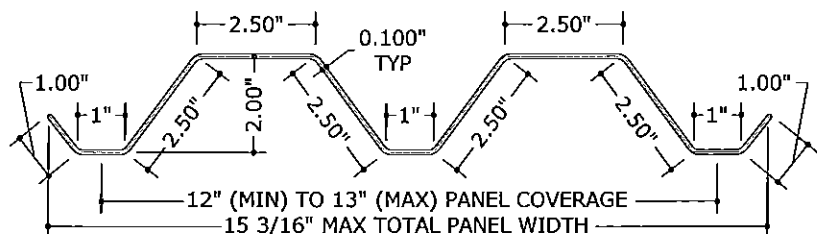




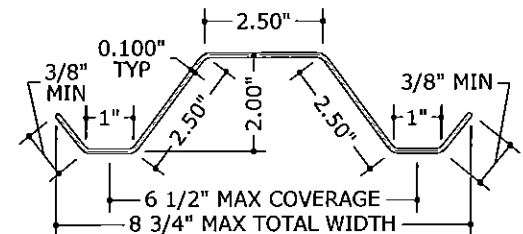
# POLYCARBONATE STORM PANELS (Non-HVHZ)

FRANK L. BENNARDO, P.E.  
FL0046549

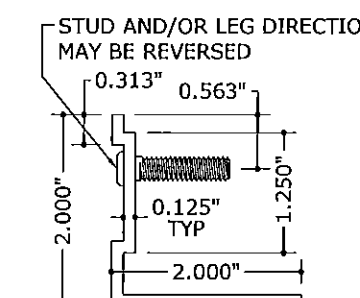
FRANK L. BENNARDO, P.E.  
LICENSE #06419/2015  
No. 46549



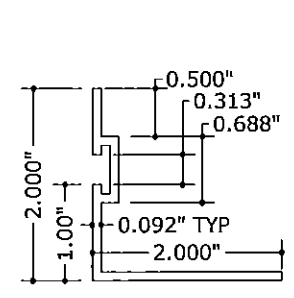
**1 FULL PANEL PROFILE**  
3" = 1'-0" (SEE GEN NOTE 7)  
MOUNT WITH FASTENERS OR STUDS AT 13" O.C. MAX



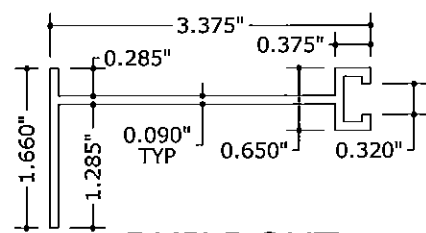
**2 HALF PANEL PROFILE**  
3" = 1'-0" (SEE GEN NOTE 7)  
MOUNT WITH FASTENERS OR STUDS AT 6-1/2" O.C. MAX



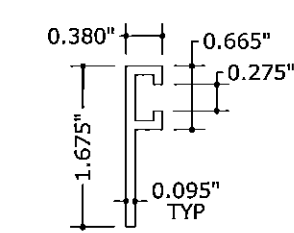
**3 STUD ANGLE**  
6" = 1'-0"



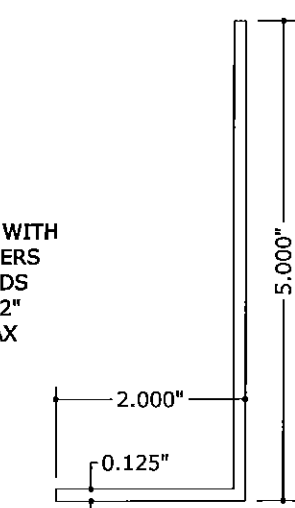
**4 REVERSE 'F' ANGLE**  
6" = 1'-0"



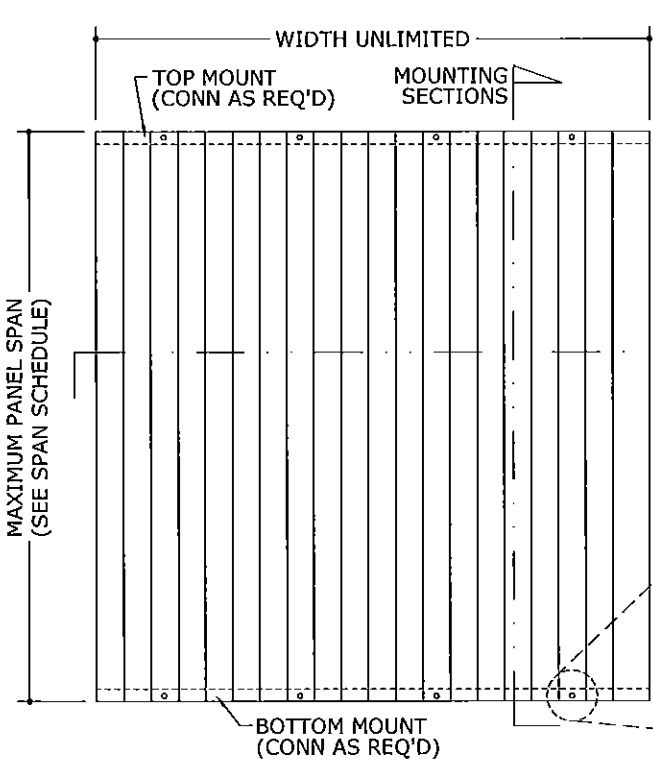
**5 BUILDOUT 'F' TRACK**  
6" = 1'-0"



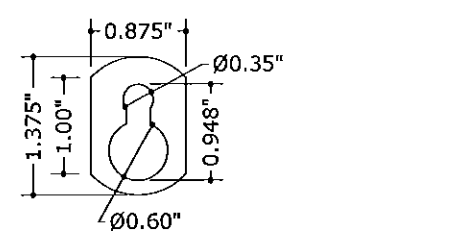
**6 'F' TRACK**  
6" = 1'-0"



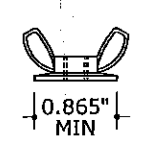
**7 CLOSURE ANGLE**  
6" = 1'-0"



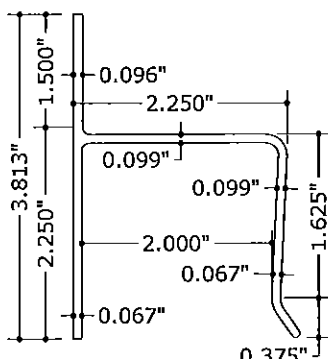
**1 TYPICAL ELEVATION**  
1 N.T.S.



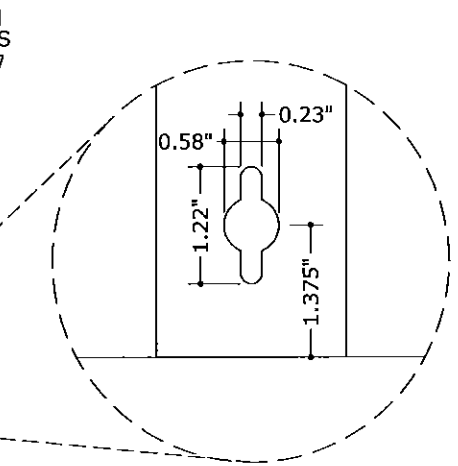
**8 KEYHOLE WASHER**  
6" = 1'-0"



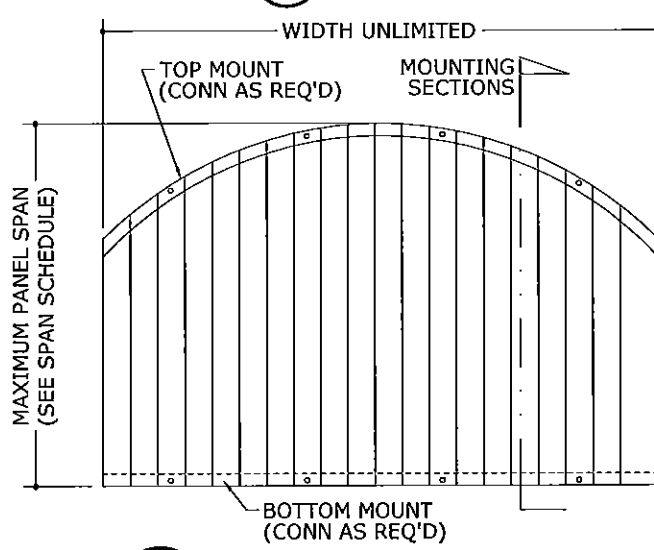
**9 WASHERED WINGNUT**  
6" = 1'-0"



