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Product Approval
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▶ OFFICE OF THE SECRETARY

FL #	FL8363-R4
Application Type	Revision
Code Version	2010
Application Status	Approved
Comments	
Archived	<input type="checkbox"/>
Product Manufacturer	Armor Screen Corp.
Address/Phone/Email	1881 Old Okeechobee Road West Palm Beach, FL 33409 (561) 841-8890 doug@armorscreen.com
Authorized Signature	Douglas Turner doug@armorscreen.com
Technical Representative	Douglas Turner
Address/Phone/Email	1881 Old Okeechobee Road West Palm Beach, FL 33409 (561) 841-8890 doug@armorscreen.com
Quality Assurance Representative	Douglas Turner
Address/Phone/Email	1881 Old Okeechobee Road West Palm Beach, FL 33409 (561) 841-8890 doug@armorscreen.com
Category	Shutters
Subcategory	Products Introduced as a Result of New Technology
Compliance Method	Evaluation Report from a Florida Registered Architect or a Licensed Florida Professional Engineer <input checked="" type="checkbox"/> Evaluation Report - Hardcopy Received
Florida Engineer or Architect Name who developed the Evaluation Report	Gary D. Foreman P.E., S.E., A.I.A.
Florida License	PE-57343
Quality Assurance Entity	National Accreditation and Management Institute
Quality Assurance Contract Expiration Date	12/31/2014
Validated By	Warren J. Von Werne, P.E. <input checked="" type="checkbox"/> Validation Checklist - Hardcopy Received
Certificate of Independence	FL8363_R4_COI_8363 R1 Cert of Independence 11-15-07.pdf

Referenced Standard and Year (of Standard)	Standard	Year
	ASTM E 1886	2005
	ASTM E 1996	2005
	ASTM E 330	2002
	TAS 201	1994
	TAS 202	1994

Equivalence of Product Standards
 Certified By

Florida Licensed Professional Engineer or Architect
[FL8363_R4_Equiv_FL8363_Equivalency Letter.pdf](#)

Sections from the Code

Product Approval Method Method 1 Option D

Date Submitted 02/21/2012
 Date Validated 04/20/2012
 Date Pending FBC Approval 04/27/2012
 Date Approved 06/11/2012

Summary of Products

FL #	Model, Number or Name	Description
8363.1	Armor Screen HVHZ Grommet and Hemcord System, Series 2000	Armor Screen HVHZ Grommet and Hemcord System, Series 2000
Limits of Use Approved for use in HVHZ: No Approved for use outside HVHZ: Yes Impact Resistant: Yes Design Pressure: +110/-115.5 Other: This system is not for use in the high velocity hurricane zone (H.V.H.Z.). Glass separation is required for installations within wind zone 4 and on essential facilities. The un-breached envelope criterion is met since the system is considered 'non-porous' and remains intact under impact and air pressure loading. The system is to enclose the protected opening all around.		Installation Instructions FL8363_R4-II_FL 8363.pdf Verified By: Gary D. Foreman P.E., S.E., A.I.A. PE-57343 Created by Independent Third Party: No Evaluation Reports FL8363_R4-AE_FL8363_Product Evaluation Letter.pdf Created by Independent Third Party: Yes

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Product Approval Accepts:



ARMOR SCREEN GROMMET AND HEMCORD SERIES 2000 HURRICANE PROTECTION

GENERAL NOTES:

- This Flexible Wind Abatement / Impact Protection System is for use outside the high velocity hurricane zone (HVHZ - Miami-Dade & Broward Counties). For information on use of this system within the HVHZ, refer to Armor Screen's Miami-Dade Notice of Acceptance (NOA) available on the Miami-Dade Product Control website. Separation from glass is required only when system is installed within wind zone 4 (wind speed > 160 mph ult) and on essential facilities.
- The design loads are calculated in accordance with the 2010 Florida Building Code and ASCE/SEI 7-10.
- Testing meets 2010 Florida Building Code; TAS 201; TAS 202; TAS 203; ASTM E 330-02; ASTM E 1996-05 Level E; and ASTM E 1886-05 per Sections 1620 and 1626 and fulfills its requirement for opening protection.
Testing performed by Fenestration Testing Laboratory, Inc. Medley, FL:
Test Reports: Date: 01/28/07 File #07-482 Lab #5174 Report #01
Date: 01/28/07 File #07-482 Lab #5180 Report #02
Date: 08/25/07 File #07-482 Lab #5279 Report #03
Date: 12/07/07 File #07-482 Lab #5446 Report #04
Date: 02/08/08 File #08-482 Lab #5533 Report #01
- The pores in Armor Screen are small enough that the surface tension of water causes the barrier screen to become solid in the presence of rain, and prevents damaging voluminous water intrusion, even from torrential rains.
In dry conditions, the pores remain open, and based on testing, allow approximately 3% of the wind to pass through.
- The unbreached envelope criterion is met since the system is considered "non-porous" and remains intact under impact and air pressure loading. This envelope criterion is met when the system encloses the protected opening all around.
- Product Marking: A permanent label shall be fixed to the screen barrier with the following statement: "Armor Screen Corporation, West Palm Beach, FL, Testing Standards, Current FBC Number, Job Name and Screen Opening/Number, Patented and Patents Pending, US Patent No. 6176050".

PRODUCT DATA:

- Geosynthetic hurricane screen: The hurricane screen shall be produced from a polypropylene, woven geotextile fabric with filaments woven such that the filaments retain dimensional stability relative to each other.
The woven geotextile fabric shall have the following minimum average roll values:
Grab Textile Strength (ASTM D4632) 425 x 325 LBS
Puncture Strength (ASTM D4833) 130 LBS
Mullen Burst (ASTM D3786) 675 PSI
Trapezoidal Tear (ASTM D4533) 150 x 125 LBS
Wide Width Tensile Strength (ASTM D4595) 225 x 205 LBS/IN
Thickness (ASTM D5199) 20 MIL.
Wide Width Elongation (ASTM D4595) 22 x 21%
Apparent Opening Size 30 US STD Sieve
Percentage of Open Area 5%

LIMITATIONS OF USE:

- | | |
|-------------------------|---|
| Maximum Span | 192 Inches Hemcord
148 Inches Grommet |
| Maximum Non-Span | Unlimited, Utilizing side overlapping details, page 8 |
| Maximum Design Pressure | +110 / -110 PSF |
- The design pressure may be increased 5% for negative loads.
 - Span equals the distance between the primary rows of fasteners or grommets.

INSTALLATION NOTES:

- Screen may be mounted with opposing primary anchored perimeters in vertical, horizontal, or any alignment appropriate to the structure being protected.
- Deflection is the minimum glass separation measured at mid span of the screen and subject to rational analysis and may be achieved by using F-track, Storm Bars, Pneumatic Device, various Angled Style Screens and Center Hem Style Screen.
- Screen unable to return should extend past protected opening by distance equal to or greater than the minimum deflection / offset, which ever is greater.
- All specifications to be equivalent or greater in product.
- Anchor attachments may include standard Wingnut, Hex, Round, and Truss Head Machine Screws, Stainless Steel Sidewalk Bolt, Carriage Bolts or any other appropriate and equal fastener.
- All Aluminum Extrusions to be minimum 6063-T6 or as indicated.
- The thickness of typical facing materials i.e. stucco, siding, stone, brick, pavers, etc. are not to be considered part of the anchor embedment. Longer fasteners may be used to allow for facing materials.
- Anchor embedment shall be in face shell, not mortar joints.
- Drop-In and Calk-In Anchors shall be flush with substrate and shall not extend into finished facing.
- If tapcons are used with Grommet Style Screen, a washer should be utilized.
- 18" and 12" attachment spacing for short spans (less than 76") may experience large screen deflections and incomplete closure at edges between anchors.
- The screens may be installed at any height on the structure as long as the design pressure rating for the screens is not exceeded.
- All fasteners shall be corrosion resistant as specified in the IRC and IBC.
- The minimum engagement of the eyebolt into the anchor is at least $\frac{2}{3}$ of the threaded length of the fastener. For a $\frac{1}{2}$ " diameter drop-in anchor the thread length is $\frac{13}{16}$ " and the fastener length is 2". Therefore, the minimum engagement length for the eyebolt is $\frac{9}{16}$ ". The minimum engagement length for a $\frac{3}{8}$ " eyebolt is $\frac{7}{16}$ " and for a $\frac{1}{4}$ " bolt $\frac{5}{16}$ ".
- In instances where a screen is made up of two pieces of fabric or for repair purposes, a flat felt seam or triple layer hem with a minimum of two rows of double lock stitch thread is acceptable. The anchor attachment, i.e. loops or buckles & strap requires three rows of double stitching and the Grommet - Hemcord System requires two rows. The fabric comes in standard lengths such as 12' wide, therefore for screens that are larger, two pieces are seamed together as noted above.
- Span side anchors are optional.
- Flaps as depicted in the drawings are optional.

All Geosynthetic Hurricane Screen assembly details depicted within these drawings are typical for the installation of this wind / rain abatement and impact system only. All other building components shown herein are depicted as existing or samples and not constructed by the screen company.



Engineering Review By:

Gary D Foreman PE
FL PE 57343

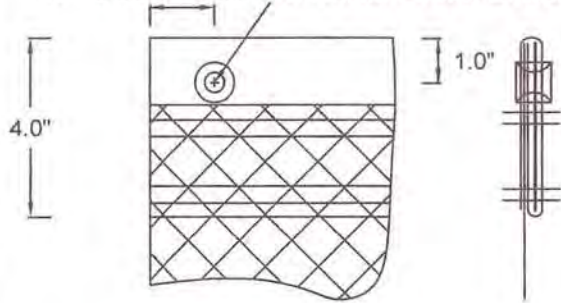
ARMOR SCREEN
GROMMET AND HEMCORD SERIES 2000
HURRICANE PROTECTION

ARMOR SCREEN, Inc.
1881 Old Okeechobee Road
West Palm Beach, FL 33409
(561) 841-8890 www.armorscreen.com

Date: 10/23/07 Rev. Date: 10/11/10 Rev. Date:

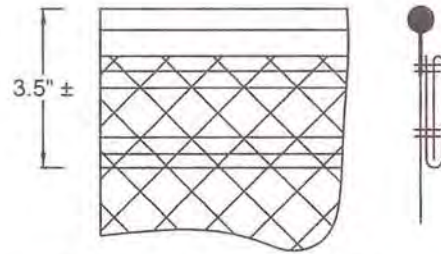
Scale: Not to Scale Page: 1 of 20

1.5" - 2 Sided Screen
 1.0" - 3 Sided Screen #2 Nickel Plated Brass Grommet



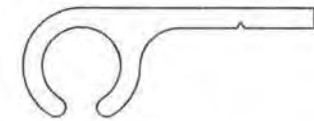
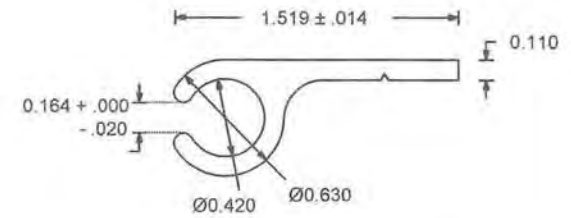
Grommet with Stitching Detail
Stitching Detail

- Support Edge, Trifold Seam around 4" Polypro webbing
- Sewing includes 2 rows, Double Lock Stitch, of Anafil Nylon T135 bonded thread or equal.
- Grommetted through seam.

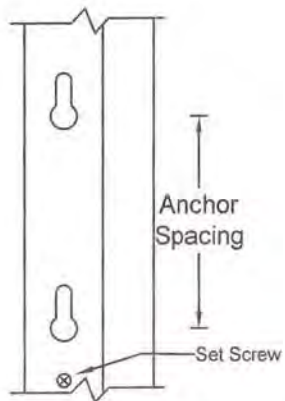


Welded Hemcord with Stitching Detail
Stitching Detail

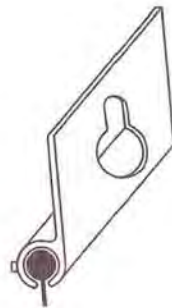
- Hemcord Dia.: $\frac{5}{16}$ "
- Sewing includes 2 rows, Double Lock Stitch, of Anafil Nylon T135 Bonded Thread or equal.
- Reinforced welded hemcord includes a 2" trifold Polypro Seam sewn over the weld.



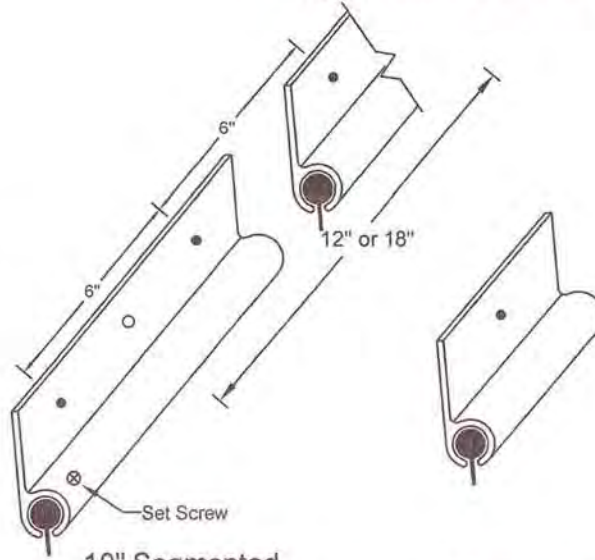
Same as above extrusion



Keyhole Slot in
 Continuous
 C-Channel

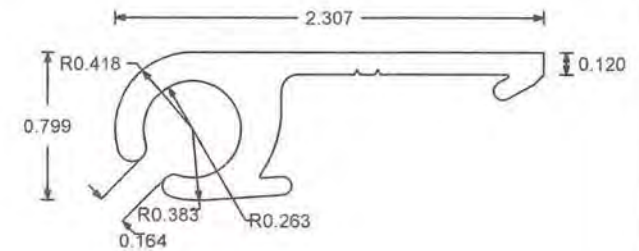
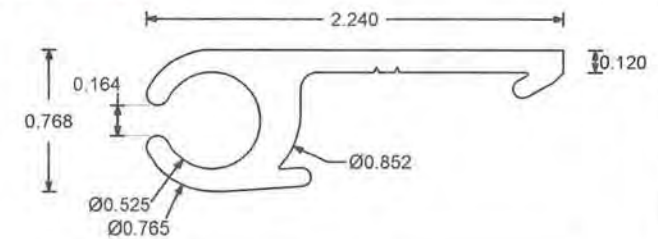


Keyhole Slot in
 Segmented C-Channel



10" Segmented
 C-Channel
 Alloy: 6063-T6
 Aluminum

5" Segmented
 C-Channel
 Alloy: 6063-T6
 Aluminum



C-Channel

Alloy: 6063-T6 Aluminum

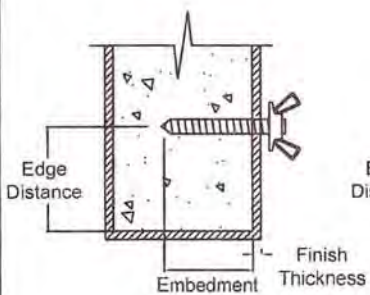
NOTE: Heavier alternate extrusion may be used.

