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 "Roll Shutters Details", prepared by Al-Farooq Corporation Inc. dated 07/22/94, with last revision on 10/28/03, 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 # 03-0519.02 and** consists of this page, evidence page and approval document mentioned above.
The submitted documentation was reviewed by **Candido F. Font, P.E.**

01/22/04

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 "f" dated 10/28/03, 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.

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

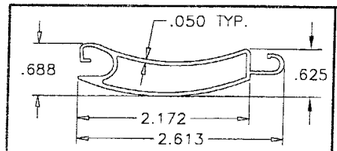
1. Letter of no change issued by Rolladen, Inc. on 05/22/00 signed by T. D. Low and notarized by E. M. Roldan on 06/05/00.
2. Letter of engineer in practice issued by Al- Farooq Corporation on 03/09/00, signed and sealed by H. Farooq, PE.

F QUALITY ASSURANCE

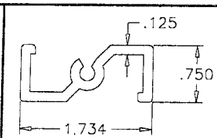
1. Miami-Dade County. Building Code Compliance Office.

01/22/04

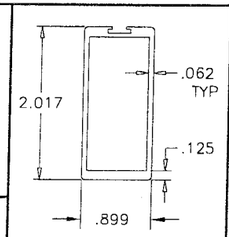
Candido F. Font, P. E.
Senior Product Control Examiner
NOA No 03-1110.04
Expiration Date: September 25, 2008
Approval Date: January 22, 2004



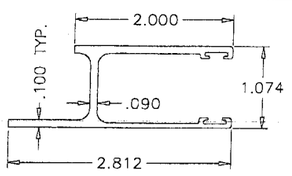
RON-68 SLAT



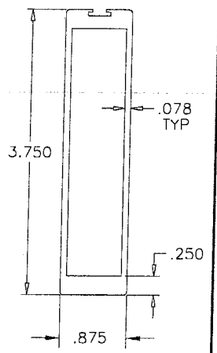
RON-23 INSERT



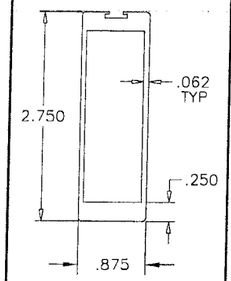
RON-24 STORM BAR



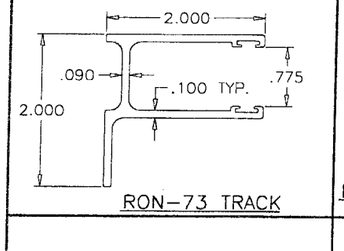
RON-72 TRACK



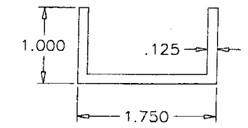
RON-56 STORM BAR



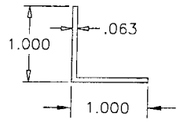
RON-57 STORM BAR



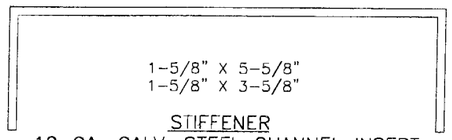
RON-73 TRACK



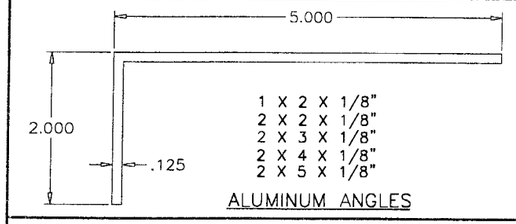
FLOOR SHOE



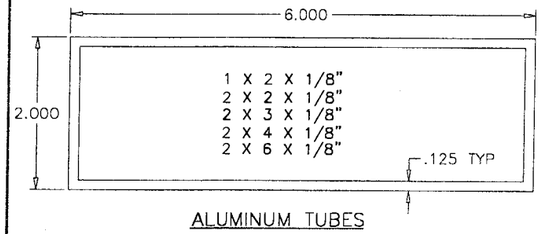
1 x 1 x 1/16"
ALUMINUM ANGLE



STIFFENER
12 GA. GALV. STEEL CHANNEL INSERT



ALUMINUM ANGLES



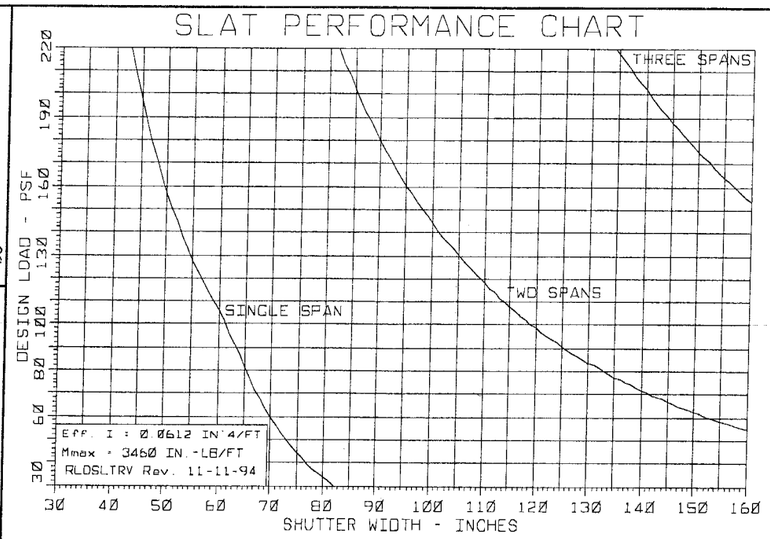
ALUMINUM TUBES

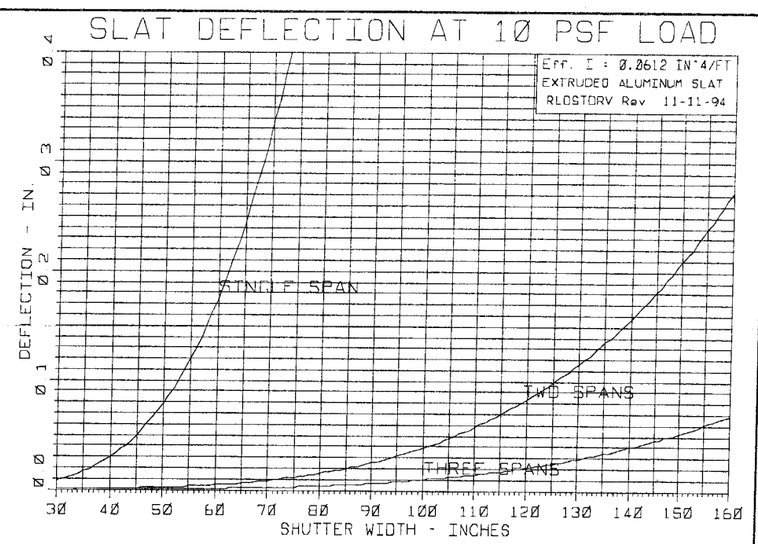
DESCRIPTION	PART #
SLAT RON-68	#1117
TRACK RON-72	#1071
TRACK RON-73	#1070
1x2x1/8" TUBE	#1019
2x2x1/8" TUBE	#1022
2x3x1/8" TUBE	#1024
2x4x1/8" TUBE	#1023
2x6x1/8" TUBE	#1026
1x1x1/16" ANGLE	#1031
1x2x1/8" ANGLE	#1029
2x2x1/8" ANGLE	#1051
2x3x1/8" ANGLE	#5012
2x4x1/8" ANGLE	#5013
2x5x1/8" ANGLE	#5014
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

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.

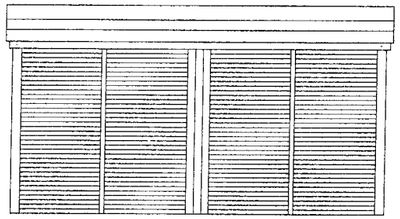
ANCHORS: EMBEDMENT & EDGE DISTANCES SHOWN ARE BEYOND THE WALL & FLOOR COVERING (STUCCO, TILES, ETC.)



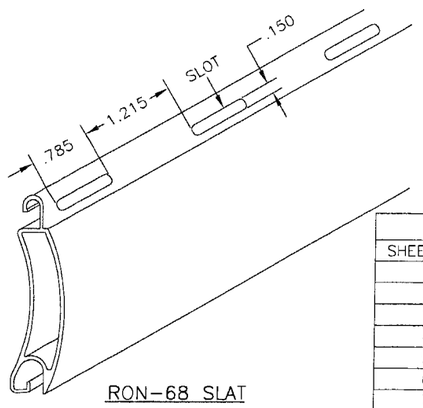


USE SLAT PERFORMANCE CHART TO VERIFY SLAT CAPACITY FOR THE REQUIRED DESIGN LOAD FOR THE PARTICULAR LOCATION.

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



TYPICAL ELEVATION



RON-68 SLAT

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 IS DESIGNED TO COMPLY WITH THE HIGH VELOCITY HURRICANE ZONE OF THE 2001 FLORIDA BUILDING CODE.
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 ≤ L/30 OR 2". FOR MULLIONS MAX DEFLECTION ≤ L/180.
9. ANCHORING OR LOADING CONDITIONS OTHER THAN THOSE SHOWN IN THESE DETAILS ARE NOT PART OF THIS APPROVAL.
10. A 33% INCREASE IN ALLOWABLE STRESS WAS USED IN DESIGN OF ANCHOR SPACING.

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

OCT 29 2003

PRODUCT REVISED
to comply with the Florida Building Code
Application No. 03-1110.04
Expiration Date: 07/23/08
By
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\94-55R1

RollShutter Details

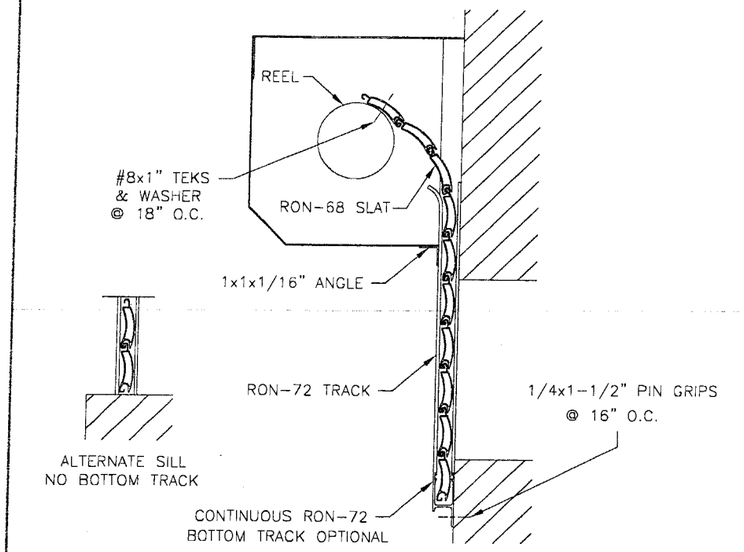
ROLLADEN INC.
550 ANSIN BOULEVARD
HALLANDALE, FL. 33009
(305) 757 - 8591

revisions:			
no	date	by	description
B	11.12.94	T.H.	GENERAL REVISION
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

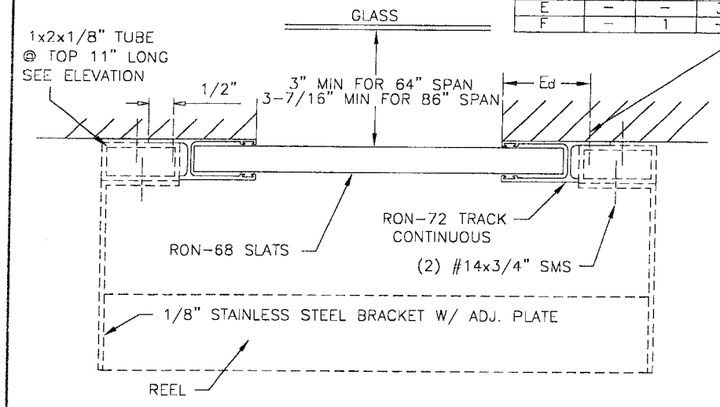
date: 07-22-94
scale: 1/2" = 1"
dr. by: HAMID
chk. by:

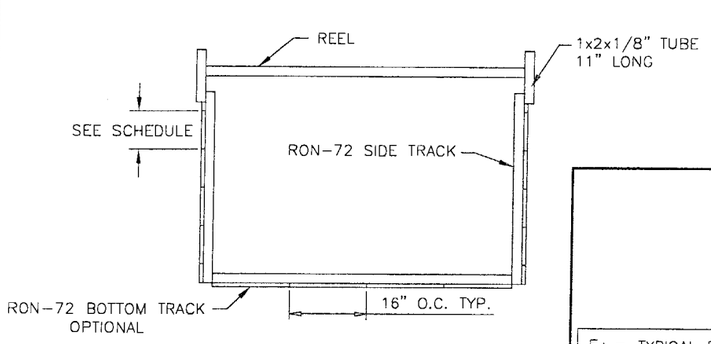
drawing no.
94-55

sheet 1 of 21



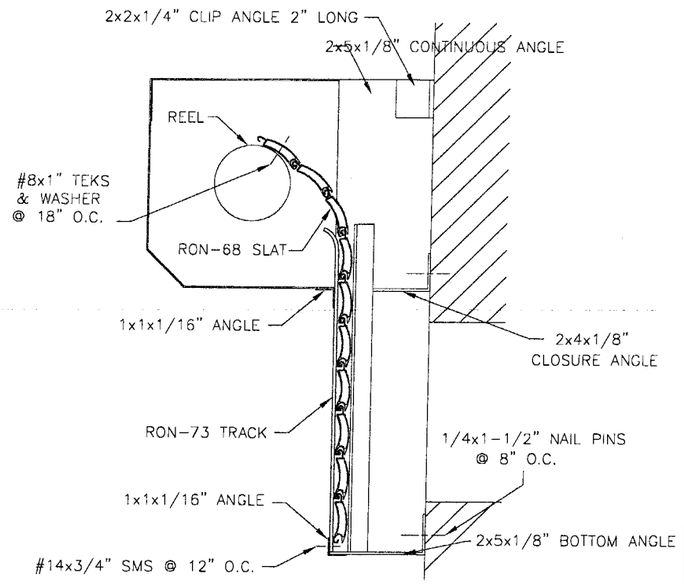
ANCHOR TYPE	CHART TO USE		
	CONC.	BLOCK	WOOD
A	4	1	–
B	2	–	–
C	2	1	–
D	4	–	–
E	–	–	3
F	–	1	–



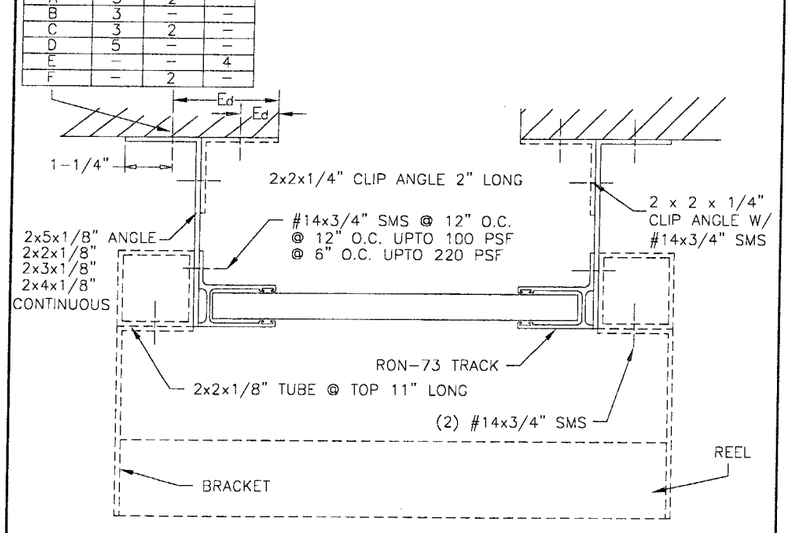


ELEVATION

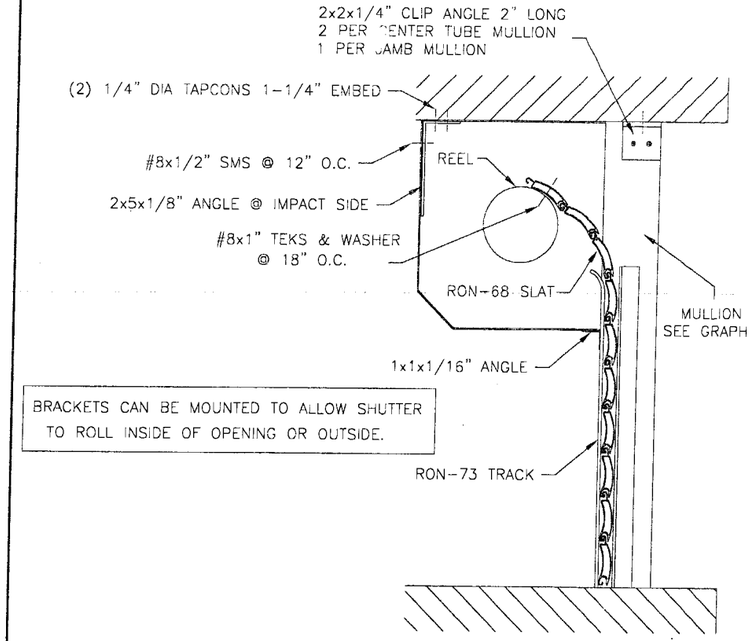
SINGLE SPAN TRACK ON WALL



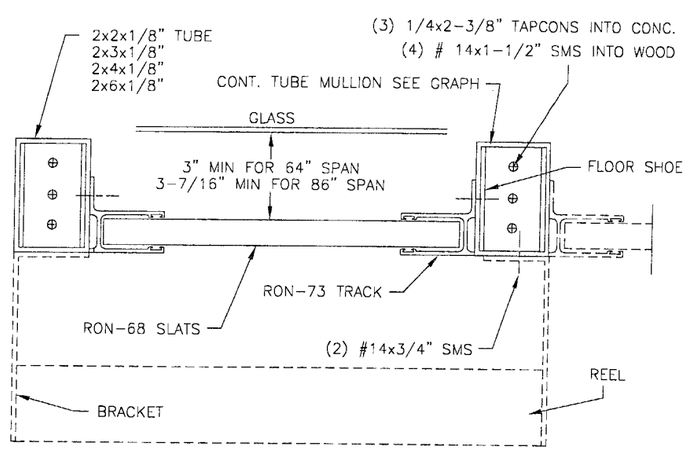
ANCHOR TYPE	CHART TO USE		
	CONC.	BLOCK	WOOD
A	5	2	–
B	3	–	–
C	3	2	–
D	5	–	–
E	–	–	4
F	–	2	–



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

OCT 29 2003

PRODUCT REVISED
as complying with the Florida Building Code.
Acceptance No. 03-1110.04
Expiration Date 02/25/08
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AL-FAROOQ CORPORATION
ENGINEERS, PLANNERS & PRODUCT DESIGN
12135 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

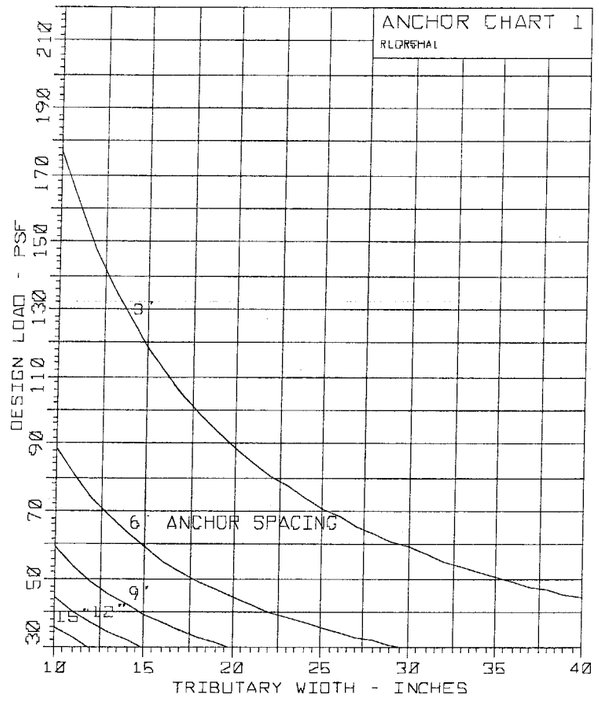
revisions:

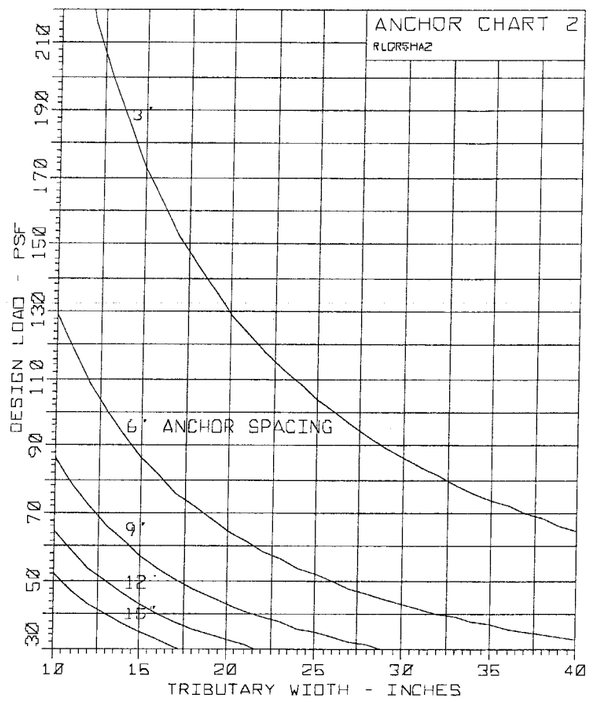
no	date	by	description
B	11.12.94	T.H.	GENERAL REVISION
C	02.02.95	T.H.	GENERAL REVISION
D	07.02.95	T.H.	SHEET 3 REVISED
E	04.25.03	T.H.	ANCHOR CHARTS REV.
F	10.28.03	T.H.	NO CHANGE THIS SHEET

