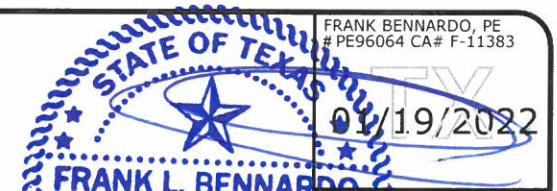
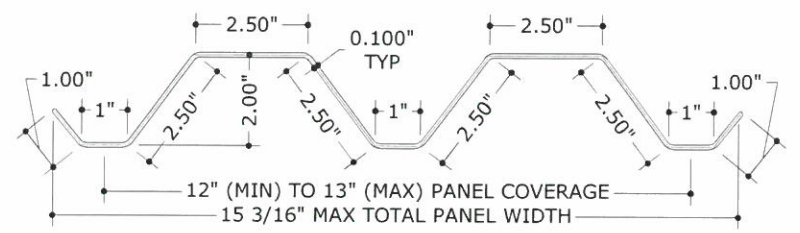


C:\Users\rickn\Engineering\Express\Production - Documents\Projects\20-31355 Polymer Industries - TDI\Updates\WPClearGuard Polycarbonate Storm Panels (TDI).dwg
 01/19/2022 - 9:09pm
 rickn

TPS CLEARGUARD® POLYCARBONATE STORM PANELS

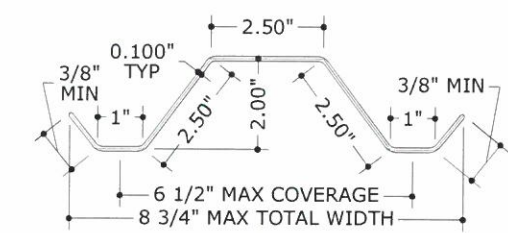


FRANK BENNARDO, PE
 #PE96064 CA# F-11383



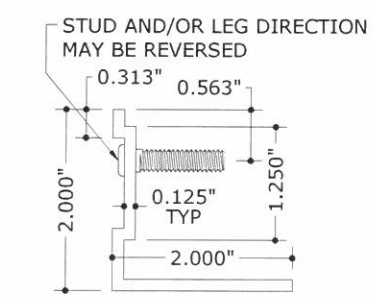
1 FULL PANEL PROFILE
 3" = 1'-0"
 (SEE GEN NOTE 7)

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

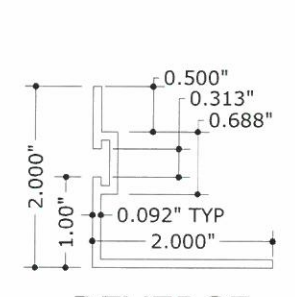


2 HALF PANEL PROFILE
 3" = 1'-0"
 (SEE GEN NOTE 7)

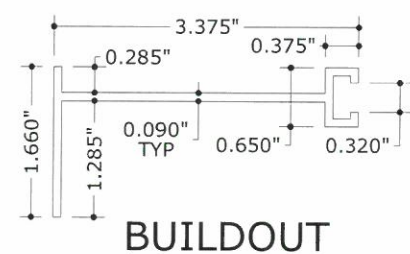
MOUNT WITH FASTENERS OR STUDS AT 6-1/2" O.C. MAX



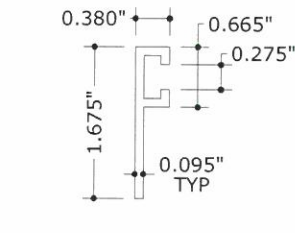
3 STUD ANGLE
 6" = 1'-0"



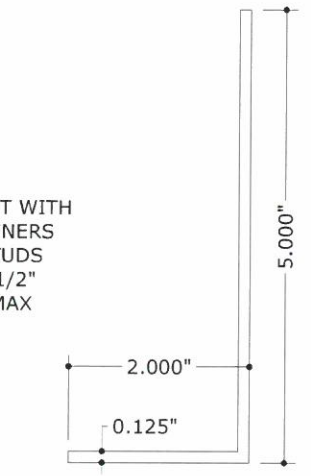
4 REVERSE 'F' ANGLE
 6" = 1'-0"



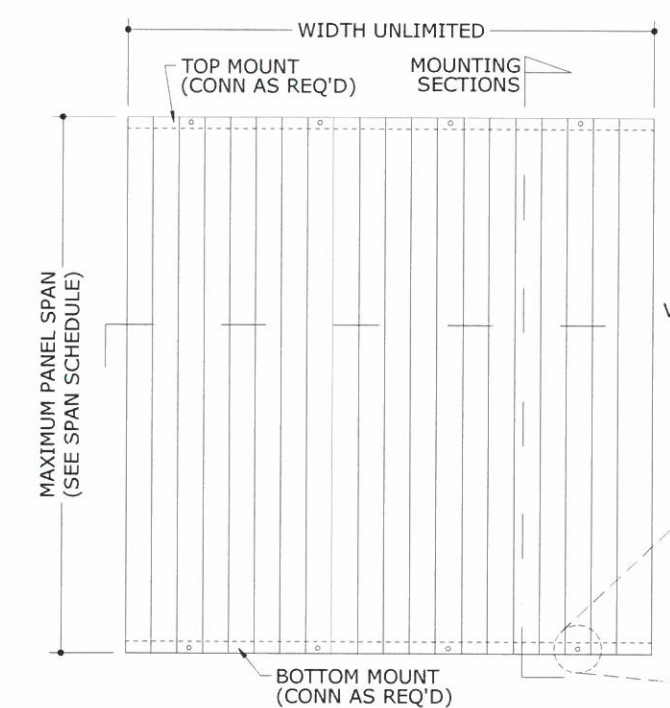
5 BUILDOUT 'F' TRACK
 6" = 1'-0"



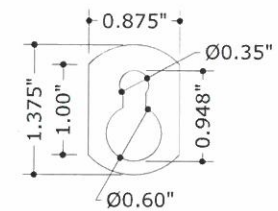
6 'F' TRACK
 6" = 1'-0"



7 CLOSURE ANGLE
 6" = 1'-0"



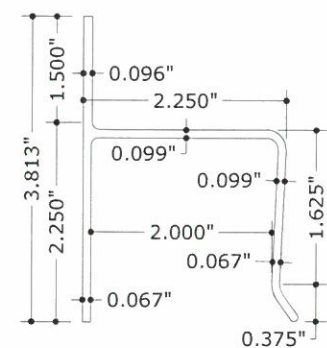
1 TYPICAL ELEVATION
 1 N.T.S.



