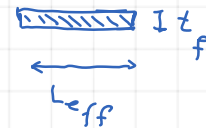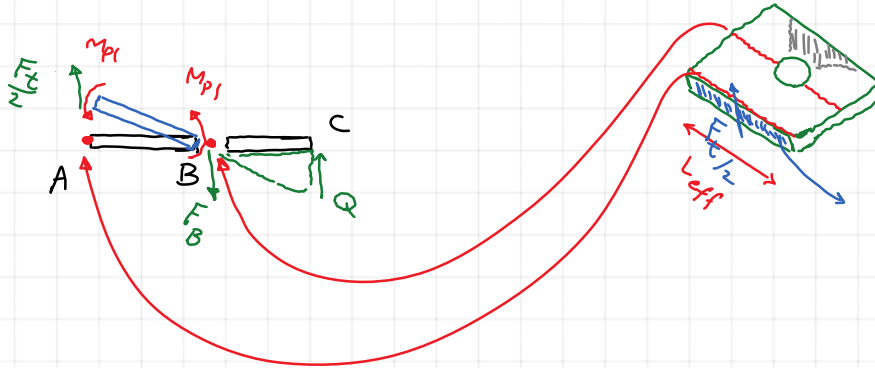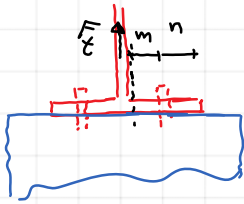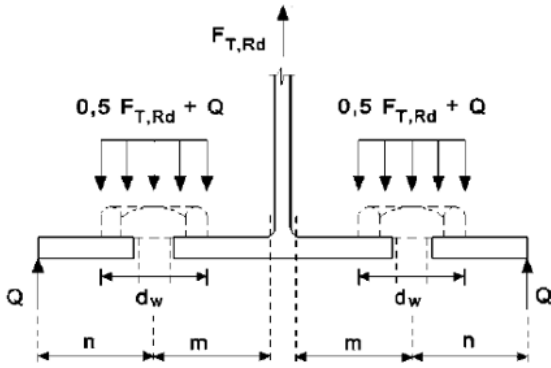In this [video](), the different failure modes of a T-Stub are explained. The given equation in Eurocode 1993-1-8 for each mode is determined and explained in how they are calculated in the code.
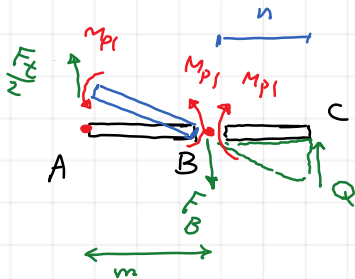
$$M_{Pl} = f_y \, W_{pl}$$

$$\underbrace{\quad}_{} \quad \frac{L_{eff} \, t_f^2}{4}$$

$$M_{Pl} = 0.25 \, t_f^2 \, l_{eff} \, f_y$$

$$M_{pl,1,Rd} = 0.25 \Sigma \ell_{eff,1} \, t_f^2 \, f_y / \gamma_{M0}$$

$$M_{pl,2,Rd} = 0.25 \Sigma \ell_{eff,2} \, t_f^2 \, f_y / \gamma_{M0}$$

$$M_{bp,Rd} = 0.25 \Sigma \ell_{eff,1} \, t_{bp}^2 \, f_{y,bp} / \gamma_{M0}$$

$\sum M_B = 0 \Rightarrow M_{Pl} + M_{Pl} - \frac{Ft}{2} \cdot m = 0$
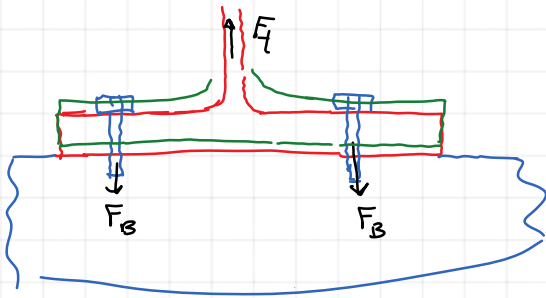left

$$\boxed{F_{t,1} = \frac{4 M_{Pl}}{m}}$$

$\sum M_B = 0 \Rightarrow Q \, n - M_{Pl} = 0$
Right

$$\boxed{Q = \frac{M_{Pl}}{n}}$$

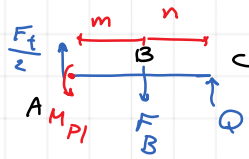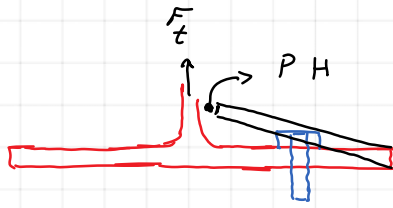$\sum F_y = 0 \Rightarrow \frac{Ft}{2} + Q - F_B = 0$

$$\boxed{F_B = \frac{Ft}{2} + Q}$$

Mode 1

Mode 1	Method 1
without backing plates	$F_{T,1,Rd} = \dfrac{4M_{pl,1,Rd}}{m}$

E_t

F_B F_B

$$\boxed{F_t = \Sigma F_B}$$

Mode 3

Mode 3	$F_{T,3,Rd} = \Sigma F_{t,Rd}$

F_t

PH

$\frac{F_t}{2}$ m n

A M_{Pl} F_B B Q C

$+\circlearrowleft \Sigma M_C = 0$ $-\dfrac{F_t}{2}(m+n) + M_{Pl} + \dfrac{\Sigma F_B}{2} \cdot n = 0$

$$\boxed{F_t = \frac{2M_{Pl} + n\,\Sigma F_B}{m+n}}$$

Mode 2	$F_{T,2,Rd} = \dfrac{2M_{pl,2,Rd} + n\Sigma F_{t,Rd}}{m+n}$

$+\circlearrowleft \Sigma M_B = 0 \Rightarrow \quad M_{Pl} + Q\cdot n - F_{t/2}\cdot m = 0 \Rightarrow \boxed{Q = \dfrac{\frac{F_t}{2}\cdot m - M_{Pl}}{n}}$

Mode 1 →   Weak flange
            Strong bolt   ⇒
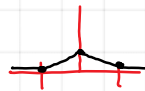
Mode 2 →   moderate flange & bolt ⇒

Mode 3 →   Strong flange
            weak bolt   ⇒)