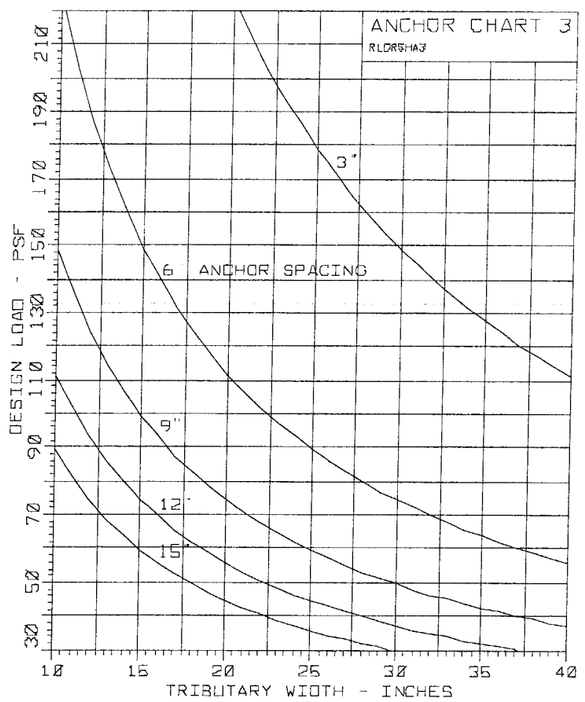
date: 07-22-94
scale: 1/2" = 1"
dr. by: HAMID
chk. by:

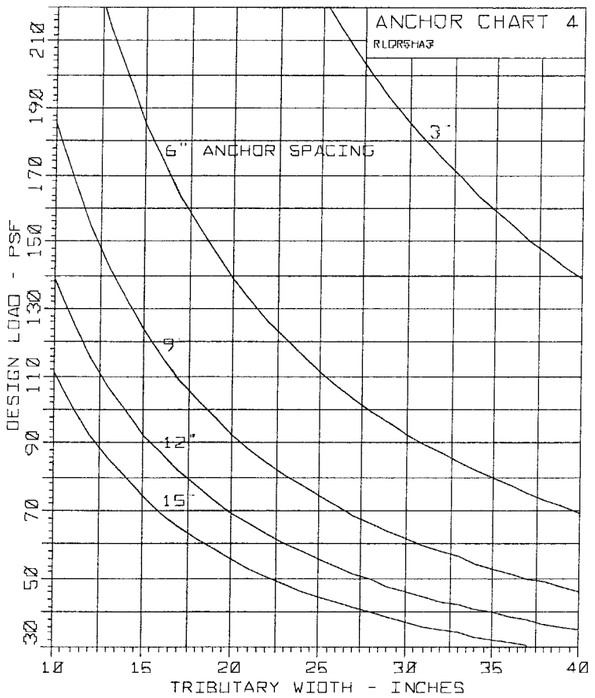
drawing no.
94-55

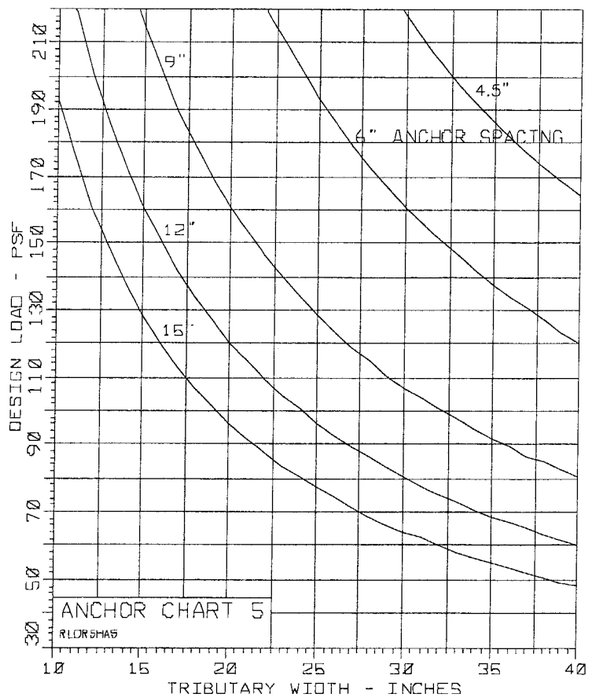
sheet 2 of 21











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

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 = 1-1/4"
NO REDUCTION FACTOR IS REQUIRED

TYPICAL ANCHORS

ANCHOR (A) = 1/4" TAPCON 1-3/4" EMBEDMENT TO CONCRETE
1-1/4" EMBEDMENT TO BLOCK

ANCHOR (B) = #14 S.M.S. W/ RAWL SCRU-LEAD INTO CONCRETE
1-1/2" EMBEDMENT.

ANCHOR (C) = 1/4" x 1-1/4" METAL HIT ANCHORS (W/ ZAMAC BODY)
1" EMBEDMENT TO CONCRETE OR BLOCK

ANCHOR (D) = 1/4" RAWL CALK-IN, STAR 'TAMPIN' OR EQUAL.
TOTAL ANCHOR BODY INTO CONC.

ANCHOR (E) = 1/4" DIA. LAG SCREWS INTO WOOD, 1-1/2" MIN. EMBEDMENT
(S.G.= 0.55)

ANCHOR (F) = 1/4" X 1-1/2" PIN GRIP
1/2" MIN. EMBEDMENT TO CONCRETE OR BLOCK.

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

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

OCT 29 2003

PRODUCT REVISED
as complying with the Florida Building Code
Application No 03-1110.04
Expiration Date 09/25/08
By
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\94-55R1

RollShutter Details

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

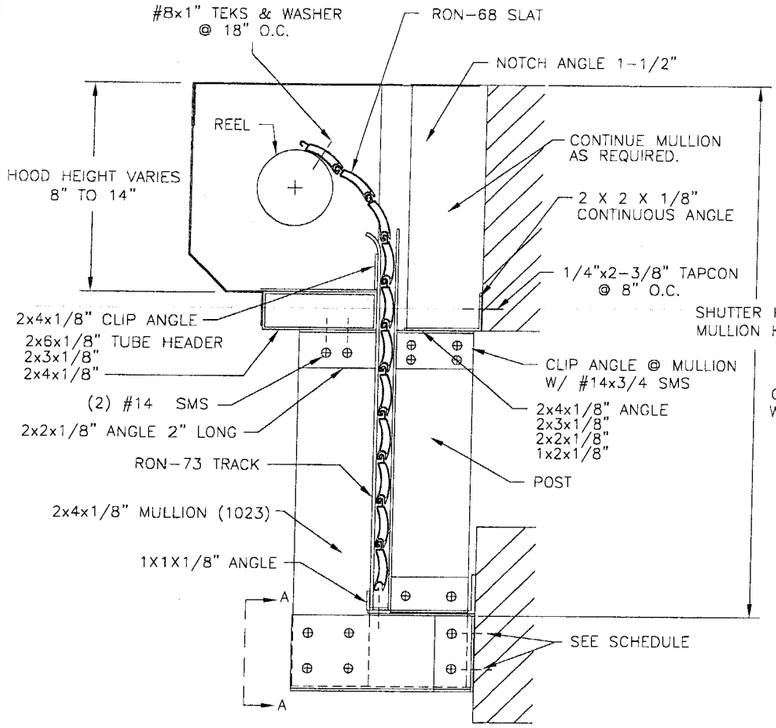
revisions:

no	date	by	description
B	11.12.94	T.H.	GENERAL REVISION
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

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

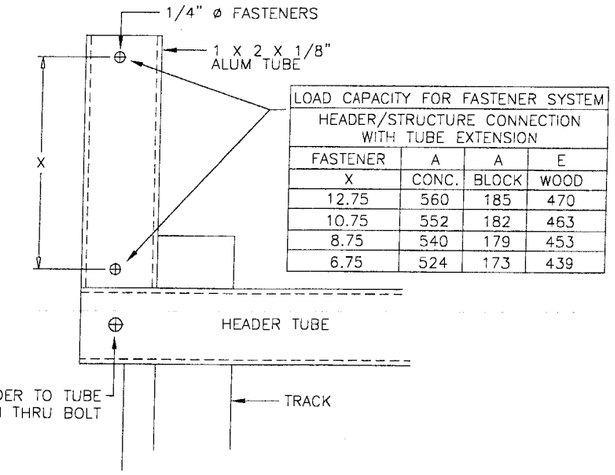
drawing no.
94-55

sheet 3 of 21



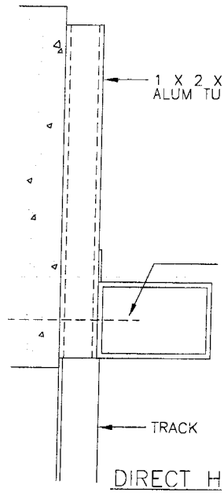
MULTIPLE SPAN SECTION

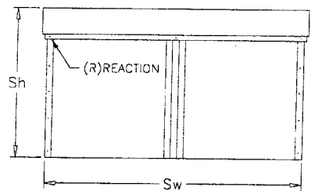
FOR MULLION ANCHOR SEE DETAIL



LOAD CAPACITY FOR FASTENER SYSTEM HEADER/STRUCTURE CONNECTION WITH TUBE EXTENSION			
FASTENER	A	A	E
X	CONC.	BLOCK	WOOD
12.75	560	185	470
10.75	552	182	463
8.75	540	179	453
6.75	524	173	439

HEADER/STRUCTURE CONNECTION WITH TUBE EXTENSION



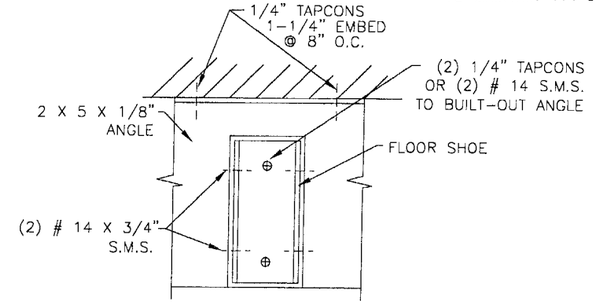


ADDITIONAL CAPACITY OF DIRECT FASTENER			
STRUCTURE	FASTENER	EMBED	P1
CONC.	3/8"øKWIK BOLT	2-1/2"	1720
	1/2"øKWIK BOLT	3-1/2"	2839
	5/8"øKWIK BOLT	4"	3800
BLOCK	1/4" SLEEVE ANCHOR	1-1/8"	266
	5/16" SLEEVE ANCHOR	1-1/4"	447
	3/8" SLEEVE ANCHOR	1-1/2"	626
WOOD	1/4" DIA. LAG SCREWS	1-1/2"	520

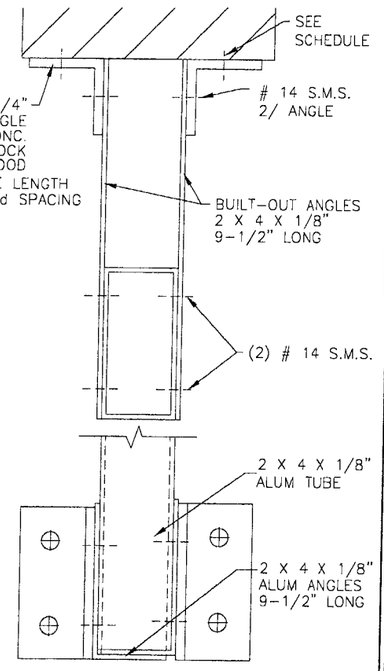
DIRECT HEADER CONNECTION TO STRUCTURE

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

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

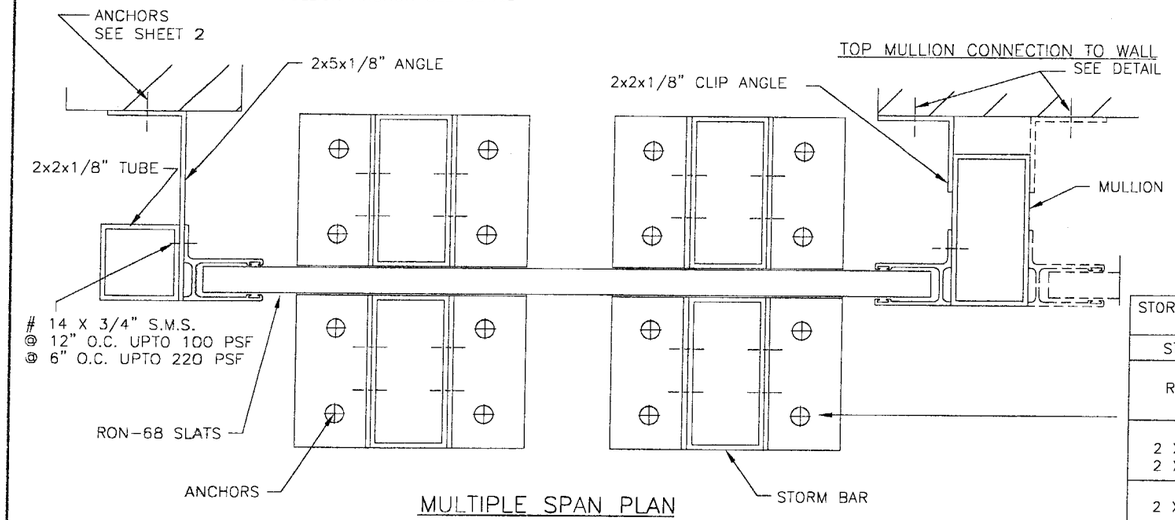


BOTTOM MULLION CONNECTION TO BUILT-OUT



STORM BAR BOTTOM CONNECTION

VIEW "A-A"



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	4
	E	–	6
RON 56 2 X 2 X 1/8" 2 X 3 X 1/8"	A, D	2	–
	E	–	6
2 X 4 X 1/8"	A, D	2	–
	E	–	6
2 X 4 X 1/8" W/ STIFFENER	A, D	3	–
	E	–	7
2 X 6 X 1/8"	A, D	3	–
	E	–	9
2 X 6 X 1/8" W/ STIFFENER	A, D	4	–
	E	–	11

NO. OF FASTENERS IN WOOD ON EACH SIDE MAY BE CALCULATED AS. $\#\ REQD. = \frac{\text{LOAD ON STORM BAR ANCHOR}}{273 \times 2}$

Engr: DR. HUMAYOUN FAROOQ
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ROLLUP\94-55R1

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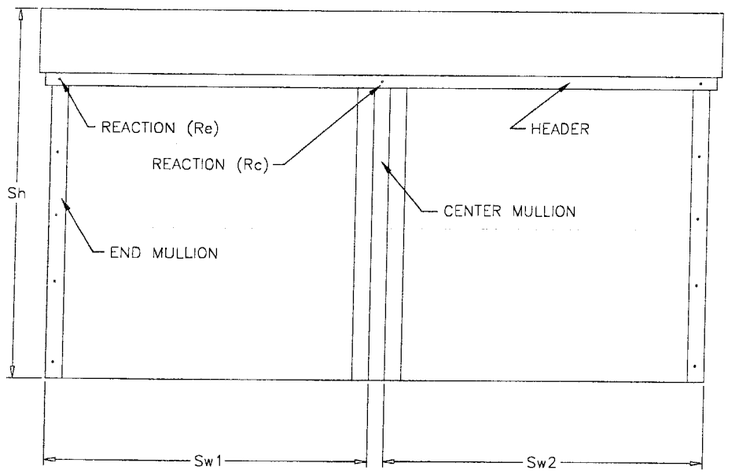
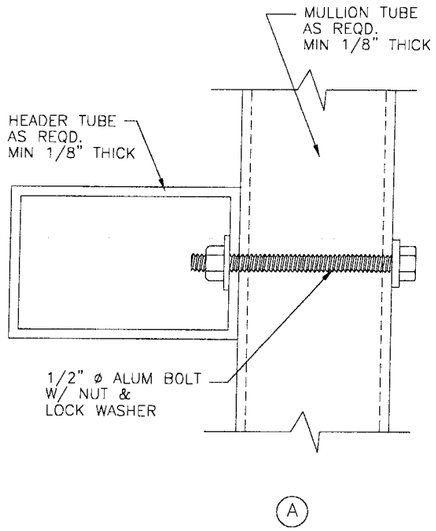
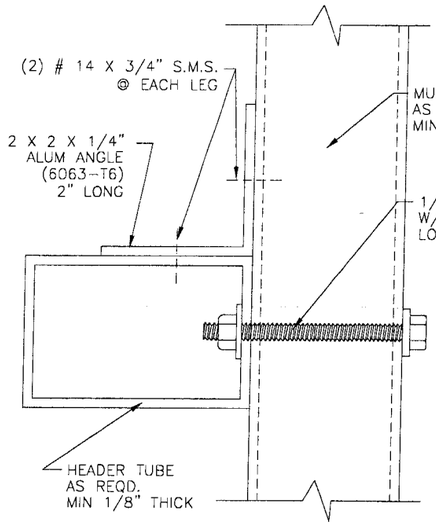
Sheet 4 of 21





A



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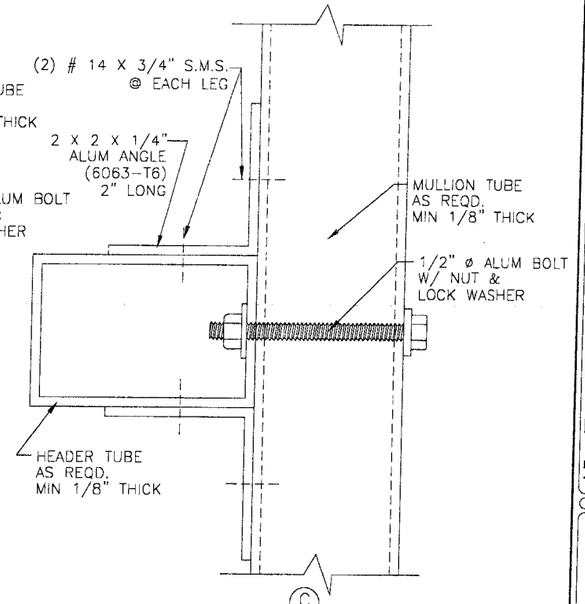


C

DESIGN LOAD = Pd = PSF

Sh	Sw1	Sw2

HEADER CONNECTION TO CENTER MULLION

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

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

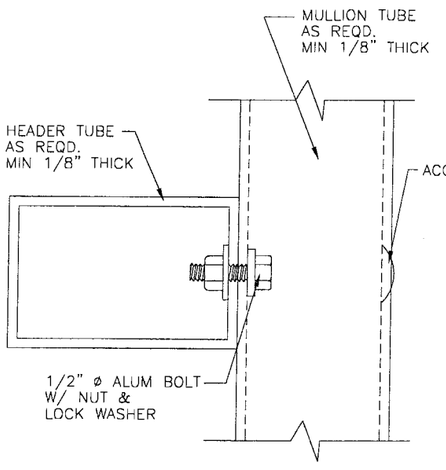
HEADER CONNECTION TO END MULLION

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

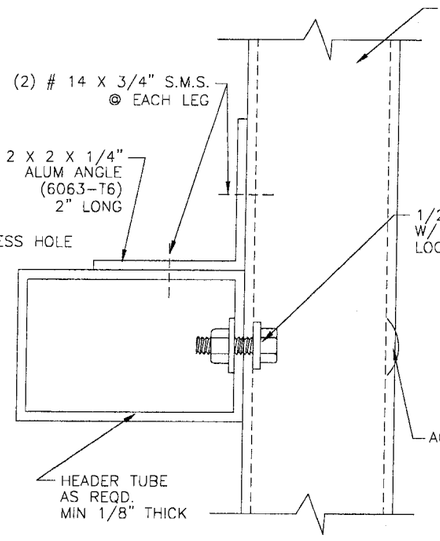
$$Re = \frac{\qquad}{4} =$$

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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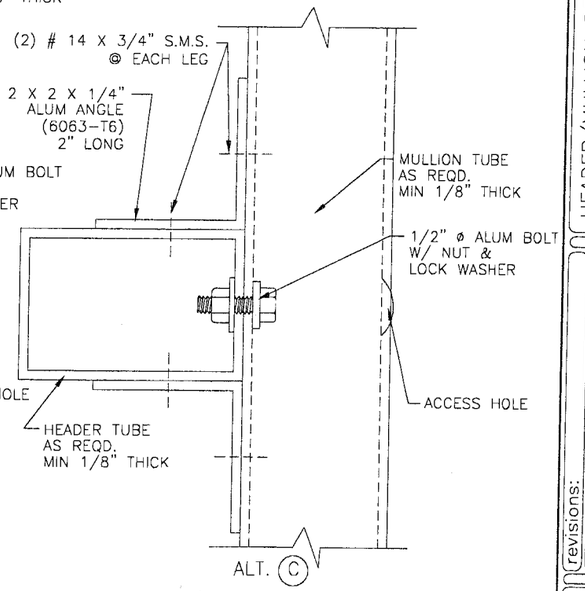

