



DESIGN FOR GALVANIZING

SAFETY CONSIDERATIONS

Hot Dip Galvanizing involves the immersion of materials in baths of acid and molten zinc. This means that all hollow section such as pipes and tubing as well as overlapping plates must be provided with holes for drainage and venting purposes.

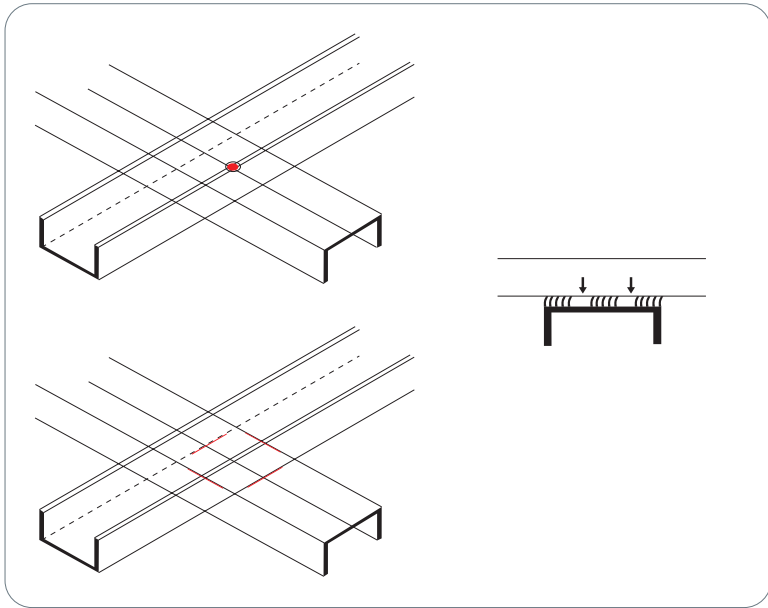
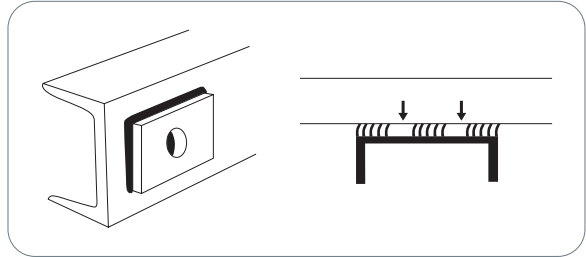
If a sufficient number of holes is not provided, air & process fluids can get trapped. When dipped in the zinc bath at 450°C the vapour pressure can rise to 200 bar and blow open the fabrication.

There is a serious risk of injury to personnel and damage to materials when these explosions occur.

OVERLAPPING / DOUBLE PLATES

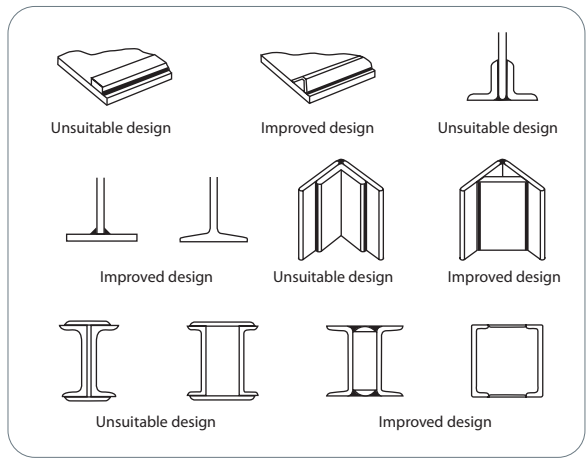
If contacting surfaces cannot be avoided, as with the channels below, then the edges of the contacting area should be continuously welded and a hole drilled through both members to eliminate the danger of an explosion in the galvanizing bath.

If this is not possible stitch welding should be used. There may be some weeping stains from acid residues trapped between the plates but this will not be detrimental to the protection given by the coating.



It will not generally be necessary to make any provision if the enclosed area is less than 70 mm x 70 mm.