**10 'H' HEADER**  
6" = 1'-0"



**2 KEYHOLE DETAIL**  
1 N.T.S. ALT: FIELD DRILL Ø3/8" HOLE (OR Ø5/8" HOLE W/ KEYHOLE WASHER)



**3 ALT. ARCH TOP\***  
1 N.T.S.

## GENERAL NOTES:

- THIS SYSTEM HAS BEEN TESTED AND EVALUATED AS A LARGE MISSILE IMPACT PROTECTIVE SYSTEM IN ACCORDANCE WITH THE REQUIREMENTS OF THE FLORIDA BUILDING CODE AND THE 2012 INTERNATIONAL BUILDING/RESIDENTIAL CODE PER ASTM STANDARDS E330, E1886 & E1996. PANELS ARE APPROVED FOR USE IN FLORIDA OUTSIDE THE HIGH VELOCITY HURRICANE ZONE, OR THROUGHOUT OTHER AREAS GOVERNED BY THE INTERNATIONAL IBC/IRC.
- NO 33-1/3% INCREASE IN ALLOWABLE STRESS HAS BEEN USED IN THE DESIGN OF THIS PRODUCT.
- POSITIVE AND NEGATIVE DESIGN PRESSURES CALCULATED FOR USE WITH THIS SYSTEM SHALL BE DETERMINED BY OTHERS ON A JOB-SPECIFIC BASIS IN ACCORDANCE WITH THE GOVERNING CODE. SITE-SPECIFIC PRESSURE REQUIREMENTS AS DETERMINED IN ACCORDANCE WITH ASCE 7-10 AND CHAPTER 1609 OF THE FLORIDA BUILDING CODE SHALL BE LESS THAN OR EQUAL TO THE POSITIVE OR NEGATIVE DESIGN PRESSURE CAPACITY VALUES LISTED HEREIN FOR ANY ASSEMBLY AS SHOWN.
- DESIGN PRESSURES NOTED HEREIN ARE BASED ON MAXIMUM TESTED PRESSURES DIVIDED BY A 1.5 SAFETY FACTOR.
- THE SYSTEM DETAILED HEREIN IS GENERIC AND DOES NOT PROVIDE INFORMATION FOR A SPECIFIC SITE. IF SITE CONDITIONS DEVIATE FROM THE CONDITIONS DETAILED HEREIN, A LICENSED ENGINEER OR REGISTERED ARCHITECT SHALL PREPARE SITE SPECIFIC DOCUMENTS TO BE USED IN CONJUNCTION WITH THIS DOCUMENT.
- THE ADEQUACY OF THE EXISTING STRUCTURE TO WITHSTAND SUPERIMPOSED LOADS IS OUTSIDE THE SCOPE OF THIS CERTIFICATION AND SHALL BE VERIFIED BY OTHERS.
- CLEAR POLYCARBONATE STORM PANELS (FULL, HALF, & DOUBLE-WIDE) MAY VARY IN "COVERAGE" WIDTH UP TO THE RESPECTIVE MAXIMA SHOWN HEREIN, PROVIDED THAT THE PANEL PROFILE HEIGHT BE MAINTAINED. PANELS SHALL BE MOUNTED WITH FASTENERS OR STUDS AT MAXIMUM SPACING SHOWN FOR EACH PROFILE.
- ALL POLYCARBONATE PANELS SHALL BE MANUFACTURED BY TRANSPARENT PROTECTION SYSTEMS, INC.
- THIS PRODUCT APPROVAL IS FOR THE USE OF CLEAR POLYCARBONATE PANELS ONLY. ALL POLYCARBONATE PANELS SHALL BE EXTRUDED WITH THICKNESS  $t=0.100"$  ( $\pm 0.010"$ ) AND SHALL BE MANUFACTURED FROM 100% SYNTHETIC THERMOPLASTIC POLYMER RESIN (UV STABILIZED). TYPICAL SYNTHETIC THERMOPLASTIC POLYMER TENSILE STRENGTH  $F_y=8,908$  KSI, FLEXURAL STRENGTH  $F_{by}=12.90$  KSI, & FLEXURAL MODULUS IS 328.7 KSI.
- ALL EXTRUSIONS SHALL BE 6063-T6 ALUMINUM ALLOY, U.N.O.
- PANELS SHALL BE PERMANENTLY LABELED WITH A MINIMUM OF ONE LABEL PER PANEL CONTAINING THE FOLLOWING:  
TRANSPARENT PROTECTION SYSTEMS, INC.  
BENSALEM, PENNSYLVANIA  
ASTM E330, E1886 & E1996  
PRODUCT APPROVAL NUMBER
- STORM PANELS HAVE BEEN DESIGNED AND TESTED TO THE MAXIMUM SPANS AND CORRESPONDING LOADS SHOWN HEREIN. REFERENCE CONSTRUCTION TESTING CORPORATION (CTC OF MIAMI, FL) TEST REPORTS #04-009-FE-ASTM & #04-009-LE-ASTM, AS WELL AS HURRICANE TEST LAB (HTL OF RIVIERA BEACH, FL) TEST REPORTS #0239-0107-05, #0239-1013-07, #0239-0312-06, #0239-0110-07 & #0239-0813-06.
- TOP & BOTTOM MOUNTING SECTIONS MAY BE INTERCHANGED AS FIELD CONDITIONS DICTATE. PANELS MAY BE MOUNTED VERTICALLY OR HORIZONTALLY AS APPLICABLE.
- USE OF KEYHOLE WASHERS IS OPTIONAL IN CONJUNCTION WITH ANY MOUNTING CONDITION. HOLES MAY BE FIELD DRILLED AT Ø3/8" (OR Ø5/8" WITH KEYHOLE WASHER) WITH ANY FASTENER TYPE. WASHERED WINGNUTS SHALL HAVE 0.865" MINIMUM WASHER DIAMETER.
- ALL BOLTS & WASHERS SHALL BE ZINC COATED STEEL, GALVANIZED STEEL, OR STAINLESS STEEL WITH A MINIMUM TENSILE YIELD STRENGTH OF 60 KSI.
- THE HURRI-OUT EGRESS STORM PANEL DETAILS ARE INTENDED TO ALLOW THE POSSIBILITY OF REMOVING PANELS FROM INSIDE OF DWELLING. RESULTS MAY VARY ACCORDING TO INSTALLATION, END-USER, AND TRAINING, ETC. ENGINEERING EXPRESS AND TRANSPARENT PROTECTION SYSTEMS DO NOT ASSUME ANY RESPONSIBILITY OR LIABILITY ASSOCIATED WITH USE OF THIS INSTALLATION AND OR ITS APPLICATIONS.

\*NOTE: FOR ALTERNATE ARCH TOP INSTALLATIONS, THE TOP TRACK OR U-HEADER SHALL BE CUT INTO 6" MINIMUM ADJACENT SEGMENTS. EACH SEGMENT SHALL HAVE ANCHORS SPACED PER THE ANCHOR SCHEDULE, WITH A MINIMUM OF (2) ANCHORS PER SEGMENT. ANCHORS SHALL BE 1-1/2" MIN FROM ENDS OF EACH SEGMENT AND SPACED 3" MINIMUM FROM ADJACENT ANCHORS. FOR STUDDED TRACKS ONLY, THERE SHALL BE A MINIMUM OF (1) STUD PER SEGMENT FASTENED TO THE STORM PANEL. STUDS SHALL BE LOCATED 2" MINIMUM FROM ENDS OF EACH SEGMENT.

**ENGINEERING EXPRESS**  
160 SW 12th AVENUE, #1000  
DEERFIELD BEACH, FL 33442  
PH: (954) 354-0660 FAX: (954) 354-0443  
WWW.ENGP.COM  
CERT OF AUTH #9885  
A. FRANK L. BENNARDO, P.E., INC. INNOVATION

**TPS** Transparent Protection Systems, Inc.  
633 Dunksferry Road  
Bensalem, PA 19020  
CLEARGUARD POLYCARBONATE STORM PANELS  
FOR USE OUTSIDE THE HVHZ  
FLORIDA STATEWIDE APPROVAL FL6417.1  
FBC 5TH ED (2014)

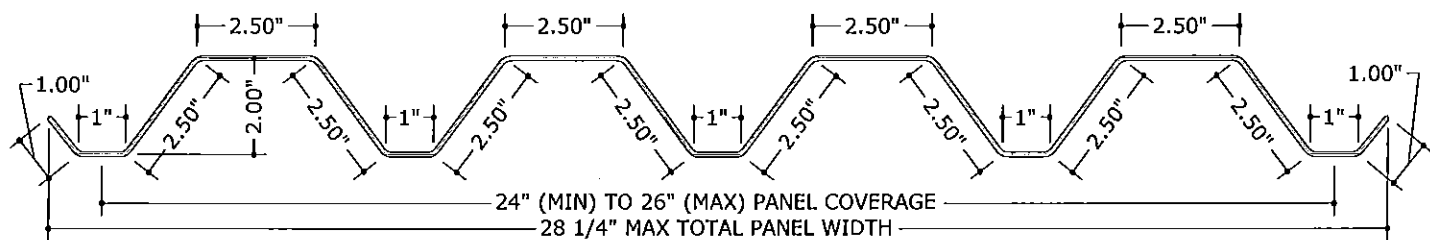
REMARKS	DRWN	CHKD	DATE
2004 FBC	CL	FLB	8/17/04
ClearMAX PROFILE ADDED	CL	FLB	8/05/05
2007 FBC REV (08-TPS-0008)	KL	CL	2/06/06
2010 FBC REVISIONS	EFT	KL	12/29/08
FBC UPDATE	RWN	CSL	12/12/11
FBC UPDATE	RWN	CSL	05/11/15

THIS DOCUMENT IS THE PROPERTY OF FRANK L. BENNARDO, P.E. AND SHALL NOT BE REPRODUCED, COPIED, OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM. ANY UNAUTHORIZED USE OF THIS DOCUMENT IS STRICTLY PROHIBITED AND WILL BE PROSECUTED TO THE FULL EXTENT OF THE LAW.

