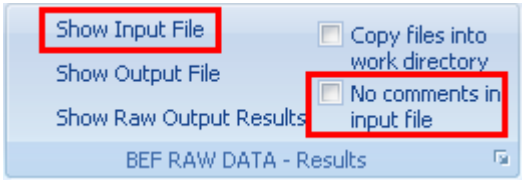
# NON LINEAR ANALYSIS INPUT FILE SYNTAX (.d FILE)

The file .d represents the non linear solver input file. It is compiled by the user interface ad send to the solver.

However it could be useful to know the syntax of this file, expecially if the user wants to compare two versions of the same model, realized one using Paratie and the other using Paratie Plus.

It's necessary to select *Show input file* under the menu *Report* (selecting or not *No comments in input file*) to edit this file.




In the following table the elements syntax is reported. To deepen the description of each element refer to Interfacing Manual.

## Stuctural elements and loads convertion table

| KIND OF ELEMENT | ICON | OBJECT IN FILE .d |
|---|---|---|
| Tieback | | WIRE |
| Strut | | TRUSS |
| Racker | | ELPL |
| Slab | | SLAB |
| Fixed support | | WIRE |
| Spring support | | CELA |
| Strip surcharge | | STRIP |
| Surface line load | | DLOAD |
| Wall surcharge | | DLOAD |
| Wall line load | | LOAD |
| Prescribed condition | | PRESCRIBE |
| 3D Load | | DLOAD |

Element syntax

WIRE *<name> <name of the wall to which it's applied > <elevation of application> <material> <stiffness multiplier> <prestress> <angle>*

Example:

WIRE SPL_0 Leftwall -1.5 REB_4_St 1.77492E-05 0 15 0 0

TRUS *<name> <elevation of application> <material> <transversal section [$m^2$/m]> <gap (for non-yielding elements)> <prestress>*

Example:

trus SPB_0 -1 STEEL_0_ 0.011559 gap 0 0 0

ELPL *<name> <name of the wall to which it's applied > <elevation of application> <material> <stiffness multiplier> <prestress (when undeformed)><minimum yield strenght>< maximun yield strenght ><angle>*

Example:

ELPL SPL_0 Leftwall -1 STEEL_0_ 0.0018251053 0 -1605.23754 0 140.55

SLAB *<name> <elevation of application (referred to the axis of the slab)> <material> <transversal section [$m^2$/m]> <bending inertia> < permanent load>*

Example:

slab SPB_0 -3.5 CONC_0_C 0.2 0.0006666667 5

CELA *<name> <name of the wall to which it's applied > <elevation of application> <stiffness[kN/$m^2$]><rotational stiffness[kN/rad]><cosine of the angle between the objest axis and x axis>< sine of the angle between the objest axis and y axis>*

Example:

CELA SPL_0 Leftwall -0.5 0 0 0 1

STRIP *< name of the wall to which it's applied >< application stage><removal stage><distance between the axis of the wal and the footing><width of the footing>< elevation of application ><average pressure of the footing><diffusion angle>*

Example:

STRIP Leftwall 2 2 0 5 0 100 45

DLOAD *<kind of load (in which step it must be applied)>< name of the wall to which it's applied ><bottom elevation><bottom elevation load value> <top elevation> <top elevation load value>*

Example:

dload step Leftwall -2 100 0 100

PRESCRIBE *< name of the wall to which it's applied ><elevation of application><direction of application of the support><value of the dislacement><kind of displacement: absolute or relative to previous stage><application stage><removal stage>*

Example:

prescribe Leftwall 0 1 0.5 REL 2 2

## Other kind of syntax

### Jet grouting

Jet Grouting can be modelled like a soil property change.

