

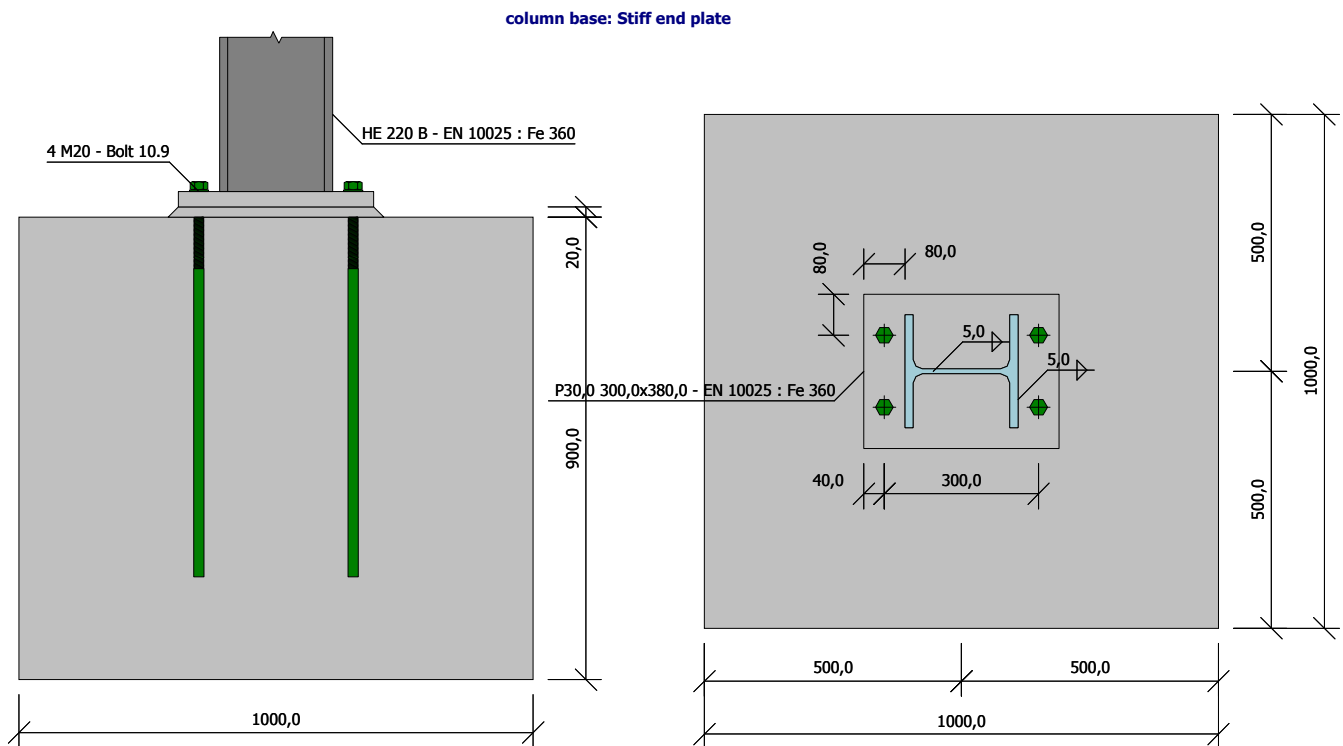
# 1 Project

## 1.1 Calculation parameters

Standard : ČSN EN 1993-1-8 (  $\gamma_{M0} = 1,00$ ;  $\gamma_{M1} = 1,00$ ;  $\gamma_{M2} = 1,25$ ;  $\gamma_C = 1,50$  )  
Structure type : Frame with sway mode failure

## 2 Steel Base 1 - column base

### 2.1 Column base scheme



### 2.2 Data recapitulation

#### Column base:

Material: C 30/37  
strength in compr. :  $f_{ck} = 30,0$  MPa  
strength in tension :  $f_{ctk} = 2,9$  MPa

#### Geometry

floor width :  $b_b = 1000,0$  mm  
vertical height :  $h_b = 900,0$  mm  
floor height :  $a_b = 1000,0$  mm

#### Grout:

Material: C 20/25  
strength in compr. :  $f_{ck} = 20,0$  MPa  
strength in tension :  $f_{ctk} = 2,2$  MPa

#### Geometry

thickness :  $t_g = 20,0$  mm

#### 2.2.1 Base plate connection - Stiff end plate

##### Joint position

column position on base :  $L_x = 0,0$  mm  
column position about soft axis :  $\alpha = 0,00$  °  
column position on base :  $L_y = 0,0$  mm



## Profile

Section: HE 220 B

cross-section height :  $h = 220,0$  mm  
section width :  $b = 220,0$  mm

web thickness :  $t_w = 9,5$  mm  
flange thickness :  $t_f = 16,0$  mm

Material: EN 10025 : Fe 360

Yield strength :  $f_y = 235,0$  MPa  
Ultimate tensile strength :  $f_u = 360,0$  MPa

Elasticity modulus :  $E = 210000,0$  MPa

## Column welding - fillet weld around

height of weld on web :  $a_{w,w} = 5,0$  mm

height of weld on flange :  $a_{w,f} = 5,0$  mm

## Bolts

Type: Glued bolts in drilled sleeves ( M20 )

shank length :  $L = 700,0$  mm

thread length :  $L_b = 100,0$  mm

washers considered

Material: Bolt 10.9

Yield strength :  $f_{yb} = 900,0$  MPa

Ultimate tensile strength :  $f_{ub} = 1000,0$  MPa

## End plate:

Material: EN 10025 : Fe 360

Yield strength :  $f_y = 235,0$  MPa

Elasticity modulus :  $E = 210000,0$  MPa

Ultimate tensile strength :  $f_u = 360,0$  MPa

## Dimensions

thickness :  $t_p = 30,0$  mm

width :  $b_p = 300,0$  mm

height :  $h_p = 380,0$  mm

beam position :  $a_1 = -80,0$  mm

Distribution of bolts: single row boring

$w_1 = 80,0$  mm,  $e = [40,0$  mm;  $300,0$  mm]

## 2.3 Results

### 2.3.1 Base plate connection - Stiff end plate

#### Bending capacity

Decisive component : Base plate in bending

Check :  $M_{y,Rd} = 100,34$  kNm  $>$   $M_{y,Sd} = 52,00$  kNm **PASS**

#### Welds capacity

Critical point : Web

Max utilization : (48,82%)

#### Bend stiffness

Initial stiffness :  $S_{j,ini} = 33025,67$  kNm/rad

Secant stiffness :  $S_{j,Sd} = 11051,09$  kNm/rad

Classification : semirigid

### 2.3.2 Warning

calculation without check of column section with respect to comb. of moment and normal force.