Detailed Joint Calculations

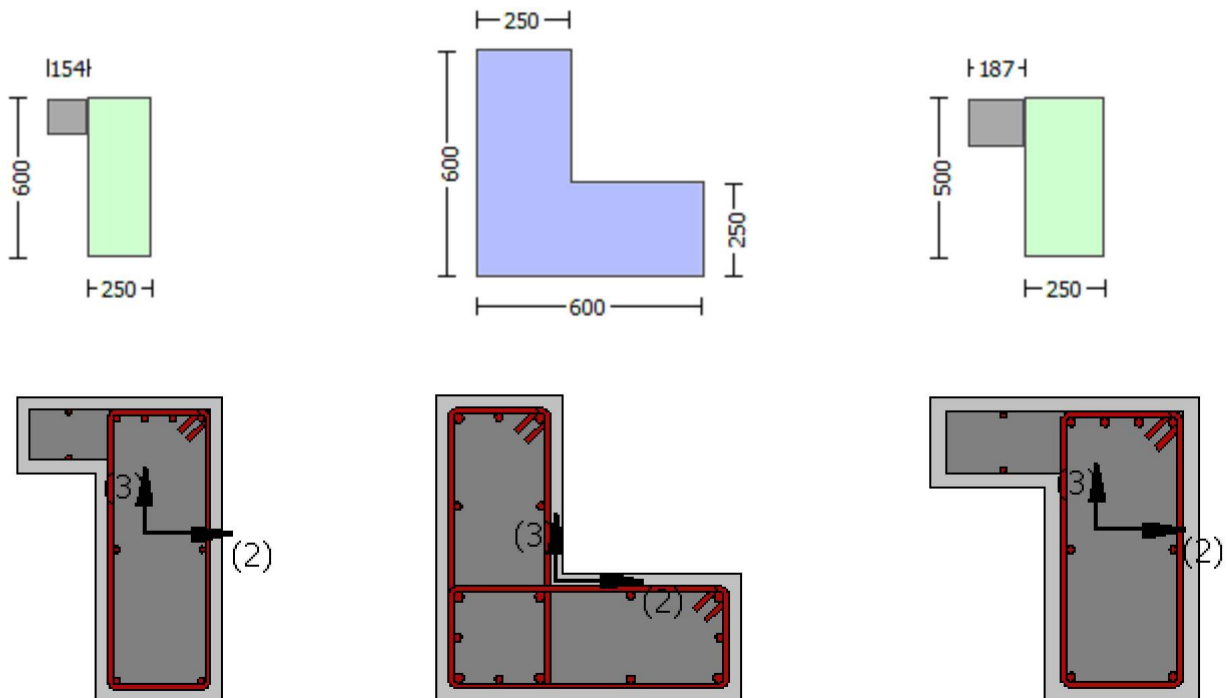**Units: N&mm**

Regulation: ASCE 41-17

Calculation No. 1

Col. C2 - Beam B2 - Beam B1, Floor : 1

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

Analysis: Uniform +X

Check: Shear Force

Demanded Shear Force: Vjhd = Max(Vjhd1,Vjhd2) = 566032.40, where
Vjhd1,Vjhd2 are calculated for beam 1 and beam 2, respectively, using TBDY, (7.11) and ACI 318-14, 18.8.2.1.
Beam 1:
Vjhd1 = 566032.40
with
  Vkol = Min(Vkol,above_joint , Vkol,below_joint) = 11235.25
  As1 = 615.7522
  As2 = 307.8761

New Material: fyd = fs_Lower_bound = 500.00

Beam 2:
Vjhd2 = 450578.87
with
  Vkol = Min(Vkol,above_joint , Vkol,below_joint) = 11235.25
  As1 = 615.7522
  As2 = 307.8761
  Existing Material: fyd = fs_Lower_bound = 400.00
----
  knowledge factor,   = 1.00

Vn = Min(Vn1, Vn2) = 996455.744, where
 provided Shear Forces are calculated for beam 1 and beam 2, respectively
Beam 1:
Existing Joint: From table 7-7, ASCE 41-17: Final value Vn1,R =   *Vn1 = 996455.744
Vn1 = 996455.744 from (10.4) ASCE 41-17
with
  fc = Min(fc_beam,fc_Column) = 16.00
    Existing Material: fc_column = fc_lower_bound_column = 16.00
    New Material: fcd_beam = fc_lower_bound_beam= 25.00
  Aj = = 150000.00
   hc = 600.00
   bj = 250.00
    column width = 250.00
    beam width plus joint depth = 850.00
    Min perpedicular distance of beam axis to column sides = 125.00
    = 20.00, from table 10-12, ASCE 41-17)
   column hoops spacing = 100.00

