

## Structures of data cabl\_precont

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### Summary:

Description of the structure of data `cabl_precont`.

This Structure of Data is created by the operator `DEFI_CABLE_BP` and used in the operator `AFFE_CHAR_MECA`.

## 1 Presentation

The structure of data `sd_cabl_precont` is produced by the operator `DEFI_CABLE_BP` [U4.42.04]. This operator calculates the initial profiles of tension along the cables of prestressed of a structure concrete, knowing the tension applied at the ends and other parameters characteristic of anchorings and materials. Each cable is defined by an occurrence of the keyword factor `DEFI_CABLE`. It also calculates the relations kinematics between the concrete and the cables.

The structure of data `sd_cabl_precont` is then used by the operator `AFFE_CHAR_MECA` [U4.44.01], in order to define a mechanical loading of type `RELA_CINE_BP`, with an aim of calculating the state of balance of the unit structure concrete/cables of prestressing. The resolution is carried out by the operator `STAT_NON_LINE` [U4.51.03], option `BEHAVIOR`.

The structure of data `sd_cabl_precont` gather two countsS, an elementary map (map of the initial constraints) and a list of relations (relations kinematics between the degrees of freedom of the nodes of the cables and the degrees of freedom of their nodes "close" to the structure concrete).

## 2 Structure of data

### 2.1 Tree structure

```
cabl_precont (K8):: = record
  (O) 'CABLE_BP'          : SD counts
  (O) 'CABLE_GL'         : SD counts
  (O) 'CABLE.LIRELA'     : SD liste_rela
  (O) 'SIGMACABLE.NOGD'  : OBJ S V K8
  (O) 'SIGMACABLE.NCMP'  : OBJ S V K8
  (O) 'SIGMACABLE.NUMA'  : OBJ S V I
  (O) 'SIGMACABLE.VALE'  : OBJ S V R
```

The table `CABLE_BP` associated with `SD cabl_precont` contains the 11 following parameters:

'NUMC_CABLE'	I
'NOEUD_CABLE'	K8
'ABSC_CURV'	R
'ALPHA'	R
'TENSION'	R
'MAILLE_BETON_VOISINE'	K8
'NOEUD_BETON_VOISIN'	K8
'INDICE_IMMERSION'	I
'INDICE_PROJECTION'	I
'ECCENTRICITY'	R
'NUM_CABLE'	K8
'NOEUD_MILIEU'	YES or not

The table `CABLE_GL` associated with `SD cabl_precont` contains the 9 following parameters:

'TYPE_ANCRAGE1'	K8
'TYPE_NOEUD1'	K8
'NOM_ANCRAGE1'	K16
'TYPE_ANCRAGE2'	K8
'TYPE_NOEUD2'	K8
'NOM_ANCRAGE2'	K16
'TENSION'	R
'RECU_L_ANCRAGE'	R

``ADHERENT'` K8

The SD table is described in [D4.02.05].

## Object ``LIRELA'`

The list of relations (structure of data `liste_rela`) with the structure of data `cabl_precont` has as a denomination

`CABL_PR (K8) / `LIRELA'`

The structure of data `liste_rela` is described in [D4.06.13].

## Object ``SIGMACABLE.NOGD'`

This vector of size 1 contains the name of the stored size `SIEF_R`.

## Object ``SIGMACABLE.NOCMP'`

This vector of size  $n_{comp}$  the name contains of  $n_{comp}$  components stored.

## Object ``SIGMACABLE.NUMA'`

This vector of size  $n_{ma}$  contains them indices of the meshes of the grid 3D of the concrete in which a tension is imposed by the cables. These indices are not sorted.

## Object ``SIGMACABLE.VALE'`

This vector of size  $n_{ma} \times n_{comp}$  contains them values of  $n_{comp}$  components of the size `SIEF_R`, for all the meshes whose indices are present in `.SIGMACABLE.NUMA`.

Thus, values corresponding to the mesh `numa (jj)` are stored in:  
`vale [(jj-1) *ncomp+1: (jj-1) *ncomp+ncomp]`