15-2494  
SCALE: -  
PAGE DESCRIPTION:  
1 OF 7

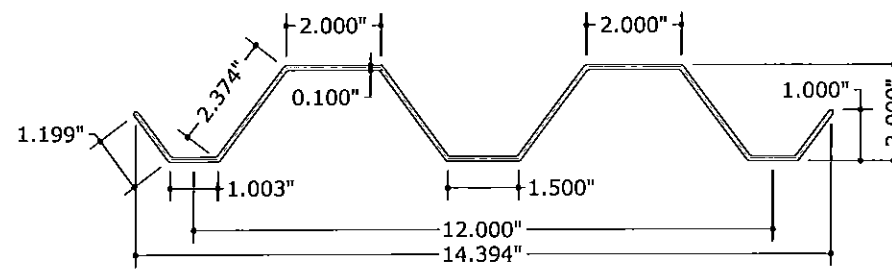
V:\Projects\15-2494 ClearGuard Storm Panels - FSA - Update FL6417 for 2014 Florida Bldg Code-Project\WP1 15-2494c ClearGuard Polycarbonate Storm Panels - Non-HVHZ (FSA).dwg  
rickn  
06/19/2015 - 10:56am

06/19/2015 - 10:54am rickn V:\Projects\15-2494 ClearGuard Storm Panels - FSA - Update FL6417 for 2014 Florida Bldg Code-Project\WP\15-2494c ClearGuard Polycarbonate Storm Panels, Non-HVHZ (FSA).dwg



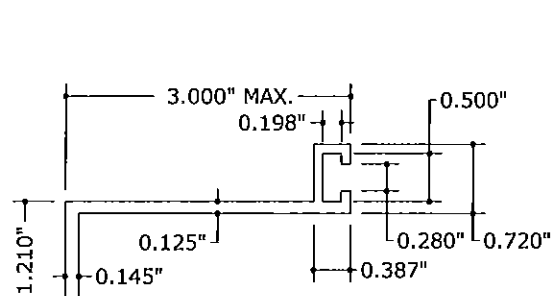
**11 "CLEARMAX™" DOUBLE-WIDE PANEL PROFILE**  
 3" = 1'-0" (SEE GEN NOTE 6)

MOUNT WITH FASTENERS OR STUDS AT 13" O.C. MAX

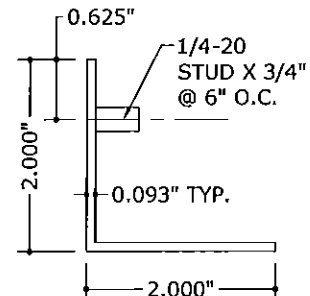


**12 ALT. FULL PANEL PROFILE**  
 N.T.S. (SEE GEN NOTE 6)

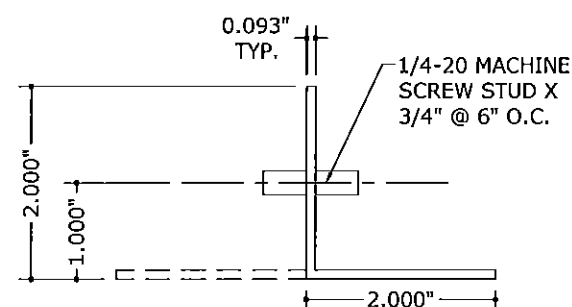
MOUNT WITH FASTENERS OR STUDS AT 13" O.C. MAX



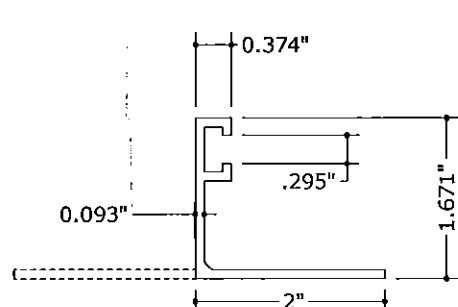
**13 ALTERNATE B.O. 'F' TRACK**  
 6" = 1'-0"



**14 ALTERNATE STUD ANGLE**  
 6" = 1'-0"



**15 STUDDED ANGLE**  
 6" = 1'-0"



**20 'F' TRACK ANGLE**  
 6" = 1'-0"

**MAXIMUM PANEL SPAN SCHEDULE (POSITIVE CONN.)**

LOAD (psf)	MAX SPAN (ft)
38	12'-0"
40	11'-5"
45	10'-1"
50	9'-1"
55	8'-3"
60	7'-7"
65	7'-0"
70	6'-7"
75	6'-1"
80	5'-9"
90	5'-1"
100	4'-7"
110	4'-2"
120	3'-10"

**MAXIMUM PANEL SPAN SCHEDULE (W/ "H" HEADER)**

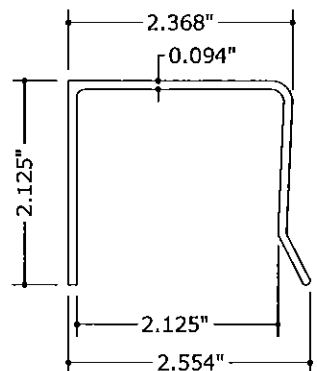
LOAD (psf)	MAX SPAN (ft)
17.3	8'-7"
24.2	7'-9"
34.6	7'-0"
41.6	6'-0"
55.4	5'-0"
104	4'-0"

**MAXIMUM PANEL SPAN SCHEDULE (W/ "U" HEADER)**

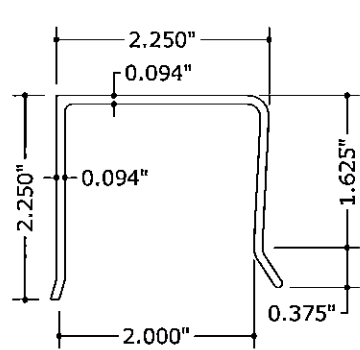
MAX SPAN (ft)	MAX DESIGN PRESSURES	
	POSITIVE (psf)	NEGATIVE (psf)
6'-3"	35	38
5'-3"	48	48
4'-4"	78	80

**MAXIMUM SPAN SCHEDULE NOTES:**

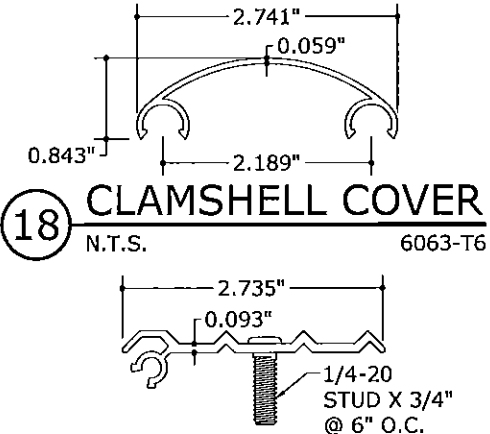
1. SPANS SHOWN IN "MAX PANEL SPAN SCHEDULES" ARE MAXIMUM ALLOWABLE SPANS AT EACH RESPECTIVE DESIGN PRESSURE.
2. THE <POSITIVE CONNECTION> SPAN SCHEDULE MAY BE USED TO DETERMINE MAXIMUM ALLOWABLE SPANS FOR PANELS INSTALLED USING ANY COMBINATION OF MOUNTING EXTRUSIONS INVOLVING A POSITIVE CONNECTION - i.e. ALL INSTALLATIONS WHICH DO NOT INCLUDE AN "H" OR "U" HEADER.
3. THE <WITH "H" HEADER> SPAN SCHEDULE SHALL BE USED FOR ALL INSTALLATIONS WHICH INCLUDE AN "H" HEADER.
4. THE <WITH "U" HEADER> SPAN SCHEDULE SHALL BE USED FOR ALL INSTALLATIONS WHICH INCLUDE A "U" HEADER.
5. TABLES ARE VALID FOR PANELS MOUNTED HORIZONTALLY OR VERTICALLY. SPAN DIRECTION IS ALWAYS PERPENDICULAR TO LINE OF ANCHORAGE.



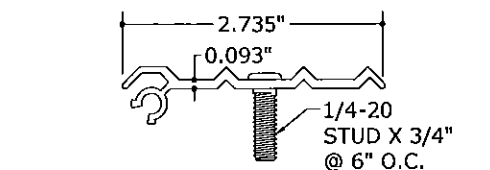
**16 U-HEADER**  
 N.T.S. 6063-T6



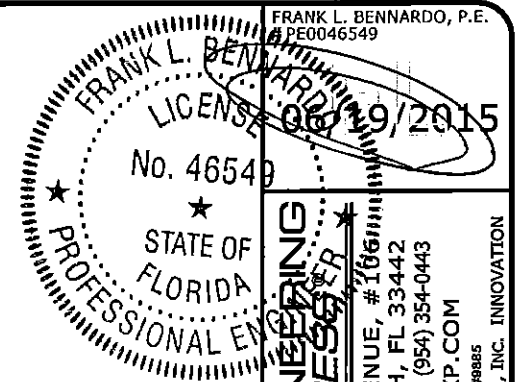
**17 ALTERNATE U-HEADER**  
 N.T.S. 6063-T6



**18 CLAMSHELL COVER**  
 N.T.S. 6063-T6



**19 CLAMSHELL TRACK**  
 N.T.S. 6063-T6



**ENGINEERING EXPRESS**  
 160 SW 12th AVENUE, #106  
 DEERFIELD BEACH, FL 33442  
 PH: (954) 354-0660 FAX: (954) 354-0443  
 WWW.ENGEXP.COM  
 CERT OF AUTH #885  
 A FRANK L. BENNARDO, P.E., INC. INNOVATION

**TPS** Transparent Protection Systems, Inc.  
 633 Dunksferry Road  
 Bensalem, PA 19020  
**CLEARGUARD POLYCARBONATE STORM PANELS**  
 FOR USE OUTSIDE THE HVHZ  
 FLORIDA STATEWIDE APPROVAL FL6417.1  
 FBC 5TH ED (2014)

