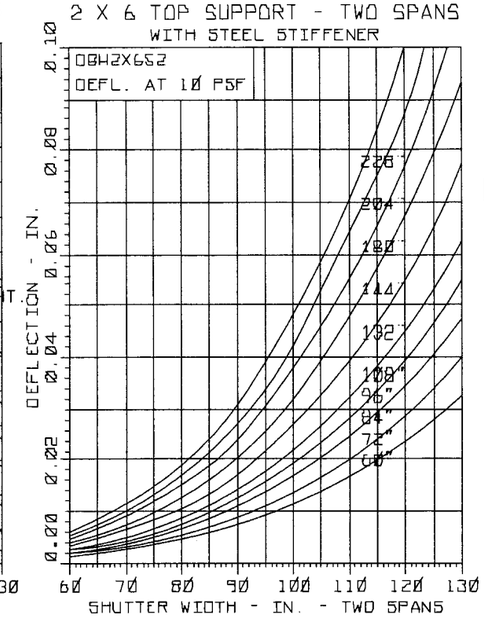

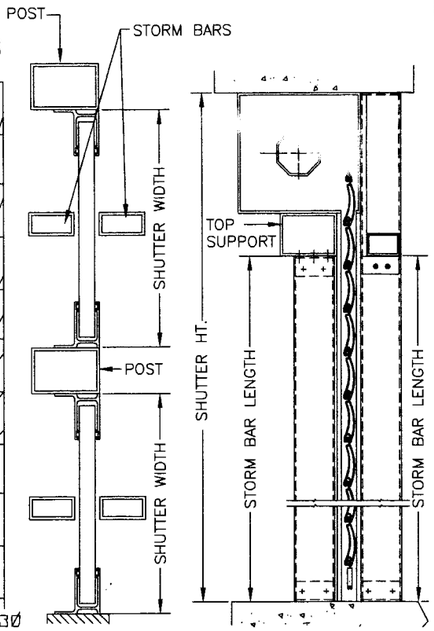

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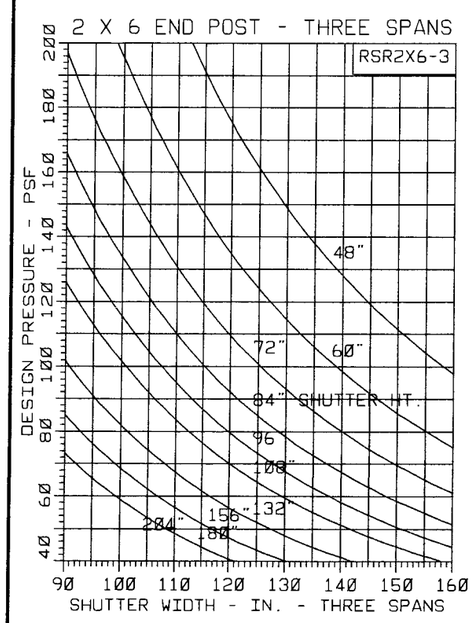

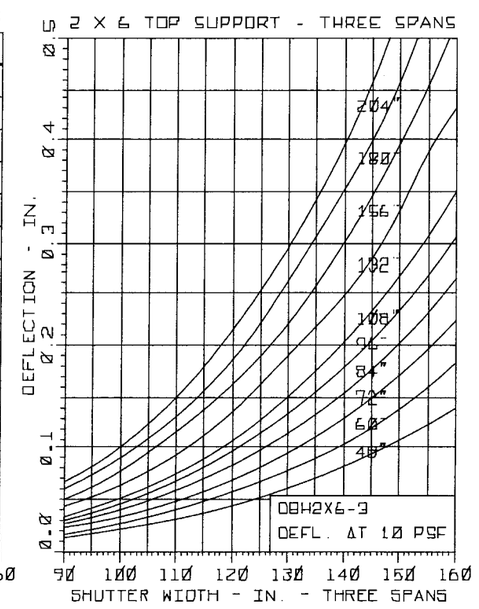

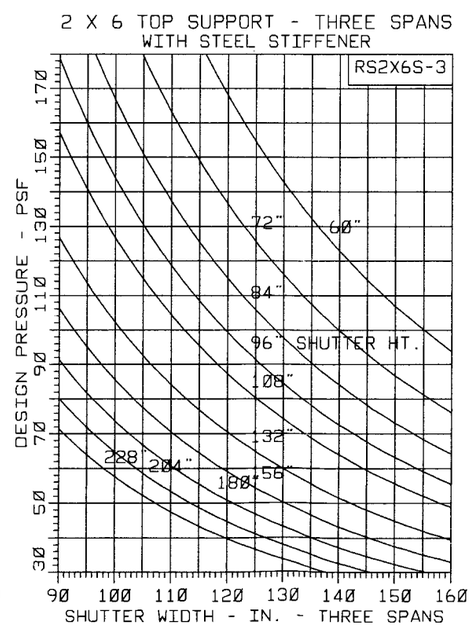

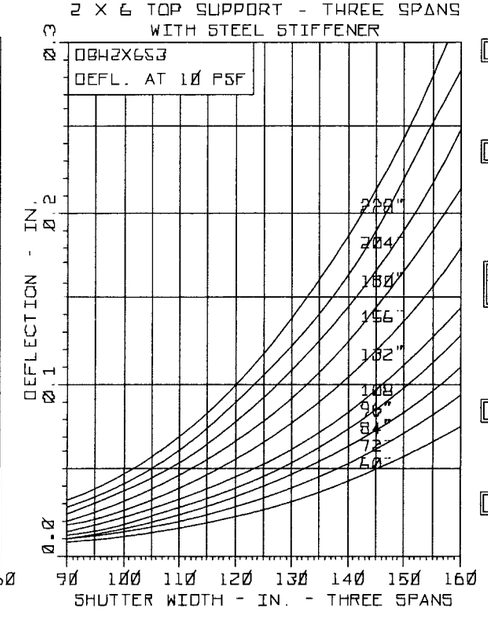

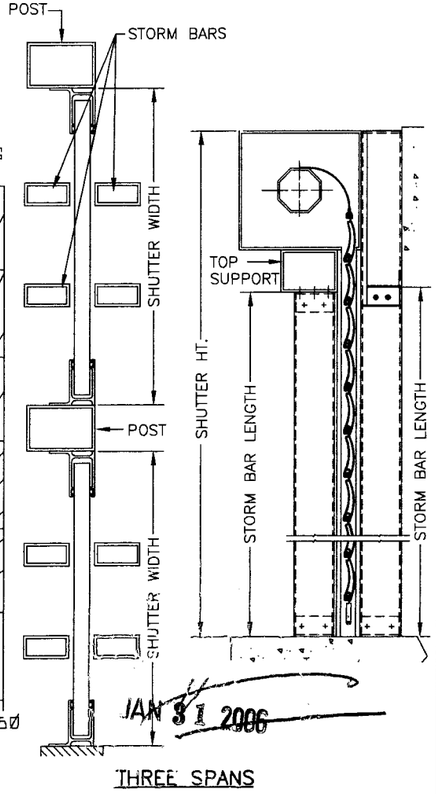

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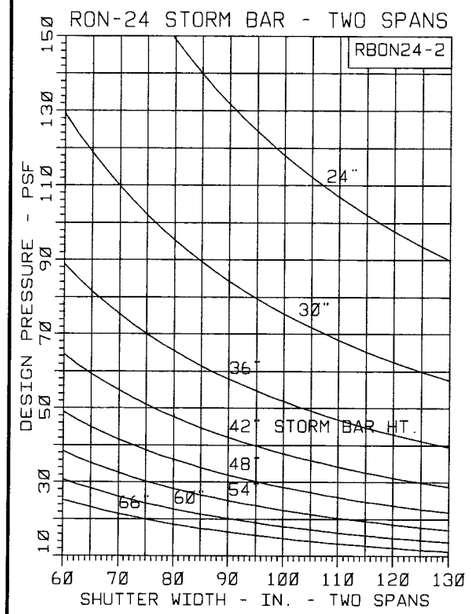