ALT. (C)

HEADER/MULLION CONNECTION DETAILS

Engr: DR. HUMAYOUN FAROOQ
STRUCTURES
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ROLL UP 94-55(R)

HEADER/MULLION DETAILS

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

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B	11.12.94	T.H.	GENERAL REVISION
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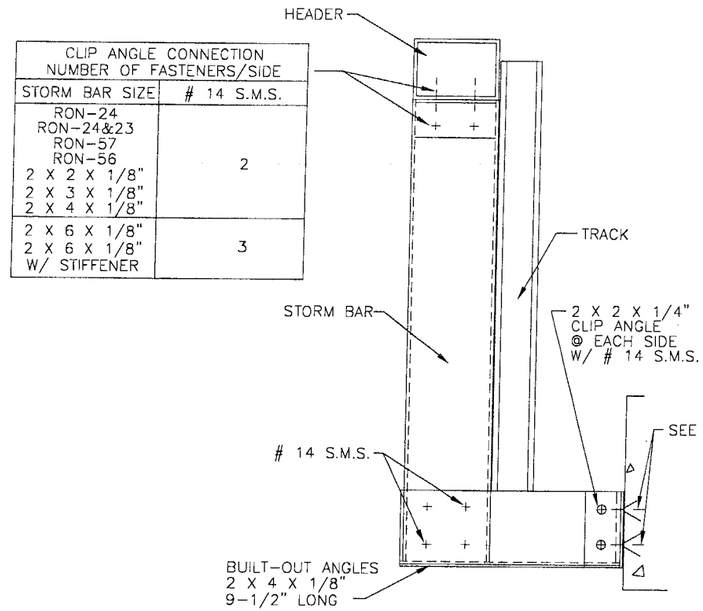
E	04.25.03	T.H.	NO CHANGE THIS SHEET
F	10.28.03	T.H.	NO CHANGE THIS SHEET

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

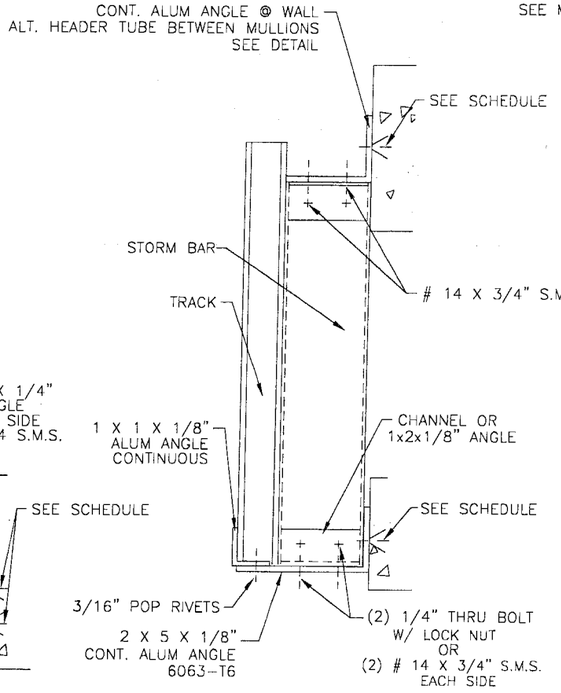
drawing no.
94-55

sheet 5 of 21

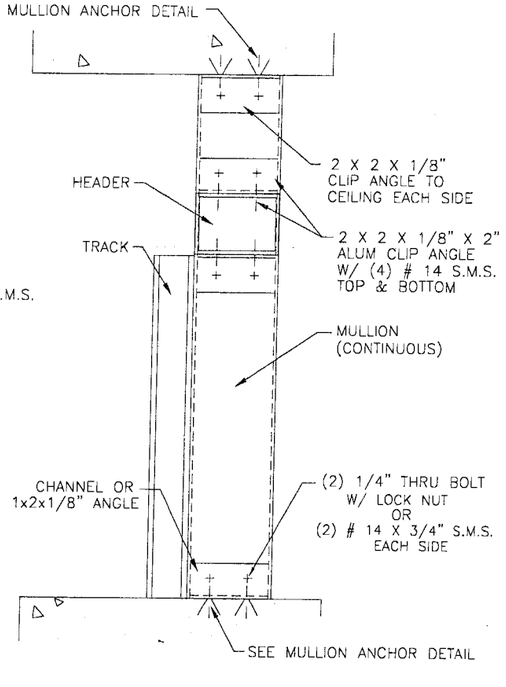
CLIP ANGLE CONNECTION NUMBER OF FASTENERS/SIDE	
STORM BAR SIZE	# 14 S.M.S.
RON-24 RON-24&23 RON-57 RON-56 2 X 2 X 1/8" 2 X 3 X 1/8" 2 X 4 X 1/8"	2
2 X 6 X 1/8" 2 X 6 X 1/8" W/ STIFFENER	3



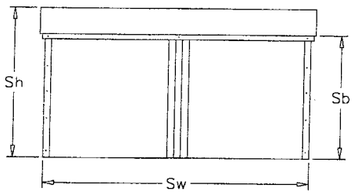
OUTSIDE STORM BAR
BUILT-OUT ANCHOR DETAIL



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	D	CONC.	876	347
		E	WOOD	650	347
		F	BLOCK	271	271
3	2	D	CONC.	1227	520
		E	WOOD	1300	520
		F	BLOCK	380	380
4	2	D	CONC.	1753	693
		E	WOOD	1300	693
		F	BLOCK	543	543
5	3	D	CONC.	1972	866
		E	WOOD	1960	866
		F	BLOCK	610	610

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

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.

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ROLLUP\94-55R

STORM BAR CONNECTION DETAILS

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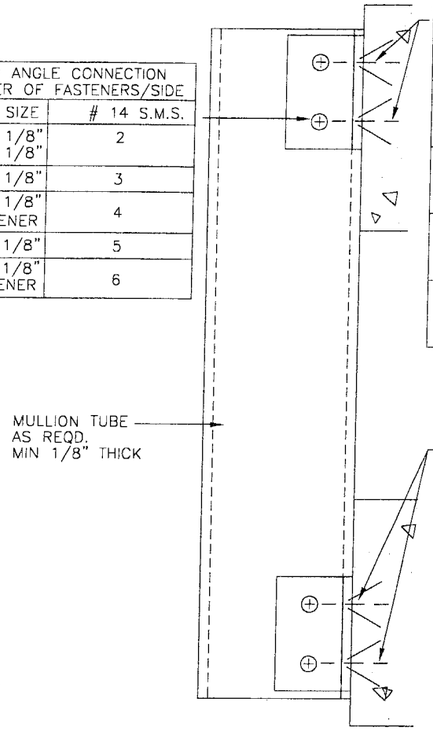
date: 07-22-94
scale: 1/2" = 1"
dr. by: HAMID
chk. by:

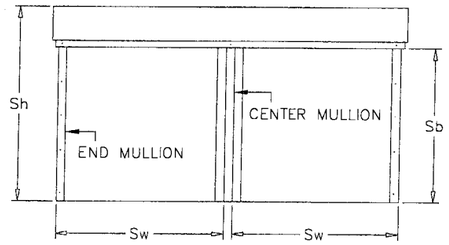
drawing no.
94-55

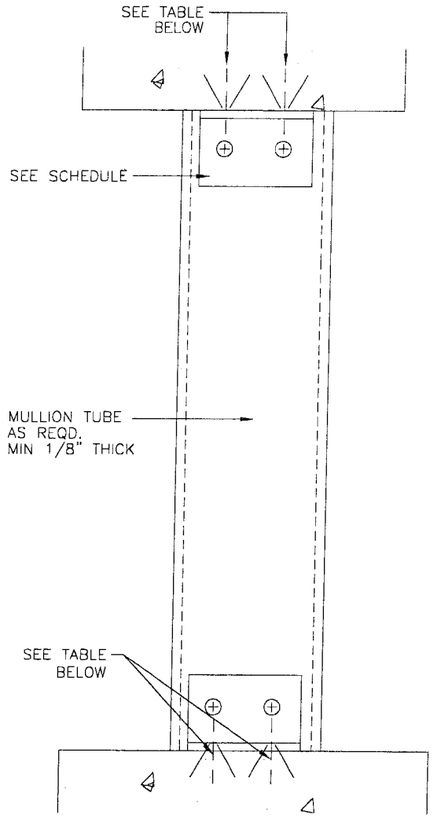
CLIP ANGLE CONNECTION NUMBER OF FASTENERS/SIDE	
MULLION SIZE	# 14 S.M.S.
2 X 2 X 1/8" 2 X 3 X 1/8"	2
2 X 4 X 1/8"	3
2 X 4 X 1/8" W/ STIFFENER	4
2 X 6 X 1/8"	5
2 X 6 X 1/8" W/ STIFFENER	6

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	D	CONC.	2629
		E	WOOD	1950
		F	BLOCK	814
8.75	4	D	CONC.	3505
		E	WOOD	2600
		F	BLOCK	1085
11.25	5	D	CONC.	4381
		E	WOOD	3250
		F	BLOCK	1356
13.75	6	D	CONC.	5258
		E	WOOD	3900
		F	BLOCK	1628



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	1	–	1	–
	B	3	–	2	–
	C	2	–	1	–
	E	–	3	–	2
2 X 4 X 1/8"	A	2	–	2	–
	B	6	–	4	–
	C	3	–	2	–
	E	–	6	–	4
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" TAPCON 1−3/4" EMBEDMENT TO CONCRETE
1−1/4" EMBEDMENT TO BLOCK

ANCHOR (B) = #14 S.M.S. W/ RAWL SCRU−LEAD INTO CONCRETE
1−1/2" EMBEDMENT

ANCHOR (C) = 1/4" x 1−1/4" HILTI METAL HIT ANCHORS
1" EMBEDMENT TO CONCRETE OR BLOCK

ANCHOR (D) = 1/4" RAWL CALK−IN, TOTAL ANCHOR BODY INTO CONC.

ANCHOR (E) = 1/4" DIA. LAG SCREWS INTO WOOD, 1−1/2" MIN. EMBEDMENT

ANCHOR (F) = 1/4" X 1−1/2" PIN GRIP
1/2" MIN. EMBEDMENT TO CONCRETE OR BLOCK

NOTE: ANCHORS, USE FULL EMBEDMENT IN CONCRETE BEYOND THE COVERING (STUCCO, TILES, ETC.)

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

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ROLLUP\94-55R1

MULLION & BOX DETAILS

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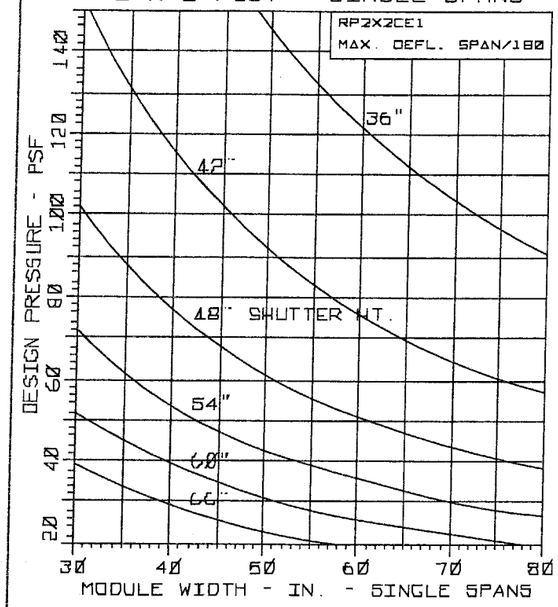
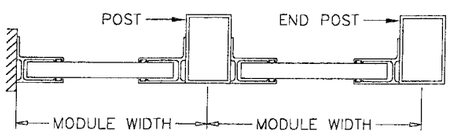
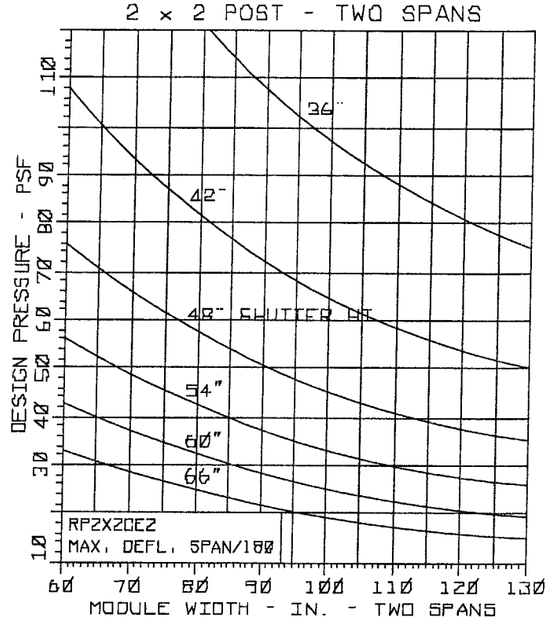
2 x 2 POST - SINGLE SPANS

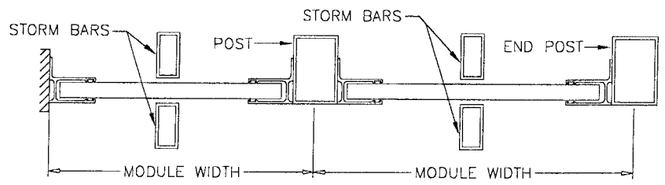




SINGLE SPANS

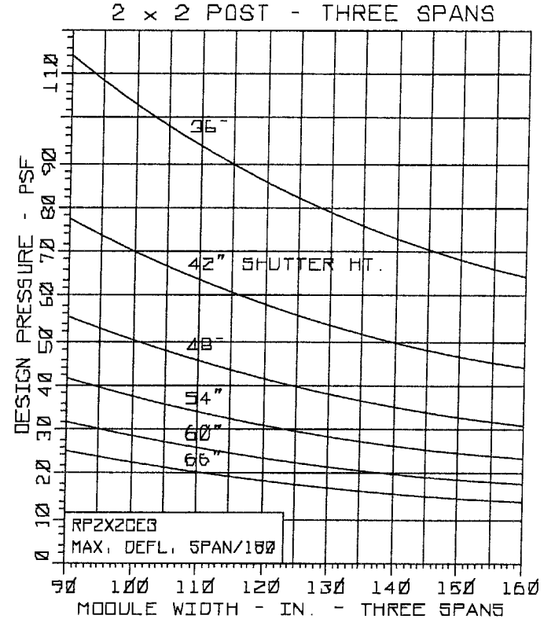
2 x 2 POST - TWO SPANS

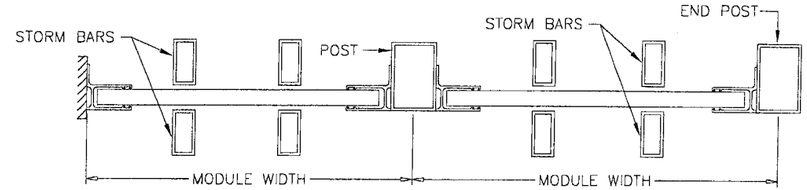




TWO SPANS

2 x 2 POST - THREE SPANS





THREE SPANS

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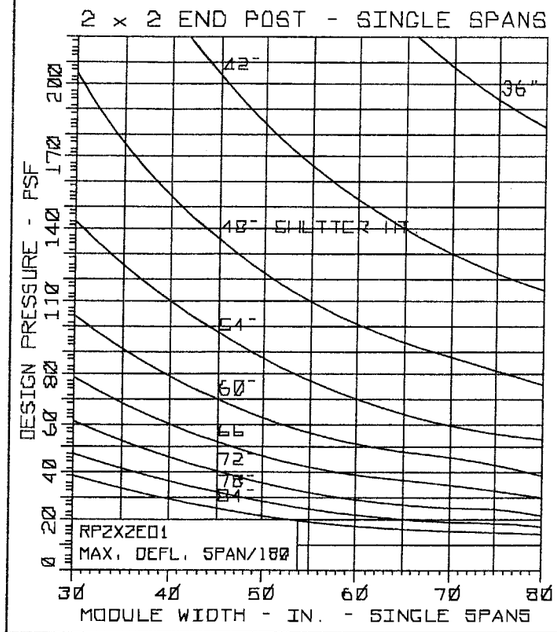

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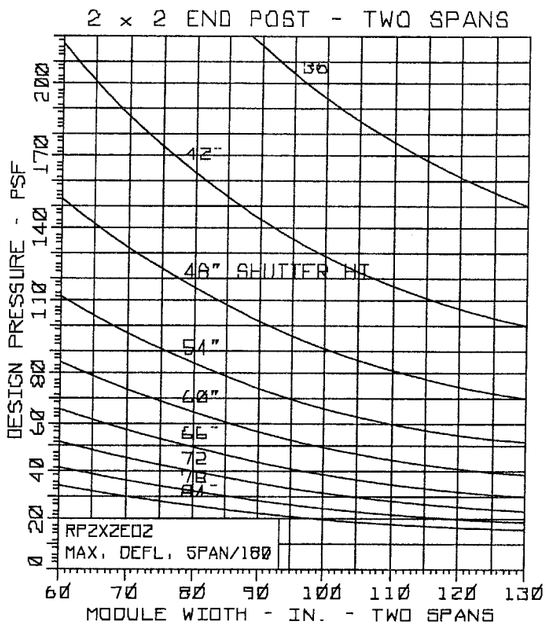

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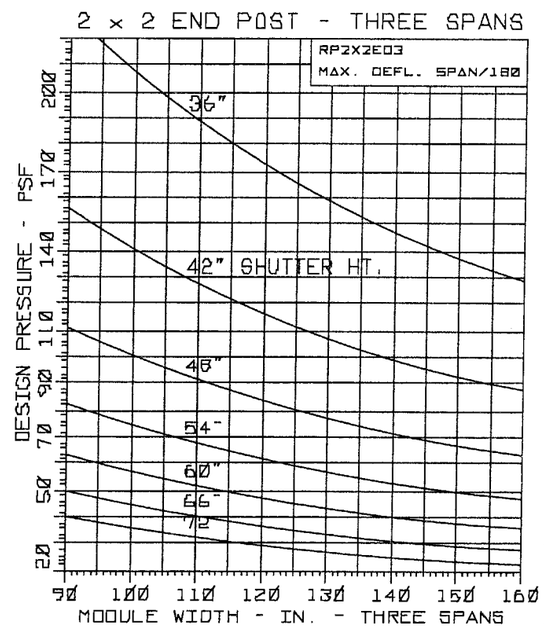

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FLA. PE # 16557
C.A.N. 3538

OCT 29 2003

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ENGINEERS, PLANNERS & PRODUCT DESIGN
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ROLLUP\94-55R1

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HALLANDALE, FL. 33009
(305) 757 - 8591

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scale: 1/2" = 1"
dr. by: HAMID
chk. by:

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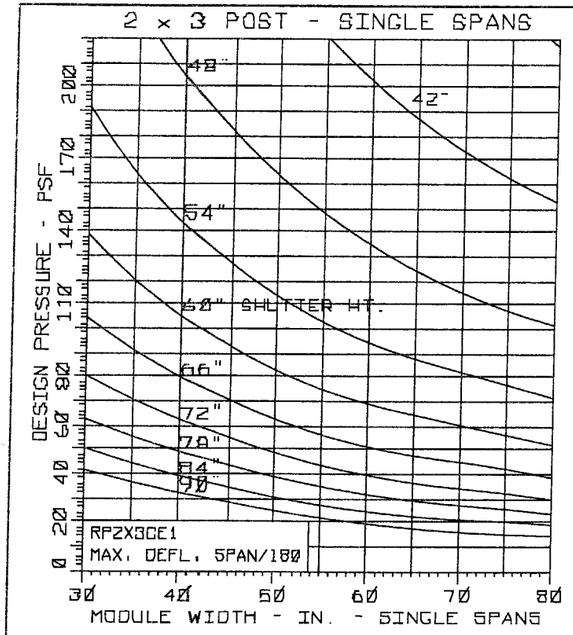
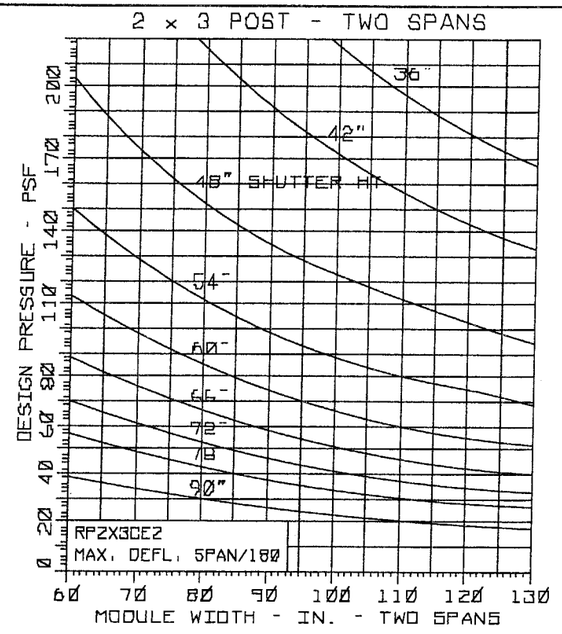
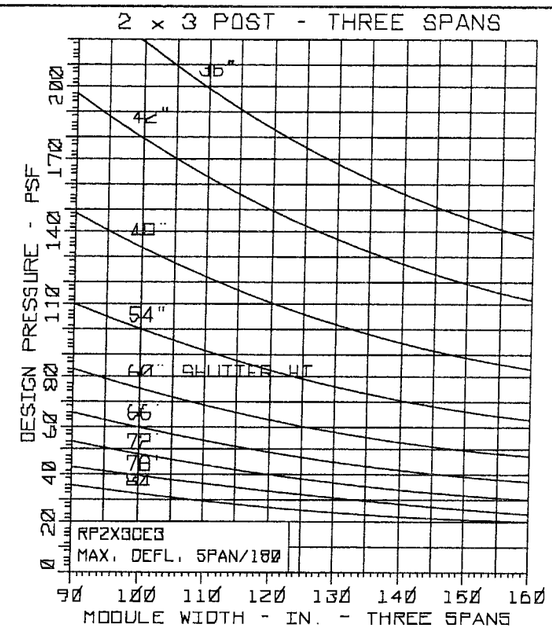
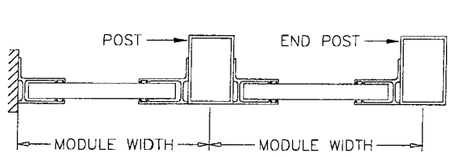
94-55

sheet 8 of 21









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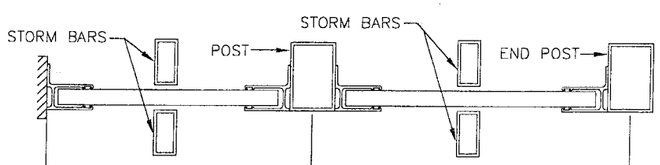