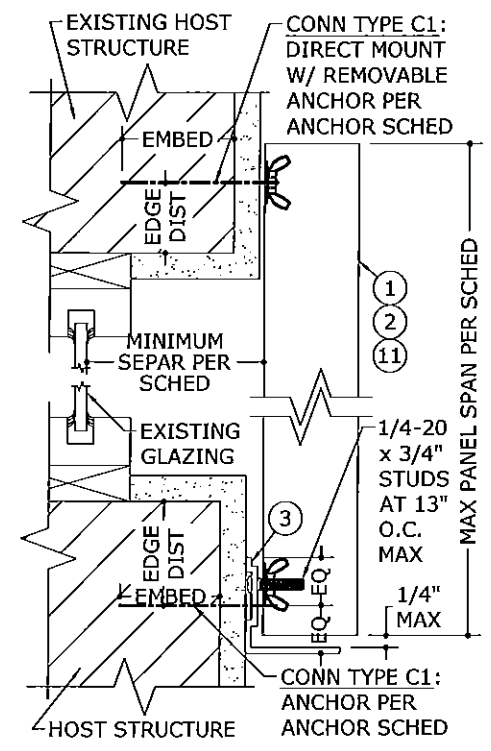
REMARKS	DRWN	CHKD	DATE
ORIG ISSUE	CL	FLB	8/17/04
2004 FBC	CL	FLB	8/05/05
ClearMAX PROFILE ADDED	CL	FLB	2/06/06
2007 FBC REV (05-TPS-0008)	EFT	KL	12/29/08
2010 FBC REVISIONS	LEFT	KL	12/12/11
FBC UPDATE	RWN	CSL	05/11/15

THIS DOCUMENT IS THE PROPERTY OF FRANK L. BENNARDO, P.E. AND SHALL NOT BE REPRODUCED, COPIED, OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, WITHOUT THE WRITTEN PERMISSION OF FRANK L. BENNARDO, P.E. ALTERATIONS, ADDITIONS, REPERCUSSIONS, OR OTHER MARKINGS TO THIS DOCUMENT ARE NOT PERMITTED AND INVALIDATE OUR CERTIFICATION.

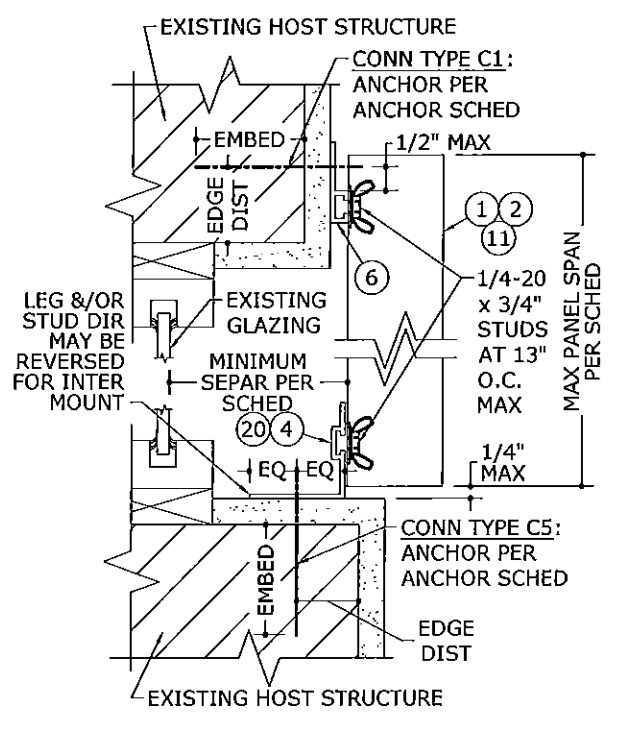
15-2494  
 SCALE:  
 PAGE DESCRIPTION:  
 2 OF 7

V:\Projects\15-2494 ClearGuard Storm Panels - FSA - Update FL6417 for 2014 Florida Bldg Code-Project\WP15-2494 ClearGuard Polycarbonate Storm Panels, Non-HVHZ (FSA).dwg

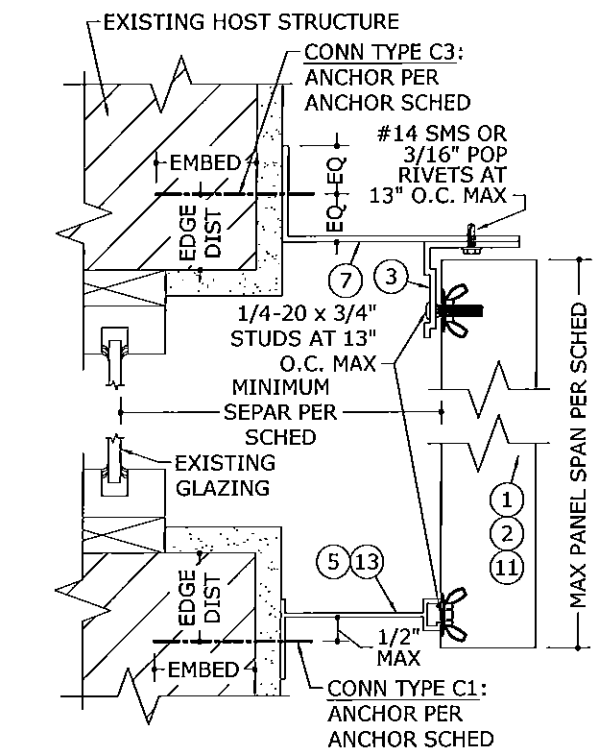
06/19/2015 - 10:54am rickn



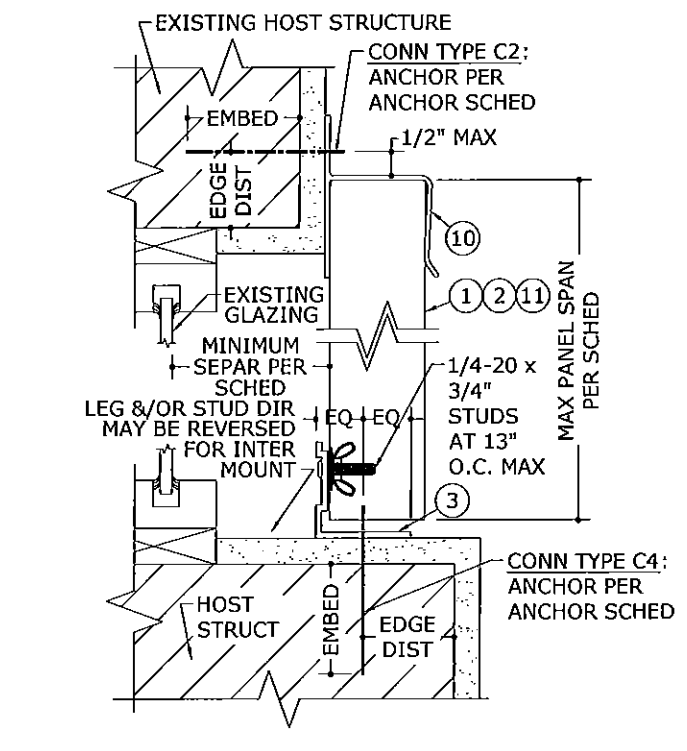
**1** MOUNTING SECTION  
3" = 1'-0" VERT SECTION



**2** MOUNTING SECTION  
3" = 1'-0" VERT SECTION



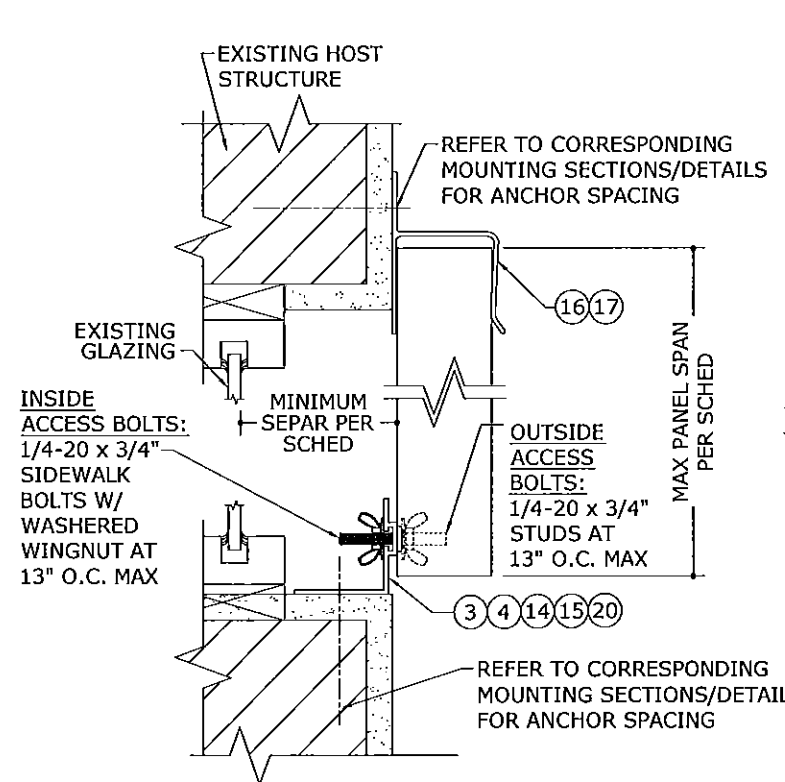
**3** MOUNTING SECTION  
3" = 1'-0" VERT SECTION