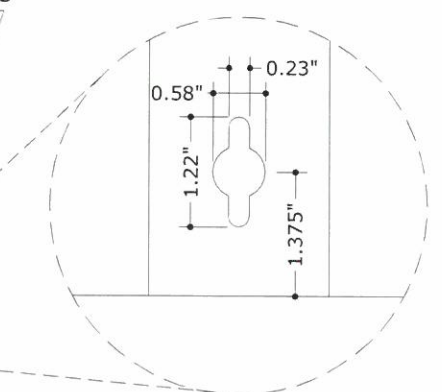
8 KEYHOLE WASHER
 6" = 1'-0"



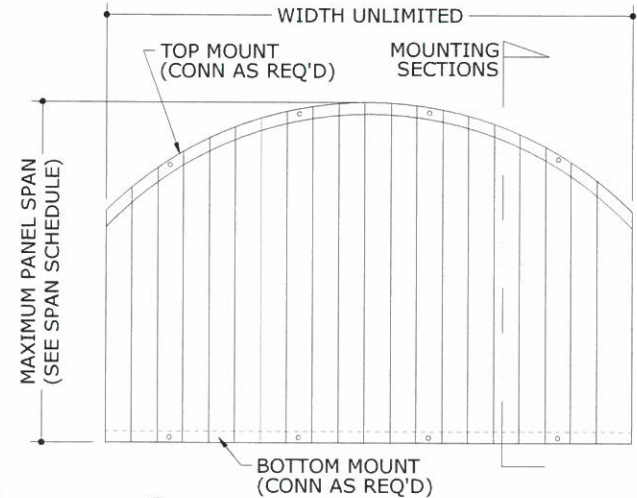
9 WASHERED WINGNUT
 6" = 1'-0"



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 INTERNATIONAL BUILDING CODE (2018) AND THE INTERNATIONAL RESIDENTIAL CODE PER ASTM STANDARDS E330, E1886, & E1996. PANELS ARE APPROVED IN ACCORDANCE WITH TEXAS DEPARTMENT OF INSURANCE REQUIREMENTS.
- NO 33-1/3% INCREASE IN ALLOWABLE STRESS HAS BEEN USED IN THE DESIGN OF THIS PRODUCT.
- POSITIVE AND NEGATIVE DESIGN PRESSURES CALCULATED FOR 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 AND CHAPTER 16 OF THE INTERNATIONAL 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 $t=0.100$ " (± 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:
 MANUFACTURER NAME
 MANUFACTURER LOCATION
 ASTM E330, E1886 & E1996
 TDI EVALUATED
- 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 STUDDER 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.

GLASS SEPARATION NOTE: GLASS SEPARATION IS NOT REQUIRED FOR THIS PRODUCT.

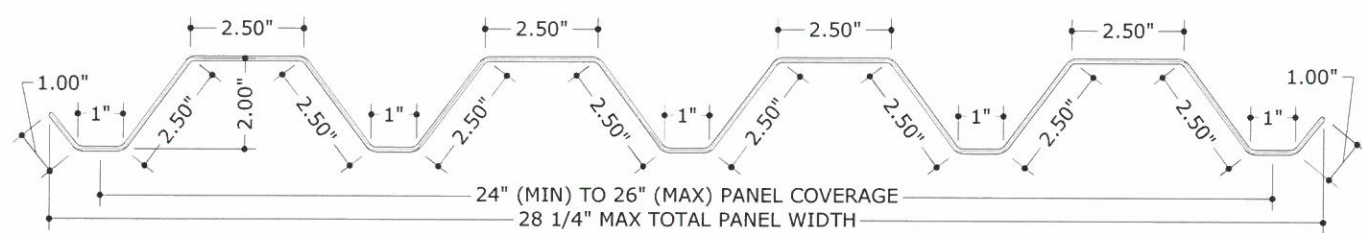
POSTAL ADDRESS:
 401 W. ATLANTIC AVE R10 # 219
 DELRAY BEACH, FL 33444
 ENGINEERINGEXPRESS.COM

Transparent Protection Systems, Inc.
 633 Dunksferry Road
 Bensalem, PA 19020
 CLEARGUARD POLYCARBONATE STORM PANELS
 INTERNATIONAL BUILDING CODE
 TEXAS DEPARTMENT OF INSURANCE

DRWN/CHKD	DATE	CL	FLB	8/17/04
CL	12/29/08	KL	CL	
EFT	12/12/11	KL	KL	
RWN	5/11/15	RWN	CSL	
TSB	8/04/17	TSB	RWN	
CCB	9/4/20	CCB	RWN	

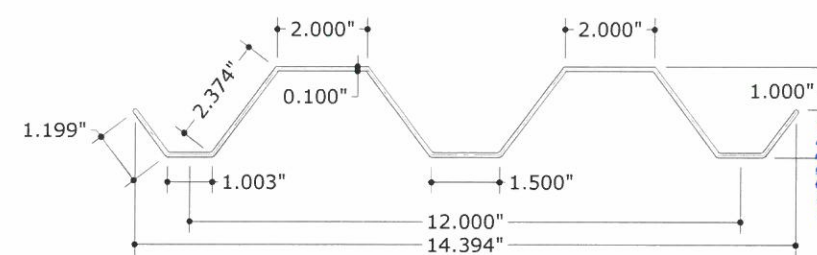
20-31355
 SCALE: -
 PAGE DESCRIPTION:

C:\Users\rckn\Engineering\Express\Production - Documents\Projects\20-31355 Polymer Industries - TDI Updates\WPI\CLEARGUARD Polycarbonate Storm Panels (TDI).dwg
01/19/2022 - 9:09pm rckn



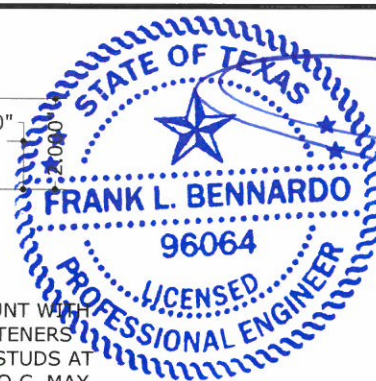
11 "CLEARMAX™" DOUBLE-WIDE PANEL PROFILE
3" = 1'-0" (SEE GEN NOTE 6)

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



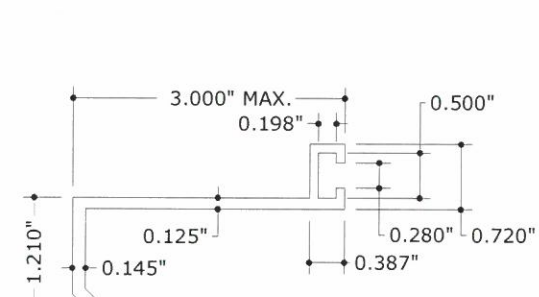
12 ALT. FULL PANEL PROFILE
N.T.S. (SEE GEN NOTE 6)

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

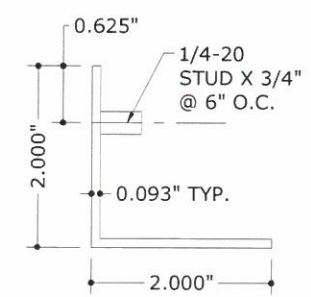


FRANK BENNARDO, PE
PE96064 CA# F-11383
01/19/2022

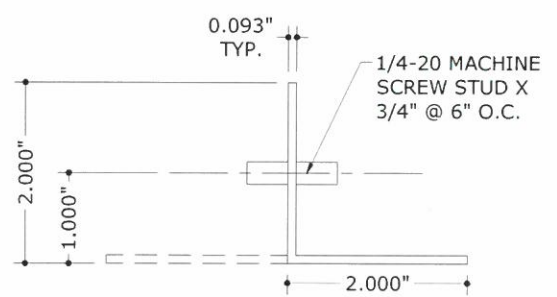
ENGINEERING EXPRESS
POSTAL ADDRESS:
401 W. ATLANTIC AVE R10 # 219
DELRAY BEACH, FL 33444
ENGINEERINGEXPRESS.COM



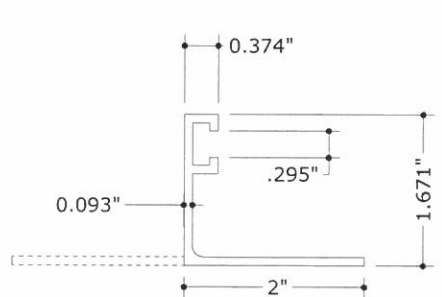
13 ALTERNATE B.O. 'F' TRACK
6" = 1'-0"



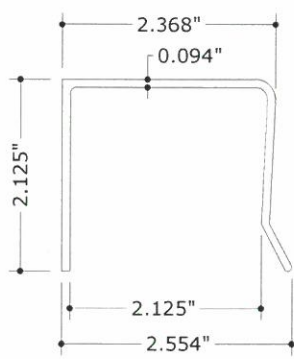
14 ALTERNATE STUD ANGLE
6" = 1'-0"



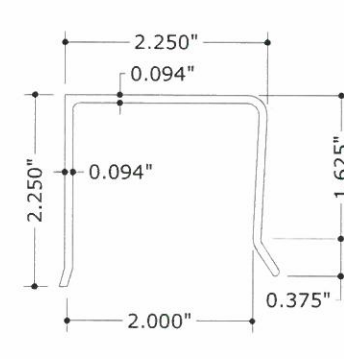
15 STUDDED ANGLE
6" = 1'-0"



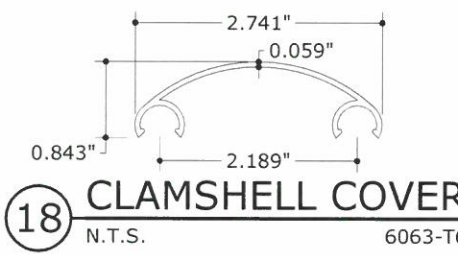
20 'F' TRACK ANGLE
6" = 1'-0"



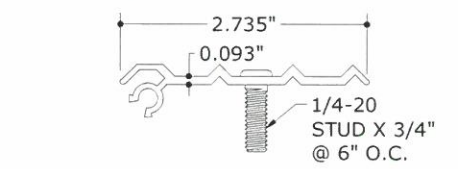
16 U-HEADER
N.T.S. 6063-T6



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

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:

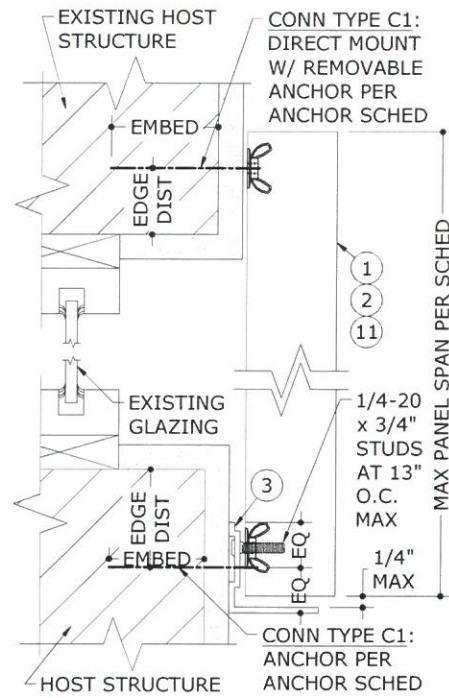
1. SPANS SHOWN IN "MAX PANEL SPAN SCHEDULES" ARE MAXIMUM ALLOWABLE SPANS AT EACH RESPECTIVE DESIGN PRESSURE.
2. THE <POSITIVE CONNECTION> SPAN SCHEDULE MAY BE USED TO DETERMINE MAXIMUM ALLOWABLE SPANS FOR PANELS INSTALLED USING ANY COMBINATION OF MOUNTING EXTRUSIONS INVOLVING A POSITIVE CONNECTION - 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.

