Insular

INSULATED STEEL FRAMING SYSTEM

Insular Corporation

ENGINEERING SPECIFICATIONS

Insular Corp
Engineering Data

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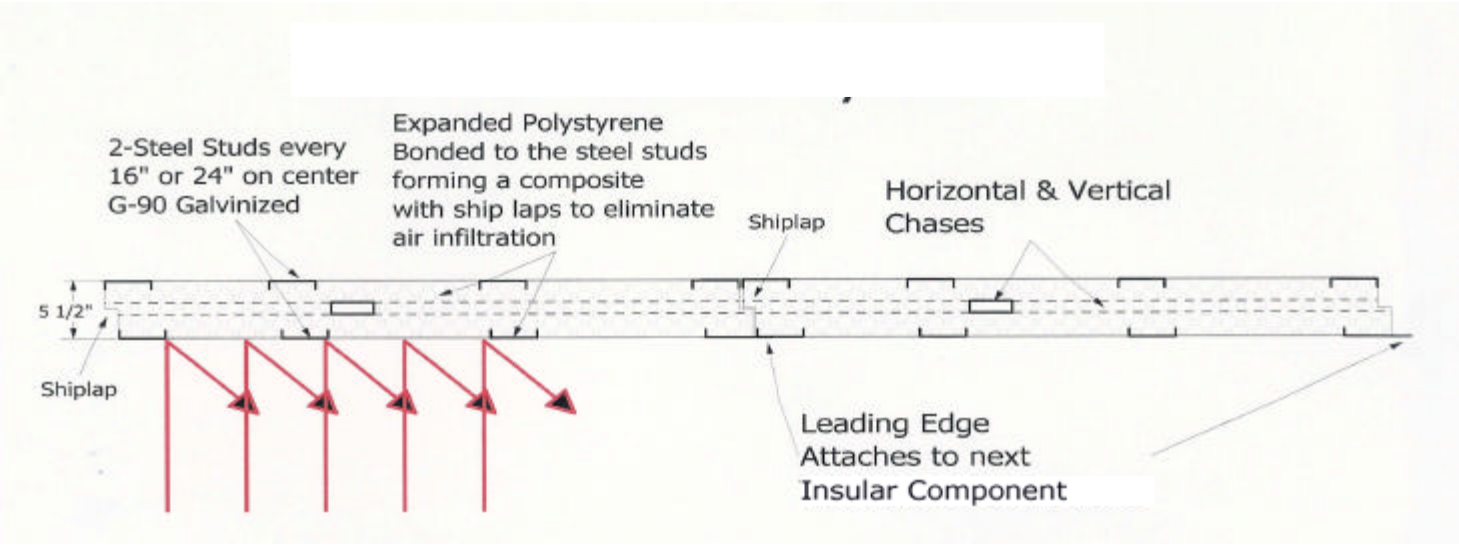
Section 1: Description of Insular Panels



Section 2: Code Listings

Insular published data and code listings are based upon tests conducted according to the ASTM Standards.

Insular panels tested for the ICC listing were Insular's standard configuration using 3 ½ " and 5 ½" with 24 Gauge metal at 16" and 24" OC. Shear values were beyond the scope of the ICC listing.
Insular provides engineering data tables on all other panel configurations, gauges and sizes as well as racking shear to facilitate engineering for building code requirements.
BOCA, ICBO and SBCCI consolidated into the International Code Council (ICC) in 2003.
Insular Corp maintains listings with the following:

1. **ICC - See Listing: www.iccsafe.org/esreports/pfc4216.pdf**
2. **SBCCI - See Listing: www.sbccies.org/Evaluation/2001/2143.pdf**
3. **BOCA - See Listing: www.bocai.org/boca-es/pdf/91-40.pdf**
4. **HUD**
5. **British Board of Agre'ment**

Section 3: Variables For Increasing Load Capability

Insular is a true composite, the components have an inherent shear value without sheathing or cladding. X-bracing or traditional sheathing may be utilized just as in traditional framing to increase shear values.

Simpson hold downs, threaded rod or equivalent can also be used to increase shear capacity.

Panel joints (ship lap or butt) are actually the strongest part of the system. 3 or 4 studs are "ganged" together.

To increase the capacity in any axis Insular can do any or all of the following:

1. **Increase the gauge of the steel components. E.g. 18 Gauge Studs with 14 Gauge top and or bottom track**
2. **Increase the size of the steel members. (e.g. 3 ½" stud to 6" stud or add one 3" x 3" 14 gauge galv. Steel post molded into the panel. These posts may also be added in the field.**
3. **Increase the density of the EPS- 3-1/2" is 1.5# density- 5-1/2' & 7-1/2" is 1 # density**
4. **Increase the KSI of the steel studs from to 33 ksi to 50 ksi**
5. **Add additional steel studs to one side. E.g. Hurricane Panel and Backbone Panel**
6. **Alter the configuration of the steel in the components. E.g. C-600 Configuration**
7. **Increase the thickness of the component. Example: Increase 5-1/2" thick to 7-1/2" thick**
8. **Increase the number of studs by spacing at 12" on center instead of 16" or 24" on center**
9. **Apply metal sheathing to one or both sides.**

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Section 4: Conversions And Formulas

4.1 Convert PSF to Wind speed

To convert PSF to Wind Speed: 1) PSF / .00256
2) SQRT of (PSF / .00256) = Wind Speed in MPH
To convert Wind Speed to PSF: 1) Wind Speed in MPH squared
2) (Wind Speed in MPH squared) x .00256 = PSF

4.2 Conversion To Metric

Convert PSF to Kg/M²: (PSF *0.453592)*10.76391	**Convert PLF to Kg/M: (LBS * 0.453592)*3.28084**

4.3 Combined Loading Formula

Combined Loading Formula: (P / Pa) + (M / Ma) = 1

M = Applied Moment

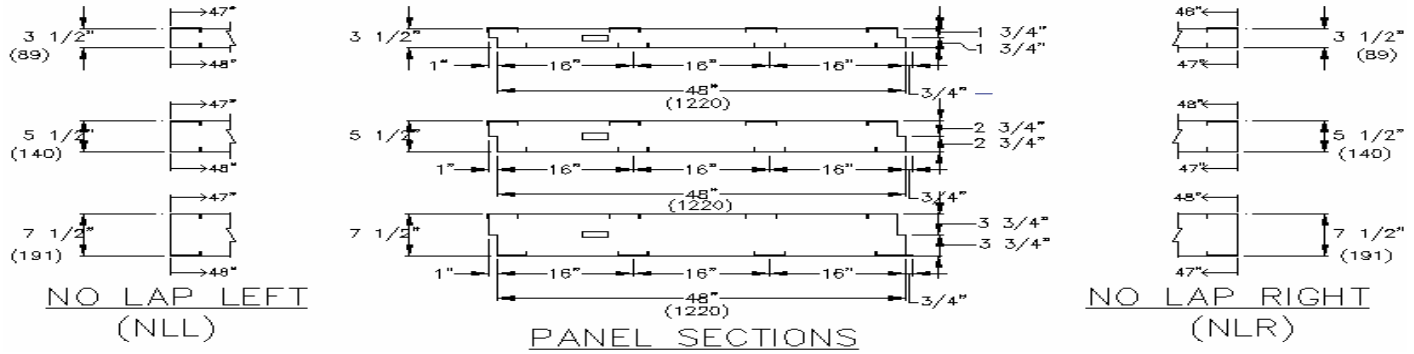
Ma = Allowable moment using loads and spans in data

P = Applied Axial Load (lbs)

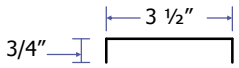
Pa = Allowable Axial load from data

Section 5: Panel Cross Sections With Stud Profiles

5.1 Standard Panel Cross Sections with 24 Gauge *Insular* C profiles. 22 Gauge, 20 Gauge and 18 Gauge also can be used



Insular
"C" profile
24,22,20,18 GA



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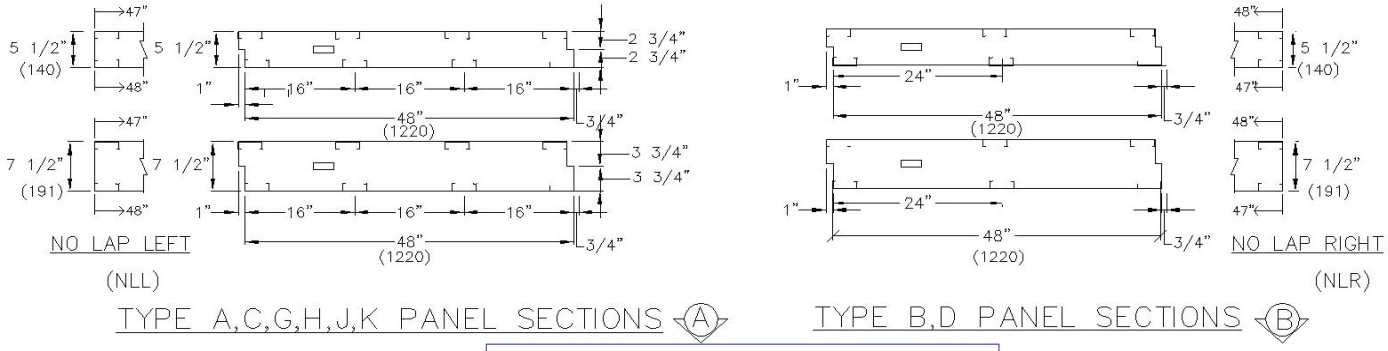
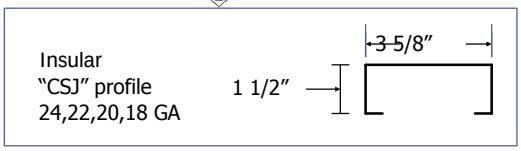
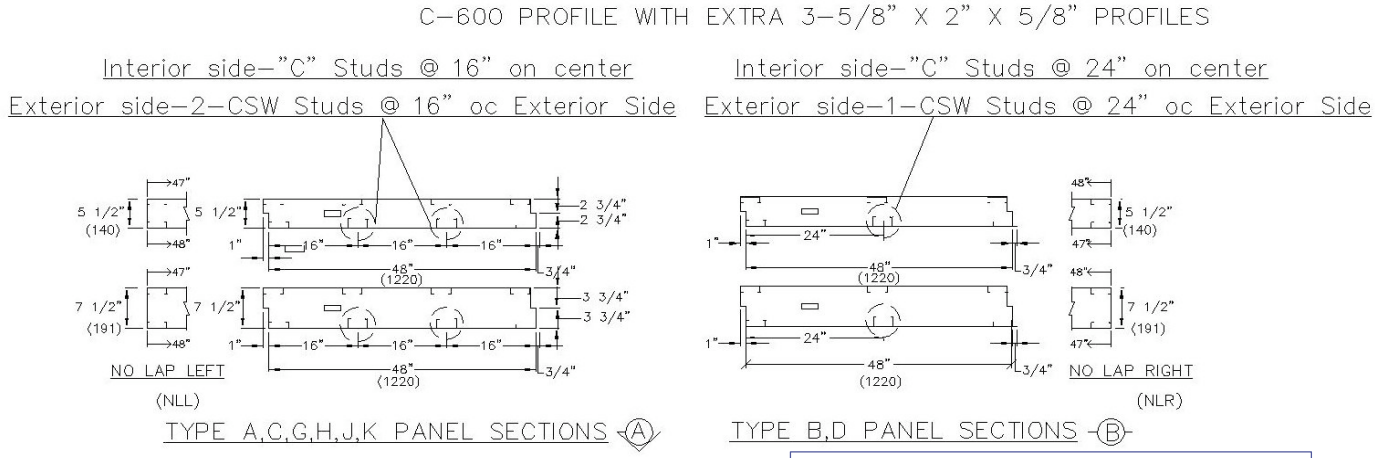
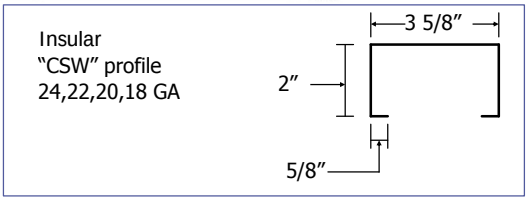
5.2 Standard Panel Cross Sections 20-18 Gauge steel CSJ Profiles





5.3 Standard Panel Cross Sections with 24 Gauge steel channels. 20 Gauge or 18 Gauge CSW 3-5/8" x 2" x 5/8" added to Exterior side





Note: CSW profiles may be added to both sides for additional capability.
Reference Section 10.1: 5 1/2" - Axial Compressive PLF- 20 Gauge- CSW Profile - 3 5/8" x 2" x 5/8"

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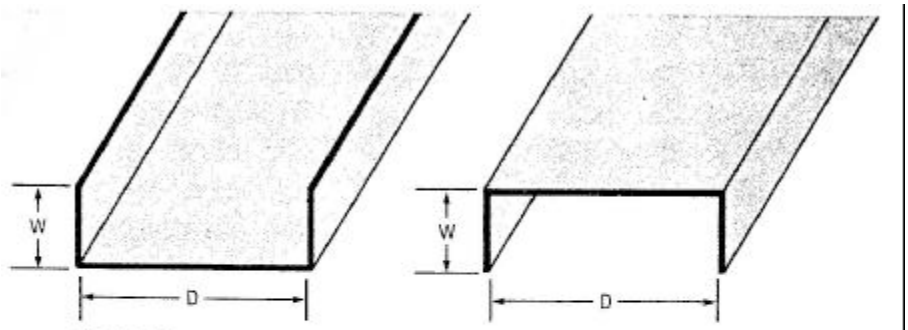
5.4 Top and Bottom Track - Gauge and Dimensions



TRACK

CODES	GAGES	W	D
TSA	20-10	1"	2-1/2"-16"
TSB	20-10	1-1/4"	2-1/2"-16"

SLIP TRACK

CODES	GAGES	W	D
TSF	20-10	1-1/2"	2-1/2"-16"
TSC	20-10	2"	2-1/2"-16"
TSD	18-10	2-1/2"	2-1/2"-16"
TSE	16-10	3"	2-1/2"-16"
TSG	14-10	3-1/2"	3-5/8"-16"

TOP TRACK

Size On Center	GAUGE	Fy-1 KSI	SPAN IN	Web IN	Flange IN	W Allow PLF	P Allow LBS
3 1/2" - 16" OC	20	33	16	3.5	1.0	217	138
3 1/2" - 16" OC	20	33	16	3.5	1.5	462	293
3 1/2" - 16" OC	20	33	16	3.5	2.0	783	497
3 1/2" - 16" OC	20	33	16	3.5	2.5	1173	745
3 1/2" - 16" OC	18	33	16	3.5	1.0	283	180
3 1/2" - 16" OC	18	33	16	3.5	1.5	615	391
3 1/2" - 16" OC	18	33	16	3.5	2.0	1051	667
3 1/2" - 16" OC	18	33	16	3.5	2.5	1195	1005
3 1/2" - 16" OC	16	50	16	3.5	1.0	532	338
3 1/2" - 16" OC	16	50	16	3.5	1.5	1163	738
3 1/2" - 16" OC	16	50	16	3.5	2.0	1195	1190
3 1/2" - 16" OC	16	50	16	3.5	2.5	1195	1190
5 1/2" - 16" OC	20	33	16	5.5	1.0	220	140
5 1/2" - 16" OC	20	33	16	5.5	1.5	470	299
5 1/2" - 16" OC	20	33	16	5.5	2.0	796	505
5 1/2" - 16" OC	20	33	16	5.5	2.5	1192	757
5 1/2" - 16" OC	18	33	16	5.5	1.0	290	184
5 1/2" - 16" OC	18	33	16	5.5	1.5	630	400
5 1/2" - 16" OC	18	33	16	5.5	2.0	1077	684
5 1/2" - 16" OC	18	33	16	5.5	2.5	1265	1029
5 1/2" - 16" OC	16	50	16	5.5	1.0	546	347
5 1/2" - 16" OC	16	50	16	5.5	1.5	1192	757
5 1/2" - 16" OC	16	50	16	5.5	2.0	1265	1260
5 1/2" - 16" OC	16	50	16	5.5	2.5	1265	1260

5.5 Connection Details

5.6 Screw Pull Out Data

Fastener Type	Application
 #8 x 1/2" Round Washer #2 Phillips Drive	Track to stud 14ga to 14ga max
 #10 x 3/4" DP3 BLAZER 5/16" Hex Washer Head	General framing 14ga to 14ga max

Performance Properties

SELF-DRILLING FASTENERS
Pullout Values In Steel
(Average Ultimate Pounds)

Steel Thknss	#6-20 DP2	#8-18 DP2	#10-16 DP3	#12-14 DP3	#12-24 DP4.5	1/4-14 DP1
26 ga	120	119	126	143		208
24 ga	183	193	208	215		329
22 ga	248	265	267	292		428
20 ga	296	298	295	343		562
18 ga	471	491	503	555	468	800
16 ga	679	703	710	752	683	1151
14 ga	847	959	968	1066	923	
12 ga			1476	1634	1508	
3/16"				2990	3865	
1/4"					4104	

SELF-DRILLING FASTENERS
Shear Results In Steel
(Average Ultimate Pounds)

Steel Thknss (Lapped)	#6-20 DP2	#8-18 DP2	#10-16 DP3	#12-14 DP3	#12-24 DP4.5	1/4-14 DP1
26 ga	278	294				511
24 ga	466	496				849
22 ga	526	560				885
20 ga	758	740	728	769		1244
18 ga	845	1060	1266	1358		1764
16 ga			1540	1620		
14 ga			1552	1970		
12 ga				1986	2641	
1/8"					2700	

Strengths of Fasteners

Fastener Diameter	Torsional (Inch Lbs.)	Tensile (Pounds)	Shear (Pounds)
#6-20 (.125")	25	1125	750
#8-18 (.164")	42	1575	1000
#10-16 (.190")	61	2100	1400
#12-14 (.216")	92	2778	2000
#12-24 (.210")	100	3188	2100
1/4-14 (.250")	150	4275	2600
1/4-20 (.250")	156	4275	2700

#10, #12, #14, #15 Diameters
Truss Head with Phillips Drive

Heavy duty truss head fasteners for fastening into metal, wood, and concrete decks.

