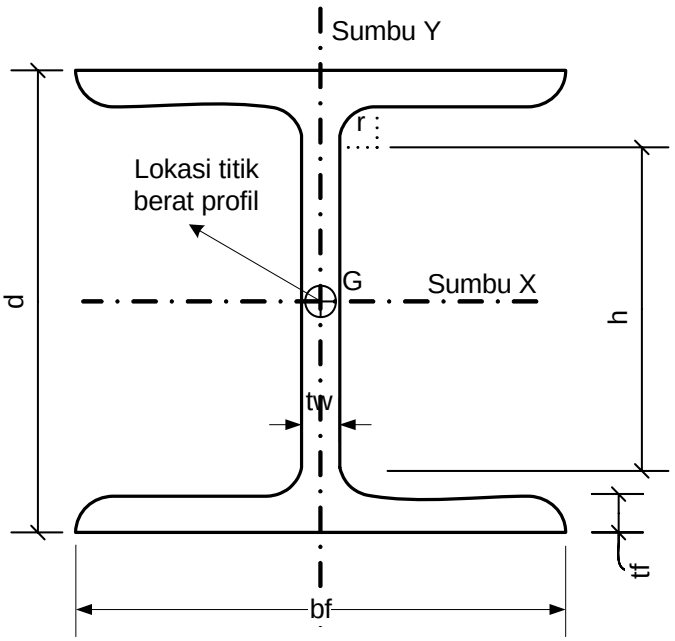
BESARAN PENAMPANG PROFIL I



Profil WF Standard Jepang (Indonesia)

Satuan metrik

lihat tabel hal.21

Data Penampang: Profil WF 400x200x8x13

Momen Inersia	$Ix := 23700cm^4$	$Iy := 1740cm^4$
Luas Penampang	$A := 84.12cm^2$	
Tinggi total profil	$d := 400mm$	
Tebal sayap	$tf := 13mm$	
Tebal badan	$tw := 8mm$	
Lebar sayap	$bf := 200mm$	
Jari2 sudut flens-badan	$r := 16mm$	

Besaran Penampang

$Sx := \frac{Ix}{0.5 \cdot d}$ $Sx = 1185000.00 \cdot mm^3$

$Sy := \frac{Iy}{0.5 \cdot bf}$ $Sy = 174000.00 \cdot mm^3$

$rx := \sqrt{\frac{Ix}{A}}$ $rx = 16.79 \cdot cm$

$ry := \sqrt{\frac{Iy}{A}}$ $ry = 4.55 \cdot cm$

$h := d - 2 \cdot tf - 2r$ $h = 342.00 \cdot mm$

$Cw := \frac{Iy \cdot (d - tf)^2}{4}$

$Cw = 651495150000.00 \cdot mm^6$

$J := \frac{2bf \cdot tf^3 + (d - tf) \cdot tw^3}{3}$

$J = 358981.33 \cdot mm^4$

$Zx := bf \cdot tf \cdot (d - tf) + \frac{1}{4} \cdot tw \cdot (d - 2 \cdot tf)^2$

$Zx = 1285952.00 \cdot mm^3$

$Zy := \frac{2}{4} \cdot tf \cdot bf^2 + \frac{1}{4}(d - 2 \cdot tf) \cdot tw^2$

$Zy = 265984.00 \cdot mm^3$

Profil WF Standard Amerika **Satuan inchi**

lihat tabel hal.8

Data Penampang: Profil WF W18x71

Momen Inersia	$Ix := 1170in^4$	$Iy := 60.3in^4$	
Luas Penampang	$A := 20.8in^2$		
Tinggi total profil	$d := 18.47in$	Berat	$brt := 71\frac{lb}{ft}$
Tebal sayap	$tf := 0.810in$		
Tebal badan	$tw := 0.495in$		
Lebar sayap	$bf := 7.635in$		
Jari2 sudut flens-badan	$r := 1.5in - tf$	$r = 0.69 \cdot in$	

Besaran Penampang

$$Sx := \frac{Ix}{0.5 \cdot d} \qquad Sx = 126.69 \cdot in^3$$

$$Sy := \frac{Iy}{0.5 \cdot bf} \qquad Sy = 15.80 \cdot in^3$$

$$rx := \sqrt{\frac{Ix}{A}} \qquad rx = 7.50 \cdot in$$

$$ry := \sqrt{\frac{Iy}{A}} \qquad ry = 1.70 \cdot in$$

$$Cw := \frac{Iy \cdot (d - tf)^2}{4} \qquad Cw = 4701.52 \cdot in^6$$

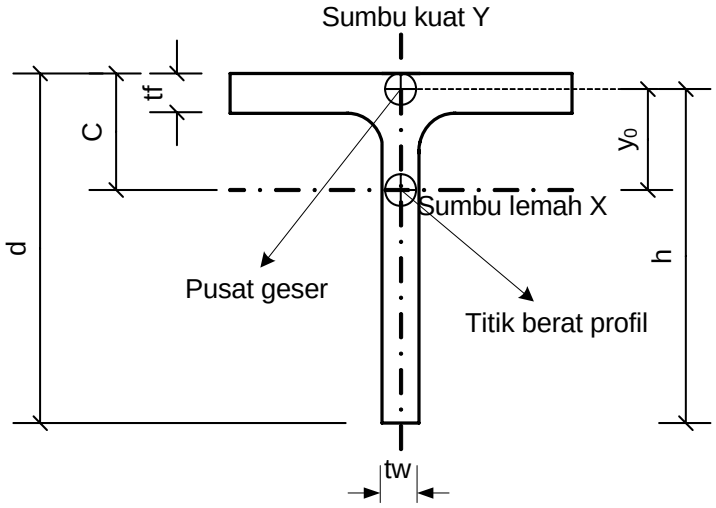
$$J := \frac{2bf \cdot tf^3 + (d - tf) \cdot tw^3}{3} \qquad J = 3.42 \cdot in^4$$

$$Zx := bf \cdot tf \cdot (d - tf) + \frac{1}{4} \cdot tw \cdot (d - 2 \cdot tf)^2 \qquad Zx = 144.35 \cdot in^3$$

$$Zy := \frac{2}{4} \cdot tf \cdot bf^2 + \frac{1}{4}(d - 2 \cdot tf) \cdot tw^2 \qquad Zy = 24.64 \cdot in^3$$

$$h := d - 2 \cdot tf - 2r \qquad h = 15.47 \cdot in$$

BESARAN PENAMPANG PROFIL T



Data Penampang: Profil WT 100x200x8x12

Momen Inersia	$Ix := 4720cm^4$	$Iy := 1600cm^4$
Luas Penampang	$A := 31.765cm^2$	
Tinggi total profil	$d := 100mm$	
Tebal sayap	$tf := 12mm$	
Tebal badan	$tw := 8mm$	
Lebar sayap	$bf := 200mm$	
Jari2 sudut flens-badan	$r := 13mm$	

$$y := \frac{[0.5tf + (d - tf)](tf \cdot bf) + [0.5(d - tf)][tw \cdot (d - tf)]}{tf \cdot bf + tw \cdot (d - tf)} \qquad y = 82.66 \cdot mm$$

$C := d - y$

Koordinat pusat berat dari tepi atas flens $C = 1.73 \cdot cm$ $yo := C - 0.5 \cdot tf$ $yo = 11.34 \cdot mm$

$$Ix = \left[\frac{1}{12} \cdot bf \cdot tf^3 + (tf \cdot bf) \cdot yo^2\right] + \left[\frac{1}{12} \cdot tw \cdot (d - tf)^3 + tw \cdot (d - tf) \cdot [y - 0.5 \cdot (d - tf)]^2\right] + \blacksquare$$

$$\blacksquare + 2\left[0.01825 \cdot r^4 + \left(1 - \frac{\pi}{4}\right) r^2 \cdot [(C - tf - r) + 0.7766r]^2\right]$$

$Ix = 1845412.32 \cdot mm^4$

$$Iy := \left(\frac{1}{12} \cdot bf^3 \cdot tf + 0\right) + \left[\frac{1}{12} \cdot tw^3 \cdot (d - tf) + 0\right] + \left[0.1370 \cdot r^4 + \left(1 - \frac{\pi}{4}\right) r^2 \cdot [(0.5 \cdot tw) + 0.2234r]^2\right]$$

$Iy = 8009396.33 \cdot mm^4$

Besaran Penampang

$Sx := \frac{Ix}{d - C}$ $Sx = 22325.39 \cdot mm^3$

$Sy := \frac{Iy}{0.5 \cdot bf}$ $Sy = 80093.96 \cdot mm^3$

$rx := \sqrt{\frac{Ix}{A}}$ $rx = 24.10 \cdot mm$

$ry := \sqrt{\frac{Iy}{A}}$ $ry = 50.21 \cdot mm$

$h := d - 0.5 \cdot tf$ $h = 94.00 \cdot mm$

$Cw := \frac{1}{36}\left(\frac{bf^3 \cdot tf^3}{4} + h^3 \cdot tw^3\right)$

$Cw = 107812750.22 \cdot mm^6$

$J := \frac{1}{3}\left(bf \cdot tf^3 + h \cdot tw^3\right)$

$J = 131242.67 \cdot mm^4$

$$Ix := \left[\frac{1}{12}\cdot bf\cdot tf^{3} + (tf\cdot bf)\cdot yo^{2}\right] + \left[\frac{1}{12}\cdot tw\cdot(d - tf)^{3} + tw\cdot(d - tf)\cdot[y - 0.5\cdot(d - tf)]^{2}\right.$$

$$\left] + 2\left[0.01825 \cdot r^4 + \left(1 - \frac{\pi}{4}\right) r^2 \cdot [(C - tf - r) + 0.7766r]^2\right]\right.$$