NOTES:

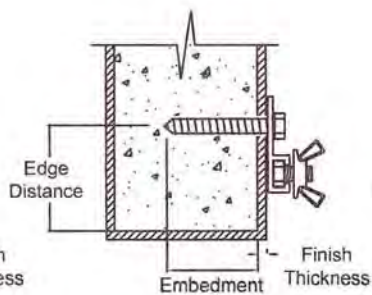
- The length of the segmented C-Channel is governed by the strength of the fabric to C-Channel connection, not the hardware attachment to the C-Channel.
- When a Keyhole Slot or washer is used on continuous C-Channel, a set screw through the channel and into the substrate is required to lock in place.
- For Anchor Spacing, see Anchor Tables on pages 15 - 20.
- A $\frac{1}{4}$ " TEK Screw may be used to secure the C-Channel end to limit screen movement.

HEMCORD / C-CHANNEL

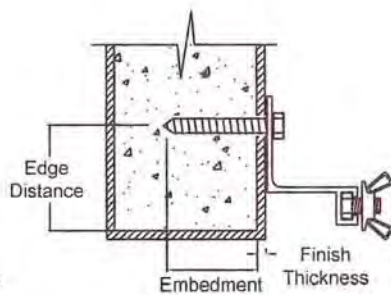
	Engineering Review By:	ARMOR SCREEN GROMMET AND HEMCORD SERIES 2000 HURRICANE PROTECTION			
		ARMOR SCREEN, Inc. 1881 Old Okeechobee Road West Palm Beach, FL 33409 (561) 841-8890 www.armorscreen.com			
		Date: 10/23/07	Rev. Date: 10/11/10	Rev. Date:	
		Scale: Not to Scale	Page: 2 of 20		



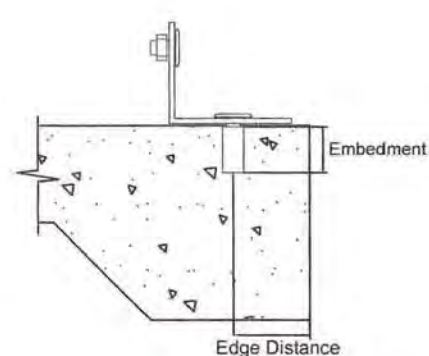
Grommet
Direct Mount
Anchoring Detail



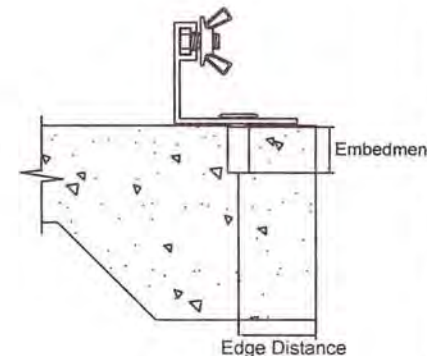
Grommet
F-Track 6063-T6
Anchoring Detail



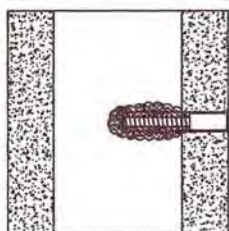
Grommet
F-Track 6063-T6
(1", 2", and 3"
Build-Out)
Anchoring Detail



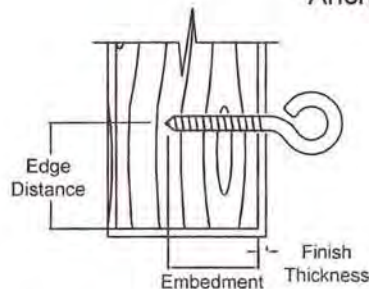
Grommet
Angle Aluminum
Minimum .125" x 6063-T6
Anchoring Detail



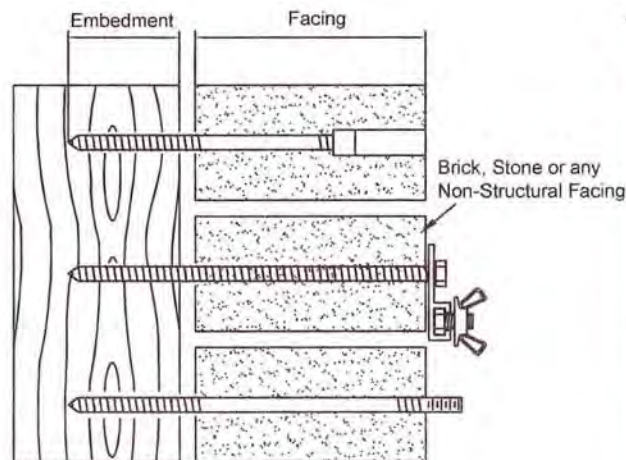
Grommet
Studded / Studless Angle F-Track
6063-T6
Anchoring Detail



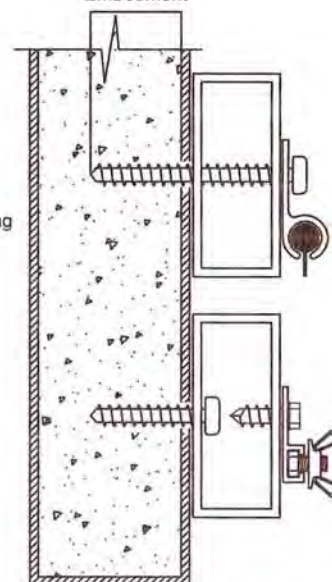
CMU and Terracotta
Block Epoxy Anchor
see Table 5, page 18
for anchoring details



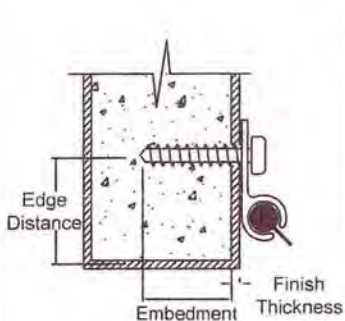
Grommet
3/8" Eye Lag
Anchoring Detail



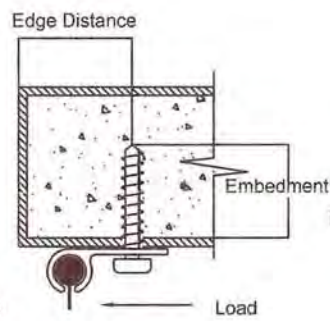
1/4" or 3/8" Hanger Bolt with Coupler,
Panelmate or Hex Lag Screw
(Non-Structural Facing)
(Caulk or Sealant suggested to seal facing)
Some damage to the facing maybe
expected.



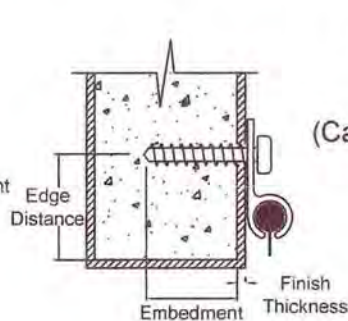
1/8" Aluminum Tube / Angle
For Build-Out
6063-T6 Alloy



45° C-Channel



90° C-Channel



180° C-Channel



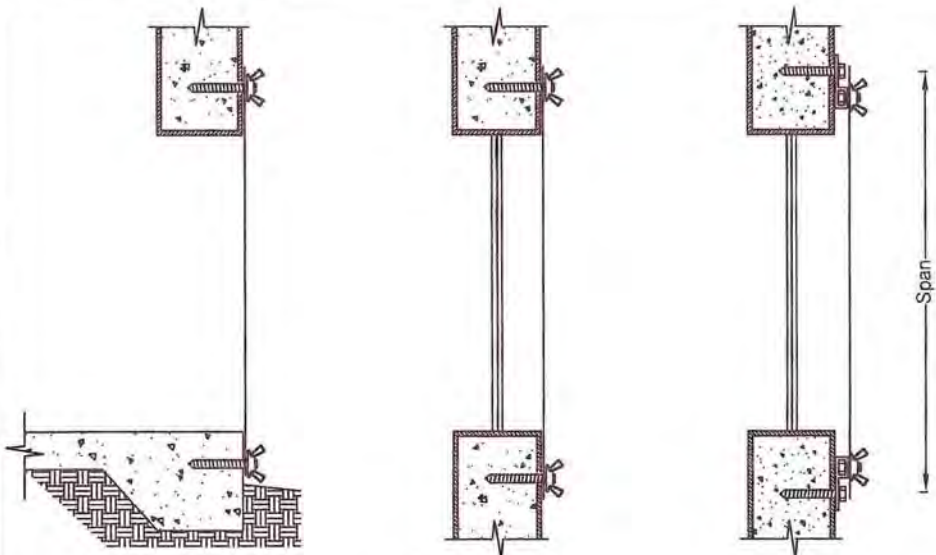
Engineering Review By:

Gary D Foreman PE
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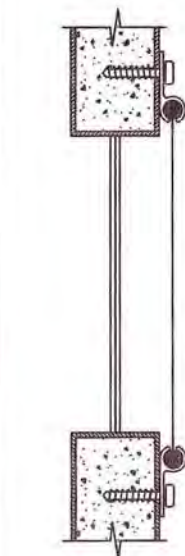
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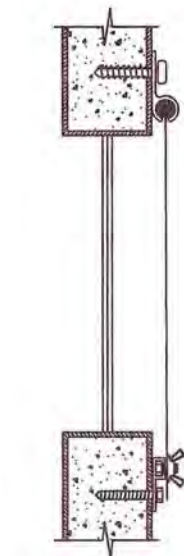
Direct Mount
Typical Vertical
Sectional View

Direct Mount
Typical Vertical
Window
Sectional View

F-Track
Typical Vertical
Window
Sectional View



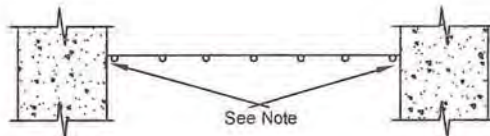
C-Channel
Typical Vertical
Window
Sectional View



C-Channel (top)
F-Track (bottom)
Typical Vertical
Window
Sectional View

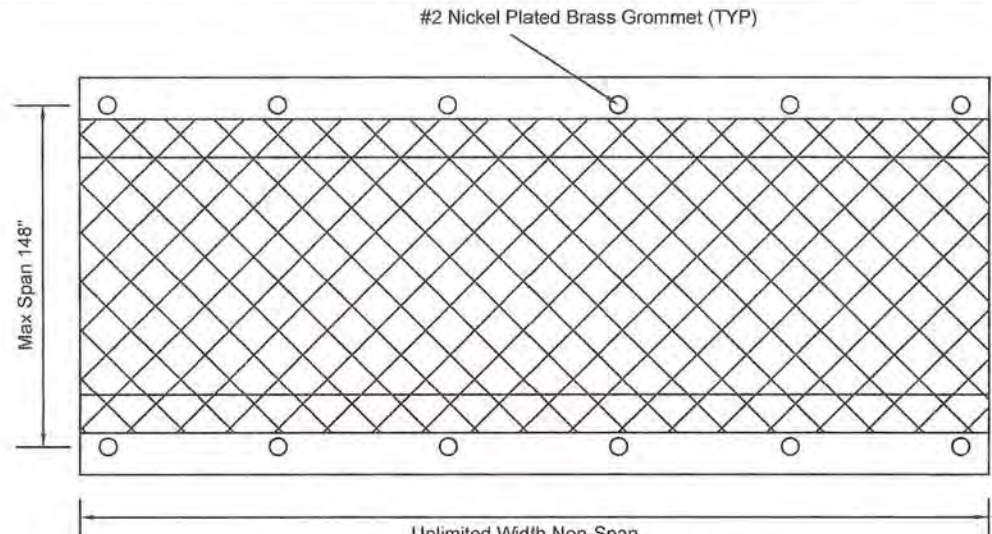
NOTES:

- Typical screen anchor attachment may be grommet, continuous C-Channel, segmented C-Channel or any combination.
- The length of the Segmented C-Channel is governed by the strength of the fabric to C-Channel connection, not the hardware attachment to the C-Channel.

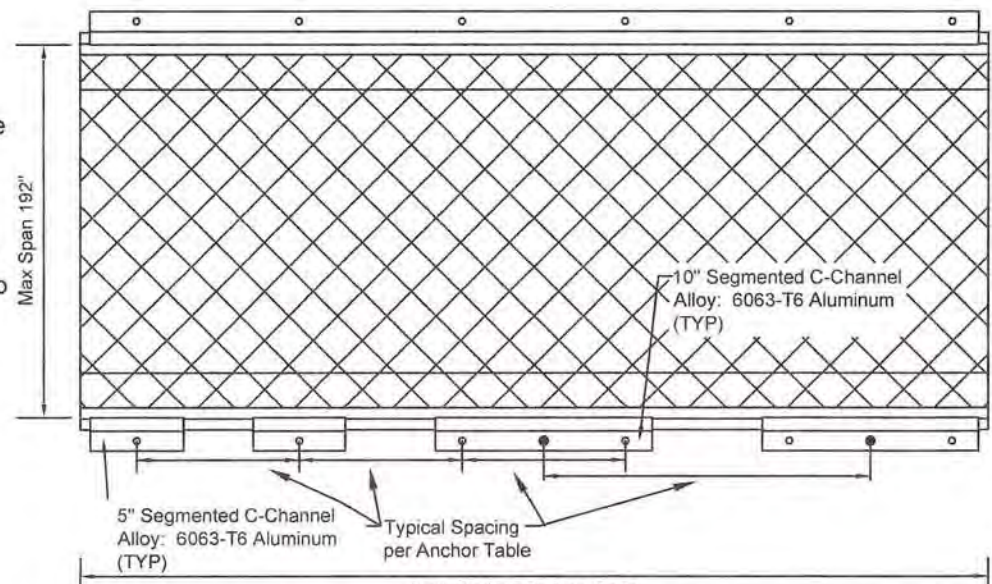


**PLAN VIEW, VERTICAL SCREEN,
TRAPPED OPENING**

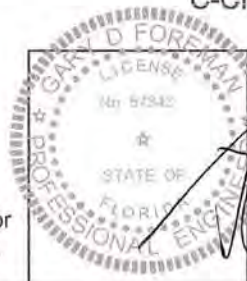
NOTE: For a trapped opening, side anchors are optional for the span side of the screen. Screen should butt the walls.