- Provided with #3 phillips truss head for driving stability.
- Epoxy coated for optimal corrosion protection exceeds FM 4470 standard!
- Available in stainless steel for reroof applications!
- Compatible with warranty roof systems

STAINLESS IS PAINLESS WITH TFC!

Pullout Values in STEEL
(Average Ultimate in Pounds)
SENTRY PLUS FIVE ROOFING FASTENERS

MATERIAL THICKNESS	FASTENER DIAMETERS #10-11	#12-15	#12-24	#14-13	#15-13
24ga	364 lbs.	335 lbs.		347 lbs.	
22ga	410 lbs.	452 lbs.		472 lbs.	538 lbs.
20ga	560 lbs.	456 lbs.		656 lbs.	646 lbs.
18ga		558 lbs.	375 lbs.	830 lbs.	916 lbs.
16ga			500 lbs.		
14ga			978 lbs.		
12ga			1200 lbs.		
1/8"			2000 lbs.		
1/4"			3844 lbs.		

Grade E Decking (30KSI Minimum Steel)

Pullout Values in WOOD
(Average Ultimate in Pounds)
SENTRY PLUS FIVE ROOFING FASTENERS

MATERIAL	FASTENER DIAMETERS #10-11	#12-15	#14-13	#15-13
1/2" Ply	348 lbs.	339 lbs.	347 lbs.	455 lbs.
5/8" Ply			516 lbs.	
3/4" Ply	585 lbs.	588 lbs.	596 lbs.	661 lbs.
7/16" OSB		218 lbs.	218 lbs.	260 lbs.
19/32" OSB		320 lbs.	310 lbs.	323 lbs.
23/32" OSB		326 lbs.	327 lbs.	444 lbs.
2x Pine (1")		539 lbs.	742 lbs.	913 lbs.
2x Pine (full)		1161 lbs.	1298 lbs.	1567 lbs.

Full Penetration Except Where Noted

Strengths of Fasteners

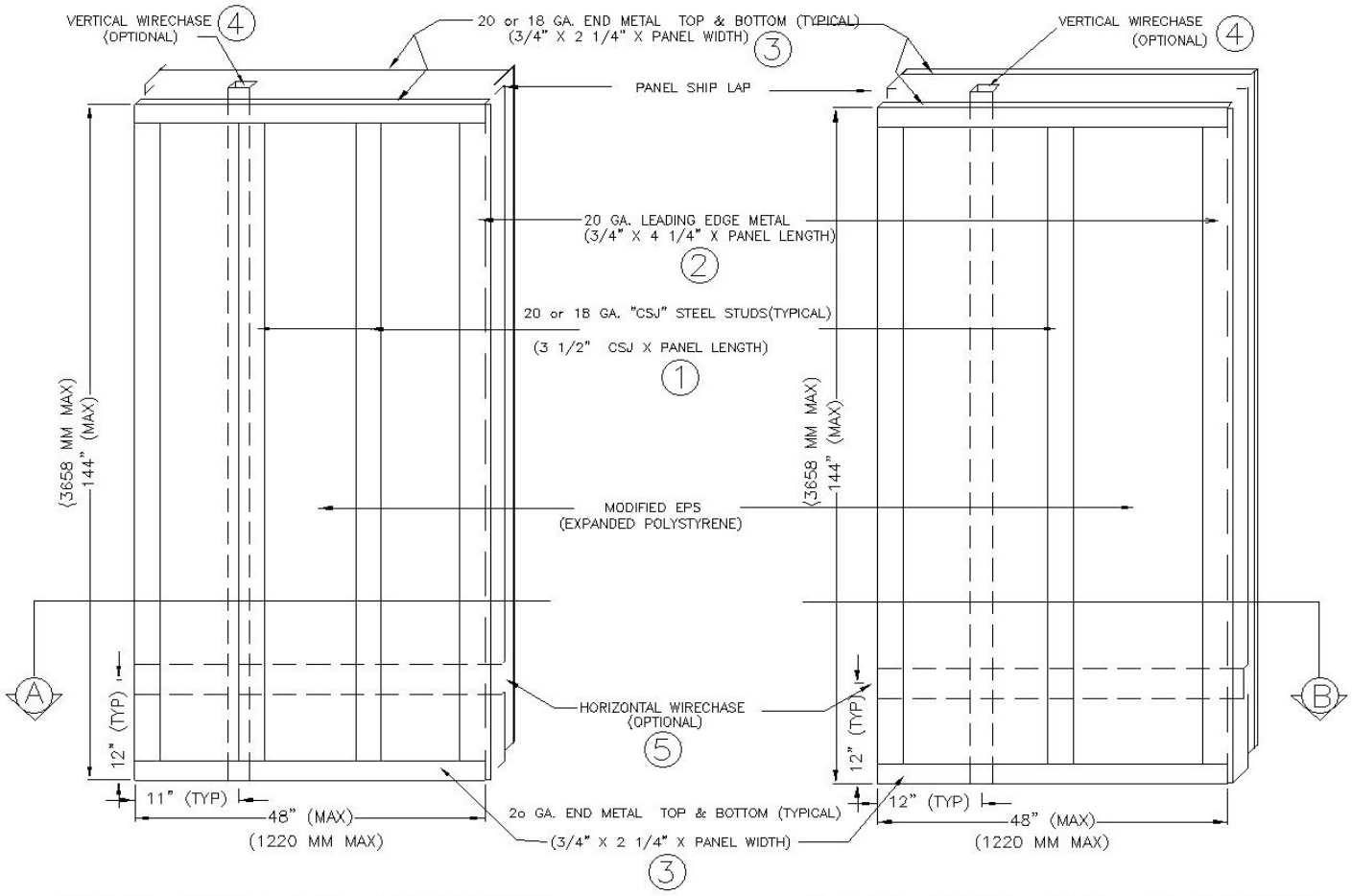
Fastener Diameter	Torsional (Inch Lbs.)	Tensile (Pounds)	Shear (Pounds
#6-20 (.125")	25	1125	750
#8-18 (.164")	42	1575	1000
#10-16 (.190")	61	2100	1400
#12-13 SP5 (.222)	76	2410	1815
#12-14 (.216")	92	2778	2000
#12-24 (.210")	100	3188	2100
#14-13 SP5 (238")	115	3600	2630
1/4-14 (.250")	150	4275	2600
1/4-20 (.250")	156	4275	2700
#15-13 SP5 (.263")	140	4350	3700

Section 6: Panel Configurations-16" and 24" On Center

Refer to Section 5 for Cross Sections: Note: 12" On Center Spacing is another alternative.

FIGURE 1

PANELS



PANEL TYPE A,C ELEVATION
Studs @ 16" on center

PANEL TYPE B,D ELEVATION
Studs @ 24" on center

Panel Type A= 3 1/2" 24 Gauge- 16" OC
Panel Type C= 5 1/2" 24 Gauge- 16" OC

Panel Type B= 3 1/2" 24 Gauge- 24" OC
Panel Type D= 5 1/2" 24 Gauge- 24" OC

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Section 7: Fire Rated Assemblies

Fire Ratings:		EPS: 5 ½" Insular Components with a density - 1.0 PCF Flame Spread = 5, Smoke Developed = 55-175					
Load bearing/GA		**Non-Load bearing/GA**		**15 Min**	**1-hr**	**2-Hr**	**Gypsum type and layers**
		X	**24 GA**	**X**			**1 layer- 1/2" gypsum both sides**
		X	**24 GA**		**X**		**1-layer-5/8" type X gypsum 2 sides**
		X	**24 GA**			**X**	**2 layers-1/2" type X gypsum 2 sides**
X	**24 GA**			**X**			**1 layer- 1/2" gypsum both sides**
X	**20 GA**				**X**		**1-layer-5/8" type X gypsum 2 sides**
X	**20 GA**					**X**	**2 layers-5/8" type X gypsum 2 sides**

Section 7: UL Listing

BRYX December 15, 1997
Foamed Plastic

NOVA CHEMICALS INC **R4775 (N)**
400 FRANKFORT RD, MONACA PA 15061 **(A card)**
Foamed plastic in the form of blocks and boards.

Type M-77
(A, A-HD, A-LV, A-NL, B, B-HD, B-HDS, B-LK, B-LV, B-NL, C, C-HD or C-NL)
or Type M-97

	1 in. Max*
Flame spread	5+
Smoke developed	55-90+

	2 In Max*	4 In Max*	5 In Max*	6 In Max*
Flame spread	5++	5+++	5+++	5+++
Smoke developed	55-90++	55-90+++	55-175+++	55-175+++

*Installed in a thickness, or stored in an effective thickness as indicated, for a density of 1.0 pcf.

Replaces R4775A dated February 3, 1997. **(Cont. on B card)**
106844006 H7979 **Underwriters Laboratories Inc.®** A1I/0062886

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Section 8: Sound Rated Assemblies

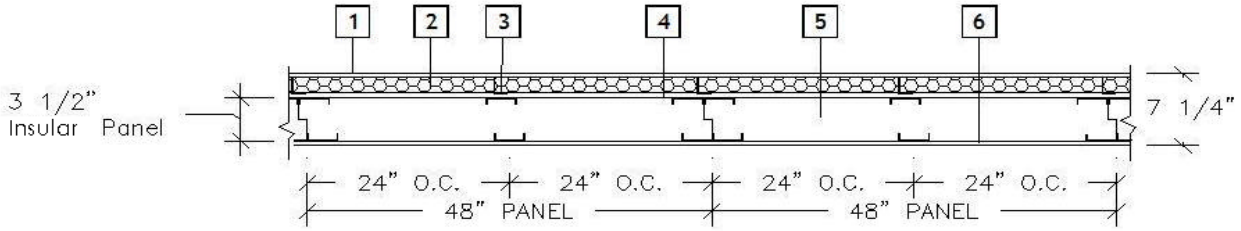
Sound Rated Assemblies:	
STC 51	**1 Hr. Load bearing: 3 1/2" Panel with 20 GA profile: 1 Layer - 5/8" X-type gypsum board both sides Resilient channel one side with 4" unfaced FG Batt insulation. 1/2" Gypsum board fastened to resilient channel. For Added Shear- Refer to Section 17- Hold Downs**
STC 55-60	**1 Hr. Load bearing: 3 1/2" Panel with 20 GA profile: 2 layer 5/8" X-type gypsum board one side-1 Layer opposite side Resilient channel one side with 4" unfaced FG Batt insulation. 1/2" Gypsum board fastened to resilient channel. For Added Shear- Refer to Section 17- Hold Downs**

ACOUSTIC SYSTEMS
REPORT #TL87O86A
SOUND TRANSMISSION LOSS TEST

STC 51 RADVA PARTY WALL

1. 1/2 DRYWALL
2. 4" R-11 STANDARD BUILDERS INSULATION (UNFACED)
3. 2" METAL Z BRACKET (RESILIENT CHANNEL)
4. (1) 5/8" X-TYPE GYP
5. INSULAR 3 1/2" Panel (24GA STUDS)
6. 5/8" X-TYPE GYP

SPECIMEN WAS 8.8 psf.

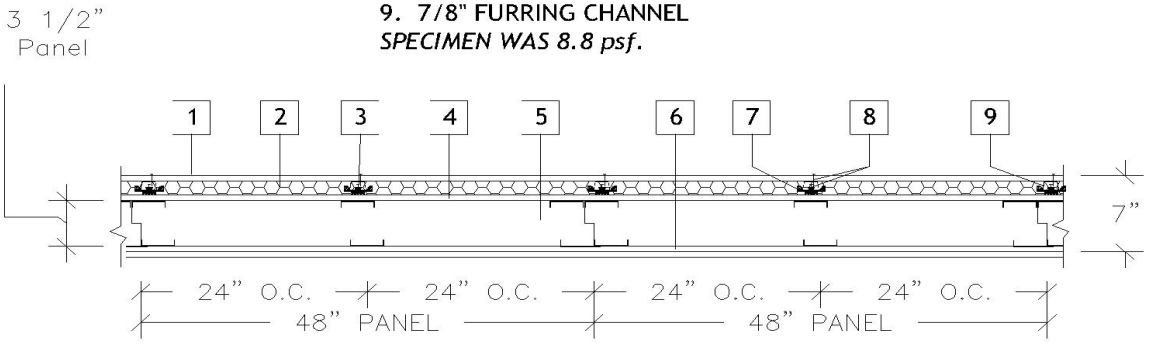


ACOUSTIC SYSTEMS
(BASED ON REPORT #TL87O86A)
SOUND TRANSMISSION LOSS TEST

STC 55-60 INSULAR PARTY WALL*

1. 5/8" DRYWALL
2. 4" R-11 STANDARD BUILDERS INSULATION (UNFACED)
3. 2" METAL Z BRACKET (RESILIENT CHANNEL)
4. (1) 5/8" X-TYPE GYP
5. 3 1/2" Panel (24GA STUDS)
6. (2 LAYERS) 5/8" X-TYPE GYP
7. RESILIENT SOUND RESISTING CLIP (RSIC-1)
8. FASTENERS
9. 7/8" FURRING CHANNEL

SPECIMEN WAS 8.8 psf.



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Section 9: 3 1/2" and 4" Data Tables

9.1 3-1/2" or 4" Axial

3 1/2" or 4" - Axial Compressive PLF- 24 Gauge-TS "C Profile								
			Uniform					
24 Gauge- (27 mil) Insular "C"- 37 ksi			Ultimate	Allowable (apply safety factor)				
Standard Panels			PLF / Kg/m	1.67	1.7	2	2.5	3
3.5-4"x4'x8'	16" OC		3250 / 4836	1946 / 2896	1912 / 2845.4	1625 / 2418.3	1300 / 1934.6	1083 / 1611.7
3.5-4"x4'x10' 3.5-4"x4'x12'	16" OC 16" OC							
3.5-4"x4'x8'	24" OC		2583 / 3843.9	1547 / 2302.2	1519 / 2260.5	1292 / 1922.7	1033 / 1537.3	861 / 1281.3
3.5-4"x4'x10' 3.5-4"x4'x12'	24" OC 24" OC							

3.5 or 4" - Axial Compressive PLF- 24 Gauge- TS "C" Profile-capacity @ vertical panel joint between 2 panels							
		Uniform					
24 Gauge- (27 mil) Insular "C"- 37 ksi		Ultimate	Allowable (apply safety factor)				
Standard Panels		PLF / Kg/m	1.67	1.7	2	2.5	3
3.5-4"x4'x8'	Capacity of Vertical Panel Joint	5600 / 8333.7	3360 / 5000.2	3294 / 4902	2800 / 4166.9	2240 / 3333.5	1867 / 2778.4

9.2 3-1/2" or 4" Transverse

3.5 or 4" - Transverse PSF- 24 Gauge-TS "C Profile							
24 Gauge- (27 mil) Insular "C"- 37 ksi			Ultimate PSF / Kg/m²	Allowable @ L/180	Allowable @ L/240	Allowable @ L/360	
3.5-4"x4'x8'	16" OC		69.3 / 338.4	32.8 / 160.1	26.7 / 130.4	19.5 / 95.2	
3.5-4"x4'x10' 3.5-4"x4'x12'	16" OC 16" OC						
3.5-4"x4'x8'	24" OC		48.8 / 238.3	26 / 126.9	19.5 / 95.2	13 / 63.5	
3.5-4"x4'x10' 3.5-4"x4'x12'	24" OC 24" OC						

9.3 3-1/2" or 4" Racking Shear

3.5 or 4" - Racking Shear PLF- 24 Gauge-TS "C Profile - Standard Panel-No Bracing								
24 Gauge- (27 mil) Insular "C"- 37 ksi			Uniform					
			Ultimate	V Allowable (apply safety factor)				
			PLF / Kg/m	1.67	1.7	2	2.5	3
3.5-4"x4'x8'	16" OC		753 / 1120.6	451 / 671.2	443 / 659.3	377 / 561	301 / 447.9	251 / 373.5
3.5-4"x4'x8'	16" OC	Min 1/2" gypsum board one side	853 / 1269.4	551 / 820	543 / 808.1	477 / 709.9	401 / 596.8	351 / 522.3

3.5 or 4" - Racking Shear PLF - 24 Gauge-TS "C Profile-Double 5" - 24 Gauge diagonal brace: REFER TO SECTION 18.1								
Double 5" Diagonal Bracing 24 Gauge- (27 mil) Insular"C"- 37 ksi			Uniform					
			Ultimate	V Allowable (apply safety factor)				
			PLF / Kg/m	1.67	1.7	2	2.5	3
3.5-4"x4'x8'	16" OC		2742 / 4080.5	1642 / 2443.6	1612 / 2398.9	1371 / 2040.3	1097 / 1632.5	914 / 1360.2
3.5-4"x4'x8'	16" OC	Min 1/2" gypsum board one side	2842 / 4229.4	1742 / 2592.4	1712 / 2547.7	1471 / 2189.1	1197 / 1781.3	1014 / 1509

