

DATE: August 7, 1991

TO: Staff Bridge Branch/Consulting Engineers

FROM: A. J. Siccardi

SUBJECT: Technical Memorandum #9
Full Penetration Welds on Webs and Flanges

Full penetration welds on webs and flanges made with backing should not be allowed. It has been brought to my attention that full penetration welds made with backing have a relatively high repair rate. The repairs are necessary to eliminate cracks which result from a fusion type of defect between the backing and the base metal. The crack continues to propagate as subsequent weld passes are made. The cracks are known to occur when a B-U2-S weld is used. See Figure 1.

Our typical plans require a double groove weld, a B-U3c-S weld, when a full penetration weld is required on webs or flanges. See Figure 2. This weld is usually used when the plate thickness is greater than 2 inches. Rather than holding the fabricator by contract to this particular weld for all welds regardless of plate thickness, a weld symbol with "CJP, NO BACKING, BACK GOUGE, GRIND FLUSH" in the tail should be used. See Figure 3. This will allow the fabricator to select a weld which suits his means and methods of fabrication. The shop drawing shall show, and be checked for, the weld selected by the fabricator. The pre-qualified welds which may be used in lieu of the B-U3c-S weld include the following: B-L1a-S, B-L2c-S, B-U6-S, C-U6-S, and B-U7-S. See Figures 4, 5, and 6.

Pre-qualified full penetration welds other than those welds specified above should not be allowed on webs and flanges.

AJS/DEC/mmk

CC: A. Eastwood/D. O'Dell