GROMMET VERTICAL INSTALLATION
(Span Sides = Welded Seam)



C-CHANNEL VERTICAL INSTALLATION
(Span Sides = Welded Seam)



Engineering Review By:

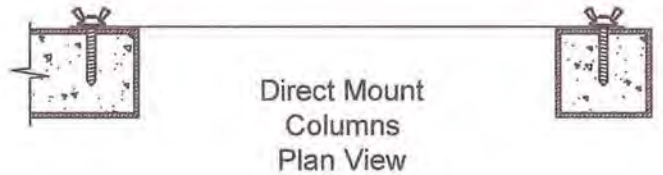
Gary D Foreman PE
FL PE 57343

**ARMOR SCREEN
GROMMET AND HEMCORD SERIES 2000
HURRICANE PROTECTION**

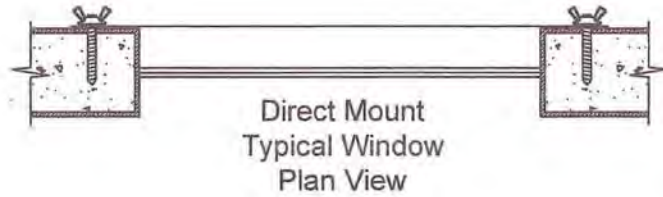
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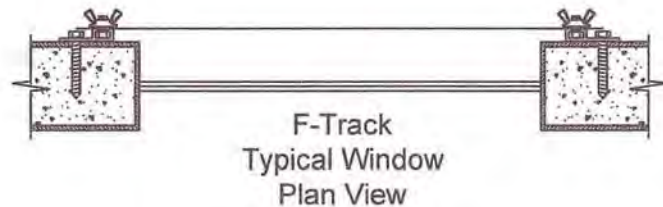
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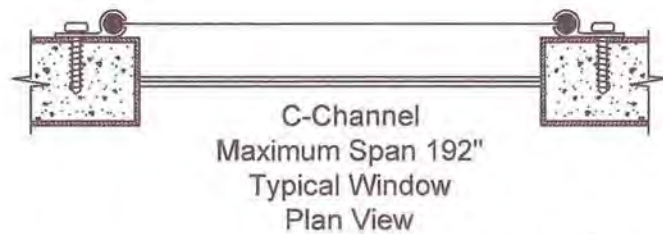
Direct Mount
Columns
Plan View



Direct Mount
Typical Window
Plan View



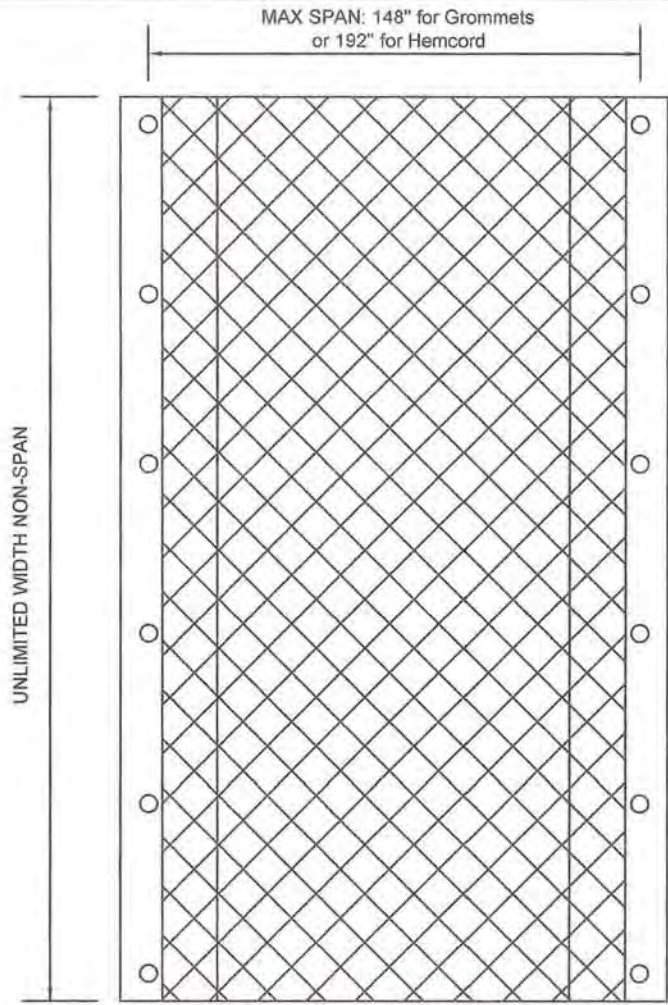
F-Track
Typical Window
Plan View



C-Channel
Maximum Span 192"
Typical Window
Plan View



C-Channel
Maximum Span 192"
Column Mount
Plan View



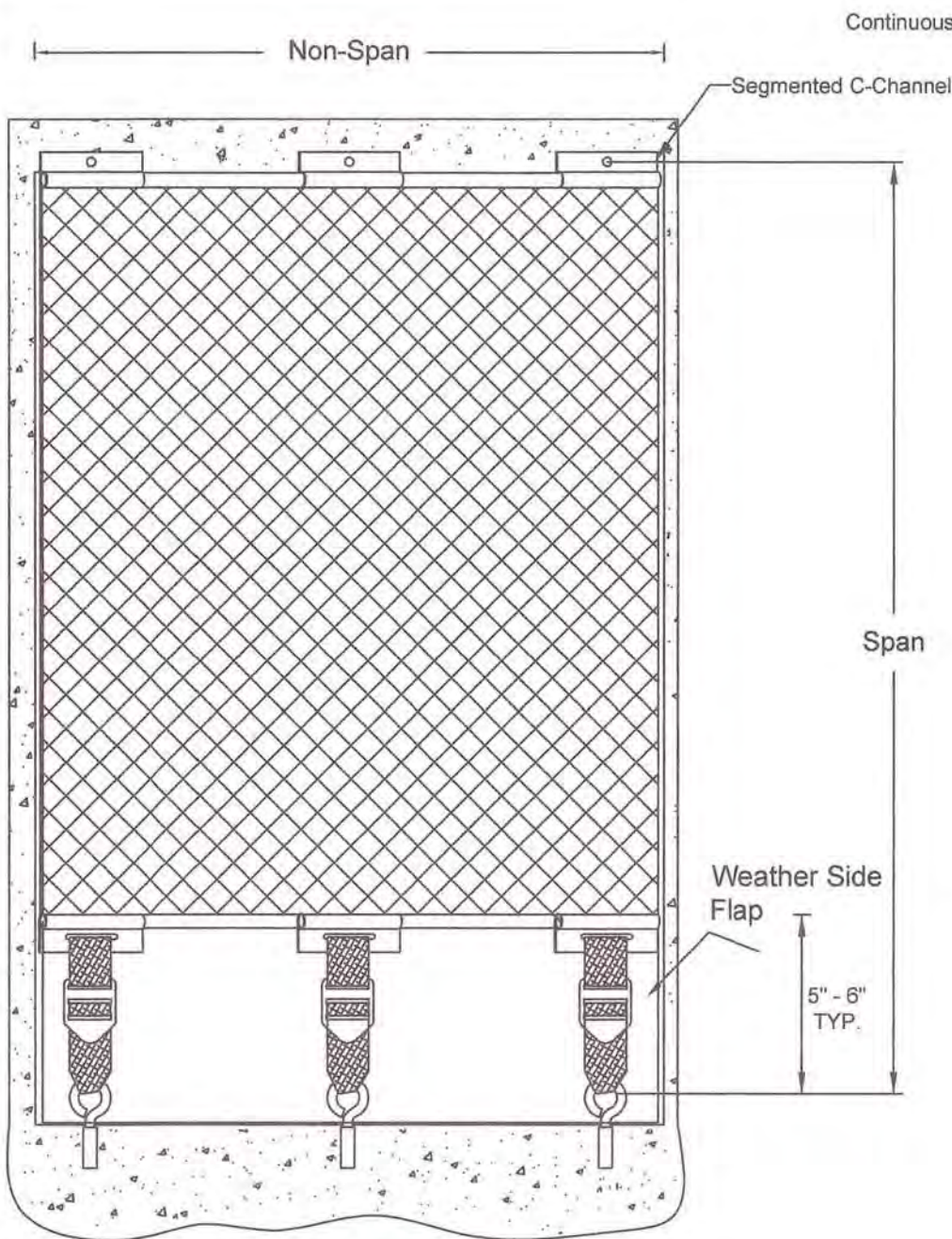
HORIZONTAL INSTALLATION
(Span Sides = Welded Seam)

NOTE:
Typical screen anchor attachment may be grommet, continuous C-Channel, segmented C-Channel or any combination.

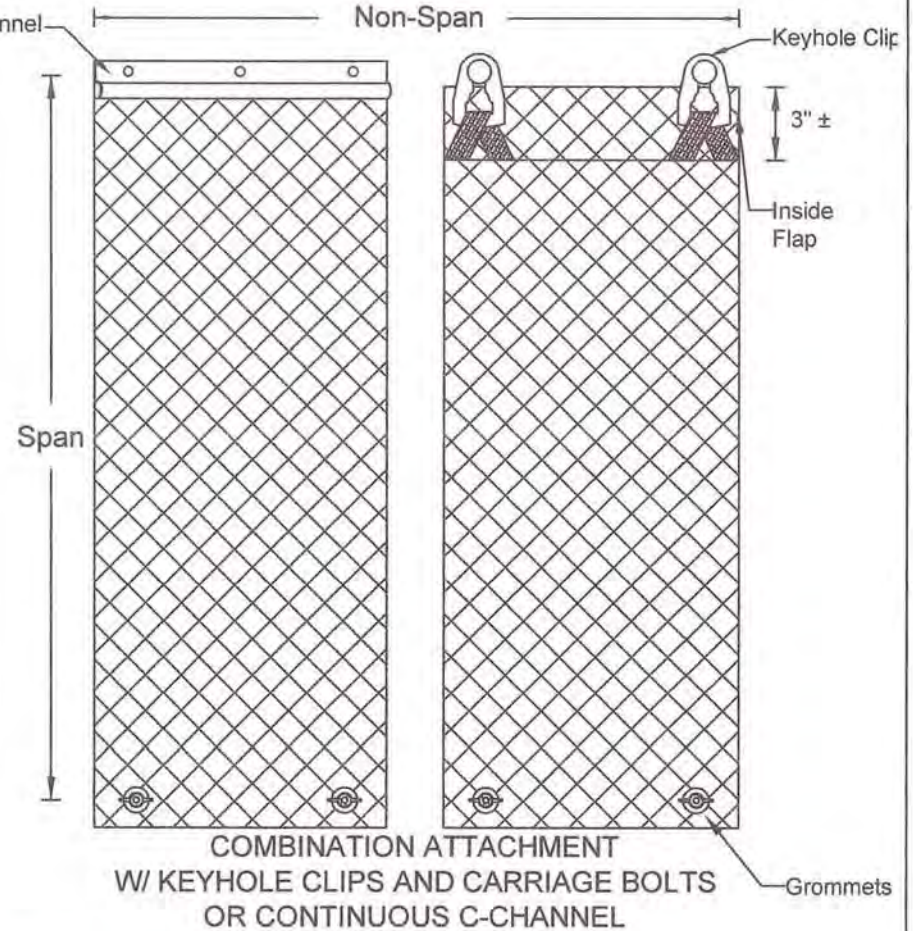


Engineering Review By:
[Signature]
Gary D Foreman PE
FL PE 57343

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Scale: Not to Scale	Page: 5 of 20	



COMBINATION ATTACHMENT
W/ EYEBOLT, BUCKLE/STRAP,
AND SEGMENTED C-CHANNEL
not to scale



COMBINATION ATTACHMENT
W/ KEYHOLE CLIPS AND CARRIAGE BOLTS
OR CONTINUOUS C-CHANNEL

NOTES:

- Typical screen anchor attachment may be grommet, continuous C-Channel, segmented C-Channel or any combination.
- For Combination Grommet / Hemcord System, use the grommet span.
- Strap material equal to DirecTex 2" High Tenacity Polypro black or white.
- Buckle with raised "Armor Screen" imprint is proprietary to Armor Screen Corp.

Engineering Review By: *[Signature]*

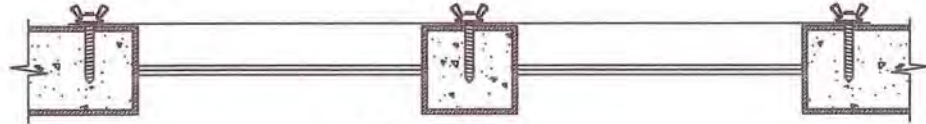
GARY D FOREMAN
LICENSE
No 57343
STATE OF FLORIDA
PROFESSIONAL ENGINEER

Gary D Foreman PE
FL PE 57343

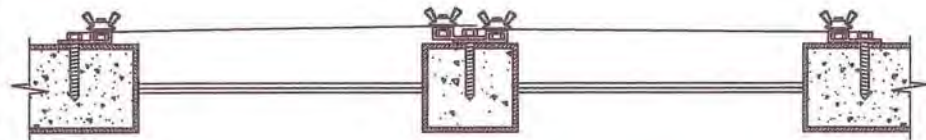
ARMOR SCREEN GROMMET AND HEMCORD SERIES 2000 HURRICANE PROTECTION		
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Scale: Not to Scale	Page: 6 of 20	



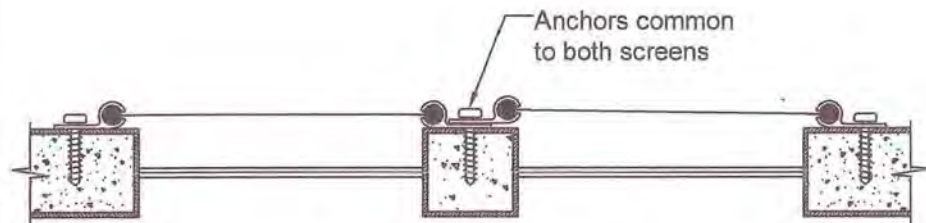
Direct Mount
Columns
Plan View



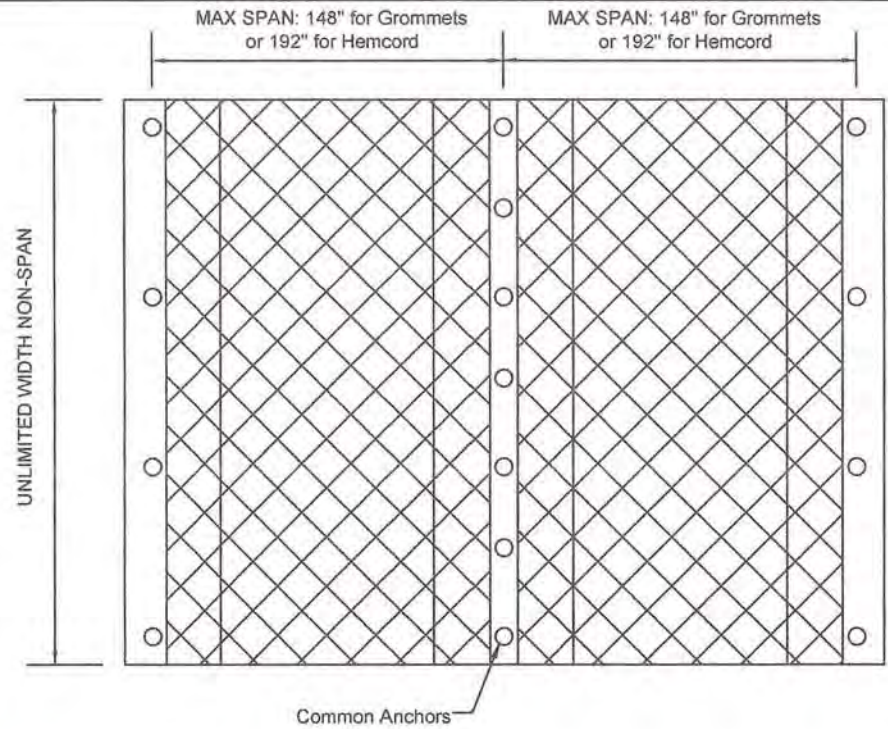
Direct Mount
Typical Window
Plan View



F-Track
Typical Window
Plan View



C-Channel Max. Span 192"
Typical Window
Plan View



NOTES:

- Two adjacent screens may share common anchors.
- Typical screen anchor attachment may be grommet, continuous C-Channel, segmented C-Channel or any combination.

