"Barzy.bg" Ltd.
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Job Number	Мини игрище за футбол в село Калище			Sheet	1
Job Title	Ограда				
Client	ОБЩИНА КОВАЧЕВЦИ				
Calcs by	инж.Михаил Барзов	Checked by	инж.Георги Барзов	Date	02.06.2020г.

Space Frame Analysis - Ver W2.0.23 - 31/07/2004

Created: 02.6.2020 г. 14:05:33

TITLE :

Units: Distance:m Force:kN
Analysis type:Non linear

INPUT DATA

Nodes

Node number	X (m)	Y (m)	Z (m)	No. of	Node Inc	X-inc or X-end	Y-inc or Y-end	Z-inc or Z-end	Use end (Y) or inc [N]
1	0.000	0	0.000						
2	0.000	3.5	0.000						
3	0	7	0						

Beam Elements

Beam element definition e.g. 4-6--16	Section Name	? (°)	Fixity low node	Fixity high node	Group fix Y/[N]	Number of extra	Node no inc.
1-2-3	1						

Supports

'XYZ' = transl. fixity 'xyz' = rot. fixity 'P' = Presc. displ.(m) or (rad) 'S' = Spring const.(kN/m) or (kNm/rad)

Node no.	Fixity XYZxyz	[P] /S	X	Y	Z	x	y	z	Number of extra	Node no inc.
1	XYZxyz									

Properties

Section name	Beam section designation	Area (m^2)	Shear Area Ay (m^2)	Shear Area Ax (m^2)	Ixx (m^4)	Iyy (m^4)	J (m^4)	Material
1	100x100x4 S1	1.490E-3			2.260E-6	2.260E-6	3.620E-6	Steel:300W

Materials

	Material	E (kPa)	Poisson's Ratio	Density (kN/m^3)	Thermal Exp. Co.	Stress-Strain Curve	Yield criterion	c (kN/ml)	ϕ(°)
1	Steel:300W	206.0E6	.300	77.0000	11.70E-6				
2	Steel:Stainless	210.0E6	.300	77.0000	17.80E-6				
3	Concrete:25 MPa	25.00E6	.200	25.0000	10.00E-6				
4	Concrete:30 MPa	26.00E6	.200	25.0000	10.00E-6				
5	Concrete:40 MPa	28.00E6	.200	25.0000	10.00E-6				
6									

Nodal Loads

Load case	Node number	Px (kN)	Py (kN)	Pz (kN)	Mx (kNm)	My (kNm)	Mz (kNm)	Number of extra	Node no inc.
DL	3	1.75							

