BETONexpress Command Line

BETONexpress can run as a post processor of various Finite Element Programs (ANSYS, SAP2000,) to perform the concrete element design. The communication of BETONexpress with other programs can be done with a command file in simple text format. Each line of this <u>Command line file</u> describes an object that is going to be created in BETONexpress. Commands and data can be read in BETONexpress and the design objects are automatically created. The format of the command text file is given below.

How to import the command file

Click at menu File/ <u>Read Command Line File</u>
  Browse and [Open] the file with the command lines (.TXT)
  Enter the name of the new project file as .BetonExpress data.
  … and the Design objects are created from the commands and the data of the text file.

Example of command text file

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MATER BI=4, SI=5, gG=1.35, gQ=1.50

PLATE-1 NM=Slab-1, H=0.20, Cb=15, D=10,   Mb=12.10
PLATE-1 NM=Slab-2, H=0.25, Cb=15, D=10.1, Mb=12.30

PLATE-2 NM=Slab-7, TP=0011, H=0.20, Cb=15, D=10, Lx=3.60, Ly=4.00, G=0.80, Q=2.00
PLATE-2 NM=Slab-8, TP=1010, H=0.20, Cb=15, D=10, Lx=3.90, Ly=4.50, G=0.80, Q=2.00

BEAM-1  NM=BeamA-1, BW=0.20,  H=0.50, Cb=25, D=14,   Mb=48.65, Vs=56.80, Na=12.56
BEAM-1  NM=BeamA-2, BW=0.20,  H=0.60, Cb=25, D=14.1, Mb=58.65, Vs=66.80, Na=22.56

BEAM-2  NM=BeamT-5, TP=1, BW=0.20, Bf=1.25, H=0.50, Hf=0.07, Cb=25, D=14,   Mb=48.65, Vs=56.80, Na=12.56,  L=6.47,  SP=0
BEAM-2  NM=BeamT-6, TP=2, BW=0.20, Bf=1.25, H=0.60, Hf=0.07, Cb=25, D=14.1, Mb=58.65, Vs=66.80, Na=22.56,  L=7.47,  SP=1

MATER BI=5, SI=5, gG=1.35, gQ=1.50

COLUMN-1 NM=Column-1, TP=0, Bx=0.35, By=0.35, Cb=25, D=20,    Mx=48.65, My=56.70, Na=-812.16, H=3.50
COLUMN-1 NM=Column-2, TP=1, Bx=0.36, By=0.36, Cb=26, D=22.1,  Mx=48.75, My=56.80, Na=-812.26, H=3.60