COMMON ANCHORS



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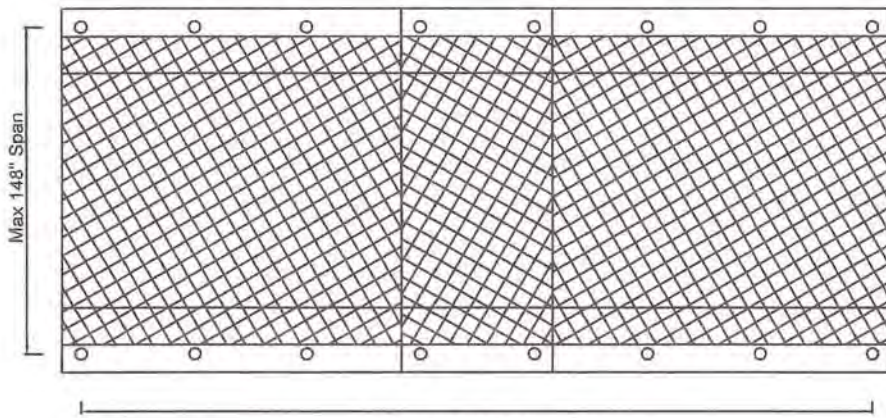
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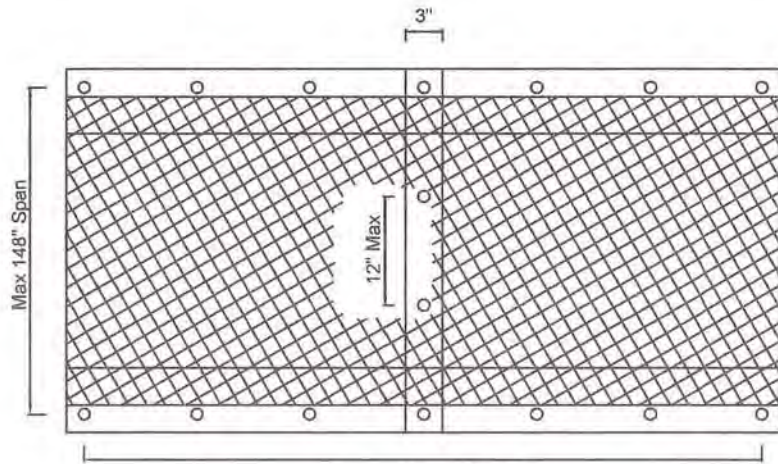
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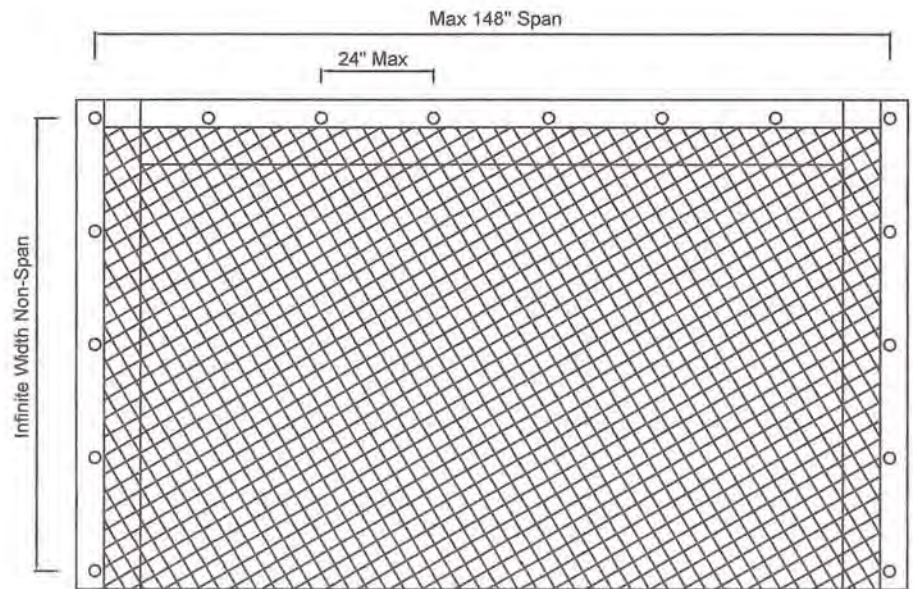
Unlimited Width Non-Span
TYPE 1 GROMMET SCREEN OVERLAP



Unlimited Width Non-Span
TYPE 2 GROMMET SCREEN OVERLAP



**NON-SPAN SECTION
 MINIMUM EDGE OVERLAP
 (Vertical and Horizontal)**



THREE SIDED SCREEN -GROMMET / C-CHANNEL

NOTES:

- Span Side Anchors are optional.
- If adjacent screens are overlapped 3" and connected through the grommets with minimum deflection, a 1/4" nylon bolt / nut assembly should be used 12" on center maximum.
- Adjacent screens may also be connected with approved buckle/strap.



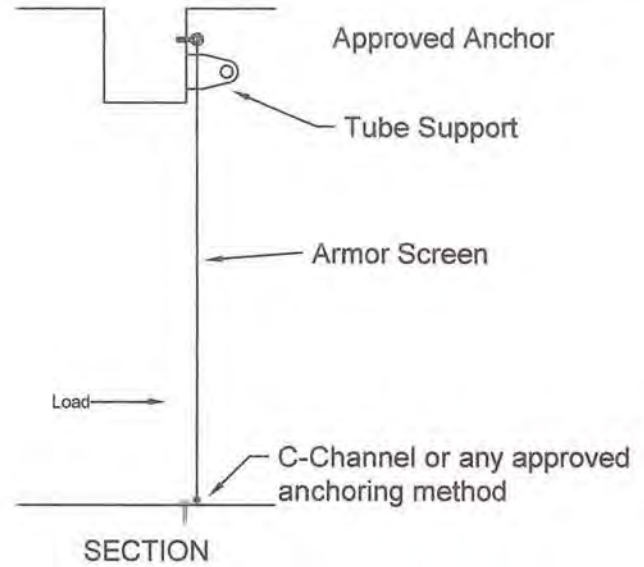
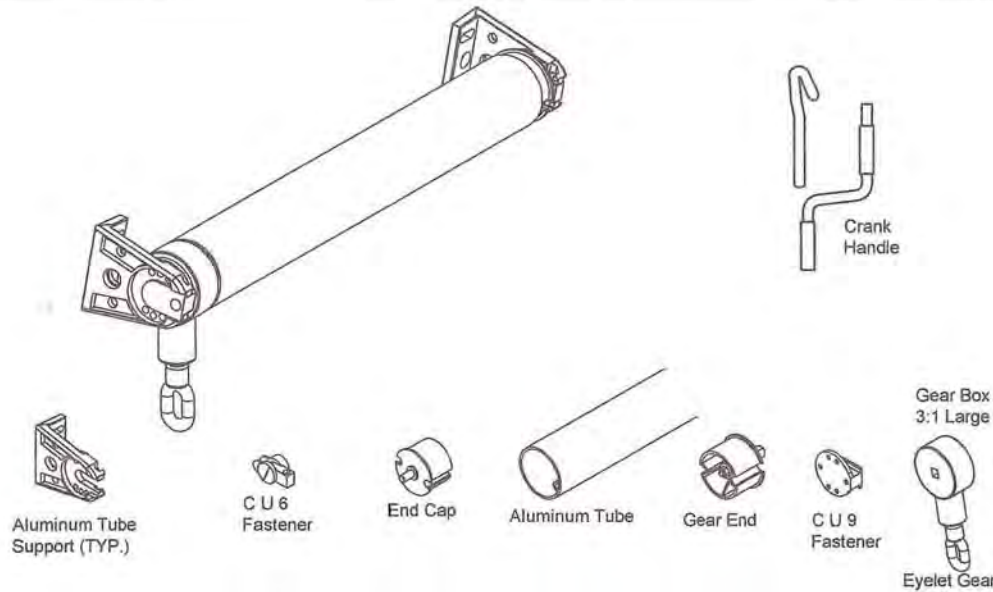
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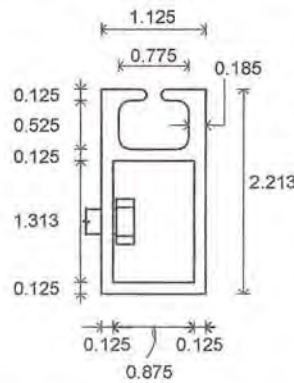
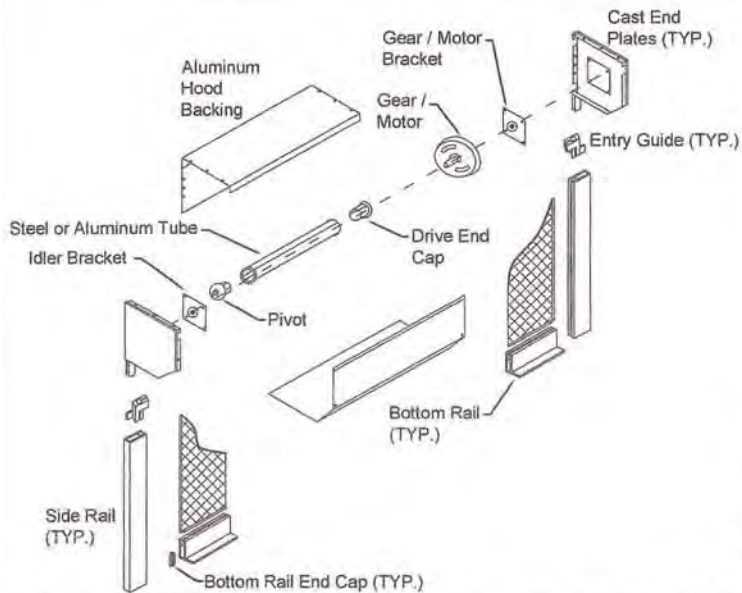
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Scale: Not to Scale	Page: 8 of 20	

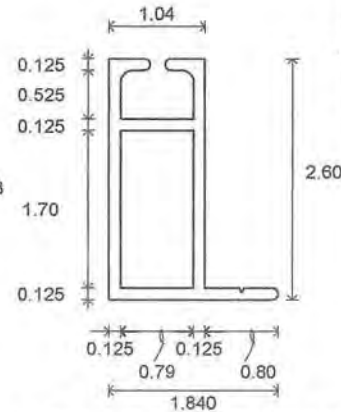


MANUAL AWNING STYLE ROLLUP ASSEMBLY

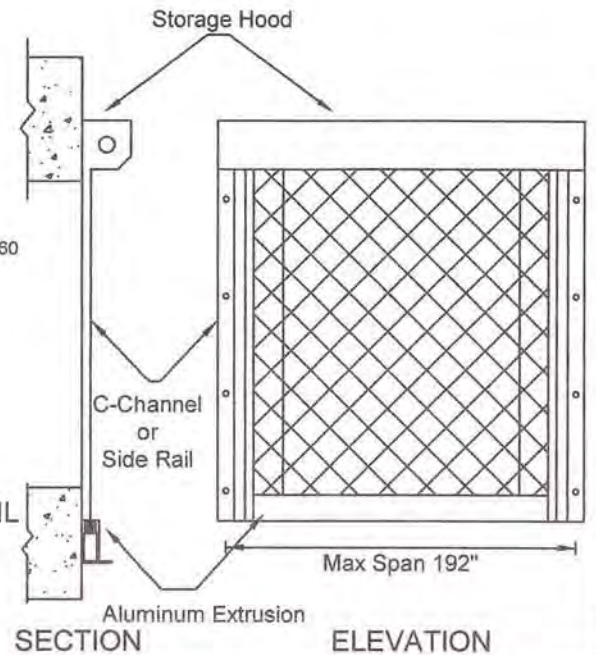
NOTE: This System is a storage device only, as there is no load on the roller tube. Typically, top anchors always remain attached. A storage hood is not required. It is recommended that the tube assembly should be protected by the screen when under load.



ROLL UP SIDE RAIL
6063-T6 Aluminum



ROLL UP BOTTOM RAIL
6063-T6 Aluminum



SECTION ELEVATION

NOTES:

- Heavier alternate extrusion may be used.
- Anchor Spacing per tables.

ELECTRIC / MANUAL C-CHANNEL ROLLUP STORAGE ASSEMBLY

NOTES:

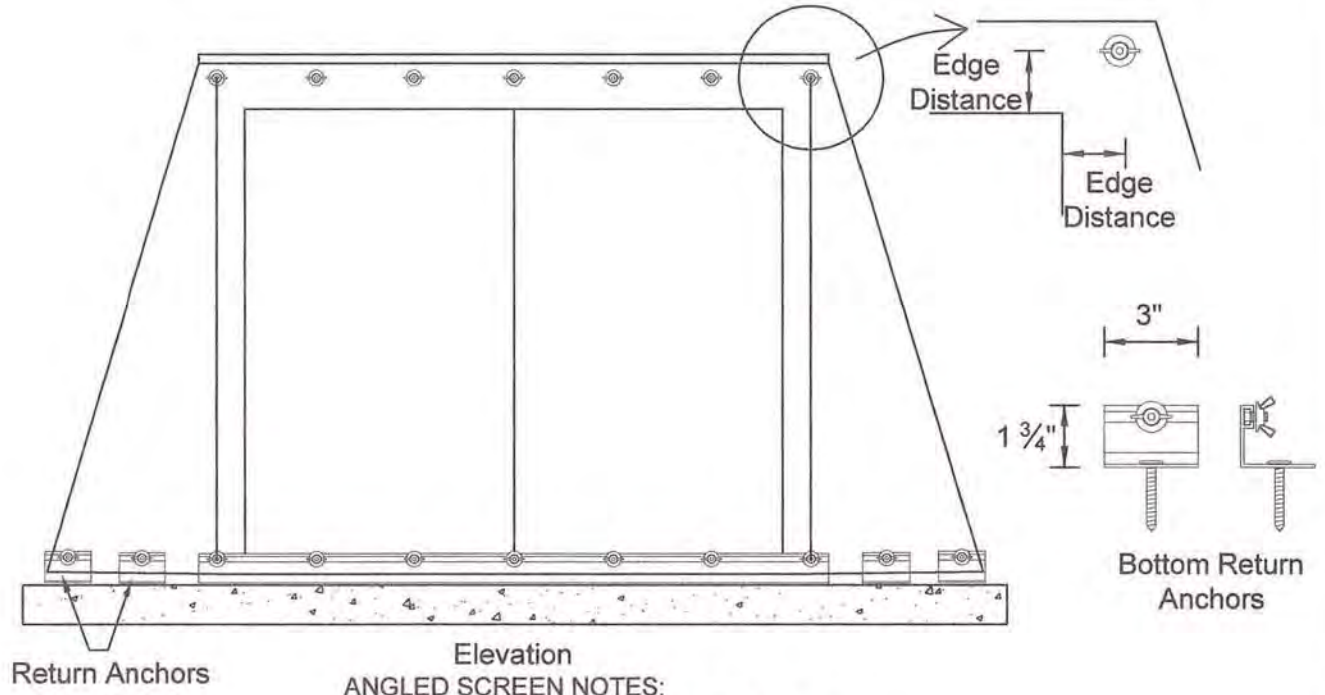
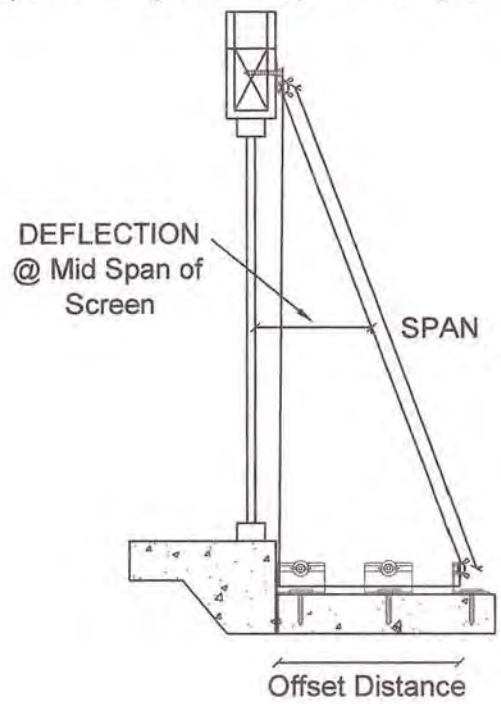
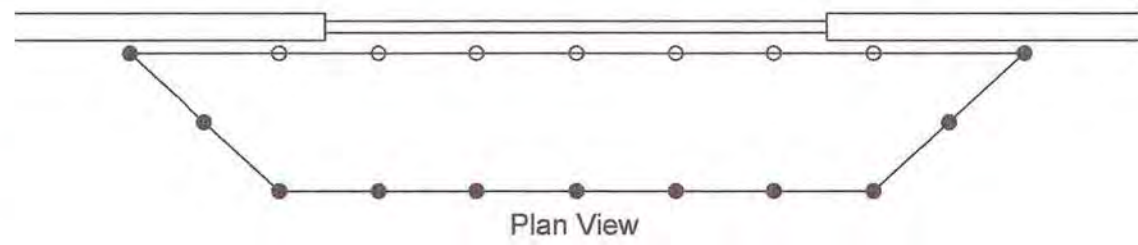
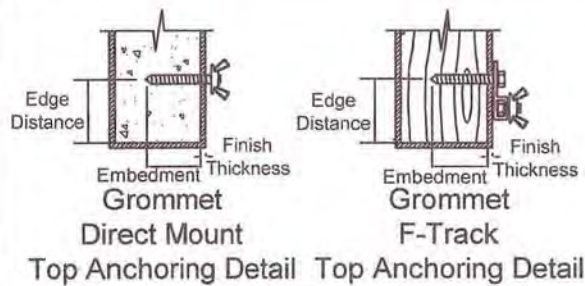
- For C-Channel and Hemcord details, see page 2.
- For trapped openings, site specific engineering is required.