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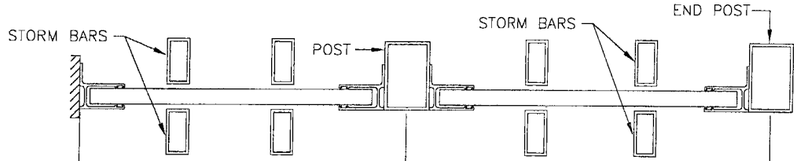

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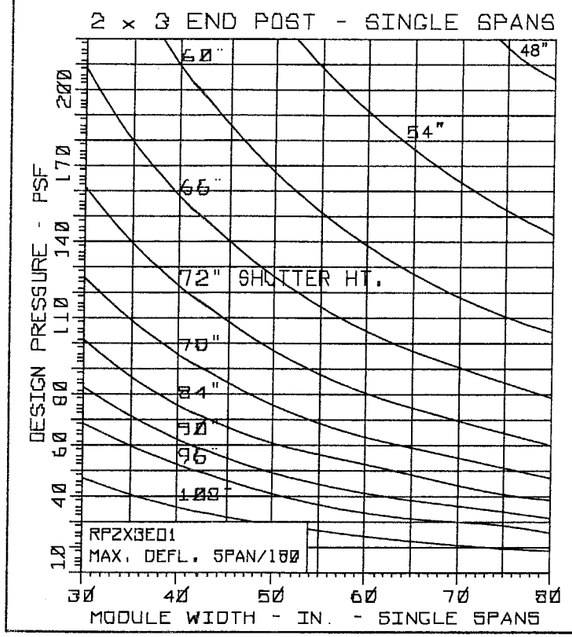

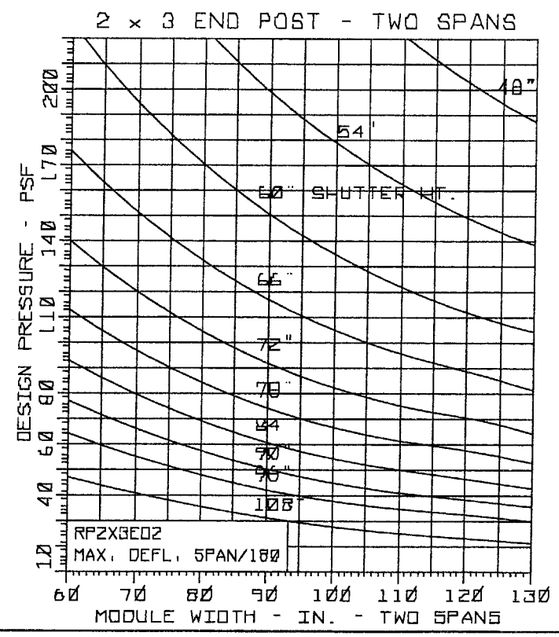

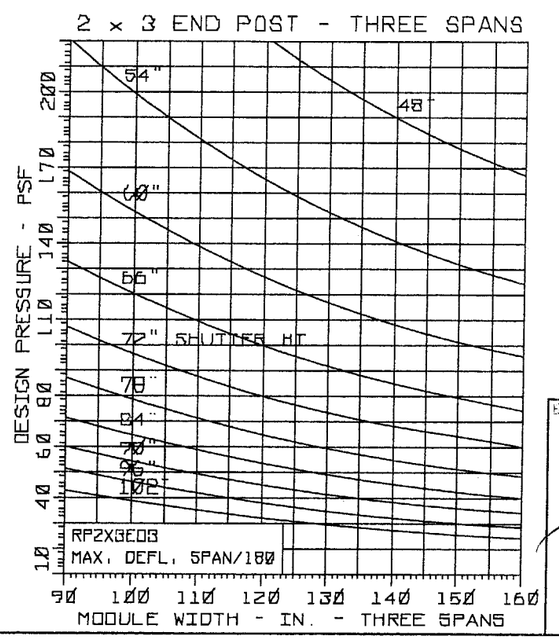

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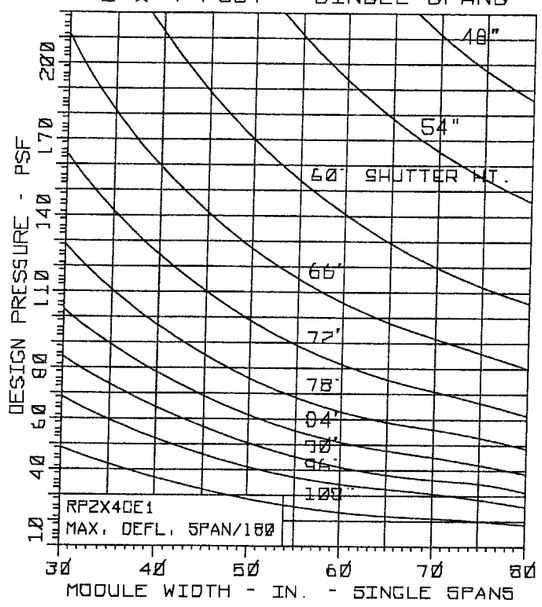
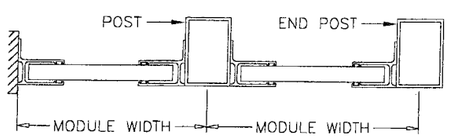
2 × 4 POST - SINGLE SPANS





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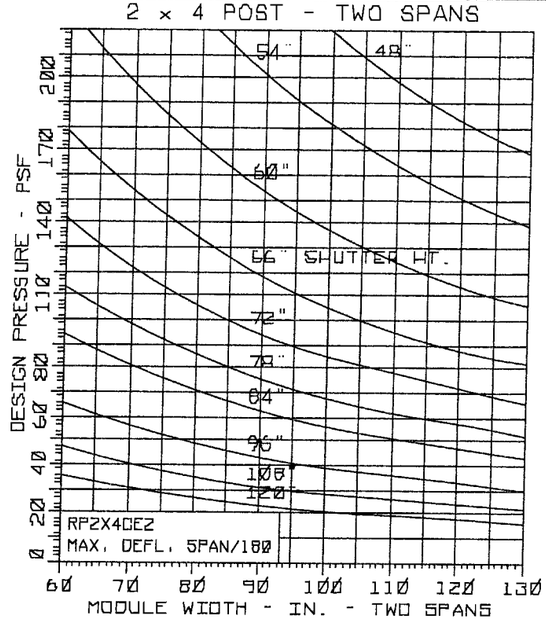

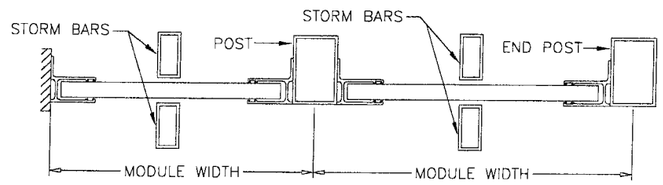

TWO SPANS

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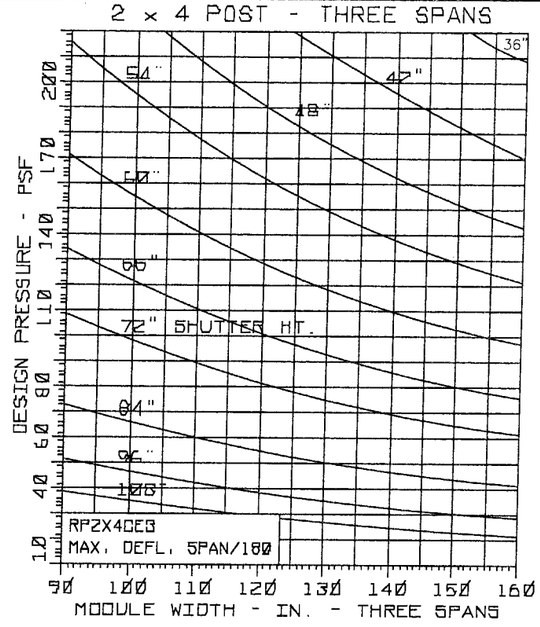

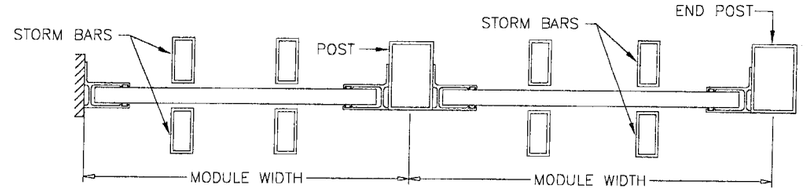

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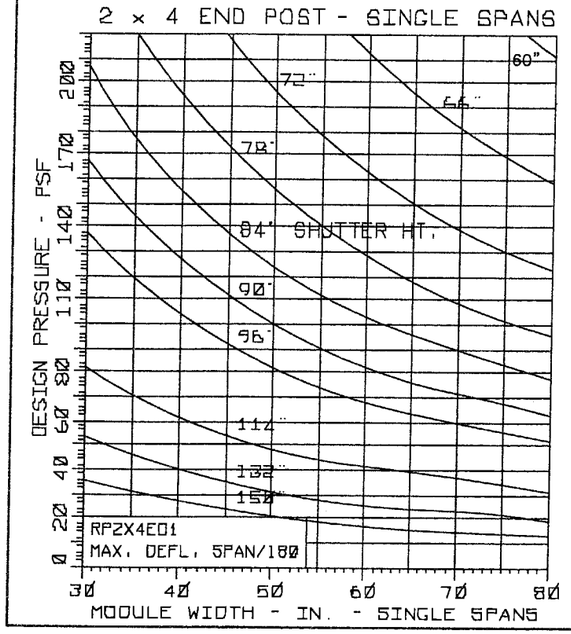

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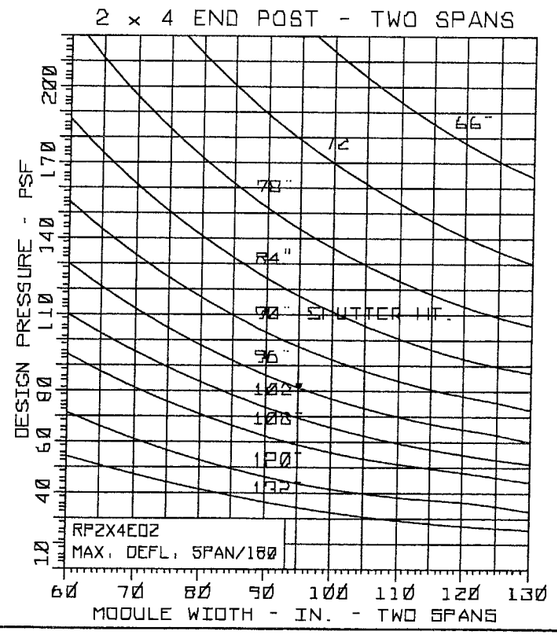

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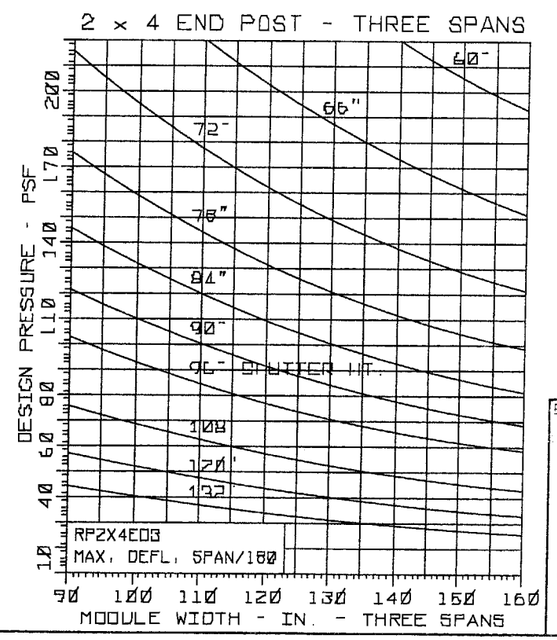

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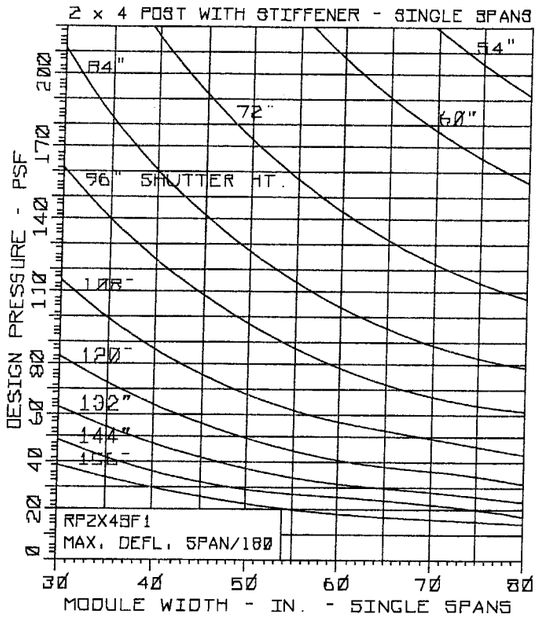

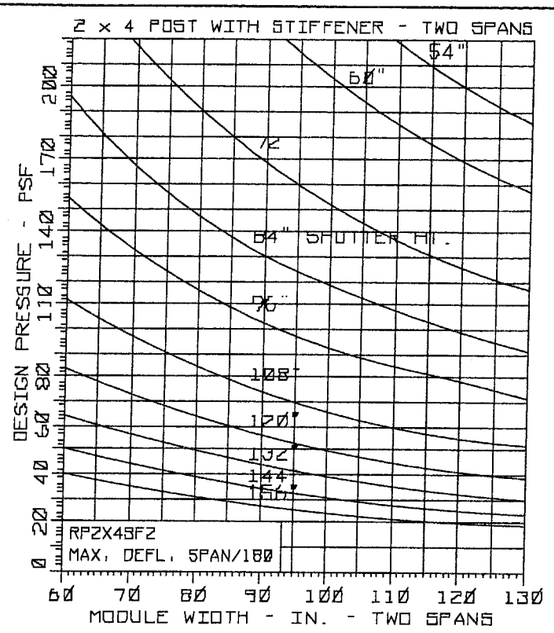

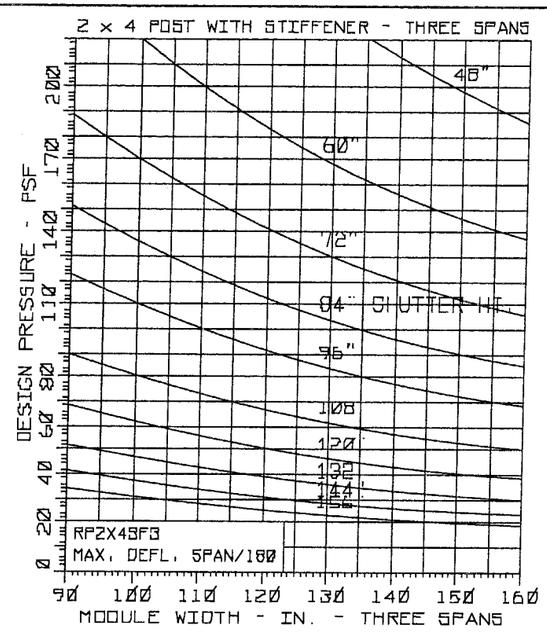

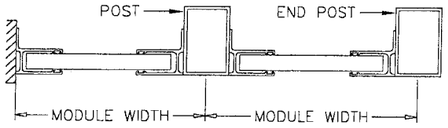

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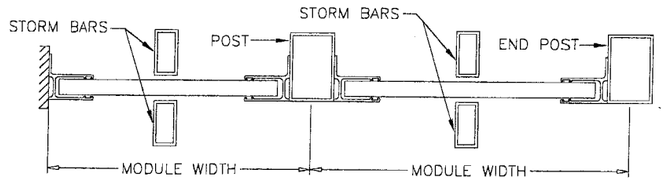

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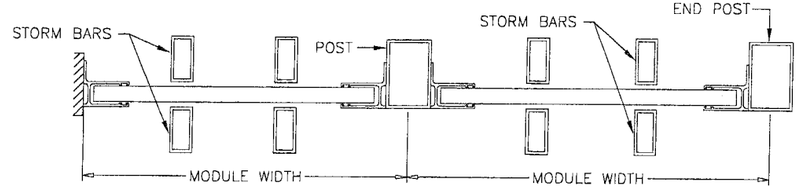

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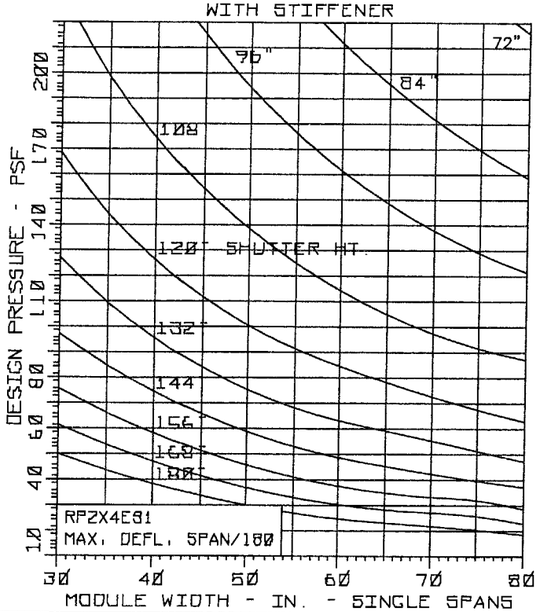

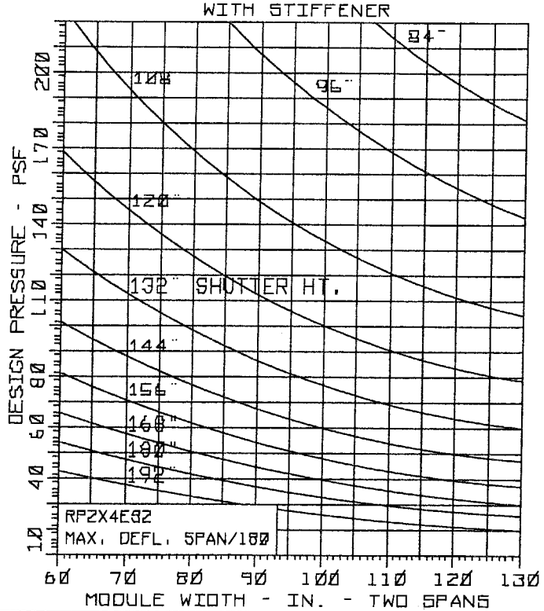

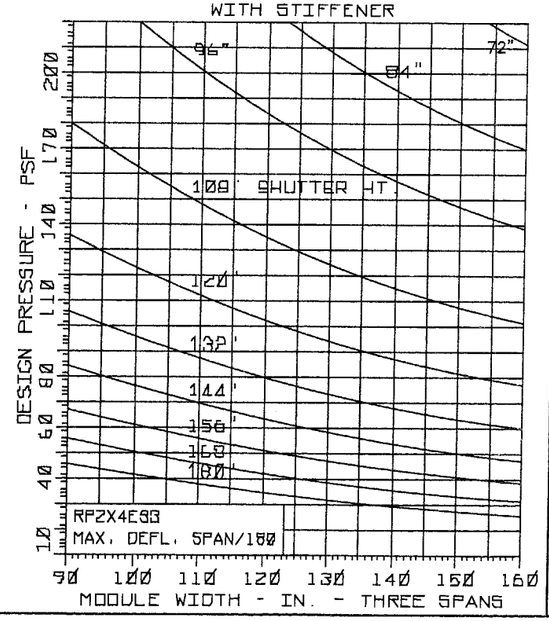

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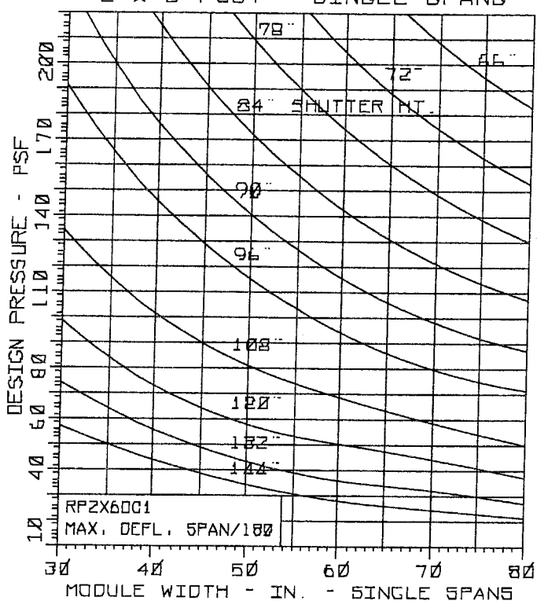
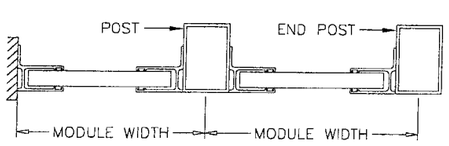
ROLLUP\94-55RI