FOOT-1 NM=Foot-1, Lx=1.50, Ly=1.40, Cx=0.30, Cy=0.40,  H=0.70, H1=0.40, Cb=30, D=12,    Ng=148.61, Nq=156.71, Qu=0.21, Ws=1.91, Hs=2.1
FOOT-1 NM=Foot21, Lx=1.60, Ly=1.50, Cx=0.40, Cy=0.50,  H=0.70, H1=0.40, Cb=30, D=12.1,  Ng=128.62, Nq=186.72, Qu=0.22, Ws=1.92, Hs=2.2
```

Command Line explanations

Every part of a command must separated with comma (,)
Code words (first word and words with =) must be exactly the same
Capital and small letters are the same

MATER   **Materials and partial safety factors**
BS=C16/20 Concrete class
   SS=S500 Steel class
   gG=1.35 γ_G **Partial factor for permanent loads**
   gQ=1.50 γ_Q **Partial factor for variable loads**

If Material Command is omitted, then the <u>default values</u> that are set in the program the moment you read the command file are taken.

Many material cards may be included. Each one affects the set of following commands.

PLATE-1   **Cross section of Plate**
    NM=SLAB-1 Name of slab object (any name up to 16 characters)
                    *** NOTE object names are <u>unique</u> and must not repeated *****
        H=0.20 Slab thickness in [m].
       Cb=15 Concrete cover in [mm]
        D=10 Rebar diameter (optimum). The program uses a optimum diameter around this.
                    If you use D=10.1 then only10 mm rebar diameter will be used
    Mb=12.10 Bending moment in [kNm/m] for the slab cross section.

PLATE-2   **Two way slab**
    NM=SLAB-1 Name of slab object (up to 16 characters)
        H=0.20 Slab thickness in [m].
       Cb=15 Concrete cover in [mm]
        D=10 Rebar diameter (optimum). The program uses an optimum diameter around this.
                    If you use D=10.1 then only 10 mm rebar diameter will be used
    TP=0011 Support conditions.
                    0=support
                    1=fixed
                    Numbers in order Left, Bottom, Right, Top supports
      Lx=3.60 Span x in [m]
      Ly=4.00 Span y in [m]
         g=0.80 Uniformly distributed permanent load in addition to self weight in [kn/m²]
         q=2.00 Uniformly distributed variable load in [kn/m²]

BEAM-1   **Beam section of orthogonal cross section**
    NM=BEAMA-1 Name of slab object (any name up to 16 characters).
       Cb=25 Concrete cover in [mm]
        D=14 Rebar diameter (optimum). The program uses a optimum diameter around this.
                    If you use D=14.1 then only 14 mm rebar diameter will be used
     BW=0.20 Beam width in [m]
      H=0.50 Beam height in [m]
   Mb=48.65 Beam bending moment in [kNm]
   Vs=56.80 Beam shear force in [kN]
   Na=12.56 Beam axial force in [kN]

BEAM-2   **Beam section of T cross section**
    NM=BEAMT-5 Name of slab object (up to 16 characters).
       Cb=25 Concrete cover in [mm]
        D=14 Rebar diameter (optimum). The program uses a optimum diameter around this.
                    If you use D=14.1 then only14 mm rebar diameter will be used
       TP=1 Beam type
                    0=orthogonal cross section
                    1=T beam
                    2=L beam
     BW=0.20 Beam width in [m]
      Bf=1.25 Effective beam width in [m]
      H=0.50 Beam height in [m]

Hf=0.07 Beam flange thickness in [m]
Mb=48.65 Beam bending moment in [kNm]
Vs=56.80 Beam shear force in [kN]
Na=12.56 Beam axial force in [kN]
L=6.47 Beam span length
SP=1 Span type
        0 simply supported
        1 simply supported-fixed
        2 fixed-fixed

COLUMN-1 Short column cross section
NM=Column-1 Name of slab object (up to 16 characters).
Cb=25 Concrete cover in [mm]
D=20 Rebar diameter (optimum). The program uses a optimum diameter around this.
        If you use D=20.1 then 20 mm rebar diameter will be used only
TP=0 Section type
        0, 1 for square section
        2 for round cross section (in this case Bx=By=D)

Bx=0.35 x column side in [m]
By=0.35 y column side in [m]
Mx=48.65 Bending moment Mxx in [kNm]
My=56.70 Bending moment Myy in [kNm]
Na=-812.16 Axial load in [kN]
H=3.50 Column height in [m]

FOOT-1 **Short column cross section**
NM=Foot-1 Name of slab object (up to 16 characters).
Cb=25 Concrete cover in [mm]
D=12 Rebar diameter (optimum). The program uses a optimum diameter around this.
        If you use D=12.1 then 12 mm rebar diameter will be used only
Lx=1.50 Footing x dimension in [m]
Ly=1.40 Footing y dimension in [m]
Cx=0.30 Column x dimension in [m]
Cy=0.40 Column y dimension in [m]
H=0.70 Footing total height in [m]
H1=0.40 Footing base height in [m]
Ng=148.61 Permanent vertical load on top in [kN]
Nq=156.71 Variable vertical load on top in [kN]
Qu=0.21 Soil bearing pressure in [N/mm²]
Ws=1.91 Soil unit weight in [kN/m³]
Hs=2.1 Foundation depth in [m]