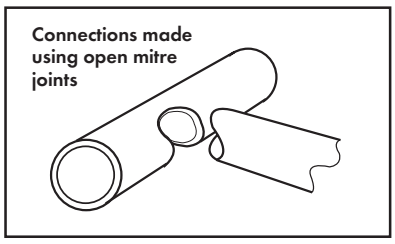

Figure 54.

In case of double-sided fillet welds, the weld must be continued around the ends to prevent unnecessary penetration of acid into any crevices *(figure 61)*.

Weld Spatter

Weld spatter does not reduce the protective properties of a hot dip galvanized coating to the same extent as with a paint coating, but it is recommended practice to remove spatter prior to hot dip galvanizing.

9.2 VENTING, FILLING AND DRAINAGE

External stiffeners, welded gussets and webs on columns and beams and gussets in channel sections should have cropped corners. The gaps created should be as large as possible without compromising structural strength. If welding is required around the edge created, a radiused corner is desirable to facilitate continuity of the weld around the cut end to the other side. Circular holes are less effective: if used, they should be as close to corners and edges as practical. Where more convenient, the cropped corners or holes may be in the main beam. Consultation with the galvanizer, regarding the appropriate vent and drainage hole sizes is recommended *(figure 49 and table 17)*.

Welded Pipe Sections

Closed sections must never be incorporated in a fabrication. Sections should be interconnected using open mitred joints as illustrated in *figure 54*, or interconnecting holes should be drilled before fabrication as in *figure 55*.

Alternatively external holes may be positioned as in *figure 56*, a method which is often preferred by the galvanizer, since quick visual inspection shows that the work is safe to hot dip galvanize.

Pipe ends can be left open, or provided with removable plugs. *(See unwanted vent holes)*.

Unwanted Vent Holes

These may be closed by hammering in lead or aluminium plugs after galvanizing and filing off flush with surrounding surfaces.

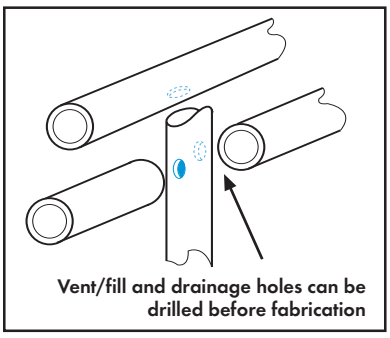

Figure 55.

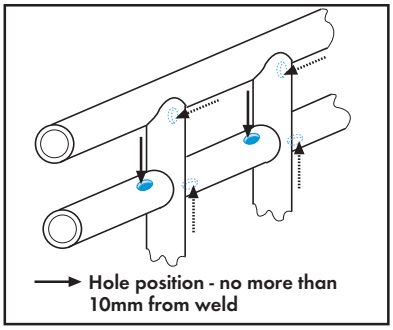

Figure 56.

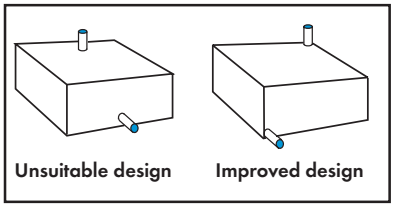

Figure 57.

Small Tubular Fabrications

Small tubular fabrications must be vented, preferably with holes not less than 10mm diameter *(table 17)*.

Tubular Fabrications / Hollow Structurals

Drain/vent hole sizes should preferably be 25% of internal diameter or diagonal dimension for components with a maximum cross sectional area of 180cm². This percentage can be influenced by the shape of the fabrication. Consultation with the galvanizer at the design stage is recommended.

Tubular Fabrication After Hot Dip Galvanizing

The requirement for bending tubes after hot dip galvanizing, ie. for the fabrication of gates etc. must be carried out according to the method set out in the Bend Test (galvanized tube). *See 11.5 Adhesion of the Coating, page 35.*

Tanks and Closed Vessels

When both internal and external surfaces are to be hot dip galvanized at least one filling and draining hole must be provided, with a vent hole diagonally opposite to allow the exit of air during immersion *(figure 57)*. For each 0,5 cubic metres of volume, provide at least one fill/drain hole of minimum size ø60mm and vent hole of minimum size ø40mm or both at ø60mm *(figure 58)*.