3.5 or 4" x 2' x 8' - Racking Shear PLF - 24 Gauge - TS "C Profile-3" diagonal braces (24 Gauge)								
2 Ft x 8Ft Racking Shear Panel 24 Gauge- (27 mil) Insular "C"- 37 ksi			Uniform					
			Ultimate	V Allowable (apply safety factor)				
			PLF / Kg/m	1.67	1.7	2	2.5	3
3.5-4"x2'x8'	24" OC		570 / 848.3	341 / 507.5	335 / 498.5	285 / 424.1	228 / 339.3	190 / 282.8
3.5-4"x2'x8'	24" OC	Min 1/2" gypsum board one side	670 / 997.1	441 / 656.3	435 / 647.4	385 / 572.9	328 / 488.1	290 / 431.6

Section 10: 5 1/2" Data Tables

10.1 5-1/2" Axial

51/2" - Axial Compressive PLF- 24 Gauge-TS "C Profile									
				Uniform					
24 Gauge- (27 mil) Insular"C"- 37 ksi			Ultimate	Allowable (apply safety factor)					
Standard Panels			PLF / Kg/m	1.67	1.7	2	2.5	3	
5 1/2"x4'x8'	16" OC		4672 / 6952.7	2798 / 4163.9	2748 / 4089.5	2336 / 3476.3	1869 / 2781.4	1557 / 2317.1	
5 1/2"x4'x10'	16" OC								
5 1/2"x4'x12'	16" OC		3852 / 5732.4	2307 / 3433.2	2266 / 3372.2	1926 / 2866.2	1541 / 2293.3	1284 / 1910.8	

5 1/2" - Axial Compressive PLF- 20 Gauge- CSJ Profile									
				Uniform					
20 Gauge (36 mil) CSJ-33 ksi			Ultimate	Allowable (apply safety factor)					
			PLF - Kg/m	1.67	1.7	2	2.5	3	
5 1/2"x4'x8'	16" OC		9176 / 13655.4	5495 / 8177.5	5398 / 8033.1	4588 / 6827.7	3670 / 5461.6	3059 / 4552.3	
5 1/2"x4'x10'	16" OC		8630 / 12842.8	5167 / 7689.3	5076 / 7553.9	4315 / 6421.4	3452 / 5135.6	2877 / 4281.4	
5 1/2"x4'x12'	16" OC		8083 / 11949.9	4840 / 7202.7	4755 / 7076.2	4042 / 6015.2	3233 / 4811.2	2694 / 4009.1	

5 1/2" - Axial Compressive PLF- 20 Gauge- CSW Profile - 3 5/8" x 2" x 5/8" - Reference note in Section 5.3									
				Uniform					
20 Gauge (36 mil) CSW -33 ksi			Ultimate	Allowable (apply safety factor)					
			PLF - Kg/m	1.67	1.7	2	2.5	3	
5 1/2"x4'x8'	16" OC								
5 1/2"x4'x10'	16" OC								
5 1/2"x4'x12'	16" OC		9334 .2 / 13890.8	5589 / 8317.3	5491 / 8171.5	4667 / 6945.3	3734 / 5556.8	3111 / 4629.7	

5 1/2" - Axial Compressive PLF - 18 Gauge- CSJ Profile									
				Uniform					
18 Gauge (48 mil) CSJ-33 ksi			Ultimate	Allowable (apply safety factor)					
			PLF - Kg/m	1.67	1.7	2	2.5	3	
5 1/2"x4'x8'	16" OC		14730 / 21920.6	8820 / 13125.6	8665 / 12894.9	7365 / 1 0960.3	5892 / 8768.3	4910 / 7306.9	
5 1/2"x4'x10'	16" OC		14365 / 21377.5	8602 / 12801.2	8450 / 12575	7183 / 10689.5	5746 / 8551	4788 / 7125.3	
5 1/2"x4'x12'	16" OC		14000 / 20834.3	8383 / 12475.3	8235 / 12255	7000 / 10417.1	5600 / 8333.7	4667 / 6945.3	

10.2 5-1/2" Transverse

5 1/2" -Transverse PSF- 24 Gauge-TS "C Profile								
24 Gauge- (27 mil) Insular "C"- 37 ksi			Ultimate PSF / Kg/m²	Allowable @ L/180	Allowable @ L/240	Allowable @ L/360		
5 1/2"x4'x8'	16" OC		105 / 512.7	54.2 / 264.6	42.3 / 206.5	40.9 / 199.7		
5 1/2"x4'x10'	16" OC							
5 1/2"x4'x12'	16" OC		59.8 / 292	27 / 131.8	20.8 / 101.6	16 / 78.1		

5 1/2"-Transverse PSF- 24 Gauge-TS "C Profile - 1/4" Stucco Exterior Side								
RamsTech Labs-ASTM E330 24 Gauge- (27 mil) Insular "C"- 37 ksi			Ultimate PSF / Kg/m²	Allowable @ L/180	Allowable @ L/240	Allowable @ L/360		
5 1/2"x4'x8'	16" OC		161.2 / 787.1	83 / 405.2	65.9 / 321.8	46.8 / 228.5		
5 1/2"x4'x10'	16" OC							
5 1/2"x4'x12'	16" OC		115.3 / 563	52 / 253.9	42 / 205.1	32.1 / 156.7		

5 1/2"-Transverse PSF- 24 Gauge - TS "C" Profile - C-600 Configuration-24 GA								
24 Gauge- (27 mil) Insular "C"- 37 ksi			Ultimate PSF / Kg/m²	Allowable @ L/180	Allowable @ L/240	Allowable @ L/360	L/600	
2 additional 24 GA TS-C studs added- Perpendicular to ext. studs								
5 1/2"x4'x8'	16" OC							
5 1/2"x4'x9'	16" OC		112 / 546.8	62.4 / 304.7	41.6 / 203.1	31.2 / 152.3	20.8 / 101.6	
5 1/2"x4'x10'	16" OC							
5 1/2"x4'x12'	16" OC							

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10.2 Continued

5 1/2"-Transverse PSF- 24 Gauge - TS "C" Profile- C-600 Configuration-20 GA								
24 Gauge- (27 mil) Insular "C"- 37 ksi			*Ultimate PSF / Kg/m²*	*Allowable @ L/180*	*Allowable @ L/240*	*Allowable @ L/360*	*L/600*	
2 additional 20 GA TS C studs added- Perpendicular to ext. studs								
5 1/2"x4'x9'	16" OC		122 / 595.7	72.8 / 355.4	52 / 253.9	41.6 / 203.1	20.8 / 101.6	
5 1/2"x4'x10'	16" OC							
5 1/2"x4'x12'	16" OC							

5 1/2"-Transverse PSF- 24 Gauge - TS "C" Profile - Backbone Panel-24 GA metal one side								
24 Gauge- (27 mil) Insular "C"- 37 ksi			*Ultimate PSF / Kg/m²*	*Allowable @ L/180*	*Allowable @ L/240*	*Allowable @ L/360*		
24 GA 3/4" x 4" x panel length angle, continuous								
5 1/2"x4'x8'	16" OC		148 / 722.6	89 / 434.5	67 / 327.1	43 / 209.9		
5 1/2"x4'x12'	16" OC		75 / 366.2	51 / 249	40 / 195.3	27 / 131.8		

5 1/2"- Transverse PSF-20 Gauge - TS "C" Profile								
20 Gauge (36 mil) Insular "C"-33 ksi			*Ultimate PSF / Kg/m²*	*Allowable @ L/180*	*Allowable @ L/240*	*Allowable @ L/360*		
5 1/2"x4'x8'	16" OC		157 / 766.6	75 / 366.2	56 / 273.4	39 / 190.4		
5 1/2"x4'x10'	16" OC							
5 1/2"x4'x12'	16" OC		93 / 454.1	46 / 224.6	35 / 170.9	24 / 117.2		

5 1/2"- Transverse PSF- 20 Gauge - CSJ Profile								
20 Gauge (36 mil) CSJ Metal-33 ksi			*Ultimate PSF / Kg/m²*	*Allowable @ L/180*	*Allowable @ L/240*	*Allowable @ L/360*		
5 1/2"x4'x8'	16" OC		268 / 1308.5	110 / 537.1	82 / 400.4	57 / 278.3		
5 1/2"x4'x10'	16" OC							
5 1/2"x4'x12'	16" OC		147 / 717.7	57 / 278.3	44 / 214.8	30 / 146.5		

5 1/2"- Transverse PSF- 20 Gauge - CSW Profile - 3 5/8" x 2" x 5/8" Studs								
20 Gauge (36 mil) TS "C"- 33 ksi			*Ultimate PSF / Kg/m²*	*Allowable @ L/180*	*Allowable @ L/240*	*Allowable @ L/360*		
2 - 20 GA CSW studs added to Exterior side								
5 1/2"x4'x8'	16" OC							
5 1/2"x4'x10'	16" OC		135 / 659.1	65 / 317.4	52 / 253.9	31.2 / 152.3		
5 1/2"x4'x12'	16" OC		119.6 / 583.9	59 / 288	43.9 / 214.3	29.2 / 142.6		

5 1/2"-Transverse PSF- 18 Gauge - CSJ Profile								
18 Gauge (48 mil) CSJ Metal-33 ksi			*Ultimate PSF / Kg/m²*	*Allowable @ L/180*	*Allowable @ L/240*	*Allowable @ L/360*		
5 1/2"x4'x8'	16" OC		298 / 1455	122 / 595.7	98 / 478.5	67 / 327.1		
5 1/2"x4'x10'	16" OC							
5 1/2"x4'x12'	16" OC		152 / 742.1	63 / 307.6	49 / 239.2	33 / 161.1		

Insular Corp
Engineering Data

10.3 5-1/2" Racking Shear

5 1/2"- Racking Shear PLF- 24 Gauge - TS "C" Profile - Standard Panel-1/2" gyp brd - No attached shear bracing								
				Uniform				
24 Gauge- (27 mil) Insular "C"- 37 ksi			Ultimate	V Allowable (apply safety factor)				
			PLF - Kg/m	1.67	1.7	2	2.5	3
5 1/2"x4'x8'	16" OC	Min 1/2" gypsum board one side	779.6 / 1160.2	466 / 693.5	458.6 / 682.5	389.8 / 580.1	312 / 464.3	260 / 386.9
ref: RADCO test 835								

5 1/2"- Racking Shear PLF- 24 Gauge - TS "C" Profile - Diagonal Strap Bracing-1 7/8" - 16 GA								
				Uniform				
24 Gauge- (27 mil) Insular "C"- 37 ksi			Ultimate	V Allowable (apply safety factor)				
			PLF - Kg/m	1.67	1.7	2	2.5	3
5 1/2"x4'x8'	16" OC		802 / 1193.5	480 / 714.3	472 / 702.4	401 / 596.8	321 / 477.7	267 / 397.3
5 1/2"x4'x8'	16" OC	Min 1/2" gypsum board one side	902 / 1342.3	580 / 863.1	572 / 851.2	501 / 745.6	421 / 626.5	367 / 546.2
5 1/2"x4'x10'	16" OC							
5 1/2"x4'x12'	16" OC							

5.5" - Racking Shear PLF - 24 Gauge-TS "C Profile-Double 5" - 24 Gauge diagonal brace: REFER TO SECTION 18.2								
Double 5" Diagonal Bracing				Uniform				
24 Gauge- (27 mil) Insular "C"- 37 ksi			Ultimate	V Allowable (apply safety factor)				
			PLF / Kg/m	1.67	1.7	2	2.5	3
5 1/2"x4'x8'	16" OC		2742 / 4080.5	1642 / 2443.6	1612 / 2398.9	1371 / 2040.3	1097 / 1632.5	914 / 1360.2
5 1/2"x4'x8'	16" OC	Min 1/2" gypsum board one side	2842 / 4229.4	1742 / 2592.4	1712 / 2547.7	1471 / 2189.1	1197 / 1781.3	1014 / 1509

5 1/2" - Racking Shear PLF - 20 Gauge - CSJ Profile - No Bracing								
				Uniform				
20 Gauge (36 mil) CSJ Studs- 33 ksi			Ultimate	V Allowable (apply safety factor)				
			PLF - Kg/m	1.67	1.7	2	2.5	3
5 1/2"x4'x8'	16" OC		552 / 821.5	331 / 492.6	325 / 483.7	276 / 410.7	221 / 328.9	184 / 273.8
5 1/2"x4'x8'	16" OC	Min 1/2" gypsum board one side	652 / 970.3	431 / 641.4	425 / 632.5	376 / 559.5	321 / 477.7	284 / 422.6

5 1/2" - Racking Shear PLF - 20 Gauge - CSW Profile - With Simpson HD hold downs								
				Uniform				
20 Gauge (36 mil) CSW Studs- 33 ksi			Ultimate	V Allowable (apply safety factor)				
3 5/8"x2"x5/8"			PLF - Kg/m	1.67	1.7	2	2.5	3
5 1/2"x4'x8'	16" OC							
5 1/2""x4'x10'	16" OC							
5 1/2"x4'x12'	16" OC		1298 / 1931.6	777 / 1156.3	764 / 1137	649 / 965.8	519 / 772.4	433 / 644.4
5 1/2"x4'x12'	16" OC	Min 1/2" gypsum board one side	1398 / 2080.5	877 / 1305.1	864 / 1285.8	749 / 1114.6	619 / 921.2	533 / 793.2

5 1/2" - Racking Shear PLF - 20 Gauge - CSW Profile - With Simpson HD hold downs-X bracing-REFER TO SECTION 18.2.1&2								
				Uniform				
20 Gauge (36 mil) CSW Studs- 33 ksi			Ultimate	V Allowable (apply safety factor)				
3 5/8"x2"x5/8"			PLF - Kg/m	1.67	1.7	2	2.5	3
5 1/2"x4'x8'	16" OC							
5 1/2""x4'x10'	16" OC							
5 1/2"x4'x12'	16" OC		2028 / 3018	1214.4 / 1807.2	1192.9 / 1775.3	1014 / 1509	811.2 / 1207.2	676 / 1006
5 1/2"x4'x12'	16" OC	Min 1/2" gypsum board one side	2128 / 3166.8	1314.4 / 1956	1292.9 / 1924	1114 / 1657.8	911.2 / 1356	776 / 1154.8

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Engineering Data

Section 11: 7-1/2" Data Tables

11.1 7-1/2" Axial

7 1/2" - Axial Compressive PLF- 24 Gauge - TS "C" Profile									
24 Gauge- (27 mil) Insular "C"- 37 ksi			Uniform						
			Ultimate	Allowable (apply safety factor)					
			PLF - Kg/m	1.67	1.7	2	2.5	3	
7 1/2"x4'x8'	16" OC		3927 / 5844	2351 / 3498.7	2310 / 3437.7	1963.5 / 2922	1570.8 / 2337.6	1309 / 1948	

11.2 7-1/2" Transverse

7 1/2" - Transverse PSF- 24 Gauge- TS "C" Profile - Standard Panel-No Bracing								
24 Gauge- (27 mil) Insular "C"- 37 ksi			Ultimate PSF / Kg/m²	Allowable @ L/180	Allowable @ L/240	Allowable @ L/360		
7 1/2"x4'x8'	16" OC		180.7 / 882.3		70.2 / 342.8	44.2 / 215.8		
7 1/2"x4'x10'	16" OC		152.1 / 742.6		57.2 / 279.3	35.1 / 171.4		
7 1/2"x4'x12'	16" OC		105.3 / 514.1		42.9 / 209.5	27.3 / 133.3		

7 1/2" - Transverse PSF- 24 Gauge- TS "C" Profile - 7/16" OSB one side								
24 Gauge- (27 mil) Insular "C"- 37 ksi			Ultimate PSF / Kg/m²	Allowable @ L/180	Allowable @ L/240	Allowable @ L/360		
7 1/2"x4'x8'	16" OC							
7 1/2"x4'x10'	16" OC							
7 1/2"x4'x12'	16" OC		92.3 / 450.7	72.8 / 3 55.4	59.6 / 291	50.5 / 246.6		

7 1/2" -Transverse PSF- 22 Gauge- CSJ Profile								
22 Gauge (33 mil) CSJ - 33 ksi			Ultimate PSF / Kg/m²	Allowable @ L/180	Allowable @ L/240	Allowable @ L/360		
7 1/2"x4'x9'	16" OC		166.4 / 812.4	93.6 / 457	72.8 / 355.4	52 / 253.9		
7 1/2"x4'x10'	16" OC							
7 1/2"x4'x12'	16" OC							