TPS Transparent Protection Systems, Inc.
633 Dunksferry Road
Bensalem, PA 19020
CLEARGUARD POLYCARBONATE STORM PANELS
INTERNATIONAL BUILDING CODE
TEXAS DEPARTMENT OF INSURANCE

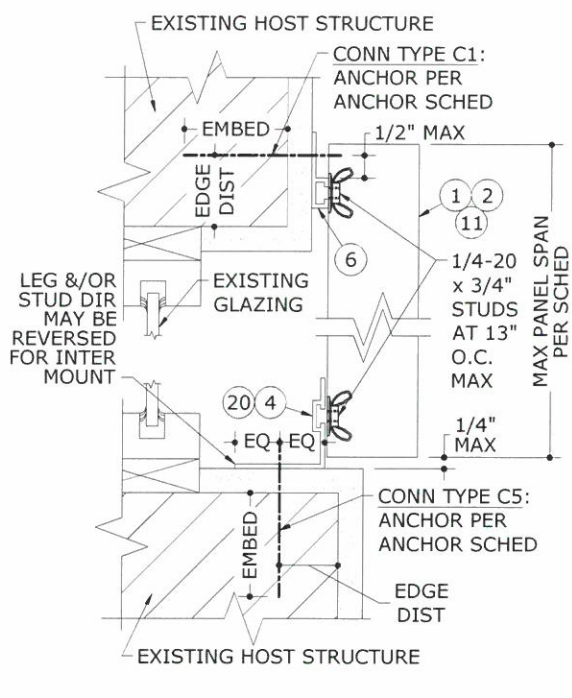
REMARKS	DRWN	CHKD	DATE
ORIG ISSUE	CL	FLB	8/17/04
2007 FBC	KL	CL	12/29/08
2010 FBC	EFT	KL	12/12/11
2014 FBC	RWN	CSL	5/11/15
2017 FBC	TSB	RWN	8/04/17
2020 FBC & 2018 IBC	CCB	RWN	9/4/20

20-31355
SCALE: -
PAGE DESCRIPTION:

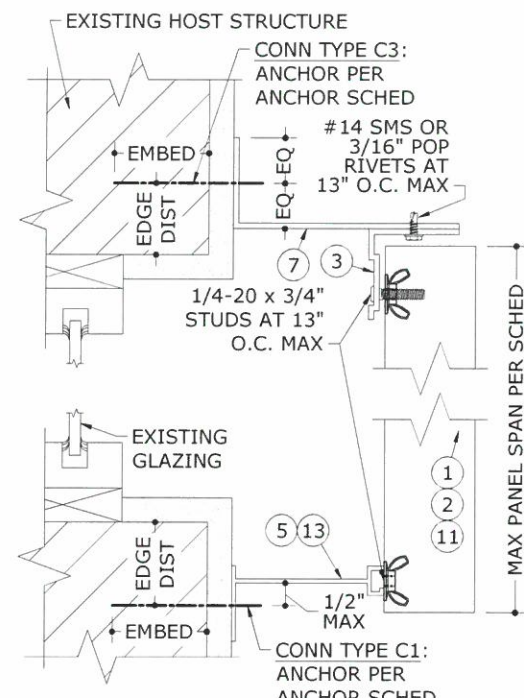
C:\Users\rckn\Engineering_Express\Production - Documents\Projects\20-31355 Polymer Industries - TDI Updates\WP\ClearGuard Polycarbonate Storm Panels (TDI) - SHU-116\20-31355d CG Polycarb Storm Panels (TDI).dwg



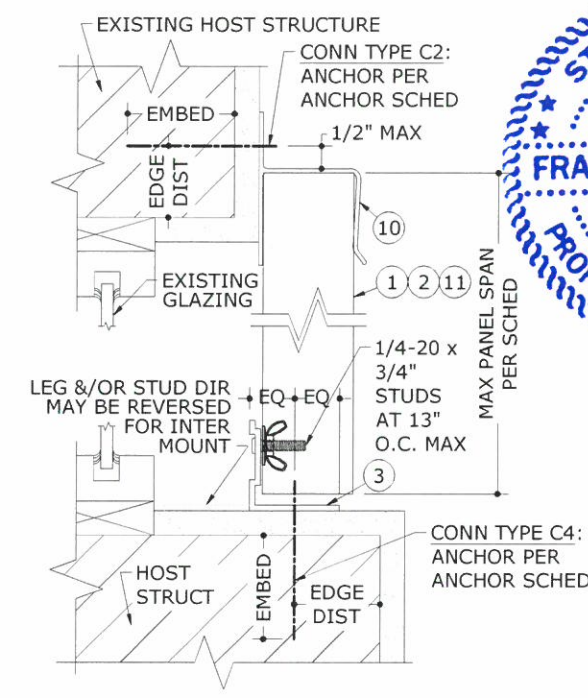
1 MOUNTING SECTION
3" = 1'-0" VERT SECTION