Load Case Descriptions

Load Case	Description

Self weight to be added to:DL

Space Frame Analysis Ver W2.0.23 - 31/07/2004
Input file:D:KVC_mini_kol.A03
Created : 02.6.2020 г. 14:09:07

```
========== S p a c e - F r a m e   A n a l y s i s  -  P R O K O N ===========
                      Ver W2.0.23 - 31/07/2004

TITLE :

Data file : D:KVC_mini_kol.A03
Created on: 02.6.2020 г.

========================== NODAL POINT COORDINATES ============================

Node no. X-coord    Y-coord    Z-coord  Node no. X-coord    Y-coord    Z-coord
            m          m          m                m          m          m

1         0.000      0.000      0.000   2         0.000      3.500      0.000
3         0.000      7.000      0.000

================================ ELEMENT DATA =================================

Beam        Secn. type           Fixity   Length        Я
                                            m          (°)

1-2         1                     00      3.500        0.00
2-3         1                     00      3.500        0.00


============================ SECTION PROPERTIES ===============================

Section : 1      Section designation: 100x100x4      S1
----------------
     A          Ay         Ax        Ixx       Iyy       J      Material
   m^2        m^2        m^2       m^4       m^4       m^4

 1.490E-3    0.000     0.000  2.26E-6  2.26E-6  3.62E-6   Steel:300W


================================== MATERIALS ==================================

Designation              E       poisson    Density    Exp. coeff.
                        kPa                  kN/m^3
Steel:300W            206.0E6   0.30       77.00       11.70E-6


================================ SUPPORT DATA =================================

                                      Prescribed displacements
Node    Fixity      X          Y          Z         X-Rot      Y-Rot      Z-Rot
                    m          m          m          rad.       rad.       rad.

1       XYZxyz     0.00       0.00       0.00       0.00       0.00       0.00

                                     Spring constants
Node    Fixity      X          Y          Z         X-Rot      Y-Rot      Z-Rot
                  kN/m       kN/m       kN/m      kNm/rad    kNm/rad    kNm/rad


================================== LOADS ======================================

Load Case  Description

DL

Add own weight to load case : DL

============================ LOAD CASE DL     =================================


*** POINT LOADS ***

Node         Fx         Fy         Fz         Mx         My         Mz
             kN         kN         kN         kNm        kNm        kNm
```

```
3           1.75        0.00        0.00        0.00        0.00        0.00


====================== OUTPUT: NON - LINEAR ANALYSIS ========================
====================== NODAL POINT DISPLACEMENTS at SLS ======================

Node  Lcase        X-disp.     Y-disp.     Z-disp.     X-rot.      Y-rot.     Z-rot.
                     mm          mm          mm         rad.        rad.       rad.

1     DL             0.00        0.00        0.00      0.0000      0.0000     0.0000
2     DL           136.03       -2.92        0.00      0.0000      0.0000    -0.0700
3     DL           434.64      -16.96        0.00      0.0000      0.0000    -0.0932

============================== REACTIONS at ULS ==============================

Note:Only load combinations have ULS load factors. Factor for Load cases = 1

Node  Lcase      X-force     Y-force     Z-force     X-moment    Y-moment   Z-moment
                   kN          kN          kN          kNm         kNm        kNm

1     DL           -1.75        0.80        0.00        0.00        0.00      12.41

EQUILIBRIUM CHECK AT ULS:

*** IMPORTANT NOTE ***

Small differences between the summations of the loads and  those of the
corresponding reactions will occur. This is because the load summations
are based on the original (undeflected) structure whereas the reactions
and moments are based on the final (deflected) structure.

LC          APPLIED LOADS & MOMENTS about (0.0,0.0,0.0)

Sum of:        Px          Py          Pz          Mx          My          Mz

DL            1.75       -0.80        0.00        0.00        0.00      -12.25

LC          REACTIONS & REACTION MOMENTS about (0.0,0.0,0.0)

Sum of:        Rx          Ry          Rz          MRx         MRy         MRz

DL           -1.75        0.80        0.00        0.00        0.00       12.41

============ BEAM ELEMENT END FORCES IN LOCAL ELEMENT AXES at ULS ==============

Elem   Lcase         Axial     Y-Shear     X-Shear     Torsion       M-yy       M-xx
                       kN          kN          kN          kNm         kNm        kNm

1-     DL             0.56        1.76        0.00        0.00        0.00      12.41
2                    -0.56       -1.76        0.00        0.00        0.00      -6.18
2-     DL             0.12        1.74        0.00        0.00        0.00       6.18
3                    -0.12       -1.74        0.00        0.00        0.00       0.00

============================== STATISTICAL DATA ==============================

Own weight of structure = 0.80 kN

No. of real numbers in Stiffness matrix = 135  (1350 bytes)
Time used to analyse = 0: 0:0.016 seconds
Total number of : Nodes               = 3
                  Beam Elements       = 2
                  Shell Elements      = 0
                  Supports            = 1
                  Section properties  = 1
                  Load cases          = 1
                  Load combinations   = 0

============================== END OF OUTPUT ================================
```

Base Plate Design :

Input Data

Column on Base Plate:
100x100x4

Base Plate Geometry

Plate Length L	(mm)	200
Plate Width W	(mm)	200
Offset L1	(mm)	50
Offset W1	(mm)	50
Bolt distance a1	(mm)	25.00
Bolt distance a2	(mm)	25.00
Bolt distance a3	(mm)	25.00
Bolt distance a4	(mm)	25.00

General Parameters

Concrete: fcu	(MPa)	30
Plate fy:	(MPa)	235
Welds fuw:	(MPa)	360
Bolt Grade		4.8
Use studs	(Y/N)	