2 × 6 POST - SINGLE SPANS





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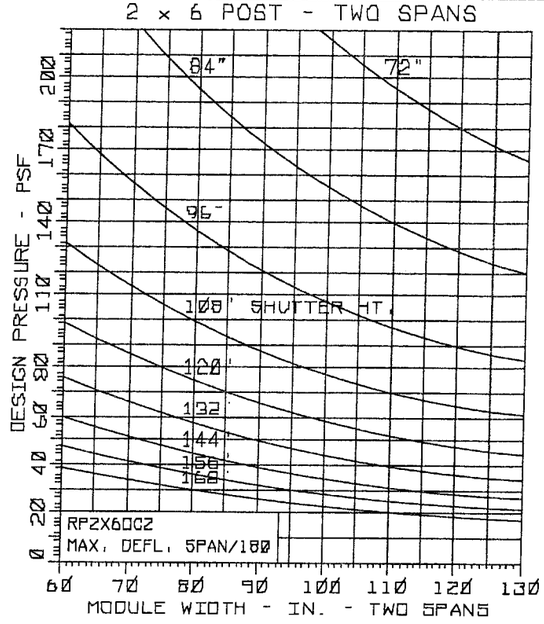

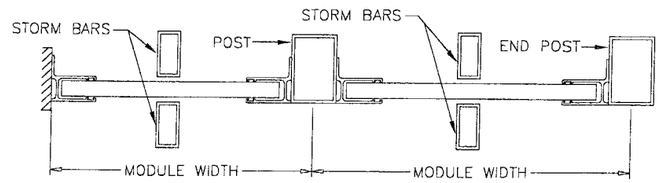

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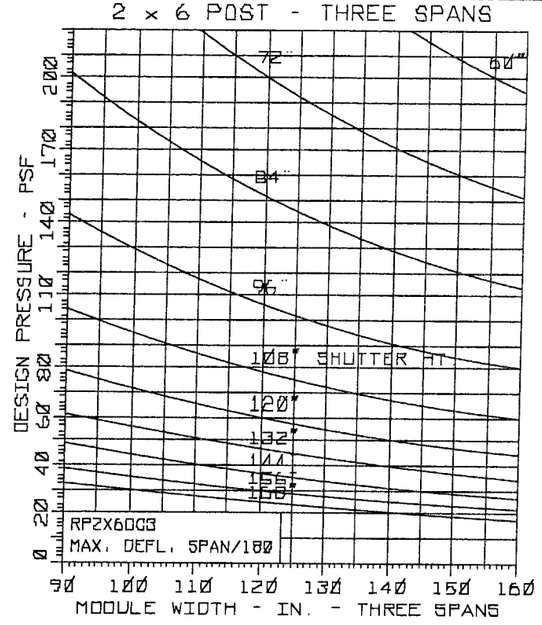

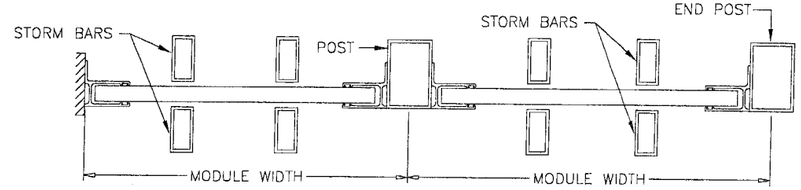

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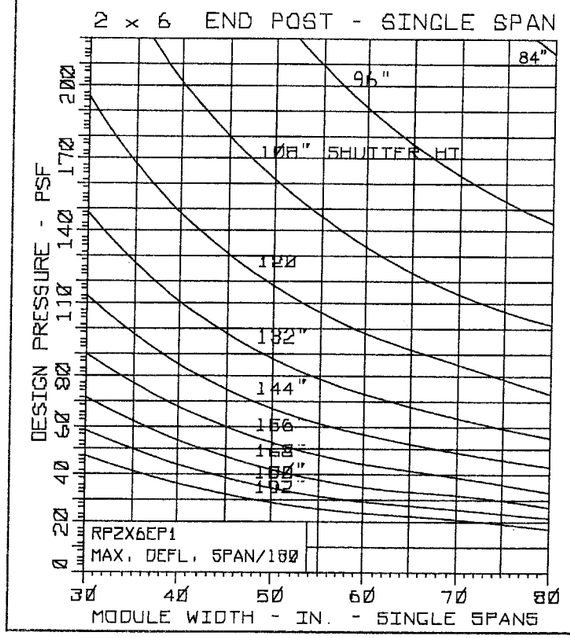

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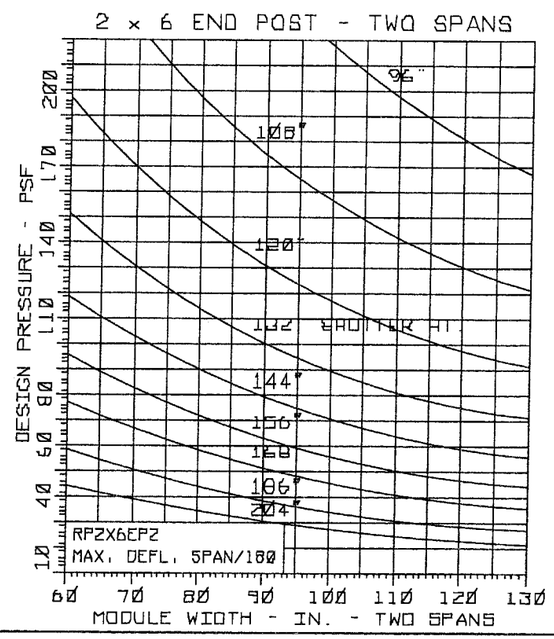

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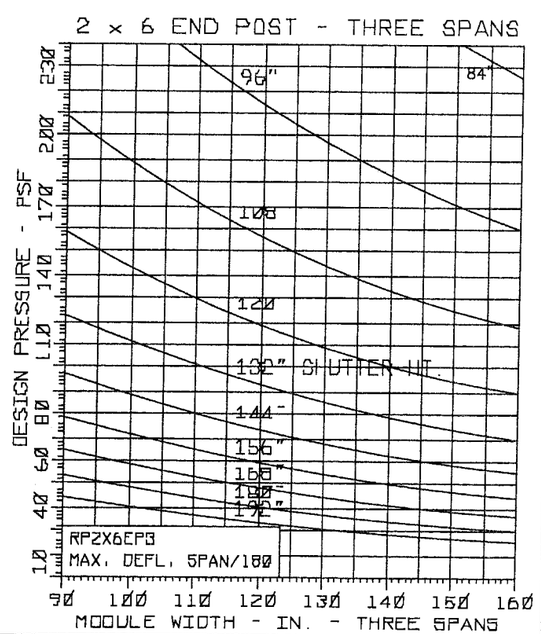

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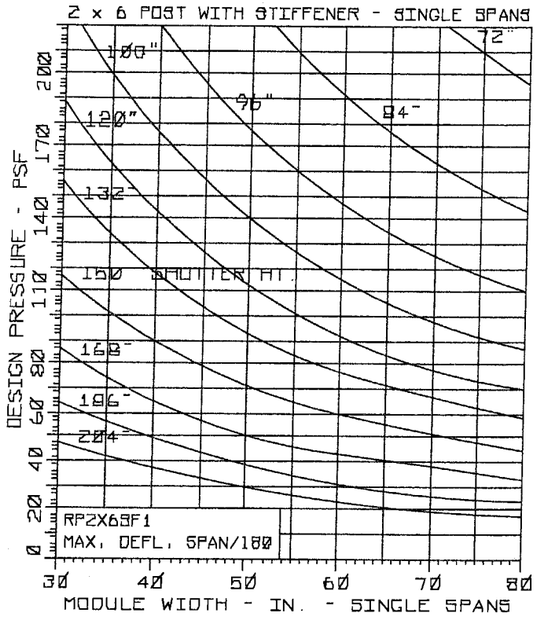
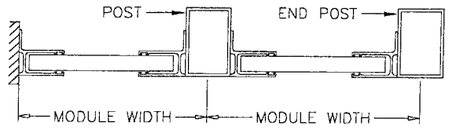
2 x 6 POST WITH STIFFENER - SINGLE SPANS





SINGLE SPANS

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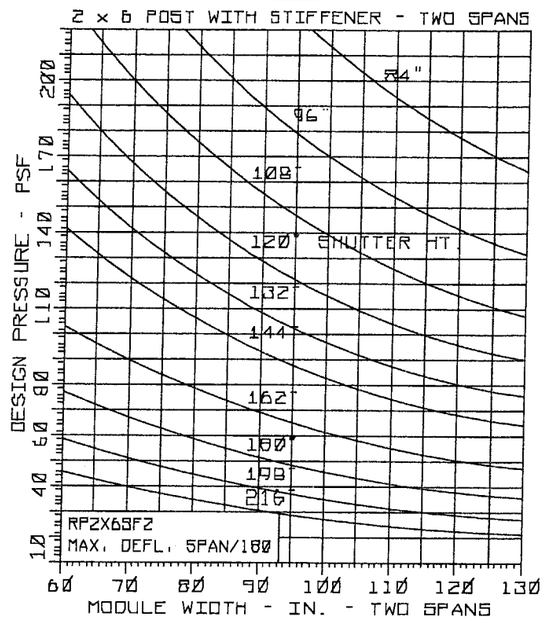
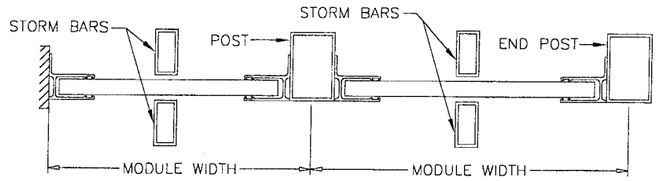
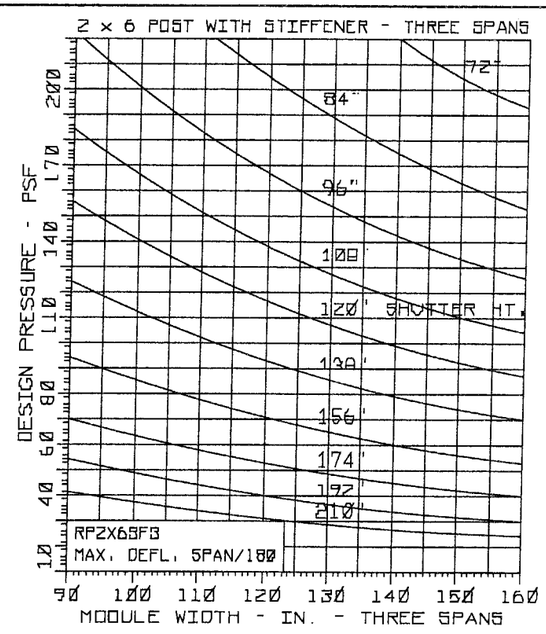
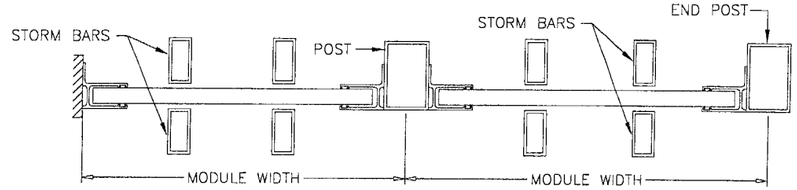




TWO SPANS

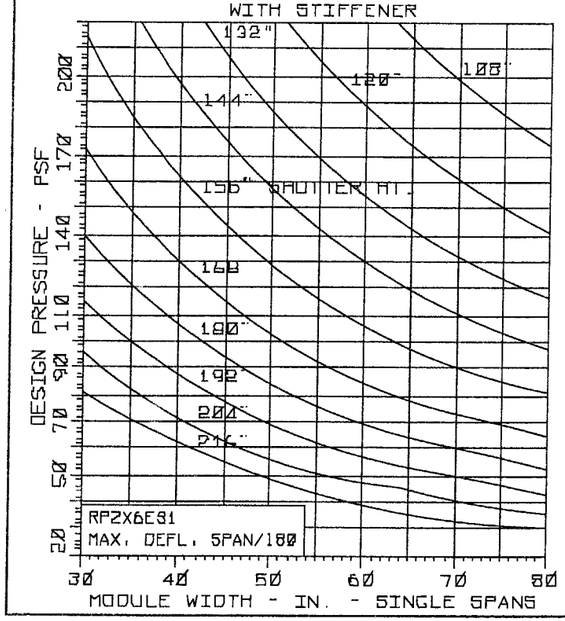
2 x 6 POST WITH STIFFENER - THREE SPANS



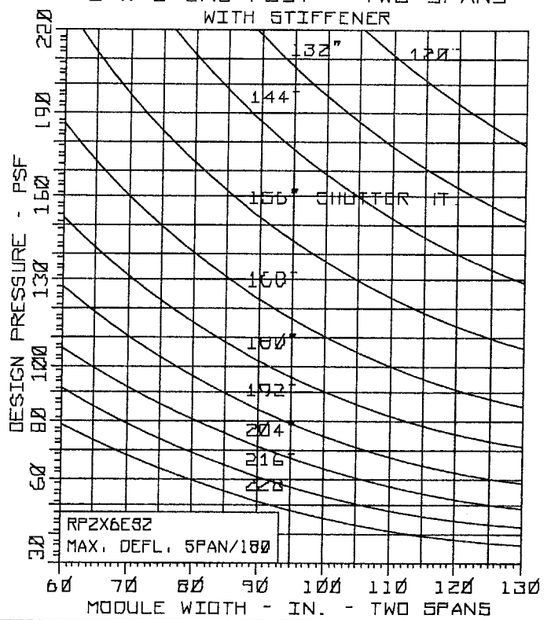


THREE SPANS

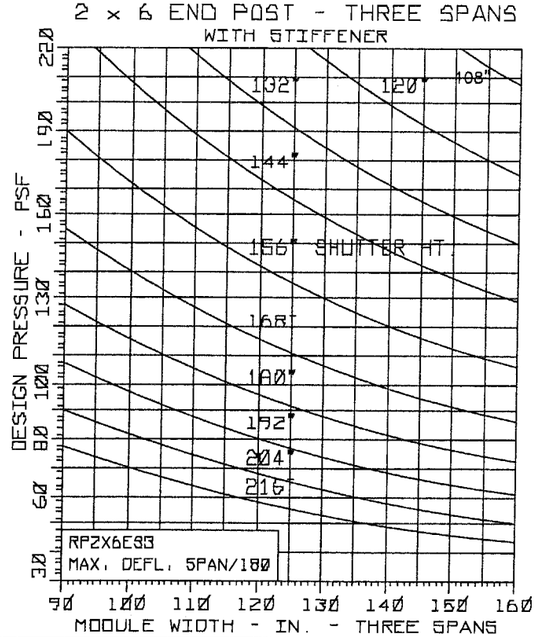
2 x 6 END POST - SINGLE SPANS WITH STIFFENER



2 x 6 END POST - TWO SPANS WITH STIFFENER



2 x 6 END POST - THREE SPANS WITH STIFFENER



PRODUCT REVISED
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By
Miami Dade Product Control Division

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

OCT 29 2003

AL-FAROOQ CORPORATION
ENGINEERS, PLANNERS & PRODUCT DESIGN
12135 SW 87 AVE.
MIAMI, FLORIDA 33174
TEL. (305) 264-8100 FAX. (305) 262-6978

ROLLUP\94-55R1

POST LOADING CHARTS

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

revisions:			
no	date	by	description
B	11.12.94	T.H.	GENERAL REVISION
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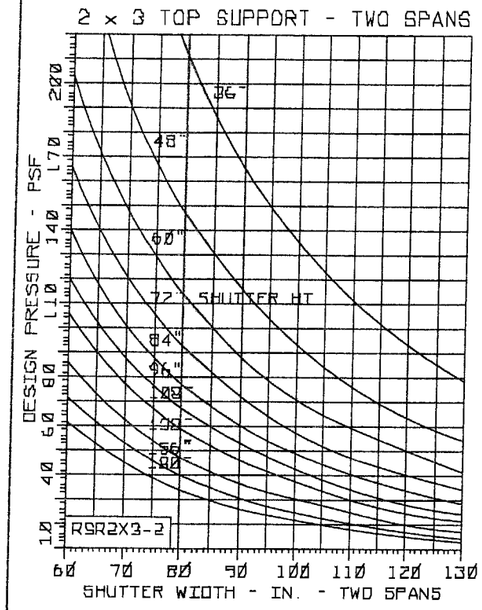
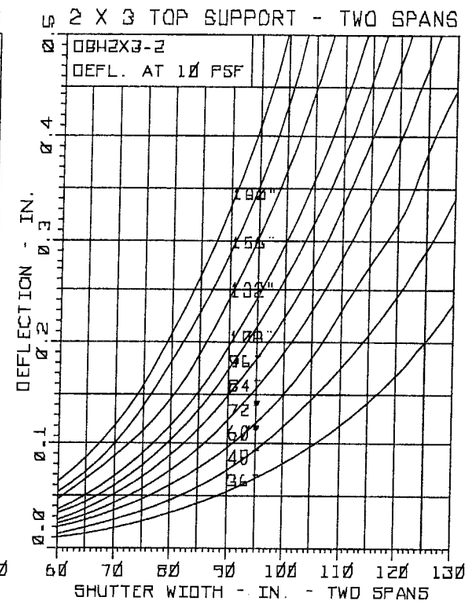
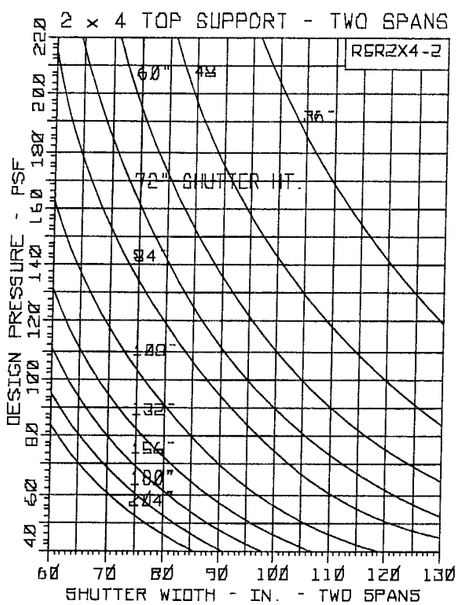
date: 07-22-94
scale: 1/2" = 1"
dr. by: HAMID
chk. by:

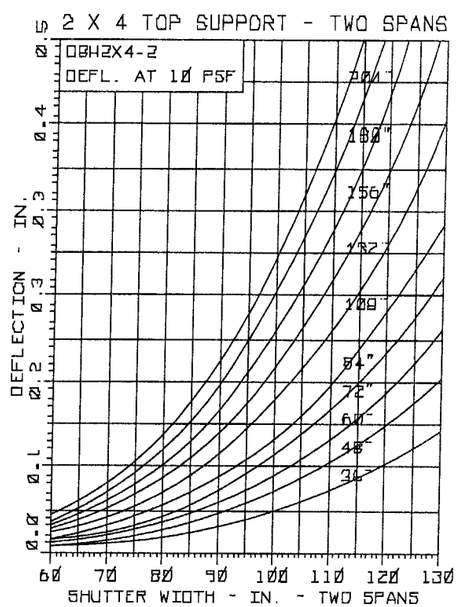
drawing no.
94-55

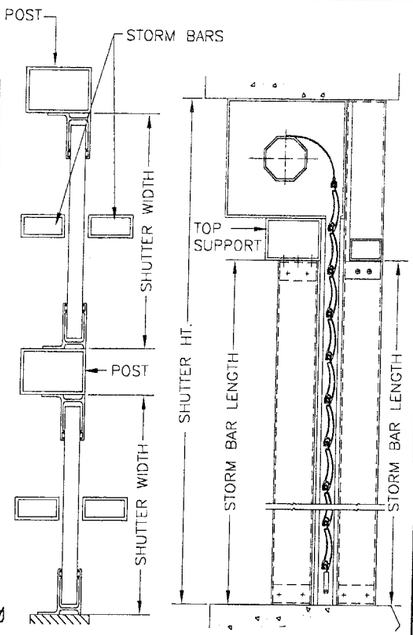
sheet 13 of 21











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THE CURVES ON THESE GRAPHS SHOW SHUTTER HEIGHT
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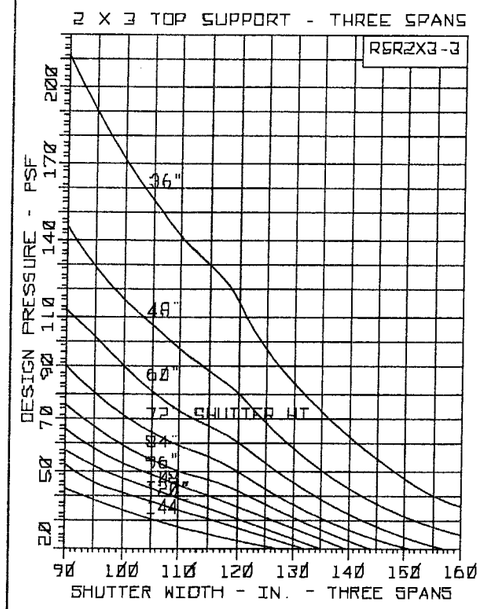