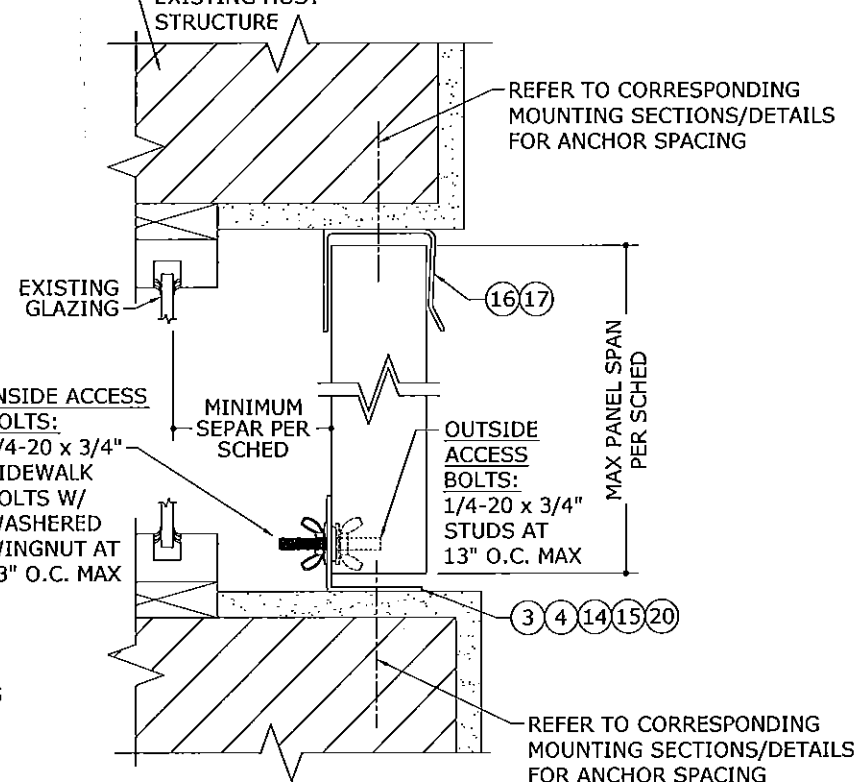
**4** MOUNTING SECTION  
3" = 1'-0" VERT SECTION

**HURRI-OUT™ EGRESS STORM PANEL DETAILS\***

(\*NOTE: SEE GENERAL NOTE #15)

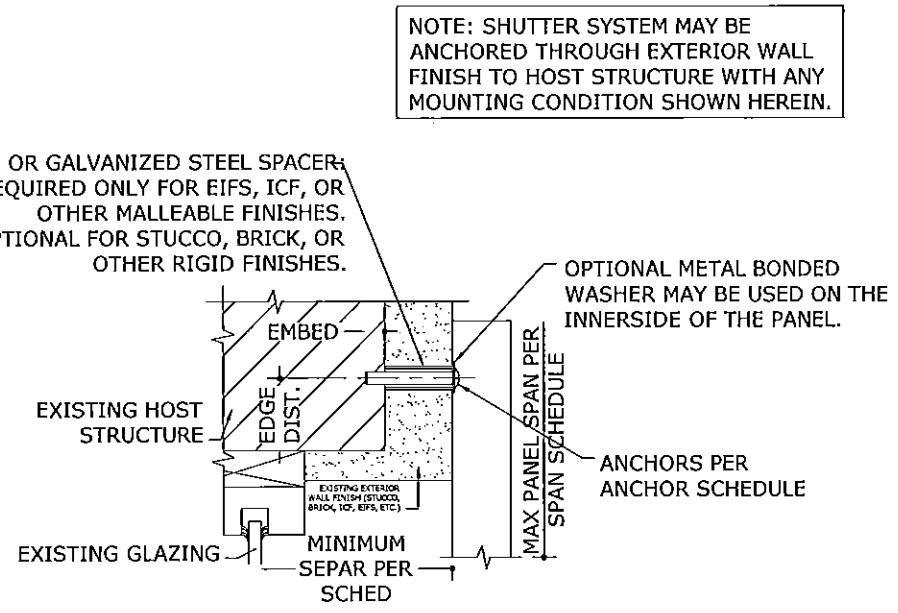


**5** MOUNTING SECTION  
3" N.T.S. VERT SECTION



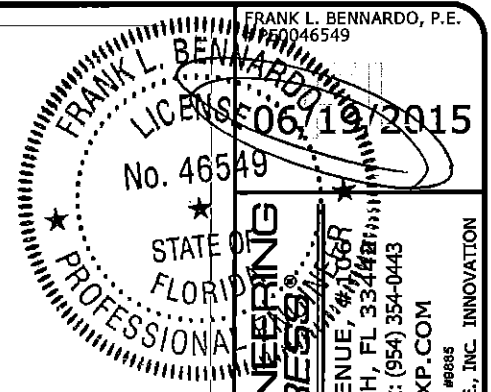
**6** MOUNTING SECTION  
3" N.T.S. VERT SECTION

- ALUMINUM OR GALVANIZED STEEL SPACER:
- REQUIRED ONLY FOR EIFS, ICF, OR OTHER MALLEABLE FINISHES.
  - OPTIONAL FOR STUCCO, BRICK, OR OTHER RIGID FINISHES.



**7** MOUNTING SECTION THRU EXTERIOR WALL FINISH (BRICK, ICF, EIFS, ETC.)  
3" N.T.S. VERT SECTION

NOTE: SHUTTER SYSTEM MAY BE ANCHORED THROUGH EXTERIOR WALL FINISH TO HOST STRUCTURE WITH ANY MOUNTING CONDITION SHOWN HEREIN.



**ENGINEERING EXPRESS**  
160 SW 12th Avenue, #1068  
Deerfield Beach, FL 33441  
PH: (954) 354-0660 FAX: (954) 354-0443  
WWW.ENGP.COM  
CERT. OF AUTH. #885  
A FRANK L. BENNARDO, P.E., INC. INNOVATION

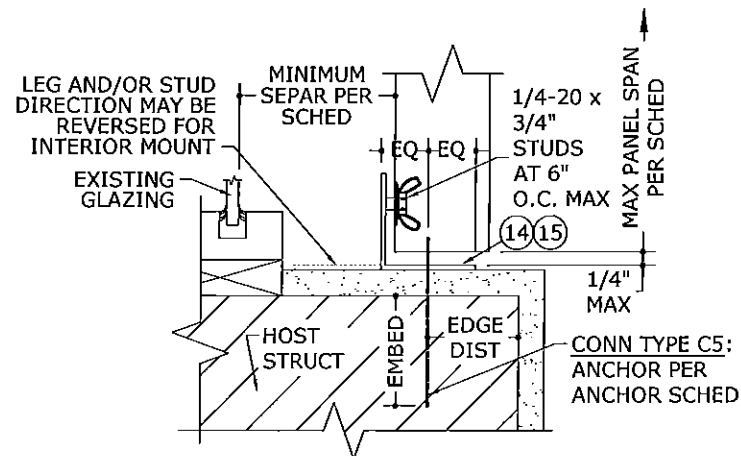
Transparent Protection Systems, Inc.  
633 Dunksferry Road  
Bensalem, PA 19020  
CLEARGUARD POLYCARBONATE STORM PANELS  
FOR USE OUTSIDE THE HVHZ  
FBC 5TH ED (2014) FLORIDA STATEWIDE APPROVAL FL6417.1

REMARKS	DRWN	CHKD	DATE
ORIG ISSUE	CL	FLB	8/17/04
ClearMAX PROFILE ADDED	CL	FLB	8/05/05
2007 FBC REV (08-TPS-0008)	CL	FLB	2/06/06
2010 FBC REVISIONS	EFT	KL	12/29/08
FBC UPDATE	RWN	CSL	05/11/15

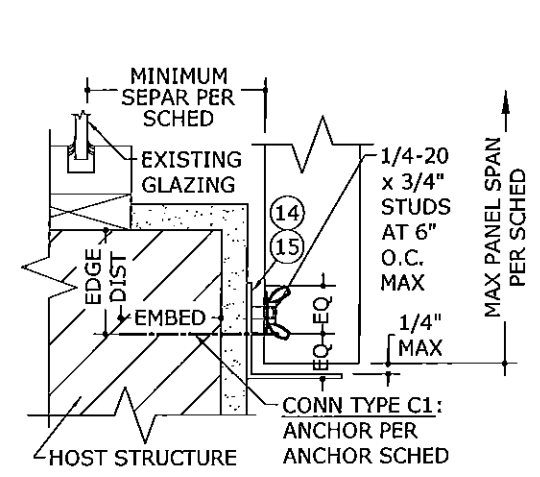
THIS DOCUMENT IS THE PROPERTY OF FRANK L. BENNARDO, P.E. AND SHALL NOT BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, ELECTRONIC OR MECHANICAL, INCLUDING PHOTOCOPYING, RECORDING, OR BY ANY INFORMATION STORAGE AND RETRIEVAL SYSTEM. PERMISSION IS GRANTED TO MAKE COPIES OF THIS DOCUMENT FOR PERSONAL USE ONLY. ALL OTHER MARKINGS TO THIS DOCUMENT ARE NOT PERMITTED AND INVALIDATE OUR CERTIFICATION.