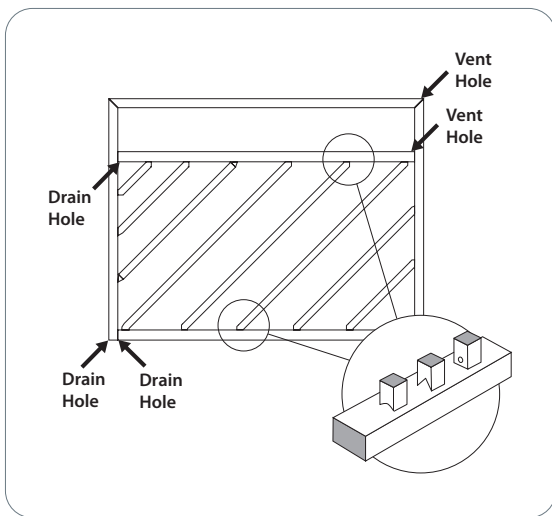
Where designs cannot avoid large areas with double plates (e.g. flange to flange and plate along flange) advice must be sought from Sperrin as to the correct method of venting.



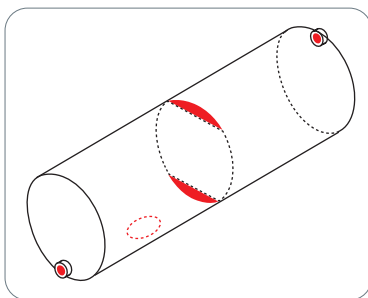


PRINCIPLES OF VENTING & DRAINING

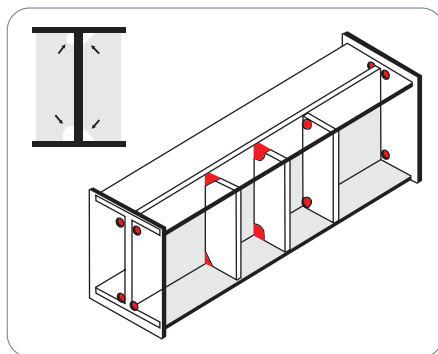
- ✓ When an item is immersed in process solutions or molten zinc, the liquids have to flow freely in and out. The viscosity of molten zinc and its density are important factors in designing adequate drainage into fabrications.
- ✓ To ensure total protection it is important that the liquids can reach into every corner and crevice - especially with hollow components.
- ✓ Any air trapped in pockets will prevent the preparation chemicals adequately preparing the surface and prevent the zinc from reacting with the steel.



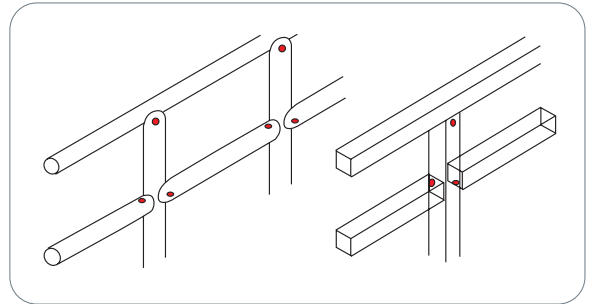
- ✓ If drain holes are too small, the zinc will not be able to enter quickly enough and the item may become buoyant causing it to float off the jig or be subject to erratic immersion.



It should be possible to view the interior of the vessel through either the vent holes or an inspection hole. Holes/ Lugs must be provided so the fabrication may be hung by wires onto jigs.



External Stiffeners on open sections should incorporate cropped corners or drainage holes to eliminate dead pockets.

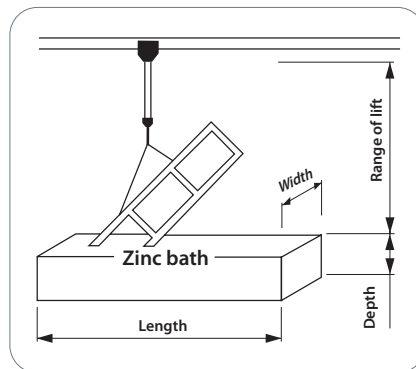


BASIC RULES OF VENTING & DRAINING

- ✓ No hole should be less than 10 mm.
- ✓ Preferred minimum hole is 12 mm.
- ✓ For hollow sections the absolute minimum hole diameters are as follows:

Diameter width of hollow section (mm)	Minimum size of hole
<25	10
> 25 to 50	12
>50 to 100	16
>100 to 150	20
>150	Consult Sperrin

- ✓ Holes should be located at the ends of hollow sections arranged in diagonally opposite pairs.
- ✓ The method of suspension of the fabrication (see below) should be borne in mind when preparing holes.
- ✓ The preferred method is to crop, punch or drill holes.
- ✓ Concealed/internal venting is not acceptable.



Sections incorporating internal diaphragms and end flanges must also be properly vented. With small rectangular hollow sections the four corners of the diaphragm plates should be cropped. Larger hollow sections should incorporate an additional 'manhole' at the centre of the diaphragm.