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



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



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



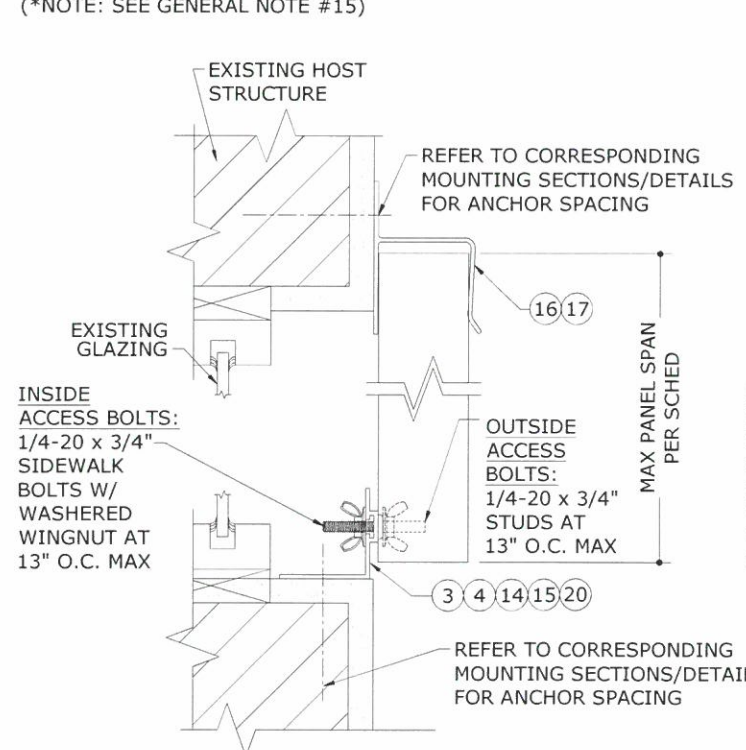
FRANK BENNARDO, PE
PE96064 CA# F-11383

01/19/2022

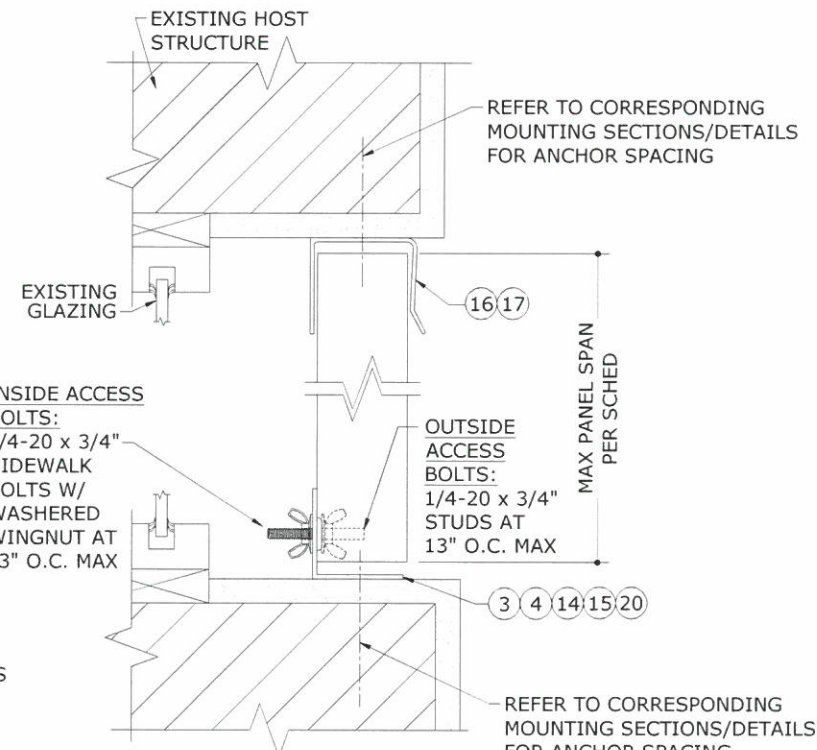
ENGINEERING EXPRESS
POSTAL ADDRESS:
401 W. ATLANTIC AVE R10 # 219
DELRAY BEACH, FL 33444
ENGINEERINGEXPRESS.COM

HURRI-OUT™ EGRESS STORM PANEL DETAILS*

(*NOTE: SEE GENERAL NOTE #15)

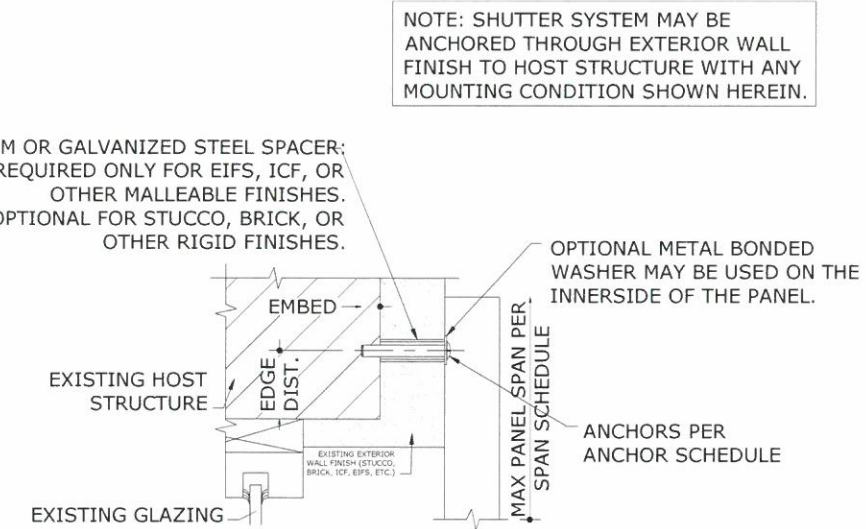


5 MOUNTING SECTION
3" N.T.S. VERT SECTION



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.

