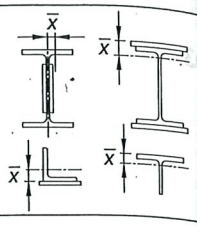
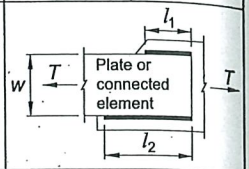
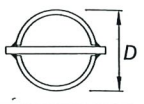
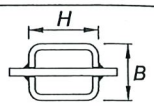
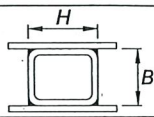
E D3.1
s for Connections
ı Members

Shear Lag Factor, U	Example
$U = 1.0$	–
$U = 1 - \frac{\bar{x}}{l}$	
$U = 1.0$ and A_n = area of the directly connected elements	–
$U = \frac{3l^2}{3l^2 + w^2}\left(1 - \frac{\bar{x}}{l}\right)$	
$l \geq 1.3D$, $U = 1.0$ $D \leq l < 1.3D$, $U = 1 - \frac{\bar{x}}{l}$ $\bar{x} = \frac{D}{\pi}$	
$l \geq H$, $U = 1 - \frac{\bar{x}}{l}$ $\bar{x} = \frac{B^2 + 2BH}{4(B+H)}$	
$l \geq H$, $U = 1 - \frac{\bar{x}}{l}$ $\bar{x} = \frac{B^2}{4(B+H)}$	
$b_f \geq \frac{2}{3}d$, $U = 0.90$ $b_f < \frac{2}{3}d$, $U = 0.85$	–
$U = 0.70$	–
$U = 0.80$	–
$U = 0.60$	–

to the plane of the connection, in. (mm); D = outside diameter of
3 member, measured in the plane of the connection, in. (mm);
on from which the tee was cut, in. (mm); l = length of connection,
ıection, in. (mm).

mes the weld size.

(a) For tensile rupture on the net effective area

$$P_n = F_u(2tb_e) \tag{D5-1}$$

$$\phi_t = 0.75 \text{ (LRFD)} \qquad \Omega_t = 2.00 \text{ (ASD)}$$

(b) For shear rupture on the effective area

$$P_n = 0.6F_uA_{sf} \tag{D5-2}$$

$$\phi_{sf} = 0.75 \text{ (LRFD)} \qquad \Omega_{sf} = 2.00 \text{ (ASD)}$$

where

$A_{sf} = 2t(a + d/2)$
= area on the shear failure path, in.^{2} (mm^2)

a = shortest distance from edge of the pin hole to the edge of the member measured parallel to the direction of the force, in. (mm)

b_e = $2t + 0.63$, in. ($= 2t + 16$, mm), but not more than the actual distance from the edge of the hole to the edge of the part measured in the direction normal to the applied force, in. (mm)

d = diameter of pin, in. (mm)

t = thickness of plate, in. (mm)

(c) For bearing on the projected area of the pin, use Section J7.

(d) For yielding on the gross section, use Section D2(a).

2. Dimensional Requirements

Pin-connected members shall meet the following requirements:

(a) The pin hole shall be located midway between the edges of the member in the direction normal to the applied force.

(b) When the pin is expected to provide for relative movement between connected parts while under full load, the diameter of the pin hole shall not be more than $^1/_{32}$ in. (1 mm) greater than the diameter of the pin.

(c) The width of the plate at the pin hole shall not be less than $2b_e + d$ and the minimum extension, a, beyond the bearing end of the pin hole, parallel to the axis of the member, shall not be less than $1.33b_e$.

(d) The corners beyond the pin hole are permitted to be cut at 45° to the axis of the member, provided the net area beyond the pin hole, on a plane perpendicular to the cut, is not less than that required beyond the pin hole parallel to the axis of the member.

D6. EYEBARS

1. Tensile Strength

The available tensile strength of eyebars shall be determined in accordance with Section D2, with A_g taken as the cross-sectional area of the body.

For calculation purposes, the width of the body of the eyebars shall not exceed eight times its thickness.