Section 12: Hurricane Panels-Tested for Coastal High Wind Areas

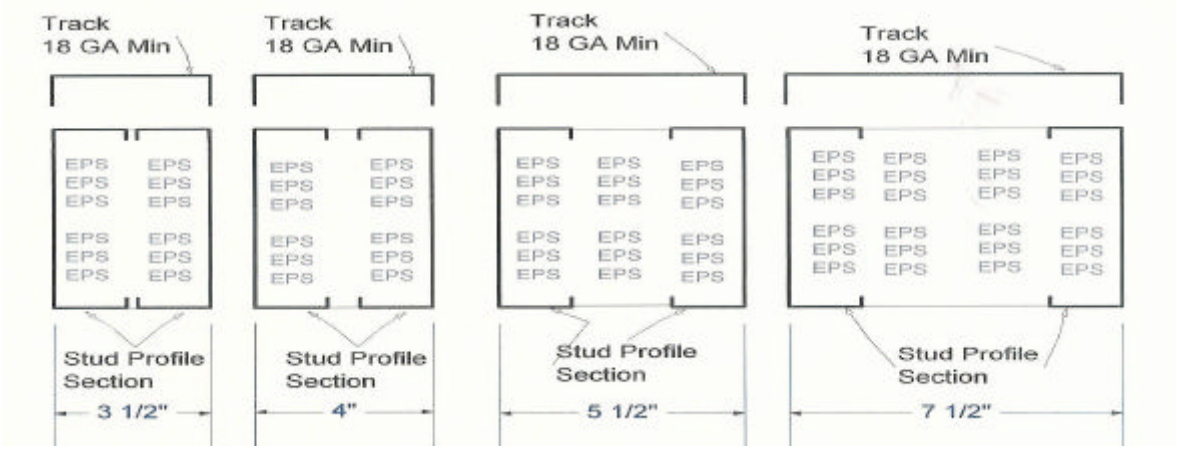
Hurricane Panels-Transverse PSF- 24 Gauge- TS "C" Profile								
24 Gauge- (27 mil) Insular"C"- 37 ksi Calculate Axial from 5 1/2" Axial - 24 Gauge Exterior Side Inside Side			Ultimate PSF / Kg/m²	Allowable @ L/180	Allowable @ L/240	Allowable @ L/360		
5 1/2" x 4'x8'	11 studs	16 oc	NA	90 / 439.4	60 / 293	45 / 219.7		
5 1/2" x 4'x10' 5 1/2" x 4'x12' 7 1/2" x 4'x8' 7 1/2" x 4'x10' 7 1/2" x 4'x12'								

Insular Corp
Engineering Data

Section 13: Insular ***Insul-Headers and L-Header Data***

Header load Table Notes

1. ***Deflection is L/360***
2. ***Allowable loads have not been modified for wind or earthquake loading.***
3. ***Headers are made from two "boxed" or back to back members.***
4. ***Allowable moment, shear and web crippling are based on twice the capacity of a single member. The moment of inertia is based on twice the value of the single member.***
5. ***Bearing length for web crippling = 1" minimum***
6. ***Values are for unpunched members.***
7. ***Members are assumed adequately braced for bending.***
8. ***Allowable loads are for simply supported headers with uniform bending loads only.***



Insular Insul-Headers		**SPAN**						
Section	Yield Strength	3(ft)	4(ft)	5(ft)	6(ft)	8(ft)	10(ft)	12(ft)
550S162-33	33	893 e	670 e	536 e	374 e	210 e	127 e	73 e
550S162-43	33	1982 e	1232 e	789 e	547 e	308 e	164 e	95
550S162-54	33	2779 e	1563 e	1000 e	694 e	390 e	203	117
550S162-54	50	3643 e	2049 e	1311 e	910 e	396 e	203	117
550S162-68	33	3514 e	1976 e	1265 e	878 e	488 e	250	144
550S162-68	50	5176 e	2911 e	1863 e	1157 e	488	250	80 e
600S137-33	33	816 e	612 e	489 e	373 e	209 e	134 e	90 e
600S162-33	33	816 e	612 e	489 e	408 e	237 e	152 e	104 e
600S200-33	33	816 e	612 e	489 e	408 e	254 e	162 e	103 e
600S137-43	33	1810 e	1233 e	789 e	548 e	308 e	178 e	117 e
600S162-43	33	1810 e	1357 e	889 e	617 e	347 e	202 e	135 e
600S200-43	33	1810 e	1357 e	919 e	638 e	359 e	229 e	155 e
600S250-43	33	1810 e	1357 e	987 e	871 e	377 e	241 e	127
600S137-54	33	2812 e	1581 e	1012 e	703 e	395 e	220 e	144
600S162-54	33	3135 e	1763 e	1128 e	783 e	440 e	250 e	167
600S200-54	33	3568 e	2005 e	1283 e	891 e	501 e	290 e	193 e
600S250-54	33	3392 e	1908 e	1221 e	848 e	477 e	305 e	127
600S137-54	50	3610 e	2269 e	1462 e	1008 e	429 e	220	144
600S162-54	50	3610 e	2313 e	1480 e	1028 e	488 e	250	167
600S200-54	50	3610 e	2500 e	1600 e	1111 e	566 e	280 e	190
600S250-54	50	3610 e	2686 e	1706 e	1185 e	641 e	328 e	156
600S137-68	33	3582 e	2004 e	1282 e	890 e	501 e	270	178
600S162-68	33	3968 e	2232 e	1428 e	992 e	558 e	308	207
600S200-68	33	4506 e	2534 e	1822 e	1126 e	633 e	358 e	23
600S250-68	33	4456 e	2506 e	1604 e	1114 e	626 e	401 e	9
600S137-68	50	5274 e	2969 e	1898 e	1252 e	528 e	270	156
600S162-68	50	5846 e	3288 e	2104 e	1426 e	601 e	308	178
600S200-68	50	6475 e	3642 e	2331 e	1618 e	700 e	358	207
600S250-68	50	5954 e	3348 e	2143 e	1488 e	807 e	413 e	239
600S137-97	33	5108 e	2873 e	1839 e	1277 e	715	368	211
600S162-97	33	5685 e	3197 e	2046 e	1421 e	799	419	242
600S200-97	33	6443 e	3624 e	2319 e	1610 e	906 e	490	283
600S250-97	33	7229 e	4066 e	2602 e	1807 e	1016 e	567	328
600S137-97	50	7526 e	4233 e	2709 e	1894 e	715	388	211
600S162-97	50	8403 e	4727 e	3025 e	1941 e	819	419	242
600S200-97	50	9560 e	5377 e	3441 e	2270 e	958	490	283
600S250-97	50	10277 e	5781 e	3700 e	2569 e	1109 e	567	328

"e" Web Stiffeners Required at Each Support

Insular Corp
Engineering Data

L-Header Data-1

Fy	50 ksi	12, 14, 16 gauge
Fy	33 ksi	18 gauge
E	29500 ksi	

b (in)	**d** (in)	**Gage #**	Fy (ksi)	t (in)	Corner R (in)	ycg (in)	Effective le (in4)	Effective Se (in3)
1.5	6.0	12	50	0.1017	0.1875	2.3636	2.661	0.732
1.5	7.0	12	50	0.1017	0.1875	2.8447	4.095	0.986
1.5	8.0	12	50	0.1017	0.1875	3.3300	5.950	1.274
1.5	9.0	12	50	0.1017	0.1875	3.8200	8.270	1.597
1.5	10.0	12	50	0.1017	0.1875	4.3135	11.103	1.952
1.5	11.0	12	50	0.1017	0.1875	4.8082	14.505	2.343
1.5	12.0	12	50	0.1017	0.1875	5.3040	18.526	2.767
2.5	6.0	12	50	0.1017	0.1875	2.2486	2.859	0.762
2.5	7.0	12	50	0.1017	0.1875	2.7343	4.355	1.021
2.5	8.0	12	50	0.1017	0.1875	3.2240	6.279	1.315
2.5	9.0	12	50	0.1017	0.1875	3.7162	8.680	1.643
2.5	10.0	12	50	0.1017	0.1875	4.2101	11.609	2.005
2.5	11.0	12	50	0.1017	0.1875	4.7052	15.117	2.401
2.5	12.0	12	50	0.1017	0.1875	5.2012	19.255	2.832
3.5	6.0	12	50	0.1017	0.1875	2.2081	2.928	0.772
3.5	7.0	12	50	0.1017	0.1875	2.6939	4.451	1.034
3.5	8.0	12	50	0.1017	0.1875	3.1837	6.404	1.330
3.5	9.0	12	50	0.1017	0.1875	3.6761	8.838	1.660
3.5	10.0	12	50	0.1017	0.1875	4.1702	11.804	2.025
3.5	11.0	12	50	0.1017	0.1875	4.6655	15.352	2.424
3.5	12.0	12	50	0.1017	0.1875	5.1617	19.535	2.857
1.5	6.0	14	50	0.0713	0.0938	2.4911	1.806	0.515
1.5	7.0	14	50	0.0713	0.0938	2.9854	2.764	0.688
1.5	8.0	14	50	0.0713	0.0938	3.4812	4.004	0.886
1.5	9.0	14	50	0.0713	0.0938	3.9781	5.563	1.108
1.5	10.0	14	50	0.0713	0.0938	4.4757	7.475	1.353
1.5	11.0	14	50	0.0713	0.0938	4.9737	9.776	1.622
1.5	12.0	14	50	0.0713	0.0938	5.4721	12.503	1.915
2.5	6.0	14	50	0.0713	0.0938	2.4460	1.862	0.524
2.5	7.0	14	50	0.0713	0.0938	2.9406	2.840	0.700
2.5	8.0	14	50	0.0713	0.0938	3.4368	4.103	0.899
2.5	9.0	14	50	0.0713	0.0938	3.9339	5.687	1.123
2.5	10.0	14	50	0.0713	0.0938	4.4317	7.628	1.370
2.5	11.0	14	50	0.0713	0.0938	4.9300	9.961	1.641
2.5	12.0	14	50	0.0713	0.0938	5.4286	12.722	1.936
3.5	6.0	14	50	0.0713	0.0938	2.4277	1.885	0.528
3.5	7.0	14	50	0.0713	0.0938	2.9224	2.870	0.704
3.5	8.0	14	50	0.0713	0.0938	3.4187	4.143	0.904
3.5	9.0	14	50	0.0713	0.0938	3.9160	5.737	1.128
3.5	10.0	14	50	0.0713	0.0938	4.4139	7.690	1.377
3.5	11.0	14	50	0.0713	0.0938	4.9123	10.035	1.648
3.5	12.0	14	50	0.0713	0.0938	5.4110	12.810	1.944

Insular Corp
Engineering Data

L-Header Data-2

Fy	50 ksi	12, 14, 16 gauge
Fy	33 ksi	18 gauge
E	29500 ksi	

b (in)	d (in)	Gage #	Fy (ksi)	t (in)	Corner R (in)	ycg (in)	Effective le (in4)	Se (in3)
1.5	6.0	16	50	0.0566	0.0938	2.5585	1.377	0.400
1.5	7.0	16	50	0.0566	0.0938	3.0549	2.113	0.536
1.5	8.0	16	50	0.0566	0.0938	3.5523	3.070	0.690
1.5	9.0	16	50	0.0566	0.0938	4.0504	4.274	0.864
1.5	10.0	16	50	0.0566	0.0938	4.5489	5.755	1.056
1.5	11.0	16	50	0.0566	0.0938	5.0477	7.541	1.267
1.5	12.0	16	50	0.0566	0.0938	5.5467	9.661	1.497
2.5	6.0	16	50	0.0566	0.0938	2.5305	1 405	0.405
2.5	7.0	16	50	0.0566	0.0938	3.0272	2.151	0.541
2.5	8.0	16	50	0.0566	0.0938	3.5248	3.118	0.697
2.5	9.0	16	50	0.0566	0.0938	4.0231	4.335	0.871
2.5	10.0	16	50	0.0566	0.0938	4.5218	5.830	1.064
2.5	11.0	16	50	0.0566	0.0938	5.0207	7.632	1.276
2.5	12.0	16	50	0.0566	0.0938	5.5199	9.768	1.507
3.5	6.0	16	50	0.0566	0.0938	2.5190	1.416	0.407
3.5	7.0	16	50	0.0566	0.0938	3.0158	2.166	0.544
3.5	8.0	16	50	0.0566	0.0938	3.5136	3.138	0.699
3.5	9.0	16	50	0.0566	0.0938	4.0120	4.360	0.874
3.5	10.0	16	50	0.0566	0.0938	4.5107	5.861	1.068
3.5	11.0	16	50	0.0566	0.0938	5.0098	7.669	1.280
3.5	12.0	16	50	0.0566	0.0938	5.5089	9.812	1.512
1.5	6.0	18	33	0.0451	0.0938	2.5665	1.097	0.320
1.5	7.0	18	33	0.0451	0.0938	3.0632	1.683	0.427
1.5	8.0	18	33	0.0451	0.0938	3.5609	2.444	0.551
1.5	9.0	18	33	0.0451	0.0938	4.0591	3.402	0.689
2.5	6.0	18	33	0.0451	0.0938	2.5399	1.118	0.323
2.5	7.0	18	33	0.0451	0.0938	3.0369	1.711	0.432
2.5	8.0	18	33	0.0451	0.0938	3.5347	2.481	0.556
2.5	9.0	18	33	0.0451	0.0938	4.0332	3.449	0.694

Insular Corp
Engineering Data

*Section 14: Insular **Roof Panel Load Data***

Roof System Panels See Connection details for Attachments to calculate uplift			*Ultimate PSF / Kg/m²*	*Allowable @ L/180*	*Allowable @ L/240*	*Allowable @ L/360*
3 1/2"x4'x8'	16" OC	***24 GA (27 mil)TSteel "C"***	69.33 / 338.5	32.75 / 159.9	26.65 / 130.1	19.5 / 95.2
4"x4'x8'	16" OC	***24 GA (27 mil)TSteel "C"***	69.33 / 338.5	32.75 / 159.9	26.65 / 130.1	19.5 / 95.2
5 1/2"x4'x8'	16" OC	***24 GA (27 mil)TSteel "C"***	105 / 512.7	54.2 / 264.6	42.3 / 206.5	40.9 / 199.7
5 1/2"x4'x12'	16" OC	***24 GA (27 mil)TSteel "C"***	59.8 / 292	27 / 131.8	20.8 / 101.6	16 / 78.1
5 1/2"x4'x8'	16" OC	***24 GA (27 mil) Backbone***	148 / 722.6	89 / 434.5	67 / 327.1	43 / 209.9
5 1/2"x4'x12'	16" OC	***24 GA (27 mil) Backbone***	75 / 366.2	51 / 249	40 / 195.3	27 / 131.8
5 1/2"x4'x8'	16" OC	***20 GA (33 mil)TSteel "C"***	157 / 766.6	75 / 366.2	56 / 273.4	39 / 190.4
5 1/2"x4'x12'	16" OC	***20 GA (33 mil)TSteel "C"***	93 / 454.1	46 / 224.6	35 / 170.9	24 / 117.2
5 1/2"x4'x8'	16" OC	***20 GA (33 mil) CSJ***	268 / 1308.5	110 / 537.1	82 / 302.7	57 / 278.3
5 1/2"x4'x12'	16" OC	***20 GA (33 mil) CSJ***	147 / 717.7	57 / 278.3	44 / 214.8	30 / 146.5
5 1/2"x4'x8'	16" OC	***18 GA (43 mil) CSJ***	298 / 1455	122 / 595.7	98 / 478.5	67 / 327.1
5 1/2"x4'x12'	16" OC	***18 GA (43 mil) CSJ***	152 / 742.1	63 / 307.6	49 / 239.2	33 / 161.1
7 1/2"x4'x8'	16" OC	***24 GA (27 mil)TSteel "C"***	180.7 / 882.3		70.2 / 342.8	44.2 / 215.8
7 1/2"x4'x10'	16" OC	***24 GA (27 mil)TSteel "C"***	152.1 / 742.6		57.2 / 279.3	35.1 / 171.4
7 1/2"x4'x12'	16" OC	***24 GA (27 mil)TSteel "C"***	105.3 / 514.1		42.9 / 209.5	27.3 / 133.3

Section 15: Galvanized Steel Post Load Data

Length	Size	Gauge	Yield Strength	Max Load	Sec. Modu.	Radius of Gyration
8'	**3" SQ.**	***13***	***50,000***	**59,488**	**1.0352**	**1.186697**
9'	**3" SQ.**	***13***	***50,000***	**47,003**	**1.0352**	**1.186697**
10'	**3" SQ.**	***13***	***50,000***	**38,072**	**1.0352**	**1.186697**
11'	**3" SQ.**	***13***	***50,000***	**31,465**	**1.0352**	**1.186697**
12'	**3" SQ.**	***13***	***50,000***	**26,439**	**1.0352**	**1.186697**
8'	**3" SQ.**	**12**	***50,000***	**87,295**	**1.172209**	**1.181186**
9'	**3" SQ.**	**12**	***50,000***	**53,172**	**1.172209**	**1.181186**
10'	**3" SQ.**	**12**	***50,000***	**43,089**	**1.172209**	**1.181186**
11'	**3" SQ.**	**12**	***50,000***	**35,594**	**1.172209**	**1.181186**
12'	**3" SQ.**	**12**	***50,000***	**29,909**	**1.172209**	**1.181186**
8'	**3" SQ.**	**11**	***50,000***	**73,288**	**1.276232**	**1.176877**
9'	**3" SQ.**	**11**	***50,000***	**57,891**	**1.276232**	**1.176877**
10'	**3" SQ.**	**11**	***50,000***	**46,891**	**1.276232**	**1.176877**
11'	**3" SQ.**	**11**	***50,000***	**38,763**	**1.276232**	**1.176877**
12'	**3" SQ.**	**11**	***50,000***	**32,583**	**1.276232**	**1.176877**
8'	**4" SQ.**	**11**	***50,000***	**179,016**	**2.338678**	**1.584897**
9'	**4" SQ.**	**11**	***50,000***	**141,445**	**2.338678**	**1.584897**
10'	**4" SQ.**	**11**	***50,000***	**114,570**	**2.338678**	**1.584897**
11'	**4" SQ.**	**11**	***50,000***	**94,686**	**2.338678**	**1.584897**
12'	**4" SQ.**	**11**	***50,000***	**62,799**	**2.338678**	**1.584897**
14'	**4" SQ.**	**11**	**50,000**	**58,454**	**2.338678**	**1.584897**

Insular Corp
Engineering Data

Section 16: Panel Weight / R and U Values / Water Vapor Transmission

Panel Type			EPS	Total	~	u-Value	Permability
Gauge	OC	Thick	Density	Weight/Ft²	R- Value	k - Value	Rating
24 GA-"C"	16" OC	3.5	1.5	1.53	16	0.06	0.6
24 GA-"C"	16" OC	4	1.5	1.59	18	0.05	0.55
24 GA-"C"	16" OC	5.5	1.0	1.55	24	0.04	0.5
24 GA-"C"	16" OC	7.5	1.0	1.72	34	0.03	0.4
20 GA-"C"	16" OC	3.5	1.5	1.94	16	0.06	0.6
20 GA-"C"	16" OC	4	1.5	1.59	18	0.05	0.55
20 GA-"C"	16" OC	5.5	1.0	2.19	24	0.04	0.5
20 GA-"C"	16" OC	7.5	1.0	2.44	34	0.03	0.4
20 GA-CSJ	16" OC	5.5	1.0	2.18	24	0.04	0.5
20 GA-CSJ	16" OC	7.5	1.0	2.35	34	0.03	0.4
18 GA-CSJ	16" OC	5.5	1.0	2.66	24	0.04	0.5
18 GA-CSJ	16" OC	7.5	1.0	2.83	34	0.03	0.4

Due to the following factors:
R-values may be 34% greater than Theoretical
Reduction of air infiltration;
Elimination of thermal bridges;
Effect of the int. and ext. cladding;
Effect of ship lap joints;

E.g. A 3 1/2" wall panel with no penetrating metal studs with exterior and interior finish is effective R-22;
*5 1/2" wall panel with no penetrating 2 x 6's with ext. and int. finish is effective R-33 (k-value .030)
7 ½" is effective R-45.6 (k-value .023).

