



My Logic Icr:

$$I_x = \frac{bh^3}{12} + Ad^2$$

$$I_{cr} = \frac{3000 \cdot 43.3^3}{12} + 3000 \cdot 43.3 \cdot (43.3/2)^2 + 5600 \cdot (54.5 - 43.3)^2 + 5600 \cdot (167.5 - 43.3)^2$$

$$I_{cr} = 168\,270\,000\text{ mm}^4$$

Sum=2765-861-1904~0kN Good
Mr=2765kN(167.5-36.6/2)-861kN(167.5-54.5)=
Mr=315.2kNm > Mf Good

From CSA 23.3-14 on page 6-5 (Table 6.2) Icr:

$$n=6.2 \quad B=0.0864 \quad r=0.8389$$

$$kd=52.1\text{mm}$$

$$I_{cr}=604\,400\,000\text{ mm}^4$$

$$52.1\text{mm}=kd \neq c=43.3\text{mm}???$$

Gross Section	Cracked Transformed Section	Gross and Cracked Moment of Inertia
	<p>Without compression steel</p>	$n = \frac{E_s}{E_c}$ $B = \frac{b}{(nA_s)}$ $I_g = \frac{bh^3}{12}$ Without compression steel $kd = \frac{\sqrt{2dB + 1} - 1}{B}$ $I_{cr} = \frac{bk^3d^3}{3} + nA_s(d - kd)^2$
	<p>With compression steel</p>	$r = \frac{(n-1)A'_s}{(nA_s)}$ $kd = \frac{\left[\sqrt{2dB(1 + rd'/d) + (1+r)^2} - (1+r) \right]}{B}$ $I_{cr} = \frac{bk^3d^3}{3} + nA_s(d - kd)^2 + (n-1)A'_s(kd - d')^2$