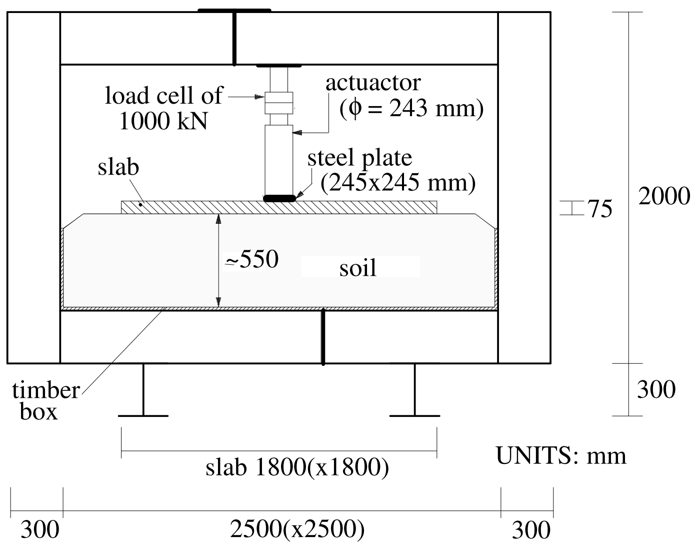


Figure 1 - Schematic representation of the supporting structure utilised in the tests.