Extensive SSTB testing has been done to determine the design load capacity at a common application, the garage stem wall. Design loads are based on a series of five tests, with a three-times safety factor.

SPECIAL FEATURES: • Rolled threads for higher tensile capacity.
- Offset angle reduces side-bursting, provides more concrete cover.
- Stamped embedment line aids installation.
- Configuration results in minimum rebar interference.

MATERIAL: ASTM A36

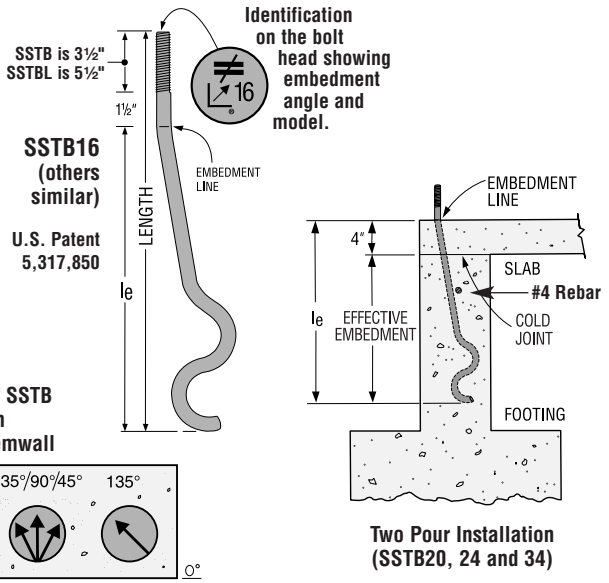
FINISH: None. May be ordered HDG; check factory

INSTALLATION: • SSTB is used for monolithic and two-pour installations.
- Nuts and washers are not supplied with the SSTB; install standard nuts, couplers and/or washers as required.

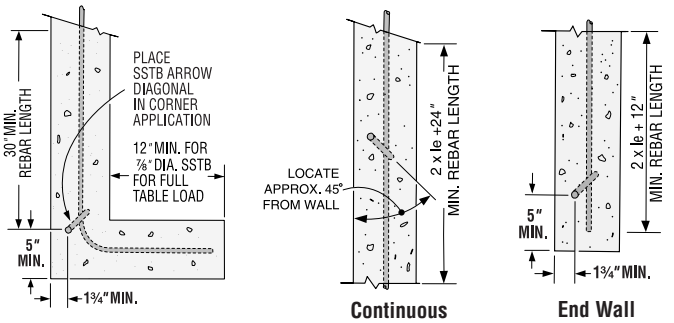
REINFORCED CONCRETE FOUNDATION
- Install SSTB before the concrete pour using AnchorMates *(see page 16)*. Install the SSTB per plan view detail. Install one #4 rebar 3" to 5" *(may be foundation rebar)* from the top of the foundation.
- **The SSTB does not need to be tied to the rebar.**
- Minimum concrete compression strength is 2500 psi. Unless noted otherwise, no special inspection is required for foundation concrete when the structural design is based on concrete no greater than 2500 psi *(UBC Section 1701.5.1 and IBC Section 1704.4)*.
- Unless otherwise noted, do NOT install where: (a) a horizontal cold joint exists within the embedment depth between the slab and foundation wall or footing beneath, unless provisions are made to transfer the load, or the slab is designed to resist the load imposed by the anchor; or (b) slabs are poured over concrete block foundation walls.
- Use 90% of the table load for 2000 psi concrete.

REINFORCED CONCRETE BLOCK
- Before concrete pour, install diagonally at approx. 45° in the cell.
- Horizontal #4 rebar *(minimum 56" long)*—approx. one rebar 12" from the top and two rebars approx. 28" from the top. Vertical #4 rebar *(minimum 24" long)*—install with maximum 24" o.c. spacing.
- Grout all cells with minimum 2000 psi concrete. Vibrate the grout per the 1997 Uniform Building Code, section 2104.6.2.

CODES: See page 10 for Code Listing Key Chart.



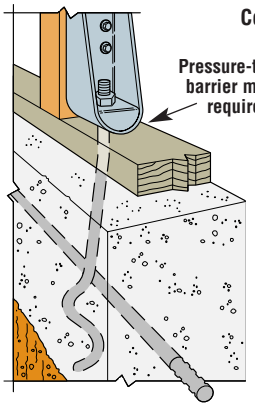
TYPICAL PLAN VIEWS OF REBAR INSTALLATION

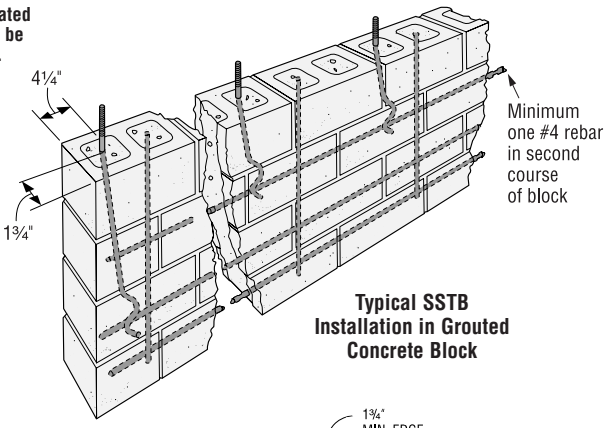


SELECTION GUIDE
(Per Anchor Bolt Diameter)

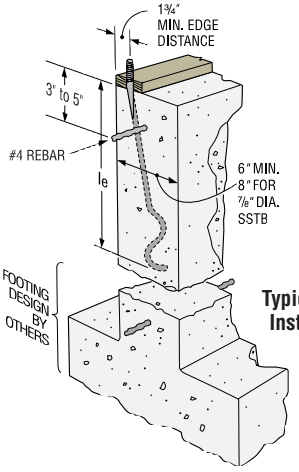
Model No.	2x, 3x, 2-2x Sill Plates	
	Mono Pour	Two Pour
PHD2[1] HD2A LTT20B LTTI31 HTT16 HD5A	SSTB16	SSTB20
PHD5[1] MTT28B	SSTB20	SSTB24
HTT22 HDC5/22[4] HDC5/4[4]	SSTB24	—
PHD6[1] PHD8[1] HD6A HD8A HD10A HDQ8[1] HDC10/22[4] HDC10/4[4]	SSTB28	SSTB34

1. SSTBL models are recommended for PHD and HDQ8 holdowns on 2-2x and 3x sill plates.
2. No cold joint within embedment depth unless provisions are made to transfer the load.
3. The design engineer may specify an alternate anchorage system, provided the anchor diameter is the same.
4. **Increase the embedment depth 2½" to accomodate the HDC standoff block.**





Model[7] No.	Stemwall Width	Dia	Length	Min Embed l_e	Avg Ult Concrete	Allowable Tension Load[1,2]			Code Ref.
						Concrete[4] f'c = 2500 psi	Concrete 8" CMU Block	Concrete 8" CMU Block End	
SSTB16	6	⅝	17⅝	12⅝	13640	4420	4780	1850	23, 94
SSTB20	6	⅝	21⅝	16⅝	14745	4600	4780	1850	
SSTB24	6	⅝	25⅝	20⅝	16439	5175	4780	1850	
SSTB28	8	⅞	29⅞	24⅞	32700	10100	6385	4815	
SSTB34	8	⅞	34⅞	28⅞	32700	10100	6385	4815	
SSTB36	8	⅞	36⅞	28⅞	32700	10100	6385	4815	



1. Loads may not be increased for short-term loading. Loads apply to earthquake and wind loading.
2. Minimum anchor center-to-center spacing is $2l_e$ for anchors acting in tension at the same time for full load.
3. The SSTB was tested in a stem wall with a minimum amount of concrete cover.
4. Maximum allowable load is 8150 lbs. for SSTB28, 34 and 36 when used 5" from the end of a concrete foundation. Use full table load when installed 24" from the end or installed in a corner condition (see illustration).
5. Connection is limited by the lowest of bolt or holdown capacity.
6. PHD and HTT minimum end distance is 4⅜".
7. **Order the SSTBL models for longer thread length (5½") ex. SSTB24L. SSTBL and SSTB loads are the same.**
8. SSTB34 has 4½" of thread and SSTB36 has 6½". These two models are not available in SSTBL versions.

Tension Loads in Normal-Weight Concrete

*See page 5 for an explanation of the load table icons

Size in. (mm)	Drill Bit Dia. in.	Embed. Depth in. (mm)	Critical Edge Dist. in. (mm)	Critical Spacing Dist. in. (mm)	Tension Load					
					f'c >= 2000 psi (13.8 MPa) Concrete			f'c >= 4000 psi (27.6 MPa) Concrete		
					Ultimate lbs. (kN)	Std. Dev. lbs. (kN)	Allow. lbs. (kN)	Ultimate lbs. (kN)	Std. Dev. lbs. (kN)	Allow. lbs. (kN)
3/8 (9.5)	3/8	2 3/4 (70)	3 (76)	6 (152)	4,297 (19.1)	•	1,075 (4.8)	6,204 (27.6)	•	1,550 (6.9)
		3 3/4 (95)			7,087 (31.5)	347 (1.5)	1,770 (7.9)	9,820 (43.7)	1,434 (6.4)	2,455 (10.9)
1/2 (12.7)	1/2	2 3/4 (70)	4 (102)	8 (203)	4,610 (20.5)	•	1,155 (5.1)	6,580 (29.3)	•	1,645 (7.3)
		3 5/8 (92)			7,413 (33.0)	412 (1.8)	1,855 (8.3)	10,742 (47.8)	600 (2.7)	2,685 (11.9)
		5 3/4 (146)			10,278 (45.7)	297 (1.3)	2,570 (11.4)	15,640 (69.6)	2,341 (10.4)	3,910 (17.4)
5/8 (15.9)	5/8	2 3/4 (70)	5 (127)	10 (254)	4,610 (20.5)	•	1,155 (5.1)	6,580 (29.3)	•	1,645 (7.3)
		4 1/8 (105)			8,742 (38.9)	615 (2.7)	2,185 (9.7)	12,286 (54.7)	1,604 (7.1)	3,070 (13.7)
		5 3/4 (146)			12,953 (57.6)	1,764 (7.8)	3,240 (14.4)	18,680 (83.1)	•	4,670 (20.8)
3/4 (19.1)	3/4	2 3/4 (70)	6 (152)	12 (305)	4,674 (20.8)	•	1,170 (5.2)	6,580 (29.3)	•	1,645 (7.3)
		4 5/8 (117)			10,340 (46.0)	1,096 (4.9)	2,585 (11.5)	17,426 (77.5)	1,591 (7.1)	4,355 (19.4)
		5 3/4 (146)			13,765 (61.2)	1,016 (4.5)	3,440 (15.3)	18,680 (83.1)	1,743 (7.8)	4,670 (20.8)

See Notes Below

Shear Loads in Normal-Weight Concrete

Size in. (mm)	Drill Bit Dia. in.	Embed. Depth in. (mm)	Critical Edge Dist. in. (mm)	Critical Spacing Dist. in. (mm)	Shear Load					
					f'c >= 2000 psi (13.8 MPa) Concrete			f'c >= 4000 psi (27.6 MPa) Concrete		
					Ultimate lbs. (kN)	Std. Dev. lbs. (kN)	Allow. lbs. (kN)	Ultimate lbs. (kN)	Std. Dev. lbs. (kN)	Allow. lbs. (kN)
3/8 (9.5)	3/8	2 3/4 (70)	4 1/2 (114)	6 (152)	6,353 (28.3)	•	1,590 (7.1)	•	•	1,740 (7.7)
		3 3/4 (95)			6,377 (28.4)	1,006 (4.5)	1,595 (7.1)	•	•	1,740 (7.7)
1/2 (12.7)	1/2	2 3/4 (70)	6 (152)	8 (203)	6,435 (28.6)	•	1,610 (7.2)	9,987 (44.4)	•	2,495 (7.8)
		3 5/8 (92)			9,324 (41.5)	1,285 (5.7)	2,330 (10.4)	13,027 (57.9)	597 (2.7)	3,255 (14.5)
		5 3/4 (146)			11,319 (50.3)	1,245 (5.5)	2,830 (12.6)	•	•	3,255 (14.5)
5/8 (15.9)	5/8	2 3/4 (70)	7 1/2 (191)	10 (254)	7,745 (34.5)	•	1,935 (8.6)	9,987 (44.4)	•	2,495 (11.1)
		4 1/8 (105)			8,706 (38.7)	1,830 (8.1)	2,175 (9.7)	18,607 (82.8)	1,650 (7.3)	4,650 (20.7)
		5 3/4 (146)			12,498 (55.6)	2,227 (9.9)	3,125 (13.9)	•	•	4,650 (20.7)
3/4 (19.1)	3/4	2 3/4 (70)	9 (229)	12 (305)	7,832 (34.8)	•	1,960 (8.7)	11,460 (51.0)	•	2,865 (12.7)
		4 5/8 (117)			11,222 (49.9)	2,900 (12.9)	2,805 (12.5)	24,680 (109.8)	2,368 (10.5)	6,170 (27.4)
		5 3/4 (146)			19,793 (88.0)	3,547 (15.8)	4,950 (22.0)	24,680 (109.8)	795 (3.5)	6,170 (27.4)

1. The allowable loads listed are based on a safety factor of 4.0.
2. Allowable loads may be increased 33⅓% for short term loading due to wind or seismic forces when permitted by code.
3. Refer to allowable load adjustment factors for spacing and edge distance on pages 93-94.
4. The minimum concrete thickness is 1½ times the embedment depth.
5. Tension and Shear loads for the Titen HD may be combined using the elliptical interaction equation (n=⅔). Allowable load may be interpolated for concrete compressive strengths between 2000 psi and 4000 psi.