15-2494  
SCALE:  
PAGE DESCRIPTION:  
OF 7  
3

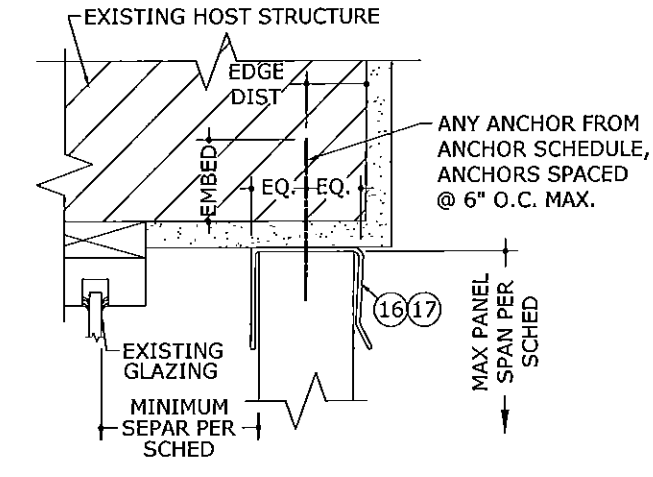
V:\Projects\15-2494\_ClearGuard Storm Panels - FSA - Update FL6417 for 2014 Florida Bldg Code-Project\WP15-2494c\_ClearGuard Polycarbonate Storm Panels - Non-HVHZ (FSA).dwg  
 06/19/2015 - 10:54am rickn



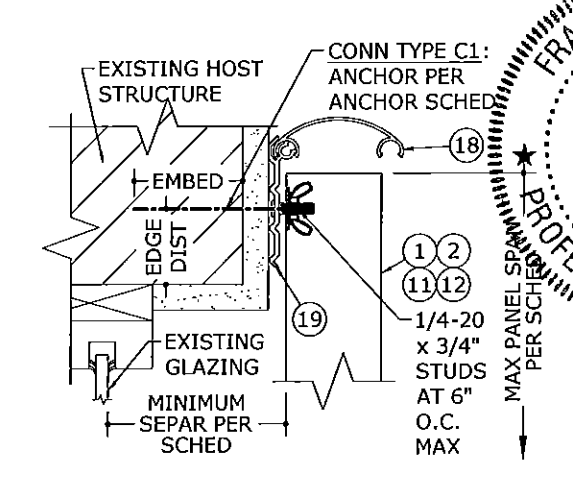
**1 MOUNTING SECTION**  
 3" = 1'-0" VERT SECTION



**2 MOUNTING SECTION**  
 3" = 1'-0" VERT SECTION



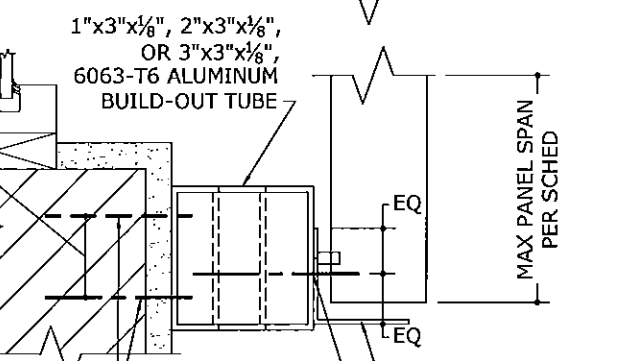
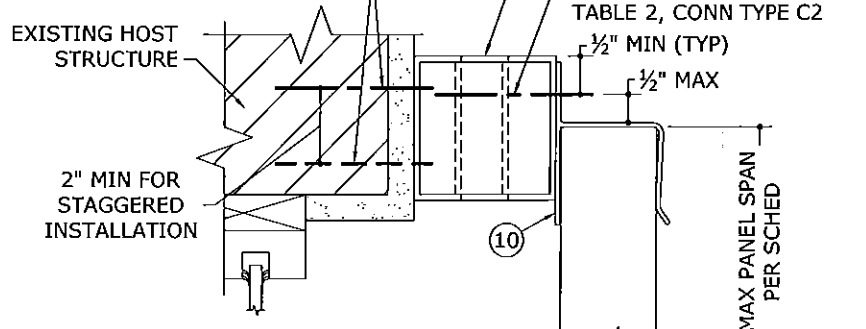
**3 MOUNTING SECTION**  
 N.T.S. VERT SECTION



**4 MOUNTING SECTION**  
 N.T.S. VERT SECTION

**BUILDOUT MOUNTING DETAILS**

- 1/4" TAPCONS (SS ITW OR ELCO) SPACED PER TABLE 1:
- STAGGERED (SHOWN): C1
- NON-STAGGERED: C2
- (NON-STAGGERED ANCHORS SHALL BE PLACED AT CENTER OF THE BUILD-OUT TUBE)



- 1/4" TAPCONS (SS ITW OR ELCO) SPACED PER TABLE 1:
- STAGGERED (SHOWN): C1
- NON-STAGGERED: C2
- (NON-STAGGERED ANCHORS SHALL BE PLACED AT CENTER OF THE BUILD-OUT TUBE)

**5 BUILDOUT MOUNTING DETAIL**  
 N.T.S. VERT SECTION

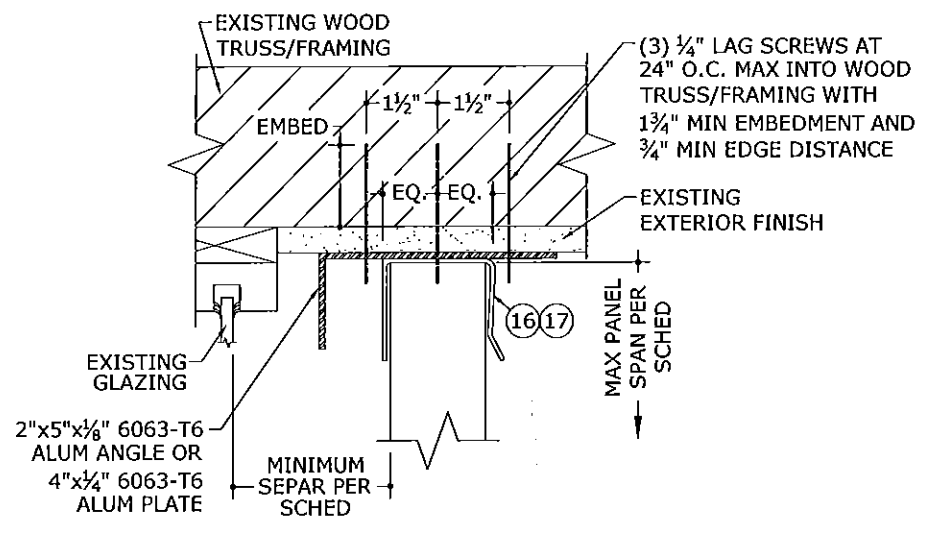
**TABLE 1\*: BUILDOUT ONLY**

HOST STRUCT.	LOAD (psf)	Spans Up To 6'-0"		Spans Up To 8'-6"		Spans Up To 11'-4"	
		CONN TYPE C1	CONN TYPE C2	CONN TYPE C1	CONN TYPE C2	CONN TYPE C1	CONN TYPE C2
CONCRETE	30	13.0"	13.0"	13.0"	13.0"	13.0"	11.8"
	38	13.0"	13.0"	13.0"	12.4"	13.0"	9.3"
	47	13.0"	13.0"	13.0"	10.1"	13.0"	8.5"
	54	13.0"	12.4"	13.0"	8.8"	13.0"	8.5"
HOLLOW BLOCK	30	13.0"	8.5"	13.0"	8.5"	13.0"	8.5"
	38	10.9"	6.6"	7.7"	4.6"	5.8"	3.5"
	47	8.6"	5.2"	6.1"	3.7"	4.6"	
	54	7.0"	4.2"	4.9"	3.0"	4.2"	
WOOD	30	13.0"	8.5"	10.0"	6.0"	7.5"	4.5"
	38	11.2"	6.7"	7.9"	4.7"	5.9"	3.6"
	47	9.1"	5.4"	6.4"	3.8"	5.4"	3.3"
	54	7.9"	4.7"	5.6"	3.3"	5.4"	3.3"

**TABLE 2\*: BUILDOUT ONLY**

LOAD (psf)	Spans Up To 6'-0"		Spans Up To 8'-6"		Spans Up To 11'-4"	
	CONN TYPE C1	CONN TYPE C2	CONN TYPE C1	CONN TYPE C2	CONN TYPE C1	CONN TYPE C2
30	13.0"	13.0"	13.0"	13.0"	13.0"	13.0"
38	13.0"	13.0"	13.0"	13.0"	11.3"	8.1"
47	13.0"	13.0"	12.2"	9.4"	10.3"	6.8"
54	13.0"	13.0"	10.6"	7.2"	10.3"	6.8"
120	10.3"	6.8"	10.3"	6.8"	10.3"	6.8"

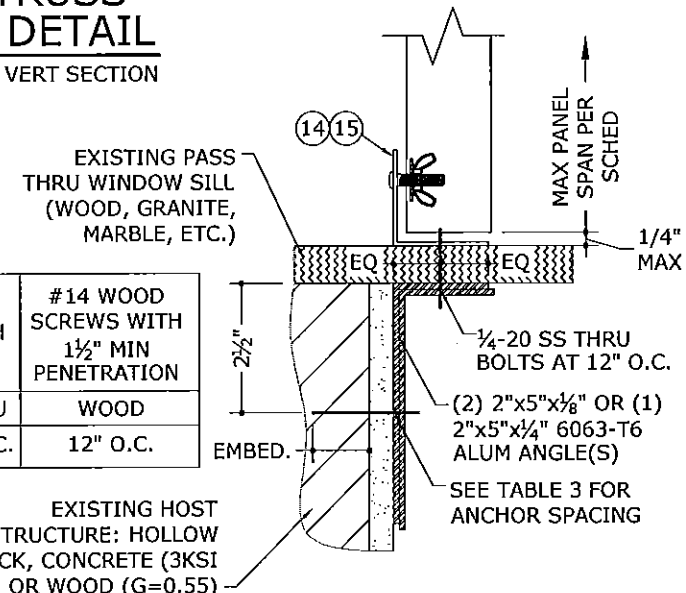
- NOTES:
- TABLE 1 AND 2 APPLY ONLY TO BUILDOUT MOUNTING DETAIL (7/3).
  - TAPCONS SHALL BE INSTALLED WITH THE FOLLOWING MINIMUM EMBEDMENT:
    - TO CONCRETE: 1 3/4" MIN
    - TO HOLLOW BLOCK: 1 1/4" MIN
    - TO WOOD: 1 1/2" MIN
  - REFER TO SHT 6 FOR ADDITIONAL ANCHOR NOTES.
  - THESE MOUNTING CONDITIONS MAY BE USED INDEPENDENTLY OF ONE ANOTHER AND IN CONJUNCTION WITH OTHER MOUNTING CONDITIONS/DETAILS DEPICTED HEREIN.