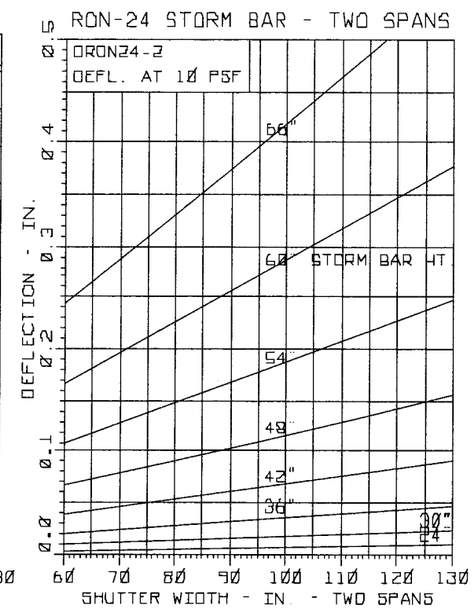

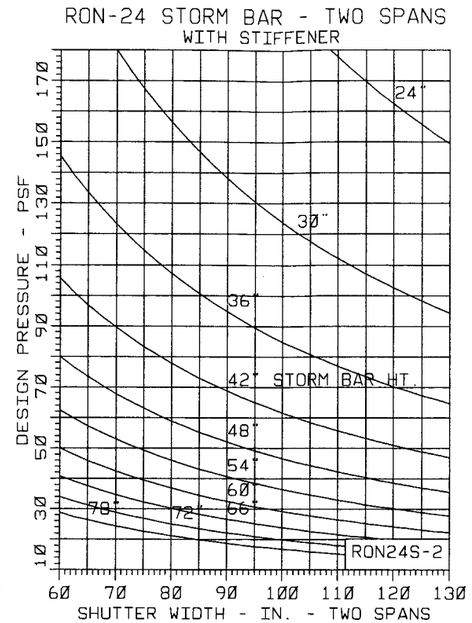

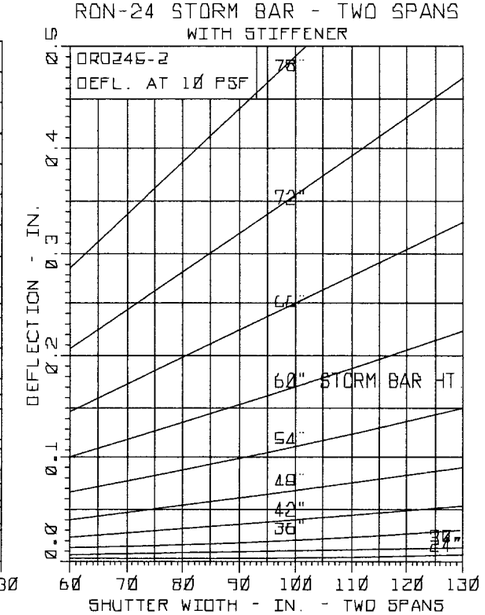

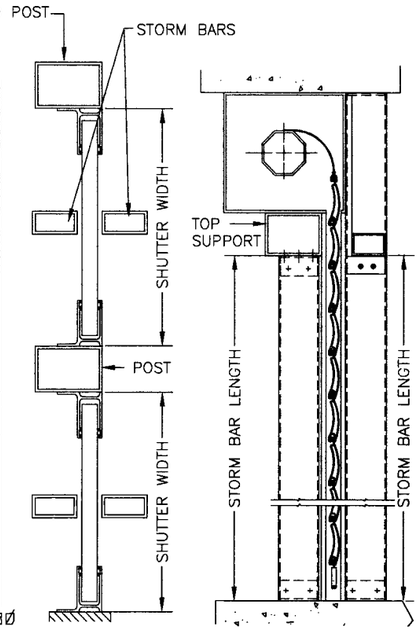

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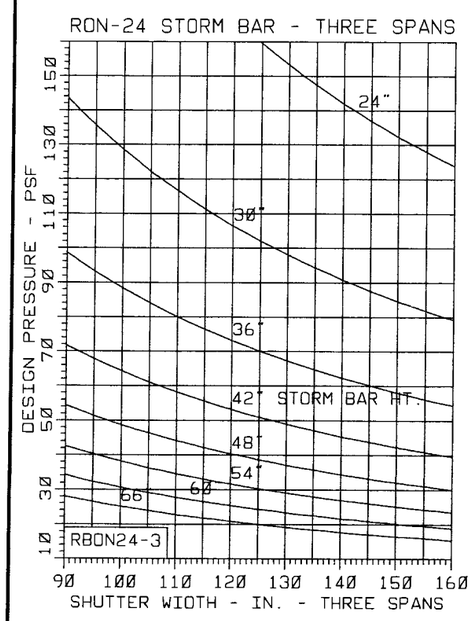

