

SSNP129 - Validation of the constitutive law regulated Summarized

BETON_PR:

Validation of constitutive law `JOINT_BA` of steel-concrete connection by means of the element of plane 2D joint. This joined element is embedded in two nodes and bound to an element cubes with the characteristics of an unspecified elastic material. By applying a monotonic loading in sliding to the cubic element, one checks the degradation of the interface, as well as the transition of the small strains at the beginning of the experiment, with the great observable slidings starting from the peak of the strength of connection. In this case test, the parameters used do not correspond to the data of a particular experimental case. However, the validation is carried out by comparison with results got with code FEAP of Professor Taylor, of Berkeley, software in which this formulation was established.

1 Problem of reference

1.1 Geometry

One considers a plate of dimension 1.

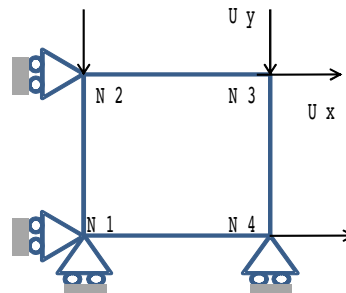


Figure 1.1-1: Diagram of the Boundary conditions

1.2 benchmark and loadings

One considers that the problem thus remains plane $DZ = DRX = DRY = DRZ = 0$.

A condition of symmetry is applied to the sides $N1N2$ and $N1N3$.

One applies to $N2N3$ a uniform displacement according to y equal to $-0,002$.

One applies to $N3N4$ a uniform displacement according to x equal to $0,0002$.

1.3 Properties of the material

$$E = 2,1 \cdot 10^6 \text{ MPa}$$

$$\nu = 0,2$$

$$E_T = -10^4 \text{ MPa}$$

$$\sigma_y^t = 3 \text{ MPa}$$

$$\sigma_y^c = 30 \text{ MPa}$$

$$\varepsilon_c = 10^{-3}$$

$$n = 2$$

2 Reference solution

the solution is analytical

3 Modelization A

3.1 Characteristic of the modelization

standard Modelization shell DKT.

3.2 Characteristics of mesh

Warning : The translation process used on this website is a "Machine Translation". It may be imprecise and inaccurate in whole or in part and is provided as a convenience.

1 QUAD4 .

4 Results of the modelization A

4.1 Quantities tested and results

One tests the nodal forces with the nodes $N2$ and $N4$, respectively in the directions y and x , at times $t=4,6$ and $t=10$.

Field FORC_NODA:

Identification	Reference	Tolerance
Node $N4$ F_x , urgent $t=4,6$	$1,29 \times 10^6$	10^{-4} %
Node $N2$ F_y , time $t=4,6$	$-1,4706 \times 10^7$	10^{-4}
Node $N4$ F_x , time $t=10$	10^6	10^{-4}
Node $N2$, F_y , time $t=10$	$-1,5 \times 10^7$	10^{-4}

5 Summary of the results

the results are validated.