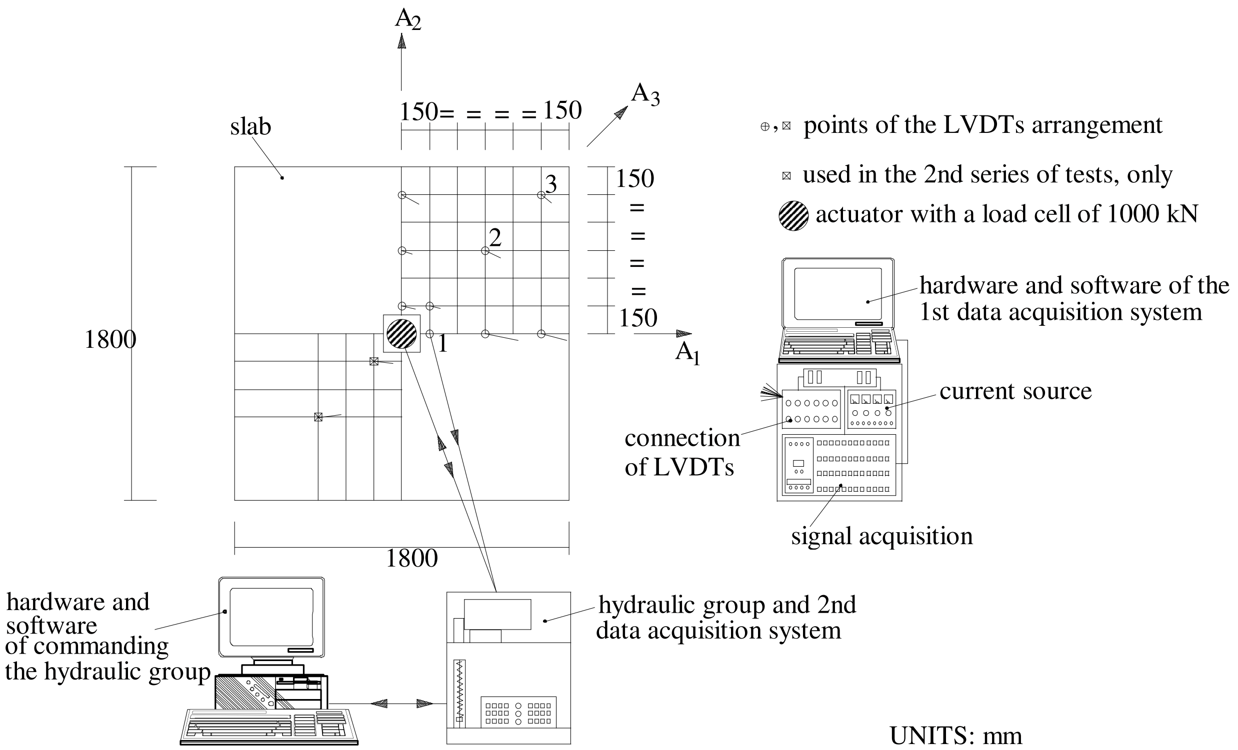
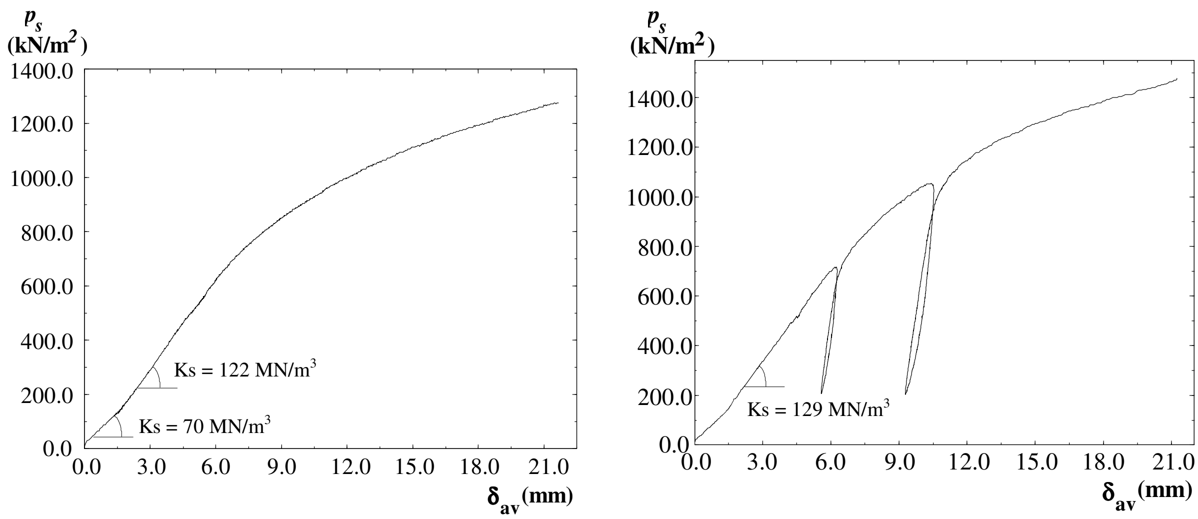
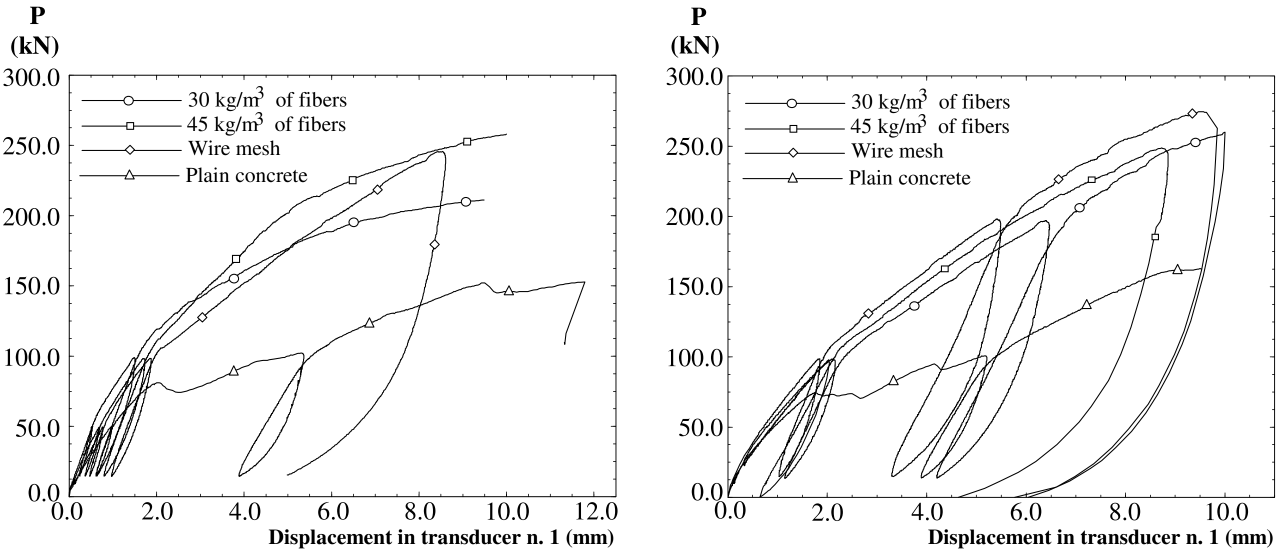


