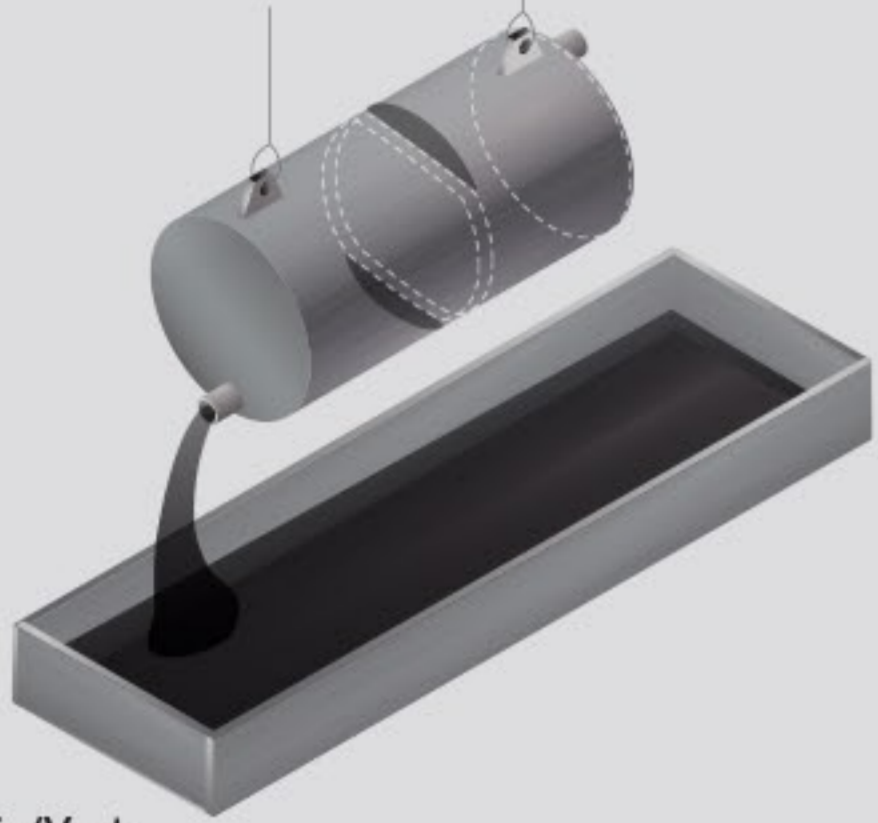


# AZZ METAL COATINGS

## DESIGN FOR GALVANIZING

### Internal Baffling

Vents should be diametrically opposite and at least 2" (50 mm) in diameter. Internal baffles should be cropped at top and bottom. Lifting lugs are required as indicated. It should be possible to view the baffles through either the vent holes or the inspection hole. The placement of the inspection hole should be discussed with the galvanizer.



#### Drain/Vents

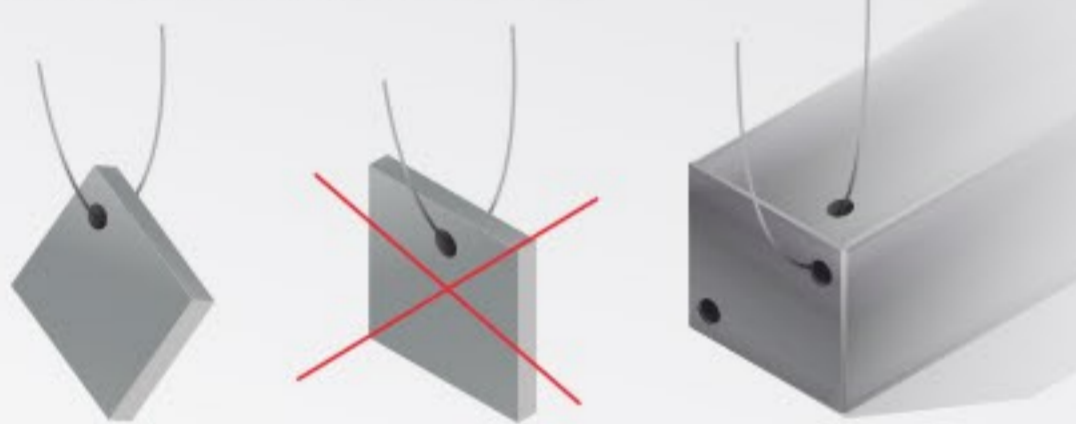
- As large as design will allow
- 2" minimum
- 3" for each 27ft<sup>3</sup>

#### Internal Baffling:

- Crop top and bottom to allow free passage of zinc
- Design so air cannot be trapped
- Internal pipes or flanges should be flush with surface

### Rack/Fixture Hole Locations

Where possible, orient components as a diamond as opposed to horizontal surfaces.