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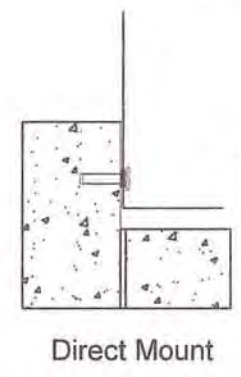
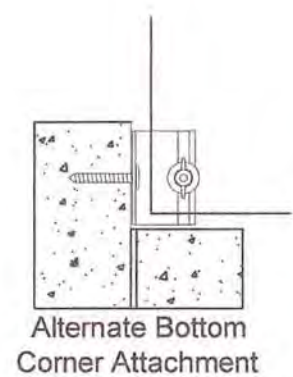
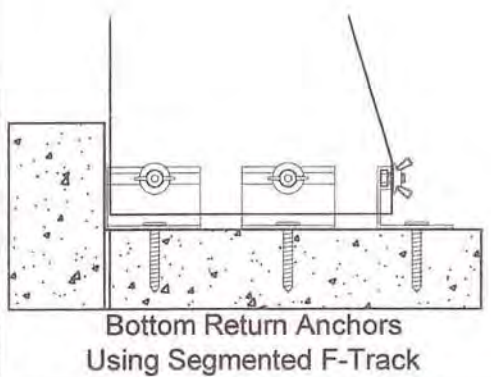
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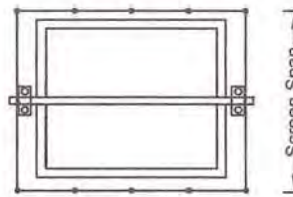
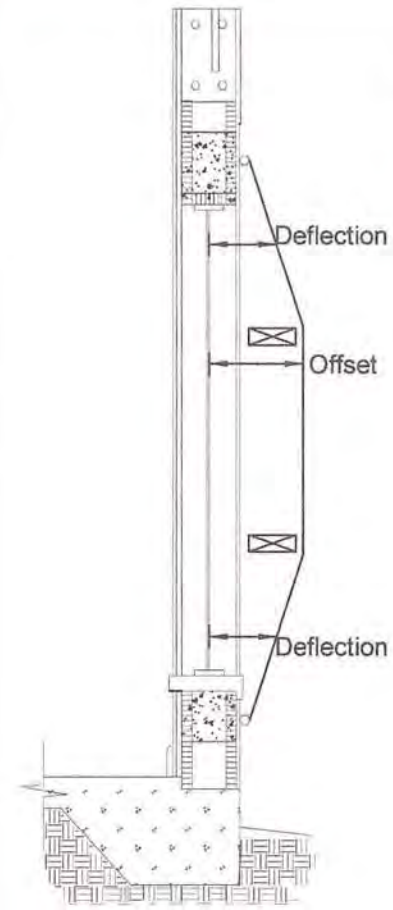


- ANGLED SCREEN NOTES:**
1. Refer to Deflection Table D-1.1 page 14.
 2. Bottom Return Requires a midpoint anchor.
 3. Side Return (span side) anchors are optional.
 4. Typical screen anchor attachment may be grommet, continuous C-Channel, segmented C-Channel or any combination.

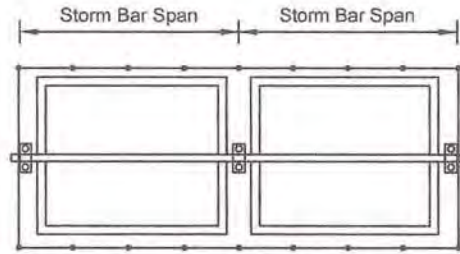


ANGLED SCREEN

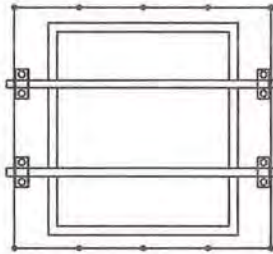
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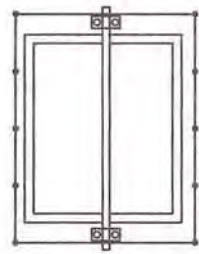
Single Storm Bar Elevation



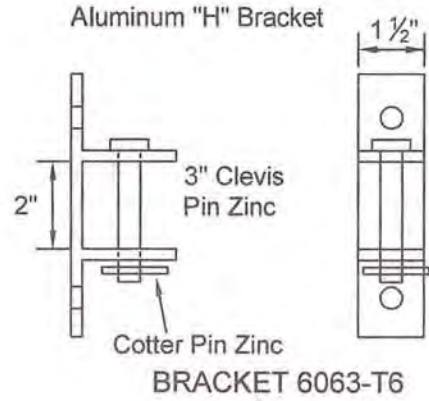
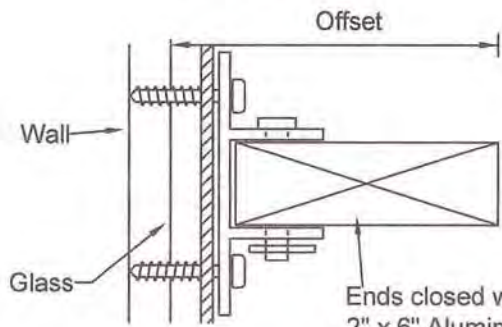
Single Storm Bar with Multiple Openings Elevation



Multiple Storm Bar Elevation



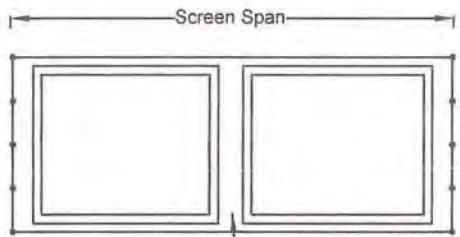
Vertical Storm Bar Elevation



STORM BAR NOTES:

1. Refer to Table D-1.2 on page 14.
2. The storm bar system is designed to achieve deflection and may utilize one or more storm bars. The offset may be increased with blocking.
3. Storm bars may be positioned horizontal, vertical or as required.
4. The storm bar bracket may be permanent or removable and attached to the structure using two (2) approved 1/4 inch anchors. Refer to pages 15 - 20.
5. The storm bar and screen should extend past the protected opening by the distance equal to or greater than the required deflection / offset, which ever is greater.

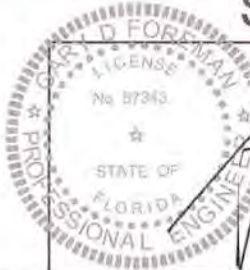
Multiple Storm Bar with Single Opening



STORM BAR & BRACKET

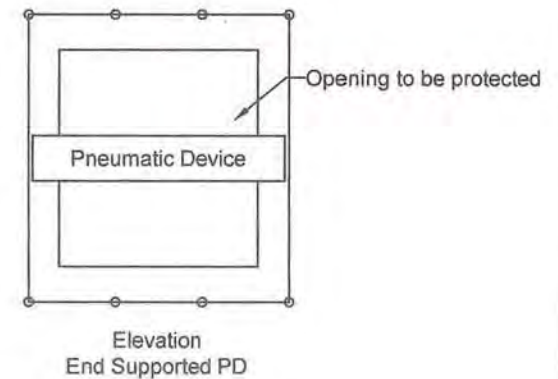
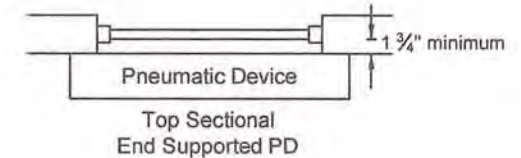
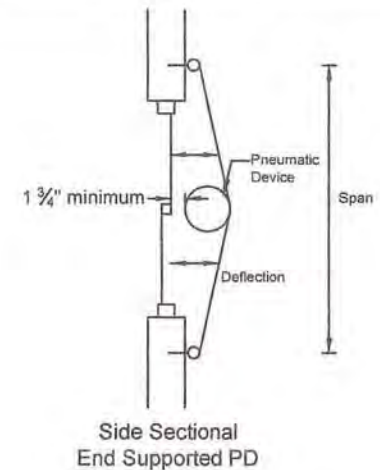
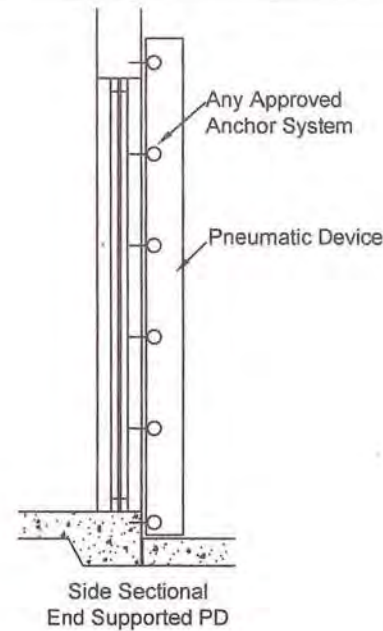
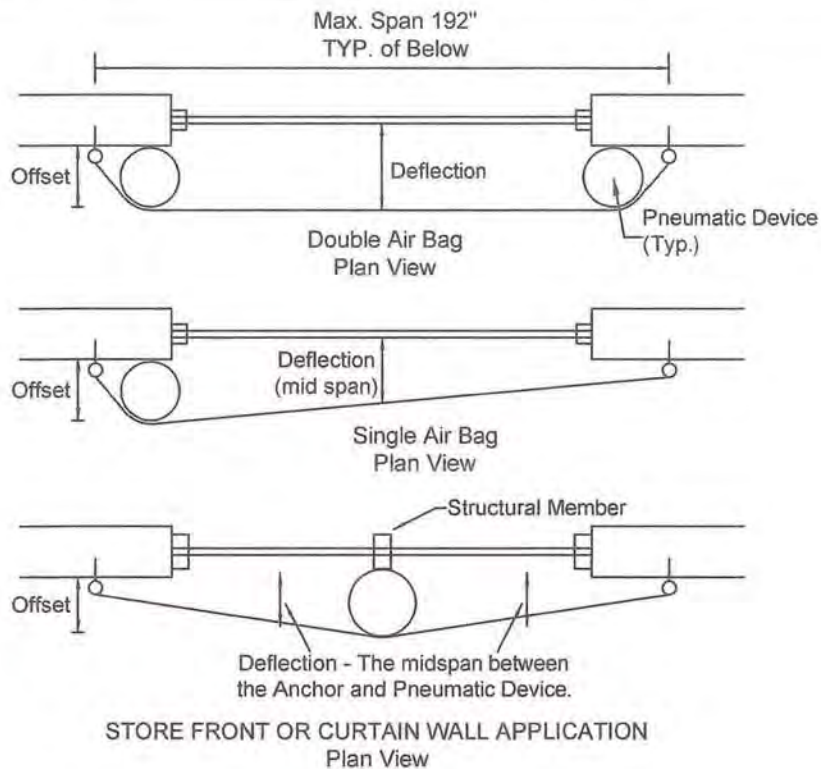
STORM BAR SYSTEM

Building Structure between adjacent window / door frames may act as a Storm Bar if proper offset to the glazing is present. This applies to a vertical or horizontal applications.



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PNEUMATIC DEVICE (PD) SPECIFICATIONS:

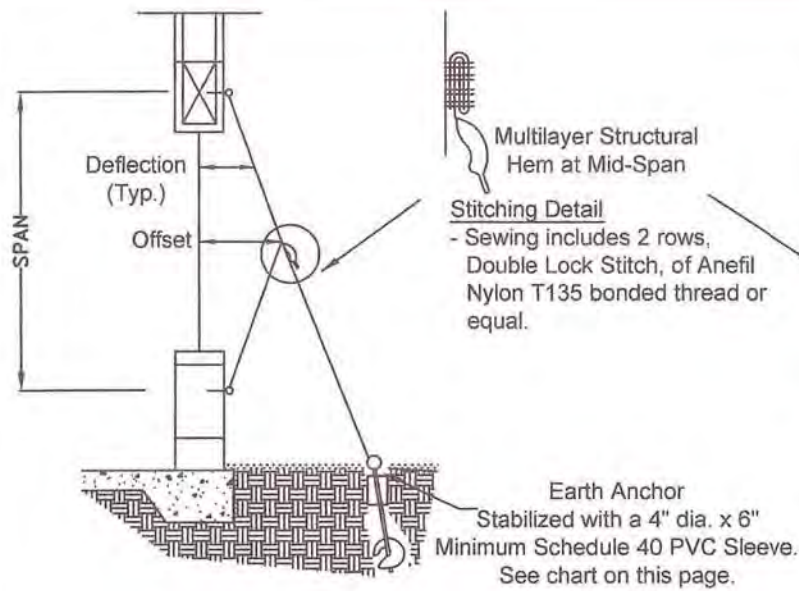
1. Pneumatic Device consists of two parts, a refillable polymer air bladder capable of holding air without perceptible leakage, and a tough fabric cover for structural integrity and durability.
2. May be inflated by any residential or commercial vacuum cleaner, or air pump intended for air mattresses or equivalent devices.
3. Upon removal, the Pneumatic Device should be deflated and stored with screen barrier.

