



BROCHURE

BRIDGEFORMS

Permanent Metal Deck Forms

Permanent Corrugated Steel Bridge Deck Forms

L.B. Foster's manufactured bridge forms are ideal for special design applications, tight construction schedules, quick installation processes and innovative solutions.

Permanent Corrugated Steel Bridge Deck is a heavy-duty system for forming bridge deck slabs quickly and permanently. It is fabricated from structural quality high strength, galvanized steel conforming to ASTM A 653/A 653M. A uniform zinc coating, conforming to ASTM A 924/A 924M, latest edition, coating class G-165, G-210 or G-235, protects all exposed parts of the form and adds an extra measure of durability.

Our corrugated steel bridge forms are custom fabricated to individual bridge specifications and adapt to pre-stressed concrete beams, built-up girders or steel beam bridges, with or without shear connectors. Construction is fast, safe, easy, and can be performed in a fraction of the time needed to install conventional forms. The complete operation of slab deck forming, placement of rebar, and pouring of concrete is a low-cost, smooth, and uninterrupted procedure. We also offer detailing and design services.



BENEFITS

Strength

- > Specially fabricated to sustain heavy loads
- > Adapts to most loading conditions up to 14' stringer spacing
- > Helps control moisture during curving, gives deck greater strength

Speed

- > Fabricated, bundled, marked for placement, and shipped ready for installation
- > Work is done with small crews, completed much faster than with wood forming
- > Screw fastening is fast, positive, and easy

Safety

- > Provides a solid, sure-footed working platform
- > No scaffolding or shoring is needed: removal of wooden forms no longer necessary
- > Safety factor is especially important over water, high-density roadways, railroads, electric transmission systems, high bridges, etc.

Design Loads/Construction Requirements

The metal bridge forms are designed on the basis of dead load of form plus wet weight of reinforced concrete at 240 Kg/M³ (150 pcf) plus 2.4 kPa (50 lb/sq ft) for construction loads. The unit working stress in the steel sheet shall not be more than 0.725 of the specified minimum yield strength of the material furnished but not to exceed 250 Mpa (36,000 psi). Deflection under the weight of the forms, the plastic concrete and reinforcing steel shall not exceed 1/180 of the form span or 13 mm (0.5 in.) whichever is less. However, the deflection loading will not be less than 5.8 kPa (120 lb/sq ft) total. For spans in excess of ten feet, the permissible deflection is not to exceed 19 mm (0.75 in) or L/240, which ever is less. The permissible form camber will be based on the actual dead load condition. Camber will not be used to compensate for deflection in excess of the foregoing limits.

The design span of the bridge form sheets shall be the clear span of the form plus 50 mm (2 in.) measured parallel to the form flutes. Physical design properties will be computed in accordance with requirements of the American Iron and Steel Institute Specifications for the Design of Cold Formed Steel Structural Members.





2" BRIDGE DECKING

All bridge deck forms are produced from structural quality galvanized sheet steel conforming to ASTM designation A-653. Finish is hot dipped galvanized conforming to ASTM designation A-924. Standard coating weight is G165. Other weights available. Manufactured in Bedford, PA.

2" deep x 8-½" pitch x 34" coverage



GAGE	Thickness (in)	Section Properties (per ft. of width)		Weight (psf)
		I_p (in ⁴ /ft)	S_p (in ³ /ft)	
22	0.0299	0.346	0.294	1.79
21	0.0329	0.381	0.324	1.95
20	0.0359	0.416	0.355	2.11
19	0.0418	0.484	0.412	2.44
18	0.0478	0.553	0.471	2.81
17	0.0538	0.622	0.530	3.15
16	0.0598	0.691	0.588	3.48

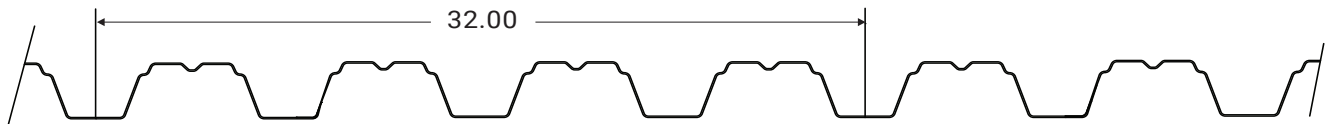
22 gage through 16 gage formed from A-653 Grade 50 or Grade 80 steel.