Promotes run off to a point. Minimizes drips and cleanup.

When oriented horizontal entire edge subject to runoff and drips. Excess cleanup required.

Where design will allow, provide additional hole to aid in suspending and racking of product.

Suspending holes size must be sufficient for the size/weight of the material and never < 3/8"



Where possible, products galvanize cleaner with vertical orientation. When lengths are too long to galvanize vertically suspending holes should be located in the upper 1/3 of the part so orientation can be maintained during galvanizing. Alternatively holes can be located in the flanges in diagonally opposite ends.

### Identification Marking

For permanent identification use heavily embossed, punched or welded lettering. For temporary identification use heavily embossed metal tags wired to work.

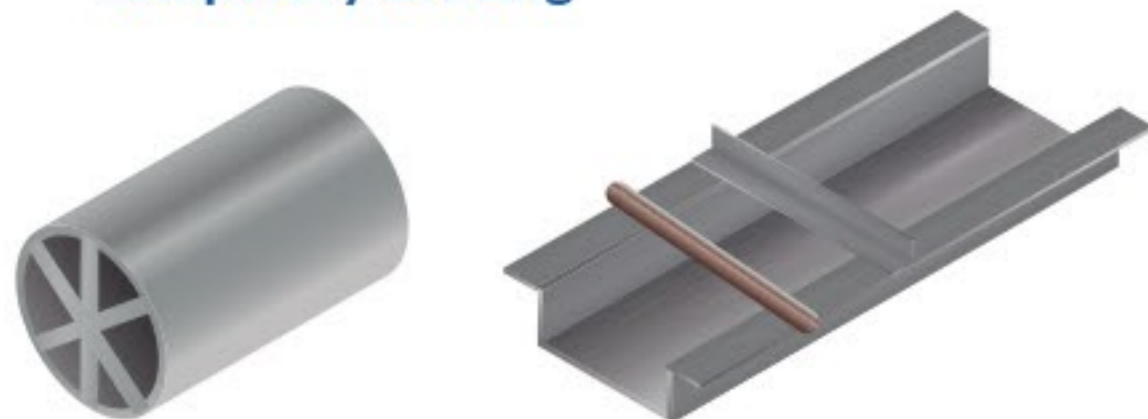


Wire attached ID tags should have twists between the tag and the member to prevent the tag from sticking to the galvanized coating.

To prevent coating voids do not use paints, paint pens, grease pens, lacquer coats, stickers (adhesive) or any other foreign substances that prevent pickling to base metal.

Call AZZ for no-void markers.

### Temporary Bracing



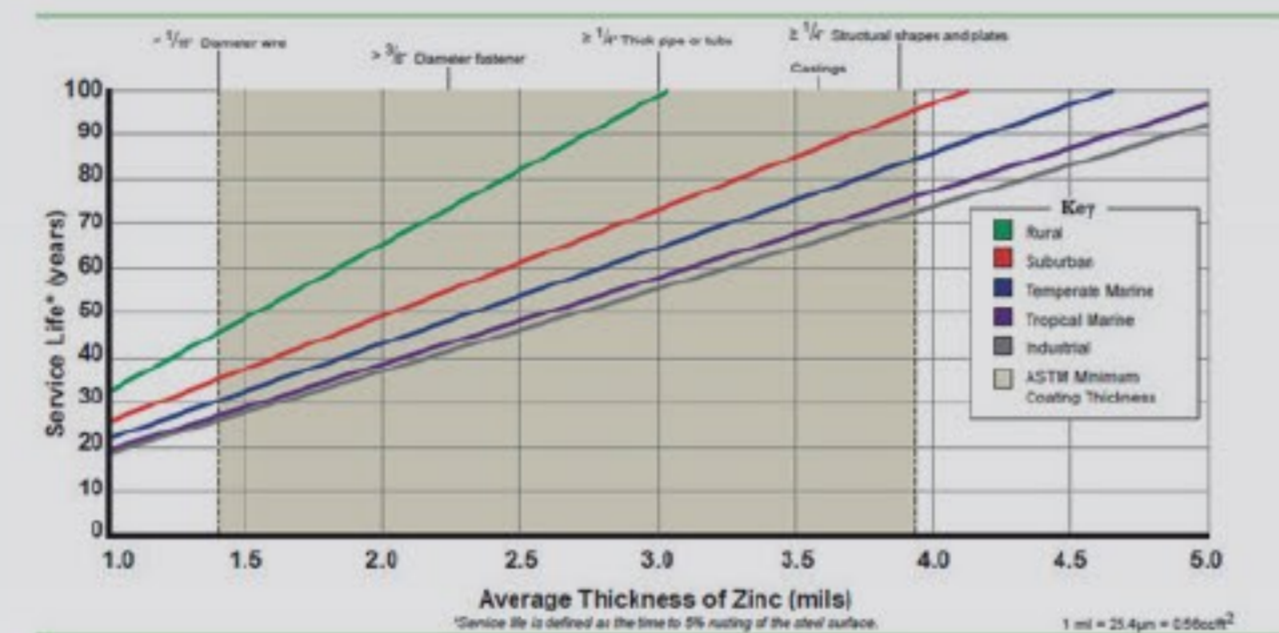
Brace with round bar, square stock or angle