PNEUMATIC DEVICE (PD) DEFLECTION SYSTEM NOTES:

1. Refer to the Deflection Table D-1.1 on page 14.
2. Pneumatic device must not rest on glazing.
3. The pneumatic device may be attached to barrier and may rest on but not attached to the structure. The device may be end supported if spanning the protected opening.
4. Inflation of the device requires a minimum pressure of 2.0 psi.
5. One or more devices may be used to achieve separation.
6. This system may be positioned horizontally, vertically, or as required.
7. The pneumatic device may be permanently attached to the screen or made removable.
8. The sleeve should not be attached to the building structure unless designed as a site specific installation by a structural engineer.
9. The pneumatic device should be positioned to provide adequate deflection between the screen / barrier and surface being protected.

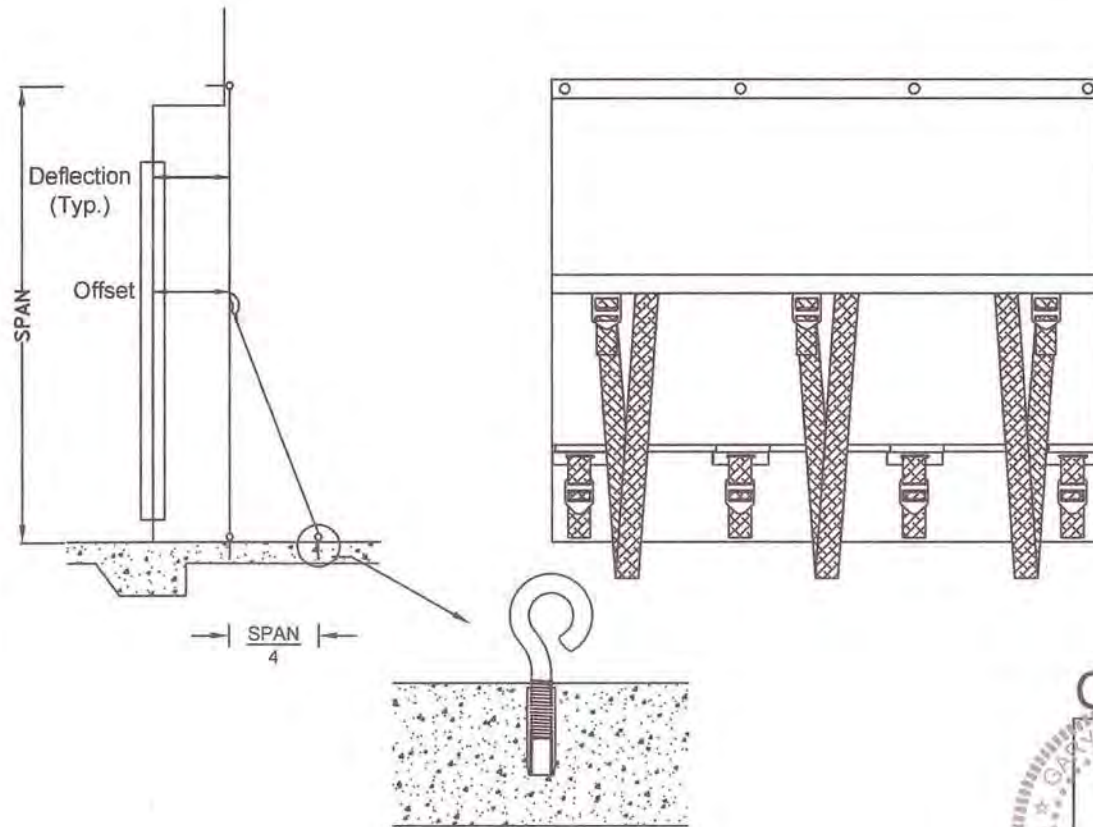
PNEUMATIC DEFLECTION SYSTEM

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Scale: Not to Scale		Page: 12 of 20	



CENTER HEM DEFLECTION SYSTEM NOTES:

1. Refer to Deflection Table D-1.1 on page 14.
2. This system is designed to achieve deflection by pulling and supporting the center of the screen towards the windward direction.
3. One or more structural hems with buckles and straps may be used to achieve deflection.
4. The support hem system may be positioned horizontal, vertical or as required.
5. Screen unable to return should extend past protected opening by distance equal to or greater than the minimum deflection / offset, which ever is greater.
6. Strap material equal to DirecTex 2" High Tenacity Polypro black or white.
7. Buckle with raised "Armor Screen" imprint is proprietary to Armor Screen Corp.



Drop-In Anchor
See chart on this page.

CENTER HEM SUPPORT ANCHORS					
	ANCHOR	MIN. EMBED.	MIN. E.D.	SPAN	
				up to 100"	up to 192"
				ANCHOR SPACING	
3000 PSI CONCRETE	3/8" DROP-IN ANCHOR	1 1/2"	4"	18"	12"
	1/2" DROP-IN ANCHOR	2"	5"	24"	18"
SOIL CLASS 5 MED DENSE COURSE SAND	EARTH ANCHOR 1/2" x 30" SHAFT x 4" HELIX WITH WELDED EYE. 3150 LBS WORKING LOAD	28"	N/A	24"	24"
	PAVER ANCHOR 1/2" x 30" SHAFT x 4" HELIX WITH SS COUPLER AND SS EYEBOLT	28"	N	24"	18"

CENTER HEM DEFLECTION SYSTEM



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Scale: Not to Scale Page: 13 of 20

TABLE D-1.1

Grommet - Hemcord Series 2000 Deflection Table									
Span in feet	Span in inches	Deflection in inches							
		30 psf	40 psf	50 psf	60 psf	70 psf	90 psf	110 psf	
2 ft.	24	2.0	2.1	2.3	2.5	2.6	3.0	3.4	
3 ft.	36	3.0	3.2	3.4	3.8	4.0	4.6	5.1	
4 ft.	48	3.9	4.3	4.5	5.0	5.3	6.1	6.8	
5 ft.	60	4.9	5.3	5.7	6.3	6.6	7.6	8.5	
6 ft. 4 in.	76	6.2	6.8	7.1	8.0	8.4	9.7	10.8	
7 ft. 4 in.	88	7.2	7.8	8.3	9.2	9.7	11.2	12.5	
8 ft. 4 in.	100	8.2	8.9	9.4	10.5	11.0	12.7	14.2	
9 ft. 4 in.	112	9.2	10.0	10.5	11.8	12.3	14.2	15.9	
10 ft. 4 in.	124	10.2	11.0	11.7	13.0	13.7	15.7	17.6	
11 ft. 4 in.	136	11.2	12.1	12.8	14.3	15.0	17.3	19.3	
12 ft. 4 in.	148	12.1	13.2	13.7	15.5	16.3	18.8	21.0	
Hemcord Series 2000 Deflection Table									
13 ft.	156	12.8	13.9	14.7	16.4	17.2	19.8	22.2	
14 ft.	168	13.8	15.0	15.8	17.6	18.5	21.3	23.9	
15 ft.	180	14.8	16.0	16.9	18.9	19.8	22.9	25.6	
16 ft.	192	15.7	17.1	18.0	20.2	21.2	24.4	27.3	

NOTE: Deflection is the minimum glass separation measured at mid span of the screen and subject to rational analysis.

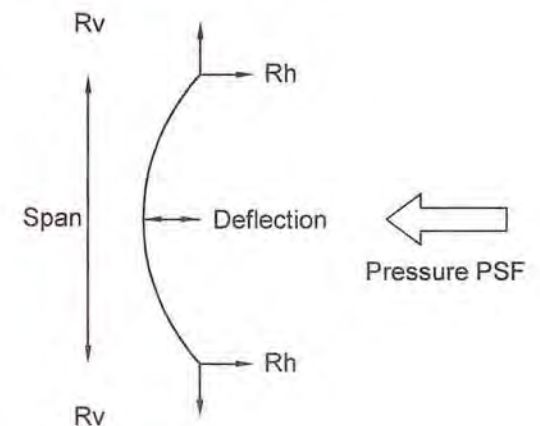
TABLE D-1.2

Grommet / Hemcord Storm Bar						
Storm Bar Span / Length	4'	5'	6'	8'	10'	12'
Max. PSF	PER TABLE D1.1					
Deflection	PER TABLE D1.1					
SYP 2" X 6"	X	X	X			
Alum. Tube 2" X 6" X 1/8" 6063-T6	X	X	X	X		
Alum. Tube 2" X 6" X 1/4" 6061-T6	X	X	X	X	X	X

SCREEN REACTIONS FOR PRESSURE AND SPAN

Load (psf)		Span														
		2 ft.	3 ft.	4 ft.	5 ft.	6 ft. 4 in.	7 ft. 4 in.	8 ft. 4 in.	9 ft. 4 in.	10 ft. 4 in.	11 ft. 4 in.	12 ft. 4 in.	13 ft.	14 ft.	15 ft.	16 ft.
		24"	36"	48"	60"	76"	88"	100"	112"	124"	136"	148"	156"	168"	180"	192"
30	Rh	30.0	45.0	60.0	75.0	95.0	110.0	125.0	140.0	155.0	170.0	185.0	195.0	210.0	225.0	240.0
	Rv	90.0	135.0	184.6	229.6	291.1	336.1	381.1	426.1	471.1	516.1	565.7	595.1	639.1	684.1	733.8
40	Rh	40.0	60.0	80.0	100.0	126.7	146.7	166.7	186.7	206.7	226.7	246.7	260.0	280.0	300.0	320.0
	Rv	114.3	168.8	223.3	283.0	353.9	413.6	468.1	522.6	582.4	636.9	691.4	729.5	784.0	843.8	898.3
60	Rh	60.0	90.0	120.0	150.0	190.0	220.0	250.0	280.0	310.0	340.0	370.0	390.0	420.0	450.0	480.0
	Rv	144.0	213.2	288.0	357.1	451.2	526.0	595.2	664.3	739.2	808.3	883.2	927.5	1002.3	1071.4	1140.6
70	Rh	70.0	105.0	140.0	175.0	221.7	256.7	291.7	326.7	361.7	396.7	431.7	455.0	490.0	525.0	560.0
	Rv	150.0	225.0	300.0	375.0	478.6	553.5	628.5	703.5	714.1	778.6	928.6	980.4	1055.4	1130.4	1205.4
90	Rh	90.0	135.0	180.0	225.0	285.0	330.0	375.0	420.0	465.0	510.0	555.0	585.0	630.0	675.0	720.0
	Rv	180.0	264.1	354.1	444.1	558.2	648.2	738.2	828.2	918.2	1002.3	1092.3	1152.3	1242.3	1326.4	1416.4
110	Rh	110.0	165.0	220.0	275.0	384.3	403.3	458.3	513.3	568.3	623.3	678.3	715.0	770.0	825.0	880.0
	Rv	194.1	291.2	388.2	485.3	612.8	709.9	806.9	904.0	1001.1	1098.1	1195.2	1256.1	1353.1	1450.2	1547.3

$R_h = W \cdot L / 2$
 $R_v = W \cdot (L^2) / (\text{DEFLECTION})$
 $\text{TENSION} = (R_h^2 + R_v^2)^{0.5}$



NOTES:

1. Deflections are delivered from test results.
2. Reaction Rh can be positive (towards structure) or negative (away from structure).
3. Rv is always tension as shown.

DEFLECTION TABLES



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CONCRETE, 3000 PSI - 1/4" AND 5/16" ANCHORS

TABLE 2 ANCHOR SPACING

Anchor	Min. Embed.	Min. E.D.	Pressure (psf)	Span				
				to 48"	to 76"	to 100"	to 124"	to 148"
1/4" DIA. SS DROP-IN ANCHORS	1"	3 1/2"	30 (psf)	12"	12"	12"	6"	6"
			40 (psf)	12"	12"	6"	6"	6"
			60 (psf)	12"	6"	6"	6"	---
			90 (psf)	12"	6"	6"	---	---
			110 (psf)	12"	6"	6"	---	---
1/4" DIA. TAPCON SG	1 3/4"	2 1/2"	30 (psf)	12"	12"	12"	12"	12"
			40 (psf)	12"	12"	12"	12"	12"
			60 (psf)	12"	12"	12"	12"	6"
			90 (psf)	12"	12"	6"	6"	6"
			110 (psf)	12"	12"	6"	6"	6"
1/4" DIA. X 1 3/4" SS TAPCON	1 3/4"	2 1/2"	30 (psf)	12"	12"	12"	6"	6"
			40 (psf)	12"	12"	12"	6"	6"
			60 (psf)	12"	12"	6"	6"	6"
			90 (psf)	12"	6"	6"	6"	---
			110 (psf)	12"	6"	6"	6"	---
1/4" DIA. X 2 1/4" PANELMATE (INSTALL PER PANELMATE INSTRUCTIONS)	1 3/4"	2 1/2"	30 (psf)	12"	12"	12"	12"	6"
			40 (psf)	12"	12"	12"	6"	6"
			60 (psf)	12"	12"	6"	6"	6"
			90 (psf)	12"	6"	6"	6"	---
			110 (psf)	12"	6"	6"	---	---
1/4" DIA. SAMMYS SSC (INSTALL PER MIAMI-DADE NOA NO. 06-0222.07)	2 1/4"	2 1/2"	30 (psf)	12"	12"	12"	12"	12"
			40 (psf)	12"	12"	12"	12"	12"
			60 (psf)	12"	12"	12"	6"	6"
			90 (psf)	12"	12"	6"	6"	6"
			110 (psf)	12"	12"	6"	6"	6"
1/4" ELCO CRETE FLEX 410 SS	2"	2 1/2"	30 (psf)	12"	12"	12"	12"	12"
			40 (psf)	12"	12"	12"	12"	12"
			60 (psf)	12"	12"	12"	6"	6"
			90 (psf)	12"	12"	6"	6"	6"
			110 (psf)	12"	12"	6"	6"	6"
1/4" POWERS POWER STUD SS	2"	3"	30 (psf)	12"	12"	12"	6"	6"
			40 (psf)	12"	12"	12"	6"	6"
			60 (psf)	12"	12"	6"	6"	6"
			90 (psf)	12"	6"	6"	6"	6"
			110 (psf)	12"	6"	6"	---	---
1/4" DIA POWERS WEDGE BOLT 410 SS	1 3/4"	3"	30 (psf)	18"	18"	18"	18"	12"
			40 (psf)	18"	18"	18"	12"	12"
			60 (psf)	12"	12"	12"	12"	6"
			90 (psf)	12"	12"	6"	6"	6"
			110 (psf)	12"	12"	6"	6"	6"