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



CLEARGUARD POLYCARBONATE STORM PANELS
INTERNATIONAL BUILDING CODE
TEXAS DEPARTMENT OF INSURANCE

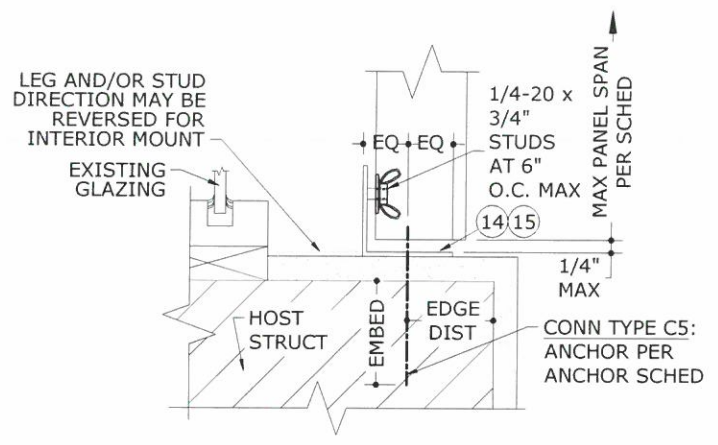
REMARKS	DRWN	CHKD	DATE
ORIG ISSUE	CL	FLB	8/17/04
2007 FBC	KL	CL	12/29/08
2010 FBC	EFT	KL	12/12/11
2014 FBC	RWN	CSL	5/11/15
2017 FBC	TSB	RWN	8/04/17
2020 FBC & 2018 IBC	CCB	RWN	9/4/20

20-31355

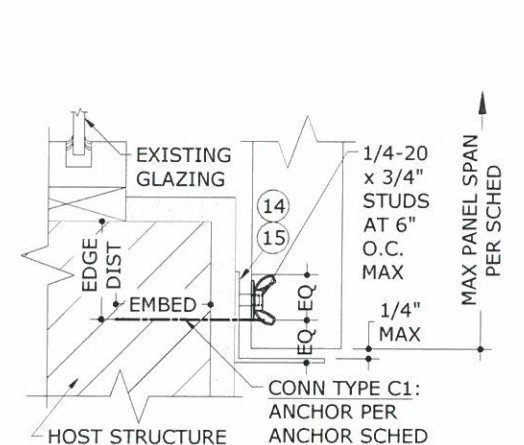
SCALE: -
PAGE DESCRIPTION:

3

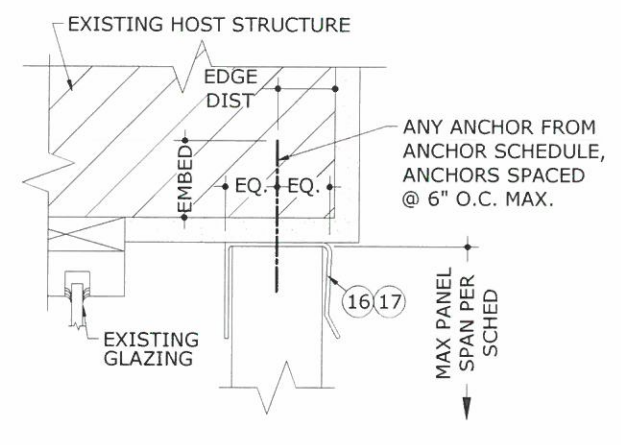
C:\Users\rickn\Engineering\Express\Production - Documents\Projects\20-31355 Polymer Industries - TDI\Updates\WPClearGuard Polycarbonate Storm Panels (TDI) - SHU-11620-31355d CG Polycarb Storm Panels (TDI).dwg



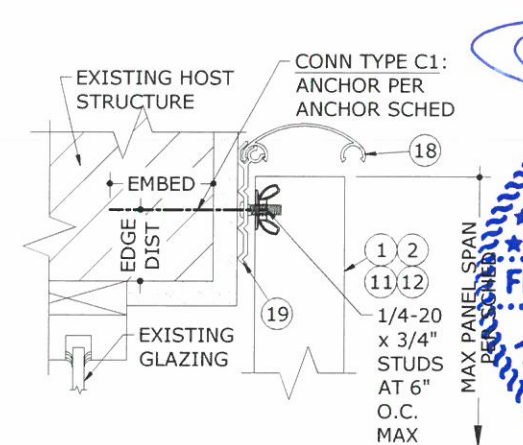
1
4 MOUNTING SECTION
3" = 1'-0" VERT SECTION