**6 WOOD TRUSS MOUNT DETAIL**  
 N.T.S. VERT SECTION

**TABLE 3:**

1/4" ITW SS TAPCONS WITH 1/4" MIN EMBED		1/4" ALL POINTS SOLID-SET WITH 7/8" MIN EMBED		#14 WOOD SCREWS WITH 1 1/2" MIN PENETRATION	
CONC	CMU	CONC	CMU	WOOD	
12" O.C.	8" O.C.	12" O.C.	11" O.C.	12" O.C.	



**7 PASS THRU WINDOW DETAIL**  
 N.T.S. VERT SECTION

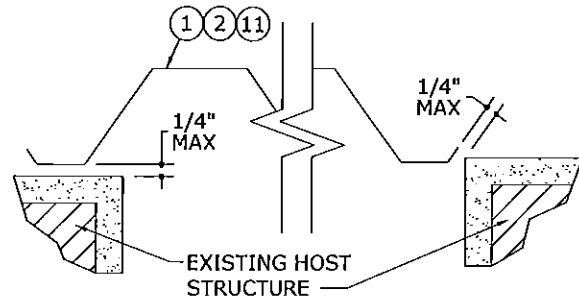
FRANK L. BENNARDO, P.E.  
 License No. 46549  
 State of Florida  
**ENGINEERING EXPRESS**  
 160 SW 12th Avenue, #168  
 Deerfield Beach, FL 33444  
 PH: (954) 354-0660 FAX: (954) 354-0443  
 WWW.ENGPXP.COM  
 CERT. OF AUTH. #885  
 A FRANK L. BENNARDO, P.E., INC. INNOVATION

**TPS** Transparent Protection Systems, Inc.  
 633 Dunkisferry Road  
 Bensalem, PA 19020  
 CLEARGUARD POLYCARBONATE STORM PANELS  
 FOR USE OUTSIDE THE HVHZ  
 FBC 5TH ED (2014) FLORIDA STATEWIDE APPROVAL FL6417.1

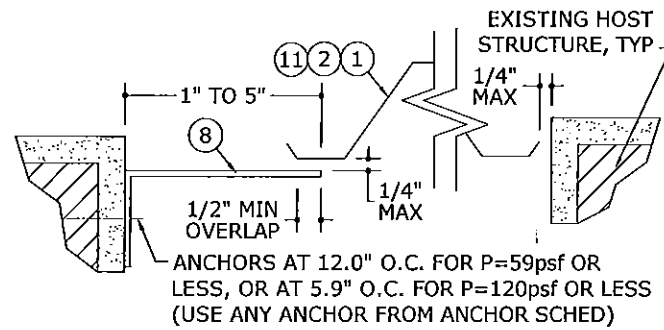
DRWN	CHKD	DATE
CL	FLB	8/17/04
CL	FLB	8/05/05
CL	FLB	2/06/06
CL	FLB	12/29/08
EFT	KL	12/12/11
RWN	CSL	05/11/15

REMARKS: 15-2494  
 SCALE: -  
 PAGE DESCRIPTION: -  
 OF 7

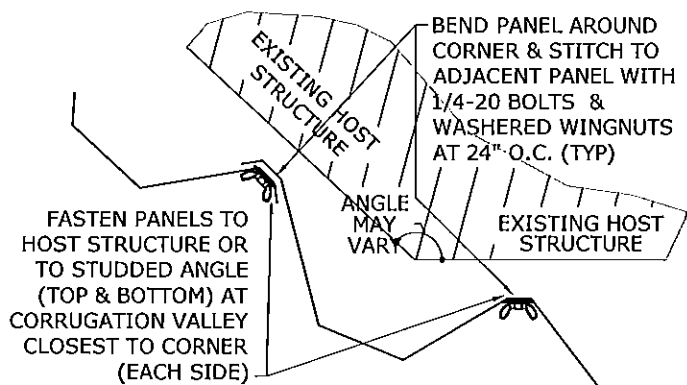
# CLOSURE DETAILS



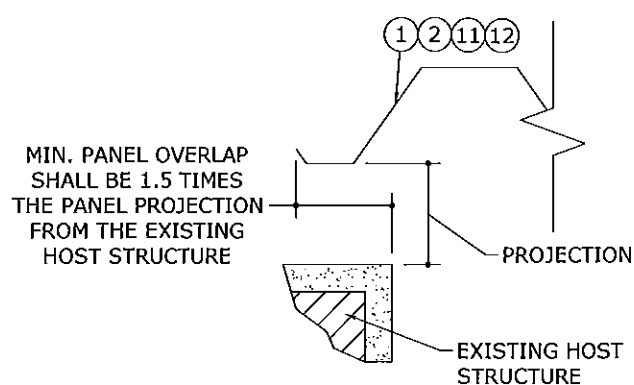
**1 WALL MOUNT CLOSURE**  
 5 3" = 1'-0" PLAN VIEW



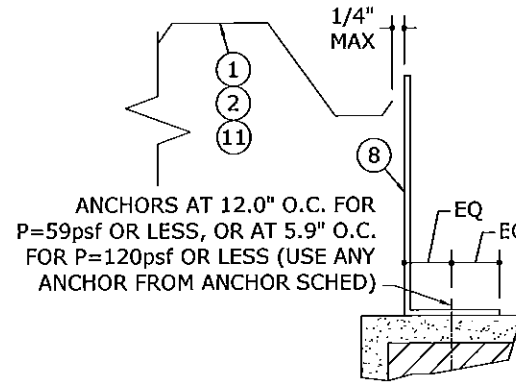
**2 TRAP MOUNT CLOSURE**  
 5 3" = 1'-0" PLAN VIEW



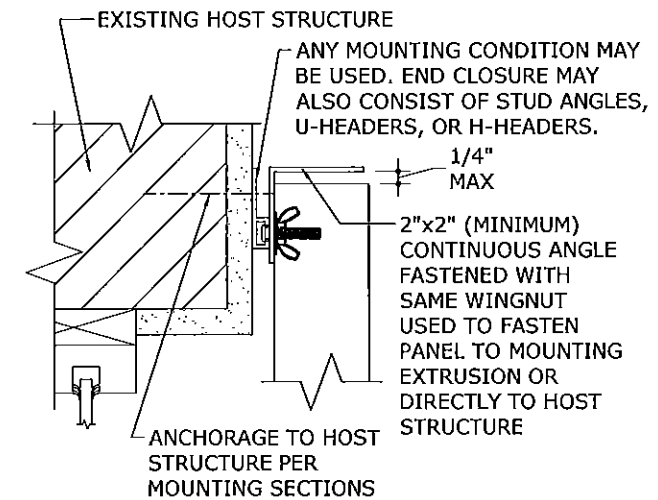
**3 CORNER CLOSURE**  
 5 N.T.S. PLAN VIEW



**4 PANEL OVERLAP**  
 5 N.T.S. PLAN VIEW



**5 BUILD-OUT CLOSURE**  
 5 3" = 1'-0" PLAN VIEW



**6 TOP/BOTTOM CLOSURE**  
 5 N.T.S. VERT SECTION

## MINIMUM SPAN SCHEDULE

ONE (1) CLOSURE AT TOP OR BOTTOM

TOP OR BOTTOM WITH CLOSURE	TOP OR BOTTOM MOUNT WITHOUT CLOSURE							
	DIRECT MOUNT	STUD ANGLE (WALL MOUNT)	"F" TRACK	REVERSE "F" ANGLE	B.O. 2x5 + STUD ANGLE	B.O. "F" TRACK	"H" HEADER	STUD ANGLE (TRAP MOUNT)
DIRECT MOUNT	32"	30"	33"	30"	30"	32"	30"	30"
STUD ANGLE (WALL MOUNT)	32"	30"	33"	30"	30"	32"	30"	30"
"F" TRACK	33"	30"	35"	30"	30"	33"	30"	30"
REVERSE "F" ANGLE	32"	30"	33"	30"	30"	32"	30"	30"
B.O. 2x5 + STUD ANGLE	32"	30"	33"	30"	30"	32"	30"	30"
B.O. "F" TRACK	32"	30"	33"	30"	30"	32"	30"	30"
"H" HEADER	30"	30"	30"	30"	30"	30"	30"	30"
STUD ANGLE (TRAP MOUNT)	32"	30"	33"	30"	30"	32"	30"	30"