Tension Loads in Normal-Weight Concrete

*See page 5 for an explanation of the load table icons

Size in. (mm)	Drill Bit Dia. in.	Embed. Depth in. (mm)	Critical Edge Dist. in. (mm)	Critical Spacing Dist. in. (mm)	Tension Load					
					f'c >= 2000 psi (13.8 MPa) Concrete			f'c >= 4000 psi (27.6 MPa) Concrete		
					Ultimate lbs. (kN)	Std. Dev. lbs. (kN)	Allow. lbs. (kN)	Ultimate lbs. (kN)	Std. Dev. lbs. (kN)	Allow. lbs. (kN)
3/8 (9.5)	3/8	2 3/4 (70)	3 (76)	6 (152)	4,297 (19.1)	•	1,075 (4.8)	6,204 (27.6)	•	1,550 (6.9)
		3 3/4 (95)			7,087 (31.5)	347 (1.5)	1,770 (7.9)	9,820 (43.7)	1,434 (6.4)	2,455 (10.9)
1/2 (12.7)	1/2	2 3/4 (70)	4 (102)	8 (203)	4,610 (20.5)	•	1,155 (5.1)	6,580 (29.3)	•	1,645 (7.3)
		3 5/8 (92)			7,413 (33.0)	412 (1.8)	1,855 (8.3)	10,742 (47.8)	600 (2.7)	2,685 (11.9)
		5 3/4 (146)			10,278 (45.7)	297 (1.3)	2,570 (11.4)	15,640 (69.6)	2,341 (10.4)	3,910 (17.4)
5/8 (15.9)	5/8	2 3/4 (70)	5 (127)	10 (254)	4,610 (20.5)	•	1,155 (5.1)	6,580 (29.3)	•	1,645 (7.3)
		4 1/8 (105)			8,742 (38.9)	615 (2.7)	2,185 (9.7)	12,286 (54.7)	1,604 (7.1)	3,070 (13.7)
		5 3/4 (146)			12,953 (57.6)	1,764 (7.8)	3,240 (14.4)	18,680 (83.1)	•	4,670 (20.8)
3/4 (19.1)	3/4	2 3/4 (70)	6 (152)	12 (305)	4,674 (20.8)	•	1,170 (5.2)	6,580 (29.3)	•	1,645 (7.3)
		4 5/8 (117)			10,340 (46.0)	1,096 (4.9)	2,585 (11.5)	17,426 (77.5)	1,591 (7.1)	4,355 (19.4)
		5 3/4 (146)			13,765 (61.2)	1,016 (4.5)	3,440 (15.3)	18,680 (83.1)	1,743 (7.8)	4,670 (20.8)

See Notes Below

Shear Loads in Normal-Weight Concrete

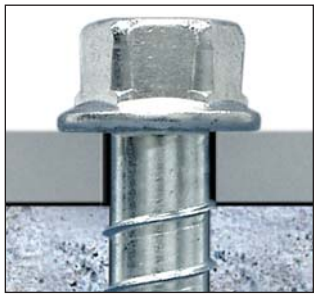
Size in. (mm)	Drill Bit Dia. in.	Embed. Depth in. (mm)	Critical Edge Dist. in. (mm)	Critical Spacing Dist. in. (mm)	Shear Load					
					f'c >= 2000 psi (13.8 MPa) Concrete			f'c >= 4000 psi (27.6 MPa) Concrete		
					Ultimate lbs. (kN)	Std. Dev. lbs. (kN)	Allow. lbs. (kN)	Ultimate lbs. (kN)	Std. Dev. lbs. (kN)	Allow. lbs. (kN)
3/8 (9.5)	3/8	2 3/4 (70)	4 1/2 (114)	6 (152)	6,353 (28.3)	•	1,590 (7.1)	•	•	1,740 (7.7)
		3 3/4 (95)			6,377 (28.4)	1,006 (4.5)	1,595 (7.1)	•	•	1,740 (7.7)
1/2 (12.7)	1/2	2 3/4 (70)	6 (152)	8 (203)	6,435 (28.6)	•	1,610 (7.2)	9,987 (44.4)	•	2,495 (7.8)
		3 5/8 (92)			9,324 (41.5)	1,285 (5.7)	2,330 (10.4)	13,027 (57.9)	597 (2.7)	3,255 (14.5)
		5 3/4 (146)			11,319 (50.3)	1,245 (5.5)	2,830 (12.6)	•	•	3,255 (14.5)
5/8 (15.9)	5/8	2 3/4 (70)	7 1/2 (191)	10 (254)	7,745 (34.5)	•	1,935 (8.6)	9,987 (44.4)	•	2,495 (11.1)
		4 1/8 (105)			8,706 (38.7)	1,830 (8.1)	2,175 (9.7)	18,607 (82.8)	1,650 (7.3)	4,650 (20.7)
		5 3/4 (146)			12,498 (55.6)	2,227 (9.9)	3,125 (13.9)	•	•	4,650 (20.7)
3/4 (19.1)	3/4	2 3/4 (70)	9 (229)	12 (305)	7,832 (34.8)	•	1,960 (8.7)	11,460 (51.0)	•	2,865 (12.7)
		4 5/8 (117)			11,222 (49.9)	2,900 (12.9)	2,805 (12.5)	24,680 (109.8)	2,368 (10.5)	6,170 (27.4)
		5 3/4 (146)			19,793 (88.0)	3,547 (15.8)	4,950 (22.0)	24,680 (109.8)	795 (3.5)	6,170 (27.4)

1. The allowable loads listed are based on a safety factor of 4.0.
2. Allowable loads may be increased 33⅓% for short term loading due to wind or seismic forces when permitted by code.
3. Refer to allowable load adjustment factors for spacing and edge distance on pages 93-94.
4. The minimum concrete thickness is 1½ times the embedment depth.
5. Tension and Shear loads for the Titen HD may be combined using the elliptical interaction equation (n=⅔). Allowable load may be interpolated for concrete compressive strengths between 2000 psi and 4000 psi.

DESIGNED TO BE BETTER

The Titen HD has been designed to offer maximum anchor performance when compared to other anchor types of the same, or in some cases, larger diameter.

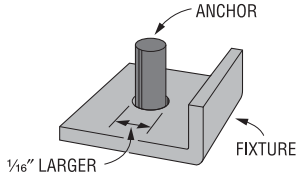
- **Full Shank Diameter:** The actual diameter of the anchor shank, not the outside diameter of the threads, is equal to the nominal diameter of the anchor. A ⅝" diameter Titen HD has a full ⅝" diameter shank. This gives the Titen HD higher shear values than competitive products which are undersized. It also allows the Titen HD to be installed with commonly used ANSI standard carbide tipped drill bits.
- **Deeper Cutting Threads:** The threads on the Titen HD are larger in diameter in relation to the shank than competitive products. They are designed to undercut the concrete and provide higher tension values, as well as resistance to vibratory and dynamic loads.



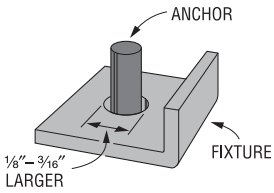
FIXTURE HOLE DIAMETER

Due to the full shank diameter and larger threads, consideration needs to be given to specifying the appropriate diameter Titen HD based on the fixture hole type to be used. The American Institute of Steel Construction (AISC) has established the following guidelines with regards to fixture hole sizing depending on the hole type:

- "**Standard**" fixture holes are 1/16" larger than the nominal anchor diameter.
- "**Oversized**" fixture holes are ⅛ -3/16" larger than the nominal anchor diameter, depending upon the specific anchor diameter.



Standard fixture hole



Oversized fixture hole

Use the following table to identify which diameter Titen HD to use based on the fixture hole type and diameter. In most cases where a smaller diameter Titen HD is called out in comparison to the competitor's larger diameter anchor, the Titen HD still generally provides allowable tension and shear load values comparable to or greater than those of the competitor's anchor.

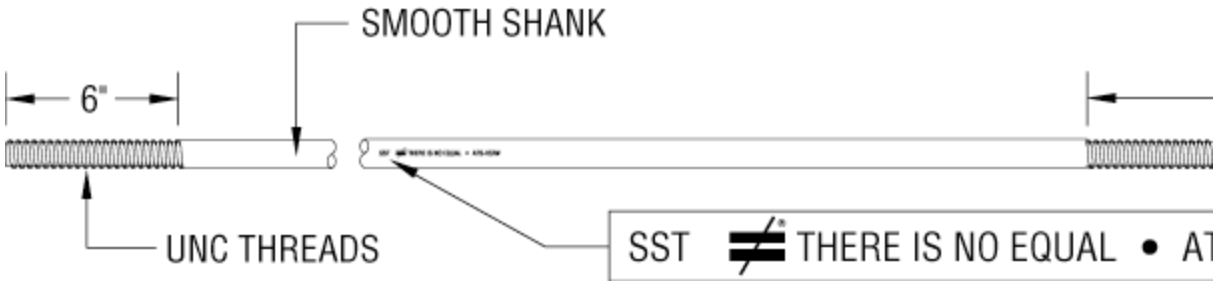
Hole Dimensions

Titen HD Diameter (in)	Wrench Size (in)	Recommended Fixture Hole Size (in)
3/8	9/16	1/2
		9/16
1/2	3/4	5/8
		11/16
5/8	15/16	3/4
		13/16
3/4	1-1/8*	7/8
		15/16

*12 point socket required.

Avoid anchor damage from forklift hits with the Titen HD.

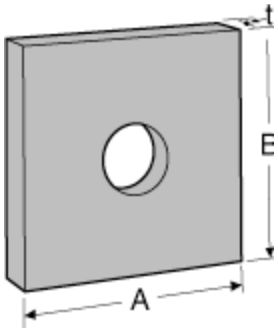
Section 17.3 - Simpson ATS-Strong Rods



Strong Rod No.	Diameter (in)	Allowable Tensile Capacity (lbs)	
		(100) [5]	(133)
ATS-SR4	½	3,790	5,060
ATS-SR5	⅝	5,930	7,900
ATS-SR6	¾	8,540	11,380
ATS-SR7	⅞	11,620	15,500
ATS-SR8	1	15,180	20,240
ATS-SR9	1 ⅛	19,210	25,620
ATS-SR4H	½	7,850	10,400
ATS-SR5H	⅝	12,270	16,360
ATS-SR6H	¾	17,670	23,560
ATS-SR7H	⅞	24,050	32,070
ATS-SR8H	1	31,410	41,880
ATS-SR9H	1 ⅛	39,760	53,010

1. Simpson Strong Rod is based on ASTM A36 with Fu = 58000psi.
2. High Strength Simpson Strong Rod is based on ASTM A108-C1045 with Fu = 120000psi.
3. ATS-SR# (ATS-SR#H for high strength rods) where # is the rod diameter in eights of an inch.
4. Other threaded rod sizes and grades available, contact factory.
5. The values represent capacities which do not include a 1/3 stress increase on the steel calculations. (Refer to nc the General Notes)

Model	A (in)	B (in)	Hole Dia. (in)	t (in)
ATS-PW4	2 3/8	2	9/16	5/8
ATS-PW5	2 3/8	2	11/16	5/8
ATS-PW6	2 3/8	2	13/16	5/8
ATS-PW7	2 3/8	2	15/16	5/8
ATS-PW8	2 3/8	2	1 1/16	5/8
ATS-PW9	2 3/8	2	1 3/16	5/8



ATS Plate Washer

1. Used above 3 series plates at rod terminations when necessary.

Model	A (in)	B (in)	Hole Dia. (in)	t (in)
ATS-DW4	2 7/8	3	9/16	5/8
ATS-DW5	2 7/8	3	11/16	3/4
ATS-DW6	2 7/8	3	13/16	3/4
ATS-DW7	2 7/8	3	15/16	3/4
ATS-DW8	2 7/8	3	1 1/16	3/4
ATS-DW9	2 7/8	3	1 3/16	3/4

1. Used with ATS-2BH, ATS-2CH, ATS-2DH, or AB-2EH cages at rod termination.

ATS - 3 Series Plate Washers:

1. CNW tested average ultimate capacity exceeds the minimum tensile strength, as determined from the minimum tensile stress (f_u), of A36 rod.

Model No.	Rod Dia. (in)	H min. (in)
ATS-C54	0.625 to 0.50	1¼
ATS-C64	0.75 to 0.50	1½
ATS-C65	0.75 to 0.625	1½
ATS-C75	0.875 to 0.625	1¾
ATS-C76	0.875 to 0.75	1¾
ATS-C86	1.00 to 0.75	2
ATS-C87	1.00 to 0.875	2
ATS-C88	1.00	2¾
ATS-C97	1.125 to 0.875	3
ATS-C98	1.125 to 1.00	3
ATS-C99	1.125	3
ATS-HSC54	0.625 to 0.50	1¼
ATS-HSC77	0.875	2½
ATS-HSC88	1.00	2¾

1. Other coupler nuts available, contact factory.
2. ATS-C and ATS-HSC tested average ultimate capacity the minimum tensile strength, as determined from the r tensile stress (f_u), of A36 rod, A108-C1045 for high stre

Section 17.3 - Simpson ATS-Strong Rods

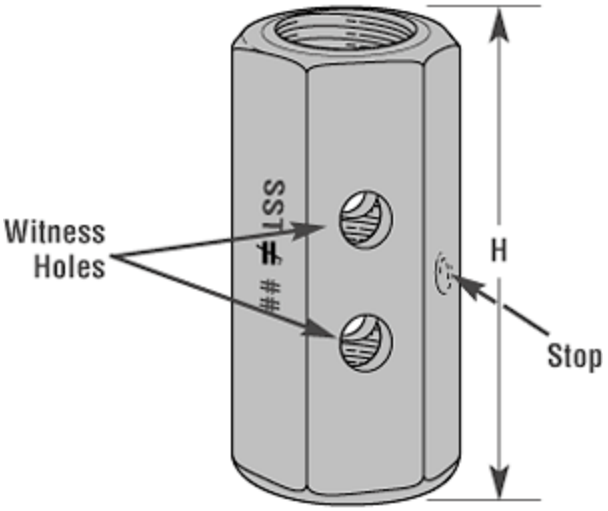
All-thread rod is correctly installed when visible through the “witness” holes. The CNW dimple provides a p
stop to allow even bolt threading top and bottom. ATS couplers are partially threaded at each end to creat
positive stop for the threaded rod.

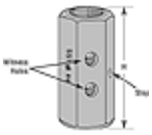
CNWs and standard or high-strength ATS couplers are tested and load-rated coupling nuts. They can be u
extending anchor bolts, for example, through floor framing. CNWs and ATS-C coupling nuts meet and exc
allowable tensile capacity of the corresponding ASTM A36 threaded rod. ATS-HSC coupling nuts meet an
exceed the allowable tension capactiy of the corresponding ASTM A108-C1045 threaded rod.

Installation: Tighten the two rods until each all-thread rod can be fully seen in the witness hole.

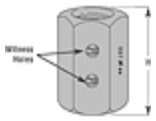
Gallery:

roll over images below to see larger image





CNW allows fast visual check for correct all thread rod installation.



Standard Coupler ATS-C

High Strength Coupler ATS-HSC

Sta
Tra
Co

High Strength Transition Coupler

CNW Couplers:

Model No.	Rod Dia. (in)	H Min. (in)
CNW½	0.50	1½
CNW⅝	0.625	1⅞
CNW¾	0.75	2
CNW⅞	0.875	2 3/16

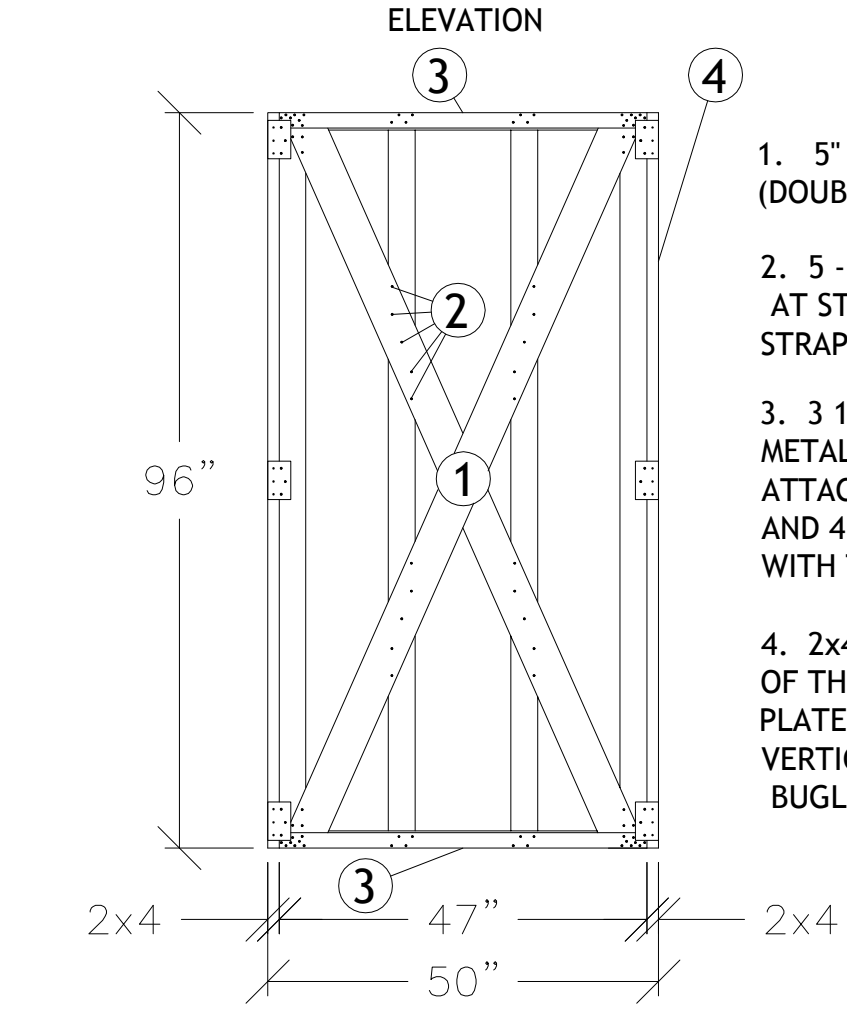
Standard Couplers and High Strength Couplers:

Model	A (in)	B (in)	Hole Dia. (in)	t (in)
ATS-3B	3	3	9/16	3/8
ATS-3C	4	3	11/16	3/8
ATS-3D	5½	3	11/16	½
ATS-3E	5½	3½	13/16	5/8
ATS-3G	6	3½	15/16	5/8
ATS-3J	8	3½	15/16	7/8
ATS-3K	9	3½	1 1/16	7/8
ATS-3U	6½	3½	9/16	5/8
ATS-3V	8½	3½	11/16	7/8
ATS-3W	10	3½	13/16	1
ATS-3WW	10	3½	1 1/16	1 1/8
ATS-3X	11	3½	13/16	1 3/8
ATS-3Y	12	3½	13/16	1 1/4
ATS-3Z	13	3½	15/16	1½
ATS-3ZZ	13	3½	1 3/16	1½
ATS-3ZX	15	3½	1 5/16	1½

1. Other plates available, contact Simpson.

Section 18.1: 3 1/2" & 4" Shear Panel Detail

Refer to Section 9.3 for table

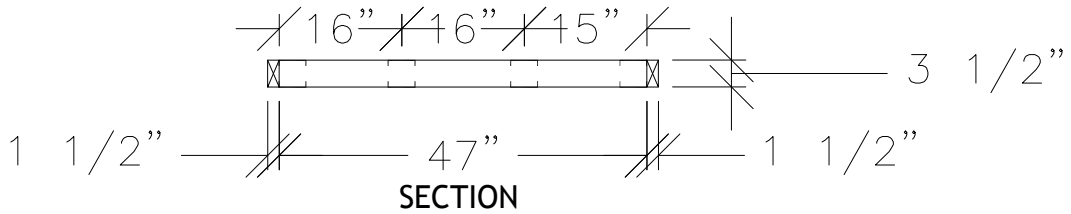


1. 5" 24GA METAL STRAP (DOUBLE THICKNESS) EXTERIOR SIDE ONLY

2. 5 - #8 x 1/2" SCREWS AT STUD AND DIAGONAL STRAP INTERSECTION

3. 3 1/2" x 3" x 47" 16GA METAL CHANNEL (TOP & BOTTOM). ATTACHED WITH 6 SCREWS ON THE CORNERS AND 4 SCREWS AT THE INTERSECTION WITH THE VERTICAL STUDS.

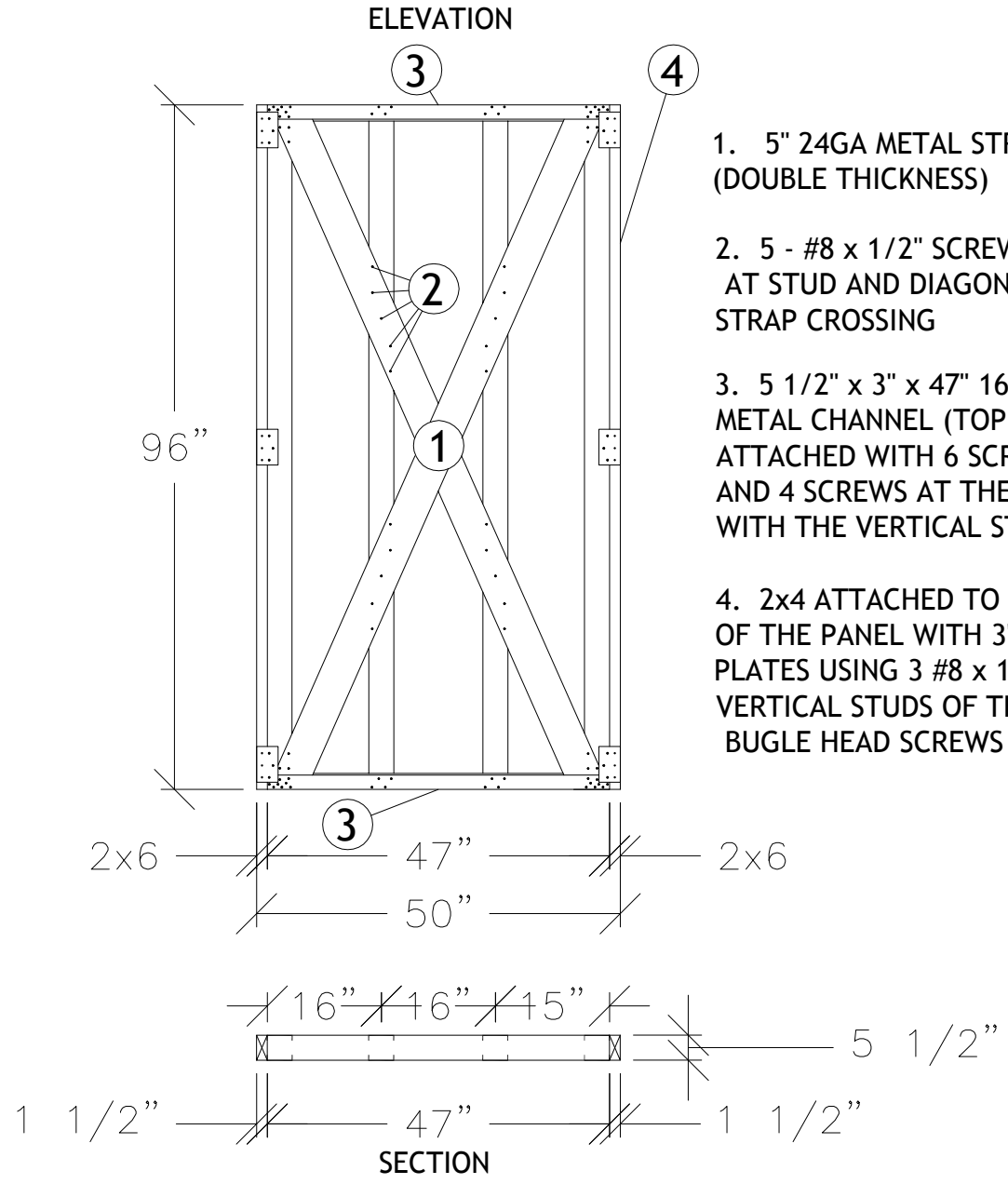
4. 2x4 ATTACHED TO THE VERTICAL SIDES OF THE PANEL WITH 3" x 5" x 20GA ATTACHMENT PLATES USING 3 #8 x 1/2" SCREWS INTO THE VERTICAL STUDS OF THE PANEL AND 3 - 1 1/2" BUGLE HEAD SCREWS INTO THE 2x4.



SECTION

Section 18.2 - 5 1/2" Shear Panel Detail

Refer to Section: 10.3 for Tables



1. 5" 24GA METAL STRAP (DOUBLE THICKNESS)

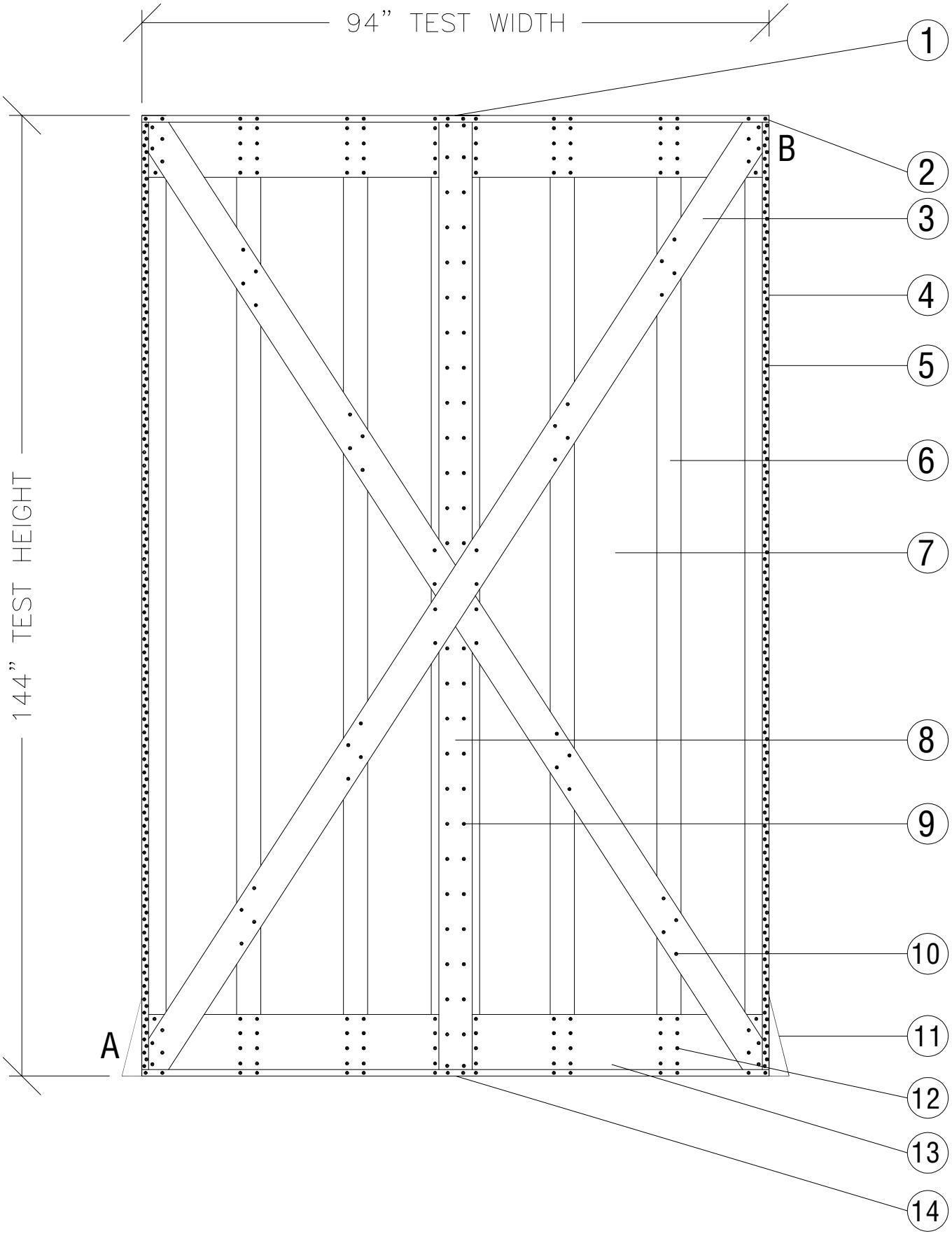
2. 5 - #8 x 1/2" SCREWS AT STUD AND DIAGONAL STRAP CROSSING

3. 5 1/2" x 3" x 47" 16GA METAL CHANNEL (TOP & BOTTOM). ATTACHED WITH 6 SCREWS ON THE CORNERS AND 4 SCREWS AT THE INTERSECTION WITH THE VERTICAL STUDS.

4. 2x4 ATTACHED TO THE VERTICAL SIDES OF THE PANEL WITH 3" x 5" x 20GA ATTACHMENT PLATES USING 3 #8 x 1/2" SCREWS INTO THE VERTICAL STUDS OF THE PANEL AND 3 - 1 1/2" BUGLE HEAD SCREWS INTO THE 2x4.

Section 18.2.1 Page 1

5 1/2" x 94" x 144" Racking Shear with X-Brace



Racking Shear Description - 5 1/2" x 94" x 144" with X-brace

1. 16 GA 5 1/2" x 1" TOP TRACK
2. #8 1/2" TECH SCREWS; 2 SCREWS PER STUD (TOP & BOTTOM)
3. 5" 20GA STRAP
4. 18GA 5 1/2" x 2" TRACK
5. #8 1/2" TECH SCREWS; 2" O.C. STAGGERED
6. 20GA CSW unpunched @ 16" O.C.
7. EXPANDED POLYSTYRENE
8. 5" 20GA STRAP
9. #8 1/2" TECH SCREWS; 5 1/4" O.C.
10. #8 1/2" TECH SCREWS; 4 SCREWS AT EACH STUD
11. USP #TD10S (OR EQUIVALENT) TIE DOWN CONNECTOR
    USE 30 #10 HEX HEAD SCREWS INTO 18GA 5 1/2" x 1" TRACK FOR CONNECTION
12. #8 1/2" TECH SCREWS; 8 SCREWS AT EACH STUD
13. 18GA 9 1/4" x 3/4" ANGLE (TOP & BOTTOM OF WALL)
14. 18GA 5 1/2" x 1" BOTTOM TRACK

DETAIL SHOWN ARE TO BE APPLIED TO BOTH SIDES OF THE WALL

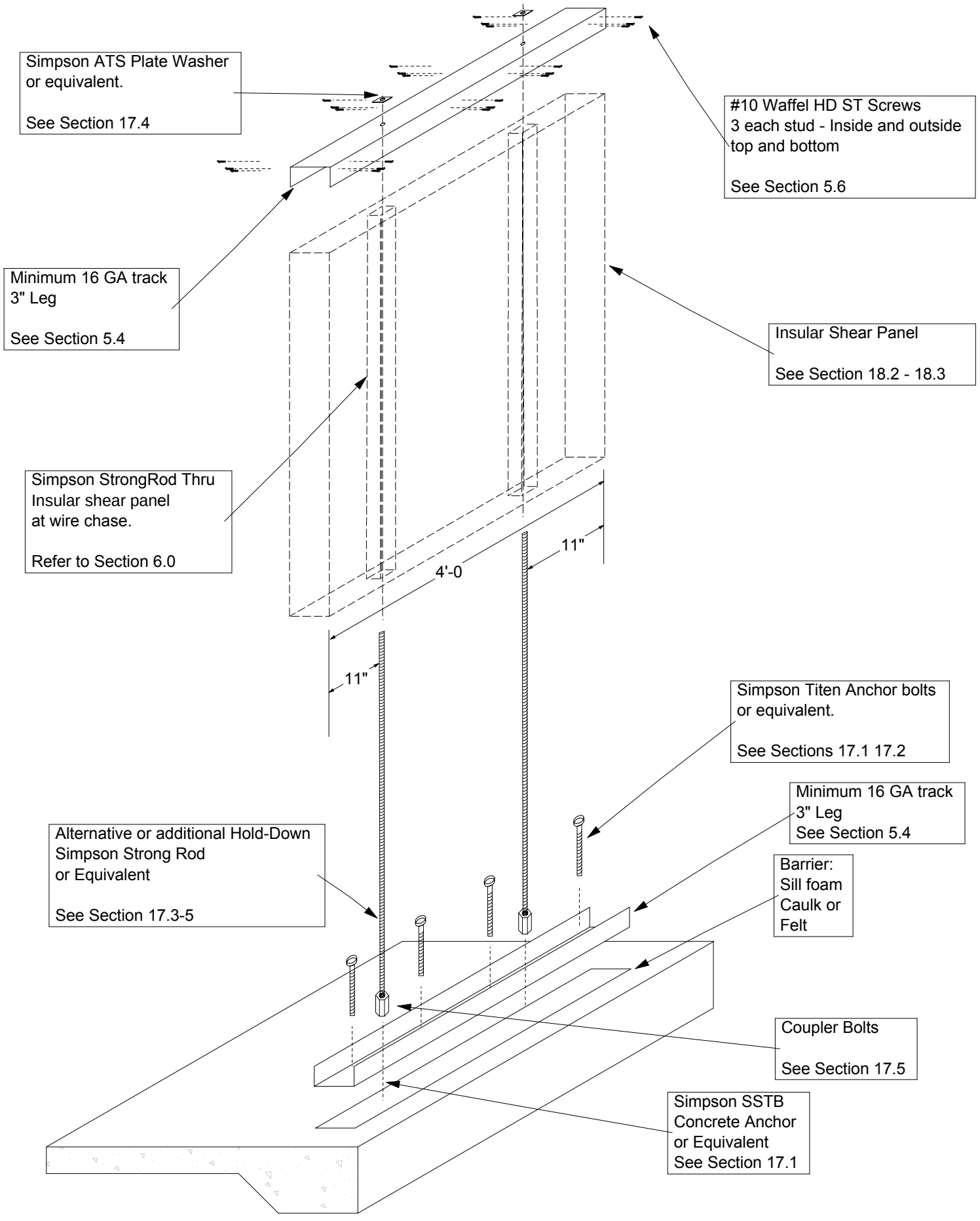
TEST RESULTS
3/16/04
(A & B REPRESENT INDICATOR DIAL LOCATIONS)

PSI	811	1625	2433
A	.009	.013 (Returned to .003)	.017 (Returned to .003)
B	.137	.182 (Returned to .010)	.235 (Returned to .013)

DEFLECTION

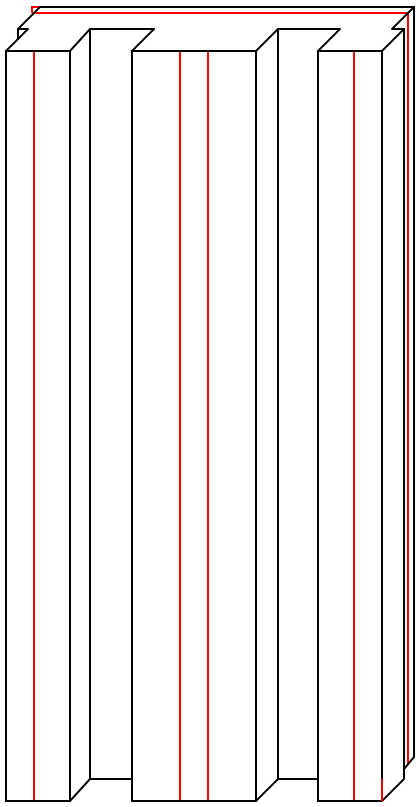
ULTIMATE: 2500 PSI ON RAM JACK (6.49, THE AREA OF THE RAM) = 16,225/8 = 2028.125/2.5 SF = 811.25 # PER FOOT

Section 18.3 - Shear Panel Hold Down Alternatives



Insular Corp

CONCRETE T – BEAM PANEL STRUCTURAL ANALYSIS



CONCRETE T - BEAM PANEL

DATE: 20 NOV-98	CONCRETE T - BEAM PANEL STRUCTURAL ANALYSIS	JOB # :
DRAFTER: C. WHITT		SHEET # : COVER

Section 19.2

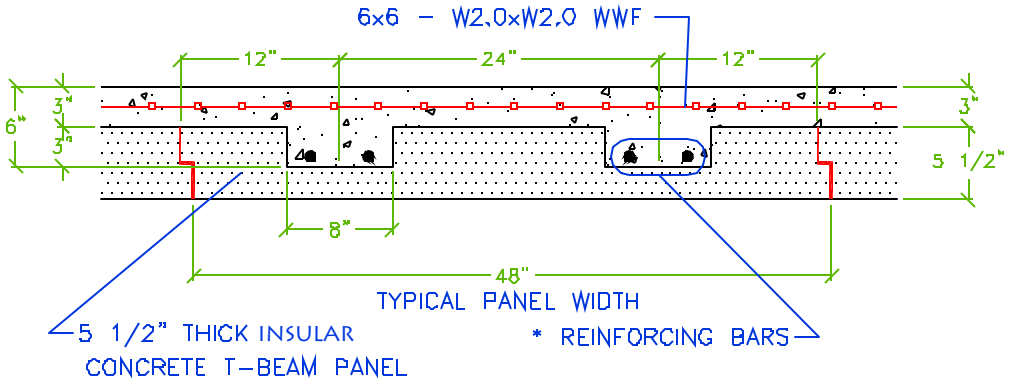


FIG. 1 - FPB - 1 & RPB - 1

* 2X THE BAR DIAMATER ABOVE BOTTOM OF POCKET

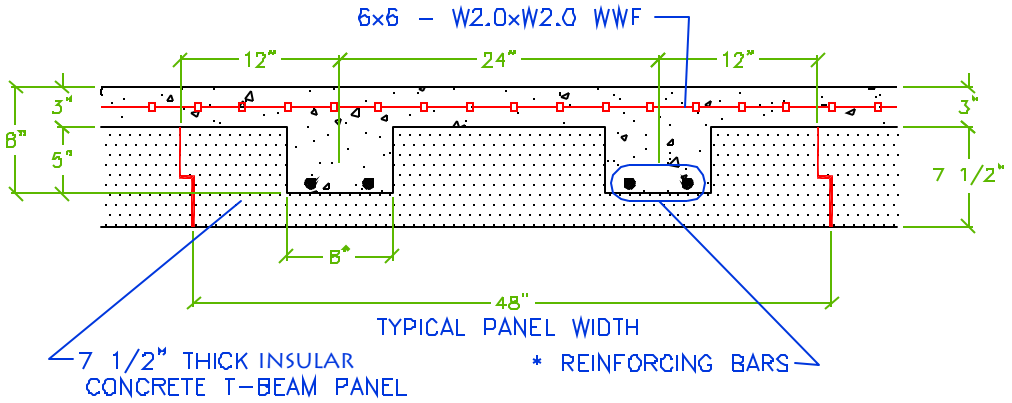


FIG. 2 - FPB - 2 & RPB - 2

* 2X THE BAR DIAMATER ABOVE BOTTOM OF POCKET

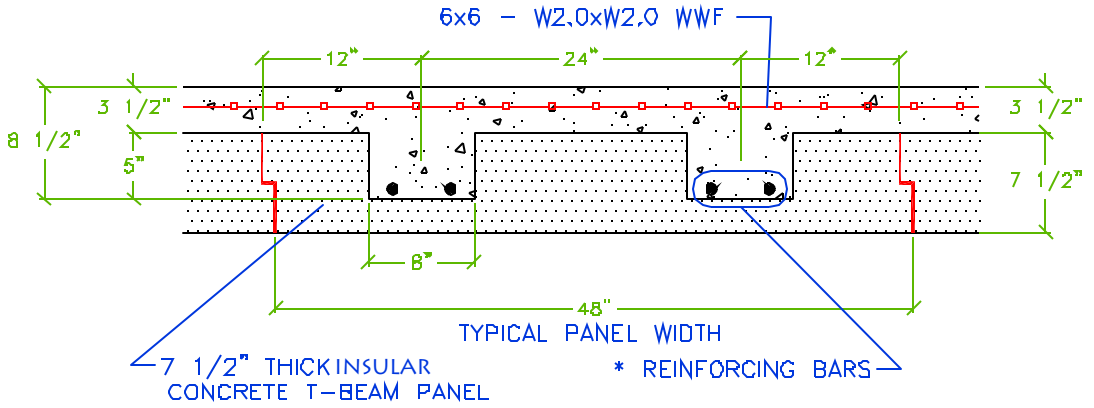


FIG. 3 - FPB - 3

* 2X THE BAR DIAMATER ABOVE BOTTOM OF POCKET

DATE: 20 NOV-98	CONCRETE T - BEAM PANEL STRUCTURAL ANALYSIS	JOB # :
DRAFTER: C. WHITT		SHEET # : 1 OF 3

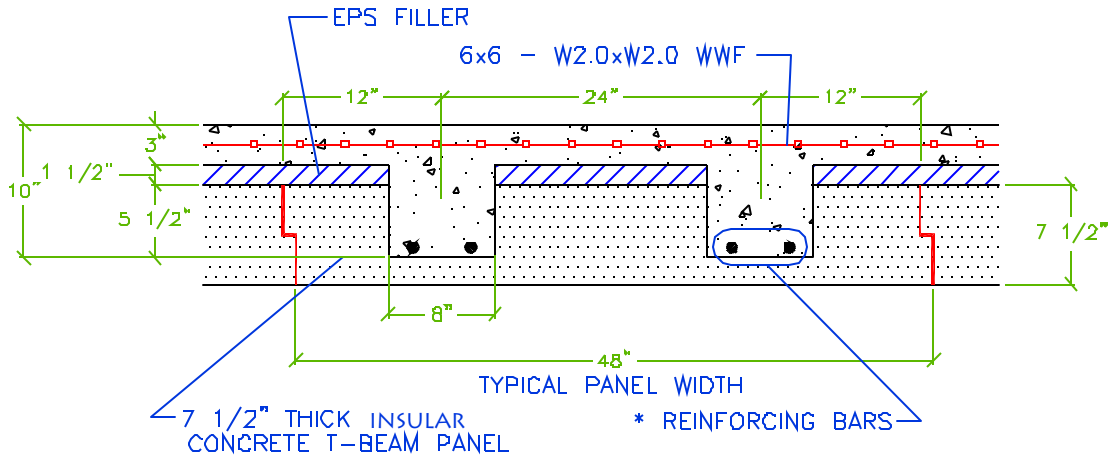


FIG. 4 - RPB - 3 & FPB - 4

* 2X THE BAR DIAMATER ABOVE BOTTOM OF POCKET

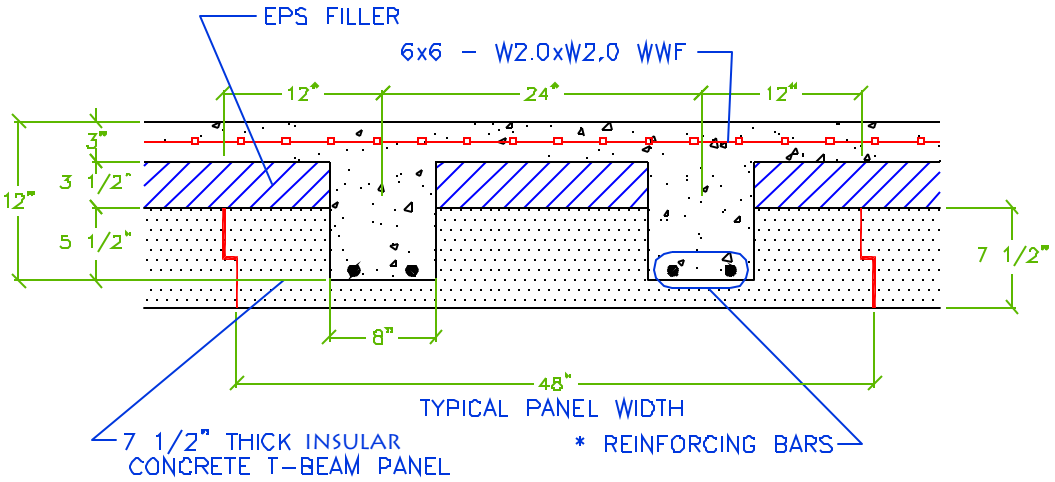


FIG. 5 - RPB - 4 & FPB - 5

* 2X THE BAR DIAMATER ABOVE BOTTOM OF POCKET

DATE: 20 NOV-98	CONCRETE T - BEAM PANEL STRUCTURAL ANALYSIS	JOB # :
DRAFTER: C. WHITT		SHEET # : 2 OF 3

STRUCTURAL ANALYSIS FOR FLOORS AND ROOFS USING INSULAR "T"-BEAM PANEL

TYPE OF FLOOR PANELLING	SPAN (FT)	RESISTING MOMENT (FT-LBS)	REINFORCING BARS (BOTTOM)
FPB -1 (SEE FIG. 1)	**10**	**3670**	**2 - # 4**
	12	**5290**	**2 - # 5**
FPB - 2 (SEE FIG. 2)	**14**	**7840**	**2 - # 5**
	16	**10240**	**2 - # 5**
	18	**12960**	**2 - # 6**
FPB - 3 (SEE FIG. 3)	**20**	**16250**	**2 - # 6**
FPB - 4 (SEE FIG. 4)	**22**	**20180**	**2 - # 6**
FPB - 5 (SEE FIG. 5)	**24**	**26650**	**2 - # 6**

TYPE OF ROOF PANELLING	SPAN (FT)	RESISTING MOMENT (FT-LBS)	REINFORCING BARS (BOTTOM)
RPB -1 (SEE FIG. 1)	**10**	**2750**	**2 - # 4**
	12	**3960**	**2 - # 4**
	14	**5400**	**2 - # 5**
RPB - 2 (SEE FIG. 2)	**16**	**7040**	**2 - # 5**
	18	**9850**	**2 - # 5**
	20	**12150**	**2 - # 6**
RPB - 3 (SEE FIG. 4)	**22**	**16100**	**2 - # 6**
	24	**19160**	**2 - # 6**
RPB - 4 (SEE FIG. 5)	**26**	**24420**	**2 - # 6**
	28	**28330**	**2 - # 7**
	30	**32520**	**2 - # 7**

SPECIFICATIONS: INSULAR CORP- Manufacturer of Pre-Insulated Steel Framing components for Walls, Floors and Roof.

PART 1 – GENERAL

1.01 RELATED WORK

(Note: Edit as required for application)

A. Division 03: Concrete
B. Division 05: Metals
C. Division 07: Thermal and Moisture Protection
D. Division 09: Finishes
E. Division 15: Mechanical
F. Division 16: Wiring and Electrical Devices

1.02 QUALITY ASSURANCE

A. Fabrication installer shall be acceptable to panel manufacturer
B. When possible field measurements shall be taken prior to completion of shop manufacturing and finishing. Do not delay job progress.
C. Maximum deviation from vertical and horizontal alignment of erected panels 0.06cm (1/4in) in 6.0 m (20ft)

1.03 REFERENCES

A. ICC Legacy Report – PFC4216 - www.iccsafe.org/esreports/pfc4216.pdf
B. ICBO Evaluation Services, Inc. Report PFC-4216
C. HUD Structural Engineering Bulletin #1072
D. BOCA Evaluation Services, Inc. Report 91-40
E. SBCCI-# 2143
F. Manufacturers handbook of construction details
G. Manufacturers Engineering Data
H. Manufacturers Design Manual
I. Manufacturers Assembly Manual

1.04 SUBMITTALS

A. Submittals shall be in accordance with Section: 1.03
B. Samples
    1. Insulated Steel Framing Panel Assembly
        a. One sample for each type of assembly. 30.5cm (12 in) by 30.5cm (12 in) minimum.
        b. Shop Drawings: Show panel layout in plan and elevation; Detail fastening and Anchoring methods.
        c. Manufacturers literature for panel material

1.05 DELIVERY, STORAGE AND HANDLING

A. Unload panels by hand or use forklift only with pallet to prevent damage to panel.
B. Inspect materials upon delivery. File freight claim for panels damaged during shipment And order replacement panels without delay. Do not install damaged panels.
C. Store materials in compliance with manufacturer's recommendations.

PART II – PRODUCTS

2.01 ACCEPTABLE MANUFACTURER

Insular Corp.
PO Box 339, Severna Park, MD 21146
Phone: 410-974-0000 Fax: 410-974-0500

2.02 PANELS

A. Insulated steel framing panels for floors, walls and roofs.
   1. Panels are a molded to form a composite of expanded polystyrene and galvanized steel.
   2. Expanded polystyrene core is manufactured from code-lined beads modified with flame and smoke retardants. 3 ½" (88.9mm) and 4"(101.6mm) panel is 1.5 pcf ±10% density; 5 ½" (139.7mm) panel is 1.0 pcf ± 10% density, 7 ½" (190.5mm) panel is 1.0 pcf ± 10% density.
   3. Metal is 24-Gauge steel, 37,000 psi minimum yield strength galvanized (ASTM A525 G-90). Metal can also be combinations of 20-Gauge or 18 Gauge CSJ, CSW (G-60) with Insular channels engineered to meet the design loads.
      2" x 3", 3" x 3" and 4" x 4" galvanized steel posts may be utilized to handle concentrated loads.
   4. Standard Panel Dimensions
      a) Thickness: 3 ½", 4", 5 ½", and 7 ½"
      b) Width: 48"(1.22 m)
      c) Length (Height): up to 144" (3.657m)
      d) Ship-lap on either side of panel length (height) is 1"wide.
      e) Metal studs 24" on center and 16" on center

B. Fire Smoke Ratings
   1. Panels have been tested as a wall system with gypsum wallboard thermal barriers for 15-minute 1-hour and 2-hour ratings.
   2. UL Flame Spread Rating
      a) 3 ½", 1.5 PCF density is 5 to 10
      b) 5 ½", 1.0 PCF density is 5 to 20
      c) 7 ½", 1.0 PCF density is 5 to 20
   3. UL Smoke Developed Rating – 55-175

      UL Flame/Smoke rating ranges are from the manufacturers of the EPS beads and were determined while the material remained in the original test position.

C. Sound transmission class ratings (ASTM E50 – E413)
   1. Panels finished with gypsum wallboard as a wall system
      a) 3 ½" panel STC 37
      b) 3 ½" partition STC 36
      c) Party wall STC 51
      d) Party wall STC 60
      e) Double 3 ½" panels with 2" air space STC-57. Other materials may be used on panels for other STC ratings.

D. Thermal Performance (ASTM-C51R, Aged R Values) & Vapor Transmission

US	Metric	@ 40°F	@ 75°F	Water Vapor Transmission
2 3/4"	(70 mm)	R-13 ; U=0.07	R-12 ; U=0.08	
3 1/2"	(89 mm)	R-16 ; U=0.06	R-15 ; U=0.066	.6 Perms
4"	(102 mm)	R-18 ; U=0.05	R-17 ; U=0.058	
5 1/2"	(140 mm)	R-24 ; U=0.04	R-23 ; U=0.04	.5 Perms
7 1/2"	(190 mm)	R-34 ; U=0.03	R-32 ; U=0.03	

Due to the following factors: Reduction of air infiltration; Elimination of thermal bridges; Effect of the interior and exterior cladding; Effect of ship lap joints; the effective R & U-Values may be 34% over theoretical. E.g. A 3 1/2" wall panel with no penetrating 2 x 4's with exterior and interior finish is effective R-22; 5 1/2" wall panel with no penetrating 2 x 6's with exterior and interior finish is effective R-33.

Studies conducted at the Oak Ridge National Laboratory* stated R-Value of virtually every product on the market evaluated in the "real world" of thermal breaks such as, corners, windows, and doors and stud walls was drastically reduced... except Structural Insulated Panels. 2" x 6" stud wall 24" on center with R-19 fiberglass batts test results show an R-Value of 13.7. Structural Insulated Panel wall tested at R-21.7.

*ASHRAE Journal March 1996, Christian and Kosny Publications available at www.ashrae.org

E. Structural Ratings (refer to the latest manufacturer's design guide for values with appropriate safety factors or refer to applicable building code for listed values.

2.03 OPTIONS AND ACCESSORIES:

A. Insulated Steel Framing Panel options:
   1. Panel widths of 24" and 36"
   2. "T' Panel for floors and roof.
   3. Standard Component configurations allowing for field modification.
   4. Foam filler panel for non-standard widths.
   5. No lap (Butt Edges)
   6. Beveled sides or top.
   7. Door, window, etc. rough openings with metal surround molded in panel.
   8. Electrical chases vertical 3" x 1" at 24" on center and 3" x 1" horizontal at 9" above bottom or below top of panel.
   9. Insul-Headers and Lintels.
   10. Metal or wood surrounds for openings.
   11. Additional steel profiles including tubing can be implemented to increase capacity.

B. Accessories
   1. Screws, track, clip plates, etc for attachment of the Insular System
   2. Panel dimensions: Allowance for field adjustments as recommended where final dimensions cannot be verified by field measurements before completion of shop manufacturing.
   3. Panel lines, lineals and angles shall be always true and surface free from warp or buckle.

PART III – EXECUTION

3.01 INSPECTION

A. Surfaces to receive panels shall be even, smooth, clean, dry and free from defects detrimental to work.

3.02 INSTALLATION

A. Erect panels plumb, level and true. Refer to Manufacturer's Assembly Manual.
B. Anchor panels securely in place, provide for necessary thermal and structural movement.
C. Installation shall be made in accordance with manufacturer's recommended procedures and layout drawings. Manufacturer's Handbook of Construction Details shall be used as a guide and for details wherever applicable.
D. No face penetrations or perforations shall be made in metal on panels by fasteners without architect's prior approval.
E. Exercise proper care during installation to avoid damage or scratching of the panels. Avoid walking over the metal roof after installation is completed.
F. Utilize proper on site fire protection during installation.
G. Protect panels from flame and weldment.

3.03 ADJUSTING AND CLEANING

A. Remove and replace panels that have damaged metal.
B. Repair minor damage to insulation core.
C. Clean exposed panel surfaces promptly after completion of installation in accordance with recommendation of panel manufacturer.
D. Remove all debris resulting from work of this section.