Loads

Load Case	P (kN)	Mx (kNm)	My (kNm)	Load Factor
DL	0.56	12.41	0.00	1

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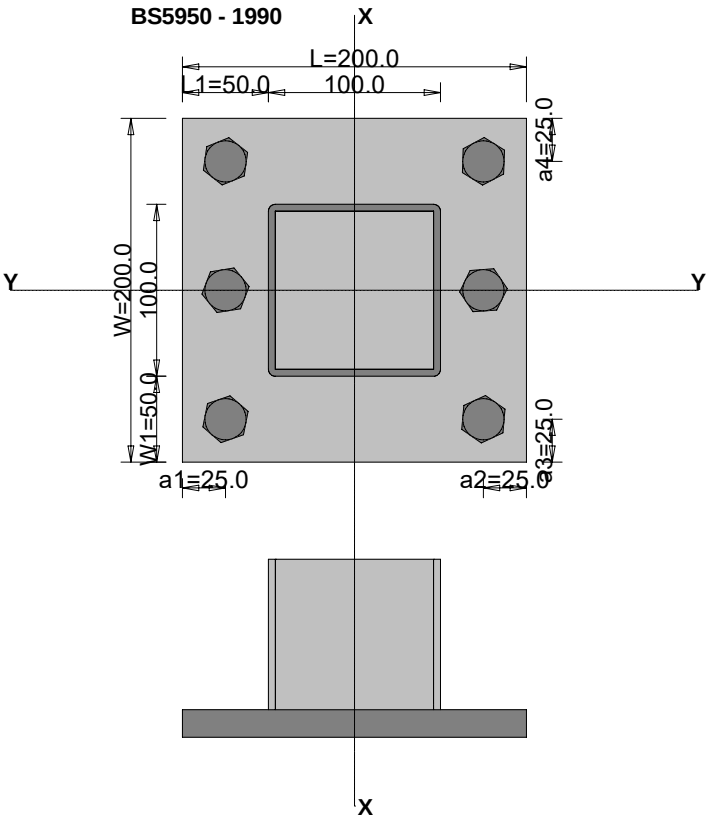
Job Title	Ограда				
Client	ОБЩИНА КОВАЧЕВЦИ				
Calcs by	инж.Михаил Барзов	Checked by	инж.Георги Барзов	Date	02.06.2020г.

Sketch of base plate



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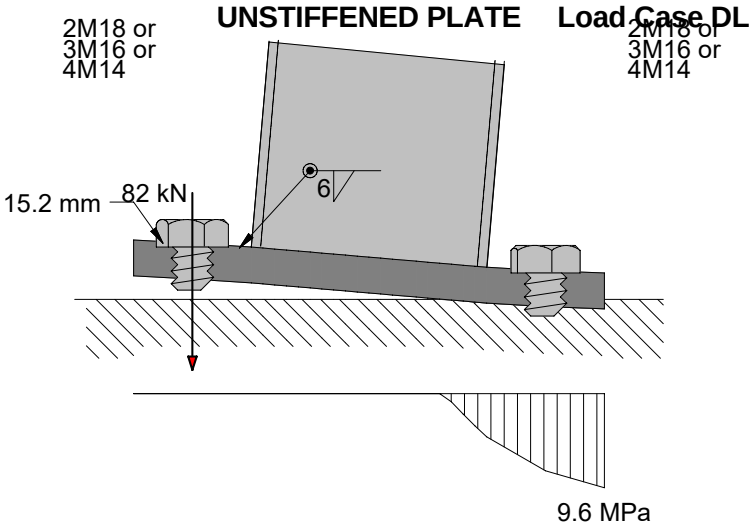
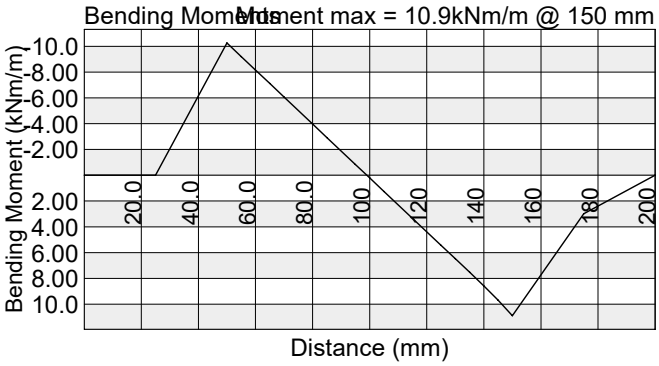
Job Number	Мини игрище за футбол в село Калище			Sheet	7
Job Title	Ограда				
Client	ОБЩИНА КОВАЧЕВЦИ				
Calcs by	инж.Михаил Барзов	Checked by	инж.Георги Барзов	Date	02.06.2020г.