2½" BRIDGE DECKING

All bridge deck forms are produced from structural quality galvanized sheet steel conforming to ASTM designation A-653. Finish is hot dipped galvanized conforming to ASTM designation A-924. Standard coating weight is G165. Other weights available. Manufactured in Bedford, PA.

2-½" deep x 8" pitch x 32" coverage



GAGE	Thickness (in)	Section Properties (per ft. of width)		Weight (psf)
		I_p (in ⁴ /ft)	S_p (in ³ /ft)	
22	0.0299	0.539	0.400	1.90
21	0.0329	0.597	0.436	2.08
20	0.0359	0.651	0.476	2.25
19	0.0418	0.758	0.554	2.60
18	0.0478	0.867	0.634	2.95
17	0.0538	0.976	0.713	3.30
16	0.0598	1.084	0.793	3.66

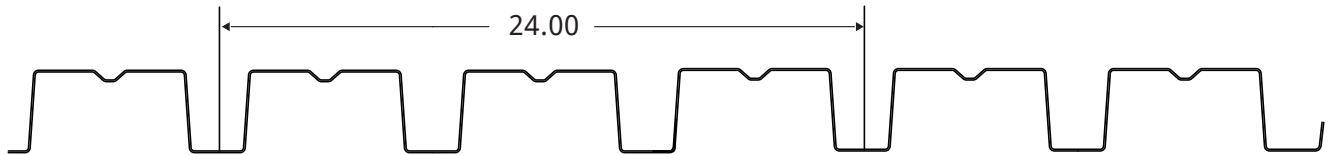
22 gage through 16 gage formed from A-653 Grade 50 or Grade 80 steel.



3" BRIDGE DECKING

All bridge deck forms are produced from structural quality galvanized sheet steel conforming to ASTM designation A-653. Finish is hot dipped galvanized conforming to ASTM designation A-924. Standard coating weight is G165. Other weights available. Manufactured in Bedford, PA.

3" deep x 8" pitch x 24" coverage



GAGE	Thickness (in)	Section Properties (per ft. of width)		Weight (psf)
		I_p (in ⁴ /ft)	S_p (in ³ /ft)	
22	0.0299	0.841	0.459	2.31
21	0.0329	0.983	0.537	2.53
20	0.0359	1.113	0.608	2.74
19	0.0418	1.296	0.708	3.17
18	0.0478	1.483	0.810	3.67
17	0.0538	1.669	0.911	4.11
16	0.0598	1.855	1.013	4.54

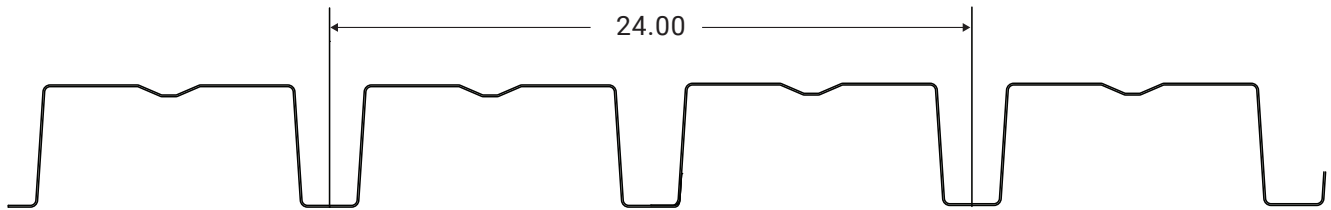
22 gage through 16 gage formed from A-653 Grade 50 or Grade 80 steel.



