

Detailed Joint Calculations

Units: N&mm

Regulation: ASCE 41-17

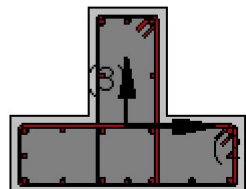
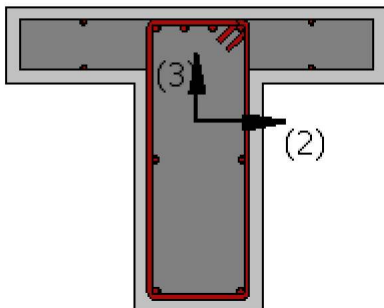
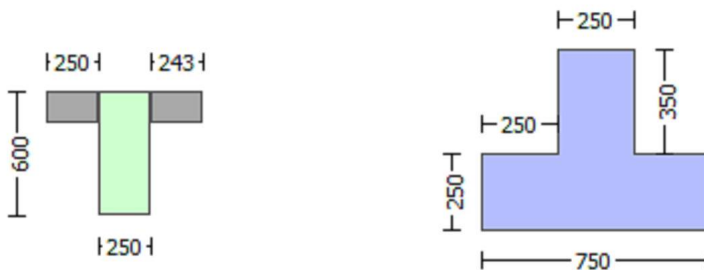
Calculation No. 1

Col. C2 - Beam B9, Floor : 1

Limit State: Life Safety (data interpolation between analysis steps 3 and 4)

Analysis: Uniform +X

Check: Shear Force



Demanded Shear Force: $V_e = 302926.539$ from TBDY, (7.11) and ACI 318-14, 18.8.2.1.
with

$V_{kol} = \text{Min}(V_{kol, \text{above_joint}}, V_{kol, \text{below_joint}}) = 4949.541$

$A_{s2} = 0$

$A_{s1} = 615.7522$

Existing Material: $f_{yd} = f_{s_Lower_bound} = 400.00$

knowledge factor, $= 1.00$

Existing Joint: From table 7-7, ASCE 41-17: Final value $V_n, R = *V_n = 747341.382$
 $V_n = 747341.382$ from (10.4) ASCE 41-17
 Demanded Shear Force: $V_e = 302926.539$ from TBDY, (7.11) and ACI 318-14, 18.8.2.1.
 with

$f_c = \text{Min}(f_{c_beam}, f_{c_Column}) = 16.00$
 Existing Material: $f_{c_column} = f_{c_lower_bound_column} = 16.00$
 Existing Material: $f_{c_beam} = f_{c_lower_bound_beam} = 16.00$
 $A_j = 149999.915$
 $h_c = 600.00$
 $b_j = 249.9999$
 column width = 250.00
 beam width plus joint depth = 850.00
 Min perpendicular distance of beam axis to column sides = 124.9999
 = 15.00, from table 10-12, ASCE 41-17)
 column hoops spacing = 100.00

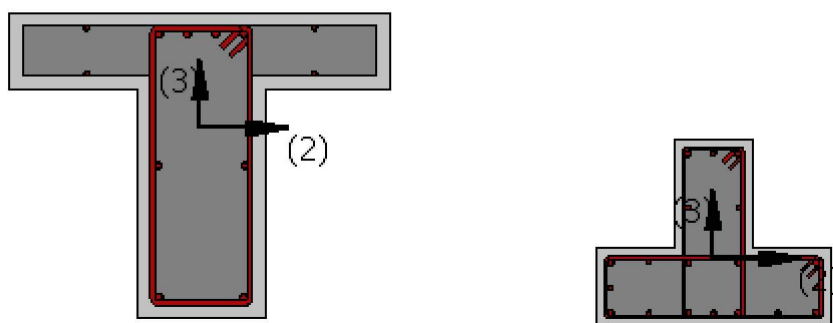
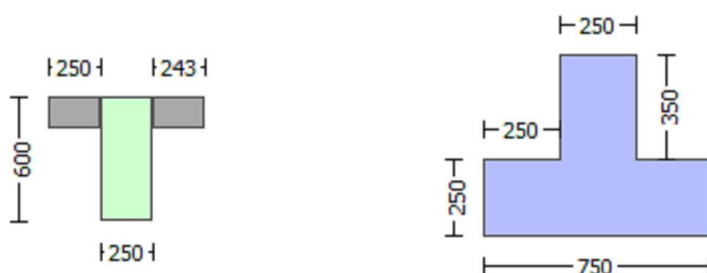
Calculation No. 2

Col. C2 - Beam B9, Floor : 1

Limit State: Collapse Prevention (data interpolation between analysis steps 4 and 5)

Analysis: Uniform +X

Check: Shear Force



Demanded Shear Force: $V_e = 302554.452$ from TBDY, (7.11) and ACI 318-14, 18.8.2.1.
 with

$V_{kol} = \text{Min}(V_{kol,above_joint}, V_{kol,below_joint}) = 5321.629$
 $A_{s2} = 0$
 $A_{s1} = 615.7522$
 Existing Material: $f_{yd} = f_{s_Lower_bound} = 400.00$

knowledge factor, = 1.00

Existing Joint: From table 7-7, ASCE 41-17: Final value $V_n, R = *V_n = 747341.382$

$V_n = 747341.382$ from (10.4) ASCE 41-17

Demanded Shear Force: $V_e = 302554.452$ from TBDY, (7.11) and ACI 318-14, 18.8.2.1.

with

$f_c = \text{Min}(f_{c_beam}, f_{c_Column}) = 16.00$

Existing Material: $f_{c_column} = f_{c_lower_bound_column} = 16.00$

Existing Material: $f_{c_beam} = f_{c_lower_bound_beam} = 16.00$

$A_j = 149999.915$

$h_c = 600.00$

$b_j = 249.9999$

column width = 250.00

beam width plus joint depth = 850.00

Min perpendicular distance of beam axis to column sides = 124.9999

= 15.00, from table 10-12, ASCE 41-17)

column hoops spacing = 100.00