CHANGE *<existing soil><property to change><new value of the property>*

The available properties are:

| | | | |
|---|---|---|---|
| GAMMAD | | Dry specific gravity | **gravity** |
| GAMMAB | | Total specific gravity (uphill e downhill) | **gravity** |
| GAMMAW | | Water specific gravity (uphill e downhill) | **gravity** |
| U-COHE | D-COHE | c' (effective cohesion) [kPa] | **Resistance** |
| U-FRICT | D-FRICT | ø' (friction angle) (deg) | **Resistance** |
| U-KA | D-KA | Ka active pressure coefficient | **Resistance** |
| U-KP | D-KP | Kp passive pressure coefficient | **Resistance** |
| U-PERM | D-PERM | Permeability [m/s] | **Permeability** |
| U-STIFAC | D-STIFAC | Stiffness factor (initial value:1):this parameter moltiplies, from the current stage on, the soil modulus in YOUNG, MODULI or WINKLER | **-** |
| U-BEHAVI | D-BEHAVI | Clay conditions: D (drained)<br>U (undrained) | **Clay** |
| U-SU | D-SU | Shear resistance of clays [kPa] | **Clay** |
| U-EU | D-EU | Undrained conditions Young modulus (simplified model) [kPa] | **Clay** |
| U-KWU | D-KWU | Undrained modulus (simplified model) [kPa/m] | **Clay** |
| U-DELTA<br>D-DELTA<br>(not used)<br>(deg) | D-DELTA | (not used) | **Clay** |

### Seism

Seism is modelled by EQK control, according to all the options and controls reported on the interface:

EQK *<horizontal seismic acceleration[g]>< vertical seismic acceleration [g], uphill>< vertical seismic acceleration [g], downhill><angle b uphill ><d/f uphill ><angle b downhill ><d/f downhill><soil behaviour(impervious or pervious> <excess pressure><not used >*

Esempio:

eqk 1.2 -1 -1 0 0 0.5 0.5 0 0

In case of Wood seism in the input file the seism is marked by the word WOOD:

WOOD *<value of the seismic pressure on the bottom elevation>< value of the seismic pressure on the top elevation><bottom elevation of application of the pressure>< top elevation of application of the pressure >*

WOOD 200 100 -5 0

## Zcut

Zcut *<elevation under which the wall is not considered>*

## Example of input file

The following input file refers to the example model Q2_ver of Paratie 7.0.

Mind: notes are marked by the symbol *.

The extended version ("Scratch version") of the file, reporting every used formula, is available.

```
mesh density choice
delta 0.2
units choice
unit m T
number of iteration choice
option param itemax 20
*2. ADD GENERAL WALLS & DIMESIONS
wall application
wall Leftwall 0 -19 0
*3.1 DEFINE SURFACE FOR LEFT WALL
model dimension definition
soil 0_L Leftwall -19 0 2 0
soil 0_R Leftwall -19 0 1 180
soil mechanical properties definition
* BORING Boring 1
    *DATA FOR LAYER: 1, SOIL TYPE= 3, unoQ2
        Ldata L1 0
            weight 1.8 1.1 1
            Resistance 0 28 0 0
            atrest 0.53 0.5  1
            Young 3000 5000
```

```
            permeabil 1E-07
        Endl
    *DATA FOR LAYER: 2, SOIL TYPE= 1, dueQ2
        Ldata L2 -5
            weight 1.9 1.2 1
            Resistance 0 38 0.24 7
            atrest 0.385 0.5  1.5
            Moduli 1600 1.5 0.5 0.5 10 0.5
            permeabil 1E-07
        Endl
    *DATA FOR LAYER: 3, SOIL TYPE= 2, treQ2
        Ldata L3 -15
            weight 2 1.25 1
            Resistance 0 40 0.24 7
            atrest 0.36 0.5  1.5
            Moduli 5000 1.5 0.5 0.5 10 0.5
            permeabil 1E-07
        Endl
Materials mechanical properties definition (steel and concrete)
*START GENERAL MATERIALS
    * GENERAL CONCRETE MATERIALS - CONVERTED TO CONSISTENT UNITS WITH FORCE/LENGTH^2
    *Concrete material: 0 Name= clsQ2, E= 2700000T/m2
  material CONC_0_c 2700000
    *Concrete material: 1 Name= 20 Grout, E= 2625000T/m2
        material CONC_1_2 2625000
    * GENERAL STEEL MEMBER MATERIALS - CONVERTED TO CONSISTENT UNITS WITH FORCE/LENGTH^2
    *Steel material: 0 Name= A-36, E= 20404521.4T/m2
        material STEEL_0_ 20404521.4
    *Steel material: 1 Name= 0 Grade, E= 20404521.4T/m2
        material STEEL_1_ 20404521.4
* GENERAL REBAR MATERIALS - CONVERTED TO CONSISTENT UNITS WITH FORCE/LENGTH^2, USED FOR ANCHORS
    *Rebar material: 0 Name= steel, E= 21000000T/m2
        material REB_0_st 21000000
    * USER DEFINED MATERIALS - CONVERTED TO CONSISTENT UNITS WITH FORCE/LENGTH^2, USED FOR ANCHORS
    *User material: 0 Name= User mat 0, E= 102T/m2
        material USER_0_U 102
* END GENERAL MATERIALS
  mate stiffMAT 1000000000
wall definition
  BEAM Leftwall_BEAM Leftwall -19 0 CONC_0_c 0.8 00 00
```