4½” BRIDGE DECKING

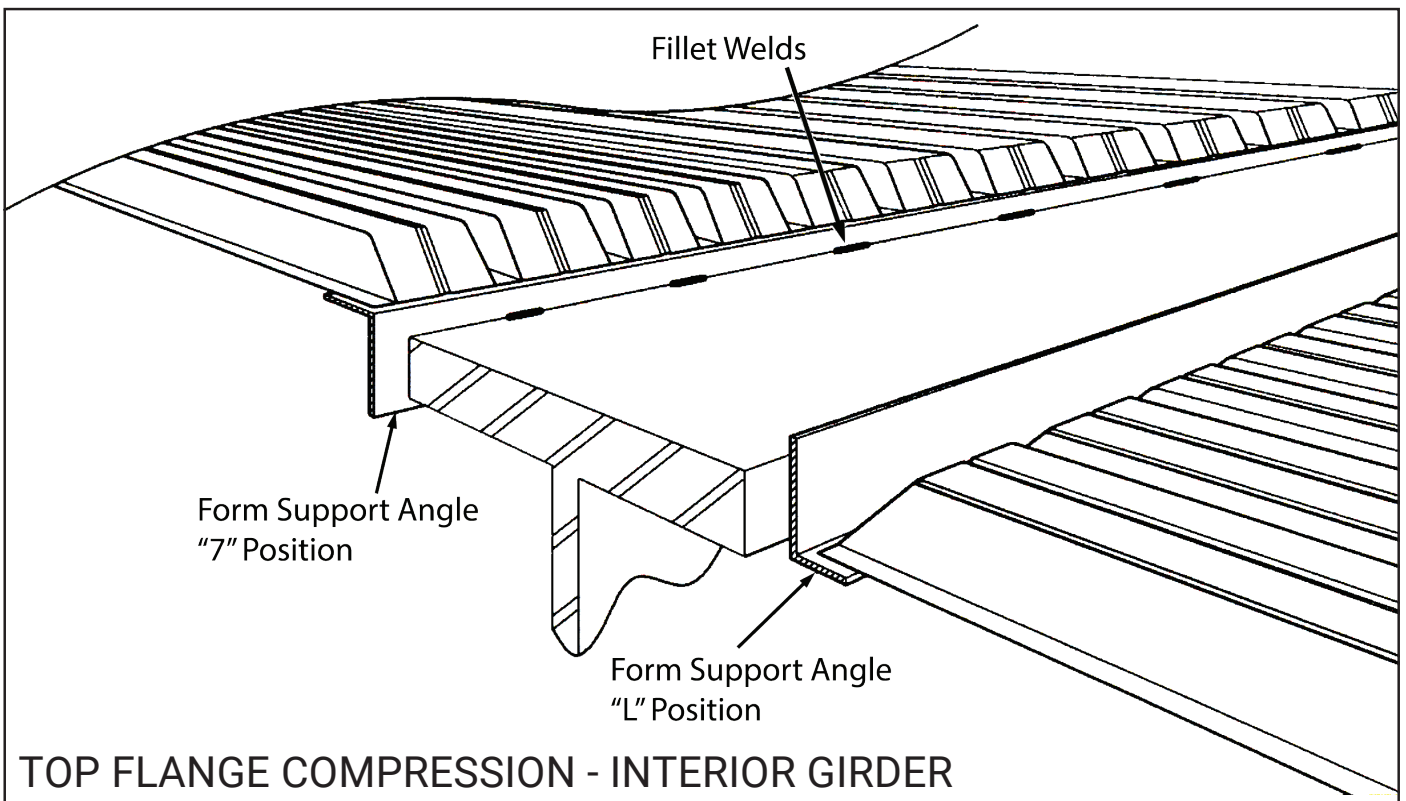
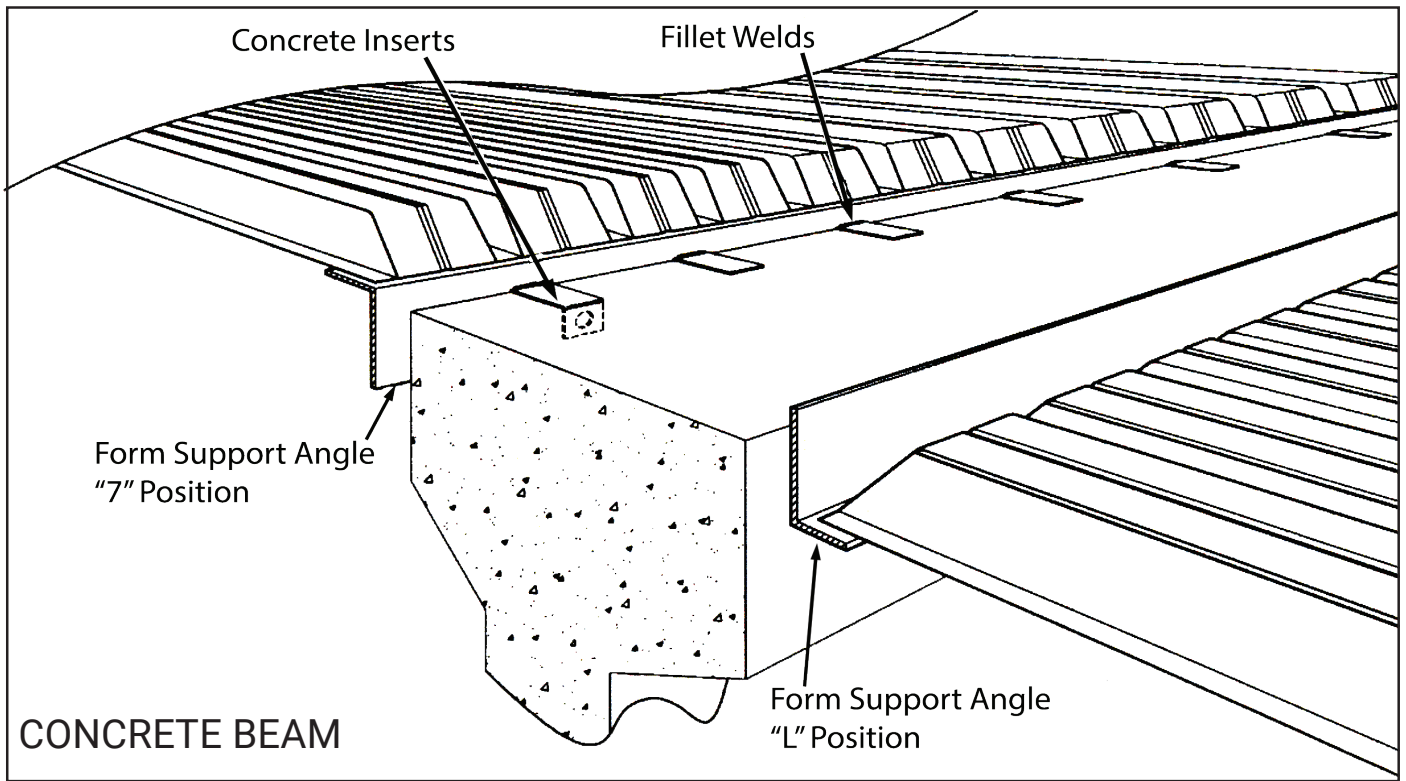
All bridge deck forms are produced from structural quality galvanized sheet steel conforming to ASTM designation A-653. Finish is hot dipped galvanized conforming to ASTM designation A-924. Standard coating weight is G165. Other weights available. Manufactured in Bedford, PA.