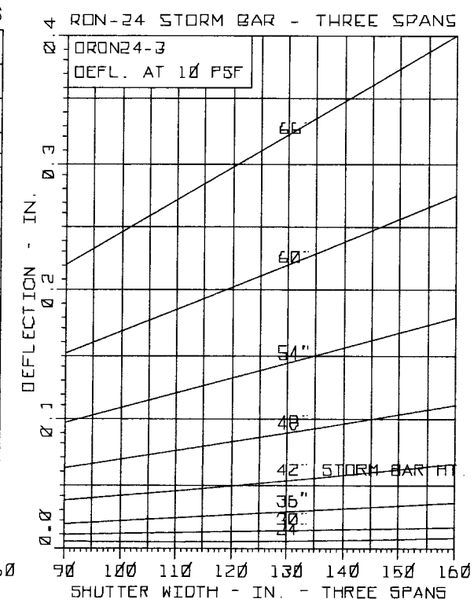

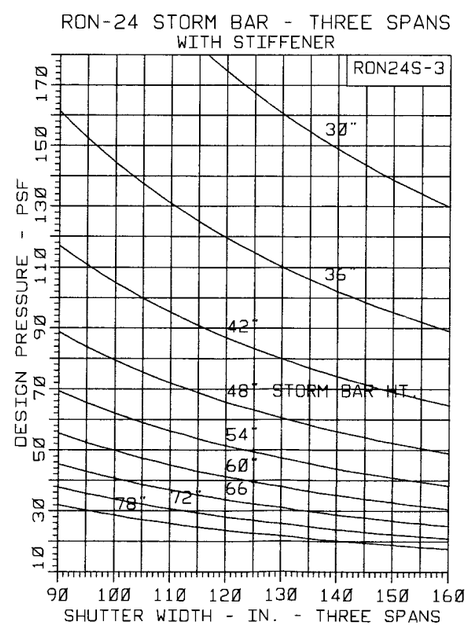

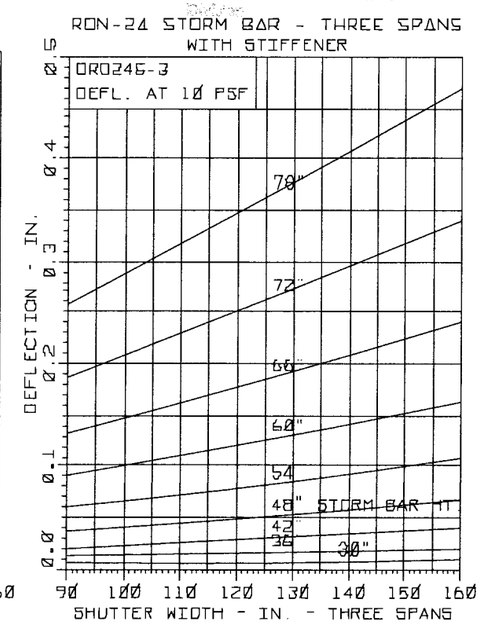

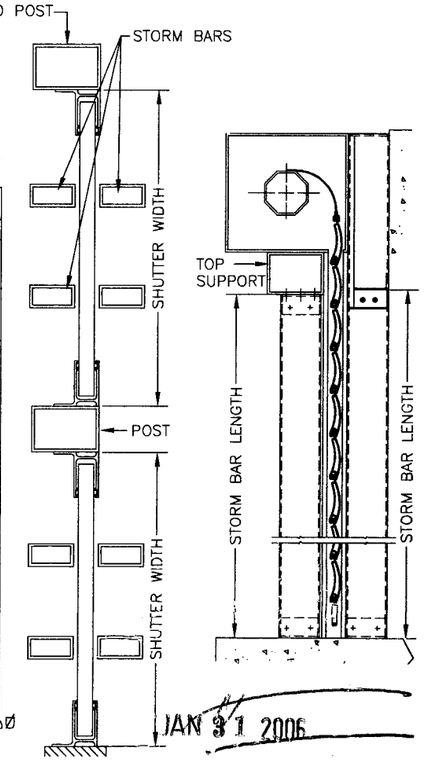

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ROLLUP\94-55R1

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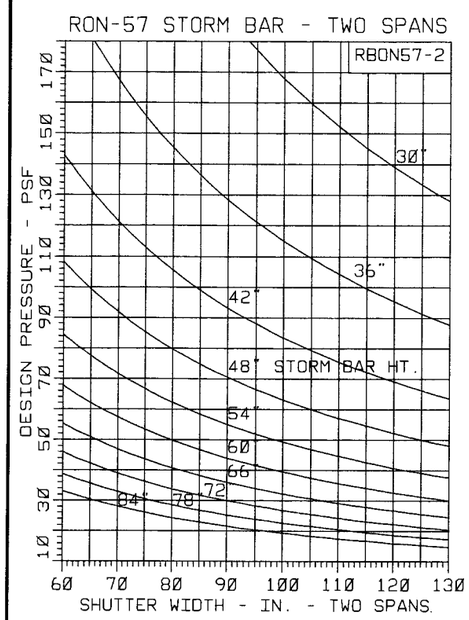

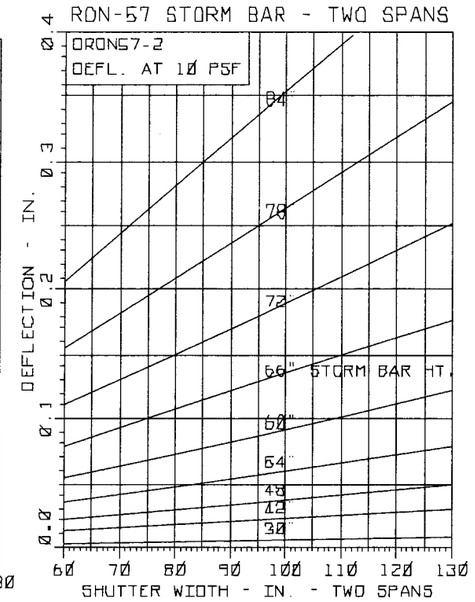

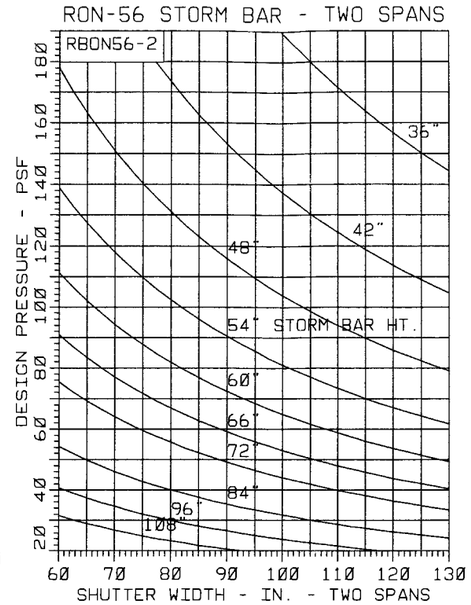

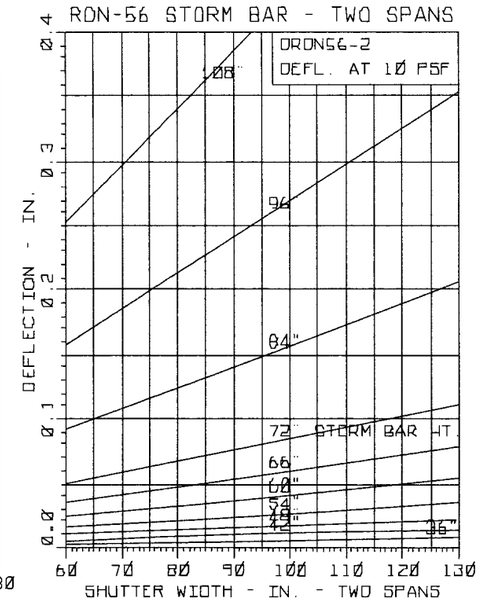

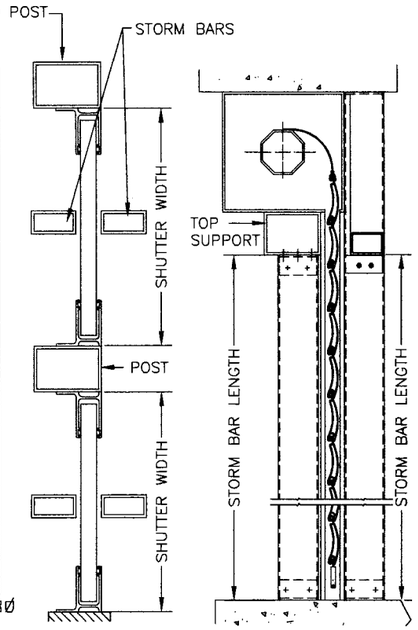

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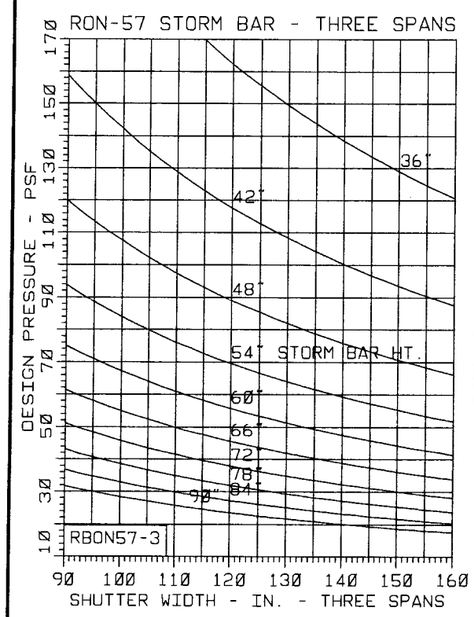