### Communication Among...



...from the project's inception to its completion can optimize turnaround times, minimize costs and ensure superior quality hot-dip galvanized steel.

### Service Life Details



Galvanizing is the choice for corrosion protection because the stable non-reactive zinc patina, that develops after several months of atmospheric exposure, provides a coating that delivers maintenance-free performance for decades. With a corrosion rate 1/10 to 1/30 that of ungalvanized steel (as determined by ASTM in-field studies since the 1920's), depending on the environment (industrial: most aggressive, to rural: least aggressive), the thicker the zinc coating, the longer lasting the corrosion protection. Variables in the environment that determine the service-life (corrosion rate) include:

- Chlorides
- Humidity
- Rainfall
- Salinity
- Sulfur Dioxide
- Temperature

#### Example:

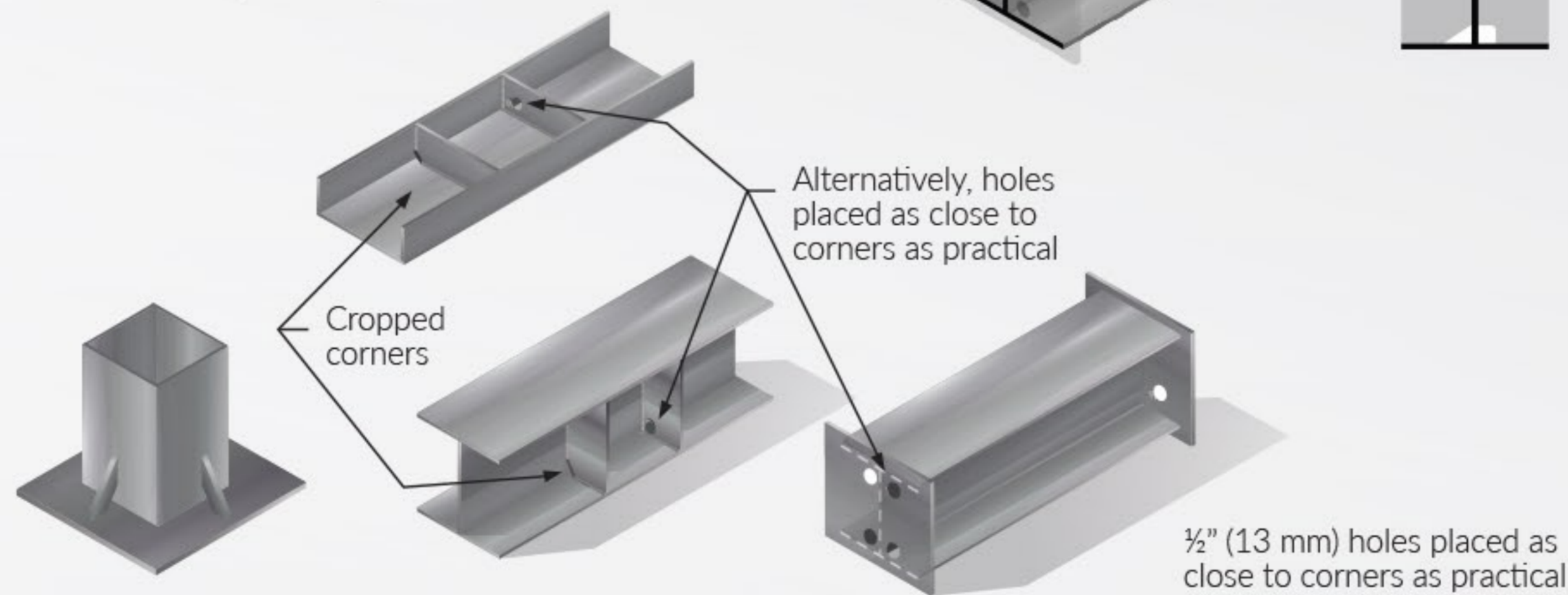
A structure comprised of 1/4" (6.4 mm) thick steel and galvanized to ASTM A123 with a minimum of 3.9 mils (100 microns) of zinc, located in industrial Bethlehem, PA, where the average annual rainfall is 37" (94 cm), salinity is 3 mg/m<sup>2</sup>, sulfur dioxide is 25 mg/m<sup>2</sup>, and the relative humidity is 68%, will not need any maintenance for 82 years.

