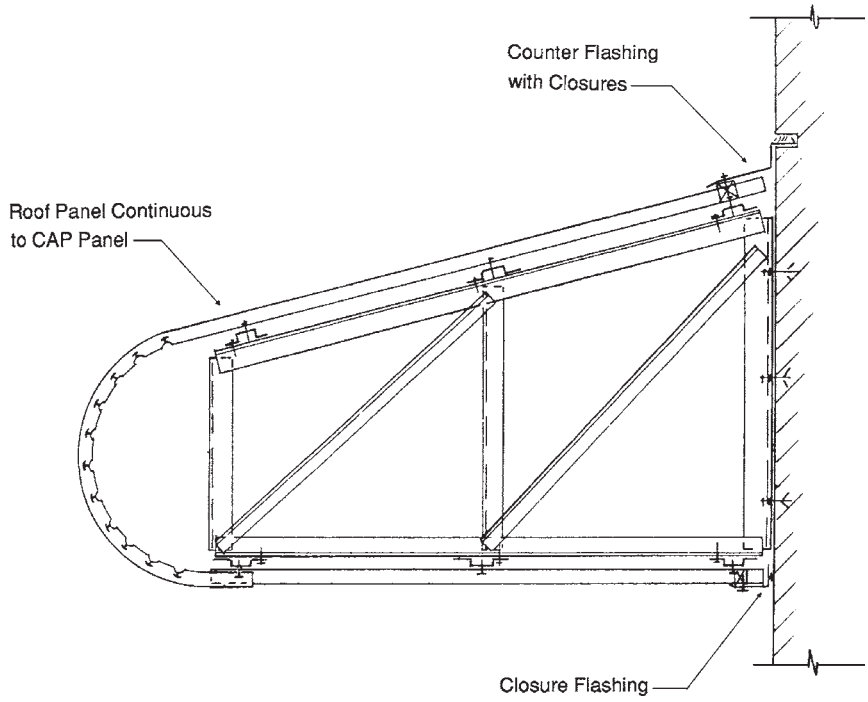


FIGURE 13.3 Bullnose canopy with soffit. (*Centria.*)

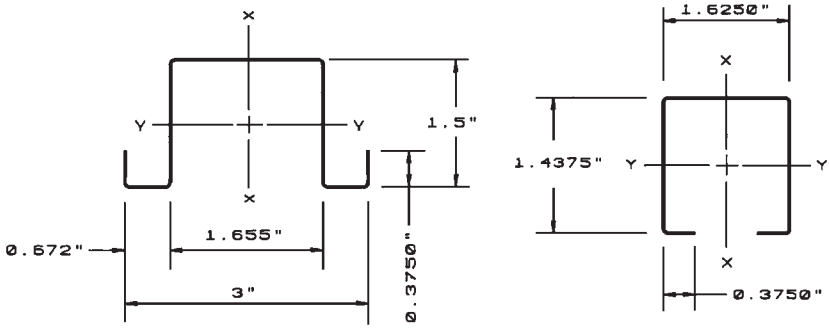
13.2 CURVED PANELS

As the illustrations demonstrate, well-proportioned curved panels can make an excellent visual impression. These panels have become extremely popular since 1985 when Curveline, Inc., of Ontario, California, brought into the United States the crimp-curving method of panel bending, first developed and patented in the Netherlands. During crimp-curving, metal panels are being incrementally pushed and pulled into rounded forms in a computer-controlled process.[1] Today, curved panels are specified not only as fascias, mansards, and canopies but also as walkway roofs, decorative column covers, equipment screens, roof transitions, and even as curved formwork for concrete.

Curveline, Inc., remains the industry leader, offering the widest range of products available for curving. The company can form panels 2 to 30 ft long, with a maximum width of 5 ft. Panel depth can range from $^3/_4$ to 6 in, the thickness from 0.016 to 0.052 in (29 to 18 gage).[2] In addition to a single-curve configuration, Curveline can produce complex and breathtaking multiple and S curves (Fig. 13.10). Exposed fastener panels are most suitable for curving, although some concealed fastener products can also be curved.

The process of crimp-curving approximates true curvature by means of many short chords, a look that some dislike. Where a smoother line is desired, the "chorded" look of crimp-curved panel ribs can be avoided if the panels are turned with their flat parts, rather than the ribs, facing the outside.

Each manufacturer of curved panels has its own standards for the minimum bending radii. Typically, the deeper the panel, the larger is the radius. Panels made of thin materials, especially high-strength steel, normally require a bigger bending radius.



HAT SECTION (HS-1) CHANNEL SECTION (CS-1)

ALLOWABLE AXIAL LOADS (POUNDS)					
	UNBRACED LENGTH (FT)				
	2′	3′	4′	5′	6′
HAT (HS-1)	2400	1590	950	650	480
CHANNEL (CS-1)	3170	2240	1400	1000	780

EFFECTIVE SECTION PROPERTIES								
					TOP IN COMP.		BOTTOM IN COMP.	
PROD. NAME	GAUGE	WT. (PLF)	FY (KSI)	FB (KSI)	IY (IN4)	SY (IN3)	IY (IN4)	SY (IN3)
HAT (HS-1)	22	0.673	33	20	0.064	0.081	0.071	0.094
CHANNEL (CS-1)	18	.798	33	20	0.067	0.079	0.067	0.079

ALLOWABLE UNIFORM LOADS (PLF)										
	STRESS CONTROL					DEFLECTION CONTROL (L/180)				
	3′	4′	5′	6′	7′	3′	4′	5′	6′	7′
HAT (HS-1)	173	97	62	43	32	173	97	62	43	32

NOTES:
1. The effective section modulus is used for allowable loads on a stress basis. The effective moment of inertia is used for allowable loads on a deflection basis.
2. Allowable uniform loads shown for hat section are for bottom in compression. Decrease loads by 15% when top is in compression.
3. Section Properties and Allowable Stresses have been calculated in accordance with the 1986 AISI Specification for the Design of Cold-Formed Steel Structural Members.
4. Steel conforms to ASTM A446-85 Grade A, G-90 Galvanized.
5. The allowable uniform loads are for bending about the Y-Y axis.
6. The allowable loads shown above may be increased by 33% for wind loading.
7. Values shown as allowable loads are based on hats covering three or more equal spans. Multiply the allowable stress values by 0.8 for one and two span conditions. Multiply the allowable deflection values by 0.5 for simple span values.

FIGURE 13.4 Section properties of hat and channel sections. (*MBCI.*)