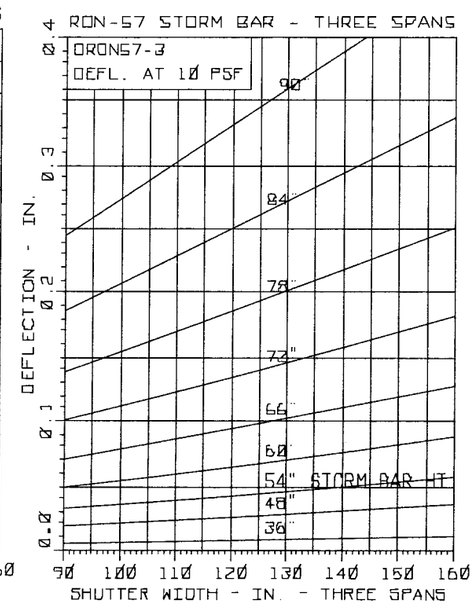

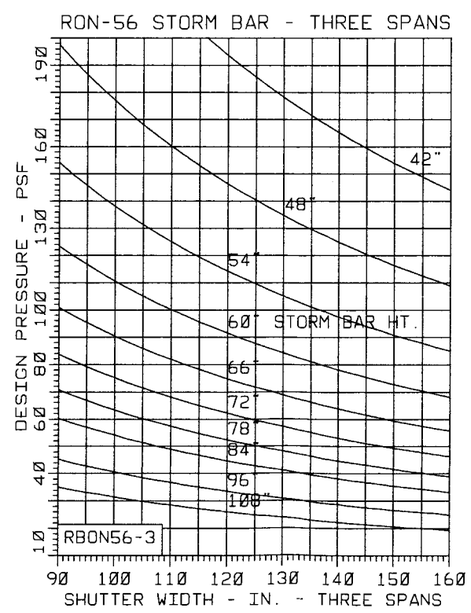

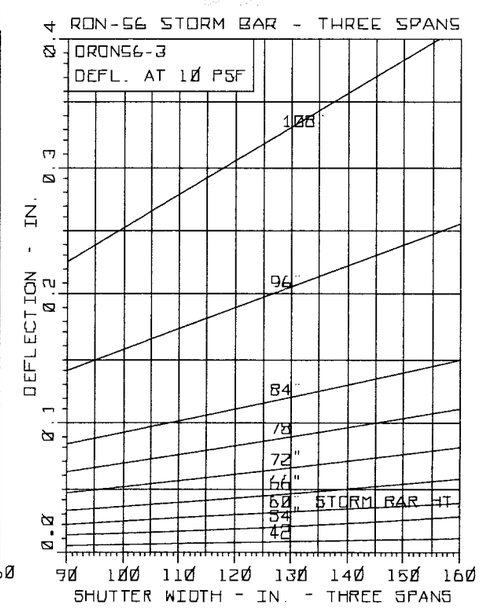

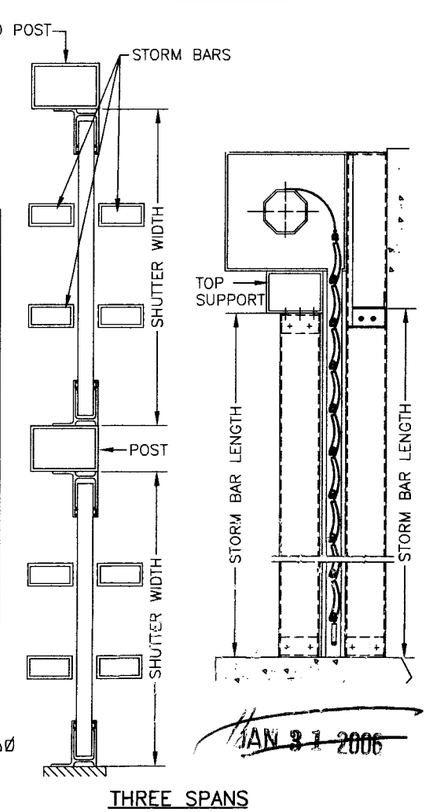

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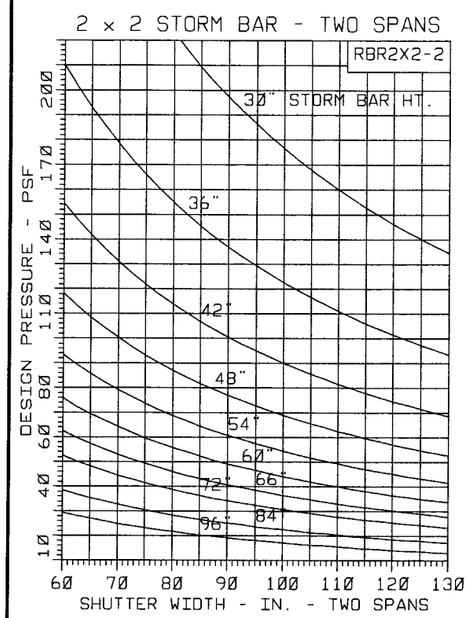

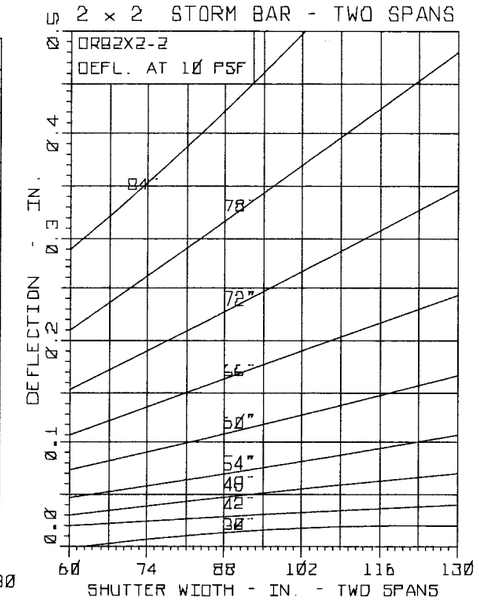

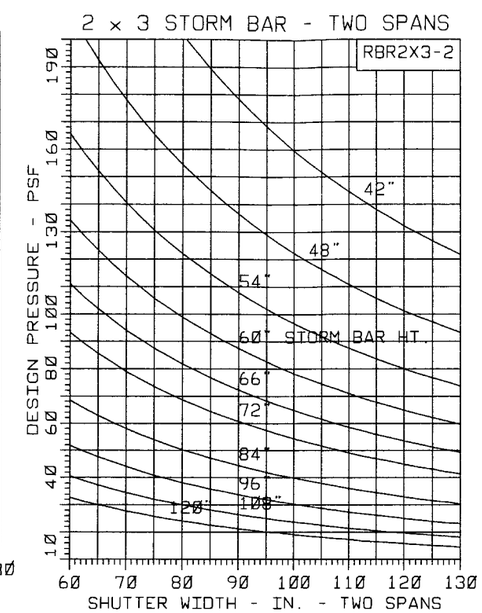

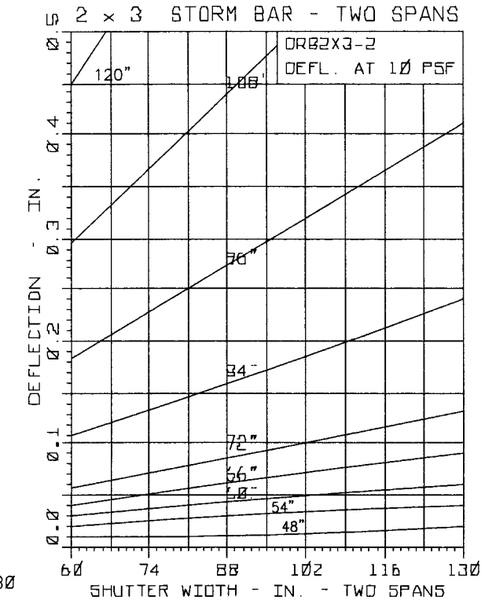

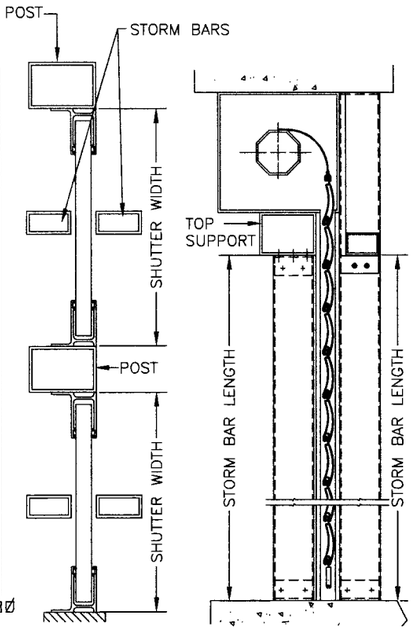

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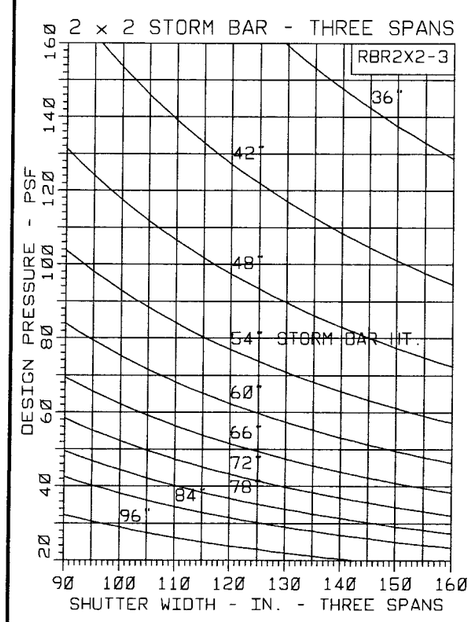