Galvanized containers are also widely-used for long-term liquid and chemical storage, ranging from alcohols and hydrocarbons to phenols and esters. Other common uses for galvanized steel include structures and facilities in fresh water and salt water. Agitation, chloride content and temperature are important variables in determining service-life in liquids, chemicals and water.

### Allowing for Proper Drainage

Welded strengthening gussets and webs on columns, beams and members fabricated from channel sections should have corners cropped, drilled or torched:

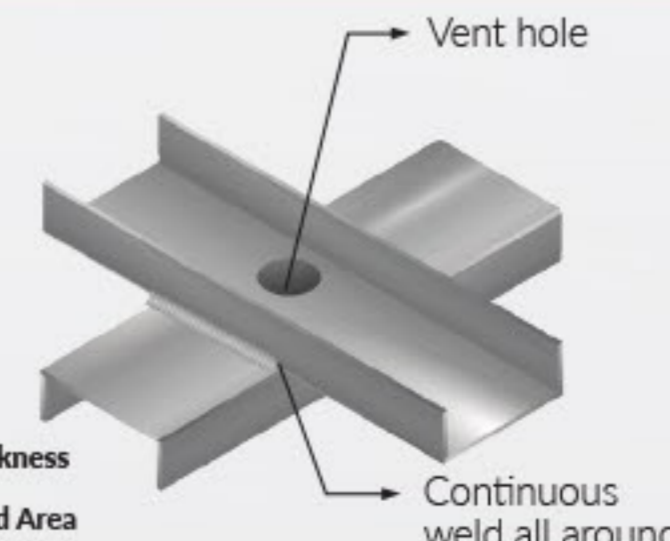
- Prevent the entrapment of air in pockets and corners, allowing complete access of pickle acids and molten zinc to the surface of the work.
- Facilitate drainage during withdrawal from acid and rinse tanks and from the galvanizing bath.



**Welding flux residue** must be removed by wire brushing, chipping, grinding, pneumatic needle or abrasive blast cleaning.

### Larger Overlapping Surfaces

If contacting surfaces cannot be avoided, a vent hole in one member or an unwelded area must be provided for pressure relief.

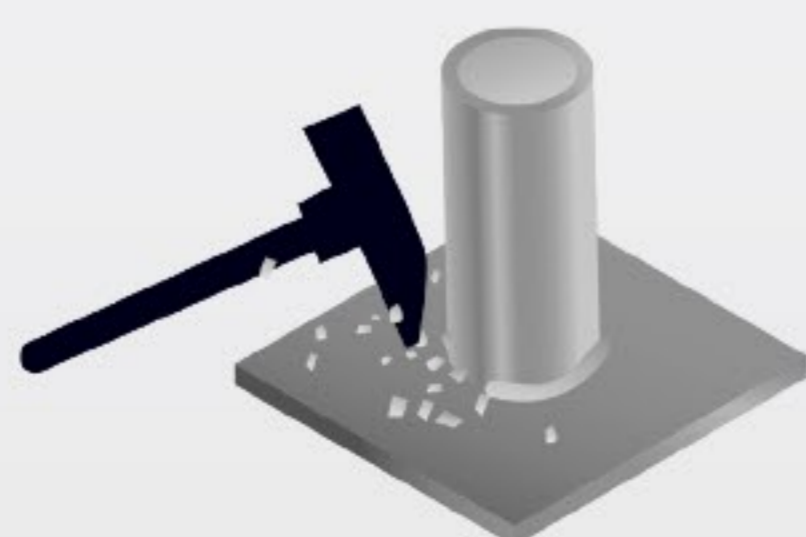


#### Vent Holes for Overlapped Areas for Steels 1/2 In. [12.75mm] or Less In Thickness

Overlapped Area in. <sup>2</sup> [cm <sup>2</sup> ]	Vent Holes	Unwelded Area
Under 16 [103]	None	None
64 [413] to under 400 [2580]	One 1/4 in. [1cm]	1 in. [2.5 cm]
400 [2580] and greater, Each 400 [2580]	One 1/2 in. [1.25cm]	2 in. [5.1cm]
	One 3/4 in. [1.91 cm]	4 in. [10.2cm]