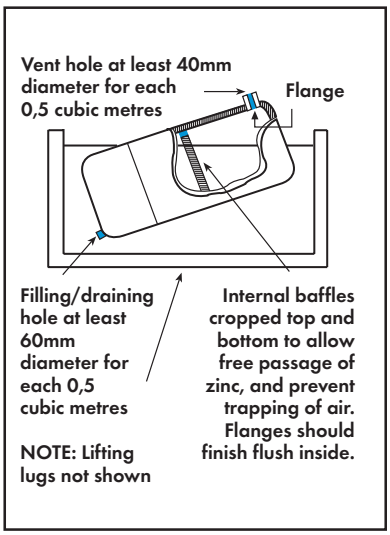

Figure 58.

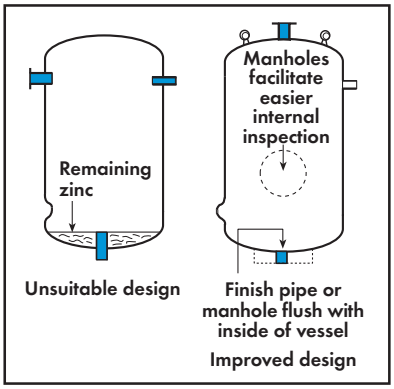

Figure 59.

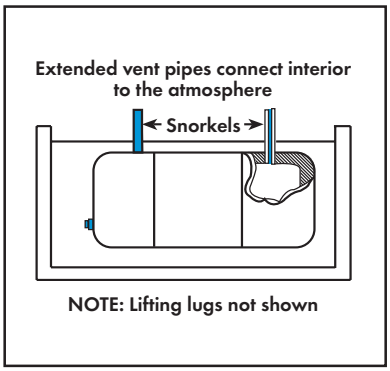

Figure 60.

Internal baffles should be cropped as illustrated *(figure 51 and 58)*. Manholes or pipes should finish flush inside to prevent trapping excess zinc *(figure 59)*.

Lifting lugs should be provided opposite the biggest and most accessible filling / draining holes and adjacent to the vent hole on the opposite end *(figure 43)*. The lugs must be designed to accommodate the excess mass of molten zinc within the cylinder / pipe on withdrawal.

Large vessels require an appropriate size manhole in the baffle.

When vessels and heat exchangers etc., are not to be galvanized internally, 'snorkels' or extended vent pipes must be fitted to allow air or steam to exit above the level of molten zinc in the galvanizing bath *(figure 60)*.

9.3 MASKING, WELDING, HANDLING, MINIMIZING DISTORTION, CLEARANCE FOR MOVING PARTS AND IDENTIFICATION

Masking
Masking materials have been developed, which if applied prior to hot dip galvanizing, will prevent the formation of the galvanized coating on surfaces where it is not required.

Combinations of Ferrous Surfaces
Fabrications containing a combination of castings and steels, or rusted and mill scaled surfaces must be abrasive blast cleaned before hot dip galvanizing.

Provision for Handling
Work not suitable for handling with chains, baskets, hooks or jigs must be provided with suspension holes or lifting lugs *(figure 43)*. If in doubt, consult the galvanizer.

Materials Suitable for Hot Dip Galvanizing
All ferrous materials are suitable, including sound stress-free castings.

Brazed assemblies may be hot dip galvanized but first consult the galvanizer. Assemblies soft soldered or aluminium rivetted cannot be hot dip galvanized.