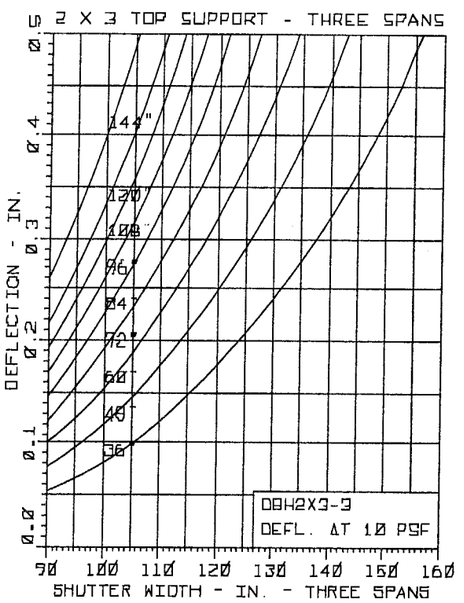

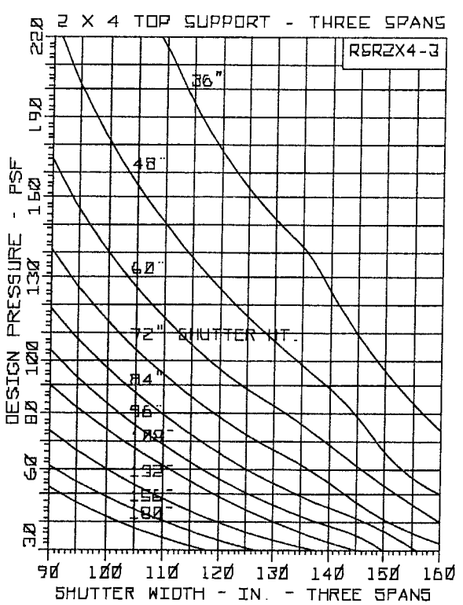

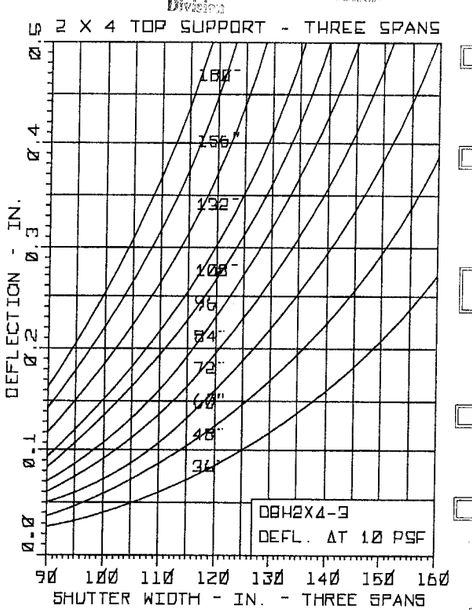

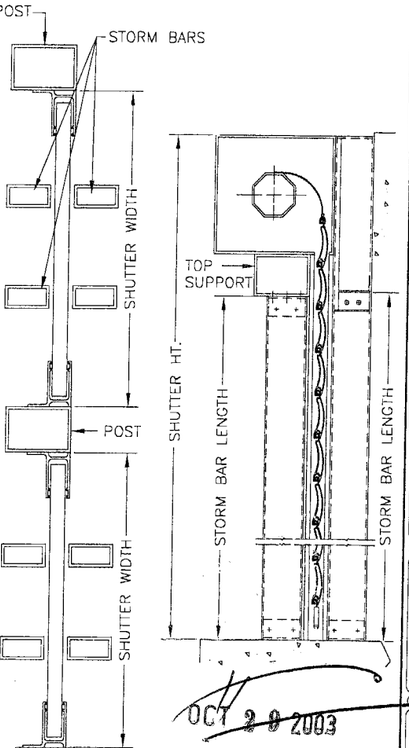

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ROLLUP\94-55R1

TOP SUPPORT LOADING CHARTS

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

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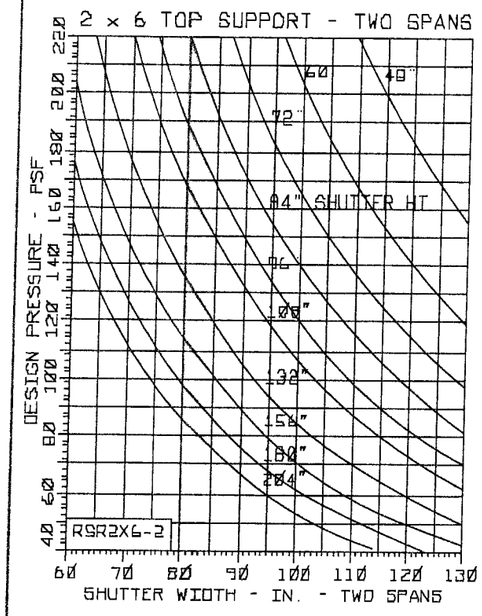

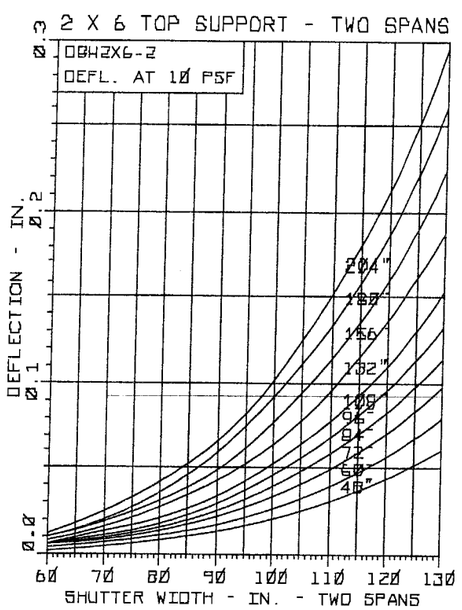

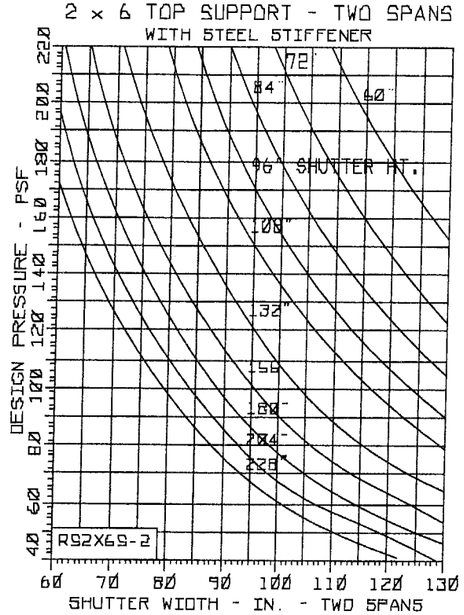

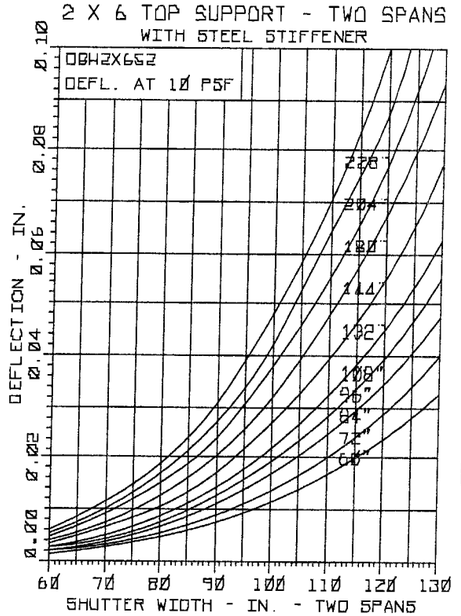

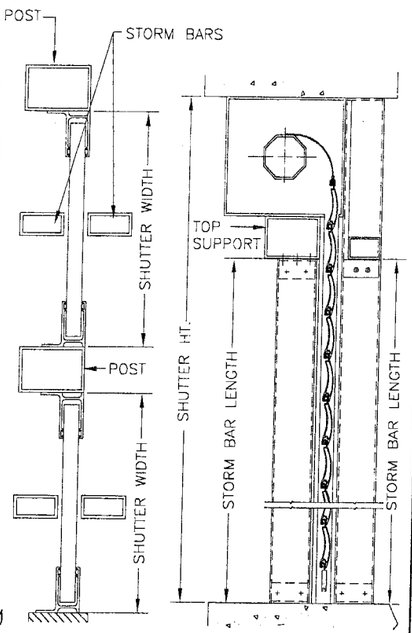

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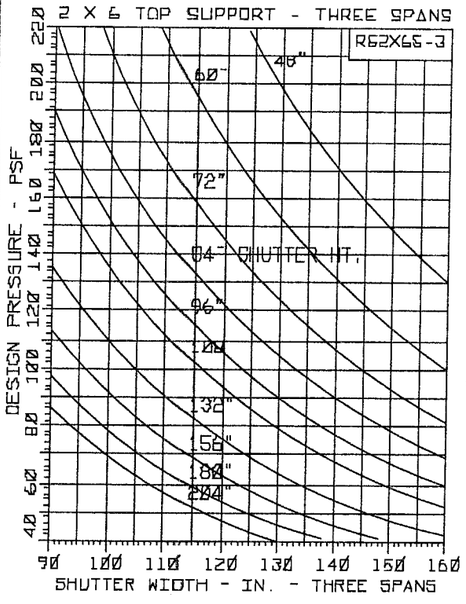

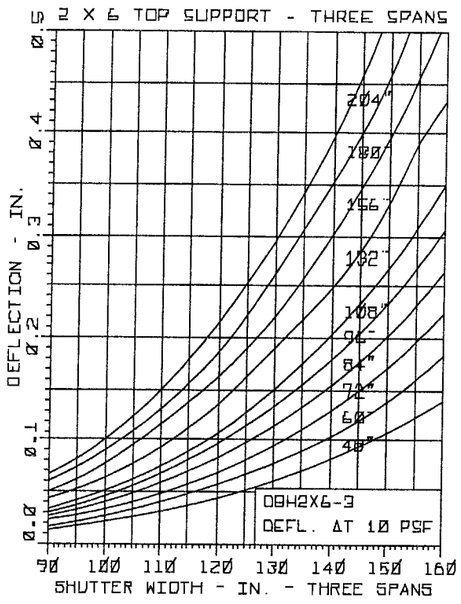

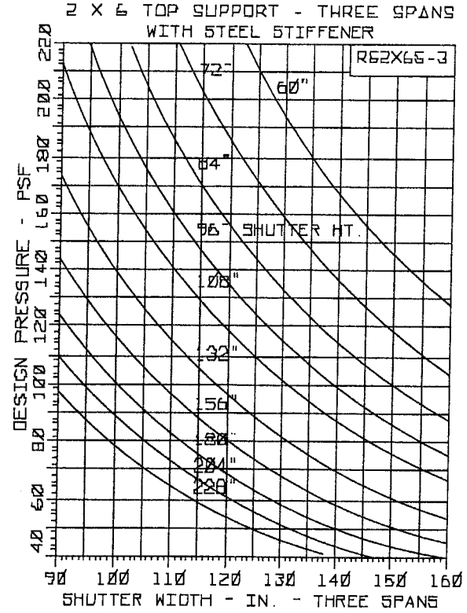

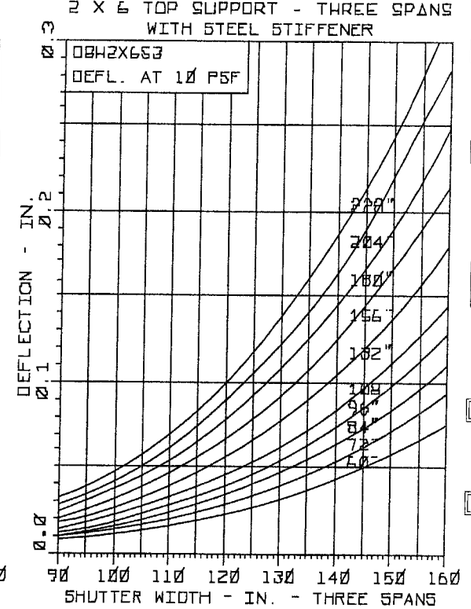

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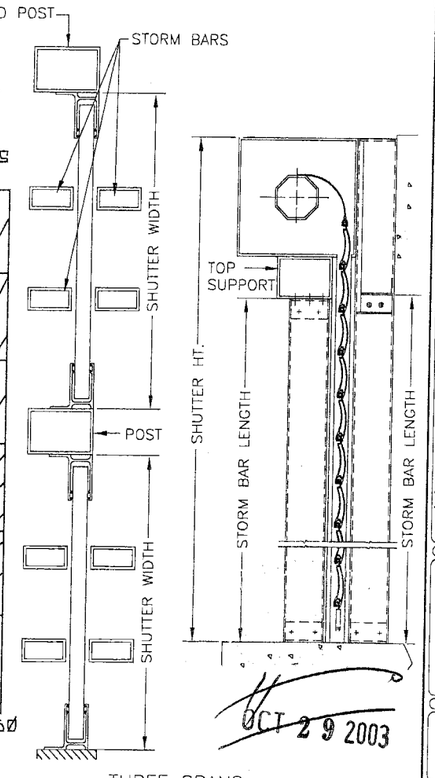

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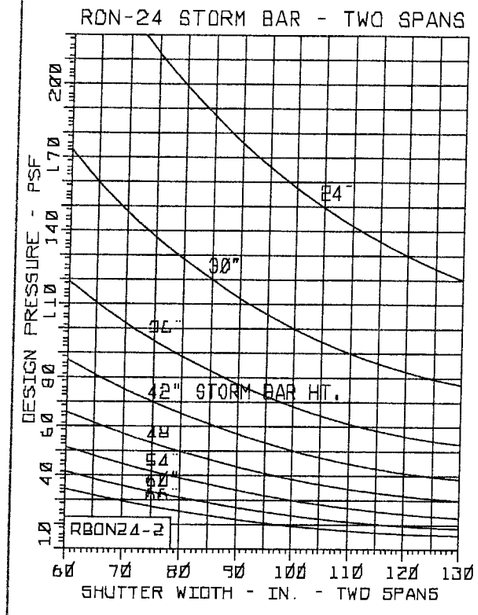

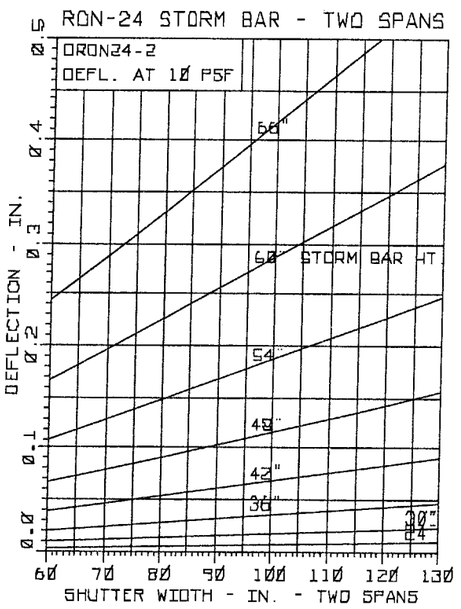

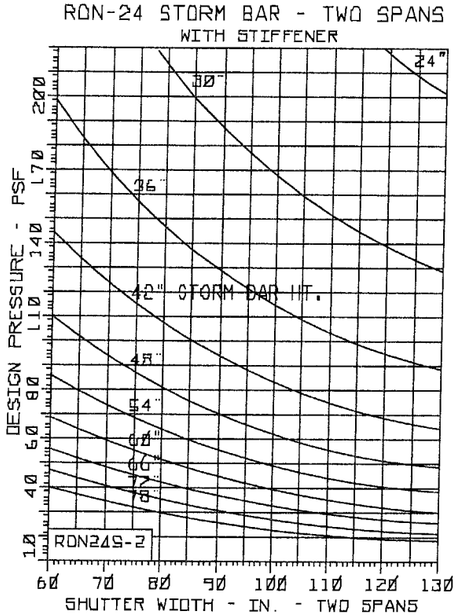

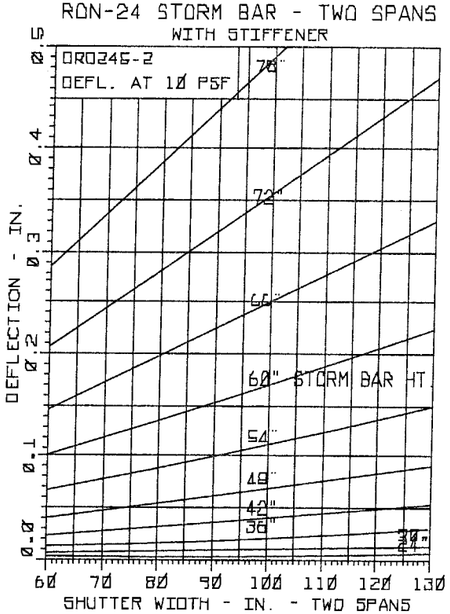

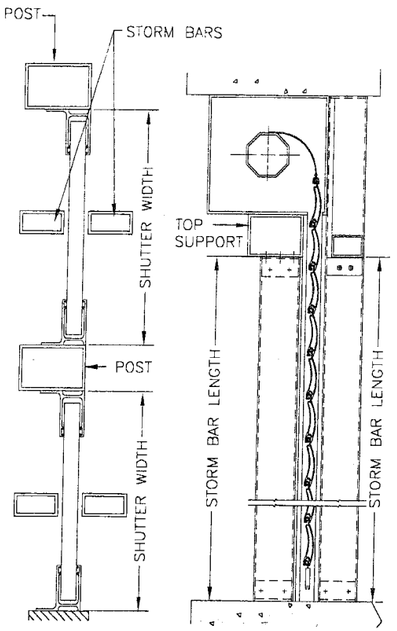

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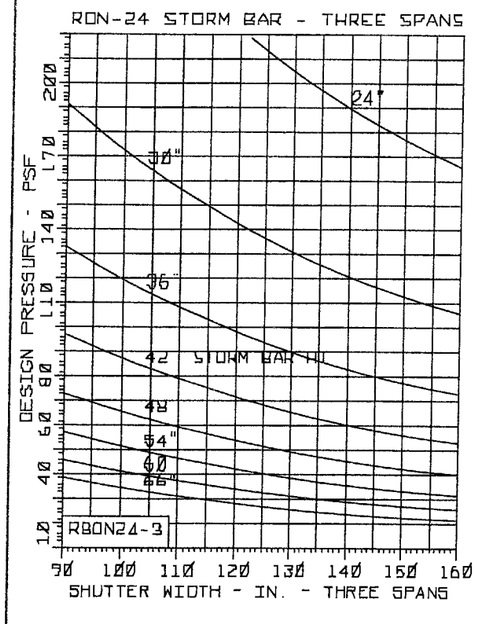

