Welding of beam unit reinforcement BSF

This memo describes the welding procedure for the reinforcing bar T4 (see MEMO 1) .

In order to reduce the cost of the units, and to make them less spacious during transport, some beam units do not have a bottom plate. In these cases the tensile bar T4 must be welded directly to the side plates.

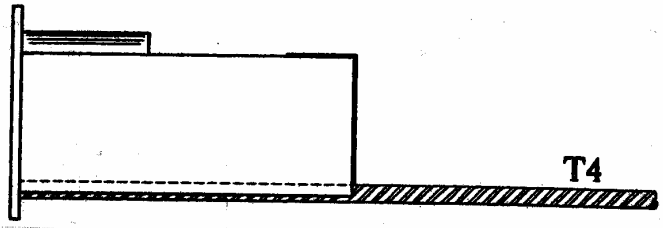

Figure 1

Method:
A suitable guiding plate (for example of plywood) is prepared (see figure 2). The plate must be approximately 100 mm longer than the space in the beam unit, with a cut out for easy gripping. The height must be 2 mm more than the height of the knife, and the thickness equal to the thickness of the knife - or a little less.

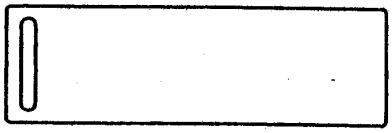

Figure 2

The beam unit is placed upside down, the guiding plate is placed inside, and the reinforcing bar T4 is positioned at the top of the guiding plate (see figure 3).

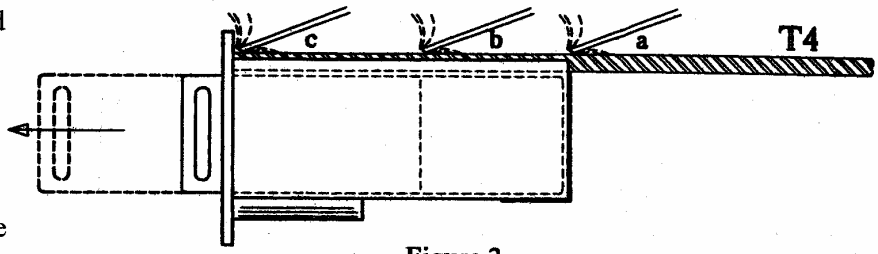

Figure 3

The reinforcing bar T4 shall then be spot welded in three locations (a, b and c, see figure 3) to the side plates, on both sides, starting at location a. The guiding plate must during this process be gradually withdrawn from the beam unit in order not to get stuck due to shrinkage of the welds. The welder must take the necessary precautions to ensure that there will be sufficient space between the side plates so that the knife later can be inserted without any problems. This is especially important when welding at point b, if necessary a tool must be used to bend the plates apart while welding at this point. At points a and c the distance between the side plates are already fixed.

After spot welding the guiding plate is fully removed. The full length of the welds on both sides can now be completed. Alternate welding on both sides is necessary to prevent longitudinal bending of the beam unit during this operation.

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To prevent welding splutter from getting into the beam unit - which will make the insertion of the knife difficult or impossible - it is advisable to keep the welding rod at approximately 20°, as shown in figure 4.

Extra welding or silicone should be used at locations a and c to make sure the beam unit is water tight.

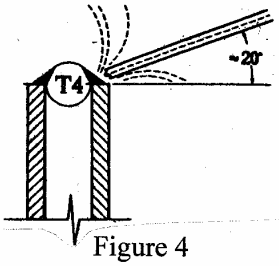

Figure 4

Always make trial insertion of the steel knife into the beam unit before it leaves the welding shop.

Size of bars: **BSF 150/20: 1-Ø20** **BSF 200/30: 1-Ø25** **BSF 200/50: 1-Ø32**

BSF 200/20: 1-Ø20 **BSF 200/40: 1-Ø25** **BSF 250/50: 2-Ø25**

(For BSF 150/20 and 200/20 bars Ø16 would be sufficient according to calculations, but normally bars Ø16 is used to further prevent welding splutter from getting into the beam unit.)

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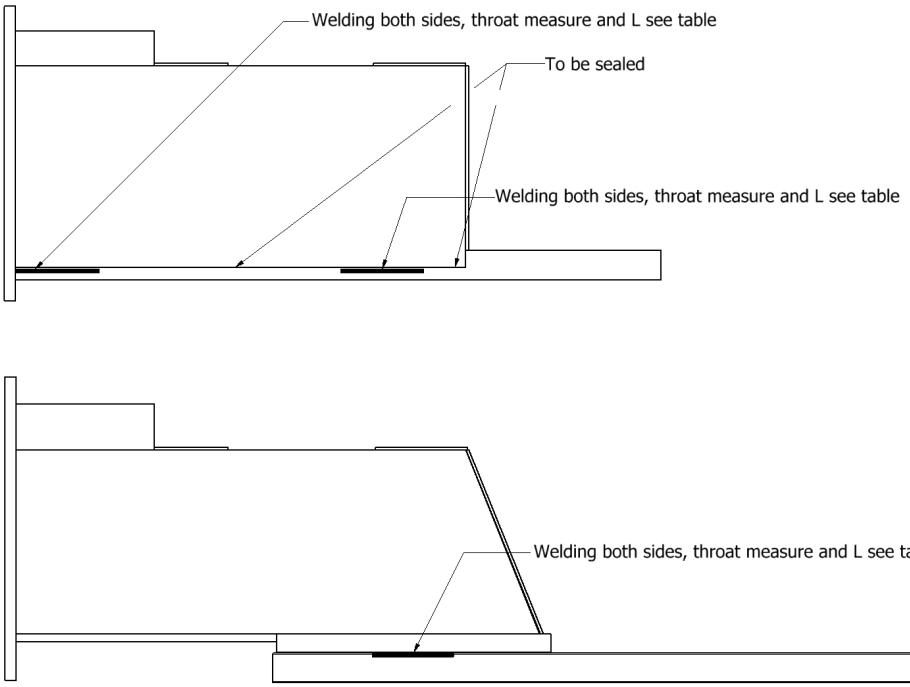
Weld length L and weld dimension (a= throat measure):



In the case where the beam units are without bottom plate (B 150/20, B 200/20 and B 200/30), a long small weld may serve as a sealant preventing water and concrete from getting into the unit. Or silicone or similar may be used

Necessary weld length L, to anchor the horizontal reinforcement bar to the bottom of the BSF beam unit. It is prerequisite that there are welds on both side of the reinforcement bar.

Throat measure	4	5	6	7	8
Anchoring for the capacity of the reinforcement bar:					
Ø20	60	50	40	35	30
Ø25	95	75	65	55	50
Ø32	155	125	105	90	80

Equation that has been used:

$L \cdot a = F_W/(\sigma_w \cdot 2) = F_W/(0{,}262 \cdot 2) = 1{,}908 \cdot F_W$ (F_W in kN, and L and a in mm)

F_W is the capacity of the reinforcement bar $= A_s \cdot 0{,}400$ (A_s in mm gives F_W in kN)

Reinforcement bars diameter (mm)	A_s (mm^2)	F_W (kN)
20	314	125,6
25	491	196,4
32	804	321,6