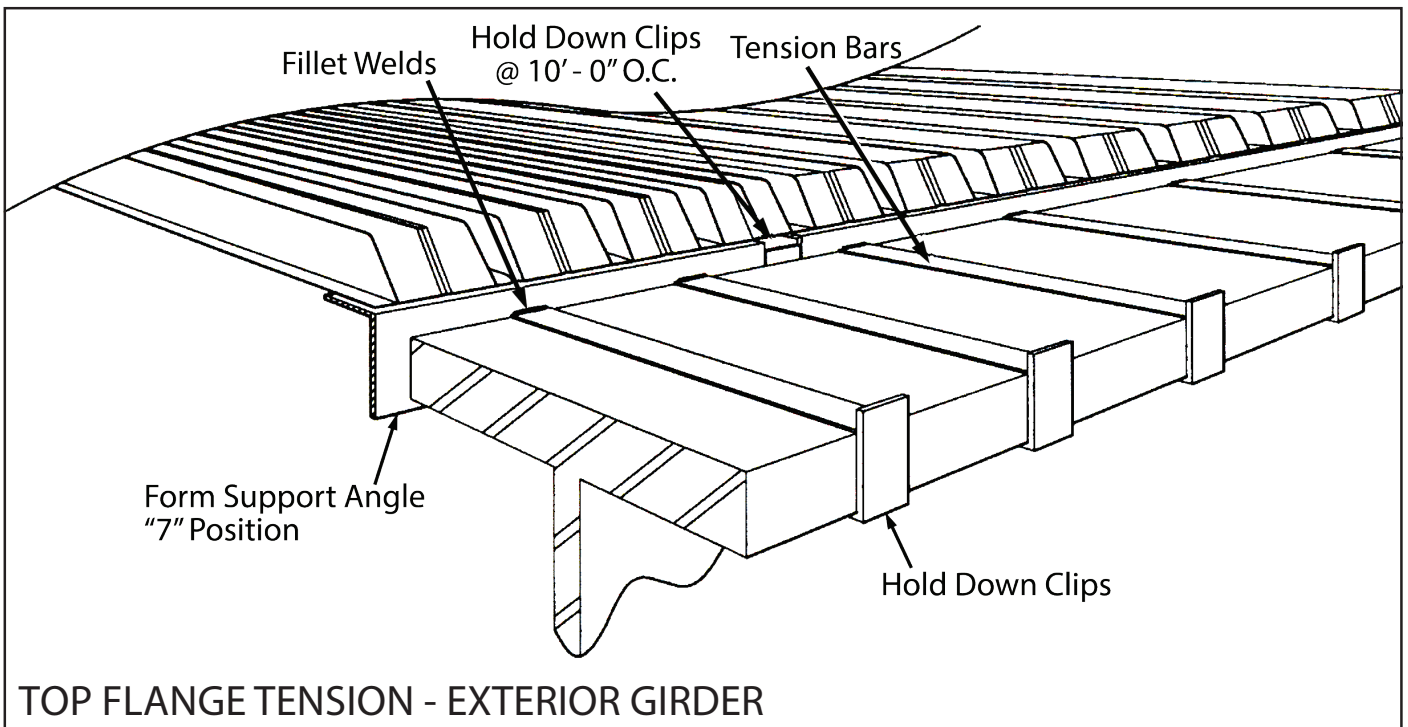
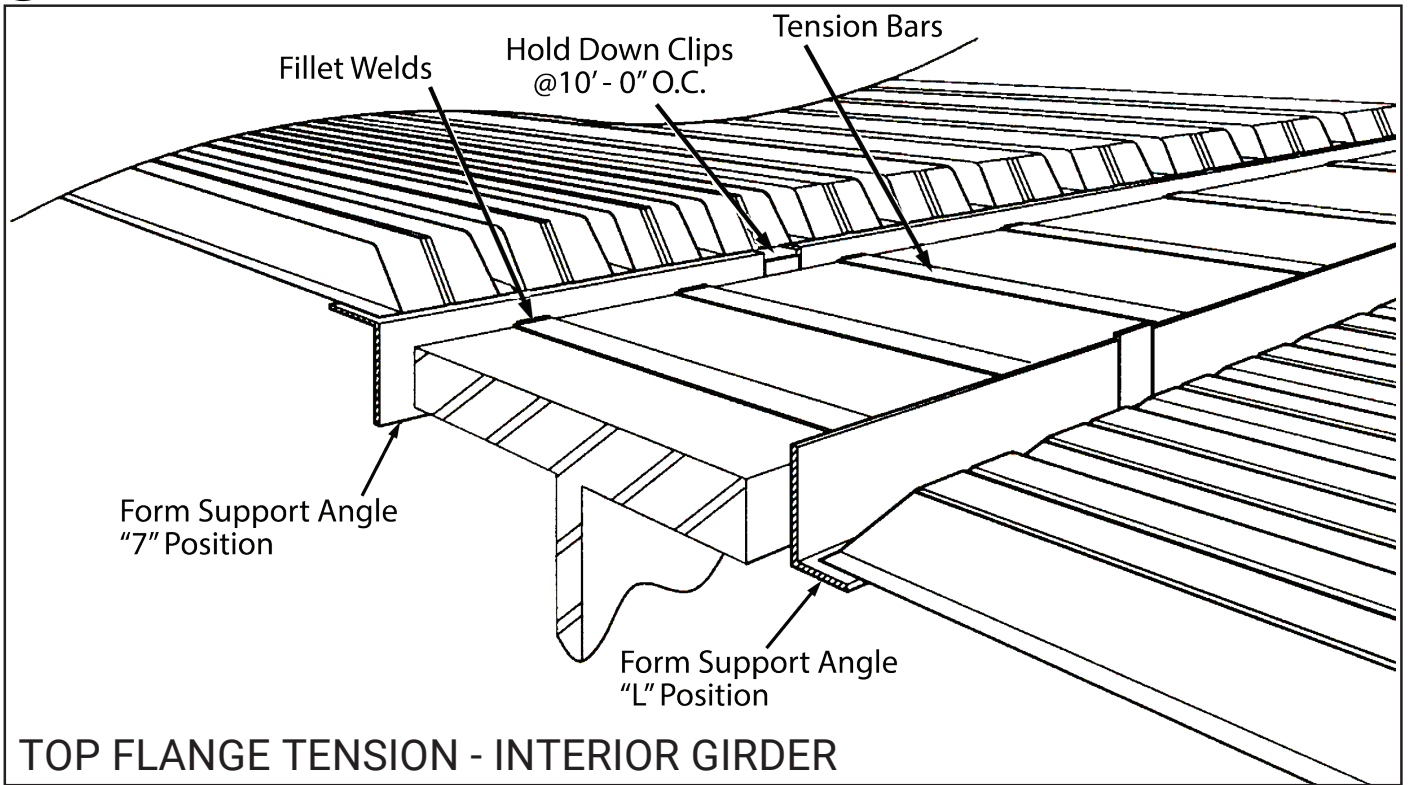
4-½” deep x 12” pitch x 24” coverage