#### Vent Hole for Overlapped Areas for Steels Greater than 1/2 In. [12.75 mm] in Thickness

Overlapped Area in. <sup>2</sup> [cm <sup>2</sup> ]	Vent Holes	Unwelded Area
Under 16 [103]	None	None
16 [103] to under 64 [413cm]	None	None
64 [413] to under [ 2580 ]	One 1/2 in. [1.25 cm]	2 in. [5.1 cm]
400 [2580] and greater, Each 400 [2580]	One 3/4 in. [1.91 cm]	4 in. [10.2 cm]



### Tubular Fabrications/Hollow Structurals

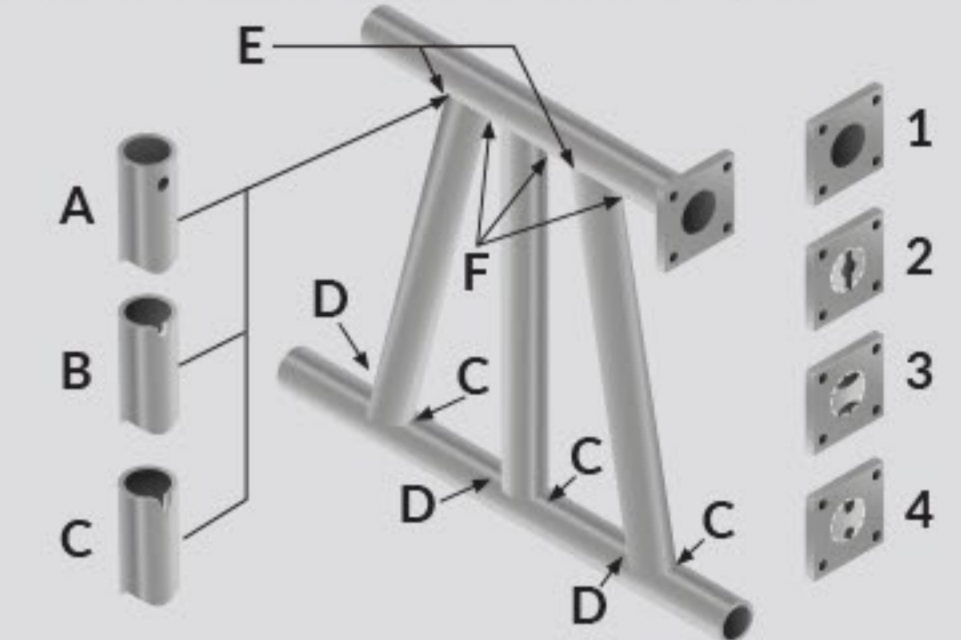
Venting options for vertical members are illustrated in examples A, B and C. Vents should be within 1/8" of horizontal member.

Each vertical member should have two holes at each end and 180° apart in line with the horizontal members as indicated by the arrows. The size of the holes preferably should be equal and the combined area of the two holes at either end of the verticals (mark "C" & "D" or "E" & "F") should be at least 30% of the cross-sectional area.

#### End Plates – Horizontal

1. The most desirable fabrication is completely open with the same diameter as the inner tube.

2., 3. and 4. – Equal substitutes should have openings as shown and should be at least 30% of the area of the inside tube diameter.



### Square and Rectangular Members

Locate holes in corners. Area of holes should be a minimum of 15% of section area (2 holes @ 1.25" for 4" x 4" tube). Minimum hole size 1/2".



### Pipe Handrails

Vent holes should be visible on the outside of pipe assemblies. External vent/drain holes must be 25% of the I.D. of the pipe, but not less than 3/8" (10mm). The two holes (180° apart) at each end or connection should be located within 1/8" of the weld. For handrail with 90° turns, locate holes in the center of the bend as shown.



### End Plates

1. The most desirable fabrication is to have the end completely open, with the same diameter as the section top and bottom.

2., 3. & 4. This is an equal substitute if full opening is not allowed.

5. This must be used when no holes are allowed in the cap or baseplate: two half circles 180° apart and at opposite ends of the pole.

**Dimensions:** Openings at each end must be at least 30% of the I.D. area of the pipe for pipe 3" (7.5cm) and greater, and 45% of the I.D. area for pipe smaller than 3" (7.5cm).



### Best Practices to Avoid Distortion

Size fabrications to avoid progressive dipping. Use similar thickness members in fabrications. Strive for symmetrical fabrications. Optimize venting and drainage. Provide strategic lift points.

This poster is intended to provide key reminders in the shop to prompt additional dialogue. Contact your galvanizing representative to discuss your specific project requirements.