Figure 2 - Schematic representation of load application and data acquisition equipment.



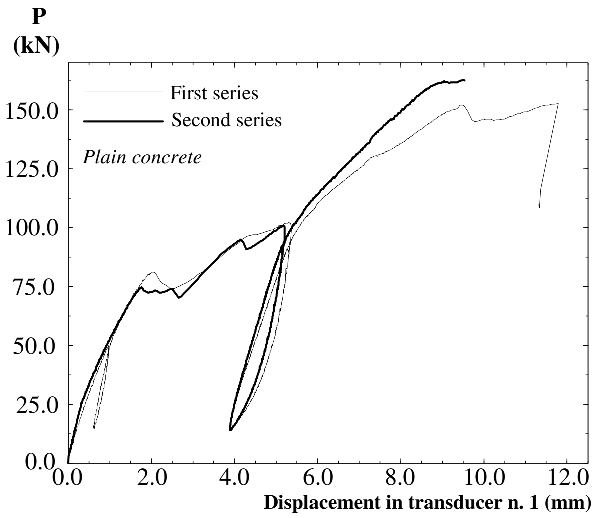
(a) (b)

Figure 3 - Relationship between the soil pressure and the average displacement, obtained in plate loading test before performing the first (a) and second (b) series of tests with slabs on soil.

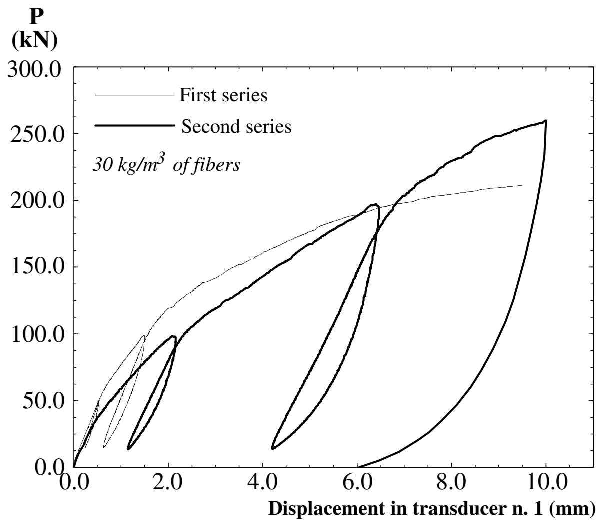


(a) (b)

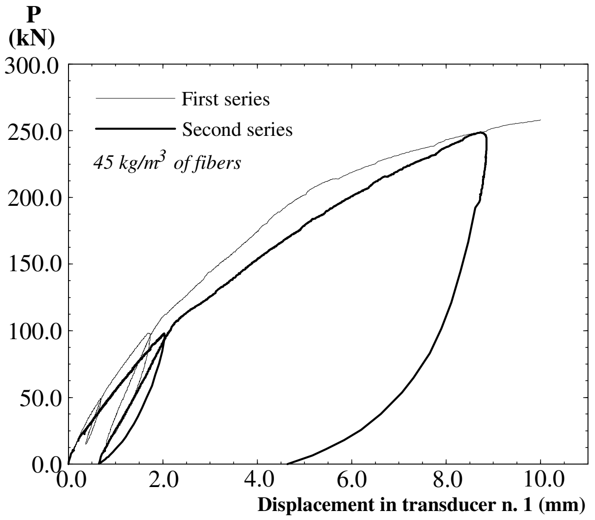
Figure 4 - Load-displacement relationship at *LVDT* number 1 (see Figure 2) for the first (a) and second (b) series of tests.