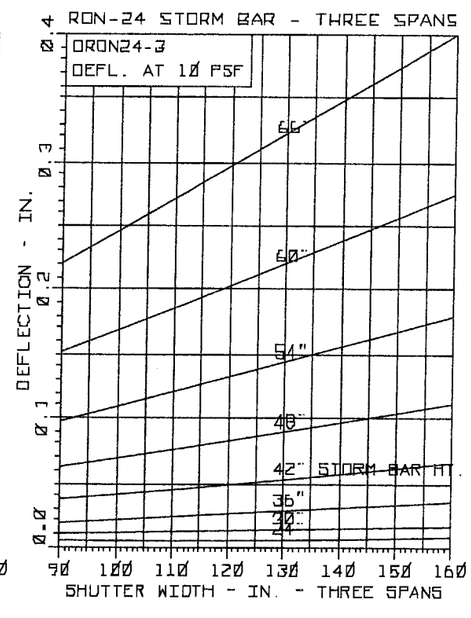

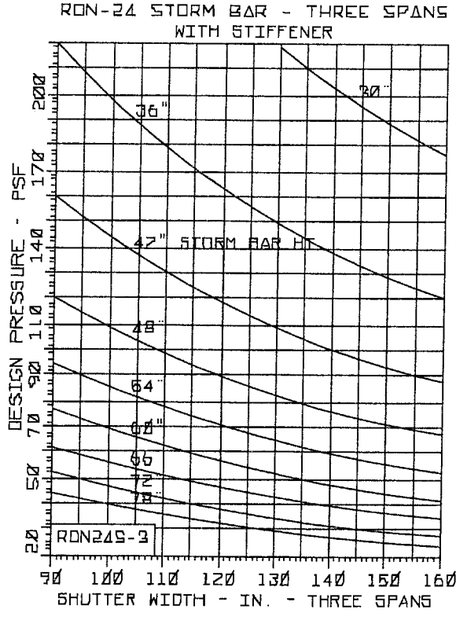

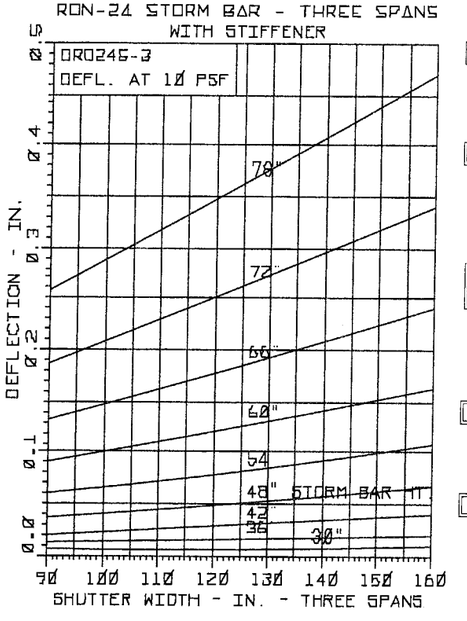

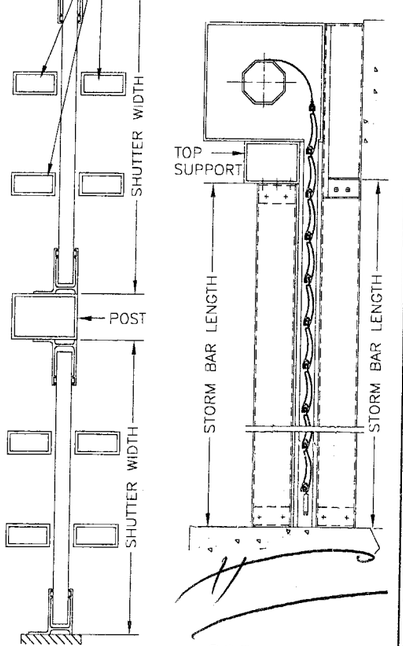

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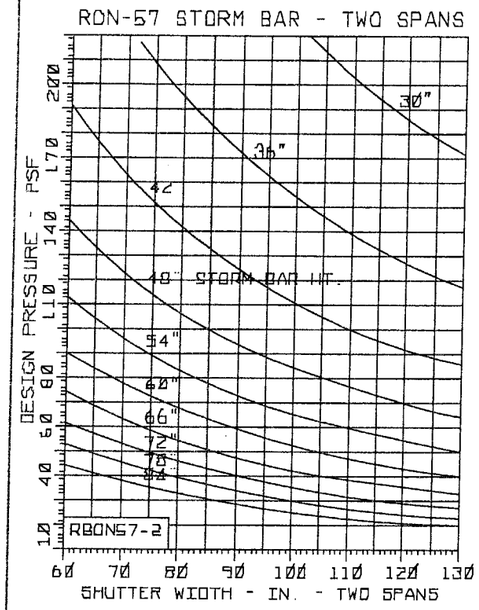

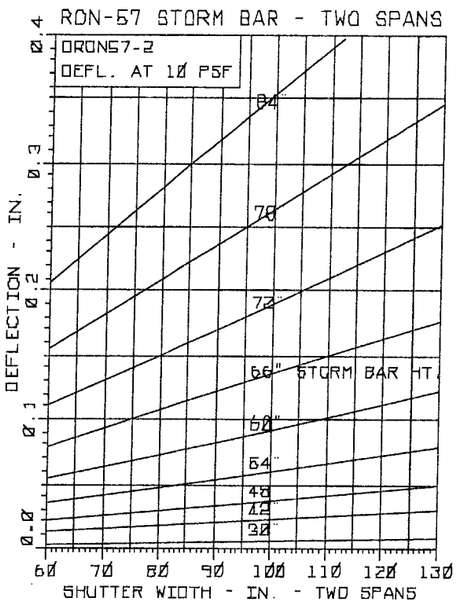

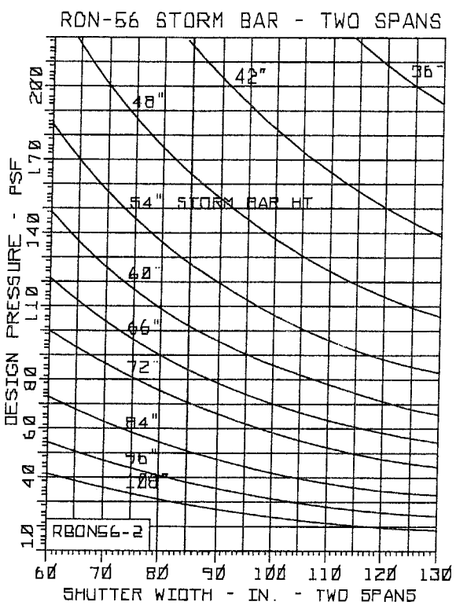

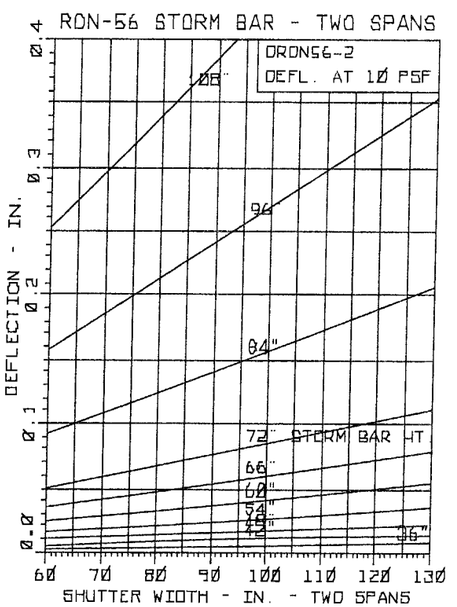

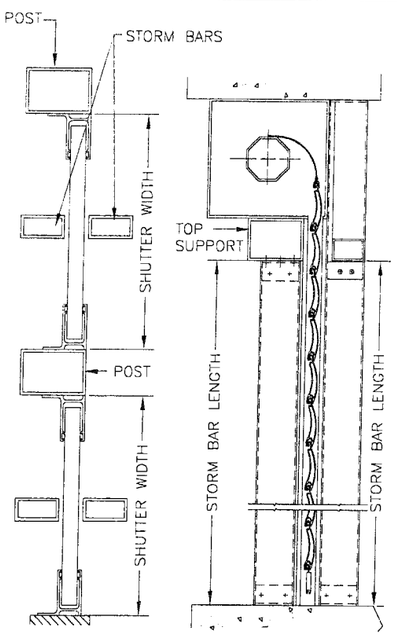

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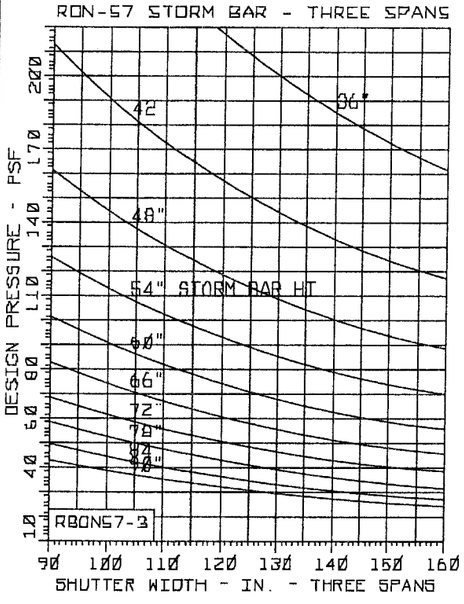

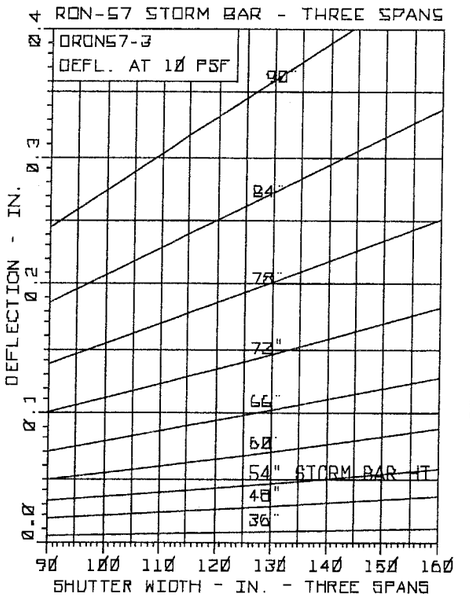

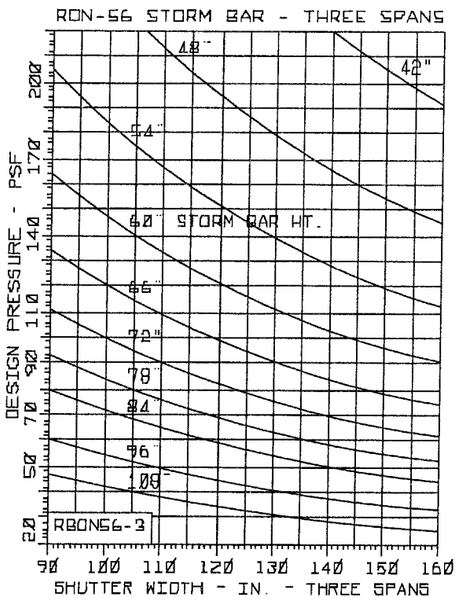

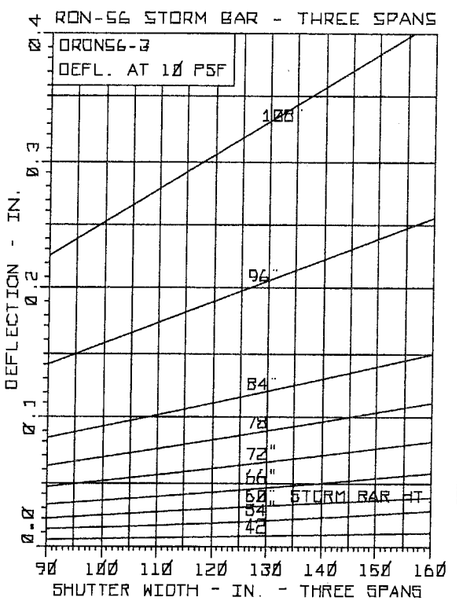

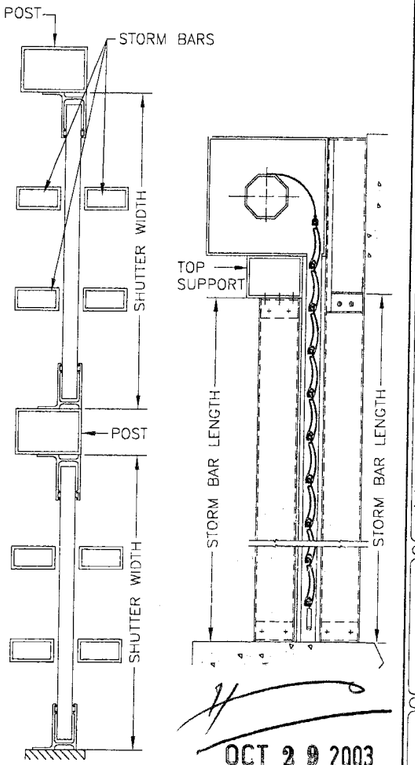

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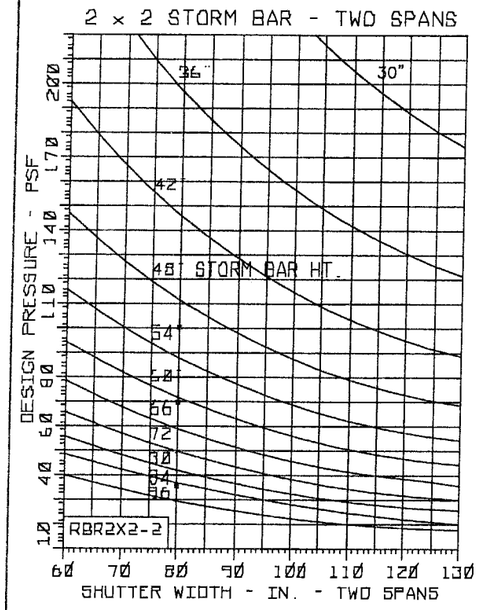
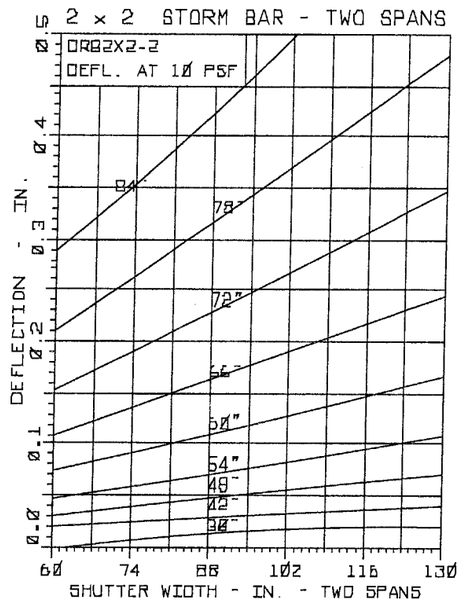
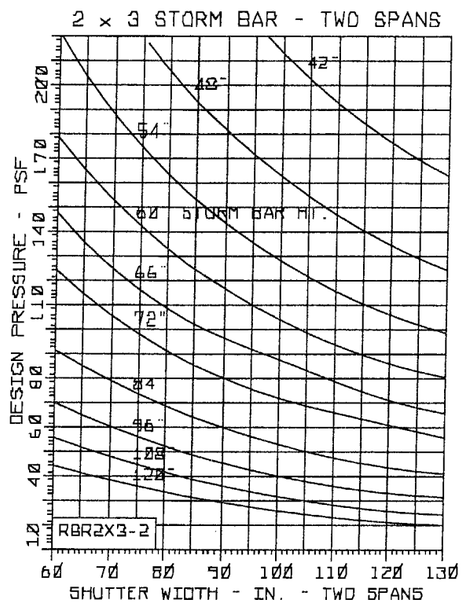
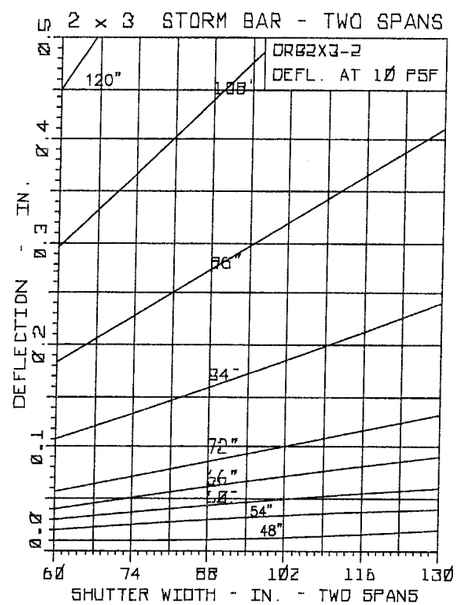
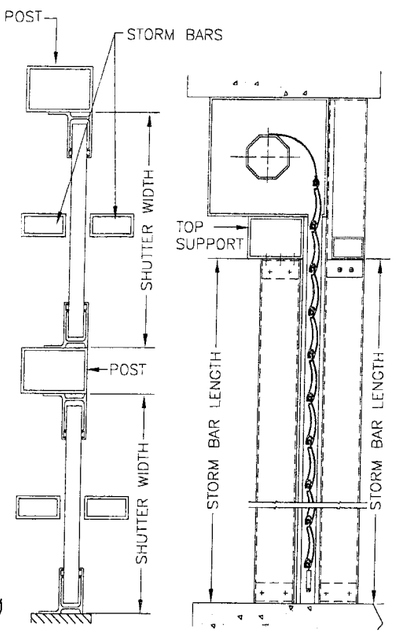
94-55







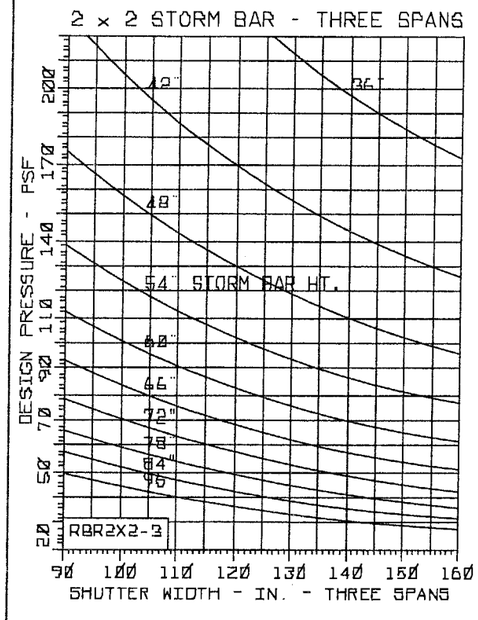


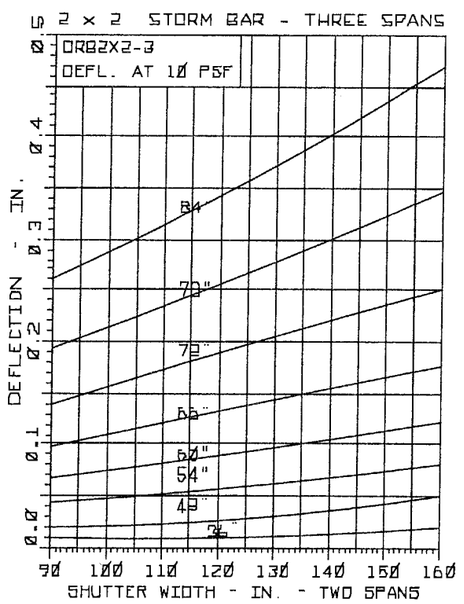


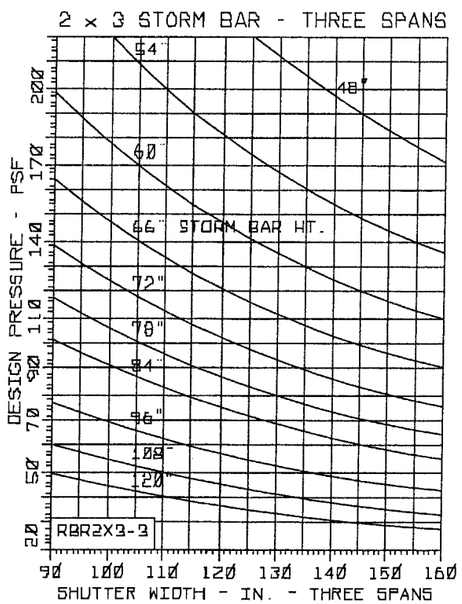
TWO SPANS

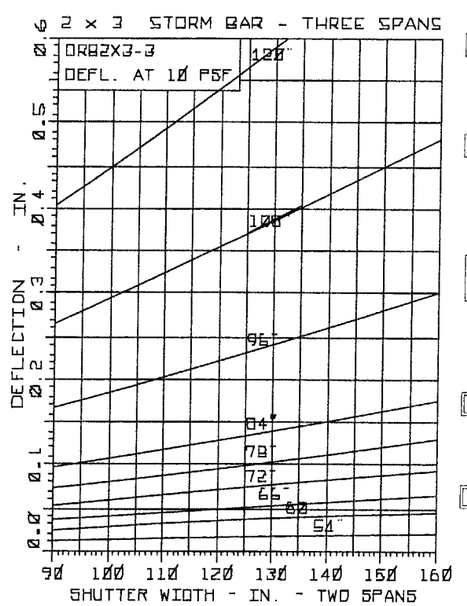
THE CURVES ON THESE GRAPHS SHOW STORM BAR LENGTHS
SEE SKETCH FOR REFERENCE

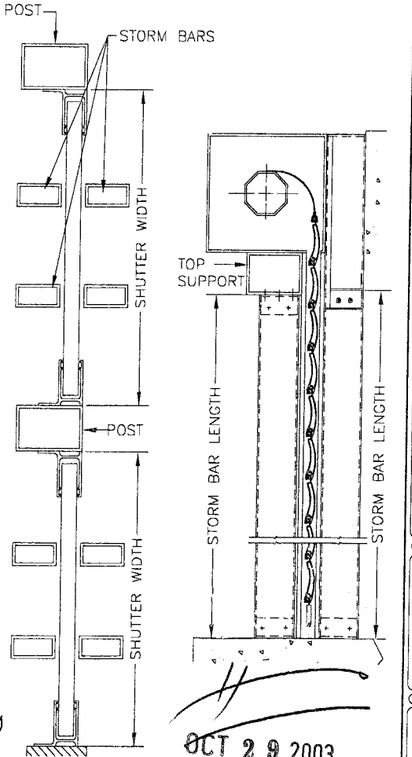
PRODUCT REVISED
as complying with the Florida Building Code
Acceptance No. 03-1110.04
Expiration Date 09/25/07
By
Miami-Dade Product Control Division











THREE SPANS

OCT 29 2003

AL-FAROOQ CORPORATION
ENGINEERS, PLANNERS & PRODUCT DESIGN
1235 SW 87 AVE
MIAMI, FLORIDA 33174
TEL. (305) 264-8100 FAX. (305) 262-6978
Engr: DR. H. FAROOQ PE # 16557 ROLLUP\94-55(R)