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



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



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

01/19/2022

STATE OF TEXAS

FRANK L. BENNARDO

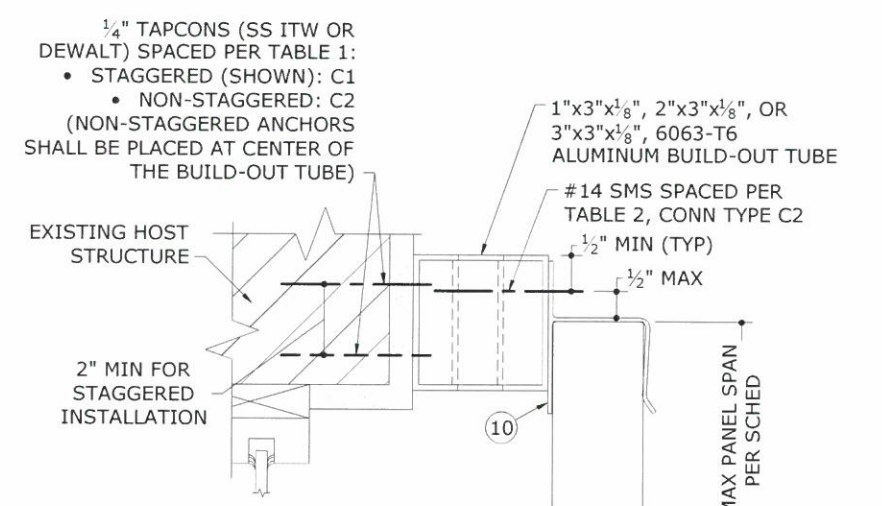
96064

PROFESSIONAL ENGINEER

401 W. ATLANTA BLVD. #200
DELRAY BEACH, FL 33426

ENGINEERINGEXPRESS.COM

BUILDOUT MOUNTING DETAILS



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

TABLE 1*: BUILDOUT ONLY

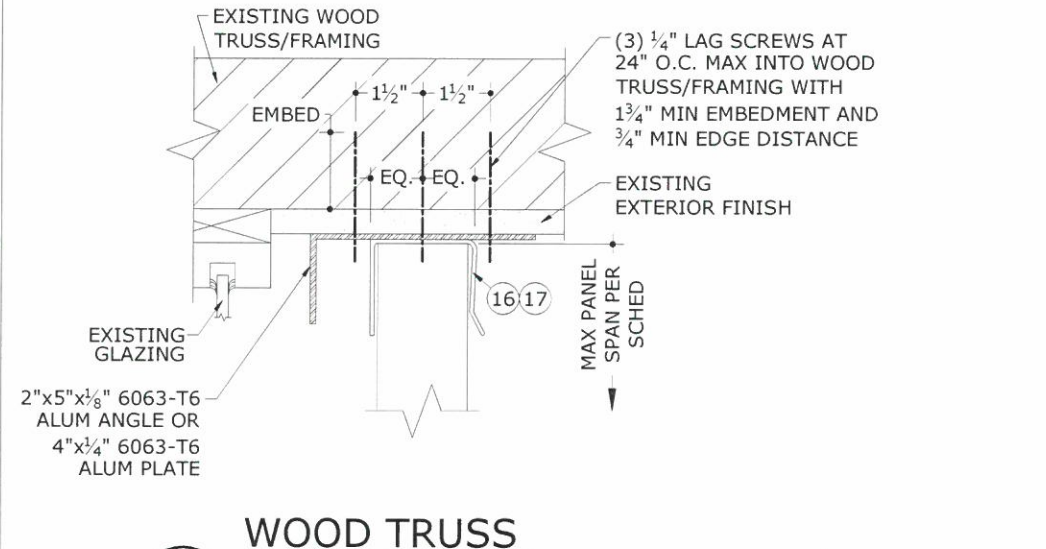
HOST STRUCT.	LOAD (psf)	Spans Up To 6'-0"		Spans Up To 8'-6"		Spans Up To 11'-4"	
		CONN TYPE C1	CONN TYPE C2	CONN TYPE C1	CONN TYPE C2	CONN TYPE C1	CONN TYPE C2
CONCRETE	30	13.0"	13.0"	13.0"	13.0"	13.0"	11.8"
	38	13.0"	13.0"	13.0"	12.4"	13.0"	9.3"
	47	13.0"	13.0"	13.0"	10.1"	13.0"	8.5"
	54	13.0"	12.4"	13.0"	8.8"	13.0"	8.5"
	120	13.0"	8.5"	13.0"	8.5"	13.0"	8.5"
HOLLOW BLOCK	30	10.9"	6.6"	7.7"	4.6"	5.8"	3.5"
	38	8.6"	5.2"	6.1"	3.7"	4.6"	
	47	7.0"	4.2"	4.9"	3.0"	4.2"	
	54	6.1"	3.6"	4.3"		4.2"	
	120	4.2"		4.2"		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"
	120	5.4"	3.3"	5.4"	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:

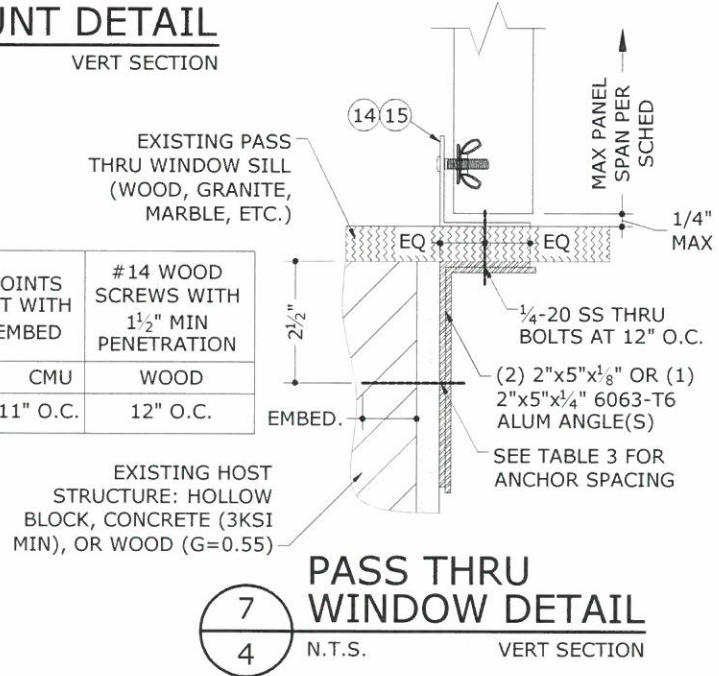
- TABLE 1 AND 2 APPLY ONLY TO BUILDOUT MOUNTING DETAIL (7/3).
- TAPCONS SHALL BE INSTALLED WITH THE FOLLOWING MINIMUM EMBEDMENT:
 - TO CONCRETE: 1 3/4" MIN
 - TO HOLLOW BLOCK: 1 1/4" MIN
 - TO WOOD: 1 1/2" MIN
- REFER TO SHT 6 FOR ADDITIONAL ANCHOR NOTES.
- THESE MOUNTING CONDITIONS MAY BE USED INDEPENDENTLY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



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

TABLE 3:

1/4" ITW SS TAPCONS WITH 1 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
4 PASS THRU WINDOW DETAIL
N.T.S. VERT SECTION

Transparent Protection Systems, Inc.