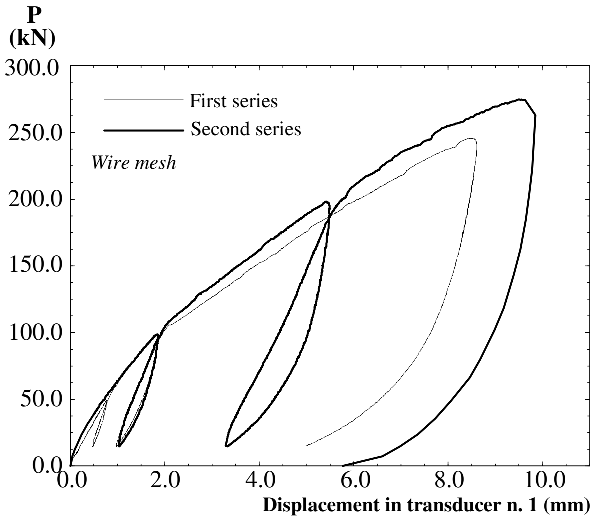
(a)



(b)



(c)



(d)

Figure 5 - Load-displacement relationship at *LVDT* number 1 (see Figure 2) for the slabs of plain concrete (a), reinforced with 30 (b) and 45 (c) kg/m^3 of fibers, and reinforced with wire mesh (d).