3000 PSI CONCRETE - 1/4" ANCHORS

Anchor	Min. Embed.	Min. E.D.	Pressure (psf)	Span				
				to 48"	to 76"	to 100"	to 124"	to 148"
1/2" DIA. ALL POINTS SOLID SET ANCHORS (VALUES AND INSTALLATION PER MIAMI-DADE NOA 05-1118.04 EXP. 12-2011)	7/8"	3"	30 (psf)	12"	12"	12"	12"	12"
			40 (psf)	12"	12"	12"	12"	6"
			60 (psf)	12"	12"	6"	6"	6"
			90 (psf)	12"	12"	6"	6"	6"
			110 (psf)	12"	6"	6"	6"	---
1/4"-20 CALK-IN ANCHORS (INSTALL PER MANUFACTURER'S INSTRUCTIONS)	1 1/4"	3 1/2"	30 (psf)	12"	12"	12"	12"	6"
			40 (psf)	12"	12"	12"	6"	6"
			60 (psf)	12"	12"	6"	6"	6"
			90 (psf)	12"	6"	6"	6"	---
			110 (psf)	12"	6"	6"	---	---
1/4" Dia. Powers SS Mushroom Spike Anchor (Install per manufacturer's instructions)	1 1/4"	3 1/2"	30 (psf)	12"	12"	6"	6"	6"
			40 (psf)	12"	6"	6"	6"	---
			60 (psf)	12"	6"	6"	---	---
			90 (psf)	6"	6"	---	---	---
			110 (psf)	6"	---	---	---	---
1/4" DIA. HOLLOW SET DROP-IN ANCHORS (INSTALL PER MANUFACTURER'S INSTRUCTIONS)	7/8"	3 1/2"	30 (psf)	12"	6"	6"	6"	---
			40 (psf)	12"	6"	6"	---	---
			60 (psf)	6"	6"	---	---	---
			90 (psf)	6"	---	---	---	---
			110 (psf)	6"	---	---	---	---
1/2" CONFAST HURRICANE SHUTTER INSERT ANCHOR W/ 1/2" DIA. INTERNAL THREAD	1"	1 1/2"	30 (psf)	12"	12"	12"	12"	12"
			40 (psf)	12"	12"	12"	12"	6"
			60 (psf)	12"	12"	12"	6"	6"
			90 (psf)	12"	12"	6"	6"	6"
			110 (psf)	12"	6"	6"	6"	---
5/16" ITW BUILDEX XL SERIES TAPCON	1 3/4"	2 1/4"	30 (psf)	12"	12"	12"	12"	12"
			40 (psf)	12"	12"	12"	12"	6"
			60 (psf)	12"	12"	12"	6"	6"
			90 (psf)	12"	12"	6"	6"	6"
			110 (psf)	12"	6"	6"	6"	---

3000 PSI CONCRETE - 1/4" AND 5/16" ANCHORS

CONCRETE NOTES:

- Provide longer fasteners, if required, to allow for thickness of finishes such as stucco, plaster, siding, etc.

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**ARMOR SCREEN
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Date: 10/23/07 Rev. Date: 10/11/10 Rev. Date:
 Scale: Not to Scale Page: 15 of 20

CONCRETE, 3000 PSI - 3/8" AND 1/2" ANCHORS

TABLE 3 ANCHOR SPACING

Anchor	Min. Embed.	Min. E.D.	Pressure (psf)	Span						
				to 48"	to 76"	to 100"	to 124"	to 148"	to 168"	to 192"
3/8" ASTM 304-316 SS THREADED ROD IN EPOXY W/ SS COUPLER AND EYEBOLT (INSTALL PER MANUFACTURER'S INSTRUCTIONS)	3 3/8"	4"	30 (psf)	18"	18"	18"	18"	18"	18"	18"
			40 (psf)	18"	18"	18"	18"	18"	18"	
			60 (psf)	18"	18"	18"	18"	18"	18"	
			90 (psf)	18"	18"	18"	18"	18"	12"	
			110 (psf)	18"	18"	18"	18"	18"	12"	
3/8" DIA. 410 SS POWERS WEDGE BOLT (LDT)	2 1/2"	3 1/2"	30 (psf)	18"	18"	18"	18"	18"	18"	
			40 (psf)	18"	18"	18"	18"	18"	12"	
			60 (psf)	18"	18"	18"	18"	12"	12"	
			90 (psf)	18"	18"	18"	12"	12"	6"	
			110 (psf)	18"	18"	12"	12"	6"	6"	
3/8" DIA. SS DROP-IN ANCHORS	1 1/2"	4"	30 (psf)	18"	18"	18"	18"	12"	12"	
			40 (psf)	18"	18"	18"	12"	12"	12"	
			60 (psf)	18"	18"	12"	12"	12"	6"	
			90 (psf)	18"	12"	12"	6"	6"	6"	
			110 (psf)	18"	12"	6"	6"	6"	6"	
3/8"-16 CAULK-IN BOLT (INSTALL PER MANUFACTURER'S INSTRUCTIONS)	1 1/4"	4"	30 (psf)	12"	12"	12"	12"	12"	6"	
			40 (psf)	12"	12"	12"	12"	12"	6"	
			60 (psf)	12"	12"	12"	6"	6"	6"	
			90 (psf)	12"	12"	6"	6"	6"	6"	
			110 (psf)	12"	6"	6"	6"	6"	6"	

Anchor	Min. Embed.	Min. E.D.	Pressure (psf)	Span						
				to 48"	to 76"	to 100"	to 124"	to 148"	to 168"	to 192"
3/8" DIA. POWERS SS MUSHROOM SPIKE ANCHOR (INSTALL PER MANUFACTURER'S INSTRUCTIONS)	1 3/4"	4"	30 (psf)	12"	12"	12"	12"	12"	6"	6"
			40 (psf)	12"	12"	12"	6"	6"	6"	
			60 (psf)	12"	12"	6"	6"	6"	6"	
			90 (psf)	12"	6"	6"	6"	6"	---	
			110 (psf)	12"	6"	6"	6"	---	---	
3/8" DIA. POWERS SS MUSHROOM SPIKE ANCHOR (INSTALL PER MANUFACTURER'S INSTRUCTIONS)	1 3/4"	3 1/2"	30 (psf)	18"	18"	18"	18"	18"	18"	
			40 (psf)	18"	18"	18"	18"	18"	12"	
			60 (psf)	18"	18"	18"	18"	12"	12"	
			90 (psf)	18"	18"	18"	12"	12"	6"	
			110 (psf)	18"	18"	12"	12"	6"	6"	
3/8" DIA. POWERS HOLLOW SET DROP-IN ANCHORS (INSTALL PER MANUFACTURER'S INSTRUCTIONS)	1 1/4"	4"	30 (psf)	18"	18"	18"	18"	12"	12"	
			40 (psf)	18"	18"	18"	12"	12"	6"	
			60 (psf)	18"	18"	12"	12"	12"	6"	
			90 (psf)	18"	12"	12"	6"	6"	6"	
			110 (psf)	18"	12"	6"	6"	6"	6"	
3/8" POWERS POWER STUD SS	1 5/8"		30 (psf)	12"	12"	12"	12"	12"	12"	
			40 (psf)	12"	12"	12"	12"	12"	12"	
			60 (psf)	12"	12"	12"	12"	12"	12"	
			90 (psf)	12"	12"	12"	12"	12"	6"	
			110 (psf)	12"	12"	12"	12"	12"	6"	

Anchor	Min. Embed.	Min. E.D.	Pressure (psf)	Span						
				to 48"	to 76"	to 100"	to 124"	to 148"	to 168"	to 192"
1/2" DIA. SS DROP-IN ANCHORS	2"	5"	30 (psf)	24"	24"	24"	24"	24"	24"	18"
			40 (psf)	24"	24"	24"	24"	18"	18"	
			60 (psf)	24"	24"	24"	18"	18"	12"	
			90 (psf)	24"	24"	18"	12"	12"	6"	
			110 (psf)	24"	24"	18"	12"	12"	6"	
1/2" DIA. SS POWERS WEDGE BOLT (LDT)	3 1/2"	5"	30 (psf)	24"	24"	24"	24"	24"	24"	
			40 (psf)	24"	24"	24"	24"	24"	24"	
			60 (psf)	24"	24"	24"	24"	24"	18"	
			90 (psf)	24"	24"	24"	24"	18"	18"	
			110 (psf)	24"	24"	24"	18"	18"	12"	

CONCRETE NOTES:

- Provide longer fasteners, if required, to allow for thickness of finishes such as stucco, plaster, siding, etc.
- 1/2" Hardware Anchor Spacing only valid with C-Channel mounting.



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Date: 10/23/07 Rev. Date: 10/11/10 Rev. Date:
 Scale: Not to Scale Page: 16 of 20

CONCRETE BLOCK (CMU) - 1/4"

TABLE 4 ANCHOR SPACING

CONCRETE BLOCK (CMU) - 3/8"

Anchor	Min. Embed.	Min. E.D.	Pressure (psf)	Span				
				to 48"	to 76"	to 100"	to 124"	to 148"
1/4" DIA. TAPCON SG (INSTALL PER MANUFACTURER'S INSTRUCTIONS)	1 1/4" shall be in face shell, not mortar joints	2 1/2"	30 (psf)	12"	12"	12"	12"	6"
			40 (psf)	12"	12"	6"	6"	6"
			60 (psf)	12"	6"	6"	6"	---
			90 (psf)	12"	6"	6"	---	---
3/8" DIA. ALL POINTS SOLID SET ANCHORS (VALUES AND INSTALLATION PER MIAMI-DADE NOA 05-1116.04 EXP. 12-2011)	7/8" shall be in face shell, not mortar joints	3"	30 (psf)	12"	12"	12"	6"	6"
			40 (psf)	12"	12"	6"	6"	6"
			60 (psf)	12"	6"	6"	6"	---
			90 (psf)	12"	6"	6"	---	---
1/2"-20 CALK-IN ANCHORS	7/8" shall be in face shell, not mortar joints	3"	30 (psf)	12"	6"	6"	---	---
			40 (psf)	6"	6"	---	---	---
			60 (psf)	6"	---	---	---	---
			90 (psf)	6"	---	---	---	---
1/4" DIA. X 1 3/4" 410 SS TAPCON (INSTALL PER MIAMI-DADE NOA NO. 03-0114.03)	1 3/4" shall be in face shell, not mortar joints	2 1/2"	30 (psf)	12"	6"	6"	---	---
			40 (psf)	6"	6"	---	---	---
			60 (psf)	6"	---	---	---	---
			90 (psf)	6"	---	---	---	---
1/2" DIA. X 2 1/4" PANELMATE (INSTALL PER MANUFACTURER'S INSTRUCTIONS)	1 1/4" shall be in face shell, not mortar joints	3"	30 (psf)	12"	6"	6"	6"	6"
			40 (psf)	12"	6"	6"	6"	---
			60 (psf)	6"	6"	---	---	---
			90 (psf)	6"	---	---	---	---
1/2" DIA. X 2 1/4" PANELMATE (INSTALL PER MANUFACTURER'S INSTRUCTIONS)	1 3/4" shall be in face shell, not mortar joints	2"	30 (psf)	12"	6"	6"	---	---
			40 (psf)	12"	6"	6"	---	---
			60 (psf)	6"	6"	---	---	---
			90 (psf)	6"	---	---	---	---
CONFAST HURRICANE SHUTTER INSERT ANCHOR W/ 1/2" DIA. INTERNAL THREAD	1 5/8" shall be in face shell, not mortar joints	4"	30 (psf)	12"	12"	6"	6"	6"
			40 (psf)	12"	6"	6"	6"	---
			60 (psf)	12"	6"	6"	---	---
			90 (psf)	6"	6"	---	---	---
110 (psf)	6"	---	---	---	---			

Anchor	Min. Embed.	Min. E.D.	Pressure (psf)	Span								
				to 48"	to 76"	to 100"	to 124"	to 148"	to 168"	to 192"		
3/8"-16 CALK-IN ANCHORS	1 3/4" shall be in face shell, not mortar joints	4"	30 (psf)	12"	12"	12"	6"	6"	6"	6"	---	---
			40 (psf)	12"	12"	6"	6"	6"	---	---	---	
			60 (psf)	12"	6"	6"	6"	---	---	---		
			90 (psf)	12"	6"	6"	---	---	---	---		
110 (psf)	6"	6"	---	---	---	---	---					
3/8" DIA. HOLLOW SET DROP-IN ANCHORS	1" shall be in face shell, not mortar joints	4"	30 (psf)	12"	6"	6"	6"	6"	---	---	---	
			40 (psf)	12"	6"	6"	---	---	---	---		
			60 (psf)	6"	6"	---	---	---	---	---		
			90 (psf)	6"	---	---	---	---	---	---		
110 (psf)	6"	---	---	---	---	---	---					
3/8" POWERS TAPPER	1 3/4" shall be in face shell, not mortar joints	4"	30 (psf)	12"	12"	6"	6"	6"	6"	---	---	
			40 (psf)	12"	6"	6"	6"	---	---	---		
			60 (psf)	12"	6"	6"	---	---	---	---		
			90 (psf)	6"	6"	---	---	---	---	---		
110 (psf)	6"	6"	---	---	---	---	---					

CMU AND TERRA COTTA BLOCK WITH STUCCO - 1/4" AND 3/8"

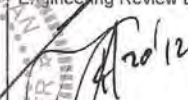
Anchor	Min. Embed.	Min. E.D.	Pressure (psf)	Span				
				to 48"	to 76"	to 100"	to 124"	to 148"
ELCO 1/2" X 2 1/4" CRETEFLEX MASONRY FASTENERS (INSTALL PER MANUFACTURER'S INSTRUCTIONS)	1 1/4"	2 1/2"	30 (psf)	12"	12"	6"	6"	6"
			40 (psf)	12"	6"	6"	6"	---
			60 (psf)	12"	6"	6"	---	---
			90 (psf)	6"	6"	---	---	---
110 (psf)	6"	6"	---	---	---			
CUSTOM COUPLER IN EPOXY	3 1/4"	4"	30 (psf)	12"	12"	12"	12"	12"
			40 (psf)	12"	12"	12"	12"	6"
			60 (psf)	12"	12"	12"	6"	6"
			90 (psf)	12"	12"	6"	6"	6"
110 (psf)	12"	12"	6"	6"	6"			

Notes: 1. Custom fastener = 3/8" x 2 1/2" threaded rod (30455) w/ 1/2" x 1 1/4" coupler (31656) fully inserted in 1/2" dia. 3 1/4" screen tube fully filled w/ Sikadur Anchorfix-4 Injection Gel.
 2. 3/8" x 1" carriage bolt, eye bolt, or machine screw

• Allowable values for Terra Cotta Block with Stucco per HTL Test report #0365-0416-06 dated 05-31-06.

CONCRETE BLOCK (CMU) NOTES:

- Provide longer fasteners, if required, to allow for thickness of finishes such as stucco, plaster, siding, etc.

