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
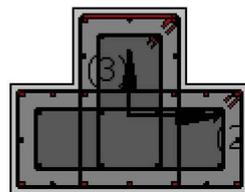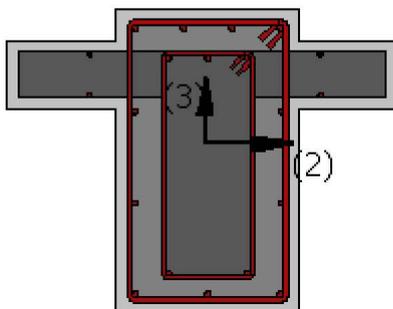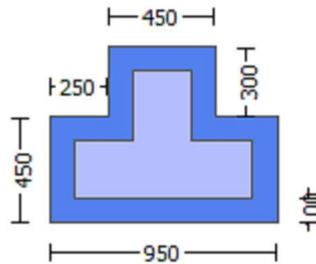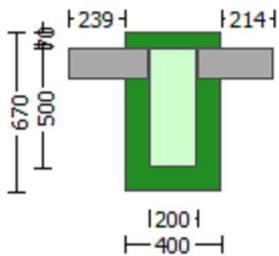
Check: Shear Force

Demanded Shear Force: Ve = 551852.401 from TBDY, (7.11) and ACI 318-14, 18.8.2.1.
with
  Vkol = Min(Vkol,above_joint , Vkol,below_joint) = 2638.702
  As2 = 0
  As1*fyd = As1_jacket*fyd_jacket+As1_core*fyd_core
    As1_jacket = 615.7522
    As1_core = 339.292
  New Material: fyd_jacket = fs_Lower_bound_jacket = 500.00

Existing Material: fyd_core = fs_Lower_bound_core = 400.00
----
  knowledge factor,   = 1.00

Existing Joint: From table 7-7, ASCE 41-17: Final value Vn,R =   *Vn = 1.4947E+006
Vn = 1.4947E+006 from (10.4) ASCE 41-17
Demanded Shear Force: Ve = 551852.401 from TBDY, (7.11) and ACI 318-14, 18.8.2.1.
with
  fc = Min(fc_beam,fc_Column) = 16.00
     Existing Material: fc_column = fc_lower_bound_column = 16.00
     Existing Material: fc_beam = fc_lower_bound_beam = 16.00
  Aj = = 300000.111
   hc = 750.00
   bj = 400.0001
     column width = 450.00
     beam width plus joint depth = 1150.00
     Min perpedicular distance of beam axis to column sides = 200.0001
     = 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
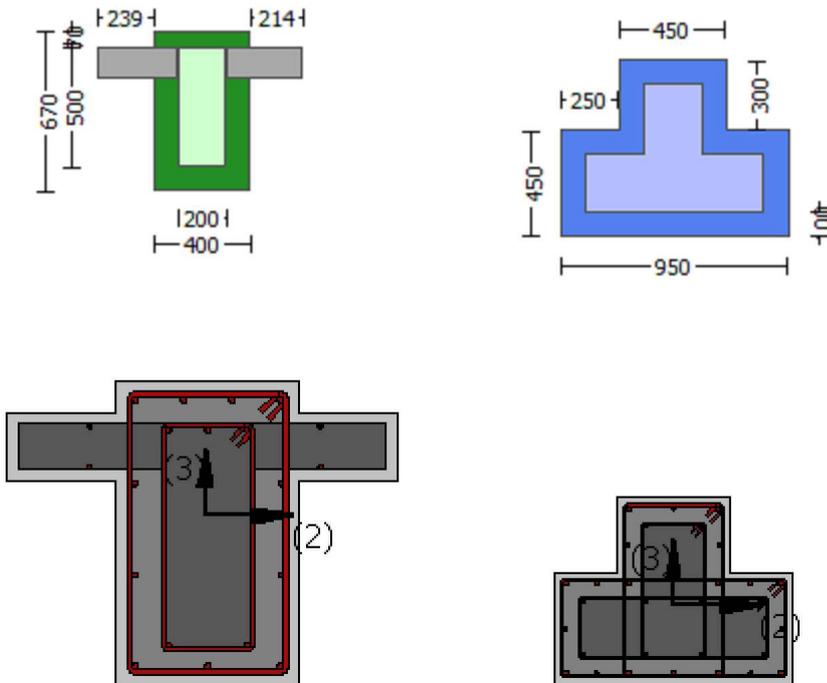
Check: Shear Force

Demanded Shear Force: Ve = 551978.983 from TBDY, (7.11) and ACI 318-14, 18.8.2.1.
with
  Vkol = Min(Vkol,above_joint , Vkol,below_joint) = 2512.12
  As2 = 0
  As1*fyd = As1_jacket*fyd_jacket+As1_core*fyd_core
     As1_jacket = 615.7522
     As1_core = 339.292

New Material: fyd_jacket = fs_Lower_bound_jacket = 500.00
Existing Material: fyd_core = fs_Lower_bound_core = 400.00
----
knowledge factor,   = 1.00

Existing Joint: From table 7-7, ASCE 41-17: Final value Vn,R =   *Vn = 1.4947E+006
Vn = 1.4947E+006 from (10.4) ASCE 41-17
Demanded Shear Force: Ve = 551978.983 from TBDY, (7.11) and ACI 318-14, 18.8.2.1.
with
  fc = Min(fc_beam,fc_Column) = 16.00
     Existing Material: fc_column = fc_lower_bound_column = 16.00
     Existing Material: fc_beam = fc_lower_bound_beam = 16.00
  Aj = = 300000.111
   hc = 750.00
   bj = 400.0001
     column width = 450.00
     beam width plus joint depth = 1150.00
     Min perpedicular distance of beam axis to column sides = 200.0001
    = 15.00, from table 10-12, ASCE 41-17)
   column hoops spacing = 100.00