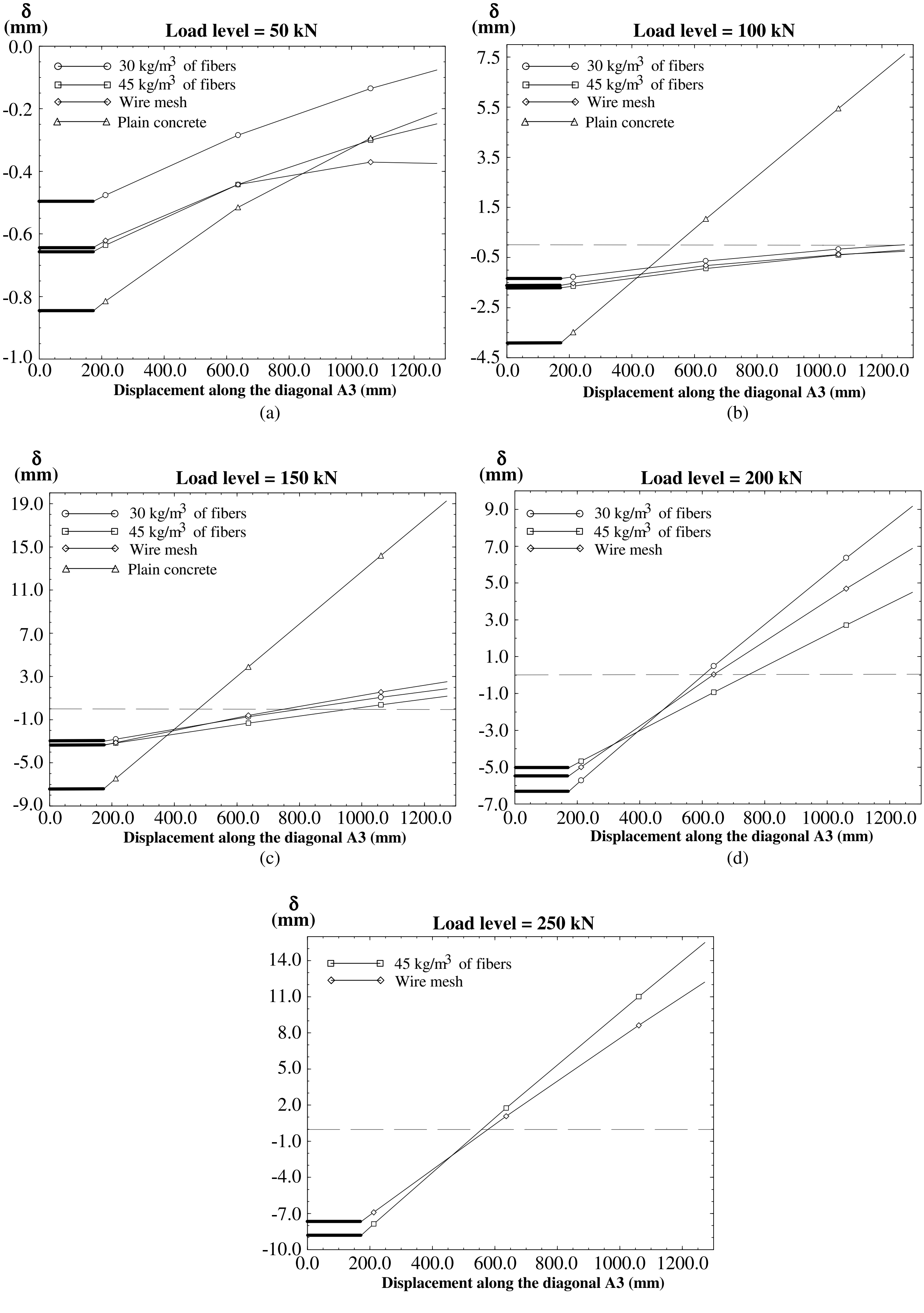


Figure 6 - Displacements measured in the *LVDTs* placed along the diagonal A3 (see Figure 2), for the first series of tests and for five load levels: 50 kN (a), 100 kN (b), 150 kN (c), 200 kN (d), 250 kN (e).