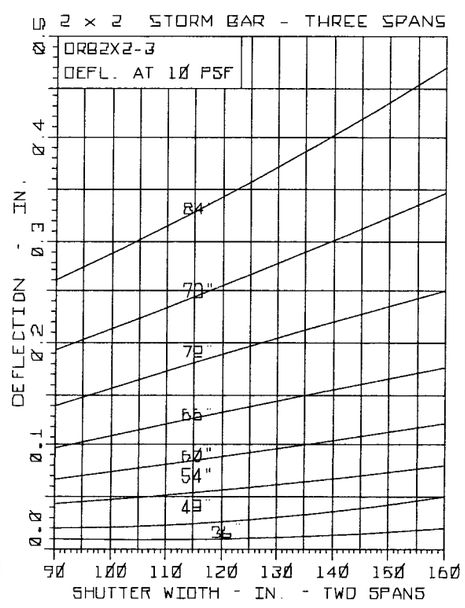

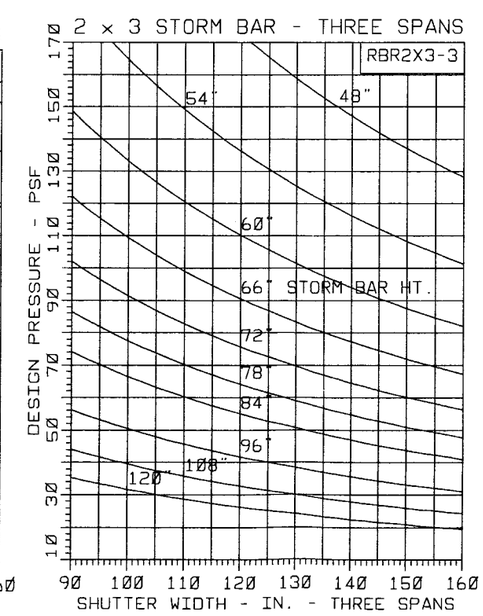

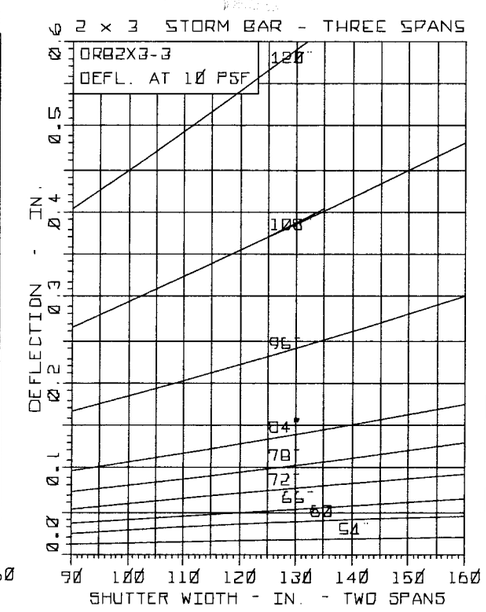

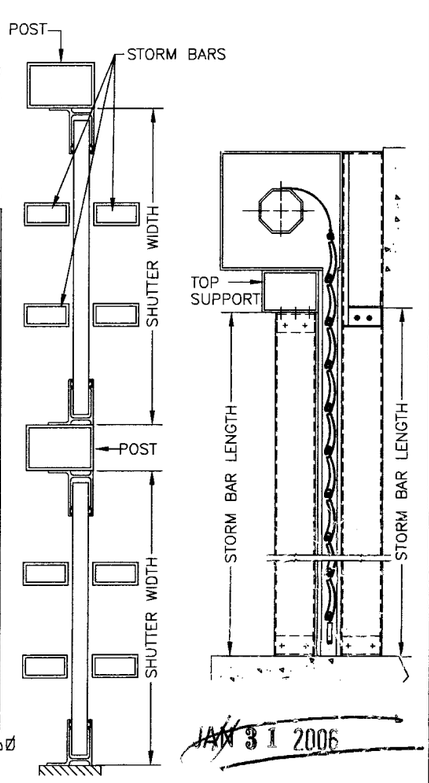

THREE SPANS

06-0213.01
09/25/08

JAN 31 2006

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Engr: DR. H. FAROOQ PE # 16557 ROLLUP\94-55RI

