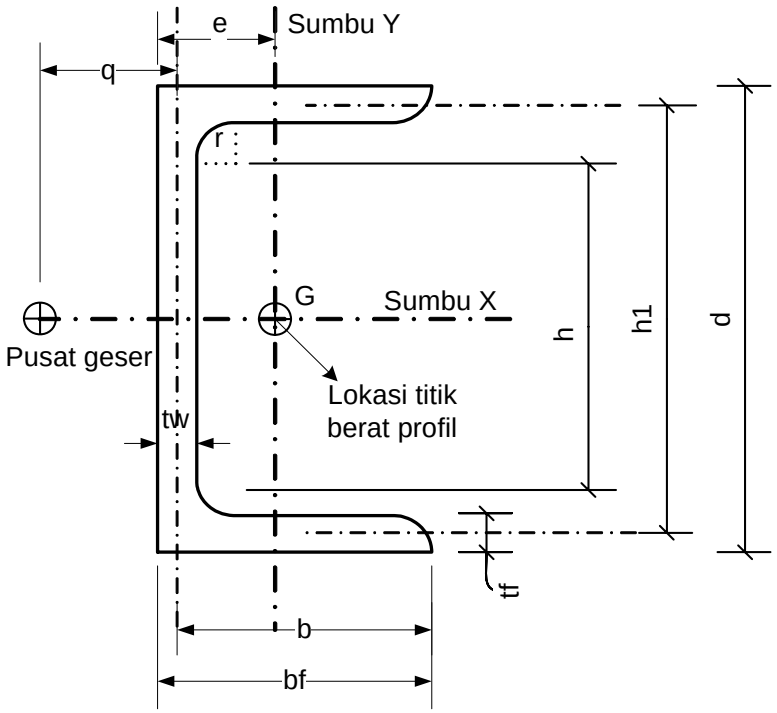
BESARAN PENAMPANG PROFIL C (Kanal/Channel)



Baja Kanal Indonesia

Data Penampang: Profil C200x70x7x10 (lihat tabel hal 32)

Momen Inersia	$Ix := 864cm^4$	$Iy := 122cm^4$	Tebal sayap	$tf := 10mm$
Luas Penampang	$A := 23.71cm^2$		Tebal badan	$tw := 6.5mm$
Tinggi total profil	$d := 150mm$		Lebar sayap	$bf := 75mm$
Jari2 sudut flens-badan	$r := 0cm$	tidak ada dalam tabel profil		
Jarak titik berat dari tepi luar web	$e := 2.31cm$	(pusat titik berat)		

Besaran Penampang

$Sx := \frac{Ix}{0.5 \cdot d}$ $Sx = 115.20 \cdot cm^3$ (dalam tabel Zx)

$rx := \sqrt{\frac{Ix}{A}}$ $rx = 6.04 \cdot cm$

$Sy := \frac{Iy}{bf - e}$ $Sy = 23.51 \cdot cm^3$ (dalam tabel Zy)

$ry := \sqrt{\frac{Iy}{A}}$ $ry = 2.27 \cdot cm$

Besaran sementara (tidak ada dalam tabel)

$h1 := d - tf$	$h1 = 14.00 \cdot cm$	$b := bf - 0.5tw$	$b = 7.17 \cdot cm$
$xbar := e - 0.5tw$	$xbar = 1.99 \cdot cm$	$hw := d - 2tf$	$hw = 13.00 \cdot cm$

Jarak sumbu netral plastis

$$x1 := \begin{cases} \frac{2 \cdot tf \cdot bf - hw \cdot tw}{4tf} & \text{if } 2 \cdot tf \cdot bf > hw \cdot tw \\ \frac{tf \cdot bf - tf \cdot tw + 0.5 \cdot d \cdot tw}{d} & \text{otherwise} \end{cases}$$

sumbu netral plastis di flens

sumbu netral plastis di badan (lebih sering terjadi)