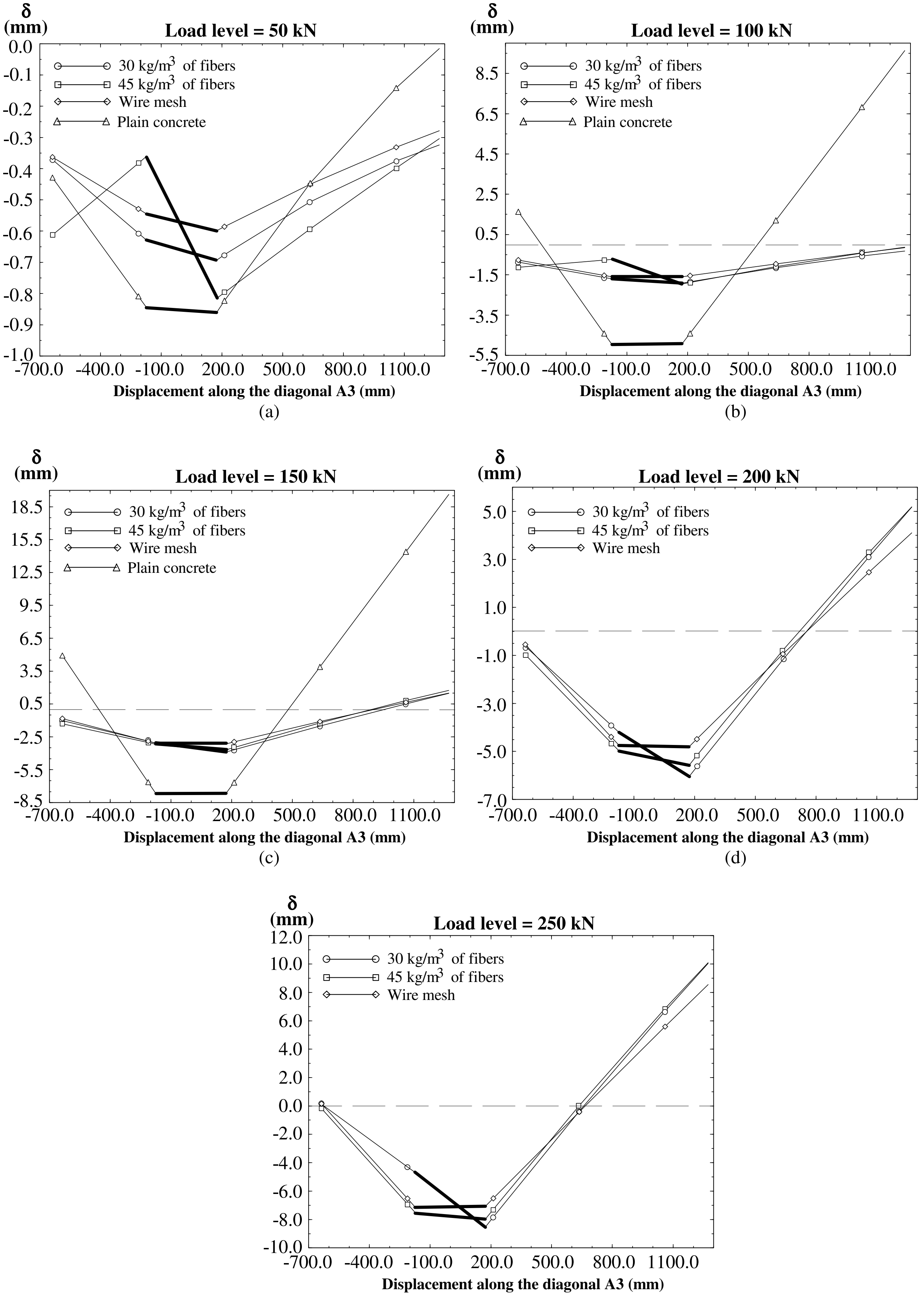


Figure 7 - Displacements measured in the *LVDTs* placed along the diagonal A3 (see Figure 2), for the second series of tests and for five load levels: 50 kN (a), 100 kN (b), 150 kN (c), 200 kN (d), 250 kN (e).

(a) (b)

(c) (d)

Figure 8 - Crack pattern of the slabs of the second series of tests: *SL2s00* (a), *SL2s30* (b), *SL2s45* (c) and *SL2sms* (d).