GAGE	Thickness (in)	Section Properties (per ft. of width)		Weight (psf)
		I_p (in ⁴ /ft)	S_p (in ³ /ft)	
20	0.0359	1.886	0.653	2.79
19	0.0418	2.425	0.840	3.22
18	0.0478	3.018	1.045	3.65
17	0.0538	3.607	1.249	4.08
16	0.0598	4.009	1.388	4.51

22 gage through 16 gage formed from A-653 Grade 50 or Grade 80 steel.





Design Loads/ Construction Requirements

The metal forms shall be designed on the basis of dead load of form plus wet weight of reinforced concrete at 240 Kg/M³ (150 pcf) plus 2.4 kPa (50 lb/sq ft) for construction loads.

The unit working stress in the steel shall not be more than 0.725 of the specified minimum yield strength of the material furnished but not to exceed 250 Mpa (36,000 psi). Deflection under the weight of the forms, the plastic concrete and reinforcing steel shall not exceed 250 Mpa (36,000 psi).

Deflection under the weight of the forms, the plastic concrete and reinforcing steel shall not exceed 1/180 of the form span or 13 mm (0.5 in.), whichever is less. However, the deflection loading shall not be less than 5.8 kPa (120 lb/sq ft) total. For spans in excess of ten feet, the permissible deflection is not to exceed 19 mm (0.75 in) or L/240, whichever is less. The permissible form camber shall be based on the actual dead load condition. Camber shall not be used to compensate for deflection in excess of the foregoing limits. The design span of the form sheets shall be the clear span of the form plus 50 mm (2 in) measured parallel to the form flutes. Physical design properties shall be computed in accordance with requirements of the American Iron and Steel Institute Specifications for the Design of Cold Formed Steel Structural Members.

Design Load

Wt. of slab 9.5 x 12.5	= 118.75 PSF
Wt. of form	= <u>4.00 PSF</u>
Deflection Load	= 122.75 PSF
Construction Load	= <u>50.00 PSF</u>
Stress Load	= 172.50 PSF

Form Span

Design span shall be clear span of form sheet plus two inches.

Stringer Spacing	9'6"
Flange Width	<u>1'6"</u>
	8'0"
Support Angle Flange 2 @ 2"	-0'4"
Required End Bearing	<u>0'2"</u>
Design Span	=7'10"

Required Physical Properties

Maximum Applied Moment for single span uniformly loaded sheet.

$$M = \frac{12WL^2}{8} \text{ in.-lb.}$$

$$M = \frac{12 \times 172.5 \times 7.83^2}{8} = 15,864 \text{ in.-lbs.}$$

Section Modulus Required equals Maximum Applied Moment divided by the Allowable Working Stress, which is 29 KSI for gages 16, 17, 18, and 36 KSI for gages 19 through 22.

$$S \text{ req'd (29 KSI)} = 15,864 / 29,000 = 0.5470 \text{ in.}^3$$

$$S \text{ req'd (36 KSI)} = 15,864 / 36,000 = 0.4407 \text{ in.}^3$$

For this application:

$$\text{Allowable } \Delta = 0.50"$$

$$I \text{ required} = \frac{5WL^4 \times 1728}{384E \Delta}$$

$$I \text{ required} = \frac{5 \times 122.75 \times 7.83^4 \times 1728}{384 \times 29.5 \times 10^6 \times 0.50} = 0.7024 \text{ in.}^4$$

Select Pans

Selection of the correct gage is made from physical property table using the required physical properties previously determined.

Refer to Spec sheets for form properties

Example: Super 8 - 22 gage.

$$F = 36 \text{ KSI}$$

$$I = 0.814 \text{ in.}^4 \text{ provided } > 0.7038 \text{ in.}^4$$

$$S = 0.453 \text{ in.}^3 \text{ provided } > 0.4407 \text{ in.}^3$$

Actual Stress and Deflection

Actual Stresses (f) and Deflections (Δ) can be determined by ratios of physical properties required to those furnished.

Actual Stress

$$F_b = \frac{0.4407 (36,000)}{0.453} = 35,022 \text{ PSI}$$

Actual Deflection

$$\Delta = \frac{0.7038 (.50)}{.814} = 0.432 \text{ in.}$$



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