$2 \cdot tf \cdot bf = 15.00 \cdot cm^2$ $hw \cdot tw = 8.45 \cdot cm^2$ $x1 = 1.64 \cdot cm$

$$Cw := \frac{tf \cdot b^3 \cdot h1^2}{12} \cdot \left(\frac{3 \cdot b \cdot tf + 2 \cdot h1 \cdot tw}{6 \cdot b \cdot tf + h1 \cdot tw} \right) \qquad Cw = 4595.68 \cdot cm^6$$

$$J := \frac{1}{3}\left(2 \cdot b \cdot tf^3 + h1 \cdot tw^3\right) \qquad J = 6.06 \cdot cm^4$$

$$Zx := bf \cdot tf \cdot (d - tf) + \frac{1}{4} \cdot tw \cdot (d - 2 \cdot tf)^2 \qquad Zx = 132.46 \cdot cm^3$$

$$Zy := \begin{cases} \left[tf \cdot \left[(bf - x1)^2 + x1^2 \right] + (d - 2 \cdot tf) \cdot tw \cdot \left(x1 - \frac{tw}{2} \right) \right] & \text{if } 2 \cdot tf \cdot bf > hw \cdot tw \\ \left[0.5 \cdot d \cdot x1^2 + tf \cdot (bf - x1)^2 + 0.5 (d - 2 \cdot tf) \cdot (tw - x1)^2 \right] & \text{otherwise} \end{cases} \qquad Zy = 48.14 \cdot cm^3$$

$h := d - 2 \cdot tf - 2r$ $h = 13.00 \cdot cm$

Jarak pusat geser dari as badan $q := \frac{3 \cdot b^2 \cdot tf}{h1 \cdot tw + 6 \cdot b \cdot tf}$ $q = 2.96 \cdot cm$

Jarak antara pusat geser dan pusat berat $q - 0.5 \cdot tw + e = 4.95 \cdot cm$

Baja Kanal Indonesia Data Penampang: Profil C200x75x8.5 (lihat tabel hal 34)

Momen Inersia $Ix := 1910 cm^4$ $Iy := 148 cm^4$ Tebal sayap $tf := 11.5mm$

Luas Penampang $A := 32.2 cm^2$ Tebal badan $tw := 8.5mm$

Tinggi total profil $d := 200mm$ Lebar sayap $bf := 75mm$

Jari2 sudut flens-badan $r := 11.5mm$

Jarak titik berat dari tepi luar web $e := 20.1mm$ (pusat titik berat)

Besaran Penampang

$Sx := \frac{Ix}{0.5 \cdot d}$ $Sx = 191.00 \cdot cm^3$ $rx := \sqrt{\frac{Ix}{A}}$ $rx = 7.70 \cdot cm$

$Sy := \frac{Iy}{bf - e}$ $Sy = 26.96 \cdot cm^3$ $ry := \sqrt{\frac{Iy}{A}}$ $ry = 2.14 \cdot cm$

$h1 := d - tf$ $h1 = 18.85 \cdot cm$ $b := bf - 0.5tw$ $b = 7.07 \cdot cm$

$xbar := e - 0.5tw$ $xbar = 1.59 \cdot cm$ $hw := d - 2tf$ $hw = 17.70 \cdot cm$

Jarak sumbu netral plastis

$$x1 := \begin{cases} \frac{2 \cdot tf \cdot bf - hw \cdot tw}{4tf} & \text{if } 2 \cdot tf \cdot bf > hw \cdot tw \\ \frac{tf \cdot bf - tf \cdot tw + 0.5 \cdot d \cdot tw}{d} & \text{otherwise} \end{cases}$$

sumbu netral plastis di flens

sumbu netral plastis di badan (lebih sering terjadi)

$2 \cdot tf \cdot bf = 17.25 \cdot cm^2$ $hw \cdot tw = 15.05 \cdot cm^2$ $x1 = 0.48 \cdot cm$

$$Cw := \frac{tf \cdot b^3 \cdot h1^2}{12} \cdot \left(\frac{3 \cdot b \cdot tf + 2 \cdot h1 \cdot tw}{6 \cdot b \cdot tf + h1 \cdot tw} \right) \qquad Cw = 10499.50 \cdot cm^6$$

$$J := \frac{1}{3}\left(2 \cdot b \cdot tf^3 + h1 \cdot tw^3\right) \qquad J = 11.03 \cdot cm^4$$

$$Zx := bf \cdot tf \cdot (d - tf) + \frac{1}{4} \cdot tw \cdot (d - 2 \cdot tf)^2 \qquad Zx = 229.16 \cdot cm^3$$

$$Zy := \begin{cases} \left[tf \cdot \left[(bf - x1)^2 + x1^2 \right] + (d - 2 \cdot tf) \cdot tw \cdot \left(x1 - \frac{tw}{2} \right) \right] & \text{if } 2 \cdot tf \cdot bf > hw \cdot tw \\ \left[0.5 \cdot d \cdot x1^2 + tf \cdot (bf - x1)^2 + 0.5 (d - 2 \cdot tf) \cdot (tw - x1)^2 \right] & \text{otherwise} \end{cases} \qquad Zy = 57.76 \cdot cm^3$$

$h := d - 2 \cdot tf - 2r$ $\qquad h = 15.40 \cdot cm$

Jarak pusat geser dari as badan $\qquad q := \frac{3 \cdot b^2 \cdot tf}{h1 \cdot tw + 6 \cdot b \cdot tf} \qquad q = 2.66 \cdot cm$

Jarak antara pusat geser dan pusat berat $\qquad q - 0.5 \cdot tw + e = 4.25 \cdot cm$

Baja Kanal Indonesia $\qquad$ Data Penampang: $\qquad$ Profil C100x50x6 $\qquad$ (lihat tabel hal 34)

Momen Inersia $\qquad Ix := 206 cm^4 \qquad Iy := 29.3 cm^4$ $\qquad$ Tebal sayap $\qquad tf := 8.5mm$

Luas Penampang $\qquad A := 13.5 cm^2$ $\qquad$ Tebal badan $\qquad tw := 6mm$

Tinggi total profil $\qquad d := 100mm$ $\qquad$ Lebar sayap $\qquad bf := 50mm$

Jari2 sudut flens-badan $\qquad r := 8.5mm$

Jarak titik berat dari tepi luar web $\qquad e := 15.5mm$ $\qquad$ (pusat titik berat)

Besaran Penampang

$Sx := \frac{Ix}{0.5 \cdot d} \qquad Sx = 41.20 \cdot cm^3 \qquad rx := \sqrt{\frac{Ix}{A}} \qquad rx = 3.91 \cdot cm$

$Sy := \frac{Iy}{bf - e} \qquad Sy = 8.49 \cdot cm^3 \qquad ry := \sqrt{\frac{Iy}{A}} \qquad ry = 1.47 \cdot cm$

$h1 := d - tf \qquad h1 = 9.15 \cdot cm \qquad b := bf - 0.5tw \qquad b = 4.70 \cdot cm$

$xbar := e - 0.5tw \qquad xbar = 1.25 \cdot cm \qquad hw := d - 2tf \qquad hw = 8.30 \cdot cm$

Jarak sumbu netral plastis

$$x1 := \begin{cases} \frac{2 \cdot tf \cdot bf - hw \cdot tw}{4tf} & \text{if } 2 \cdot tf \cdot bf > hw \cdot tw \\ \frac{tf \cdot bf - tf \cdot tw + 0.5 \cdot d \cdot tw}{d} & \text{otherwise} \end{cases}$$

sumbu netral plastis di flens

sumbu netral plastis di badan
(lebih sering terjadi)

$2 \cdot tf \cdot bf = 8.50 \cdot cm^2 \qquad hw \cdot tw = 4.98 \cdot cm^2 \qquad x1 = 1.04 \cdot cm$

$Cw := \frac{tf \cdot b^3 \cdot h1^2}{12} \cdot \left(\frac{3 \cdot b \cdot tf + 2 \cdot h1 \cdot tw}{6 \cdot b \cdot tf + h1 \cdot tw} \right) \qquad Cw = 479.96 \cdot cm^6$

$J := \frac{1}{3} \left(2 \cdot b \cdot tf^3 + h1 \cdot tw^3 \right) \qquad J = 2.58 \cdot cm^4$

$Zx := bf \cdot tf \cdot (d - tf) + \frac{1}{4} \cdot tw \cdot (d - 2 \cdot tf)^2 \qquad Zx = 49.22 \cdot cm^3$

$$Zy := \begin{cases} \left[tf \cdot \left[(bf - x1)^2 + x1^2 \right] + (d - 2 \cdot tf) \cdot tw \cdot \left(x1 - \frac{tw}{2} \right) \right] & \text{if } 2 \cdot tf \cdot bf > hw \cdot tw \\ \left[0.5 \cdot d \cdot x1^2 + tf \cdot (bf - x1)^2 + 0.5 (d - 2 \cdot tf) \cdot (tw - x1)^2 \right] & \text{otherwise} \end{cases} \qquad Zy = 17.93 \cdot cm^3$$

$h := d - 2 \cdot tf - 2r \qquad h = 6.60 \cdot cm$

Jarak pusat geser dari as badan $\qquad q := \frac{3 \cdot b^2 \cdot tf}{h1 \cdot tw + 6 \cdot b \cdot tf} \qquad q = 1.91 \cdot cm$

Jarak antara pusat geser dan pusat berat $\qquad q - 0.5 \cdot tw + e = 3.16 \cdot cm$

Baja Kanal Indonesia Data Penampang: Profil C160x65x7.5 (lihat tabel hal 34

Momen Inersia $Ix := 925cm^4$ $Iy := 85.3cm^4$ Tebal sayap $tf := 10.5mm$

Luas Penampang $A := 24cm^2$ Tebal badan $tw := 7.5mm$

Tinggi total profil $d := 160mm$ Lebar sayap $bf := 65mm$

Jari2 sudut flens-badan $r := 10.5mm$

Jarak titik berat dari tepi luar web $e := 18.8mm$ (pusat titik berat)

Besaran Penampang

$Sx := \frac{Ix}{0.5 \cdot d}$ $Sx = 115.62 \cdot cm^3$ $rx := \sqrt{\frac{Ix}{A}}$ $rx = 6.21 \cdot cm$

$Sy := \frac{Iy}{bf - e}$ $Sy = 18.46 \cdot cm^3$ $ry := \sqrt{\frac{Iy}{A}}$ $ry = 1.89 \cdot cm$

$h1 := d - tf$ $h1 = 14.95 \cdot cm$ $b := bf - 0.5tw$ $b = 6.13 \cdot cm$

$xbar := e - 0.5tw$ $xbar = 1.51 \cdot cm$ $hw := d - 2tf$ $hw = 13.90 \cdot cm$

Jarak sumbu netral plastis

$$x1 := \begin{cases} \frac{2 \cdot tf \cdot bf - hw \cdot tw}{4tf} & \text{if } 2 \cdot tf \cdot bf > hw \cdot tw \\ \frac{tf \cdot bf - tf \cdot tw + 0.5 \cdot d \cdot tw}{d} & \text{otherwise} \end{cases}$$

sumbu netral plastis di flens

sumbu netral plastis di badan (lebih sering terjadi)

$2 \cdot tf \cdot bf = 13.65 \cdot cm^2$ $hw \cdot tw = 10.42 \cdot cm^2$ $x1 = 0.77 \cdot cm$

$Cw := \frac{tf \cdot b^3 \cdot h1^2}{12} \cdot \left(\frac{3 \cdot b \cdot tf + 2 \cdot h1 \cdot tw}{6 \cdot b \cdot tf + h1 \cdot tw} \right)$ $Cw = 3764.53 \cdot cm^6$

$J := \frac{1}{3}\left(2 \cdot b \cdot tf^3 + h1 \cdot tw^3\right)$ $J = 6.83 \cdot cm^4$

$Zx := bf \cdot tf \cdot (d - tf) + \frac{1}{4} \cdot tw \cdot (d - 2 \cdot tf)^2$ $Zx = 138.26 \cdot cm^3$

$$Zy := \begin{cases} \left[tf \cdot \left[(bf - x1)^2 + x1^2 \right] + (d - 2 \cdot tf) \cdot tw \cdot \left(x1 - \frac{tw}{2} \right) \right] & \text{if } 2 \cdot tf \cdot bf > hw \cdot tw \\ \left[0.5 \cdot d \cdot x1^2 + tf \cdot (bf - x1)^2 + 0.5(d - 2 \cdot tf) \cdot (tw - x1)^2 \right] & \text{otherwise} \end{cases}$$

$Zy = 39.21 \cdot cm^3$

$h := d - 2 \cdot tf - 2r$ $h = 11.80 \cdot cm$

Jarak pusat geser dari as badan $q := \frac{3 \cdot b^2 \cdot tf}{h1 \cdot tw + 6 \cdot b \cdot tf}$ $q = 2.37 \cdot cm$

Jarak antara pusat geser dan pusat berat $q - 0.5 \cdot tw + e = 3.88 \cdot cm$

Baja Channel Amerika Data Penampang: Profil C15x50

Momen Inersia $Ix := 404in^4$ $Iy := 11in^4$ Tebal sayap $tf := 0.65in$

Luas Penampang $A := 14.7in^2$ Tebal badan $tw := 0.716in$

Tinggi total profil $d := 15in$ Lebar sayap $bf := 3.716in$

Jari2 sudut flens-badan $r := 1.4375in - tf$ $r = 0.79 \cdot in$

Jarak titik berat dari tepi luar web $e := 0.798in$

Besaran Penampang

$Sx := \frac{Ix}{0.5 \cdot d}$ $Sx = 53.87 \cdot in^3$ $rx := \sqrt{\frac{Ix}{A}}$ $rx = 5.24 \cdot in$

$Sy := \frac{Iy}{bf - e}$ $Sy = 3.77 \cdot in^3$ $ry := \sqrt{\frac{Iy}{A}}$ $ry = 0.87 \cdot in$

$h1 := d - tf$ $h1 = 14.35 \cdot in$ $b := bf - 0.5tw$ $b = 3.36 \cdot in$

$xbar := e - 0.5tw$ $xbar = 0.44 \cdot in$ $hw := d - 2tf$ $hw = 13.70 \cdot in$

Jarak sumbu netral plastis

$$x1 := \begin{cases} \frac{2 \cdot tf \cdot bf - hw \cdot tw}{4tf} & \text{if } 2 \cdot tf \cdot bf > hw \cdot tw \\ \frac{tf \cdot bf - tf \cdot tw + 0.5 \cdot d \cdot tw}{d} & \text{otherwise} \end{cases}$$

sumbu netral plastis di flens

sumbu netral plastis di badan (lebih sering terjadi)

$2 \cdot tf \cdot bf = 4.83 \cdot in^2$ $hw \cdot tw = 9.81 \cdot in^2$ $x1 = 0.49 \cdot in$

$Cw := \frac{tf \cdot b^3 \cdot h1^2}{12} \cdot \left(\frac{3 \cdot b \cdot tf + 2 \cdot h1 \cdot tw}{6 \cdot b \cdot tf + h1 \cdot tw} \right)$ $Cw = 489.70 \cdot in^6$

$J := \frac{1}{3}\left(2 \cdot b \cdot tf^3 + h1 \cdot tw^3\right)$ $J = 2.37 \cdot in^4$

$Zx := bf \cdot tf \cdot (d - tf) + \frac{1}{4} \cdot tw \cdot (d - 2 \cdot tf)^2$ $Zx = 68.26 \cdot in^3$

$$Zy := \begin{cases} \left[tf \cdot \left[(bf - x1)^2 + x1^2 \right] + (d - 2 \cdot tf) \cdot tw \cdot \left(x1 - \frac{tw}{2} \right) \right] & \text{if } 2 \cdot tf \cdot bf > hw \cdot tw \\ \left[0.5 \cdot d \cdot x1^2 + tf \cdot (bf - x1)^2 + 0.5(d - 2 \cdot tf) \cdot (tw - x1)^2 \right] & \text{otherwise} \end{cases}$$

$Zy = 8.92 \cdot in^3$

$h := d - 2 \cdot tf - 2r$ $h = 12.13 \cdot in$

Jarak pusat geser dari as badan $q := \frac{3 \cdot b^2 \cdot tf}{h1 \cdot tw + 6 \cdot b \cdot tf}$ $q = 0.94 \cdot in$

Jarak antara pusat geser dan pusat berat $q - 0.5 \cdot tw + e = 1.38 \cdot in$

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