633 Dunksferry Road
Bensalem, PA 19020

CLEARGUARD POLYCARBONATE STORM PANELS
INTERNATIONAL BUILDING CODE
TEXAS DEPARTMENT OF INSURANCE

DRWN	CHKD	DATE
CL	FLB	8/17/04
KL	CL	12/29/08
LEFT	KL	12/12/11
RWN	CSL	5/11/15
TSS	RWN	8/04/17
CCB	RWN	9/4/20

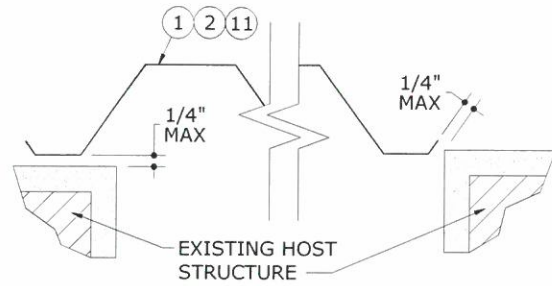
20-31355

SCALE: -

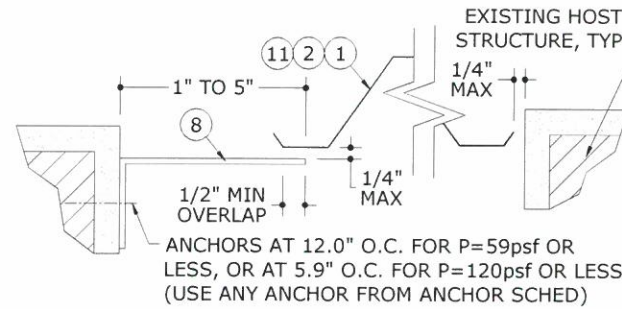
PAGE DESCRIPTION: -

C:\Users\rickn\Engineering\Express\Production - Documents\Projects\20-31355 Polymer Industries - TDI\Updates\WP\CLEARGUARD Polycarbonate Storm Panels (TDI).dwg 01/19/2022 - 9:09pm rickn

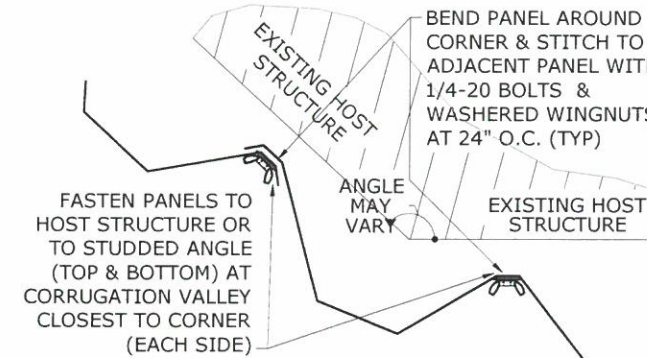
CLOSURE DETAILS



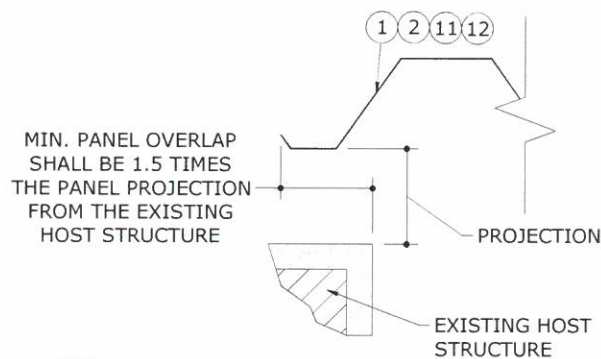
1 WALL MOUNT CLOSURE
5 3" = 1'-0" PLAN VIEW



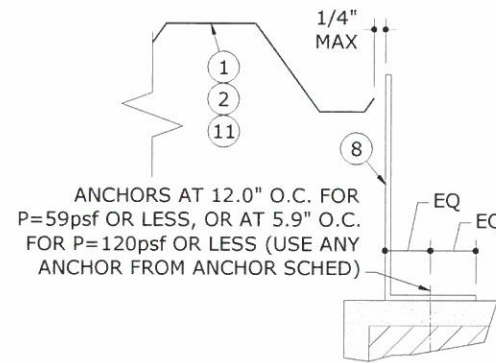
2 TRAP MOUNT CLOSURE
5 3" = 1'-0" PLAN VIEW



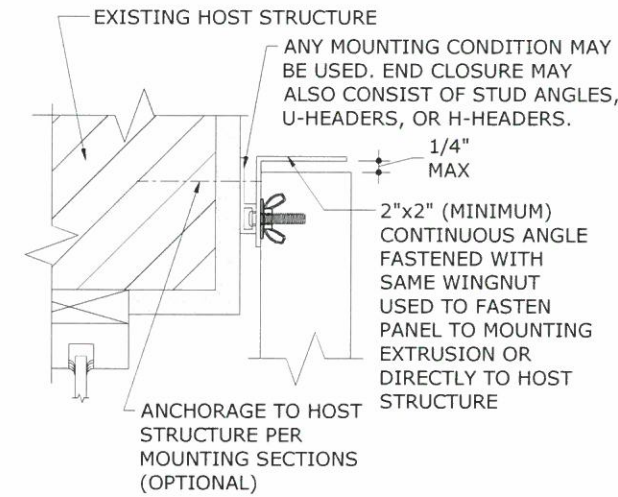
3 CORNER CLOSURE
5 N.T.S. PLAN VIEW



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



FRANK L. BENNARDO
 96064
 LICENSED PROFESSIONAL ENGINEER
 POSTAL ADDRESS:
 401 W. ATLANTIC AVE R10 # 219
 DELRAY BEACH, FL 33444
 ENGINEERINGEXPRESS.COM

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



CLEARGUARD POLYCARBONATE STORM PANELS
 INTERNATIONAL BUILDING CODE
 TEXAS DEPARTMENT OF INSURANCE

REMARKS	DRWN	CHKD	DATE
ORIG ISSUE	CL	FLB	8/17/04
2007 FBC	KL	CL	12/29/08
2010 FBC	EFT	KL	12/12/11
2014 FBC	RWN	CSL	5/11/15
2017 FBC	TSB	RWN	8/04/17
2020 FBC & 2018 IBC	CCB	RWN	9/4/20

20-31355

SCALE: -
 PAGE DESCRIPTION:

