

NEGATIVE LOAD SPAN CHART FOR : PETERSEN BOX RIB SERIES BOX RIB 4 @ 12" X 24 GA. STEEL (w/ SCREW LEG)						
Span, ft.	TWO EQUAL SPANS			THREE EQUAL SPANS		
	W (psf)	Re	Ri	W (psf)	Re	Ri
1.00	86.08	32.3	107.6	97.82	39.1	107.6
1.25	68.86	32.3	107.6	78.25	39.1	107.6
1.50	57.39	32.3	107.6	65.21	39.1	107.6
1.75	49.19	32.3	107.6	55.90	39.1	107.6
2.00	43.04	32.3	107.6	48.91	39.1	107.6
2.25	38.26	32.3	107.6	43.47	39.1	107.6
2.50	34.43	32.3	107.6	39.13	39.1	107.6
2.75	31.30	32.3	107.6	35.57	39.1	107.6
3.00	28.69	32.3	107.6	32.61	39.1	107.6
3.25	26.49	32.3	107.6	30.10	39.1	107.6
3.50	24.59	32.3	107.6	27.95	39.1	107.6
3.75	22.95	32.3	107.6	26.08	39.1	107.6
4.00	21.52	32.3	107.6	24.45	39.1	107.6

W = Allowable Uniform Wind Load, psf

Re = End Support Reaction, 107.6 #/ft. of panel

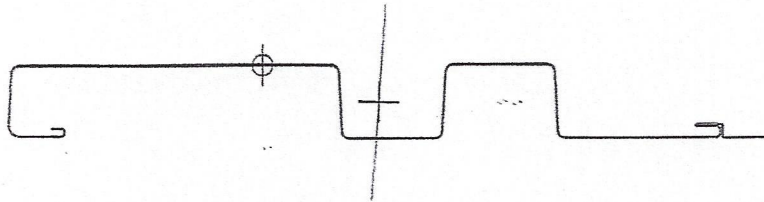
Ri = Intermediate Support Reaction, 107.6 #/ft. of panel

Deflection Limit = L/180

$F_y = 40$ ksi

$I_{xx} = 0.1361$ in⁴

$S_{xx} = 0.1211$ in³

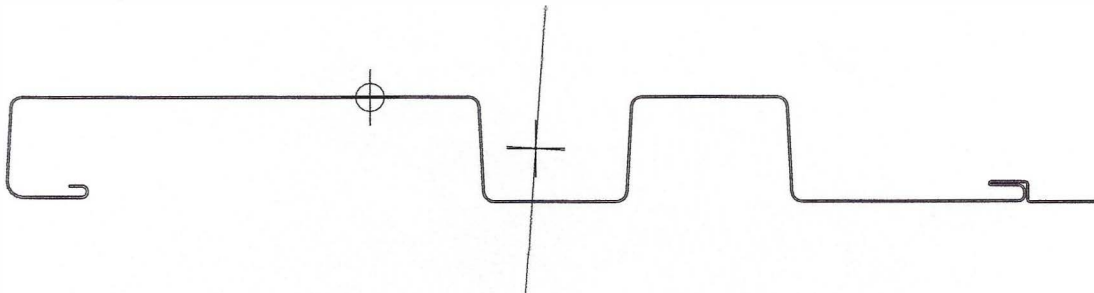


$$\underline{(+I_{xx}/77 = 0.1088 \text{ in}^4/77}$$

$$\underline{(+S_{xx}/77 = 0.1211 \text{ in}^3/77}$$

$$\underline{(-)I_{xx}/77 = 0.1473 \text{ in}^4/77}$$

$$\underline{(-)S_{xx}/77 = 0.1826 \text{ in}^3/77}$$



$$\underline{(+I_{EFF}/77 = (.71 \times 0.1088) + (.29 \times 0.1473) = 0.1200 \text{ in}^4/77}$$

$$\underline{(-)I_{EFF}/77 = (.71 \times 0.1473) + (.29 \times 0.1088) = 0.1361 \text{ in}^4/77}$$

Section: PETERSEN BOX RIB - 4 PANEL_NAIL STRIP - 12 X 24 GA..cfss

PETERSEN BOX RIB - PANEL - 12" X 24 GA.

Design Dynamics, Inc.

BOX RIB - 4 W/ NAIL STRIP

1333 W. McDermott Dr., Suite 150

Rev. Date: 8/13/2018 10:27:05 AM

Allen, Texas 75013

By: Thomas M. Shingler, PE

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Section Inputs

Material: A653 SS Grade 40

Apply cold work of forming strength increase.

No inelastic reserve strength increase.

Modulus of Elasticity, E 29500 ksi

Yield Strength, Fy 40 ksi

Tensile Strength, Fu 55 ksi

Torsion Constant Override, J 0 in⁴

Warping Constant Override, Cw 0 in⁶

Part 1, Thickness 0.024 in

Placement of Part from Origin:

X to center of gravity 0 in

Y to center of gravity 0 in

Outside dimensions, Open shape

	Length (in)	Angle (deg)	Radius (in)	Web	k Coef.	Hole Size (in)	Distance (in)
1	0.2500	0.000	0.12500	None	0.000	0.0000	0.1250
2	0.1680	-90.000	0.06000	None	0.000	0.0000	0.0840
3	0.1000	-180.000	0.06000	None	0.000	0.0000	0.0500
4	0.9670	-180.000	0.12500	None	0.000	0.0000	0.4835
5	1.3150	87.000	0.18750	Single	0.000	0.0000	0.6575
6	6.0000	0.000	0.12500	None	0.000	0.0000	3.0000
7	1.3750	-87.000	0.12500	Single	0.000	0.0000	0.6875
8	1.8440	0.000	0.12500	None	0.000	0.0000	0.9220
9	1.3750	87.000	0.12500	Single	0.000	0.0000	0.6875
10	2.0000	0.000	0.12500	None	0.000	0.0000	1.0000
11	1.3750	-87.000	0.12500	Single	0.000	0.0000	0.6875
12	3.0000	0.000	0.12500	None	0.000	0.0000	1.5000
13	0.2280	90.000	0.07550	None	0.000	0.0000	0.1140
14	0.4800	180.000	0.07550	None	0.000	0.0000	0.2400
15	0.0640	90.000	0.00800	None	0.000	0.0000	0.0320
16	0.0600	0.000	0.00800	None	0.000	0.0000	0.0300
17	0.4550	0.000	0.01875	None	0.000	0.0000	0.2275
18	0.2800	-90.000	0.01875	None	0.000	0.0000	0.1400
19	0.9650	0.000	0.01875	None	0.000	0.0000	0.4825

Full Section Properties

Area	0.51080 in ²	Wt.	0.0017367 k/ft	Width	21.283 in
Ix	0.183 in ⁴	rx	0.5985 in	Ixy	-0.619 in ⁴
Sx(t)	0.2682 in ³	y(t)	0.6822 in	α	86.192 deg
Sx(b)	0.2599 in ³	y(b)	0.7042 in		
Zx	0.2919 in ³	Height	1.3864 in		
Iy	9.447 in ⁴	ry	4.3006 in	x _o	-2.1162 in
Sy(l)	1.3945 in ³	x(l)	6.7747 in	y _o	0.6645 in
Sy(r)	1.3037 in ³	x(r)	7.2467 in	jx	1.5636 in
Zy	1.8885 in ³	Width	14.0214 in	jy	-6.2148 in

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I_1	9.488 in ⁴	r_1	4.3100 in	Cw	2.9173 in ⁶
I_2	0.142 in ⁴	r_2	0.5268 in	J	0.0000981 in ⁴
I_c	9.630 in ⁴	r_c	4.3420 in		
I_o	12.143 in ⁴	r_o	4.8758 in		

Fully Braced Strength - AISI S100-16/S1-18, US, ASD

Material Type: A653 SS Grade 40, Fy=40 ksi

Axial		Positive Bending		Positive Bending	
Pao	4.916 k	Maxo	2.900 k-in	Mayo	24.246 k-in
Ae	0.22123 in ²	Ixe	0.1088 in ⁴	Iye	7.6676 in ⁴
Ta	12.636 k	Sxe(t)	0.1211 in ³	Sye(l)	1.3007 in ³
		Sxe(b)	0.2232 in ³	Sye(r)	1.0123 in ³
Shear		Negative Bending		Negative Bending	
Vay	1.520 k	Maxo	4.373 k-in	Mayo	21.891 k-in
Vax	0.080 k	Ixe	0.1473 in ⁴	Iye	7.1426 in ⁴
		Sxe(t)	0.2541 in ³	Sye(l)	0.9139 in ³
Torsion		Sxe(b)	0.1826 in ³	Sye(r)	1.1509 in ³
Ba	12.324 k-in ²				

Section contains no web elements for horizontal shear.

DESIGN INPUT DATA FOR BOX RIB 4 X 24 GA. W/ SCREW LEG

PRODUCT PROPERTIES :

E = 29500. KSI

I = .1361 IN⁴/FT

S = .1211 IN³/FT

DESIGN PARAMETERS :

DEFLECTION = L/ 180.

ALLOW. BENDING STRESS (PSI) = 24000.0

ALLOW. END SUPPORT REACTION (#/FT) = 107.6

ALLOW. INTERMEDIATE SUPPORT REACTION (#/FT) = 107.6

LOAD-SPAN TABLE FOR BOX RIB 4 X 24 GA. W/ SCREW LEG

DEFLECIION = $L/180$.

SPAN (FT)	SIMPLE SPAN		TWO EQUAL SPAN			THREE EQUAL SPAN		
	W(PSF)	RE	W(PSF)	RE	RI	W(PSF)	RE	RI
1.00	215.20	107.6	86.08	32.3	107.6	97.82	39.1	107.6
1.25	172.16	107.6	68.86	32.3	107.6	78.25	39.1	107.6
1.50	143.47	107.6	57.39	32.3	107.6	65.21	39.1	107.6
1.75	122.97	107.6	49.19	32.3	107.6	55.90	39.1	107.6
2.00	107.60	107.6	43.04	32.3	107.6	48.91	39.1	107.6
2.25	95.64	107.6	38.26	32.3	107.6	43.47	39.1	107.6
2.50	86.08	107.6	34.43	32.3	107.6	39.13	39.1	107.6
2.75	78.25	107.6	31.30	32.3	107.6	35.57	39.1	107.6
3.00	71.73	107.6	28.69	32.3	107.6	32.61	39.1	107.6
3.25	66.22	107.6	26.49	32.3	107.6	30.10	39.1	107.6
3.50	61.49	107.6	24.59	32.3	107.6	27.95	39.1	107.6
3.75	57.39	107.6	22.95	32.3	107.6	26.08	39.1	107.6
4.00	53.80	107.6	21.52	32.3	107.6	24.45	39.1	107.6

W = ALLOWABLE UNIFORM LOAD

RE = END SOPPORT REACTION AT ALLOW. LOAD (#/FT)

RI = INTERMEDIATE SUPPORT REACTION AT ALLOW. LOAD (#/FT)