STORM BAR LOADING CHARTS

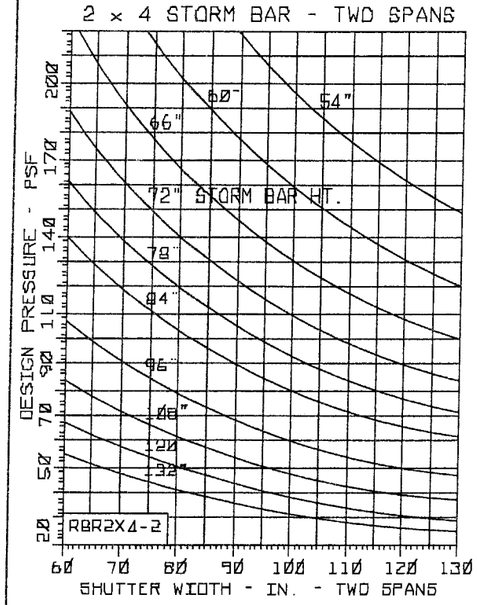
ROLLADEN INC.
550 ANSIN BOULEVARD
HALLANDALE, FL. 33009
(305) 757 - 8591

revisions:			
no	date	by	description
B	11.12.94	T.H.	GENERAL REVISION
C	02.02.95	T.H.	GENERAL REVISION
D	07.02.95	T.H.	SHEET 3 REVISED
E	04.25.03	T.H.	NO CHANGE THIS SHEET
F	10.28.03	T.H.	NO CHANGE THIS SHEET

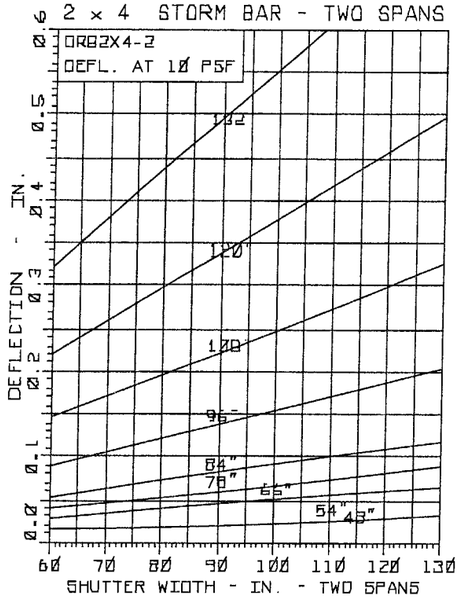
date: 07-22-94
scale: 1/2" = 1"
dr. by: HAMID
chk. by:

drawing no.
94-55

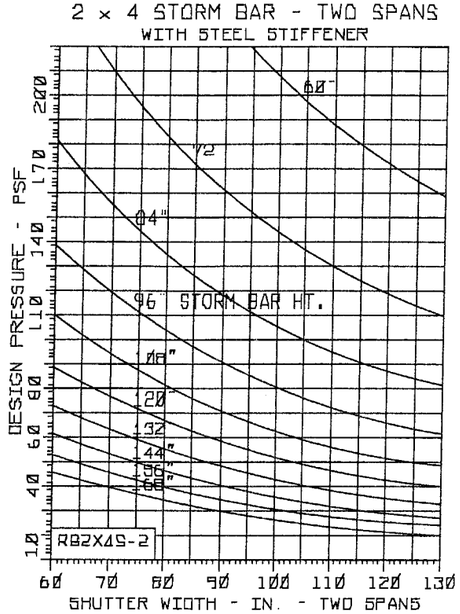
2 × 4 STORM BAR - TWO SPANS



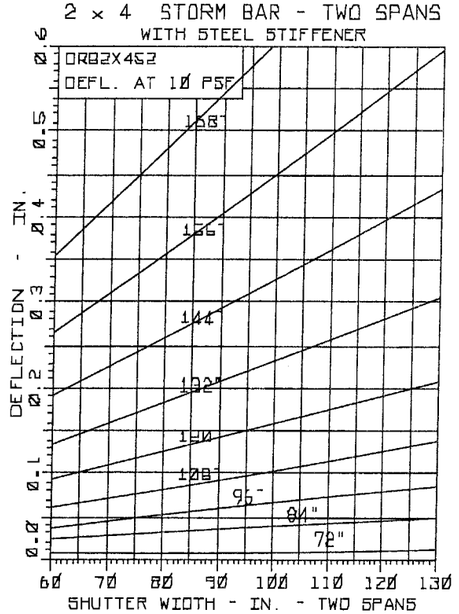
2 × 4 STORM BAR - TWO SPANS

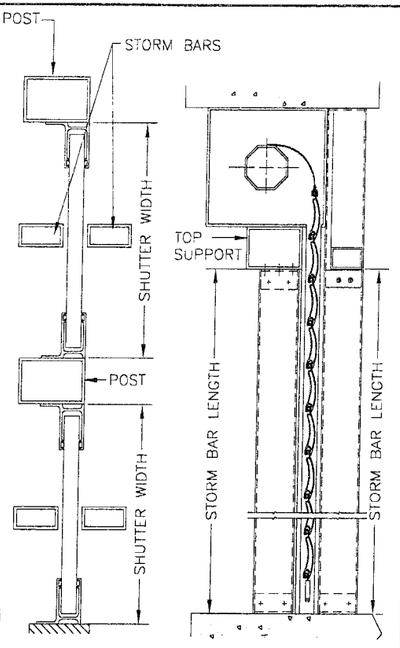


2 × 4 STORM BAR - TWO SPANS WITH STEEL STIFFENER



2 × 4 STORM BAR - TWO SPANS WITH STEEL STIFFENER





TWO SPANS

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SEE SKETCH FOR REFERENCE

PRODUCT REVISED
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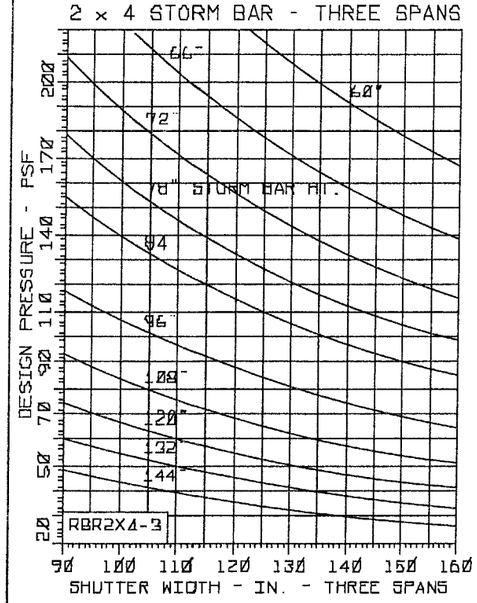
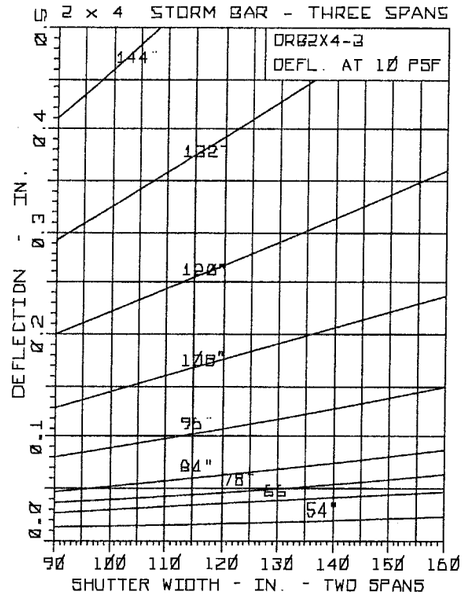
Acceptance No. 03-1119.04
Expiration Date 09/23/08
By
Miami Dade Product Control Division

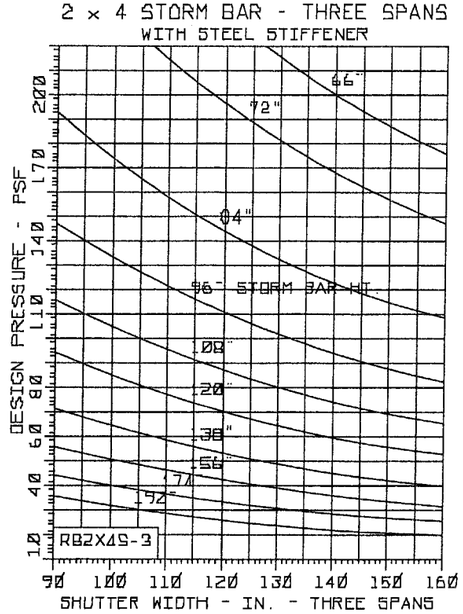
2 × 4 STORM BAR - THREE SPANS



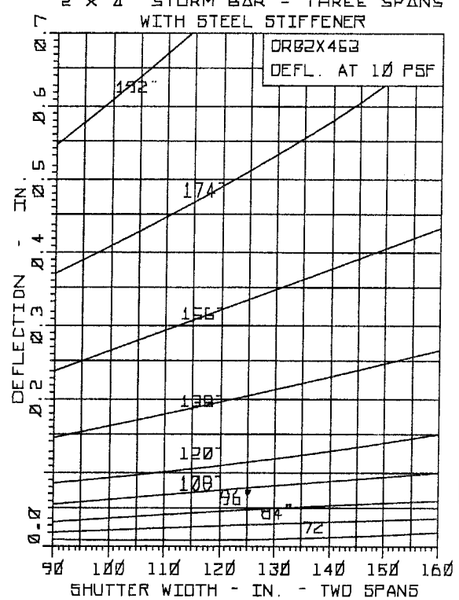
2 × 4 STORM BAR - THREE SPANS

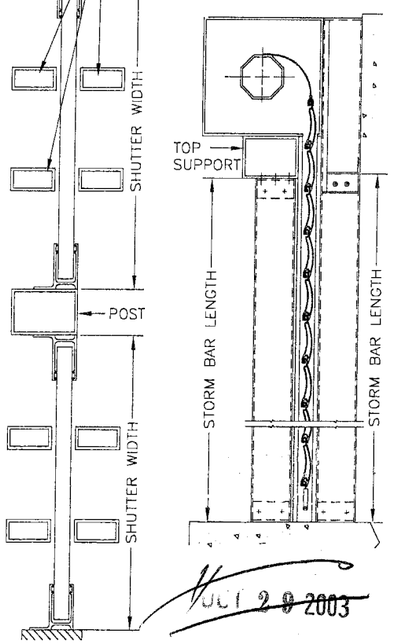


2 × 4 STORM BAR - THREE SPANS WITH STEEL STIFFENER



2 × 4 STORM BAR - THREE SPANS WITH STEEL STIFFENER





THREE SPANS

JUL 29 2003

AL-FAROOQ CORPORATION
ENGINEERS, PLANNERS & PRODUCT DESIGN
1235 SW 87 AVE
MIAMI, FLORIDA 33174
TEL. (305) 264-8100 FAX. (305) 262-6978
Engr: DR. H. FAROOQ PE # 16557 ROLLUP\94-55R1

STORM BAR LOADING CHARTS

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

revisions:			
no	date	by	description
B	11.12.94	T.H.	GENERAL REVISION
C	02.02.95	T.H.	GENERAL REVISION
D	07.02.95	T.H.	SHEET 3 REVISED
E	04.25.03	T.H.	NO CHANGE THIS SHEET
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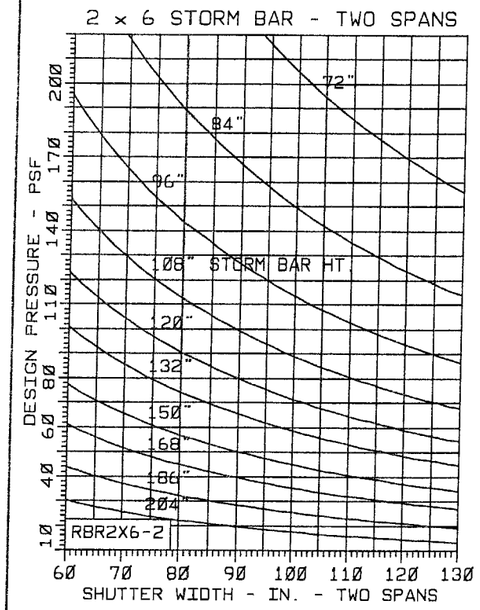
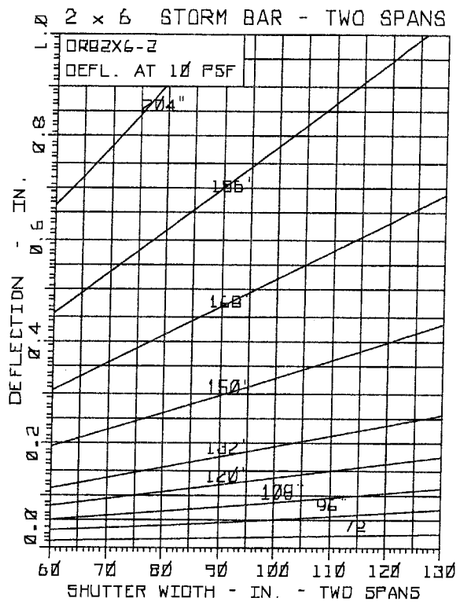
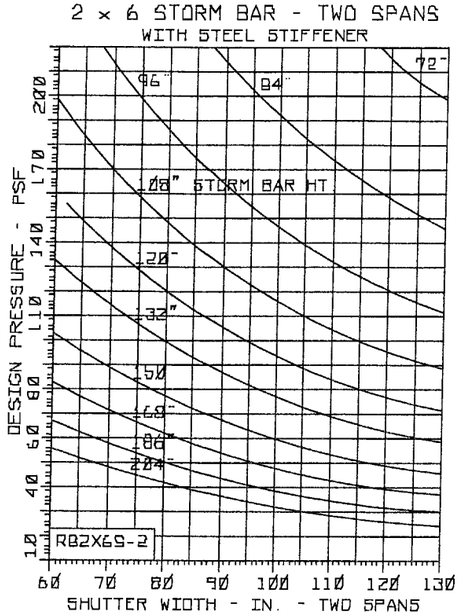
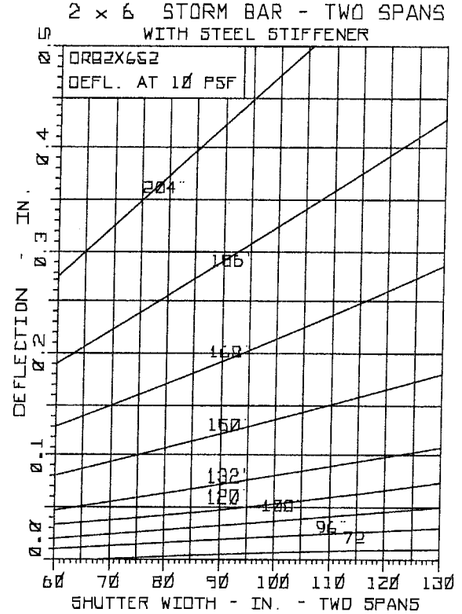
date: 07-22-94
scale: 1/2" = 1"
dr. by: HAMID
chk. by:

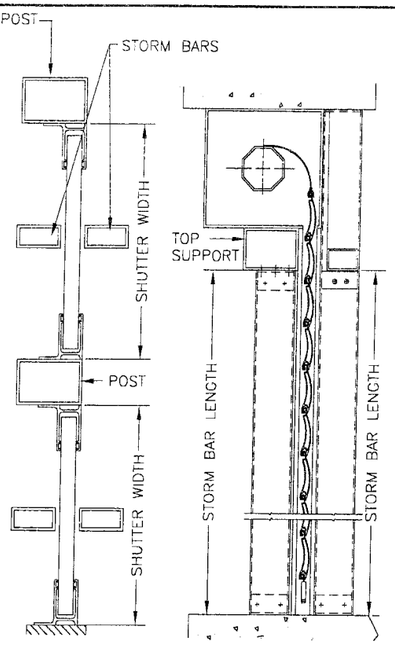
drawing no. 94-55











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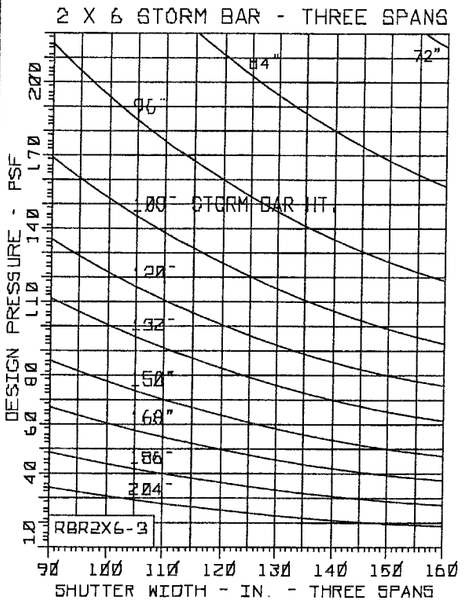

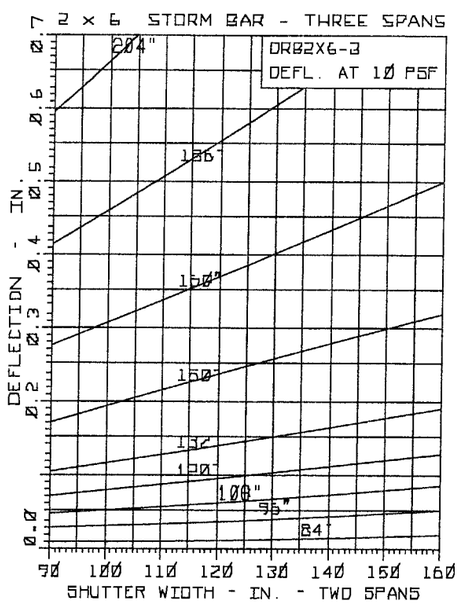

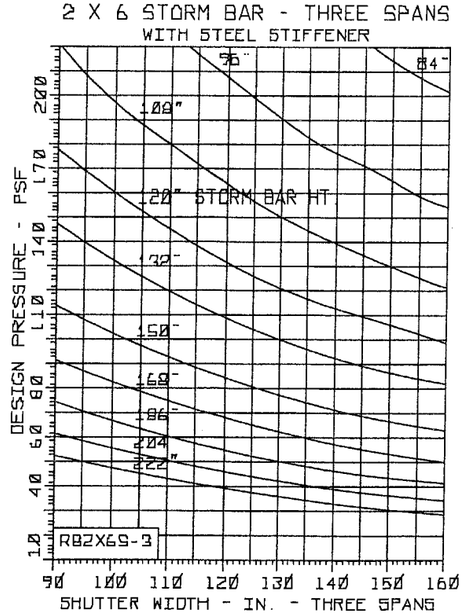

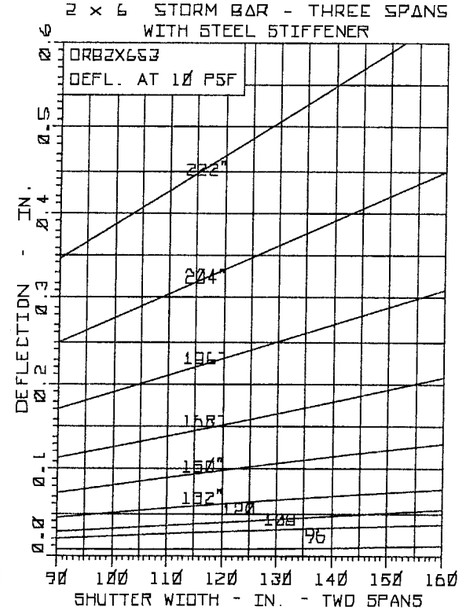

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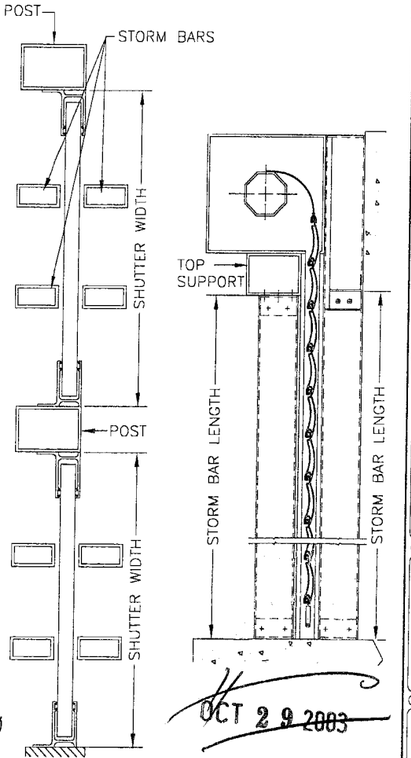
Acceptance No. 03-1110.04
Expiration Date 09/28/08
By
Miami Dade Product Control Division



THREE SPANS

OCT 29 2003

AL-FAROOQ CORPORATION
ENGINEERS, PLANNERS & PRODUCT DESIGN
1235 SW 87 AVE
MIAMI, FLORIDA 33174
TEL. (305) 264-8100 FAX. (305) 262-6978
Engr: DR. H. FAROOQ PE # 16557

ROLLUP\94-55RI

STORM BAR LOADING CHARTS

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

revisions:			
no	date	by	description
B	11.12.94	T.H.	GENERAL REVISION
C	02.02.95	T.H.	GENERAL REVISION
D	07.02.95	T.H.	SHEET 3 REVISED
E	04.25.03	T.H.	NO CHANGE THIS SHEET
F	10.28.03	T.H.	REV. PER BCCO COMMENTS

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.

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

OCT 29 2003

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ROLLUP\94-55R1

DEFLECTION CALCULATION SHEET

ROLLADEN INC.
550 ANSIN BOULEVARD
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chk. by:

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sheet 21 of 21