q tieback definition
WIRE SPL_0 Leftwall -3 REB_0_st 1.6E-05 27 150 0 0
Tieback, applied at a depth of 8 meters, definition
WIRE SPL_1 Leftwall -8 REB_0_st 2.70588E-05 43 150 0 0
Tieback, applied at a depth of 13 meters, definition
WIRE SPL_2 Leftwall -13 REB_0_st 5.30909E-05 86 150 0 0
dg
stage definition
**********
* 10: GENERATE ALL STEP/STAGES
*START DATA FOR STAGE: 0 Name: condizione geostatica
stage definition
step 0 : condizione geostatica
wall application
setwall Leftwall
*10b: START GENERATE SOIL PROPERTY CHANGE COMMANDS FOR STAGE
soil initialization
change L3 u-ka 0.24 Leftwall
change L3 d-ka 0.24 Leftwall
change L3 u-kp 7 Leftwall
change L3 d-kp 7 Leftwall
round elevations right and left
geom 0 0
water definition
water -6 0 -19 0 0
surcharge definition
SURCHARGE 3 0 3 0
end stage
ENDSTEP
*END DATA FOR STAGE 0 NAME: condizione geostatica
**********
*START DATA FOR STAGE: 1 Name: Scavo a -3.5 m
step 1 : Scavo a -3.5 m
setwall Leftwall
Excavation –3.5 m
geom 0 -3.5
water -6 0 -19 0 0
SURCHARGE 3 0 1 -3.5
ENDSTEP
*END DATA FOR STAGE 1 NAME: Scavo a -3.5 m
**********
*START DATA FOR STAGE: 2 Name: Applico tirante 1
step 2 : Applico tirante 1
setwall Leftwall

```
   geom 0 -3.5
   water -6 0 -19 0 0
q tieback application
ADD SPL_0
ENDSTEP
*END DATA FOR STAGE 2 NAME:  Applico tirante 1
**********************************************************************
*START DATA FOR STAGE: 3 Name:  Scavo a -8.5 m
step 3 :  Scavo a -8.5 m
setwall Leftwall
   geom 0 -8.5
   water -6 2.5 -19 0 0
   SURCHARGE 3 0 0 0
ENDSTEP
*END DATA FOR STAGE 3 NAME:  Scavo a -8.5 m
**********************************************************************

*START DATA FOR STAGE: 4 Name:  Applico tirante 2
step 4 :  Applico tirante 2
setwall Leftwall
   geom 0 -8.5
   water -6 2.5 -19 0 0
second tieback application
   ADD SPL_1
ENDSTEP
*END DATA FOR STAGE 4 NAME:  Applico tirante 2
**********************************************************************
*START DATA FOR STAGE: 5 Name:  Scavo a -13.5 m
step 5 :  Scavo a -13.5 m
setwall Leftwall
   geom 0 -13.5
   water -6 7.5 -19 0 0
ENDSTEP
*END DATA FOR STAGE 5 NAME:  Scavo a -13.5 m
**********************************************************************
*START DATA FOR STAGE: 6 Name:  Aggiungo tirante 3
step 6 :  Aggiungo tirante 3
setwall Leftwall
   geom 0 -13.5
   water -6 7.5 -19 0 0
third tieback application
      ADD SPL_2
ENDSTEP
*END DATA FOR STAGE 6 NAME:  Aggiungo tirante 3
```

```
************************************************************
*START DATA FOR STAGE: 7 Name:  Scavo a -16, falda a -18
step 7 :  Scavo a -16, falda a -18
setwall Leftwall
   geom 0 -16
   water -6 12 -19 0 0
ENDSTEP
*END DATA FOR STAGE 7 NAME:  Scavo a -16, falda a -18
************************************************************
set country english
```