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Date: 10/23/07 Rev. Date: 10/11/10 Rev. Date:
 Scale: Not to Scale Page: 17 of 20

SOLID GROUTED (CMU) - 1/4" AND 3/8"

TABLE 6 ANCHOR SPACING

Anchor	Min. Embed.	Min. E.D.	Pressure (psf)	Span				
				to 48"	to 76"	to 100"	to 124"	to 148"
1/2" DIA. TAPCON SG (INSTALL PER MANUFACTURER'S INSTRUCTIONS)	1 3/4" shall be in face shell, not mortar joints	2 1/2"	30 (psf)	12"	12"	12"	12"	12"
			40 (psf)	12"	12"	12"	12"	12"
			60 (psf)	12"	12"	12"	12"	6"
			90 (psf)	12"	12"	12"	6"	6"
			110 (psf)	12"	12"	6"	6"	6"
1/2" DIA. X 1 3/4" 410 SS TAPCON (INSTALL PER MIAMI-DADE NOA 03-0114.03)	2 1/4" shall be in face, not mortar joints	2 1/2"	30 (psf)	12"	12"	12"	12"	6"
			40 (psf)	12"	12"	12"	6"	6"
			60 (psf)	12"	12"	6"	6"	6"
			90 (psf)	12"	6"	6"	---	---
			110 (psf)	12"	6"	6"	---	---
1/2" DIA. 410 SS POWERS WEDGE BOLT (INSTALL PER MANUFACTURER'S INSTRUCTIONS)	1 3/4" shall be in face, not mortar joints	3 3/4"	30 (psf)	12"	12"	6"	6"	6"
			40 (psf)	12"	12"	6"	6"	6"
			60 (psf)	12"	6"	6"	---	---
			90 (psf)	6"	6"	---	---	---
			110 (psf)	6"	6"	---	---	---
CONFAST HURRICANE SHUTTER INSERT ANCHOR W/ 1/2" DIA. INTERNAL THREAD (spacing per test #01 dated 2-8-08)	1 5/8" shall be in face, not mortar joints	4"	30 (psf)	18"	18"	18"	18"	18"
			40 (psf)	18"	18"	18"	18"	18"
			60 (psf)	18"	18"	18"	18"	18"
			90 (psf)	12"	12"	12"	12"	12"
			110 (psf)	12"	6"	6"	6"	6"
1/4" DIA. -20 CALK-IN ANCHOR (INSTALL PER MANUFACTURER'S INSTRUCTIONS)	7/8" shall be in face, not mortar joints	3 1/2"	30 (psf)	12"	12"	12"	12"	6"
			40 (psf)	12"	12"	12"	6"	6"
			60 (psf)	12"	12"	6"	6"	6"
			90 (psf)	12"	6"	6"	---	---
			110 (psf)	12"	6"	6"	---	---
1/4" ELCO CRETE-FLEX 410 SS	2" shall be in face, not mortar joints	2 1/2"	30 (psf)	12"	12"	6"	6"	6"
			40 (psf)	12"	6"	6"	6"	---
			60 (psf)	12"	6"	6"	---	---
			90 (psf)	6"	6"	---	---	---
			110 (psf)	6"	6"	---	---	---

SOLID GROUTED (CMU)

Anchor	Min. Embed.	Min. E.D.	Pressure (psf)	Span							
				to 48"	to 76"	to 100"	to 124"	to 148"	to 168"	to 192"	
1/2" ASTM 304-316 SS THREADED ROD IN EPOXY W/ SS COUPLER AND EYEBOLT (INSTALL PER MANUFACTURER'S INSTRUCTIONS)	3 1/2" shall be in face shell, not mortar joints	12"	30 (psf)	12"	12"	12"	12"	12"	12"	12"	12"
			40 (psf)	12"	12"	12"	12"	12"	12"	12"	12"
			60 (psf)	12"	12"	12"	12"	12"	12"	12"	12"
			90 (psf)	12"	12"	12"	12"	12"	6"	6"	
			110 (psf)	12"	12"	12"	12"	6"	6"	6"	
3/8" DIA. POWERS WEDGE BOLT (LDT) 410 SS (spacing per test #04 dated 12-7-07)	2 1/2" shall be in face shell, not mortar joints	4"	30 (psf)	24"	24"	24"	24"	24"	24"	24"	24"
			40 (psf)	24"	24"	24"	24"	24"	24"	24"	24"
			60 (psf)	18"	18"	18"	18"	18"	18"	18"	
			90 (psf)	12"	12"	12"	12"	12"	6"	6"	
			110 (psf)	12"	12"	12"	12"	6"	6"	6"	
3/8" DIA. POWERS HOLLOW SET DROP-IN ANCHOR (INSTALL PER MANUFACTURER'S INSTRUCTIONS)	1 3/4" shall be in face shell, not mortar joints	5 1/4"	30 (psf)	12"	12"	12"	12"	12"	12"	12"	
			40 (psf)	12"	12"	12"	6"	6"	6"	6"	
			60 (psf)	12"	12"	6"	6"	6"	6"	6"	
			90 (psf)	12"	6"	6"	6"	---	---	---	
			110 (psf)	12"	6"	6"	---	---	---	---	
3/8" DIA. CALK-IN ANCHOR 410 SS (INSTALL PER MANUFACTURER'S INSTRUCTIONS)	1 1/4" shall be in face shell, not mortar joints	5 1/4"	30 (psf)	12"	12"	12"	12"	6"	6"	6"	
			40 (psf)	12"	12"	12"	6"	6"	6"	6"	
			60 (psf)	12"	12"	6"	6"	6"	6"	---	
			90 (psf)	12"	6"	6"	6"	---	---	---	
			110 (psf)	12"	6"	6"	---	---	---	---	
3/8" POWERS MUSHROOM SPIKE (SPACING PER TEST #04 DATED 12-7-07)	1 3/4" shall be in face shell, not mortar joints	4"	30 (psf)	24"	24"	24"	24"	24"	24"	24"	
			40 (psf)	24"	24"	24"	24"	24"	24"	24"	
			60 (psf)	18"	18"	18"	18"	18"	18"	18"	
			90 (psf)	12"	12"	12"	12"	12"	6"	6"	
			110 (psf)	12"	12"	12"	12"	6"	6"	6"	

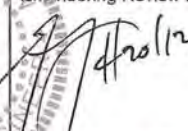
SOLID GROUTED (CMU)

SOLID GROUTED CMU NOTES:

- Spacing for fasteners used in testing are shown at spacing used in tests
- Spacing for all other fasteners calculated with SF=3 min.

SOLID GROUTED CMU NOTES:

- Provide longer fasteners, if required, to allow for thickness of finishes such as stucco plaster, siding, etc.

Engineering Review By: 

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ARMOR SCREEN
GROMMET AND HEMCORD SERIES 2000
HURRICANE PROTECTION

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Date: 10/23/07 | Rev. Date: 10/11/10 | Rev. Date:

Scale: Not to Scale | Page: 18 of 20

WOOD SYP #2 - 1/4" 5/16" 3/8" 1/2"


Anchor	Min. Embed.	Min. E.D.	Pressure (psf)	Span				
				to 48"	to 76"	to 100"	to 124"	to 148"
1/2" DIA. X 2 1/4" PANELMATE (INSTALL PER MANUFACTURER'S INSTRUCTIONS)	1 3/4"	2"	30 (psf)	12"	12"	12"	6"	6"
			40 (psf)	12"	12"	6"	6"	6"
			60 (psf)	12"	6"	6"	6"	---
			90 (psf)	6"	6"	---	---	---
			110 (psf)	6"	6"	---	---	---
1/2" DIA. PANELMATE (INSTALL PER MANUFACTURER'S INSTRUCTIONS) (VALUES PER NDS FOR WOOD CONSTRUCTION)	1 3/4"	3/4"	30 (psf)	12"	12"	12"	6"	6"
			40 (psf)	12"	12"	6"	6"	6"
			60 (psf)	12"	6"	6"	6"	---
			90 (psf)	6"	6"	---	---	---
			110 (psf)	6"	6"	---	---	---
1/2" DIA. X 1 3/4" SS TAPCON (INSTALL PER MANUFACTURER'S INSTRUCTIONS) (VALUES PER NDS FOR WOOD CONSTRUCTION)	1 3/4"	3/4"	30 (psf)	12"	12"	12"	6"	6"
			40 (psf)	12"	12"	6"	6"	6"
			60 (psf)	12"	6"	6"	6"	---
			90 (psf)	6"	6"	---	---	---
			110 (psf)	6"	6"	---	---	---
1/4" DIA. SS LAG SCREWS OR EYE LAG OR HANGER BOLT	2"	1" into stud or lintel	30 (psf)	12"	12"	12"	6"	6"
			40 (psf)	12"	12"	6"	6"	6"
			60 (psf)	12"	12"	6"	6"	---
			90 (psf)	6"	6"	---	---	---
			110 (psf)	6"	6"	---	---	---
5/16" DIA. SS LAG SCREWS OR EYE LAG OR HANGER BOLT	2"	1 1/4" into stud or lintel	30 (psf)	12"	12"	12"	6"	6"
			40 (psf)	12"	12"	12"	6"	6"
			60 (psf)	12"	6"	6"	6"	---
			90 (psf)	6"	6"	6"	---	---
			110 (psf)	6"	6"	---	---	---

TABLE 7 ANCHOR SPACING

Anchor	Min. Embed.	Min. E.D.	Pressure (psf)	Span							
				to 48"	to 76"	to 100"	to 124"	to 148"	to 168"	to 192"	
WOOD SYP #2 3/8" DIA. SS LAG SCREWS OR EYE LAG OR HANGER BOLT	2"	1 1/2" into stud or lintel	30 (psf)	12"	12"	12"	12"	6"	6"	6"	6"
			40 (psf)	12"	12"	12"	6"	6"	6"	6"	
			60 (psf)	12"	12"	6"	6"	6"	---	---	
			90 (psf)	12"	6"	6"	---	---	---	---	
			110 (psf)	6"	6"	---	---	---	---	---	
WOOD SYP #2 3/8" DIA. SS LAG SCREW OR LAG ANCHOR OR HANGER BOLT	*3"	1 1/2" into stud or lintel	30 (psf)	12"	12"	12"	12"	12"	6"	6"	
			40 (psf)	12"	12"	12"	12"	6"	6"	6"	
			60 (psf)	12"	12"	6"	6"	6"	6"	---	
			90 (psf)	12"	6"	6"	---	---	---	---	
			110 (psf)	12"	6"	6"	---	---	---	---	
WOOD SYP #2 1/2" DIA. SS LAG SCREW OR LAG ANCHOR OR HANGER BOLT	*3"	2" into side grain	30 (psf)	12"	12"	12"	12"	12"	12"	12"	
			40 (psf)	12"	12"	12"	12"	12"	12"	6"	
			60 (psf)	12"	12"	12"	6"	6"	6"	6"	
			90 (psf)	12"	12"	6"	6"	6"	6"	6"	
			110 (psf)	12"	6"	6"	6"	6"	6"	---	

WOOD SYP #2 NOTES:

- Provide longer fasteners, if required, to allow for thickness of finishes such as stucco, plaster, siding, etc.
- Design as per NDS 2005.
- *Lag Anchor to be fully embedded.
- Douglas Fir - Larch alternate acceptable wood type

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Scale: Not to Scale		Page: 19 of 20	

METAL - 1/4"-3/8"

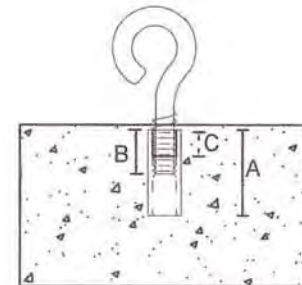
TABLE 8 ANCHOR SPACING

Anchor	Min. Embed.	Min. E.D.	Pressure (psf)	Span						
				to 48"	to 76"	to 100"	to 124"	to 148"	to 168"	to 192"
20 GAGE METAL STUDS 1/4"-14 TEKS SELF-TAPPING SCREWS			30 (psf)	6"	3"	3"	3"	---	---	---
			40 (psf)	6"	3"	3"	---	---	---	
			60 (psf)	---	---	---	---	---	---	
			90 (psf)	---	---	---	---	---	---	
			110 (psf)	---	---	---	---	---	---	
18 GAGE METAL STUDS 1/4"-14 TEKS SELF-TAPPING SCREWS (spacing per test #01 dated 2-8-08)			30 (psf)	6"	6"	6"	6"	6"	6"	6"
			40 (psf)	6"	6"	6"	6"	6"	6"	6"
			60 (psf)	6"	6"	6"	6"	6"	6"	6"
			90 (psf)	6"	6"	6"	6"	6"	6"	6"
			110 (psf)	6"	6"	6"	6"	6"	6"	6"
3/16" STEEL 1/4"-14 TEKS SELF-TAPPING SCREWS			30 (psf)	12"	12"	12"	12"	12"	12"	12"
			40 (psf)	12"	12"	12"	12"	12"	12"	12"
			60 (psf)	12"	12"	12"	12"	12"	12"	12"
			90 (psf)	12"	12"	12"	12"	12"	6"	6"
			110 (psf)	12"	12"	12"	12"	6"	6"	6"
1/8" (12 GA) STEEL 1/4"-14 TEKS SELF-TAPPING SCREWS			30 (psf)	12"	12"	12"	12"	12"	12"	6"
			40 (psf)	12"	12"	12"	12"	12"	6"	6"
			60 (psf)	12"	12"	12"	6"	6"	6"	6"
			90 (psf)	12"	12"	6"	6"	6"	6"	3"
			110 (psf)	12"	12"	6"	6"	6"	3"	3"
1/8" AND 1/4" STEEL 3/8"-RIVET-NUTS INTERNALLY THREADED		1"	30 (psf)	12"	12"	12"	12"	12"	12"	12"
			40 (psf)	12"	12"	12"	12"	12"	12"	12"
			60 (psf)	12"	12"	12"	12"	12"	12"	6"
			90 (psf)	12"	12"	12"	12"	6"	6"	6"
			110 (psf)	12"	12"	12"	12"	6"	6"	6"
1/8" ALUMINUM 6063-T6 1/4"-14 TEKS SS SELF-TAPPING SCREWS			30 (psf)	12"	6"	6"	6"	3"	3"	3"
			40 (psf)	12"	6"	6"	3"	3"	3"	3"
			60 (psf)	6"	6"	3"	3"	3"	---	---
			90 (psf)	6"	3"	3"	3"	---	---	---
			110 (psf)	6"	3"	3"	---	---	---	---
1/4" ALUMINUM 3/8"-RIVET-NUTS INTERNALLY THREADED		1"	30 (psf)	12"	12"	12"	12"	12"	6"	6"
			40 (psf)	12"	12"	12"	12"	6"	6"	6"
			60 (psf)	12"	12"	6"	6"	6"	6"	6"
			90 (psf)	12"	12"	6"	6"	6"	3"	3"
			110 (psf)	12"	6"	6"	6"	3"	3"	3"

METAL NOTES:

- Minimum 3 pitch shall extend past metal substrate.
- Install as per manufacturer's instructions.
- 3" Spacing only valid with C-Channel & F-Track mounting. Grommet spacing to be 6" on center.
- Rivet-nuts shall be installed as per manufacturer's instructions with the appropriate tool.
- Self drilling screws into 18 gage metal studs shall be through C-Channel with threads into metal studs.

DROP-IN ANCHOR			
	Embedment		
	1/4"	3/8"	1/2"
A	1"	1 1/16"	2"
B	1/2"	1 1/16"	1 3/16"
C	5/16"	7/16"	9/16"



A - Drop-In Length
 B - Drop-In Internal Thread
 C - Minimum Thread Engagement

MINIMUM BOLT ENGAGEMENT IN COUPLER

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Scale: Not to Scale		Page: 20 of 20	