Bending Moments & Design Output for (Critical) Load Case DL



Design axis: X-X Mx=12.4 kNm BS5950 - 1990



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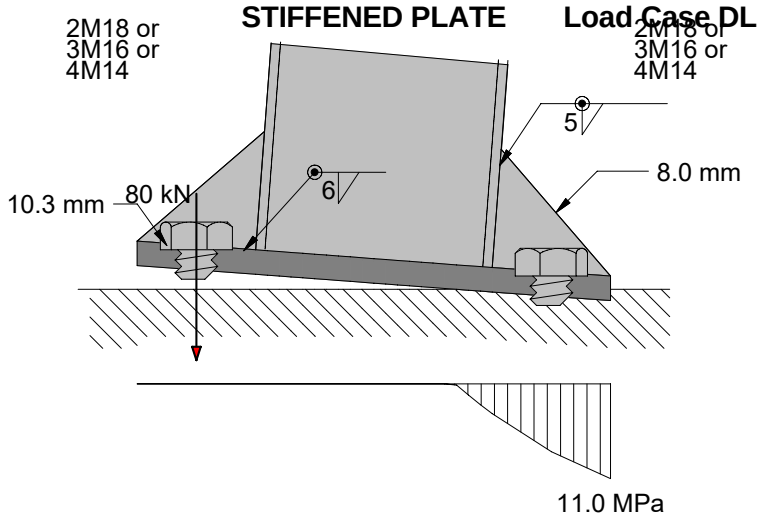
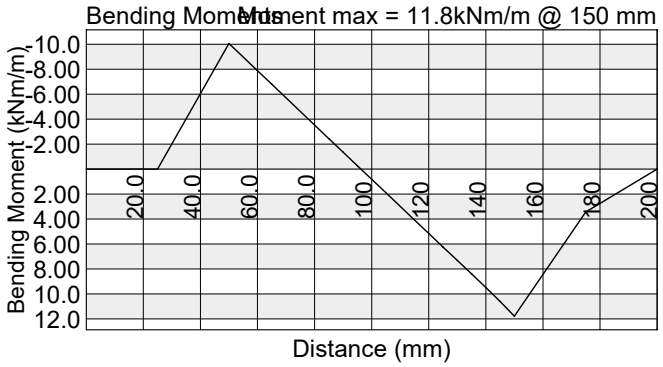
Job Number	Мини игрище за футбол в село Калище			Sheet	8
Job Title	Ограда				
Client	ОБЩИНА КОВАЧЕВЦИ				
Calcs by	инж.Михаил Барзов	Checked by	инж.Георги Барзов	Date	02.06.2020г.

Bending Moments & Design Output for (Critical) Load Case DL



Design axis: X-X Mx=12.4 kNm BS5950 - 1990



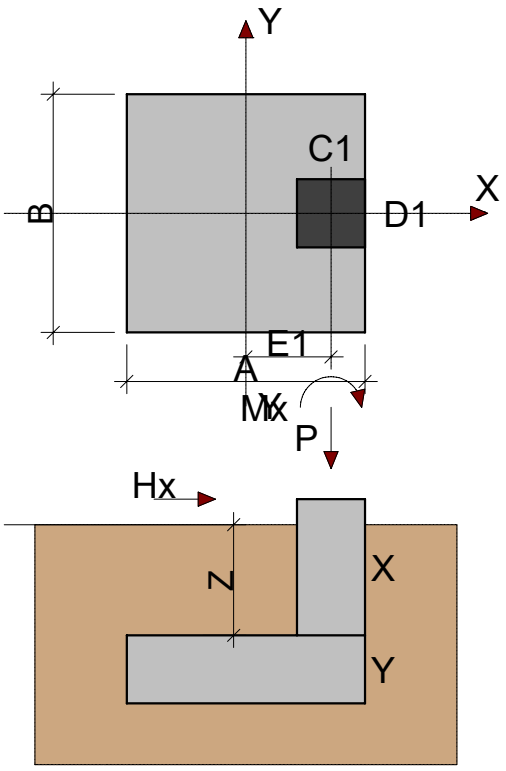
Column Base Design :