STORM BAR LOADING CHARTS

ROLLADEN INC.
550 ANSIN BOULEVARD
HALLANDALE, FL. 33009
(305) 757 - 8591

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dr. by: HAMID
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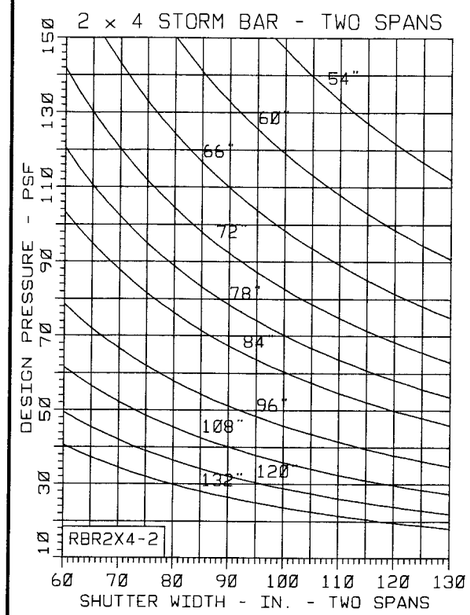
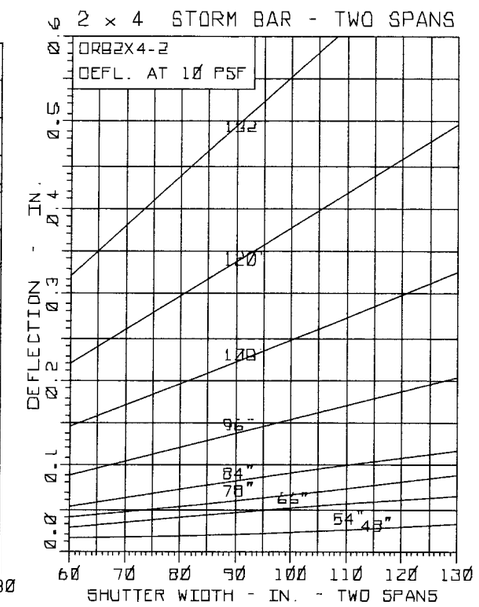
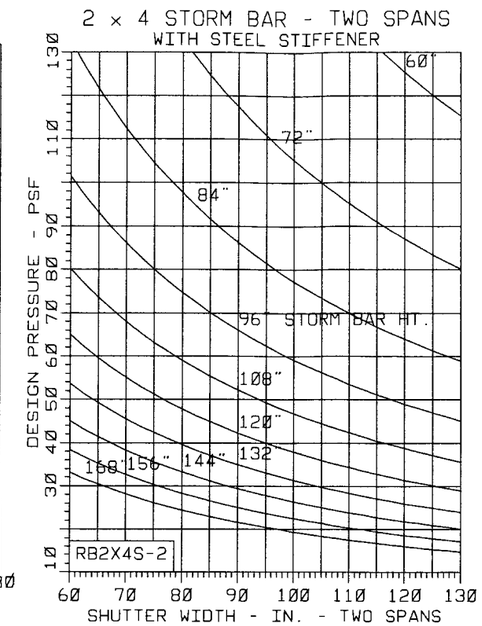
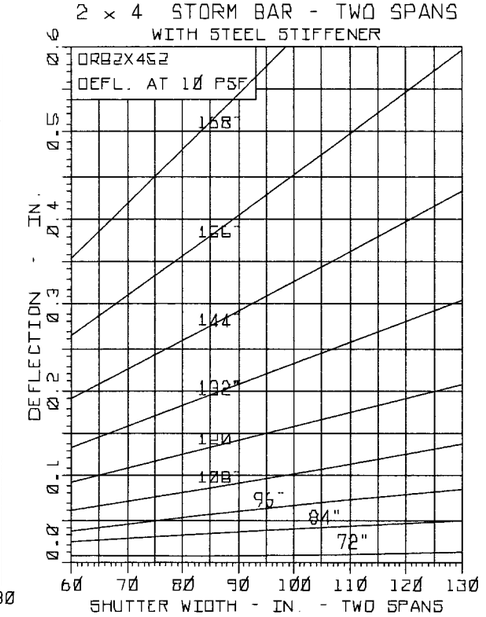
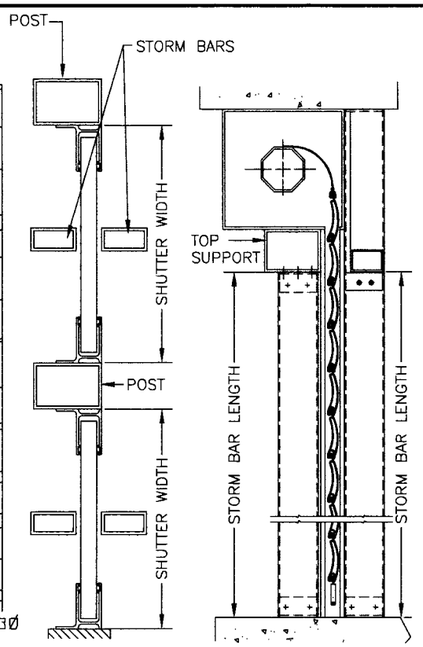
sheet 18 of 21











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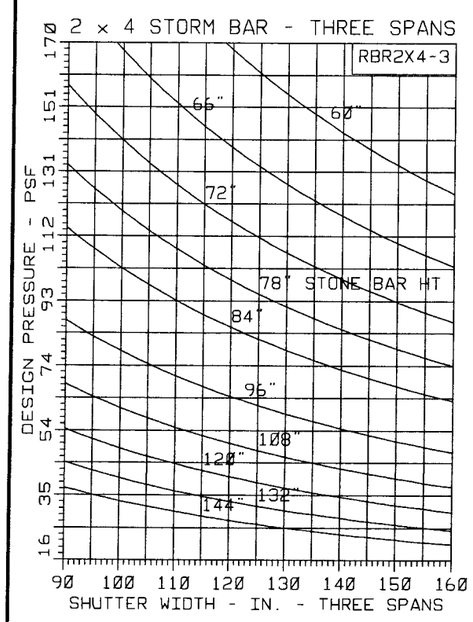

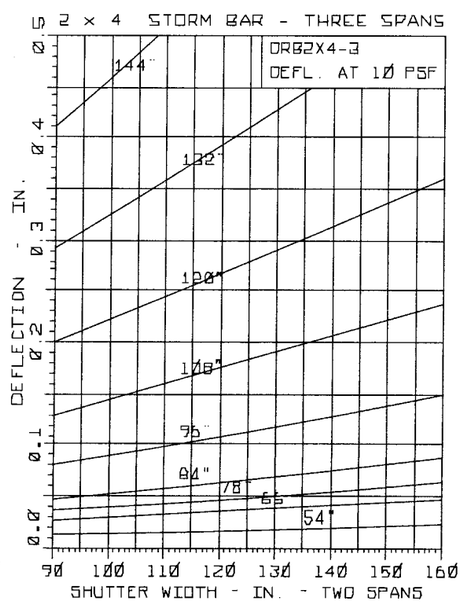

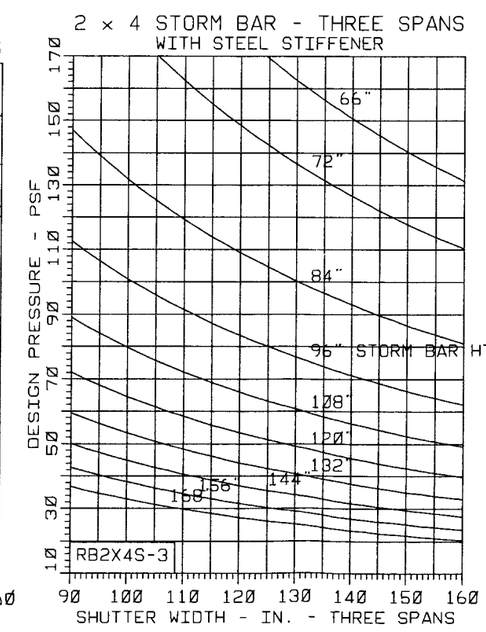

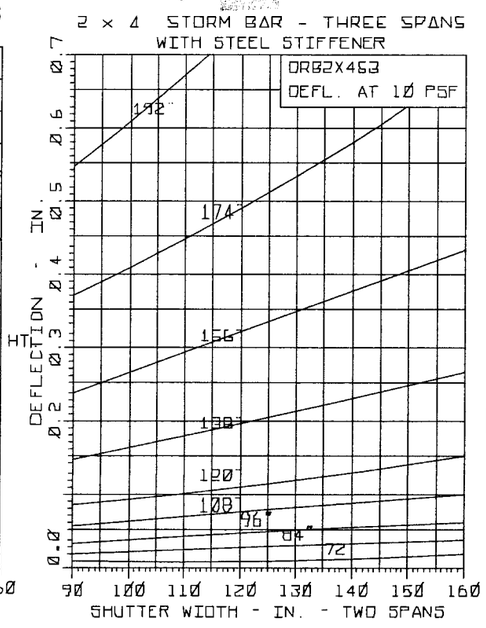

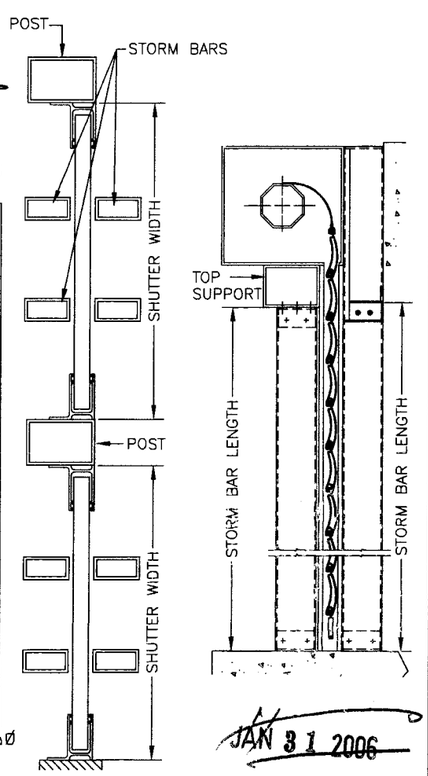

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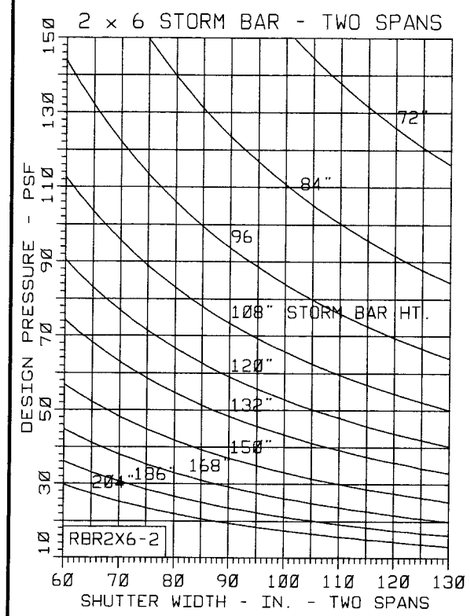