Beam 2:
Existing Joint: From table 7-7, ASCE 41-17: Final value Vn1,R =   *Vn1 = 996455.744
Vn1 = 996455.744 from (10.4) ASCE 41-17
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 = = 150000.00
   hc = 600.00
   bj = 250.00
    column width = 250.00
    beam width plus joint depth = 850.00
    Min perpedicular distance of beam axis to column sides = 125.00
    = 20.00, from table 10-12, ASCE 41-17)
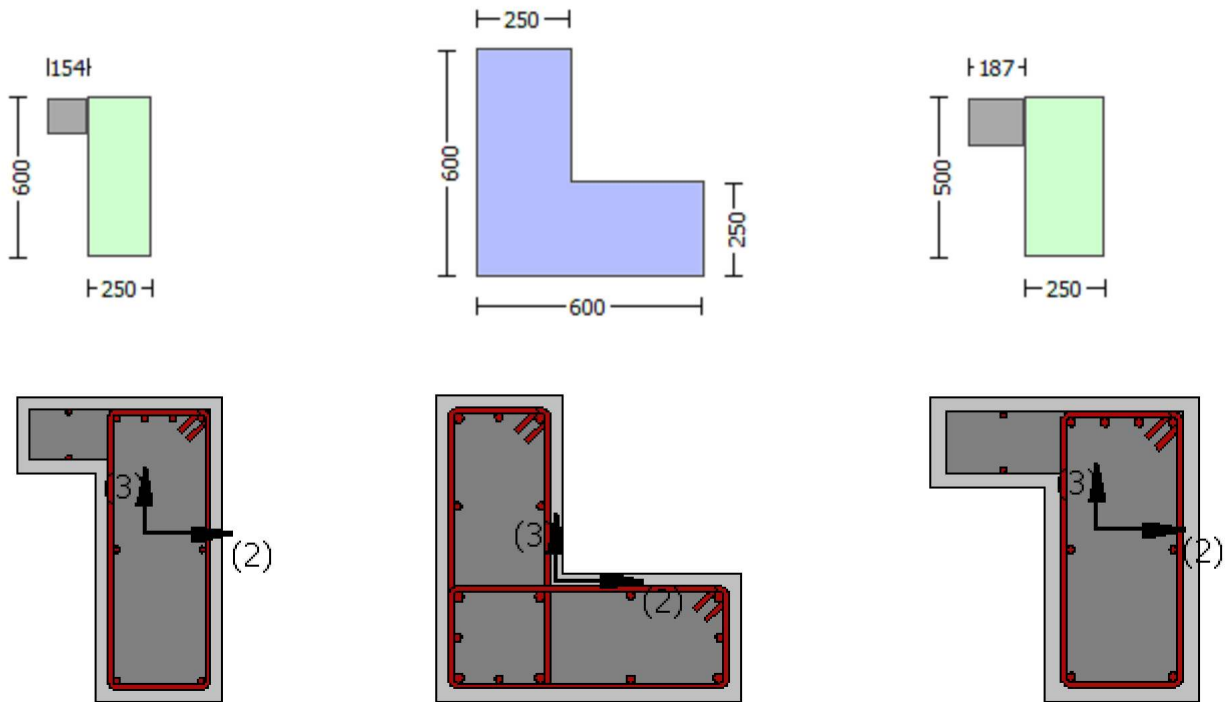   column hoops spacing = 100.00

Calculation No. 2

Col. C2 - Beam B2 - Beam B1, Floor : 1

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

Analysis: Uniform +X

Check: Shear Force

Demanded Shear Force: Vjhd = Max(Vjhd1,Vjhd2) = 563562.64, where
 Vjhd1,Vjhd2 are calculated for beam 1 and beam 2, respectively, using TBDY, (7.11) and ACI 318-14, 18.8.2.1.
Beam 1:
Vjhd1 = 563562.64
with
  Vkol = Min(Vkol,above_joint , Vkol,below_joint) = 13705.01
  As1 = 615.7522
  As2 = 307.8761
  New Material: fyd = fs_Lower_bound = 500.00

Beam 2:
Vjhd2 = 448109.11
with
  Vkol = Min(Vkol,above_joint , Vkol,below_joint) = 13705.01
  As1 = 615.7522
  As2 = 307.8761
  Existing Material: fyd = fs_Lower_bound = 400.00
----
  knowledge factor,   = 1.00

Vn = Min(Vn1, Vn2) = 996455.744, where
 provided Shear Forces are calculated for beam 1 and beam 2, respectively
Beam 1:
Existing Joint: From table 7-7, ASCE 41-17: Final value Vn1,R =   *Vn1 = 996455.744
Vn1 = 996455.744 from (10.4) ASCE 41-17
with
  fc = Min(fc_beam,fc_Column) = 16.00
     Existing Material: fc_column = fc_lower_bound_column = 16.00
     New Material: fcd_beam = fc_lower_bound_beam= 25.00
  Aj = = 150000.00
   hc = 600.00
   bj = 250.00
     column width = 250.00
     beam width plus joint depth = 850.00
     Min perpedicular distance of beam axis to column sides = 125.00
   = 20.00, from table 10-12, ASCE 41-17)
   column hoops spacing = 100.00

Beam 2:
Existing Joint: From table 7-7, ASCE 41-17: Final value Vn1,R =   *Vn1 = 996455.744
Vn1 = 996455.744 from (10.4) ASCE 41-17
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 = = 150000.00
 hc = 600.00
 bj = 250.00
  column width = 250.00
  beam width plus joint depth = 850.00
  Min perpedicular distance of beam axis to column sides = 125.00
 = 20.00, from table 10-12, ASCE 41-17)
 column hoops spacing = 100.00