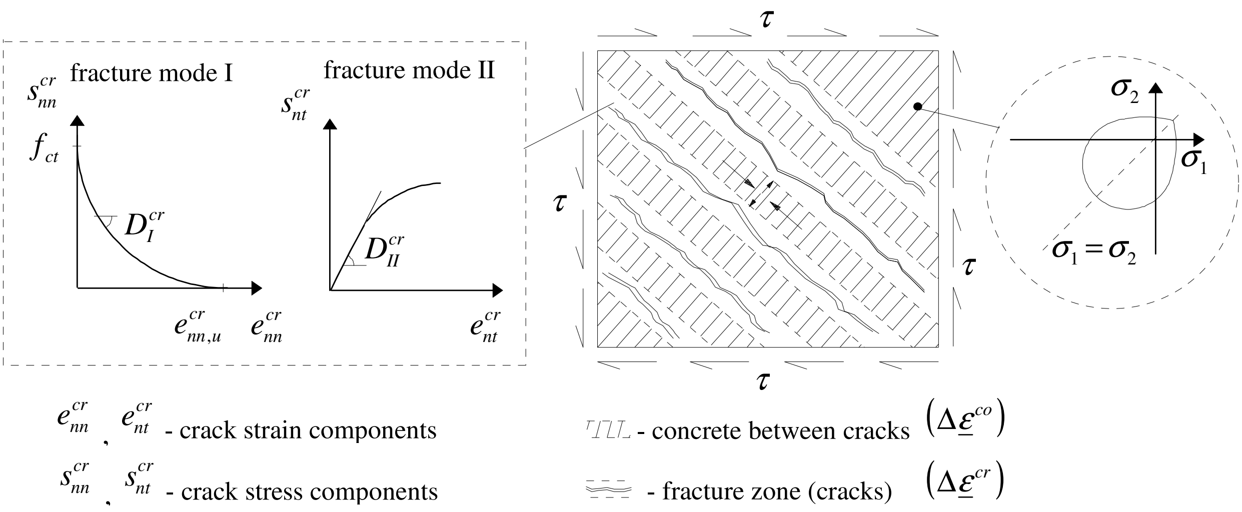
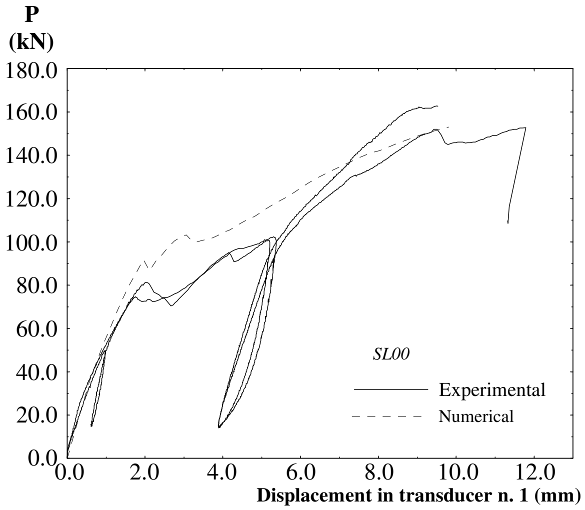
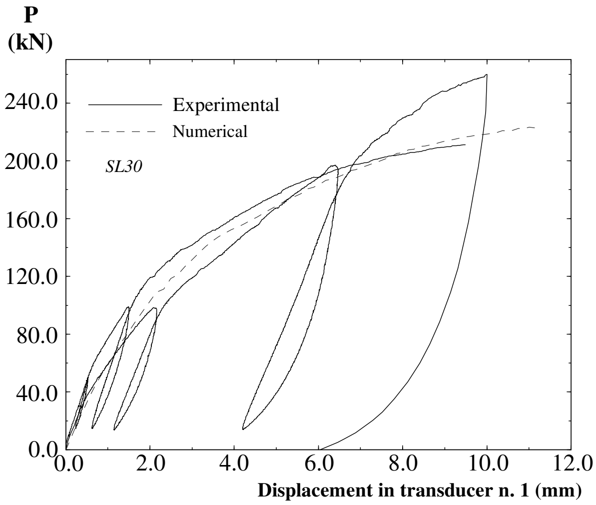


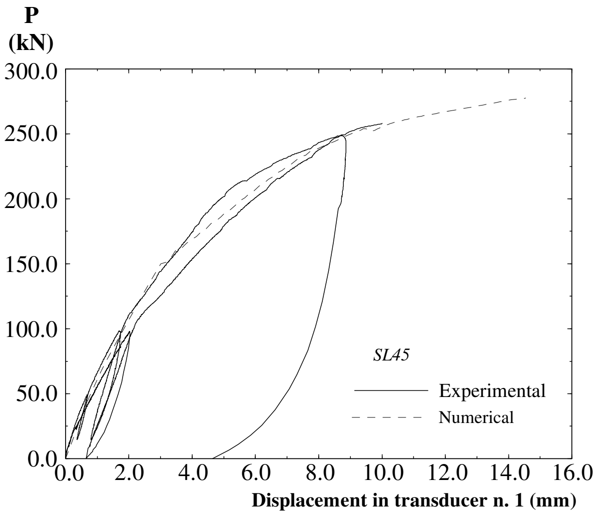
Figure 9 - Schematic representation of the strain decomposition concept for cracked concrete.



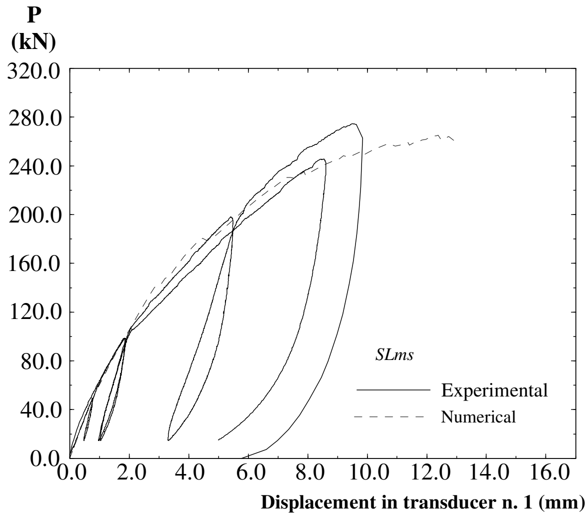
(a)