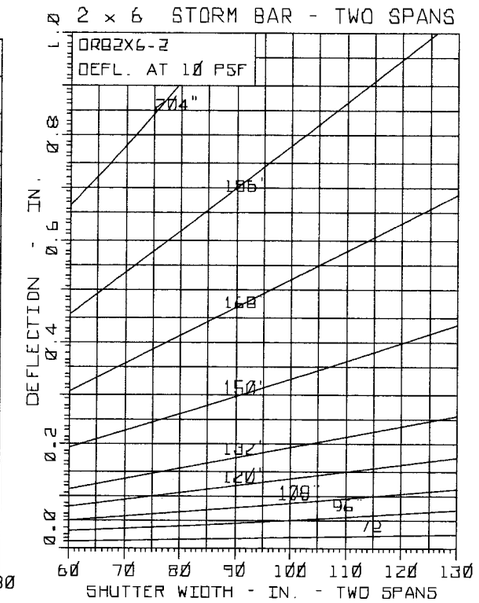

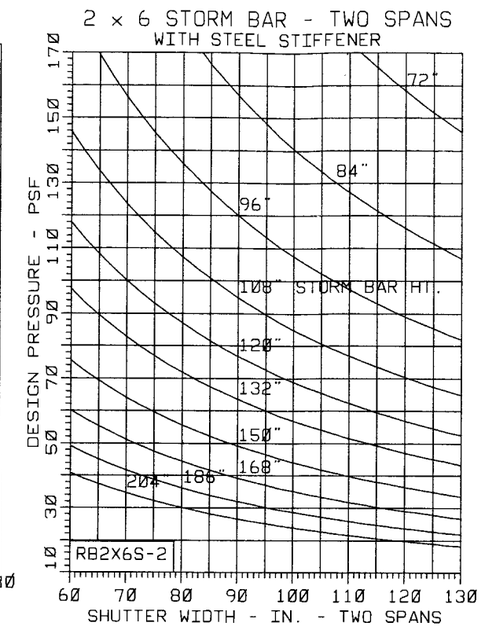

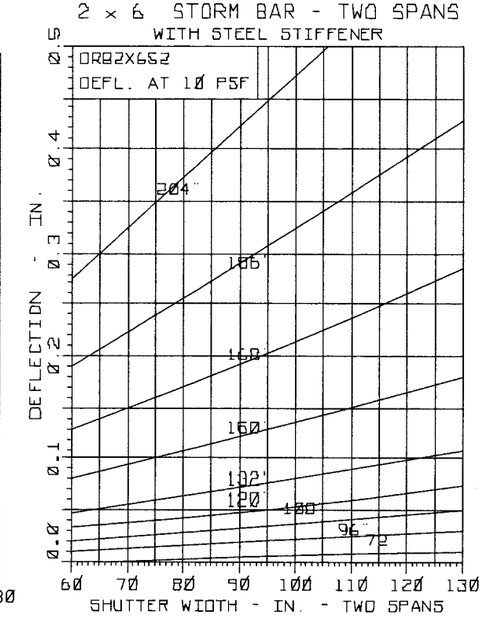

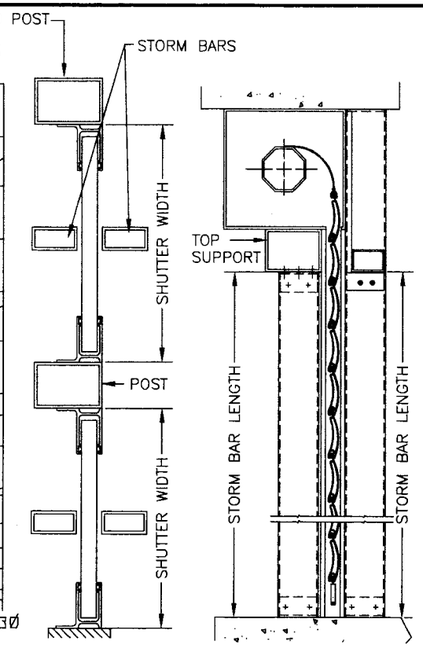

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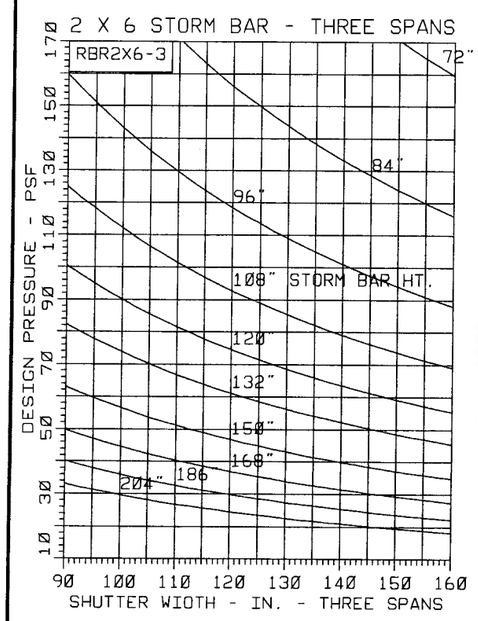