## MINIMUM SPAN SCHEDULE

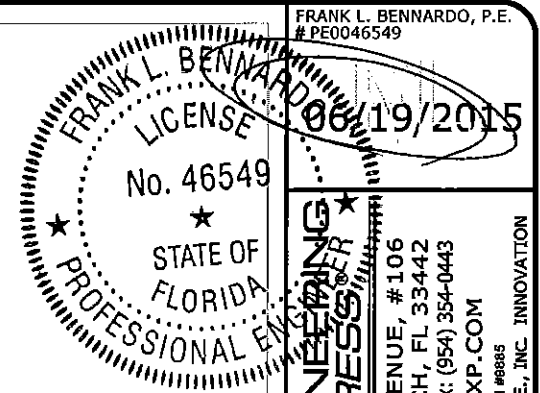
NO TOP/BOTTOM CLOSURES

TOP MOUNT	BOTTOM MOUNT							
	DIRECT MOUNT	STUD ANGLE (WALL MOUNT)	"F" TRACK	REVERSE "F" ANGLE	B.O. 2x5 + STUD ANGLE	B.O. "F" TRACK	"H" HEADER	STUD ANGLE (TRAP MOUNT)
DIRECT MOUNT	53"	32"	55"	32"	32"	53"	30"	32"
STUD ANGLE (WALL MOUNT)	32"	30"	33"	30"	30"	32"	30"	30"
"F" TRACK	55"	33"	57"	33"	33"	55"	30"	33"
REVERSE "F" ANGLE	32"	30"	33"	30"	30"	32"	30"	30"
B.O. 2x5 + STUD ANGLE	32"	30"	33"	30"	30"	32"	30"	30"
B.O. "F" TRACK	53"	32"	55"	32"	32"	53"	30"	32"
"H" HEADER	30"	30"	30"	30"	30"	30"	30"	30"
STUD ANGLE (TRAP MOUNT)	32"	30"	33"	30"	30"	32"	30"	30"

## MINIMUM SPAN SCHEDULE NOTES:

- SPANS SHOWN ABOVE ARE MINIMUM ALLOWABLE SPANS BASED ON ANY COMBINATION OF MOUNTING CONDITIONS AT TOP OR BOTTOM. PANEL LENGTHS LESS THAN THOSE NOTED IN TABLES ABOVE ARE NOT ACCEPTABLE.
- NO SEPARATION FROM GLASS IS REQUIRED WHEN PANEL LENGTH IS GREATER THAN THAT NOTED FOR RESPECTIVE MOUNTING COMBINATIONS ABOVE.
- SIDE CLOSURES REQUIRED IF GAP BETWEEN PANEL AND STRUCTURE EXCEEDS DISTANCE SHOWN IN HORIZONTAL SECTION DETAILS (REF. DETAILS 6/3, 7/3 AND 9/3).
- TABLES ABOVE ARE VALID FOR PANELS MOUNTED HORIZONTALLY OR VERTICALLY.
- TOP/BOTTOM CLOSURES MAY CONSIST OF NON-STRUCTURAL 28ga (0.018" MIN) GALV STEEL OR 0.022" MIN SHEET ALUMINUM OF ALLOY 5052-H32 OR 3004-H34. REFERENCE DETAILS HEREIN FOR DEPICTION OF TOP/BOTTOM CLOSURE MOUNTING REQUIREMENTS.
- STORM PANELS MAY BE INSTALLED WITH A 12" MINIMUM SPAN WHEN INSTALLED WITH A CLOSURE ANGLE AT BOTH TOP AND BOTTOM.

FRANK L. BENNARDO, P.E.  
 # PE0046549



**ENGINEERING EXPRESS**  
 160 SW 12th AVENUE, #106  
 DEERFIELD BEACH, FL 33442  
 PH: (954) 354-0660 FAX: (954) 354-0443  
 WWW.ENGEXP.COM  
 CERT. OF AUTH. #8885  
 A FRANK L. BENNARDO, P.E., INC. INNOVATION

Transparent Protection Systems, Inc.  
 633 Dunkisferry Road  
 Bensalem, PA 19020  
**TPS**  
 CLEARGUARD POLYCARBONATE STORM PANELS  
 FOR USE OUTSIDE THE HVHZ  
 FBC 5TH ED (2014) FLORIDA STATEWIDE APPROVAL FL6417.1

REMARKS	DRWN	CHKD	DATE
ORIG ISSUE	CL	FLB	8/17/04
2004 FBC	CL	FLB	8/05/05
CLEARMAX PROFILE ADDED	CL	FLB	2/06/06
2007 FBC REV (08-TPS-0009)	KL	KL	12/29/08
2010 FBC REVISIONS	EFT	KL	12/12/11
FBC UPDATE	RWN	CSL	05/11/15

THIS DOCUMENT IS THE PROPERTY OF FRANK L. BENNARDO, P.E. AND SHALL NOT BE REPRODUCED OR TRANSMITTED IN ANY FORM OR BY ANY MEANS, WITHOUT THE WRITTEN PERMISSION OF FRANK L. BENNARDO, P.E. ANY UNAUTHORIZED USE OF THIS DOCUMENT IS NOT PERMITTED AND WILL BE PUNISHED BY LAW.

COPYRIGHT FRANK L. BENNARDO P.E.  
**15-2494**  
 SCALE:  
 PAGE DESCRIPTION:  
 5 OF 7

V:\Projects\15-2494 ClearGuard Storm Panels - FSA - Update FL6417 for 2014 Florida Bldg Code\Project\WP\15-2494c ClearGuard Polycarbonate Storm Panels, Non-HVHZ (FSA).dwg  
 06/19/2015 - 10:54am rickn





### POSITIVE CONNECTION MINIMUM GLASS SEPARATION SCHEDULE

LOAD (PSF)	SPAN LESS THAN	MINIMUM SEPARATION AT OR BELOW 30' ABOVE GRADE	MINIMUM SEPARATION AT ELEVATION > 30' ABOVE GRADE
38	4'-0"	7.73"	1.65"
	7'-0"	7.73"	4.38"
	12'-0"	8.78"	8.78"
40	4'-0"	7.73"	1.69"
	7'-0"	7.73"	4.56"
	11'-5"	8.33"	8.33"
45	4'-0"	7.73"	1.77"
	7'-0"	7.73"	5.01"
50	10'-1"	7.73"	7.39"
	4'-0"	7.73"	1.86"
	7'-0"	7.73"	5.45"
70	9'-1"	7.73"	6.87"
	4'-0"	7.73"	2.03"
60	7'-0"	7.73"	6.34"
	7'-7"	7.73"	6.57"
70	4'-0"	7.73"	2.20"
	6'-7"	7.73"	6.38"
120	3'-10"	7.73"	2.74"

### H-HEADER MINIMUM GLASS SEPARATION SCHEDULE

SPAN LESS THAN	MINIMUM SEPARATION AT OR BELOW 30' ABOVE GRADE	MINIMUM SEPARATION AT ELEVATION > 30' ABOVE GRADE
8'-7"	8.60"	7.17"
7'-9"	8.60"	6.69"
7'-0"	8.60"	5.97"
6'-0"	8.60"	4.94"
5'-0"	8.60"	4.10"
4'-0"	8.60"	3.58"

### GLASS SEPARATION SCHEDULE NOTES:

1. GLASS SEPARATION SCHEDULE PROVIDES MINIMUM SEPARATION DISTANCE REQUIRED BETWEEN EXTERIOR FACE OF GLAZING (OR OTHER PRODUCT BEING PROTECTED) AND INTERIOR FACE OF INSTALLED STORM PANEL.
2. SEPARATION DISTANCE PER THIS SCHEDULE IS REQUIRED FOR USE WITH POSITIVE LOADS ONLY.
3. SEPARATION FROM GLASS IS REQUIRED ONLY WHEN INSTALLED WITHIN ASTM WIND ZONE 4 AND ESSENTIAL FACILITIES.

### U-HEADER MINIMUM GLASS SEPARATION SCHEDULE

SPAN LESS THAN	MINIMUM SEPARATION AT OR BELOW 30' ABOVE GRADE	MINIMUM SEPARATION AT ELEVATION > 30' ABOVE GRADE
6'-3"	3.98"	3.21"
5'-3"	3.98"	2.58"
4'-4"	3.98"	2.24"

FRANK L. BENNARDO, P.E.  
# BE0046549

LICENSE # 06/19/2015  
No. 46549

STATE OF FLORIDA  
PROFESSIONAL ENGINEERING

**EXPRESS**  
ENGINEERING

160 SW 12th AVENUE, #1106  
DEERFIELD BEACH, FL 33442  
Ph: (954) 354-0660 Fax: (954) 354-0443  
WWW.ENGEXP.COM  
CERT. OF AUTH. #9885

A FRANK L. BENNARDO, P.E., INC. INNOVATION

**TPS** Transparent Protection Systems, Inc.  
633 Dunksferry Road  
Bensalem, PA 19020

CLEARGUARD POLYCARBONATE STORM PANELS  
FOR USE OUTSIDE THE HVHZ  
FBC 5TH ED (2014) FLORIDA STATEWIDE APPROVAL FL6417.1

REMARKS	DRWN	CHKD	DATE
2004 FBC	CL	FLB	8/17/04
ClearMAX PROFILE ADDED	CL	FLB	8/05/05
2007 FBC REV (05-TPS-0008)	CL	FLB	2/06/06
2010 FBC REVISIONS	EFT	KL	12/29/08
FBC UPDATE	RWN	CSL	12/12/11
			05/11/15

THIS DOCUMENT IS THE PROPERTY OF FRANK L. BENNARDO, P.E. AND SHALL NOT BE REPRODUCED IN WHOLE OR PART WITHOUT WRITTEN CONSENT OF FRANK L. BENNARDO, P.E. ALL RIGHTS RESERVED. ANY REUSE, REPRODUCTION, OR DISTRIBUTION OF THIS DOCUMENT IS STRICTLY PROHIBITED AND WILL BE CONSIDERED A VIOLATION OF THE PROFESSIONAL ENGINEERING BOARD OF FLORIDA'S REGULATIONS.

COPYRIGHT FRANK L. BENNARDO P.E.

15-2494

SCALE: -

PAGE DESCRIPTION:

7 OF 7

V:\Projects\15-2494 - ClearGuard Storm Panels - FSA - Update FL6417 for 2014 Florida Bldg Code-Project\WP\15-2494 - ClearGuard Polycarbonate Storm Panels, Non-HVHZ (FSA).dwg  
06/19/2015 - 10:54am rickn