(b)



(c)



(d)

Figure 10 - Load-displacement relationship at *LVDT* number 1 (see Figure 2) for the slabs of plain concrete (a), reinforced with 30 (b) and 45 (c) kg/m^3 of fibers, and reinforced with wire mesh (d).

Table 1 - Mixture proportions.

Component	Content (kg/m^3)
Cement (c)	450
Fine aggregate (0-3 mm)	732
Coarse aggregate (3-15 mm)	1055
Water (w)	171 (*w/c* ratio =0.38)
Additive (ad) (Rheobuild 561)	2.25 (% in weight by cement=0.5)
Fibers (Dramix *ZX60/.80*)	0, 30, 45 (% in volume: 0.0, 0.38, 0.57)

Table 2- Average values of concrete properties evaluated from the tests on the specimens.

Specimens corresponding to the slab	**Uniaxial compression**		**Three point bending**		
	f_{cm} (3) (MPa)	ε_{c1} (4) ($\times 10^{-3}$)	Net bending stress[13], f_{fnet}, (MPa)	Fracture energy[10], G_f, (N/mm)	Toughness factor[12], f_{feq}, (MPa)
SL1s00(1)	38.3	2.47	5.1 at 139 days	0.213/2 mm(5)	0.51
SL1s30(1)	48.8	3.05	5.1 at 228 days	2.957/25 mm(5)	2.43
SL1s45(1)	56.8	2.94	6.6 at 190 days	7.506/25 mm(5)	4.80
SL1sms(1)	43.4	2.39	4.6 at 161 days	0.227/2 mm(5)	0.40
SL2s00(2)	42.2	2.36	4.7 at 29 days	0.206/2 mm(5)	0.48
SL2s30(2)	51.1	2.68	5.4 at 178 days	3.355/25 mm(5)	3.1
SL2s45(2)	50.0	2.99	5.5 at 143 days	8.617/25 mm(5)	4.1
SL2sms(2)	47.4	2.46	4.7 at 61 days	0.185/2 mm(5)	0.43

(1) - Slabs of the first series of tests (00-plain concrete; 30, 45-reinforced with 30, 45 kg/m^3 of fibers; ms-reinforced with wire mesh)
(2) - Slabs of the second series of tests
(3) - Strength at the age of slab testing (average of three to six tests)
(4) - Strain corresponding to peak stress
(5) - Estimated ultimate deflection

Table 3 - Soil characteristics and properties.

Soil classification	Silty sand well graded, non plastic; SM in the classification of soils for engineering purposes (ASTM, D2487-85); A-1-b(0) in the AASHO classification for highway and road construction
Modified Proctor tests	Maximal dry density $\gamma_{d\max} = 19.4$ kN/m^3 Optimal moisture content $W_{\mathrm{opt}} = 11.2\%$
California Bearing Ratio[14] (CBR)	30%

Table 4 - Ultimate load and failure mode of the slabs.

Slab reference (See table 2)	**Ultimate load (kN)**	**Comments on failure mode**
SL1s00	153	The cracks crossed the slab thickness splitting the slab in parts. Punching failure.
SL2s00	163	
SL1s30	211	The cracks did not reach the slab top surface. Large deformations in the soil-slab system.
SL2s30	260	
SL1s45	257	The cracks did not reach the slab top surface. Large deformations in the soil-slab system.
SL2s45	248	The cracks did not reach the slab top surface. Test stopped at 248 kN.
SL1sms	245	The cracks did not reach the slab top surface. Large deformations in the soil-slab system.
SL2sms	274	After rupture of some wires of the reinforcing mesh, the cracks crossed the slab thickness.