Input Data

Base length A	(m)	1.4
Base width B	(m)	1.40
Column(s)	Col 1	Col 2
C (m)	0.4	
D (m)	0.4	
E (m)	0.5	
F (m)		
Stub column height X	(m)	0.8
Base depth Y	(m)	0.4
Soil cover Z	(m)	0.65
Concrete density	(kN/m^3)	25
Soil density	(kN/m^3)	18
Soil friction angle (°)		27
Base friction constant		0.5
Rebar depth top X	(mm)	50
Rebar depth top Y	(mm)	50
Rebar depth bottom X	(mm)	75
Rebar depth bottom Y	(mm)	75
ULS ovt. LF: Self weight		1
ULS LF: Self weight		1.4
Max. SLS bearing pr.	(kN/ml)	200
S.F. Overturning (ULS)		1
S.F. Slip (ULS)		1
fc' base	(MPa)	25
fc' columns	(MPa)	25
fy	(MPa)	450

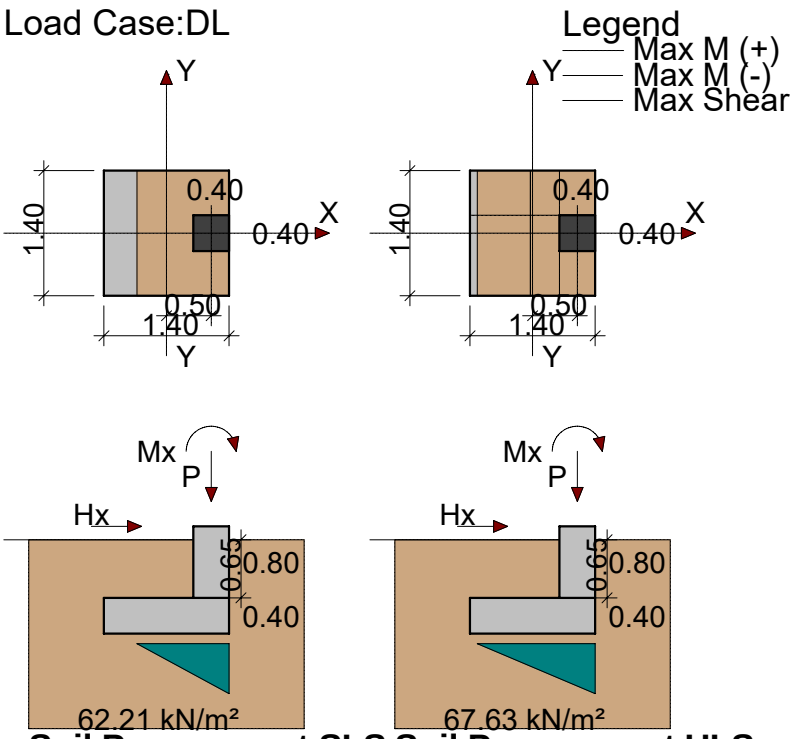
		Unfactored Loads						
Load Case	Col no.	LF ULS ovt	LF ULS	P (kN)	Hx (kN)	Hy (kN)	Mx (kNm)	My (kNm)
DL	1	1	1	1.00	1.75	0.00	12.41	0.00
							0.325	

Sketch of Base



Output for Load Case DL

Output for Load Case DL	
Soil pressure (ULS) (kN/ml)	67.63
Soil pressure (SLS) (kN/ml)	62.21
SF overturning (SLS)	1.96
SF overturning (ULS)	1.96
Safety Factor slip (ULS)	50.42
Safety Factor uplift (ULS)	>100
Bottom	
Design moment X (kNm/m)	0.00
Reinforcement X (mml/m)	0
Design moment Y (kNm/m)	0.18
Reinforcement Y (mml/m)	1
Top	
Design moment X (kNm/m)	-8.57
Reinforcement X (mml/m)	63
Design moment Y (kNm/m)	0.00
Reinforcement Y (mml/m)	0
Linear Shear X (MPa)	0.035
vc (MPa)	0.361
Linear Shear Y (MPa)	0.001
vc (MPa)	0.359
Linear Shear Other (MPa)	0.000
Punching Shear (MPa)	N.A.
vc (MPa)	N.A.
Cost	78.43



Soil Pressures at SLS Soil Pressures at ULS