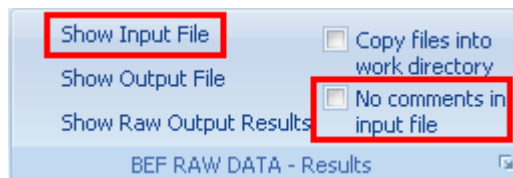


## NON LINEAR ANALYSIS INPUT FILE SYNTAX (.d FILE)

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













However it could be useful to know the syntax of this file, especially 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.

### Structural elements and loads conversion 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



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### 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<sup>2</sup>/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<sup>2</sup>/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<sup>2</sup>]><rotational stiffness[kN/rad]><cosine of the angle between the object axis and x  
axis>< sine of the angle between the object 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	<b>gravity</b>
GAMMAB		Total specific gravity (uphill e downhill)	<b>gravity</b>
GAMMAW		Water specific gravity (uphill e downhill)	<b>gravity</b>
U-COHE	D-COHE	c' (effective cohesion) [kPa]	<b>Resistance</b>
U-FRICT	D-FRICT	$\phi'$ (friction angle) (deg)	<b>Resistance</b>
U-KA	D-KA	Ka active pressure coefficient	<b>Resistance</b>
U-KP	D-KP	Kp passive pressure coefficient	<b>Resistance</b>
U-PERM	D-PERM	Permeability [m/s]	<b>Permeability</b>
U-STIFAC	D-STIFAC	Stiffness factor (initial value:1):this parameter multiplies, from the current stage on, the soil modulus in YOUNG, MODULI or WINKLER	-
U-BEHAVI	D-BEHAVI	Clay conditions: D (drained) U (undrained)	<b>Clay</b>
U-SU	D-SU	Shear resistance of clays [kPa]	<b>Clay</b>
U-EU	D-EU	Undrained conditions Young modulus (simplified model) [kPa]	<b>Clay</b>
U-KWU	D-KWU	Undrained modulus (simplified model) [kPa/m]	<b>Clay</b>
U-DELTA D-DELTA (not used) (deg)	D-DELTA	(not used)	<b>Clay</b>

### 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 >



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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 & DIMENSIONS

**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



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```
    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
```



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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



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```
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
```



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\*\*\*\*\*

\*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