Distortion
Distortion can be minimised by:

- Use of symmetrical designs *(figure 62)*.
- Use of sections of a similar thickness *(figure 63)*.
- Use of stiffened sections, particularly when steel is unsupported and of less than 3 - 4mm thick *(figure 64)*.
- Use of preformed members with the correct minimum bend radius to minimise stress.
- Use of balanced or sequence welding techniques to minimise stresses.
- Large open fabrications, thin walled trough sections and rectangular tanks may require temporary cross stays to prevent distortion during hot dip galvanizing.
- Maximise fill, drain and vent hole sizes and optimize their relative positions.
- Complete and rapid immersion of the item in the galvanizing bath i.e. avoid double end dipping if possible.
- Air cooling after hot dip galvanizing in preference to water quenching.

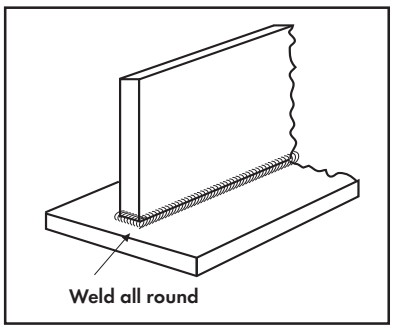

Figure 61.

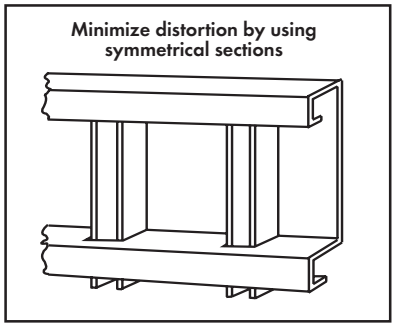

Figure 62.

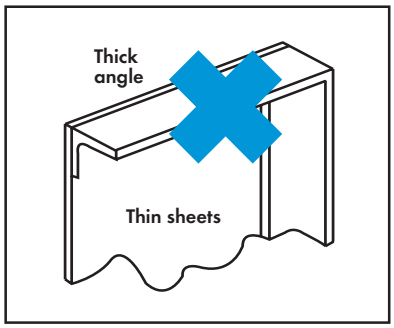

Figure 63.

Use of symmetrical sections minimises distortion during hot dip galvanizing. Avoid combinations of thick and thin material. Bolted connections are recommended for assembly after hot dip galvanizing.

Overlapping Surfaces
A minimum gap of at least 2mm between overlapping surfaces and back-to-back angles and channels, must be provided (figures 65, 66 and 67).

When small overlaps are unavoidable, seal edges by welding.

In circumstances where seal welding is not practical, a degree of temporary

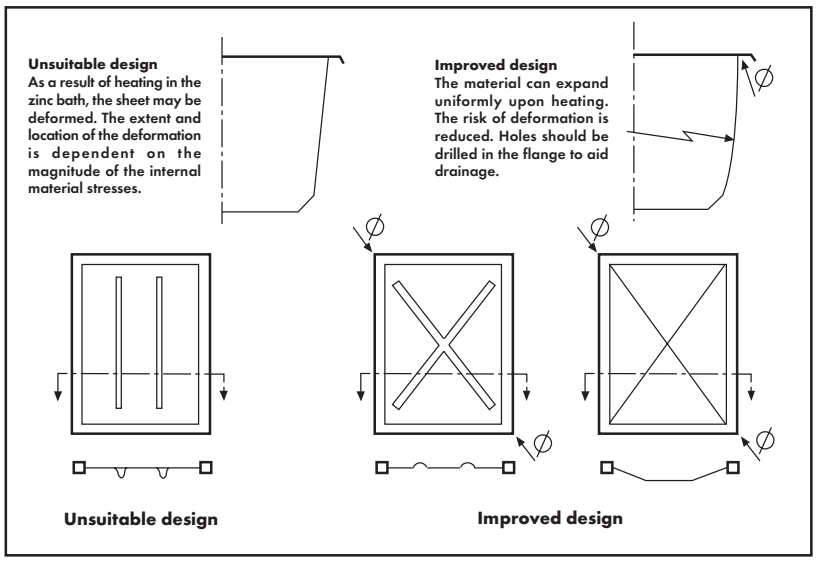

Figure 64.