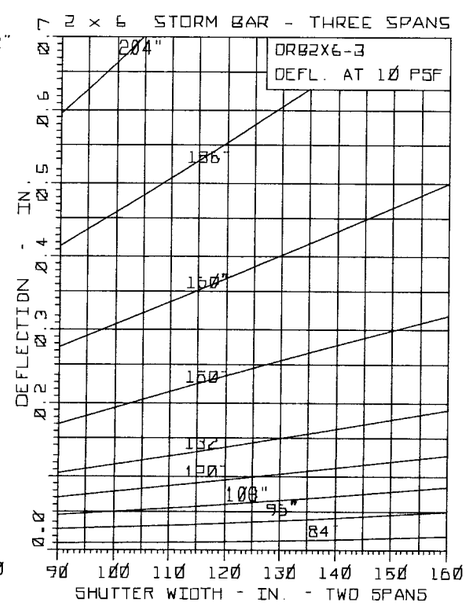

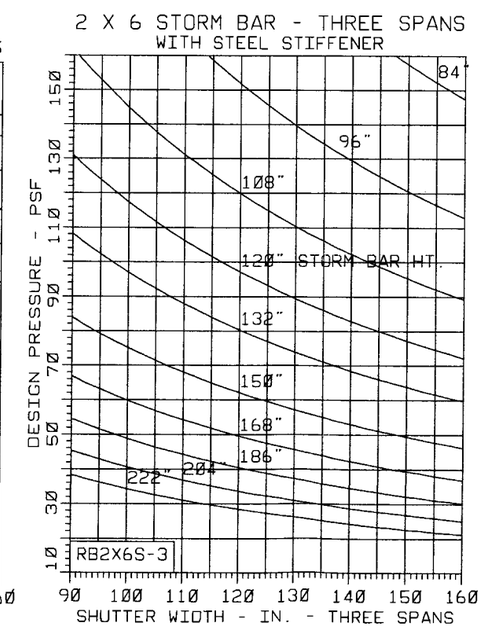

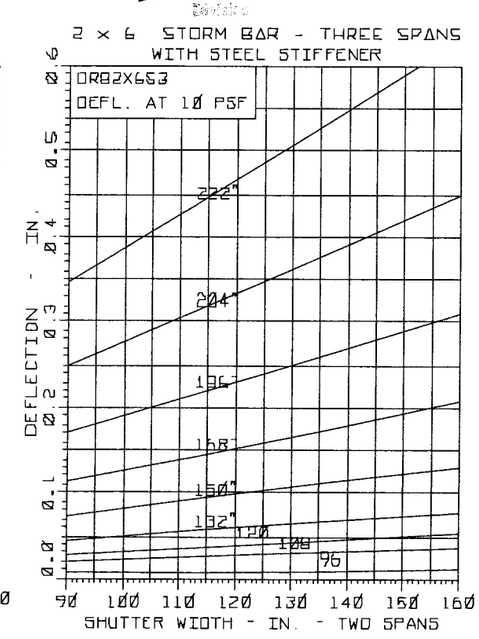

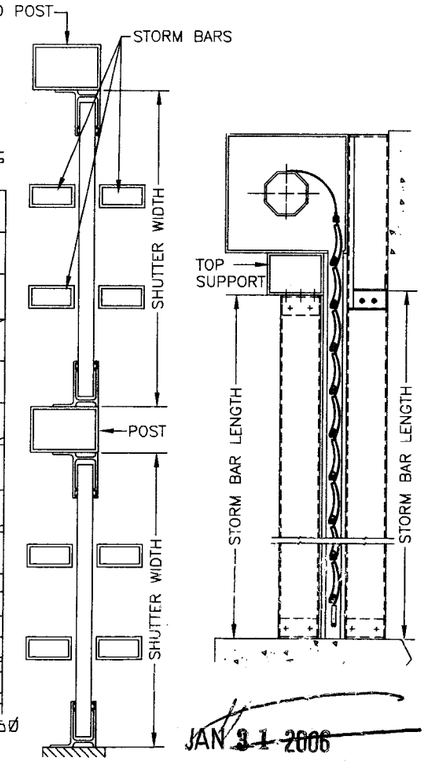

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date: 07-22-94
scale: 1/2" = 1"
dr. by: HAMID
chk. by:

drawing no. 94-55

ROLL SHUTTER OVERALL DEFLECTION CALCULATION SHEET

POSITIVE LOAD

ASCE 7-88: DESIGN LOAD = Pd = PSF
MULTIPLIER FACTOR = K = Pd/10 =

SHUTTER WIDTH = Sw = 1N.			
NO. OF STORM BARS USED = N =			
SPAN CONDITION = N+1 =			
SHUTTER HEIGHT = Sh = IN.			
BOX HEIGHT = BOXh = IN.			
STORM BAR HEIGHT = BL = SH-BOXh = IN.			
TRACK WIDTH = Tw = IN.			
	STEP		
SLAT	1	SLAT SPAN = Ls = (Sw − 2 * Tw)/(N + 1) FROM GRAPHS CHECK SLAT SPAN FOR DESIGN LOAD AND SPAN CONDITION TO MEET DEFLECTION < L/30 OR 2". AND STRESSES LESS THAN ALLOWABLE	
	2	FROM DEFLECTION GRAPH FOR 10 PSF READING FOR ABOVE SLAT SPAN = R1 DEFLECTION OF SLAT = D1 = K * R1	→
STORM BAR	3	FROM GRAPHS SELECT STORM BAR FOR ABOVE SHUTTER WIDTH, SHUTTER HEIGHT, DESIGN LOAD & SPAN CONDITION TO MEET DEFLECTION < L/30 OR 2". AND STRESSES LESS THAN ALLOWABLE TRY STORM BAR SIZE :	
	4	FROM DEFLECTION GRAPH FOR 10 PSF READING FOR ABOVE STORM BAR = R2 DEFLECTION OF STORM BAR = Db = K * R2 EFFECT ON SLATS = D2 = Db/2	→
HEADER (IF THERE IS NO HEADER SKIP STEPS 5 & 6.)	5	FROM GRAPHS SELECT HEADER SIZE FOR ABOVE SHUTTER WIDTH, SHUTTER HEIGHT, DESIGN LOAD & SPAN CONDITION TO MEET DEFLECTION < L/30 OR 2". AND STRESSES LESS THAN ALLOWABLE. TRY HEADER SIZE:	
	6	FROM DEFLECTION GRAPH FOR 10 PSF READING FOR ABOVE HEADER = R3 DEFLECTION OF HEADER = Dh = K * R3 EFFECT ON SLATS = D3 = Dh/4	→
	7	TOTAL DEFLECTION = D = D1+D2+D3 IN.	→
		Ls/30	→

NEGATIVE LOAD

ASCE 7-88: DESIGN LOAD = Pd = PSF
MULTIPLIER FACTOR = K = Pd/10 =

SHUTTER WIDTH = Sw = 1N.			
NO. OF STORM BARS USED = N =			
SPAN CONDITION = N+1 =			
SHUTTER HEIGHT = Sh = IN.			
BOX HEIGHT = BOXh = IN.			
STORM BAR HEIGHT = BL = SH-BOXh = IN.			
TRACK WIDTH = Tw = IN.			
	STEP		
SLAT	1	SLAT SPAN = Ls = (Sw − 2 * Tw)/(N + 1) FROM GRAPHS CHECK SLAT SPAN FOR DESIGN LOAD AND SPAN CONDITION TO MEET DEFLECTION < L/30 OR 2". AND STRESSES LESS THAN ALLOWABLE	
	2	FROM DEFLECTION GRAPH FOR 10 PSF READING FOR ABOVE SLAT SPAN = R1 DEFLECTION OF SLAT = D1 = K * R1	→
STORM BAR	3	FROM GRAPHS SELECT STORM BAR FOR ABOVE SHUTTER WIDTH, SHUTTER HEIGHT, DESIGN LOAD & SPAN CONDITION TO MEET DEFLECTION < L/30 OR 2". AND STRESSES LESS THAN ALLOWABLE TRY STORM BAR SIZE :	
	4	FROM DEFLECTION GRAPH FOR 10 PSF READING FOR ABOVE STORM BAR = R2 DEFLECTION OF STORM BAR = Db = K * R2 EFFECT ON SLATS = D2 = Db/2	→
HEADER	5	FROM GRAPHS SELECT HEADER SIZE FOR ABOVE SHUTTER WIDTH, SHUTTER HEIGHT, DESIGN LOAD & SPAN CONDITION TO MEET DEFLECTION < L/30 OR 2". AND STRESSES LESS THAN ALLOWABLE. TRY HEADER SIZE:	
	6	FROM DEFLECTION GRAPH FOR 10 PSF READING FOR ABOVE HEADER = R3 DEFLECTION OF HEADER = Dh = K * R3 EFFECT ON SLATS = D3 = Dh/4	→
	7	TOTAL DEFLECTION = D = D1+D2+D3 IN.	→
		Ls/30	→

NOTES:
1. IF FOR NEGATIVE LOAD D > Ls/30
   OR IF FOR POSITIVE LOAD D > Ls/30 OR 2".
   REPEAT ABOVE CALCULATIONS WITH LARGER STORM BARS AND OR LARGER HEADER.
2. DIFFERENT SIZE STORM BARS/HEADERS MAY BE USED FOR POSITIVE AND NEGATIVE LOADS.
3. USE ADDITIONAL CALCULATION SHEETS FOR DIFFERENT SHUTTERS ON THE SAME JOB.

06-021301
09/25/08

Engr: DR. HUMAYOUN FAROOQ
STRUCTURES
FLA. PE # 16557
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