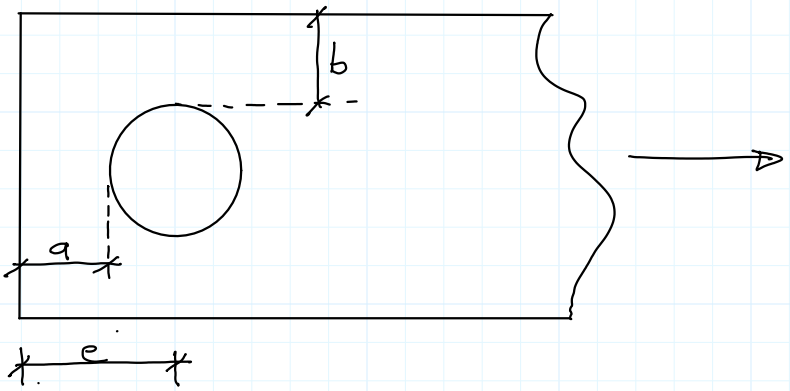
Example T-11 – Pin Connection

- use provisions of S16-14

Flat bar of 16 mm thick.
Pin 25mm dia in 26mm hole.
Determine min width, min end distance and T_r
G40.21 300W steel $F_y = 300$ MPa
$F_u = 440$ MPa



§12.4

$b_e = 2t + 16mm$
$= 2 \times 16m + 16mm$
$= 48$ mm

widths of greater than $48 + 26 + 48 = 122$ mm will not be effective in A_{net}

Try plate width 120 mm
$b = (120 - 26)\text{mm} \times 0.5$
$b = 47mm$
$b_e = 2 \times 16 + 16 \leq 47$ §12.4.1
$= 48 \leq 47$
$b_e = 47$ mm

check width $w \geq 2b_e + d$ (commentary, §12.4.2)
$120 \geq 2 \times 47 + 25$
$120 \geq 119$ OK

$A_{net} = 2t\,b_e$
$= 2 \times 16\text{ mm} \times 47\text{mm}$
$= 1504\ mm^2$

$T_r = \phi_u A_{net} F_u$ §13.2 b) ii)
$= 0.75 \times 1504\ mm^2 \times 0.440\ kN/mm^2$
$T_r = 496$ kN

check end distance

from commentary, $a \geq 1.33\, b_e$

$\geq 1.33 \times 47$

≥ 62.5

T_{ry} $e = 76\ mm$

$a = 76\ mm - \frac{26\ mm}{2}$

$a = 63\ mm \quad > 62.5 \quad$ ok

$A_{nes} = 2t\left(a + \frac{d}{2}\right)$

$= 2 \times 16\ mm \left(63\ mm + \frac{25\ mm}{2}\right)$

$= 2416\ mm^2$

$T_r = 0.6\, \phi_u\, A_{nes}\, F_u$ § 13.2 b) iii)

$= 0.6 \times 0.75 \times 2416\ mm^2 \times 0.440 \frac{kN}{mm^2}$

$T_r = 478\ kN$ ← governs

$A_g = 16\ mm \times 120\ mm$ § 13.2 b) i)

$= 1920\ mm^2$

$T_r = \phi A_g F_y$

$= 0.9 \times 1920\ mm^2 \times 0.300 \frac{kN}{mm^2}$

$T_r = 518\ kN$

$T_r = 478\ kN$

governed by end distance