Tubular Design Guide 20:

Background and design basis

by

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Tubular Design Guide 26: Fully welded – Gap planar connections
Tubular Design Guide 27: Fully welded – Overlap planar connections

CONTENTS

LIST OF FIGURES

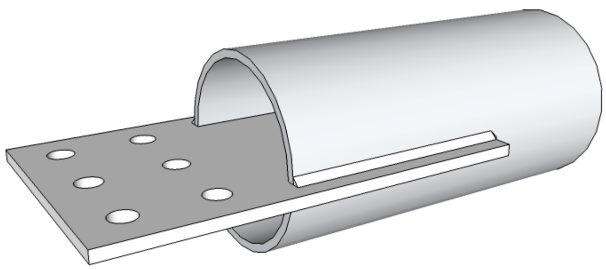
7 DETAILING AND STANDARDISATION

7.1 Detailing of SSHS connections

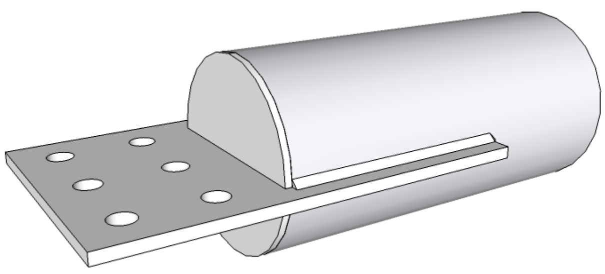
7.1.1 *Drainage and corrosion*

The interior of hollow section members may be either fully sealed by the connection details or by purpose configured seal plates, or may be left open. Both scenarios are illustrated in Figure 7.1 for the case of a slotted SSHS end connection. The decision as to the appropriate solution is influenced by a number of factors, including the intended environment for the finished member:

1. Fully (i.e. hermetically) sealed members ensure that the environment inside the SSHS member remains benign, precluding the supply of fresh oxygen that is required for continuing corrosion. However, the sealing must be effective, otherwise small holes and cracks can allow surprisingly large amounts of water to enter the SSHS member. In particular in cold and wet environments where freezing is likely, the SSHS may be split at the corners by the pressure of freezing water. A solution is to place a minimum nominal 10 mm diameter hole in a location that allows water to drain. The small amount of oxygen replenishment in these cases results in only a small amount of oxidation internally.
2. SSHS members with purpose open ends, such as shown in Fig. 7.1(a) may be used in benign internal environments where only very nominal internal corrosion would be expected.



(a) Section with open end



(b) Section with sealed end

FIGURE 7.1 DETAILING OF OPEN AND SEALED CONNECTIONS

7.1.2 *Galvanizing*

During galvanizing, fabricated steel members and assemblies are dipped into a molten zinc bath that is at an approximate temperature of 450°C for about 5 minutes. SSHS members which would otherwise have internal volumes that are sealed must have specific vent and draining holes detailed to ensure heated expanding air can escape and with a sufficient hole size for the molten zinc to drain. Hole size is based on the sectional size of the member, with suggested sizes given in Table 7.1, rationalised from galvanizer recommendation to hard metric sizes (Ref. 58). CIDECT Design Guide 7 (Ref. 65) also provides some guidance on preparation for galvanizing. Further information can also be obtained from the Galvanizer Association of Australia (www.gaa.com.au) and the Galvanizing Association of New Zealand (www.galvanizing.org.nz).

TABLE 7.1

SIZE OF VENT AND DRAIN HOLES FOR GALVANIZING SSHS MEMBERS

CHS nominal bore (mm)	RHS size (mm)	SHS size (mm)	Vent hole diameter (mm)	
			Single hole	Double hole
50			12	2 x10
65	50 x 20	50 x 50	16	2 x 12
80	75 x 50	65 x 65	20	2 x 14
100	100 x 50	75 x 75	25	2 x 18
125	125 x 75	100 x 100	32	2 x 22
150	150 x 100	125 x 125	38	2 x 27
200	200 x 100	150 x 150	50	2 x 35
250	250 x 150	200 x 200	63	2 x 45
300	300 x 200	250 x 250	75	2 x 54
350	350 x 250	300 x 300	88	2 x 63
400	400 x 300	350 x 350	100	2 x 70

NOTE: For member sizes smaller than listed, use a minimum 10 mm diameter vent hole.

7.1.3 *Recommended weld details*

Figure 7.2 illustrates a range of recommended weld details for various locations on different connection configurations. Note the limitation on the minimum angle between the brace and chord member. Clause 4.5 of AS/NZS 1554.1 (Ref. 33) provides further guidance on prequalified joint preparations, including specific requirements for hollow section members.